KITTELSON & ASSOCIATES

Downtown Medford Multimodal Concept Plan

Technical Appendix 2 – Multimodal Study Background Material

Overview

Technical Appendix 2 – Background Material contains a collection of deliverables produced to-date for the Downtown Medford Multimodal Study. These deliverables helped inform the development and selection of the preferred concept and were finalized prior to the final Downtown Medford Multimodal Concept Plan.

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Background Material Review

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Memorandum

April 27, 2022

Project# 27145

To: Christina Charvat
Karl MacNair
City of Medford

From: Nick Gross, Amy Griffiths, Susan Wright, PE

RE: Riverside, Central & E. Main Multimodal Enhancement Study

BACKGROUND MATERIAL REVIEW

The following memorandum provides a summary of the relevant background material for the Riverside, Central & E. Main Multimodal Enhancement Study (Study) with particular focus on active transportation considerations, challenges, and previously identified design concepts for Riverside Avenue, Central/Court Avenue, and E Main Street corridors.

Relevant Background Material

The following list includes the relevant background material that will inform the development of the Study. The list of documents has been developed based on discussions with City of Medford staff, knowledge of relevant statewide planning and policies guidance, and project team experience working in the City of Medford.

- City of Medford Transportation System Plan (TSP)
- Medford 2040 Vision & Action Plan
- Liberty Park Neighborhood Plan
- Rogue Valley Active Transportation Plan (RVATP)
- Central Avenue
- I-5 Exit 30 Interchange Area Management Plan (The "Big X" Project)

This memorandum is intended to guide the development of the Study and the concept design development.

CITY OF MEDFORD TRANSPORTATION SYSTEM PLAN

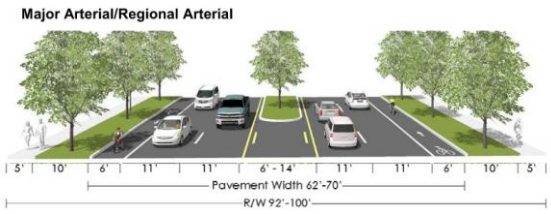
The City of Medford Transportation System Plan (TSP), 2018 provides a long-range vision for the transportation system in Medford over the next 20 years and outlines a proves for how it can be achieved with prioritized plan elements.

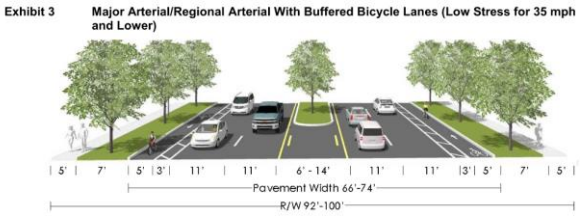
PROJECT RELEVANCE:

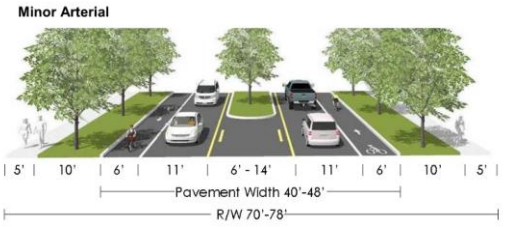
The City's TSP, adopted in 2018, identifies the following applicable projects:

- B155: Riverside Ave, OR62 to Barnett Rd. Reconfigure to provide bike facilities.
- B156: Riverside Ave, Barnett Rd to Stewart Ave. Widen sidewalk to provide 14' wide bike/pedestrian facility behind the curb.
- B157: Central Ave, 4th St to Barnett Rd. Reconfigure to provide bike facilities
- B16: Court St, Rossanley Dr to Edwards St. Reconfigure to provide bike facilities.
- B17: Central Ave, McAndrews Rd to Jackson St. Reconfigure to provide bike facilities.

The TSP also identifies standard cross sections based on roadway functional classifications. Riverside Avenue, Court Street, and Central Avenue are major arterials. E Main Street is a major arterial between the couplet and a minor arterial outside the couplet. The TSP mentions that Central Avenue, Riverside Avenue, Court Street, Main Street, and East Main Street will likely have alternative cross sections.











MEDFORD 2040 VISION & ACTION PLAN

Medford 2040 is a plan for the future that covers five topic areas: fostering economic growth & resiliency, enhancing hometown, connecting community, fostering safety & wellness, and promoting recreational

opportunities. It includes a goal to pursue funding opportunities that will promote and modernize transportation and multi-modal access systems by:

- Implementing the City of Medford Transportation System Plan. Projects include the South Stage Interchange, the MegaCorridor, and the Crater Lake Highway Interchange/Connection.
- Coordinating long term infrastructure planning with the airport authority.
- Seek and obtain funding to support Rogue Valley Transportation District expansion and integration in new developments.

It also includes a goal to invest in downtown revitalization and activities to enhance economic development efforts and quality of life by:

- Completing the City Center Revitalization Plan.
- Investing in infrastructure that makes downtown more walkable and accessible.

It aims to foster a vibrant downtown open all week with shopping and entertainment to attract people from around the region by:

- Enhance sidewalk availability and conditions to maintain a safe and clean public space.

It recommends developing develop a wayfinding system that makes it clear and easy to navigate to Medford by:

- Establish districts with thematic colors/designs/etc., signpost different areas, and encourage architectural differentiation develop interactive, real-time, electronic wayfinding.

Clarify parking standards and signage.

It promotes enhancing multi-modal transportation options to and from downtown by:

- Improve lighting and safety for public parking facilities to encourage use.
- Collaborate with Rogue Valley Transportation District on their long term plan to establish regional transportation connections.
- Build a network of separated paths downtown to encourage non-vehicle movement.

PROJECT RELEVANCE:

The goals and actions above will be incorporated into performance measures.

LIBERTY PARK NEIGHBORHOOD PLAN

The Liberty Park Neighborhood Plan (LPNP), adopted in 2020, identifies the reconfiguration of OR99 between McAndrews Rd and Jackson St as a key community priority.

PROJECT RELEVANCE:

The plan identifies the following applicable projects:

- TC1: Reduce speed limit to 25 mph on OR-99 (Riverside Ave and Central St/Court Ave from McAndrews to Jackson)

- TC2: Re-stripe OR-99 to facilitate two vehicle through lanes, a bike lane, and parking (Court St/Central Ave between McAndrews Rd and Jackson St, and Riverside between McAndrews and Jackson)
- LR1: Reconfigure lanes on Riverside Ave and Court/Central St to include a protected bike lane (Riverside/Court/Central between McAndrews Rd and Jackson Street)
  - This project reconfigures travel lanes on Oregon Route 99 (Riverside Avenue northbound and Court Street/Central Avenue southbound) from Jackson Street to East McAndrews Road by reducing from three lanes to two lanes in each direction and implementing a protected bike lane. In addition, the speed limit would be reduced to 25 mph.
  - Option 1: Striped buffer with planters to provide physical separations (estimated cost $671,000)
  - 
  - Option 2: Concrete/hardscape buffer (estimated cost: $1,187,000)
  - 
  - Considerations: impacts to existing signal operations, protected bike lanes are more comfortable for users of all ages and abilities and improve the pedestrian environment, driveway consolidation would improve the function/safety of the protected bike lanes, identify crossing for access to Liberty Park Neighborhood,
- C3: Enhance pedestrian crossing with a Rectangular Rapid Flashing Beacon and continental crosswalk at Manzanita St and Court St (Manzanita and Court)
- BS-1: Relocate bus stops on OR-99 closer to the enhanced crossings described above (Neighborhood wide)
- I-86: Update signal phasing [at 4th Street and Central Avenue] for the westbound left turn lane from protected only to protected permissive phasing
- I-87: Update signal phasing [at 4th Street and Riverside Avenue] for the eastbound and westbound left turns from protected only to protected permissive phasing

ROGUE VALLEY ACTIVE TRANSPORTATION PLAN

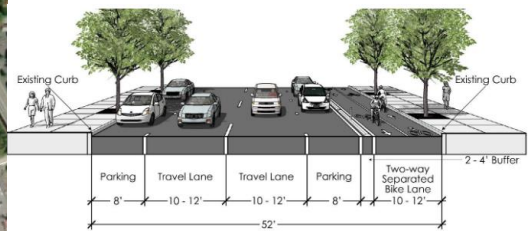
The Rogue Valley Active Transportation plan is a guiding document for engineers and planners working within the Rogue Valley to guide investment and active transportation facility design on their respective facilities.

PROJECT RELEVANCE:

The RVATP classifies the study streets as existing connector routes (with the exception of E Main Street which is classified as an existing regional route) and highlights the intersection with Rossanley Drive as an active transportation node.

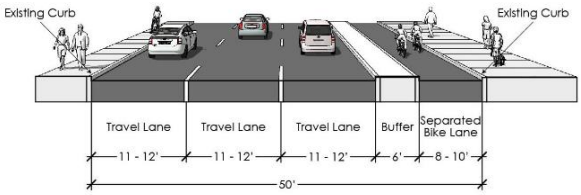
The RVATP identifies a road reorganization for E Main Street between Oakdale Avenue and the Bear Creek Greenway. The road reorganization includes the removal of a travel lane and installation of a two-way bicycle facility.





It also identifies a project to restripe N Riverside Avenue between Rossanley Drive and E McAndrews Road to provide separataed bike lane along the east side of the roadway. It menions there is an opportunity to remove one travel lane and that a buffered bike lane is recommended as an interim solution until a fully separated bike lane can be constructed.





CENTRAL AVENUE

The Medford Urban Renewal Agency (MURA) is funding a project to reconfigure Central Ave between Court/Edwards St and Jackson St. Public Works staff is currently completing the design to include two southbound travel lanes, a buffered bike lane on the west side of the street, and parallel parking on the east side of the street.

PROJECT RELEVANCE:

Central Ave between Jackson St and 10th St will continue to be striped with sharrows.

The intersection of S Central Ave and 12th St has been identified for safety mitigation as part of a private development. The crash rate exceeds the 90th percentile crash rate for similar intersections. The mitigation

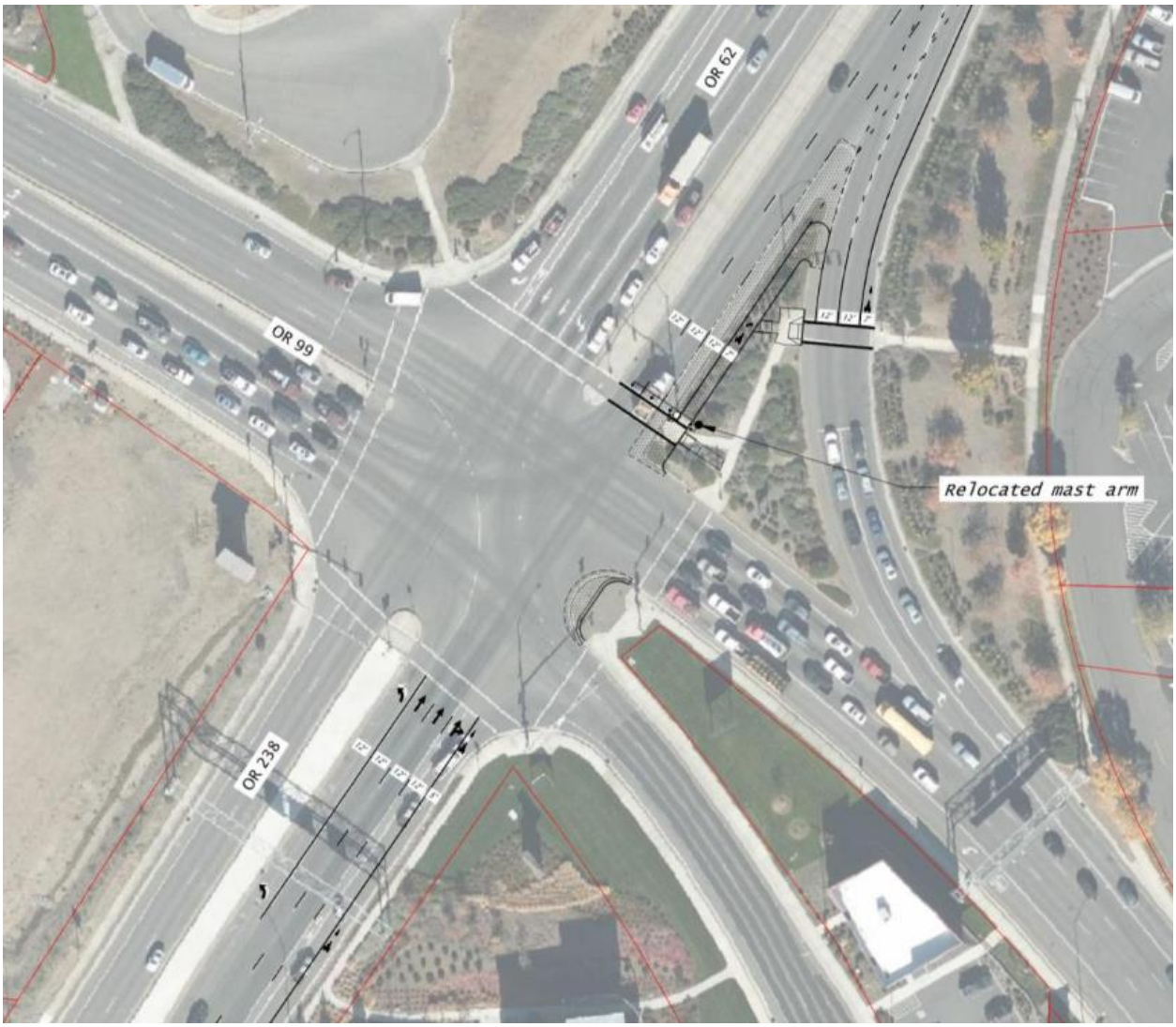
identified by the developer's traffic engineer was to convert the far-left southbound approach lane to a left-turn only lane with flexible post delineators.

I-5 EXIT 30 INTERCHANGE AREA MANAGEMENT PLAN (THE "BIG X" PROJECT)

ODOT is planning to overlay parts of OR99 and OR62 in 2024 and is currently designing a lane reconfiguration along Riverside Ave and Court St from the intersection of those state highways ("the Big X") south to Ohio St.

PROJECT RELEVANCE:

The project extents tie into The Big X project. The project results in future year volume-to-capacity ratio of 0.92. This would not outright meet the OHP mobility target, therefore potentially requiring an alternative mobility target to be adopted.



JACKSON STREET & 4TH STREET RECLASSIFICATION TO MINOR ARTERIAL TRAFFIC ANALYSIS

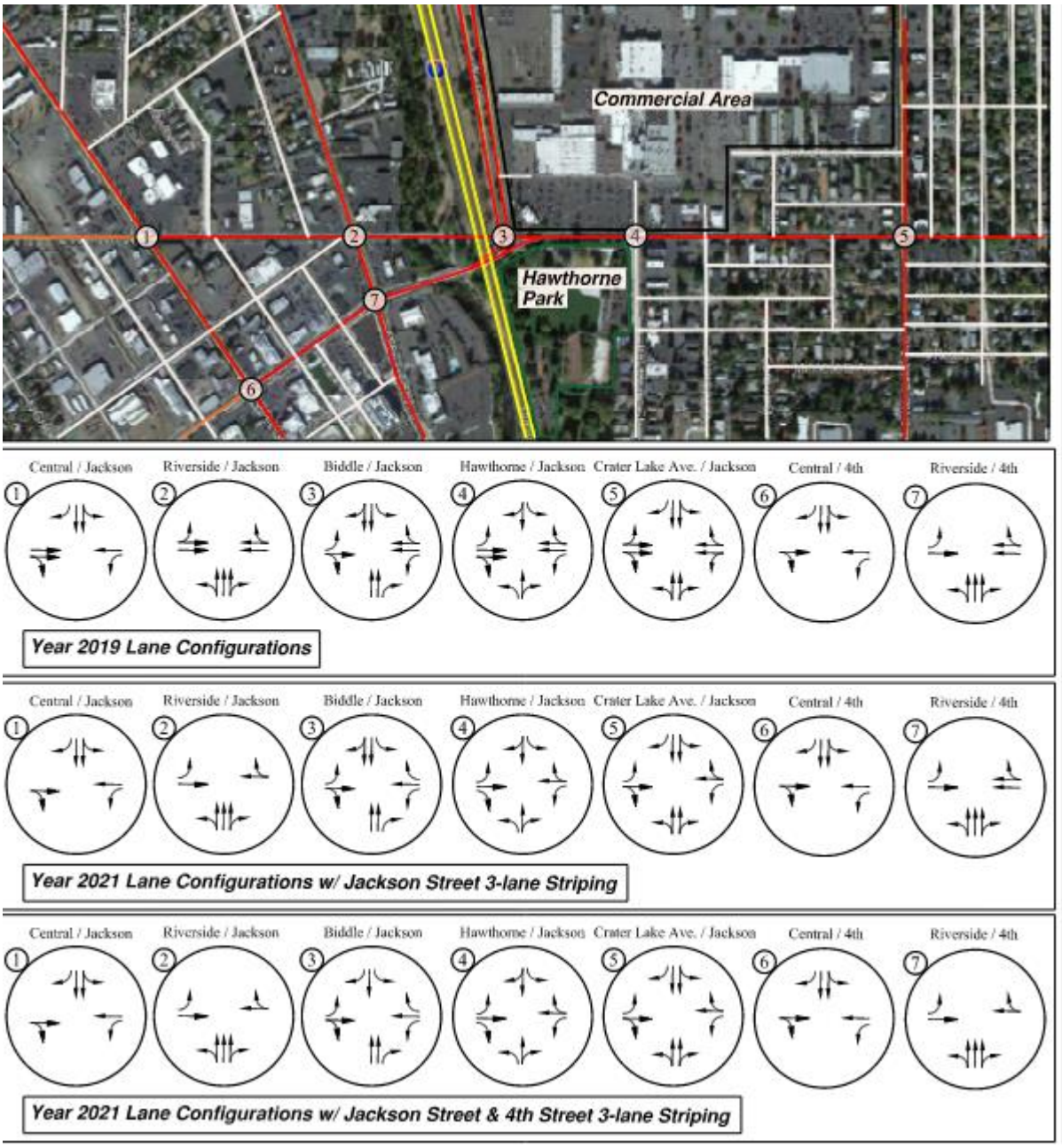
A traffic impact studied was prepared for a proposed street reclassification from Major Arterial to Minor Arterial on Jackson Street and 4th Street between Central Avenue and Jackson Street.

ODOT is planning to overlay parts of OR99 and OR62 in 2024 and is currently designing a lane reconfiguration along Riverside Ave and Court St from the intersection of those state highways ("the Big X") south to Ohio St.

PROJECT RELEVANCE:

This conversion would modify the lane configurations of Central Avenue & Riverside Avenue / Jackson Avenue as well as the intersections of Central Avenue & Riverside Avenue / 4th Street.

Results of the study show that all study area intersections operate acceptably with and without proposed striping changes. Under future year 2038 conditions, the intersection of 4th Street / Riverside Avenue exceeds mobility standards when converted to a 3-lane facility. This could be mitigated by changing the westbound left turn movement on 4th Street at Central Avenue and eastbound left turn movement on 4th Street at Riverside Avenue to permissive. It could also be converted two eastbound travel lanes, one westbound travel lane, a center TWLTL, and bike lanes. It mentions however that one or both bike lanes may need to be removed and striped as sharrows (due to the 50 foot cross section), but this would be determined in the design process.



Next Steps

The information provided in this memorandum will guide concept design development and selection of performance measures.

Performance Measures

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Memorandum

May 25, 2022

Project# 27358

To: Christina Charvat
Karl MacNair
City of Medford

From: Nick Gross, Amy Griffiths, Susan Wright, PE

RE: Riverside, Central, E Main Multimodal Study

PERFORMANCE MEASURES

The purpose of this document is to articulate the evaluation criteria and performance measures for use in comparing the design options. Two evaluations will be performed throughout the duration of the study:

1. A preliminary screening (good, fair, poor) of the draft cross sections with the purpose in identifying a narrowed down list of Concepts to be advanced.
2. A detailed evaluation including a quantitative operational assessment of the narrowed down list with the purpose of identifying a preferred Concept.

The draft performance measures provide a full picture of roadway operations, including considerations to walking, biking, rolling, accessing transit, and driving.

Study Objectives

The objective of the Study is to develop a conceptual design for enhancing the bicycle and pedestrian environment along OR99 corridor (Riverside Avenue, Court Street, Central Avenue) and along E Main Street in downtown Medford while maintaining adequate vehicular traffic flow. The conceptual design alternatives will be developed with the goal of increasing healthy mobility options and achieving the community's desired vision for low-stress, comfortable, walking, biking, and rolling facilities accessing the downtown core.

Evaluation Criteria and Performance Measures

The goals and policy guidance from the City's Transportation System Plan (TSP), Rogue Valley Active Transportation Plan (RVATP), Medford 2040 Vision Plan (VISP), and Liberty Park Neighborhood Plan (LPNP) have been reviewed and used to inform the development of the evaluation criteria and performance measures. Table 1 summaries the draft evaluation criteria and performance measures for the Riverside, Central, E Main Multimodal Study.

- **Evaluation Criteria** are derived from the goal and supplemental policies from the Medford TSP, RVATP, LPNP, and will be used to develop and evaluate the initial conceptual design cross sections.
- **Performance Measures** are the measurements used to assess the evaluation criteria.
- **Description** includes the purpose and general explanation of the evaluation criteria, connecting the criteria to the specific community values for the study.

DEVELOPMENT OF CRITERIA AND PERFORMANCE MEASURES

Evaluation criteria and performance measures were identified based on a review of policies and guidance identified in relevant background planning material as well as national best practices for developing and evaluating context-sensitive low-stress bicycle and pedestrian facilities: *Urban Bikeway Design Guide, National Association of City Transportation Officials (NACTO), Guide for Developing Pedestrian and Bicycle Performance Measures, Federal Highway Administration (FHWA), Guide for the Development of Bicycle Facilities, American Association of State Highway Transportation Officials (AASHTO), and Design Manual for Bicycle Traffic, CROW.*

Table 1: Evaluation Criteria and Performance Measures

Evaluation Criteria	Performance Measure	Description
Safety	**Crash Reduction Factors**	What is the percentage (%) of anticipated crash reduction based on facility type?
	Conflict Points	How well does the facility avoid conflict points (e.g., number of driveways or turn lanes)?
Community Support	**Public Input**	How well is the concept design supported (based on input received during Public Outreach Events)?
	Planning Documents	How well does the concept achieve the goals established in background planning documents)?
Connectivity	**Access**	How accessible is the facility to access from adjacent and nearby facilities?
	Transition Zones	What transitions are required along the facility?
User Experience	**Bicycle Level of Traffic Stress (BLTS)**	How comfortable (or stressful) is the experience using the facility?
	Pedestrian Level of Traffic Stress (PLTS)	
Economic Opportunity	**Parking**	Is there a change to the quantity of parking spaces?
Feasibility	**Planning-Level Cost**	What is the cost to implement the low-stress facility?
	Implementation	What challenges might be faced to implement the facility? How will the project be delivered (e.g., preservation, capital, development)? Can the design be implemented incrementally?
	Right-of-Way Impact	Does the conceptual design extend beyond the existing right-of-way? How much?
	Maintenance	What level of maintenance is required? Can the facility be maintained with existing equipment? Will it require new equipment?

For the purposes of preliminary screening conducted as part of the Concept Design Memorandum, all conceptual design cross sections will be evaluated based on a qualitative scale (good, fair, poor) within the evaluation matrix. The rating scale is defined below:

- **Good**: The alternative meets the criteria or makes improvements in the criteria category
- **Fair**: The criterion does not apply to the alternative, or the alternative has no net effect on the criteria category (e.g., benefits are offset by drawbacks)
- **Poor**: The alternative negatively impacts the criteria category

Once preliminary screening is complete and a narrowed down list selected, an operations analysis will be performed for the narrowed down list of alternatives to quantify the impacts of the roadway reconfiguration. The operational analysis will produce quantitative values for the performance measures identified in Table 2 to further assist in the selection of a preferred Concept.

Table 2: Operational Evaluation Criteria and Performance Measures

Evaluation Criteria	Performance Measure	Description
Operations	**Travel Time**	What is the change in travel time along the main line?
	Vehicular Delay	What are the changes to side street delay? Particularly, left-turn delay?
	Pedestrian Delay	What changes to pedestrian delay are experienced?
	Bicycle Delay	What changes to bicycle delay are experienced?
	Pedestrian Level of Service	What is the level of service experienced by people walking?
	Bicycle Level of Service	What is the level of service experienced by people biking?
	Signal Progression	How does the window of opportunity to arrive on green change? How consistent is the quality of travel along the corridor?
	Queuing	Do queues spill back to adjacent intersections?

EVALUATION MATRIX FRAMEWORK

Table 33 provides the evaluation criteria scoring scale, reflecting how well an alternative achieves the criteria and performance measures. Alternatives will be scored based on their performance relative to one another. A unique matrix will be produced for each identified segment.

Table 3: Preliminary Screening Evaluation Criteria Scoring

Evaluation Criteria	Performance Measures	Good	Fair	Poor
Safety	**Crash Reduction Factors**	The project provides a **high** crash reduction factor	The project provides a **moderate** crash reduction factor	The project is **not** anticipated to reduce crashes at a location
	Conflict Points	The facility is positioned to provide a **low** number of conflicts	The facility is positioned to provide a **moderate** number of conflicts	The facility is positioned to provide a **high** number of conflicts
Community Support	**Public Input**	The project has a **positive** public response	The project has a **neutral** public response	The project has a **negative** public response
	Planning Documents	The facility is **highly consistent** with the envisioned facility type identified in background planning document goals	The facility is **moderately consistent** with the envisioned facility type identified in background planning document goals	The project is **not consistent** with the envisioned facility type identified in background planning document goals
Connectivity	**Access**	The facility is **easily** accessible from adjacent facilities	The project is **moderately** accessible from adjacent facilities and may require additional crossings	The project is **hardly** accessible from adjacent facilities, requiring out-of-direction travel or additional crossings
	Transition Zones	The facility requires **no** transitions along the corridor	The facility requires **some** transitions along the corridor	The facility requires **many** transitions along the corridor
User Experience	**Bicycle Level of Traffic Stress**	Project improves existing BLTS by **2 or 3 points**	Project improves existing BLTS by **1 point**	Project makes **no change** to existing BLTS
	Pedestrian Level of Traffic Stress	Project improves existing PLTS by **2 or 3 points**	Project improves existing PLTS by **1 point**	Project makes **no change** to existing PLTS
Economic Opportunity	**Parking**	The project **increases** the amount of on-street parking along the segment	The project does **not change** the amount of on-street parking along the segment	The project **decreases** the amount of on-street parking along the segment
Feasibility	**Planning-Level Cost**[1]	The project has a **low** cost	The project has a **moderate** cost	The project has a **high** cost
	Implementation	The project poses **no notable** implementation challenges	The project poses **moderate** implementation challenges	The project poses **substantial** implementation challenges
	Right-of-Way Impacts	The project **does not** require right-of-way acquisition	The project requires a **small** amount of right-of-way acquisition	The project requires a **high** amount of right-of way acquisition
	Maintenance	The facility requires **low** levels of maintenance	The facility requires **moderate** levels of maintenance	The facility requires **high** levels of maintenance

[1]During the preliminary screening, cost will be assessed based on high-level project components (e.g., restriping, curbs, vertical separation

Concept Design Memorandum

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Memorandum

July 15, 2022

Project# 27358

To: Christina Charvat
Karl MacNair
City of Medford

From: Amy Griffiths, Nick Gross, Susan Wright, PE

RE: Riverside, Central, E Main Multimodal Study

CONCEPT DESIGN MEMORANDUM – FINAL

The purpose of this memorandum is to evaluate the concept design cross section alternatives developed to address the active transportation needs in the study area. The evaluation of the concept design cross section alternatives is performed in several sets of matrixes with final conclusions summarized. The results of the evaluation have been combined with the consultant team recommendation to advance a narrowed down list of concept design cross section alternatives to be advanced in Task 4.

This memorandum also includes an enhanced pedestrian crossing analysis identifying recommended crossing treatments and locations for improvements to increase connectivity across the study corridors.

Evaluation Criteria & Performance Measures

Goals and policy guidance from the City's Transportation System Plan (TSP), Rogue Valley Active Transportation Plan (RVATP), Medford 2040 Vision Plan (VISP), and Liberty Park Neighborhood Plan (LPNP) were reviewed and used to inform the development of the evaluation criteria and performance measures used to conduct the preliminary screening of the concept design alternative cross sections.

Table 1 summarizes the evaluation criteria and subset of performance measures used as part of the preliminary screening of the concept design alternative cross sections.

Table 1: Evaluation Criteria & Performance Measures[1,2]

Safety	Community Support	Connectivity	User Experience	Economic Opportunity	Feasibility
•Crash Reduction Factors •Conflict Points	•Public Input •Planning Documents	•Access •Transition Zones	•Bicycle Level of Traffic Stress •Pedestrian Level of Traffic Stress	•Parking	•Planning-Level Cost •Right-of-Way Impact •Maintenance

[1] As part of the preliminary screening, the Transition Zone performance measures is only applied when a bicycle facility interacts with three identified locations: Planned multiuse path on east side of Riverside north of Ohio, Bear Creek Greenway access (east end of E Main Street), and south end of couplet.

[2] As part of the preliminary screening, Right-of-Way Impacts is only applied to the South End of Couplet segment.

Study Area

The study area includes the corridors of Riverside Avenue, Central Avenue, and Court Street between Ohio Street (to the north), and Stewart Avenue (to the south) as well as E Main Street between Oakdale (to the west), and the Bear Creek Greenway (to the east). Figure 1 illustrates the study area streets.

TRAFFIC CALMING

The LPNP identifies the need for traffic calming treatments to address the community's concerns about speeding traffic, cut-through traffic, traffic volumes, and safety for people traveling to community destinations. The LPNP identifies a project to reduce speed limits from 30 miles per hour (MPH) to 25 MPH on OR-99 (Riverside Avenue and Central Avenue). The speed reduction project is intended to be implemented with a lane reconfiguration projects that would create a street environment to support low speed travel. Concept design cross sections presented in this memorandum are supportive of those projects by including bicycle facilities, parking, removing a vehicle lane, and narrowing the vehicle lane widths. These proposed roadway reorganization elements have proven documentation in reducing speeds and increasing safety for all users of the roadway.

PARALLEL MULTIMODAL FACILITIES

Integration into adjacent and nearby parallel facilities is a critical component to the success of concept design cross section alternatives. Two primary parallel facilities are identified within close proximity to the study area and will be considered as part of the Connectivity criteria evaluation.

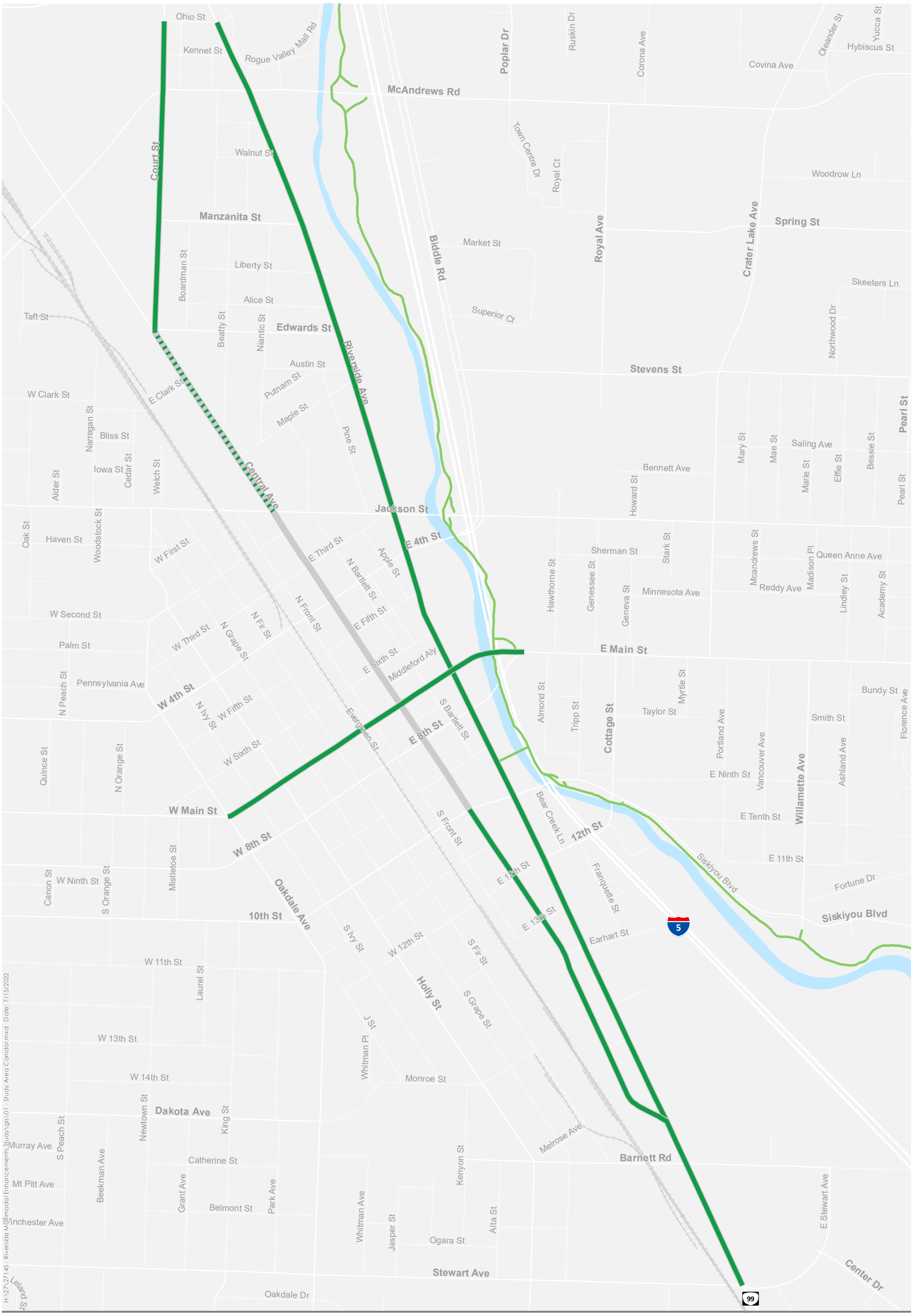
Bear Creek Greenway

The BCG is an important local and regional multiuse trail that provides transportation and recreation opportunities parallel to the study area, east of Bear Creek. The distance from the BCG to the study area varies from approximately 0.09 to 0.6 miles. Interstate 5 and Bear Creek are barriers between the study area and the BCG with limited connections providing access to downtown Medford. Within the study area, existing connections to the BCG are limited to E McAndrews Road, E Jackson Street, E Main Street, E 4th Street, E 10th Street, E 8th Street, and the 9th Street foot bridge approximately 300 feet north of E 10th Street.

Although close in proximity, connectivity between the Liberty Park Neighborhood and the BCG is currently limited. The nearest access points are located at E McAndrews Road on the north edge of the neighborhood and at E Jackson Street on the south edge.

Holly Street Neighborhood Greenway

Holly Street (from Jackson Street to Monroe Street) is identified in the City of Medford Transportation System Plan (TSP) as a planned neighborhood greenway that runs somewhat parallel to the study area. The distance between Holly Street and Central Avenue is approximately 1/4 mile. The distance between Holly Street and Riverside Avenue ranges from approximately 3/10 mile to 4/10 mile. Holly Street does not continue north of W Jackson Street and therefore, does not serve as a parallel route for the entire length of the study area. Primary connections to the planned neighborhood greenway include W Jackson Street, W 4th Street, W 10th Street, Barnett Road, and the E Main/8th Street couplet.


Study Streets
MURA Reconfiguration Project
Planned Sharrows
Bear Creek Greenway
0
1,000 Feet
Figure 1
Study Area Streets
Medford, Oregon
KITTELSON & ASSOCIATES
H:\27\27145 - Riverside Multimodal Enhancements Study\gis\01 - Study Area Corridor.mxd Date: 7/15/2022

Concept Design Cross Section Alternatives

Cross sections were developed for each segment along Riverside Avenue, Central Avenue/Court Street, and E Main. The following alternatives were considered:

- One-Way Separated Bike Lane
- One-Way Buffered Bike Lane
- Two-Way Buffered Bike Lane
- One-Way Parking-Protected Bike Lane
- Two-Way Parking-Protected Bike Lane
- Multiuse Paths
- Raised Separated Bike Lanes
- Raised Separated Bike Lanes with Buffer

The following sections illustrate the concept design cross section alternatives for E Main Street, Riverside Avenue south of the couplet, and for the typical and wider cross sections along Riverside Avenue, Central Avenue, and Court Street. The full set of cross section designs unique to each segment is provided in Appendix "A".

Note: For the purposes of concept design planning, facility widths, vertical buffer types, and level of separation are approximate and will require further refinement. The design of a preferred alternative will be refined based on the unique and location specific needs as well as further refinement of bicycle facility design concepts.

E MAIN STREET

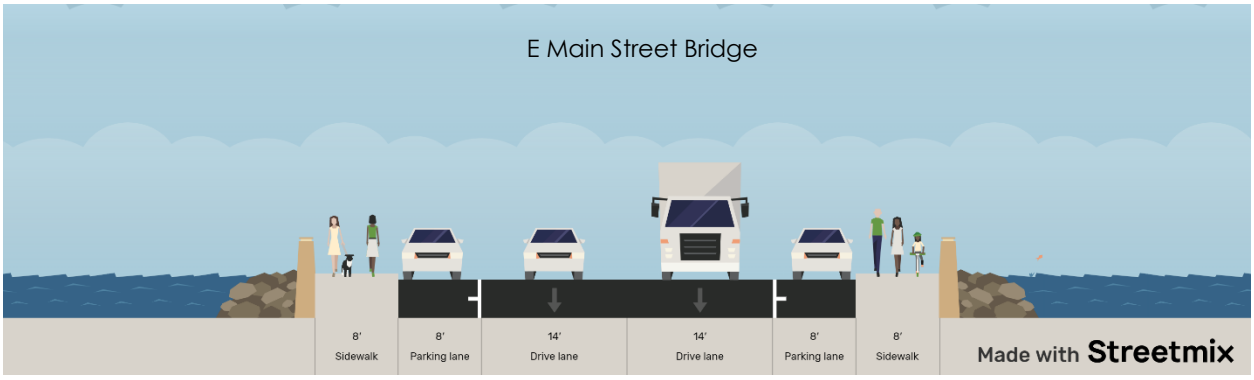


Existing Conditions

Within the study area, E Main Street is a one-way, westbound roadway with a posted speed limit of 25 MPH between Oakdale Avenue and the Bear Creek Greenway (BCG). Access to the BCG is provided at the eastern extents of the E Main Street within the study area, approximately 270 feet west of the E Main Street/Arnold Street intersection. The exhibit below illustrates the existing cross section.

Existing Conditions





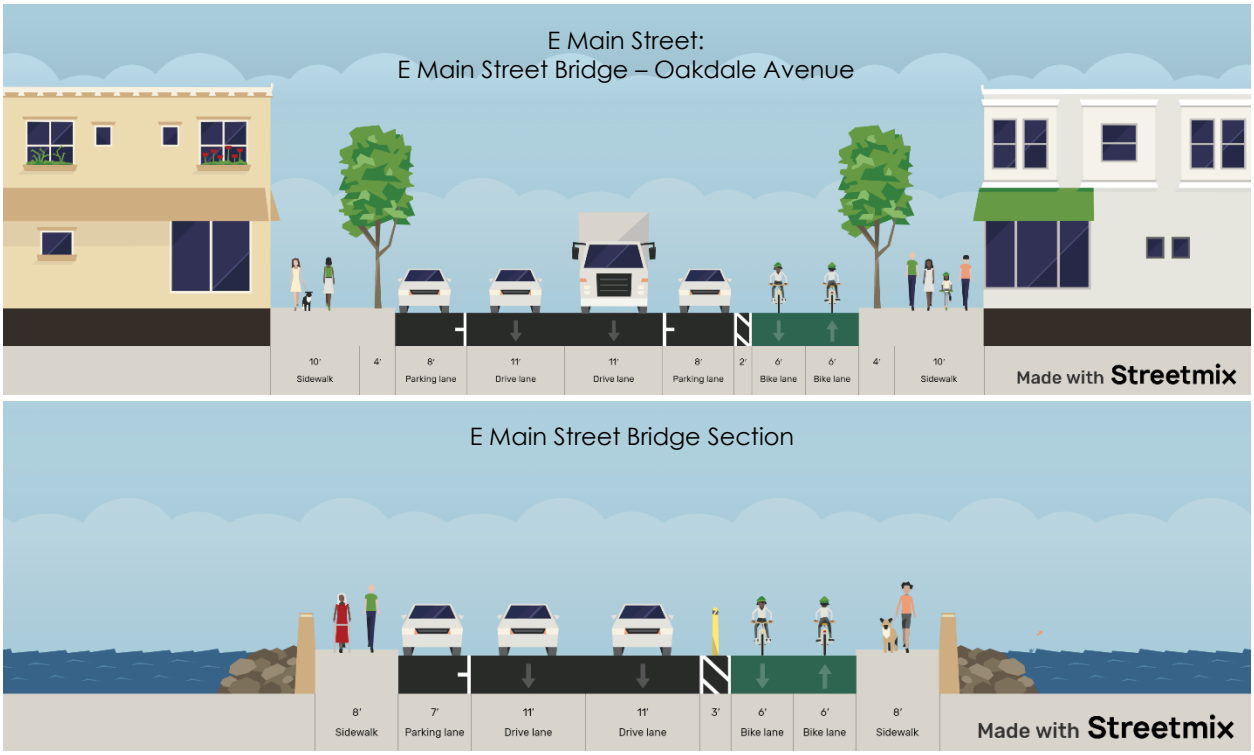
As shown in the exhibit above, the existing cross section includes three 12-foot drive lanes (one with "sharrows"), two 8-foot parallel parking lanes, and 14-foot sidewalks. The existing right-of-way (ROW) is approximately 80 feet, and the existing curb-to-curb width is approximately 52 feet.

On the bridge, the existing cross section includes two 14-foot drive lanes and two 8-foot parallel parking lanes. The existing ROW is approximately 60 feet, and the existing curb-to-curb width is approximately 44 feet.

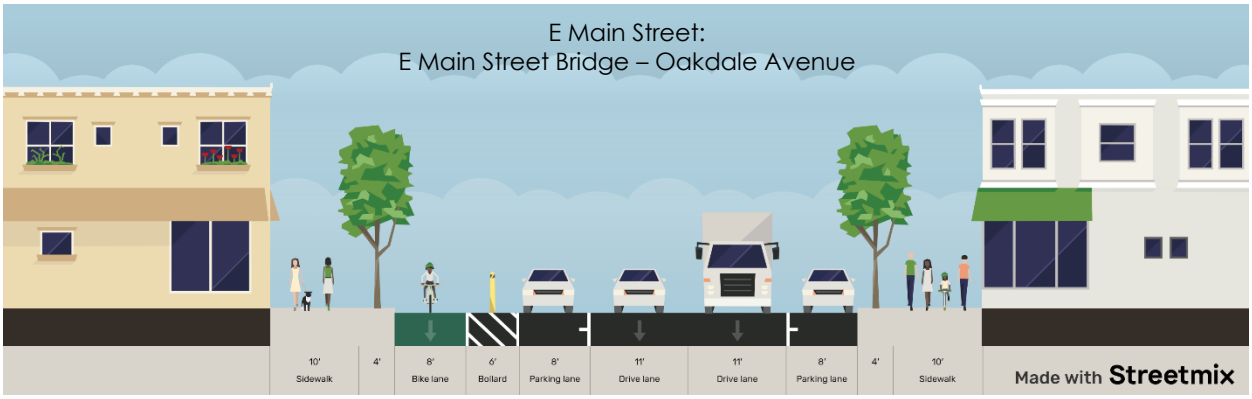
Concept Design Cross Section Alternatives

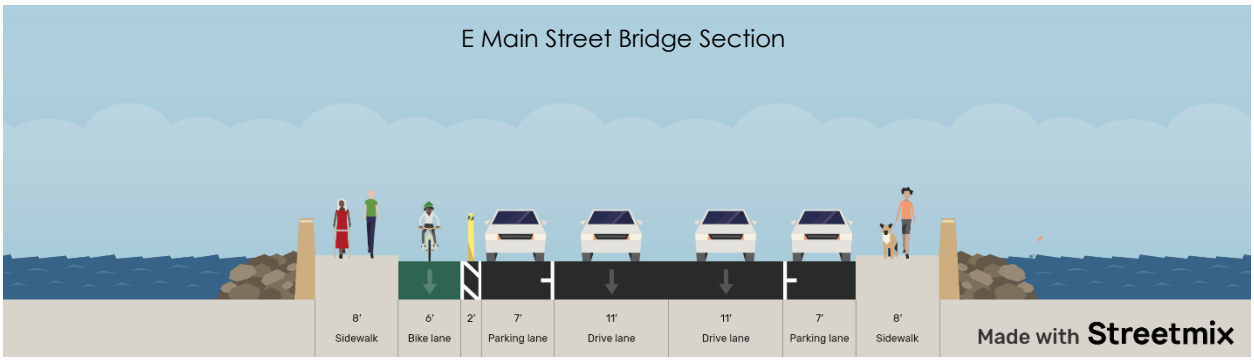
As shown in the exhibits below, three concept design cross section alternatives were produced to address the multimodal needs identified for E Main Street. All three alternatives maintain existing ROW and existing curbs, remove one drive lane, and narrow the remaining two drive lanes to 11-feet. Alternative 3 introduces an additional curb to increase level of separation for people biking, reducing the curb-to-curb travel way from 52 feet to 38 feet. Table 2 summarizes the evaluation of the E Main Street concept design cross section alternatives.

Alternative 1 | Two-Way Parking-Protected Bike Lane (Left)

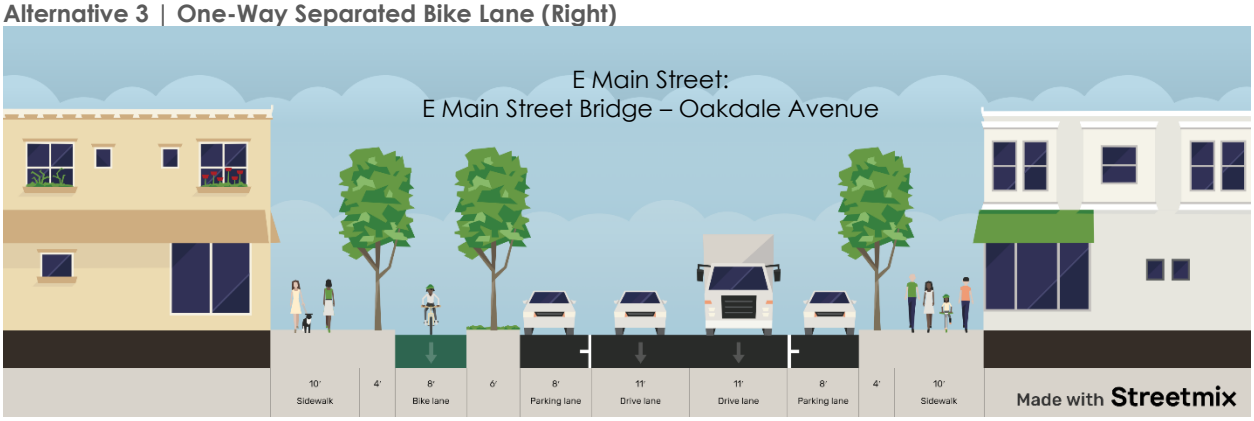


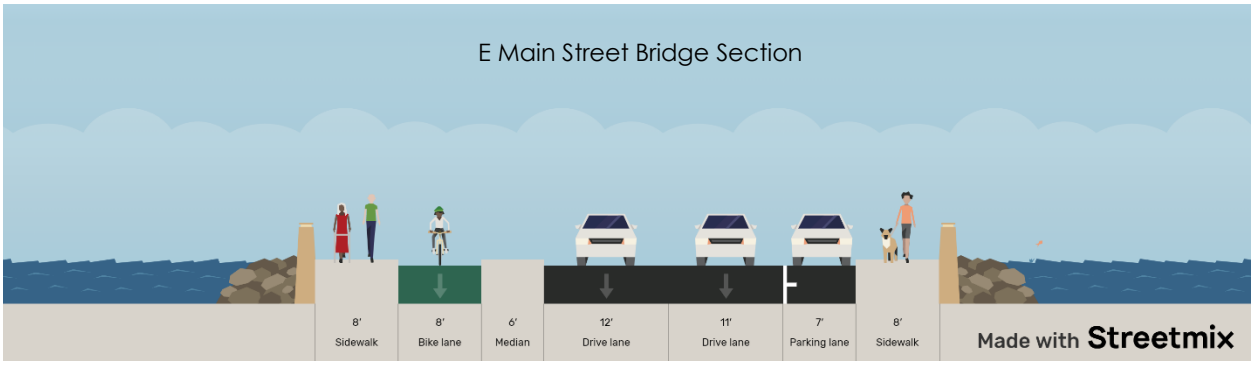
Alternative 2 | One-Way Parking-Protected Bike Lane (Right)





Alternative 3 | One-Way Separated Bike Lane (Right)





Evaluation Matrix

Table 2: E Main Street Alternatives Evaluation

Evaluation Criteria	Performance Measure	Alternative 1 | Two-Way Parking-Protected Bike Lane (Left)	Alternative 2 | One-Way Parking-Protected Bike Lane (Right)	Alternative 3 | One-Way Separated Bike Lane (Right)
Safety	Crash Reduction Factors[1]	Fair (+0) – installing buffered bike lanes[2] (BP24) has a moderate crash reduction factor (47% reduction in bicycle crashes at all injury severities)	Good (+1) – installing cycle tracks[2] (BP23) has a high crash reduction factor (59% reduction in bicycle crashes at all injury severities)	Good (+1) – installing cycle tracks (BP23) has a high crash reduction factor (59% reduction in bicycle crashes at all injury severities)
	Conflict Points	Good (+1) – the facility is positioned (left) to provide a low number of conflict points compared to other alternatives[3]	Fair (+0) – the facility is positioned (right) to provide a moderate number of conflict points compared to other alternatives	Fair (+0) – the facility is positioned (right) to provide a moderate number of conflict points compared to other alternatives
Community Support	Public Input	Fair (+0) – the two-way facility received mixed responses from the public. Some participants appreciated the convenience of a bi-directional facility, while others felt it was not as intuitive as one-way facilities	Fair (+0.5) – the one-way buffered bike lane was supported by the public, but not as strongly as other options	Good (+1) – The one-way separated bike lane was a preferred facility type in the first open house
	Planning Documents	Good (+1) – this alternative is consistent with the RVATP and is in alignment the TSP recommended "protected bike lanes" facility type.	Fair (+0) – the alternative is consistent with the TSP recommendation for providing enhanced bicycle facilities, but does not provide the amount of separation desired for the segment across the bridge.	Good (+1) – the alternative is consistent with the TSP recommendation for "protected bike lanes".
Connectivity	Access	Good (+1) – this alternative provides bi-directional access	Fair (+0) – the alternative provides one-directional access	Fair (+0) – the alternative provides one-directional access
	Transition Zones	Fair (+0) – this alternative requires addressing some challenging transitions along the corridor, particularly near the BCG access	Good (+1) – this alternative requires minimal transitions challenges along the corridor	Good (+1) – this alternative requires minimal transition challenges along the corridor
User Experience	Bicycle Level of Traffic Stress (BLTS)	Good (+1) – this alternative improves the BLTS by 2 points	Good (+1) – this alternative improves the BLTS by 2 points	Good (+1) – this alternative improves the BLTS by 2 points
	Pedestrian Level of Traffic Stress (PLTS)[4]	Fair (+0) – this alternative improves the PLTS by 1 point	Fair (+0) – this alternative improves the PLTS by 1 point	Fair (+0) – this alternative improves the PLTS by 1 point
Economic Opportunity	Parking	Fair (+0) – this alternative does not change the amount of on-street parking along the segment	Poor (-1) – this alternative reduces the amount of on-street parking available along the bridge section of this segment	Poor (-1) – this alternative reduces the amount of on-street parking available along the bridge section of this segment
Feasibility	Planning-Level Cost	Good (+1) – this alternative has a relative low cost because it only requires restriping the roadway	Good (+1) – this alternative has a relative low cost because it only requires restriping the roadway and constructing buffers	Poor (-1) – this alternative has a high cost because it requires construction of new curbs
	Maintenance	Good (+1) – this alternative does not include vertical separation and can be maintained using existing equipment. The painted buffer will require low levels of maintenance	Fair (+0) – this design requires maintenance of the buffer; the buffers can be placed so that no special road maintenance equipment is required	Poor (-1) – the facility may require special maintenance equipment[6]
TOTAL		6	3.5	2

[1] Crash Reduction Factors were identified using Oregon Department of Transportation's All Roads Transportation Safety Program (ARTS) Crash Reduction Factors (CRFs).
[2] ARTS defines a cycle track as a bike lane (one- or two-way) with a physical barrier between the bike and motor vehicle travel lanes, such as a curb or parking lanes. Note that segments are evaluated according to the most-constrained section (e.g. parking separation is not provided across the bridge, therefore Alternative 1 scores slightly lower with respect to crash reduction factors than it would if parking separated was provided across the entire segment.
[3] The moderate assessment assumes modifications at the intersection of E Main Street and the Bear Creek Greenway.
[4] This project does not change sidewalk conditions behind the curb but impacts the total buffering width and the number of vehicular travel lanes. Therefore, the change in PLTS is assessed based on Exhibit 14-23: PLTS based on Total Buffering Width, from Oregon Department of Transportation's Analysis Procedures manual.
[5]Standard maintenance equipment is assumed to require 11 feet.

Based on the results of the evaluation summarized in Table 2, **Alternative 1 | Two-Way Parking Protected Bike Lane (Left)** is the preferred alternative for this segment due to less driveway conflict points along the left side of the roadway, increased accessible to adjacent segments of E Main Street, consistency with background planning document recommendations, and relative low cost and easy to maintenance compared to the other alternatives.

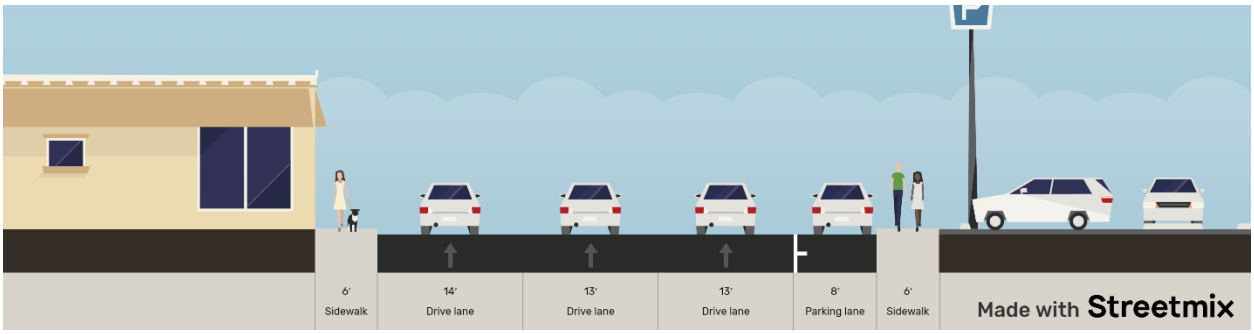
RIVERSIDE AVENUE (TYPICAL SECTION)



Existing Conditions

Within the study area, Riverside Avenue is a one-way[3], northbound roadway with a posted speed limit of 25-35 MPH. This section includes the segment of Riverside Avenue between the south end of the couplet and 6th Street. The exhibit below illustrates the existing cross section.

Existing Conditions



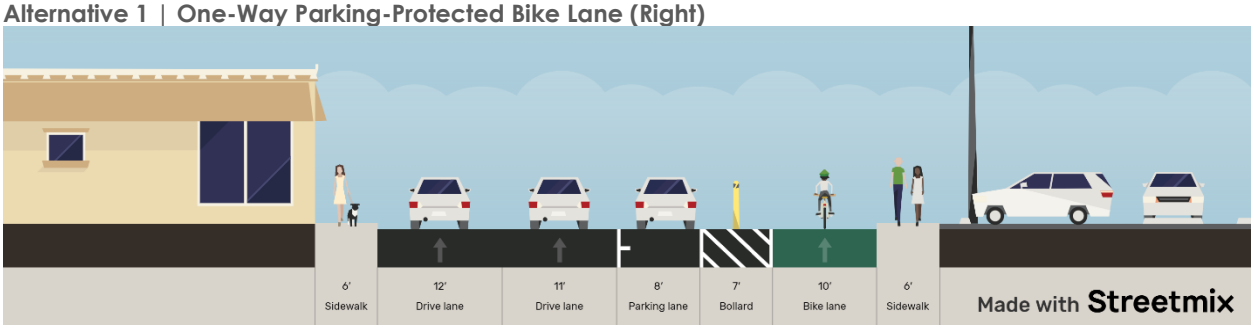
As shown in in the exhibit above, the existing cross section includes three 13 to 14-foot drive lanes, one 8-foot parking lane, and 6-foot sidewalks. The existing ROW is approximately 60 feet, and the existing curb-to-curb width is approximately 48 feet. The sidewalk is not continuous on the west side of the road and the parking lane is a turn lane on several intersection approaches.

Concept Design Cross Section Alternatives

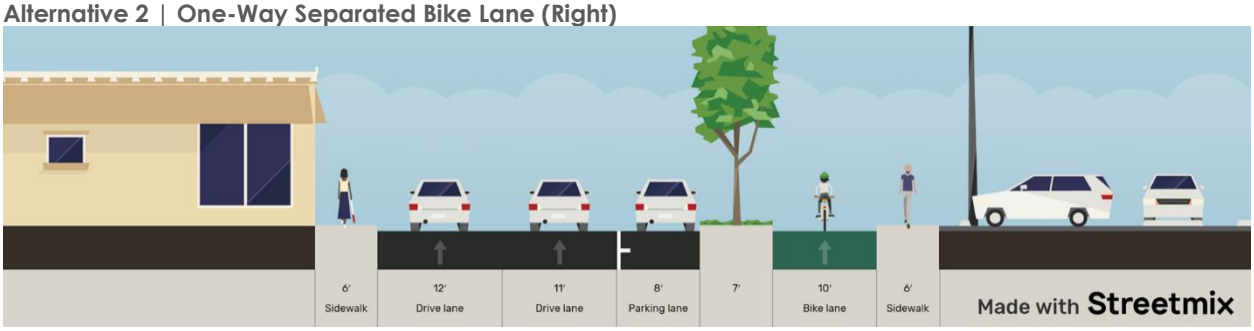
As shown in the exhibits below, five concept design cross section alternatives were produced to address the multimodal needs identified for this section. All five alternatives maintain existing ROW and curbs. Alternative 2 introduces new curbs. Table 3 illustrates the evaluation of each alternative.

[3] Riverside Avenue is a two-way roadway south of the couplet, as described in the final segment alternatives analysis.

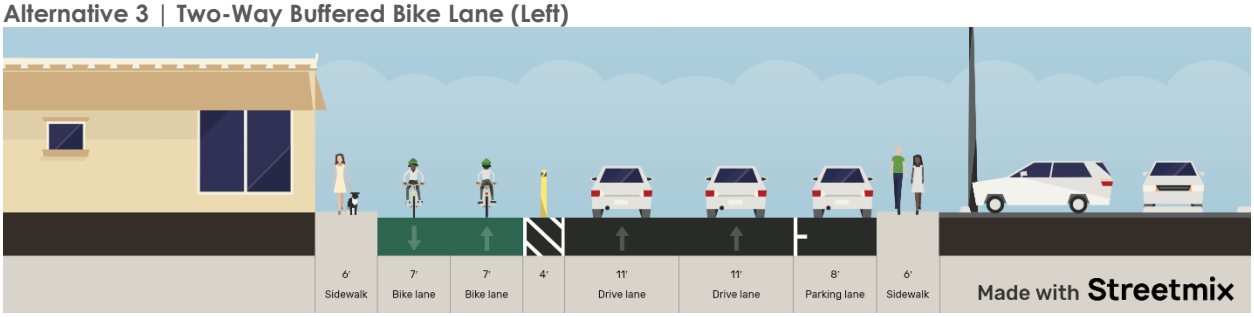
Alternative 1 | One-Way Parking-Protected Bike Lane (Right)



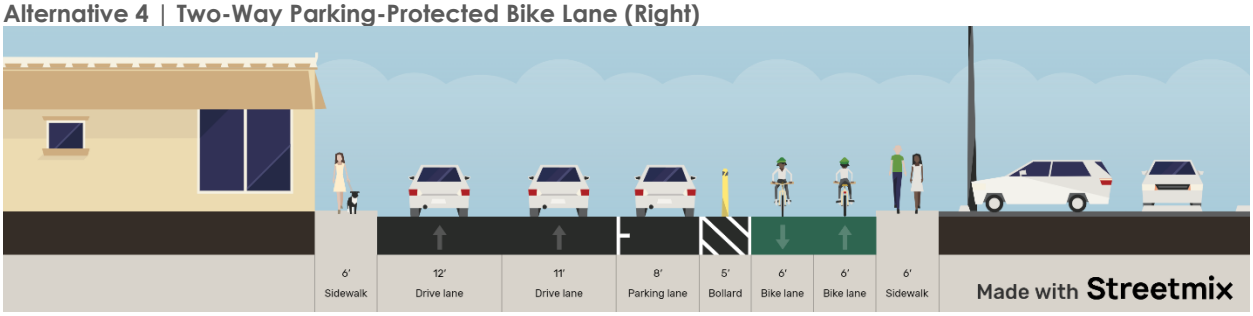
Alternative 2 | One-Way Separated Bike Lane (Right)



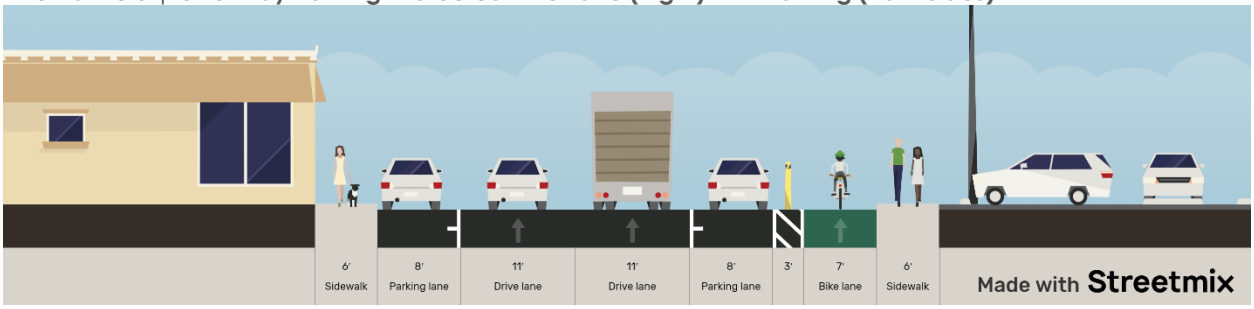
Alternative 3 | Two-Way Buffered Bike Lane (Left)



Alternative 4 | Two-Way Parking-Protected Bike Lane (Right)



Alternative 5 | One-Way Parking-Protected Bike Lane (Right) with Parking (Both Sides)



Evaluation Matrix

Table 3: Riverside Avenue (Typical Section) Alternatives Evaluation

Evaluation Criteria	Performance Measure	Alternative 1 | One-Way Parking-Protected Bike Lane (Right)	Alternative 2 | One-Way Separated Bike Lane (Right)	Alternative 3 | Two-Way Buffered Bike Lane (Left)	Alternative 4 | Two-Way Parking-Protected Bike Lane (Right)	Alternative 5 | One-Way Parking-Protected Bike Lane (Right) with Parking (Both Sides)
Safety	Crash Reduction Factors	Good (+1) – installing cycle tracks (BP23) has a high crash reduction factor (59% reduction in bicycle crashes at all injury severities)	Good (+1) – installing cycle tracks (BP23) has a high crash reduction factor (59% reduction in bicycle crashes at all injury severities)	Fair (+0) – installing buffered bike lanes[2] (BP24) has a moderate crash reduction factor (47% reduction in bicycle crashes at all injury severities)	Good (+1) – installing cycle tracks (BP23) has a high crash reduction factor (59% reduction in bicycle crashes at all injury severities)	Good (+1) – installing cycle tracks (BP23) has a high crash reduction factor (59% reduction in bicycle crashes at all injury severities)
	Conflict Points	Poor (-0.5) – the facility is positioned to provide a moderate amount of intersection/driveway conflicts compared to other alternatives. The facility is in conflict with right-turn lanes at E 12th Street, E 10th Street and E 8th Street.	Poor (-0.5) – the facility is positioned to provide a moderate amount of intersection/driveway conflicts compared to other alternatives. The facility is in conflict with right-turn lanes at E 12th Street, E 10th Street and E 8th Street.	Fair (+0) – the facility is positioned to provide a moderate amount of intersection/driveway conflicts compared to other alternatives. The facility avoids right-turn lanes at E 12th Street, E 10th Street and E 8th Street.	Poor (-0.5) – the facility is positioned to provide a moderate amount of intersection/driveway conflicts compared to other alternatives. The facility is in conflict with right-turn lanes at E 12th Street, E 10th Street and E 8th Street.	Poor (-0.5) – the facility is positioned to provide a moderate amount of intersection/driveway conflicts compared to other alternatives. The facility is in conflict with right-turn lanes at E 12th Street, E 10th Street and E 8th Street.
Community Support	Public Input	Good (+1) – the one-way parking-protected bike lane was a preferred facility type in the first open house	Good (+1) – the one-way separated bike lane was a preferred facility type in the first open house	Fair (+0) – the two-way facility received mixed responses from the public. Some participants appreciated the convenience of a bi-directional facility, while others felt it was not as intuitive as one-way facilities	Fair (+0) – the two-way facility received mixed responses from the public. Some participants appreciated the convenience of a bi-directional facility, while others felt it was not as intuitive as one-way facilities	Good (+1) – the one-way parking-protected bike lane was a preferred facility type in the first open house
	Planning Documents	Good (+1) –this alternative is consistent with the recommended low-stress "protected bike lane" facility treatment identified in the TSP	Good (+1) –this alternative is consistent with the recommended low-stress "protected bike lane" facility treatment identified in the TSP	Fair (+0) – the alternative is consistent with the TSP recommendation for providing enhanced bicycle facilities, but does not provide the amount of separation desired	Good (+1) –this alternative is consistent with the recommended low-stress "protected bike lane" facility treatment identified in the TSP	Good (+1) –this alternative is consistent with the recommended low-stress "protected bike lane" facility treatment identified in the TSP
Connectivity	Access	Fair (+0) – this alternative provides one-directional access	Fair (+0) – this alternative provides one-directional access	Good (+1) – this alternative provides bi-directional access	Good (+1) – this alternative provides bi-directional access	Fair (+0) – this alternative provides one-directional access
User Experience	Bicycle Level of Traffic Stress (BLTS)	Good (+1) – this alternative improves the BLTS by 3 points and is intuitive requiring no behavioral changes for multimodal users.	Good (+1) – this alternative improves the BLTS by 3 points and is intuitive requiring no behavioral changes for multimodal users.	Fair (+0.5) – this alternative improves BLTS by a range of 2 to 3 points[1] and is intuitive requiring no behavioral changes for multimodal users.	Poor (-1) – this alternative forces bicyclist to travel contraflow adjacent to vehicle lane reducing comfort and increasing stress[2].	Good (+1) – this alternative improves the BLTS by 3 points and is intuitive requiring no behavioral changes for multimodal users.
	Pedestrian Level of Traffic Stress (PLTS)	Fair (+0) – this alternative reduces the PLTS by 1 point on the right and left sides of the roadway	Fair (+0) – this alternative reduces the PLTS by 1 point on the right and left sides of the roadway	Fair (+0) – this alternative reduces the PLTS by 2 points on the left side of the roadway and makes no change to the PLTS on the right side of the roadway	Fair (+0) – this alternative reduces the PLTS by 1 point on the right and left sides of the roadway	Fair (+0) – this alternative reduces the PLTS by 1 point on the right and left sides of the roadway
Economic Opportunity	Parking	Fair (+0) – this alternative does not change the amount of on-street parking along the segment	Fair (+0) – this alternative does not change the amount of on-street parking along the segment	Fair (+0) – this alternative does not change the amount of on-street parking along the segment	Fair (+0) – this alternative does not change the amount of on-street parking along the segment	Good (+1) – this alternative increases the amount of on-street parking along the segment
Feasibility	Planning-Level Cost	Good (+1) – this alternative has a relative low cost because it only requires restriping the roadway and constructing buffers	Poor (-1) – this alternative has a relative high cost because it requires construction of new curbs	Good (+1) – this alternative has a relative low cost because it only requires restriping the roadway and constructing buffers	Good (+1) – this alternative has a relative low cost because it only requires restriping the roadway and constructing buffers	Good (+1) – this alternative has a relative low cost because it only requires restriping the roadway and constructing buffers
	Maintenance	Fair (+0) – this alternative requires maintenance of the buffer; the buffers can be placed so that no special road maintenance equipment is required	Poor (-1) – this alternative may require special maintenance equipment	Fair (+0) – this alternative requires maintenance of the buffer; the buffers can be placed so that no special road maintenance equipment is required	Fair (+0) – this alternative requires maintenance of the buffer; the buffers can be placed so that no special road maintenance equipment is required	Poor (-1) – this alternative may require special maintenance equipment
TOTAL		4.5	1.5	2.5	2.5	4.5

1. LTS varies based on speed
2. LTS methodology does not incorporate consideration of contraflow bicycle facility adjacent to travel lane; consultant team has incorporated qualitative assessment into BLTS performance measure to address contraflow bicycle travel adjacent to travel lane.

Based on the results of the evaluation summarized in Table 3, **Alternatives 1 | One-Way Parking Protected Bike Lane (Right)** and **Alternative 5 | One-Way Parking-Protected Bike Lane (Right) with Parking (Both Sides)** are the preferred alternatives for this segment. Both alternatives score evenly regarding planning level cost, bicycle and pedestrian LTS, and opportunity for crash reductions. Alternative 3 scores strongly for access due to the two-way nature of the facility and planning-level cost estimate.

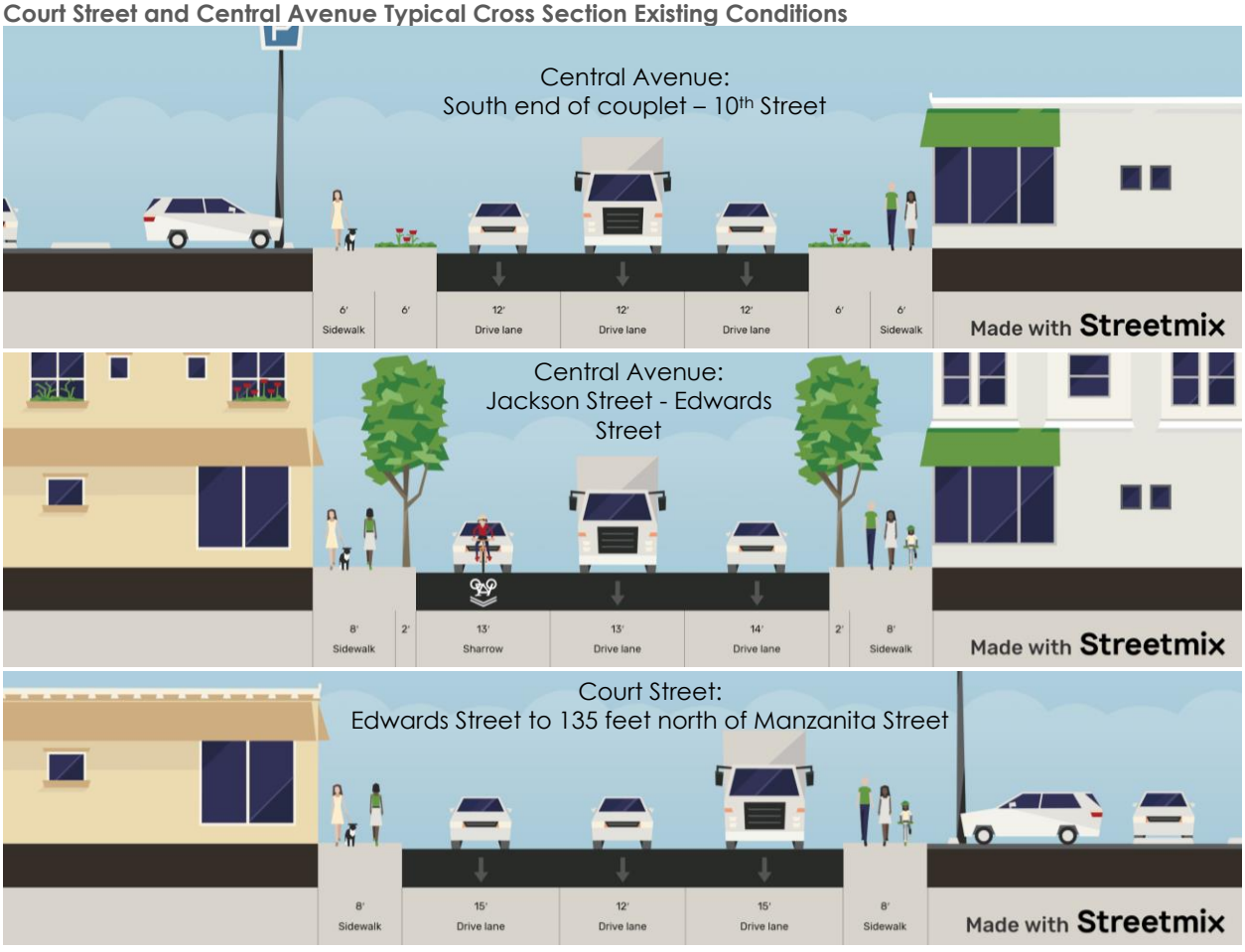
COURT STREET AND CENTRAL AVENUE (TYPICAL SECTION)



Existing Conditions

Within the study area, Court Street and Central Avenue are one-way, southbound roadways with a posted speed limit of 30-35 MPH. This section includes the segments of Central Avenue/Court Street from 135 feet north of Manzanita Street to the south end of the couplet, excluding the downtown business district between Jackson Street and 10th Street. The exhibit below illustrates the existing cross sections.

Court Street and Central Avenue Typical Cross Section Existing Conditions

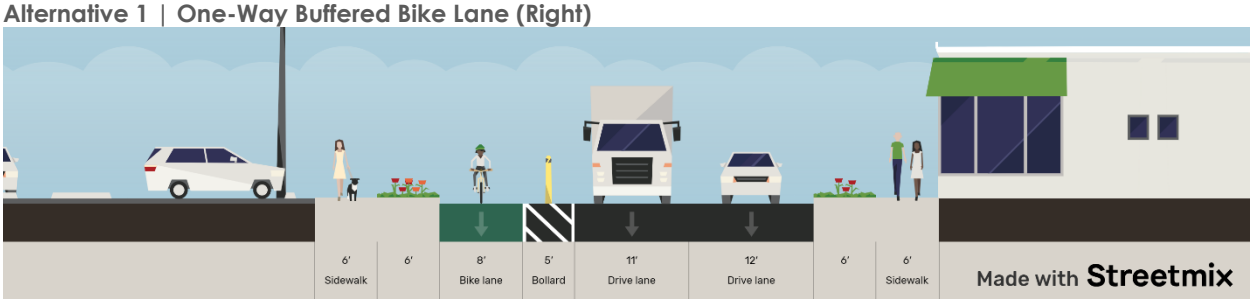


As shown in the exhibit above, the existing cross section includes three 12 to 15-foot drive lanes 6 to 8-foot sidewalks and street trees along some sections. The existing ROW is approximately 60 feet, and the existing curb-to-curb width varies between 36 to 42 feet. Sidewalk and planter widths vary.

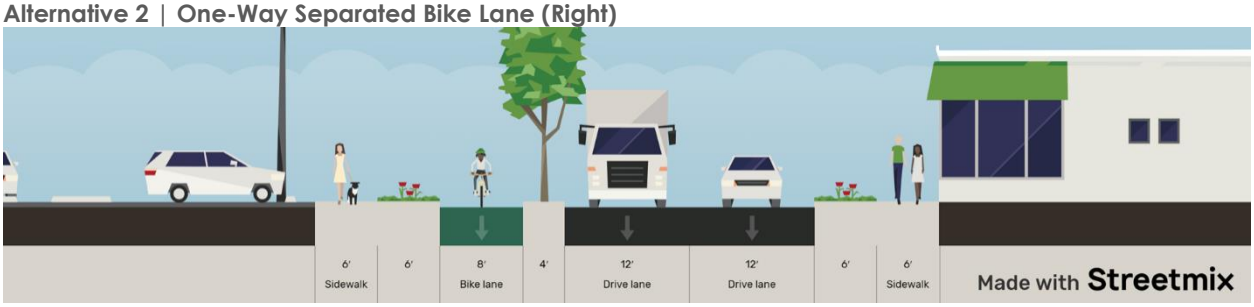
Concept Design Cross Section Alternatives

As shown in the exhibits below, four concept design cross section alternatives were produced to address the multimodal needs identified for this section. The alternatives are shown on the typical section between the south end of the couplet and 10th as this is the most constrained section. All four alternatives maintain existing ROW and curbs. Alternative 2 introduces new curbs. Table 4 illustrates the evaluation of each alternative.

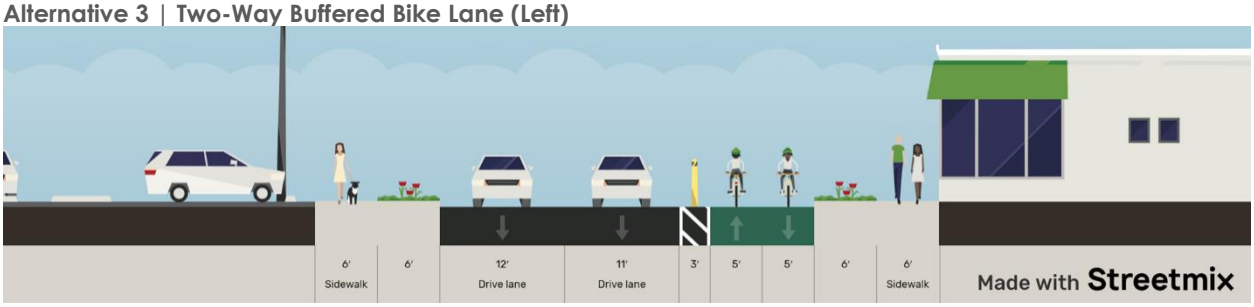
Alternative 1 | One-Way Buffered Bike Lane (Right)



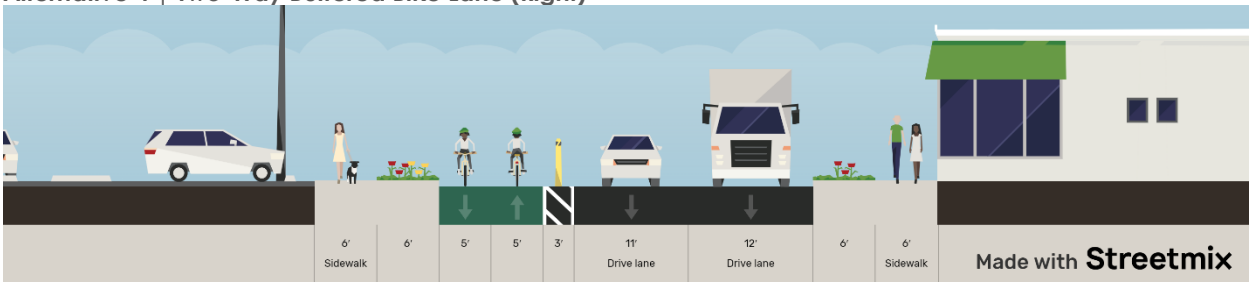
Alternative 2 | One-Way Separated Bike Lane (Right)



Alternative 3 | Two-Way Buffered Bike Lane (Left)



Alternative 4 | Two-Way Buffered Bike Lane (Right)



Evaluation Matrix

Table 4: Court Street and Central Avenue (Typical Section) Alternatives Evaluation

Evaluation Criteria	Performance Measure	Alternative 1 | One-Way Buffered Bike Lane (Right)	Alternative 2 | One-Way Separated Bike Lane (Right)	Alternative 3 | Two-Way Buffered Bike Lane (Left)	Alternative 4 | Two-Way Buffered Bike Lane (Right)
Safety	Crash Reduction Factors	Fair (+0) – Installing buffered bike lanes (BP24) has a moderate crash reduction factor (47% reduction in bicycle crashes at all injury severities)	Good (+1) – Installing cycle tracks (BP23) has a high crash reduction factor (59% reduction in bicycle crashes at all injury severities)	Fair (+0) – Installing buffered bike lanes (BP24) has a moderate crash reduction factor (47% reduction in bicycle crashes at all injury severities)	Fair (+0) – Installing buffered bike lanes (BP24) has a moderate crash reduction factor (47% reduction in bicycle crashes at all injury severities)
	Conflict Points	Fair (+0) – The facility is positioned to provide a moderate amount of intersection/driveway conflicts compared to other alternatives. The facility is in conflict with the right-turn lane at Jackson Street but avoids the left-turn lane at Boyd Street.	Fair (+0) – The facility is positioned to provide a moderate amount of intersection/driveway conflicts compared to other alternatives. The facility is in conflict with the right-turn lane at Jackson Street but avoids the left-turn lane at Boyd Street.	Poor (-0.5) – The facility is positioned to provide a higher amount of intersection/driveway conflicts compared to other alternatives. The facility avoids the right-turn lane at Jackson Street but is in conflict with the left-turn lane at Boyd Street.	Fair (+0) – The facility is positioned to provide a moderate amount of intersection/driveway conflicts compared to other alternatives. The facility is in conflict with the right-turn lane at Jackson Street but avoids the left-turn lane at Boyd Street.
Community Support	Public Input	Fair (+0) – the one-way buffered bike lane was supported by the public, but not as strongly as other options	Good (+1) – The one-way separated bike lane was a preferred facility type in the first open house	Fair (+0) – the two-way facility received mixed responses from the public. Some participants appreciated the convenience of a bi-directional facility, while others felt it was not as intuitive as one-way facilities	Fair (+0) – the two-way facility received mixed responses from the public. Some participants appreciated the convenience of a bi-directional facility, while others felt it was not as intuitive as one-way facilities
	Planning Documents	Fair (+0) – the alternative is consistent with the TSP recommendation for providing enhanced bicycle facilities, but does not provide the amount of separation desired for the segment	Good (+1) –this alternative is consistent with the recommended low-stress "protected bike lane" facility treatment identified in the TSP	Fair (+0) – the alternative is consistent with the TSP recommendation for providing enhanced bicycle facilities, but does not provide the amount of separation desired for the segment	Fair (+0) – the alternative is consistent with the TSP recommendation for providing enhanced bicycle facilities, but does not provide the amount of separation desired for the segment
Connectivity	Access	Fair (+0) – this alternative provides one-directional access	Fair (+0) – this alternative provides one-directional access	Good (+1) – this alternative provides bi-directional access	Good (+1) – this alternative provides bi-directional access
User Experience	Bicycle Level of Traffic Stress (BLTS)	Fair (+0.5) – this alternative improves BLTS by a range of 2 to 3 points[1] and is intuitive requiring no behavioral changes for multimodal users.	Good (+1) – this alternative improves the BLTS by 3 points and is intuitive requiring no behavioral changes for multimodal users.	Fair (+0.5) – this alternative improves BLTS by a range of 2 to 3 points[1] and is intuitive requiring no behavioral changes for multimodal users.	Poor (-1) – this alternative forces bicyclist to travel contraflow adjacent to vehicle lane reducing comfort and increasing stress[2].
	Pedestrian Level of Traffic Stress (PLTS)	Good (+1) – this alternative reduces the PLTS on the right side of the roadway by 2 points and the left side of the roadway by 1 point	Good (+1) – this alternative reduces the PLTS on the right side of the roadway by 2 points and the left side of the roadway by 1 point	Good (+1) – this alternative reduces the PLTS on the right side of the roadway by 1 point and the left side of the roadway by 2 points	Good (+1) – this alternative reduces the PLTS on the right side of the roadway by 2 points and the left side of the roadway by 1 point
Economic Opportunity	Parking	Fair (+0) – this alternative does not change the amount of on-street parking along the segment	Fair (+0) – this alternative does not change the amount of on-street parking along the segment	Fair (+0) – this alternative does not change the amount of on-street parking along the segment	Fair (+0) – this alternative does not change the amount of on-street parking along the segment
Feasibility	Planning-Level Cost	Good (+1) – this alternative has a relative low cost because it only requires restriping the roadway and constructing buffers	Poor (-1) – this alternative has a relative high cost because it requires construction of new curbs	Good (+1) – this alternative has a relative low cost because it only requires restriping the roadway and constructing buffers	Good (+1) – this alternative has a relative low cost because it only requires restriping the roadway and constructing buffers
	Maintenance	Poor (-1) – this alternative may require special maintenance equipment	Poor (-1) – this alternative may require special maintenance equipment	Fair (+0) – this alternative requires maintenance of the buffer; the buffers can be placed so that no special road maintenance equipment is required	Fair (+0) – this alternative requires maintenance of the buffer; the buffers can be placed so that no special road maintenance equipment is required
TOTAL		1.5	3	3	2

1. LTS varies based on speed
2. LTS methodology does not incorporate consideration of contraflow bicycle facility adjacent to travel lane; consultant team has incorporated qualitative assessment into BLTS performance measure to address contraflow bicycle travel adjacent to travel lane.

Based on the results of the evaluation summarized in Table 4, **Alternative 2 | One-Way Separated Bike Lane (Right)** and **Alternative 3 | Two-Way Buffered Bike Lane (Left)** are the preferred alternatives for this segment. Alternative 2 scores strongly for crash reduction factors, public input, and consistency with planning documents. Alternative 3 scores strong for access given the nature of the two-way facility, and planning-level cost. Both alternatives improve bicycle and pedestrian LTS.

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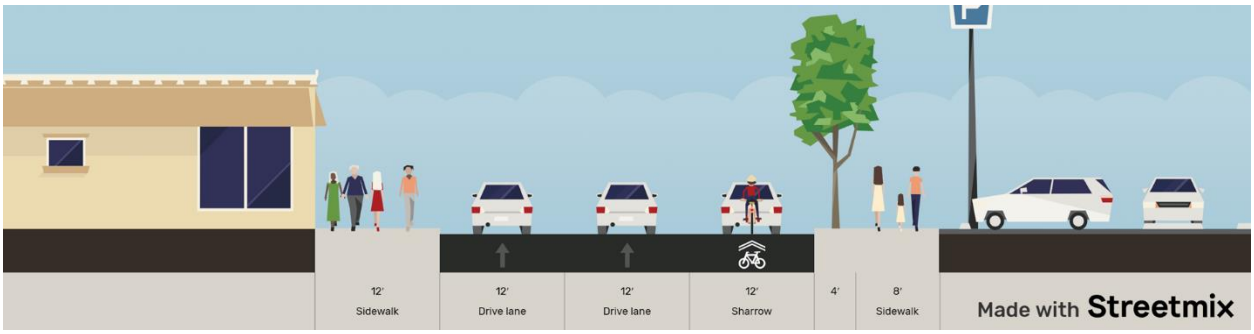
RIVERSIDE AVENUE (NARROW SECTION)



Existing Conditions

This section includes the segment of Riverside Avenue between 6th Street and Walnut Street. The exhibit below illustrates the existing cross section.

Existing Conditions

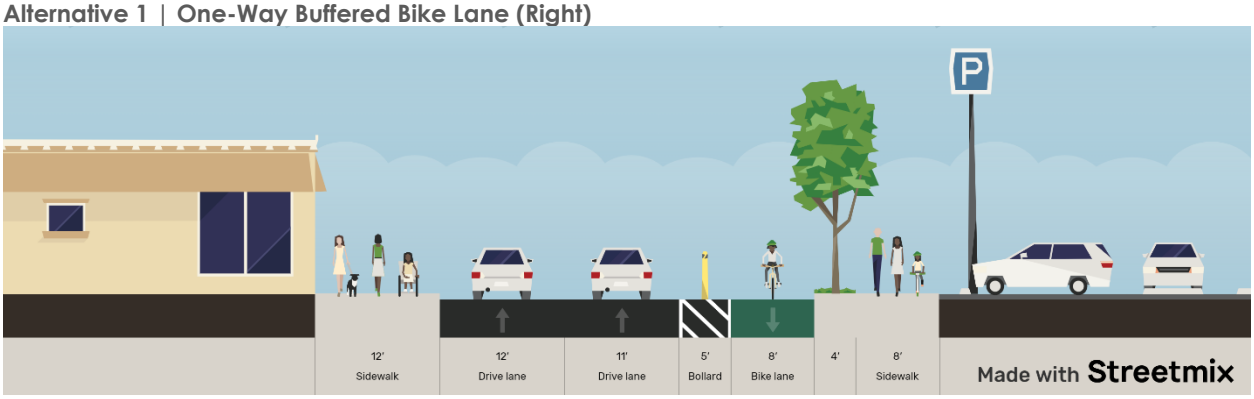


As shown in the exhibit above, the existing cross section includes three 12-foot drive lanes, 8 to 12-foot sidewalks, and planters. The existing ROW is approximately 60 feet, and the existing curb-to-curb width is approximately 36 to 38 feet. The sidewalk and planter widths vary.

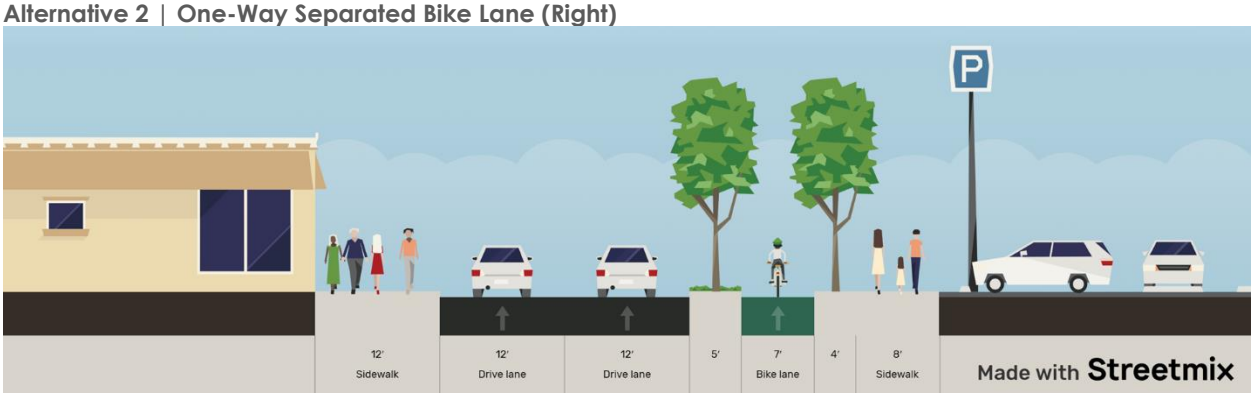
Concept Design Cross Section Alternatives

As shown in the exhibits below, four concept design cross section alternatives were produced to address the multimodal needs identified for this section. All four alternatives maintain existing ROW and curbs. Alternative 2 introduces new curbs. Table 5 illustrates the evaluation of each alternative.

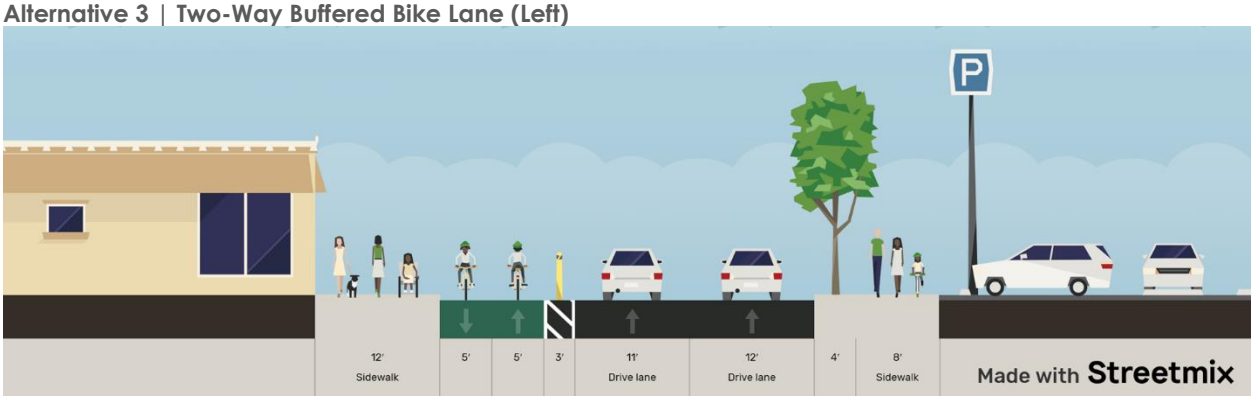
Alternative 1 | One-Way Buffered Bike Lane (Right)



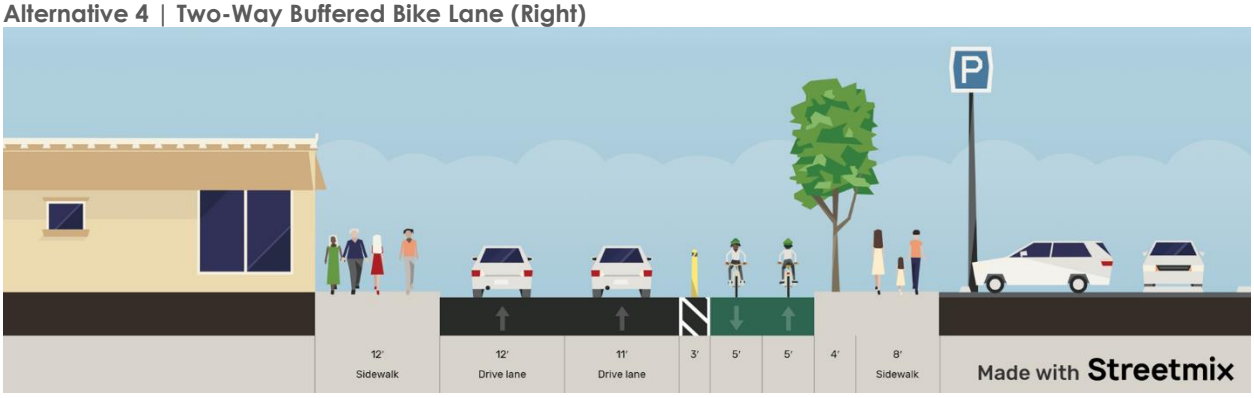
Alternative 2 | One-Way Separated Bike Lane (Right)



Alternative 3 | Two-Way Buffered Bike Lane (Left)



Alternative 4 | Two-Way Buffered Bike Lane (Right)



Evaluation Matrix

Table 5: Riverside Avenue (Narrow Section) Alternatives Evaluation

Evaluation Criteria	Performance Measure	Alternative 1 | One-Way Buffered Bike Lane (Right)	Alternative 2 | One-Way Separated Bike Lane (Right)	Alternative 3 | Two-Way Buffered Bike Lane (Left)	Alternative 4 | Two-Way Parking Buffered Bike Lane (Right)
Safety	Crash Reduction Factors	Fair (+0) – Installing buffered bike lanes (BP24) has a moderate crash reduction factor (47% reduction in bicycle crashes at all injury severities)	Good (+1) – Installing cycle tracks (BP23) has a high crash reduction factor (59% reduction in bicycle crashes at all injury severities)	Fair (+0) – Installing buffered bike lanes (BP24) has a moderate crash reduction factor (47% reduction in bicycle crashes at all injury severities)	Fair (+0) – Installing buffered bike lanes (BP24) has a moderate crash reduction factor (47% reduction in bicycle crashes at all injury severities)
	Conflict Points	Poor (-0.5) – The facility is positioned to provide a moderate amount of intersection/driveway conflicts compared to other alternatives but conflicts with the right-turn lane at 4th Street.	Poor (-0.5) – The facility is positioned to provide a moderate amount of intersection/driveway conflicts compared to other alternatives but conflicts with the right-turn lane at 4th Street.	Fair (+0) – The facility is positioned to provide a higher amount of intersection/driveway conflicts compared to other alternatives but avoids the conflict with the right-turn lane at 4th Street	Poor (-0.5) – The facility is positioned to provide a moderate amount of intersection/driveway conflicts compared to other alternatives but conflicts with the right-turn lane at 4th Street.
Community Support	Public Input	Fair (+0.5) – the one-way buffered bike lane was supported by the public, but not as strongly as other options	Good (+1) – The one-way separated bike lane was a preferred facility type in the first open house	Fair (+0) – the two-way facility received mixed responses from the public. Some participants appreciated the convenience of a bi-directional facility, while others felt it was not as intuitive as one-way facilities	Fair (+0) – the two-way facility received mixed responses from the public. Some participants appreciated the convenience of a bi-directional facility, while others felt it was not as intuitive as one-way facilities
	Planning Documents	Fair (+0) – the alternative is consistent with the TSP recommendation for providing enhanced bicycle facilities, but does not provide the amount of separation desired for the segment	Good (+1) – this alternative is consistent with the recommended low-stress "protected bike lane" facility treatment identified in the TSP	Fair (+0) – the alternative is consistent with the TSP recommendation for providing enhanced bicycle facilities, but does not provide the amount of separation desired for the segment	Fair (+0) – the alternative is consistent with the TSP recommendation for providing enhanced bicycle facilities, but does not provide the amount of separation desired for the segment
Connectivity	Access	Fair (+0) – this alternative provides one-directional access	Fair (+0) – this alternative provides one-directional access	Good (+1) – this alternative provides bi-directional access	Good (+1) – this alternative provides bi-directional access
User Experience	Bicycle Level of Traffic Stress (BLTS)	Fair (+0.5) – this alternative improves BLTS by a range of 2 to 3 points[1] and is intuitive requiring no behavioral changes for multimodal users.	Good (+1) – this alternative improves the BLTS by 3 points and is intuitive requiring no behavioral changes for multimodal users.	Fair (+0.5) – this alternative improves BLTS by a range of 2 to 3 points[1] and is intuitive requiring no behavioral changes for multimodal users.	Poor (-1) – this alternative forces bicyclist to travel contraflow adjacent to vehicle lane reducing comfort and increasing stress[2].
	Pedestrian Level of Traffic Stress (PLTS)	Good (+1) – this alternative reduces the PLTS on the right side of the roadway by 2 points and the left side of the roadway by 1 point	Good (+1) – this alternative reduces the PLTS on the right side of the roadway by 2 points and the left side of the roadway by 1 point	Good (+1) – this alternative reduces the PLTS on the right side of the roadway by 1 point and the left side of the roadway by 2 points	Good (+1) – this alternative reduces the PLTS on the right side of the roadway by 2 points and the left side of the roadway by 1 point
Economic Opportunity	Parking	Fair (+0) – this alternative does not change the amount of on-street parking along the segment	Fair (+0) – this alternative does not change the amount of on-street parking along the segment	Fair (+0) – this alternative does not change the amount of on-street parking along the segment	Fair (+0) – this alternative does not change the amount of on-street parking along the segment
Feasibility	Planning-Level Cost	Good (+1) – this alternative has a relative low cost because it only requires restriping the roadway and constructing buffers	Poor (-1) – this alternative has a relative high cost because it requires construction of new curbs	Good (+1) – this alternative has a relative low cost because it only requires restriping the roadway and constructing buffers	Good (+1) – this alternative has a relative low cost because it only requires restriping the roadway and constructing buffers
	Maintenance	Poor (-1) – this alternative may require special maintenance equipment	Poor (-1) – this alternative may require special maintenance equipment	Fair (+0) – this alternative requires maintenance of the buffer; the buffers can be placed so that no special road maintenance equipment is required	Fair (+0) – this alternative requires maintenance of the buffer; the buffers can be placed so that no special road maintenance equipment is required
TOTAL		**1.5**	**2.5**	**3.5**	**1.5**

1. LTS varies based on speed
2. LTS methodology does not incorporate consideration of contraflow bicycle facility adjacent to travel lane; consultant team has incorporated qualitative assessment into BLTS performance measure to address contraflow bicycle travel adjacent to travel lane.

Based on the results of the evaluation summarized in Table 5, **Alternative 3 | Two-Way Buffered Bike Lane (Left)** is the preferred alternative for this segment due to strong access given the nature of the two-way facility, relatively low cost, and increases to bicycle and pedestrian LTS. Alternative 2 scores well due to strong public support, strong crash reduction factor potential, consistency with planning documents but poorly for cost and maintenance.

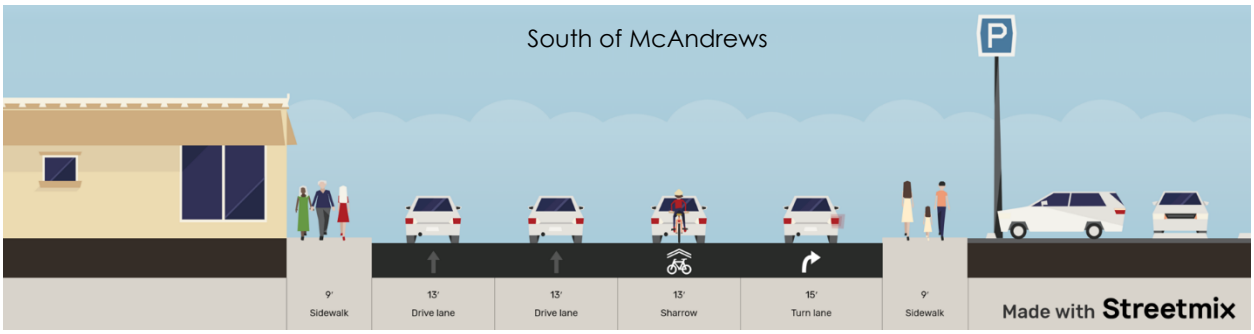
RIVERSIDE AVENUE (WIDE SECTION)

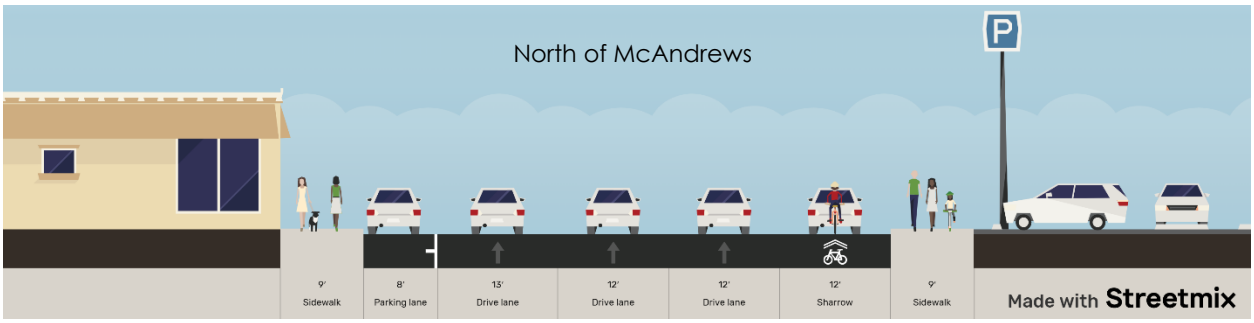


Existing Conditions

This section includes the segment of Riverside Street between Walnut Street and Ohio Street. The exhibit below illustrates the existing cross section.

Existing Conditions



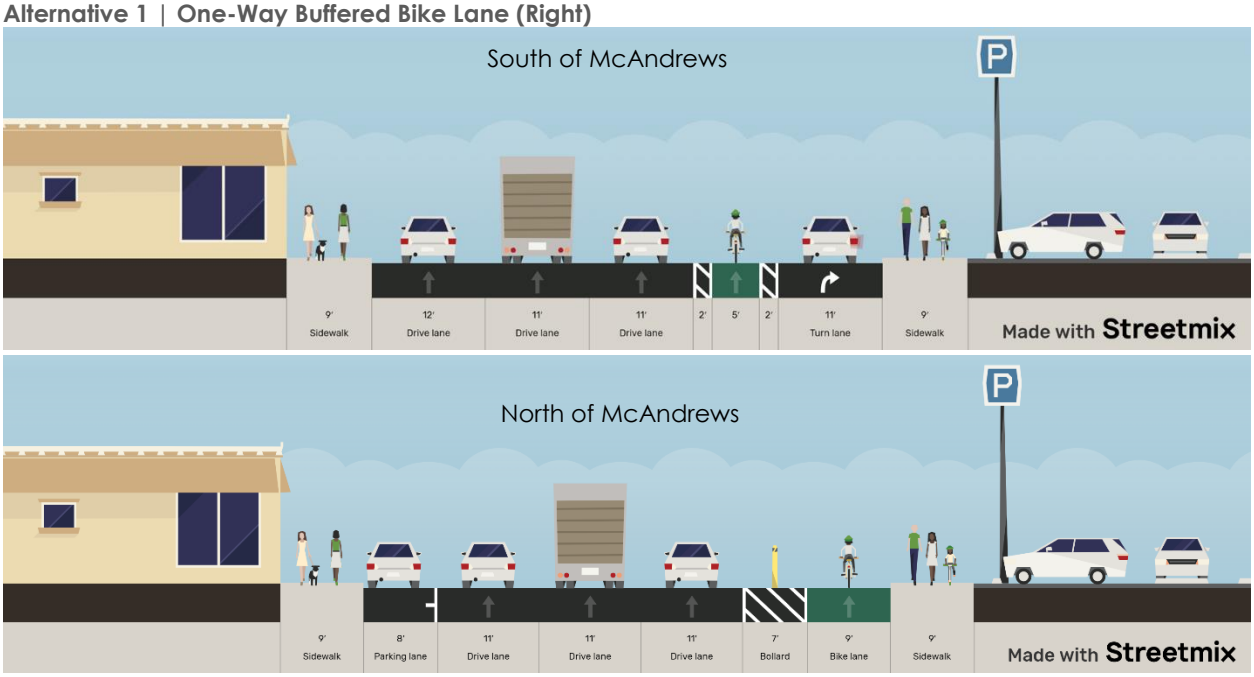


As shown in the exhibit above, The existing ROW is approximately 72 to 75 feet, and the existing curb-to-curb width is approximately 54 to 57 feet. South of McAndrews Road the existing cross section includes three 13-foot drive lanes, a 15-foot right turn lane, and 9-foot sidewalks. North of McAndrews Road, the existing cross section includes four 12 to 13-foot drive lanes, an 8-foot parking lane, and 9-foot sidewalks. The right drive lane is marked with sharrows.

Concept Design Cross Section Alternatives

As shown in the exhibits below, three concept design cross section alternatives were produced to address the multimodal needs identified for this section. All three alternatives maintain existing ROW and curbs[4]. Table 6 illustrates the evaluation of each alternative.

Alternative 1 | One-Way Buffered Bike Lane (Right)

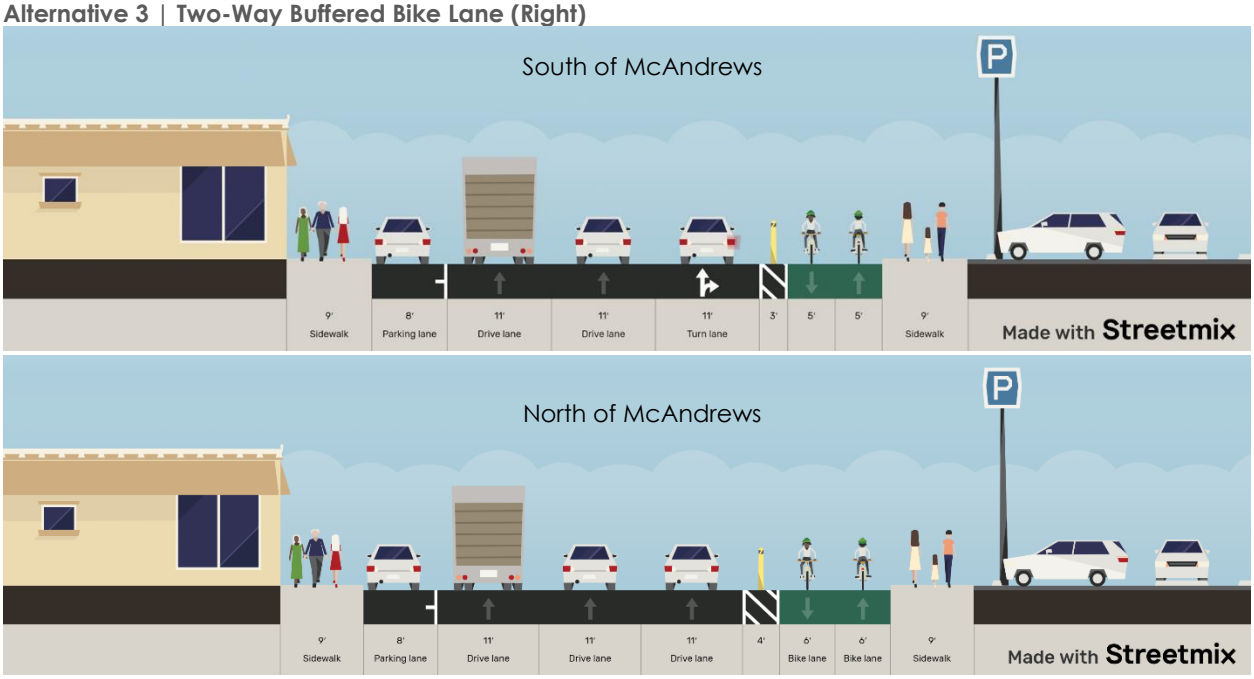


Alternative 2 | Two-Way Parking-Protected Bike Lane (Left)



[4] The intersection of Riverside Avenue at McAndrews Road is a pinch point – the existing curb to curb width to the median is 40 feet, curbs may need to be relocated at this location to install alternatives as shown.

Alternative 3 | Two-Way Buffered Bike Lane (Right)



Evaluation Matrix

Table 6: Riverside Avenue (Wider Section) Alternatives Evaluation

Evaluation Criteria	Performance Measure	Alternative 1 | One-Way Buffered Bike Lane (Right)	Alternative 2 | Two-Way Parking-Protected Bike Lane (Left)	Alternative 3 | Two-Way Buffered Bike Lane (Right)
Safety	Crash Reduction Factors	Fair (+0) – Installing buffered bike lanes (BP24) has a moderate crash reduction factor (47% reduction in bicycle crashes at all injury severities)	Good (+1) – Installing cycle tracks (BP23) has a high crash reduction factor (59% reduction in bicycle crashes at all injury severities)	Fair (+0) – Installing buffered bike lanes (BP24) has a moderate crash reduction factor (47% reduction in bicycle crashes at all injury severities)
	Conflict Points	Poor (-1) – The facility is positioned to provide a moderate amount of intersection/driveway conflicts compared to other alternatives but conflicts with the right turn lane at McAndrews Road	Fair (+0) – The facility is positioned to provide a moderate amount of intersection/driveway conflicts compared to other alternatives and avoids the right turn lane at McAndrews Road	Poor (-1) – The facility is positioned to provide a moderate amount of intersection/driveway conflicts compared to other alternatives but conflicts with the right turn lane at McAndrews Road
Community Support	Public Input	Fair (+0.5) – the one-way buffered bike lane was supported by the public, but not as strongly as other options	Fair (+0) – the two-way facility received mixed responses from the public. Some participants appreciated the convenience of a bi-directional facility, while others felt it was not as intuitive as one-way facilities. Participants prefer parking-protected facilities	Fair (+0) – the two-way facility received mixed responses from the public. Some participants appreciated the convenience of a bi-directional facility, while others felt it was not as intuitive as one-way facilities
	Planning Documents	Fair (+0) – the alternative is consistent with the TSP recommendation for providing enhanced bicycle facilities, but does not provide the amount of separation desired for the segment	Good (+1) – this alternative is consistent with the recommended low-stress "protected bike lane" facility treatment identified in the TSP	Fair (+0) – the alternative is consistent with the TSP recommendation for providing enhanced bicycle facilities, but does not provide the amount of separation desired for the segment
Connectivity	Access	Fair (+0) – this alternative provides one-directional access	Good (+1) – this alternative provides bi-directional access	Good (+1) – this alternative provides bi-directional access
	Transition Zones	Good (+1) – northbound cyclists transition directly to the planned one-way facility on the east side of Riverside north of Ohio Street.	Poor (-1) – northbound cyclists would have to cross to connect to the planned one-way facility on the east side of Riverside north of Ohio Street.	Good (+1) – northbound cyclists transition directly to the planned one-way facility on the east side of Riverside north of Ohio Street, southbound cyclists may need to transition to the facility from the planned southbound facility along the west side of Court Street.
User Experience	Bicycle Level of Traffic Stress (BLTS)	Fair (+0.5) – this alternative improves BLTS by a range of 2 to 3 points[1] and is intuitive requiring no behavioral changes for multimodal users.	Good (+1) – this alternative improves the BLTS by 3 points and is intuitive requiring no behavioral changes for multimodal users.	Poor (-1) – this alternative forces bicyclists to travel contraflow adjacent to vehicle lane reducing comfort and increasing stress[2].
	Pedestrian Level of Traffic Stress (PLTS)	Fair (+0) – this alternative reduces the PLTS on both sides of the roadway by 2 points north of McAndrews Road and makes no change to the PLTS on either side of the roadway south of McAndrews Road	Good (+1) – this alternative reduces the PLTS on the left side of the roadway by 3 points and the right side of the roadway by 1 point	Good (+1) – this alternative reduces PLTS on the left side of the roadway by 2 points; it reduces PLTS on the right side of the roadway by 3 points north of McAndrews and by 2 points south of McAndrews
Economic Opportunity	Parking	Fair (+0) – this alternative does not change the amount of on-street parking along the segment	Good (+1) – this alternative increases the amount of on-street parking along the segment	Good (+1) – this alternative increases the amount of on-street parking along the segment
Feasibility	Planning-Level Cost	Fair (+0) – this alternative has a moderate cost because it may require construction of new curbs at the intersection of Riverside/McAndrews	Poor (-1) – this alternative has a relative high cost because it requires construction of new curbs and relocation of utilities at the intersection of Riverside/McAndrews	Poor (-1) – this alternative has a relative high cost because it requires construction of new curbs and relocation of utilities at the intersection of Riverside/McAndrews
	Maintenance	Fair (+0) – this alternative requires maintenance of the buffer; the buffers can be placed so that no special road maintenance equipment is required	Fair (+0) – this alternative requires maintenance of the buffer; the buffers can be placed so that no special road maintenance equipment is required	Fair (+0) – this alternative requires maintenance of the buffer; the buffers can be placed so that no special road maintenance equipment is required
TOTAL		1	4	1

1. LTS varies based on speed
2. LTS methodology does not incorporate consideration of contraflow bicycle facility adjacent to travel lane; consultant team has incorporated qualitative assessment into BLTS performance measure to address contraflow bicycle travel adjacent to travel lane.

Based on the results of the evaluation summarized in Table 6, **Alternatives 2: Two-Way Parking Protected Bike Lane (Left)** is the preferred alternative because it provides bi-directional access, increases parking potential, improves bicycle and pedestrian LTS, has less conflicts points, and has a higher opportunity for crash reduction compared to the other alternatives.

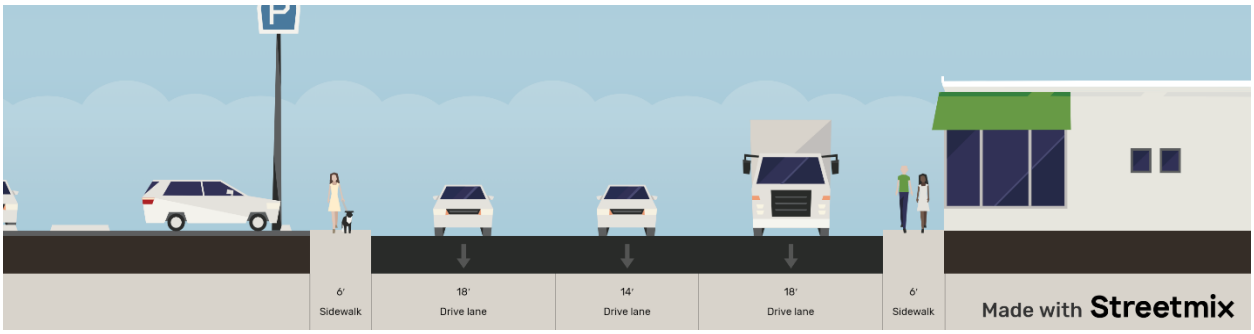
COURT STREET (WIDE SECTION)



Existing Conditions

This section includes the segment of Court Street between 150 feet north of Manzanita Street and Ohio Street. The exhibit below illustrates the existing cross section.

Court Wider Cross Section Existing Conditions

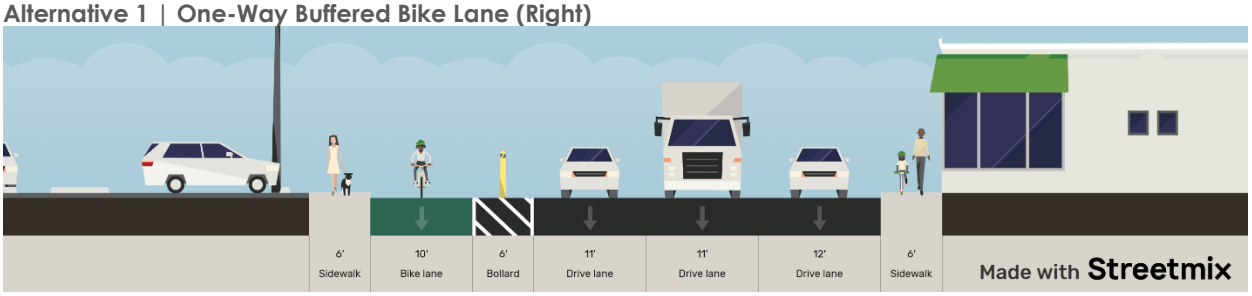


As shown in the exhibit above the existing cross section includes three 14 to 18-foot drive lanes, 6-foot sidewalks. The existing ROW is approximately 62 feet, and the existing curb-to-curb width is approximately 50 feet. The sidewalk widths vary and are not continuous.

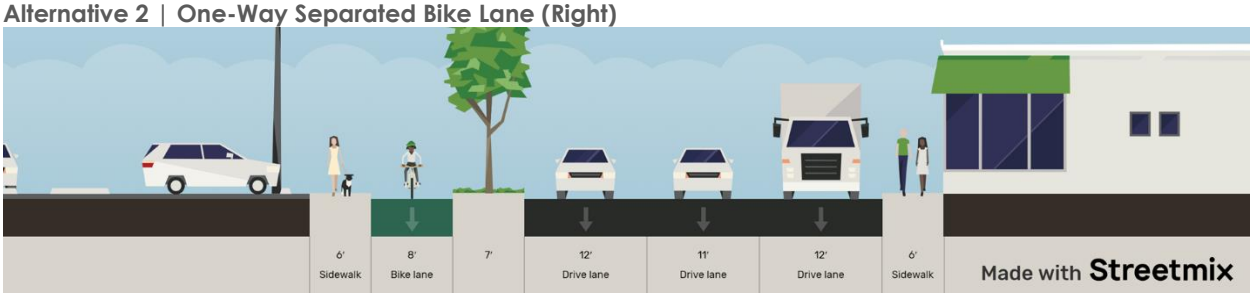
Concept Design Cross Section Alternatives

As shown in the exhibits below, five concept design cross section alternatives were produced to address the multimodal needs identified for this section. All five alternatives maintain existing ROW and curbs. Alternative 2 introduces new curbs. Table 7 illustrates the evaluation of each alternative.

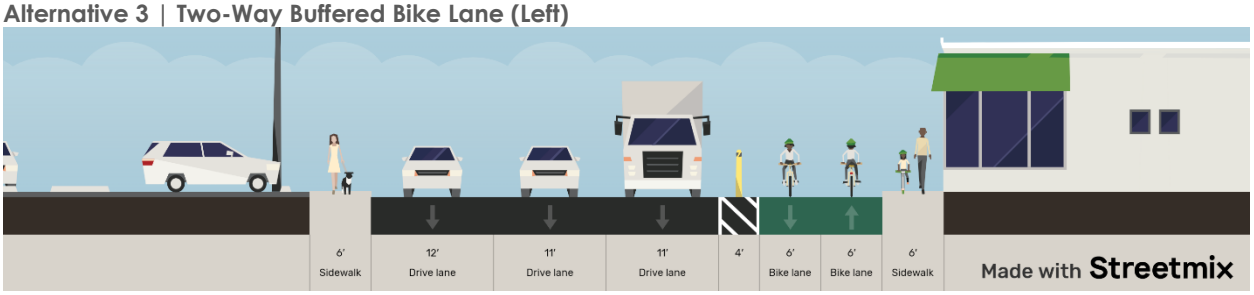
Alternative 1 | One-Way Buffered Bike Lane (Right)



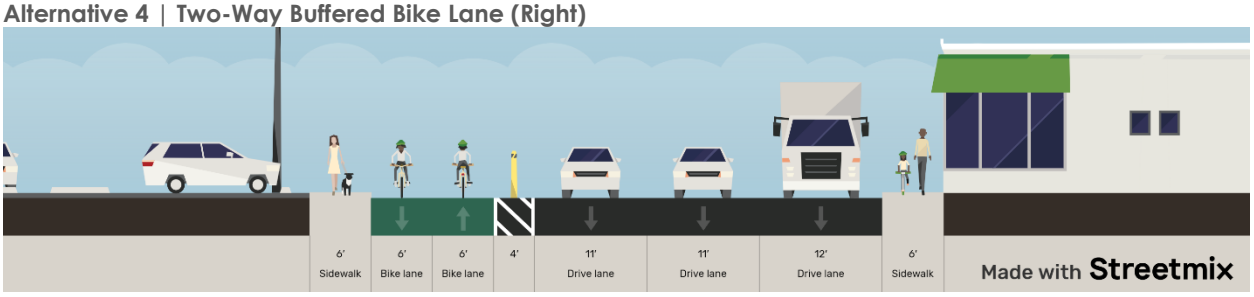
Alternative 2 | One-Way Separated Bike Lane (Right)



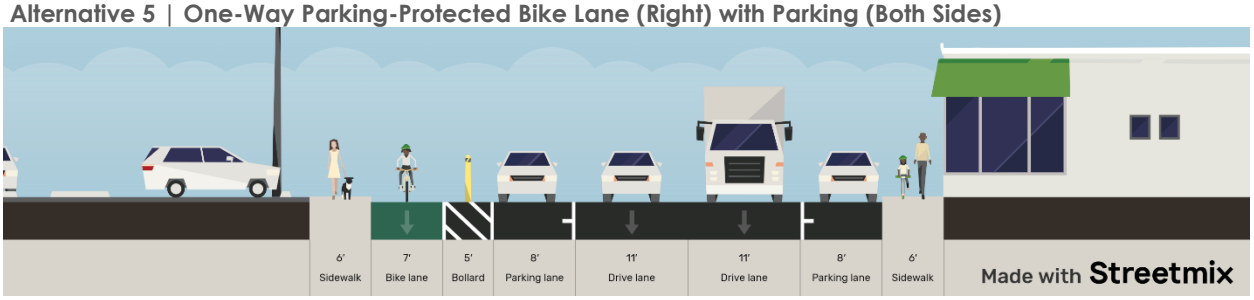
Alternative 3 | Two-Way Buffered Bike Lane (Left)



Alternative 4 | Two-Way Buffered Bike Lane (Right)



Alternative 5 | One-Way Parking-Protected Bike Lane (Right) with Parking (Both Sides)



Evaluation Matrix

Table 7: Court Street (Wide Section) Alternatives Evaluation

Evaluation Criteria	Performance Measure	Alternative 1 | One-Way Buffered Bike Lane (Right)	Alternative 2 | One-Way Separated Bike Lane (Right)	Alternative | Two-Way Buffered Bike Lane (Left)	Alternative 4 | Two-Way Buffered Bike Lane (Right)	Alternative 5 | One-Way Parking-Protected Bike Lane (Right) with Parking (Both Sides)
Safety	Crash Reduction Factors	Fair (+0) – Installing buffered bike lanes (BP24) has a moderate crash reduction factor (47% reduction in bicycle crashes at all injury severities)	Good (+1) – Installing cycle tracks (BP23) has a high crash reduction factor (59% reduction in bicycle crashes at all injury severities)	Fair (+0) – Installing buffered bike lanes (BP24) has a moderate crash reduction factor (47% reduction in bicycle crashes at all injury severities)	Fair (+0) – Installing buffered bike lanes (BP24) has a moderate crash reduction factor (47% reduction in bicycle crashes at all injury severities)	Good (+1) – Installing cycle tracks (BP23) has a high crash reduction factor (59% reduction in bicycle crashes at all injury severities)
	Conflict Points	Fair (+0) – The facility is positioned to provide a moderate amount of intersection/driveway conflicts compared to other alternatives	Fair (+0) – The facility is positioned to provide a moderate amount of intersection/driveway conflicts compared to other alternatives	Fair (+0) – The facility is positioned to provide a moderate amount of intersection/driveway conflicts compared to other alternatives	Fair (+0) – The facility is positioned to provide a moderate amount of intersection/driveway conflicts compared to other alternatives	Fair (+0) – The facility is positioned to provide a moderate amount of intersection/driveway conflicts compared to other alternatives
Community Support	Public Input	Fair (+0.5) – the one-way buffered bike lane was supported by the public, but not as strongly as other options	Good (+1) – The one-way separated bike lane was a preferred facility type in the first open house	Fair (+0) – the two-way facility received mixed responses from the public. Some participants appreciated the convenience of a bi-directional facility, while others felt it was not as intuitive as one-way facilities	Fair (+0) – the two-way facility received mixed responses from the public. Some participants appreciated the convenience of a bi-directional facility, while others felt it was not as intuitive as one-way facilities	Good (+1) – The one-way parking-protected bike lane was a preferred facility type in the first open house
	Planning Documents	Fair (+0) – the alternative is consistent with the TSP recommendation for providing enhanced bicycle facilities, but does not provide the amount of separation desired for the segment	Good (+1) – this alternative is consistent with the recommended low-stress "protected bike lane" facility treatment identified in the TSP	Fair (+0) – the alternative is consistent with the TSP recommendation for providing enhanced bicycle facilities, but does not provide the amount of separation desired for the segment	Fair (+0) – the alternative is consistent with the TSP recommendation for providing enhanced bicycle facilities, but does not provide the amount of separation desired for the segment	Good (+1) – this alternative is consistent with the recommended low-stress "protected bike lane" facility treatment identified in the TSP
Connectivity	Access	Fair (+0) – the alternative provides one-directional access	Fair (+0) – the alternative provides one-directional access	Good (+1) – this alternative provides bi-directional access	Good (+1) – this alternative provides bi-directional access	Fair (+0) – the alternative provides one-directional access
	Transition Zone	Good (+1) – southbound cyclists transition directly from the planned one-way facility on the west side of Court Street north of Ohio Street.	Good (+1) – southbound cyclists transition directly from the planned one-way facility on the west side of Court Street north of Ohio Street.	Poor (-1) – southbound cyclists would have to cross to connect to the planned one-way facility on the west side of Court Street north of Ohio Street.	Good (+1) – southbound cyclists transition directly from the planned one-way facility on the west side of Court Street north of Ohio Street. Northbound cyclists may need to transition to the facility from the planned northbound facility along the east side of Riverside.	Good (+1) – southbound cyclists transition directly from the planned one-way facility on the west side of Court Street north of Ohio Street.
User Experience	Bicycle Level of Traffic Stress (BLTS)	Fair (+0.5) – this alternative improves BLTS by a range of 2 to 3 points[1] and is intuitive requiring no behavioral changes for multimodal users.	Good (+1) – this alternative improves the BLTS by 3 points and is intuitive requiring no behavioral changes for multimodal users.	Fair (+0.5) – this alternative improves BLTS by a range of 2 to 3 points[1] and is intuitive requiring no behavioral changes for multimodal users.	Poor (-1) – this alternative forces bicyclists to travel contraflow adjacent to vehicle lane reducing comfort and increasing stress[2].	Good (+1) – this alternative improves the BLTS by 2 points and is intuitive requiring no behavioral changes for multimodal users.
	Pedestrian Level of Traffic Stress (PLTS)	Fair (+0) – this alternative reduces PLTS on the right side of the roadway by 2 points; it does not change the PLTS on the left side of the roadway	Fair (+0) – this alternative reduces PLTS on the right side of the roadway by 2 points; it does not change the PLTS on the left side of the roadway	Fair (+0) – this alternative reduces PLTS on the left side of the roadway by 2 points; it does not change the PLTS on the right side of the roadway	Fair (+0) – this alternative reduces PLTS on the right side of the roadway by 2 points; it does not change the PLTS on the left side of the roadway	Good (+1) – this alternative reduces PLTS on the right side of the roadway by 2 points and the left side of the roadway by 1 point
Economic Opportunity	Parking	Fair (+0) – this alternative does not change the amount of on-street parking along the segment	Fair (+0) – this alternative does not change the amount of on-street parking along the segment	Fair (+0) – this alternative does not change the amount of on-street parking along the segment	Fair (+0) – this alternative does not change the amount of on-street parking along the segment	Good (+1) – this alternative increases the amount of on-street parking along the segment
Feasibility	Planning-Level Cost	Good (+1) – this alternative has a low cost because it only requires restriping the roadway and constructing buffers	Poor (-1) – this alternative has a high cost because it requires construction of new curbs	Good (+1) – this alternative has a low cost because it only requires restriping the roadway and constructing buffers	Good (+1) – this alternative has a low cost because it only requires restriping the roadway and constructing buffers	Good (+1) – this alternative has a low cost because it only requires restriping the roadway and constructing buffers
	Maintenance	Fair (+0) – this alternative requires maintenance of the buffer; the buffers can be placed so that no special road maintenance equipment is required	Poor (-1) – this alternative may require special maintenance equipment	Fair (+0) – this alternative requires maintenance of the buffer; the buffers can be placed so that no special road maintenance equipment is required	Fair (+0) – this alternative requires maintenance of the buffer; the buffers can be placed so that no special road maintenance equipment is required	Poor (-1) – this alternative may require special maintenance equipment
TOTAL		**3**	**3**	**0.5**	**2**	**7**

1. LTS varies based on speed
2. LTS methodology does not incorporate consideration of contraflow bicycle facility adjacent to travel lane; consultant team has incorporated qualitative assessment into BLTS performance measure to address contraflow bicycle travel adjacent to travel lane.

Based on the results of the evaluation summarized in Table 7, **Alternative 5 | One-Way Parking Protected Bike Lane (Right) with Parking (Both Sides)** is the preferred alternative for this segment because it provides the highest opportunity for crash reduction, has strong community support, improves bicycle and pedestrian LTS more than other alternatives, increases on-street parking, and is relatively low cost compared to the other alternatives.

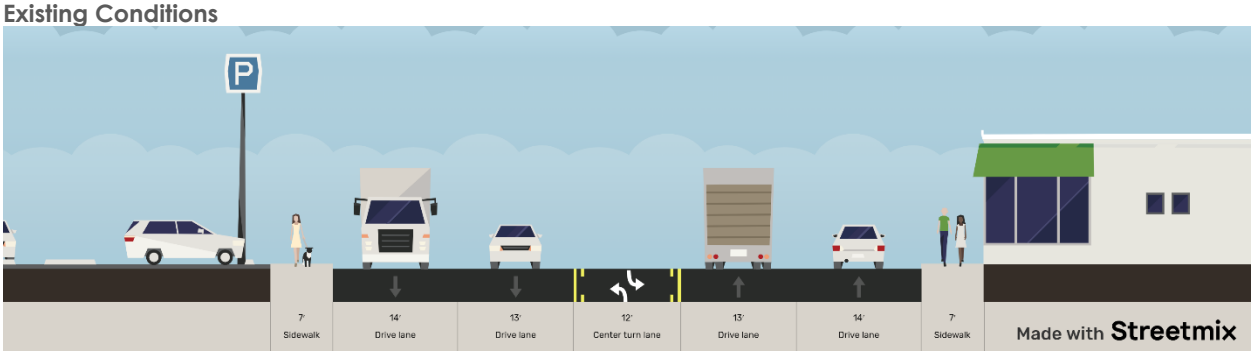
SOUTH OF COUPLET



Existing Conditions

This section includes the segment of Riverside Avenue between Stewart Avenue and the south end of the couplet. This segment of Riverside Avenue is a two-way, north-south roadway with a posted speed limit of 35 MPH. The exhibit below illustrates the existing cross section.

Existing Conditions

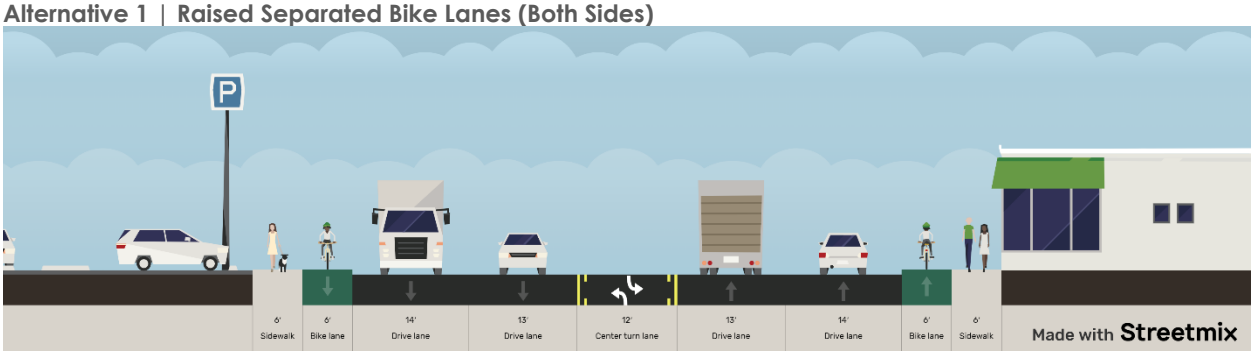


As shown in the exhibit above, the existing cross section includes four 12 to 13-foot drive lanes, one 12-foot center turn lane, and 7-foot sidewalks. The existing ROW is approximately 80 feet, and the existing curb-to-curb width is approximately 66 feet. The sidewalk is not continuous on the west side of the road and the sidewalk varies from 5 to 7-feet on the east side of the road.

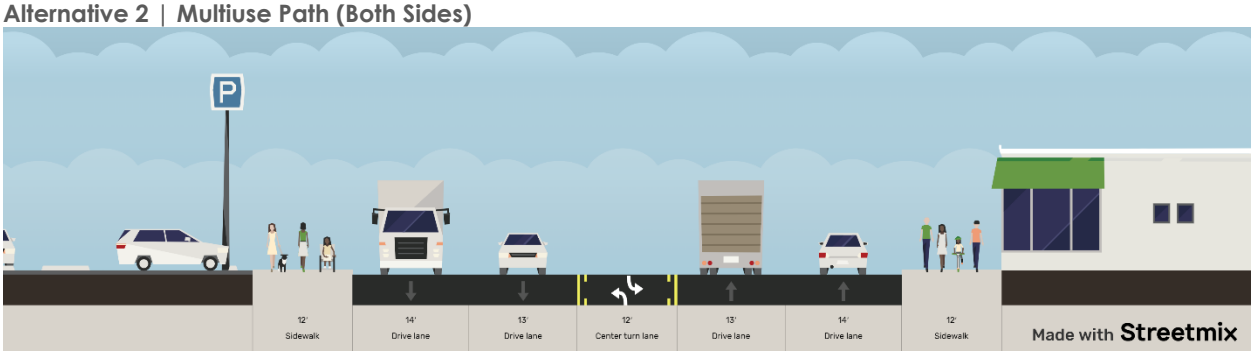
Concept Design Cross Section Alternatives

As shown in the exhibits below, four concept design cross section alternatives were produced to address the multimodal needs identified for this section. All four alternatives require additional ROW and maintain existing drive and turn lanes. Table 8 illustrates the evaluation of each alternative.

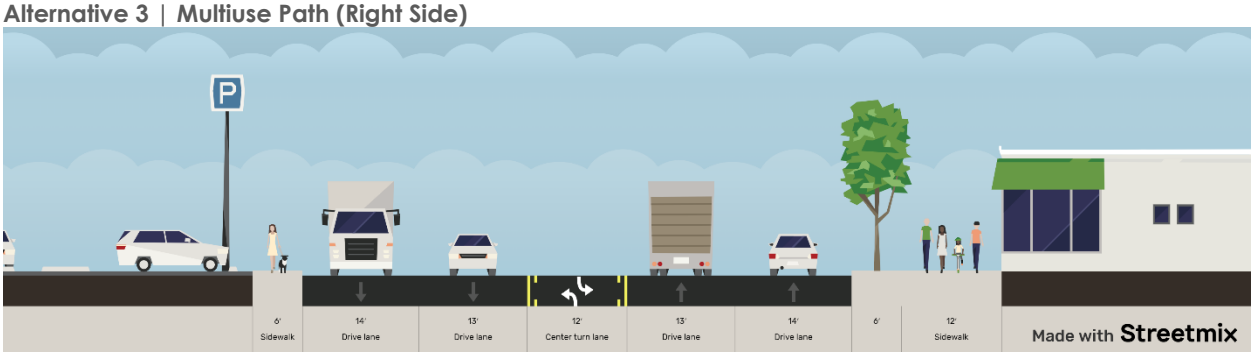
Alternative 1 | Raised Separated Bike Lanes (Both Sides)



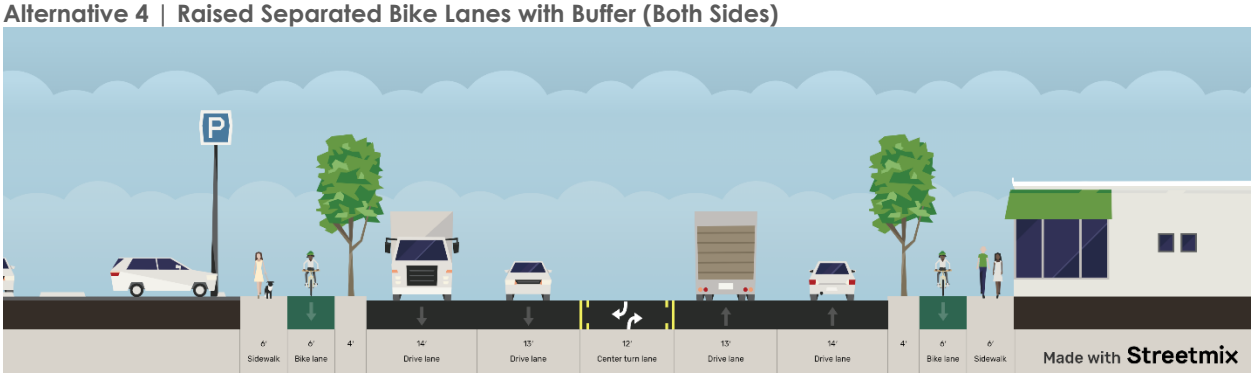
Alternative 2 | Multiuse Path (Both Sides)



Alternative 3 | Multiuse Path (Right Side)



Alternative 4 | Raised Separated Bike Lanes with Buffer (Both Sides)



Evaluation Matrix

Table 8: South of the Couplet Alternatives Evaluation

Evaluation Criteria	Performance Measure	Alternative 1 | Separated Bike Lanes (Both Sides)	Alternative 2 | Multiuse Path (Both Sides)	Alternative 3 | Multiuse Path (Right Side)	Alternative 4 | Raised Separated Bike Lanes with Buffer (Both Sides)
Safety	Crash Reduction Factors	Good (+1) – installing cycle tracks (BP23) has a high crash reduction factor (59% reduction in bicycle crashes at all injury severities)	Good (+1) – installing cycle tracks (BP23) has a high crash reduction factor (59% reduction in bicycle crashes at all injury severities)	Good (+1) – installing cycle tracks (BP23) has a high crash reduction factor (59% reduction in bicycle crashes at all injury severities)	Good (+1) – installing cycle tracks (BP23) has a high crash reduction factor (59% reduction in bicycle crashes at all injury severities)
	Conflict Points	Good (+1) – providing separate facilities for people walking and biking reduces potential for conflicts between modes	Fair (+0) – providing a multiuse path allows for conflicts between pedestrian and bicyclists	Fair (+0) – providing a multiuse path allows for conflicts between pedestrian and bicyclists	Good (+1) – providing separate facilities for people walking and biking reduces potential for conflicts between modes
Community Support	Public Input	Good (+1) – raised separated bike lanes was a preferred facility type in the first open house	Fair (+0) – the raised separated bike lanes received neutral feedback in the first open house	Fair (+0) – the raised separated bike lanes received neutral feedback in the first open house	Good (+1) – raised separated bike lanes was a preferred facility type in the first open house
	Planning Documents	Good (+1) – this alternative is consistent with the recommended low-stress "protected bike lane" facility treatment identified in the TSP	Good (+1) – this alternative is consistent with the recommended low-stress "protected bike lane" facility treatment identified in the TSP	Good (+1) – this alternative is consistent with the recommended low-stress "protected bike lane" facility treatment identified in the TSP	Good (+1) – this alternative is consistent with the recommended low-stress "protected bike lane" facility treatment identified in the TSP
Connectivity	Access	Fair (+0) – this alternative provides one-directional access on both sides of the roadway	Good (+1) – this alternative provides bi-directional access on both sides of the roadway	Fair (+0.5) – this alternative provides bi-directional access on one side of the roadway	Fair (+0) – this alternative provides one-directional access on both sides of the roadway
	Transition Zones	Good (+1) – the facility does not require transitions	Good (+1) – the facility does not require transitions	Poor (-1) – bicyclists traveling to destinations along Court or traveling southbound would have to transition to the other side of the road	Good (+1) – the facility does not require transitions
User Experience	Bicycle Level of Traffic Stress (BLTS)	Good (+1) – this alternative improves the BLTS by 3 points	Good (+1) – this alternative improves the BLTS by 3 points	Good (+1) – this alternative improves the BLTS by 3 points	Good (+1) – this alternative improves the BLTS by 3 points
	Pedestrian Level of Traffic Stress (PLTS)	Fair (+0) – this alternative improves PLTS by 1 point on both sides of the roadway	Poor (-1) – this alternative does not change the PLTS	Fair (+0) – this alternative improves the PLTS by 1 point on the right side of the roadway; it does not change the PLTS on the left side of the roadway	Good (+1) – this alternative improves PLTS by 2 points on both sides of the roadway
Economic Opportunity	Parking	Fair (+0) – this alternative does not change the amount of on-street parking along the segment	Fair (+0) – this alternative does not change the amount of on-street parking along the segment	Fair (+0) – this alternative does not change the amount of on-street parking along the segment	Fair (+0) – this alternative does not change the amount of on-street parking along the segment
Feasibility	Planning-Level Cost	Poor (-1) – this alternative has a relative high cost because it requires sidewalk widening and utility relocation	Poor (-1) – this alternative has a relative high cost because it requires sidewalk widening and utility relocation	Fair (+0) – this alternative has a moderate cost because it requires sidewalk widening and landscaping; it may be possible to maintain most utilities	Fair (+0) – this alternative has a moderate cost because it requires sidewalk widening and landscaping; it may be possible to maintain most utilities
	Right-of-Way Impact	Fair (+0) – this alternative requires approximately 10' of ROW	Fair (+0) – this alternative requires approximately 10' of ROW	Fair (+0) – this alternative requires approximately 10' of ROW	Poor (-1) – this alternative requires approximately 18' of ROW
	Maintenance	Good (+1) – this alternative requires relative low levels of maintenance	Good (+1) – this alternative requires relative low levels of maintenance	Good (+1) – this alternative requires relative low levels of maintenance	Good (+1) – this alternative requires relative low levels of maintenance
TOTAL		6	4	3.5	7

Based on the results of the evaluation summarized in Table 8, **Alternative 4 | Separated Bike Lanes with Buffer (Both Sides)** is the preferred alternative for this segment because it reduces potential for conflicts between people walking and biking, received strong public support, does not require challenges with transitioning between facilities (south) and improves PLTS more than other alternatives. Alternative 1 scored strongly, similar to Alternative 4 but may be more expensive due to required utility relocation.

Key Findings and Recommendations

Error! Not a valid bookmark self-reference. summarizes the results of the concept design alternative evaluation by study area segment. The consultant team recommends two primary concept design alternatives be advanced for each of the study area segments. The consultant team recommendation takes into account the results of the evaluation and further considers a holistic approach and benefits of consistent facility implementation as well as integration with adjacent streets in this study area. The consultant team recommendations are summarized in Table 9.

Table 9. Concept Design Cross Section Evaluation

Segment	Rank	Top Scoring Alternative	Narrowed Down List Recommendations	Justification/Considerations
E Main Street	1st	Alternative 1 | Two-Way Parking-Protected Bike Lane (Left)	**Alternative 1 | Two-Way Parking-Protected Bike Lane (Left)** **Alternative 2 | One-Way Parking-Protected Bike Lane (Right)**	Alternatives 1 and 2 are the top scoring alternatives and are consistent with the recommended bicycle facility treatment for other study area streets.
	2nd	Alternative 2 | One-Way Parking-Protected Bike Lane (Right)		
Riverside Avenue (Typical Section)	1st	Alternative 1 | One-Way Parking-Protected Bike Lane (Right) Alternative 5 | One-Way Parking-Protected Bike Lane (Right) with Parking (Both Sides)	**Alternative 1 | One-Way Parking-Protected Bike Lane (Right)** **Alternative 3 | Two-Way Buffered Bike Lane (Left)**	Alternative 1 and 5 are the top scoring alternatives. Due to the similarity between Alternative 1 and 5, both alternatives will be advanced as a single alternative "Alternative 1". Public input will be collected as part of Public Outreach Event #2 to determine if parking both sides (Alternative 5) or if parking one side with a wider bicycle facility (Alternative 1) is preferred. Alternative 3 is recommended to be advanced due to consistency with the recommended bicycle facility treatments for other study area streets.
	2nd	Alternative 3 | Two-Way Buffered Bike Lane (Left) Alternative 4 | Two-Way Parking-Protected Bike Lane (Right)		
Court Street and Central Avenue (Typical Section)	1st	Alternative 2 | One-Way Separated Bike Lane (Right) Alternative 3 | Two-Way Buffered Bike Lane (Left)	**Alternative 2 | One-Way Separated Bike Lane (Right)** **Alternative 1 | One-Way Buffered Bike Lane (Right)**	Alternative 2 is the top scoring alternative and is with consistent with the recommended bicycle facility treatment for other study area streets. Alternative 1 is consistent with the recommended bicycle facility treatment for other study area streets. Alternative 3 is not recommended due to the limitations of a continuous two-way facility along Central Avenue/Court Street associated with the planned one-way shared lane "sharrow" facility between 6th Street and Jackson Street.
Riverside Avenue (Narrow Section)	1st	Alternative 3 | Two-Way Buffered Bike Lane (Left)	**Alternative 3 | Two-Way Buffered Bike Lane (Left)** **Alternative 1 | One-Way Buffered Bike Lane (Right)**	Alternative 3 is the top scoring alternative and is consistent with the recommended facility treatment for other study area streets. Alternative 1 is recommended to be advanced for consistency with the recommended facility treatments for other study area streets. A fully separated facility may be recommended as a long-term option along the corridor.
	2nd	Alternative 2 | One-Way Separated Bike Lane (Right)		
Riverside Avenue (Wide Section)	1st	Alternative 2 | Two-Way Parking-Protected Bike Lane (Left)	**Alternative 2 | Two-Way Parking-Protected Bike Lane (Left)** **Alternative 1 | One-Way Buffered Bike Lane (Right)**	Alternative 2 is the top scoring alternative and is consistent with the recommended facility treatment for other study area streets. Alternative 1 and Alternative 3 both score second highest; Alternative 1 is recommended to be advanced for consistency with the recommended facility treatments for other study area streets.
	2nd	Alternative 1 | One-Way Buffered Bike Lane (Right) Alternative 3 | Two-Way Buffered Bike Lane (Right)		
Court Street (Wide Section)	1st	Alternative 5 | One-Way Parking-Protected Bike Lane (Right) with Parking (Both Sides)[1]	**Alternative 5 | One-Way Parking-Protected Bike Lane (Right) with Parking (Both Sides)[1]** **Alternative 2 | One-Way Separated Bike Lane (Right)** **Alternative 1 | One-Way Buffered Bike Lane (Right)[1]**	Alternative 5 is the top scoring alternative and is consistent with the recommended facility treatment for other study area streets. Due to the similarity between Alternative 2 and 1, both alternatives will be advanced as a single alternative "Alternative 1". A fully separated facility may be recommended as a long-term option along the corridor.
	2nd	Alternative 2 | One-Way Separated Bike Lane (Right) Alternative 1 | One-Way Buffered Bike Lane (Right)		
South of the Couplet	1st	Alternative 4 | Raised Separated Bike Lanes with Buffer (Both Sides)	**Alternative 4 | Raised Separated Bike Lanes with Buffer (Both Sides)** **Alternative 1 | Raised Separated Bike Lanes (Both Sides)**	Alternative 4 is the top scoring alternative and is recommended to be advanced. The public will be consulted as part of Public Outreach Event #2 to determine the preferred facility type and tradeoffs separated bike lanes with buffers (Alternative 4) or separate bike lanes without buffers (Alternative 1) as it relates to cost.
	2nd	Alternative 1 | Raised Separated Bike Lanes (Both Sides)		

KEY FINDINGS

Key findings of the analysis are summarized below:

- A one-way buffered facility, with parking-protection where space allows, was a high-scoring alternative for Riverside Avenue/Central Avenue /Court Street because it provides the opportunity for high crash-reductions, improves bicycle and pedestrian LTS, and is relatively low-cost with strong community support.
- A two-way left side facility was a high scoring alternative for E Main/Riverside Avenue /Central Avenue /Court Street because the two-way facility provides strong, bi-directional access at key transition zones, can be relatively low-cost, and can avoid key conflict points throughout the study area corridors.
- A raised, separated bike lane with buffers on both sides of the roadway is the preferred alternative south of the couplet because it provides strong access and the greatest level of separation between people biking and walking with people driving.

The narrowed down list of alternatives will be further analyzed to understand the operational impacts of different options. Additionally, the public and stakeholders input will be collected to further understand preferences on the narrowed down list of alternatives and considerations for further concept design refinement.

Enhanced Crossing Opportunities

Opportunities to improve and enhanced existing pedestrian crossings with a particular emphasis on access to transit were analyzed as part of the Concept Design Alternatives Memorandum. The analysis focuses on identifying locations within the Riverside Avenue, Central Avenue, and Court Street one-way couplet system.

ENHANCED CROSSING LOCATIONS

Location opportunities for enhanced crossings were identified based on a spatial analysis of gaps in the existing pedestrian network and a review of transit ridership data derived from the Rogue Valley Transit District (RVTD) Transit Master Plan. Locations along the study corridor with existing signals were not considered for enhanced crossing opportunities.

Target Pedestrian Crossing Spacings

The Oregon Department of Transportation (ODOT) Blueprint for Urban Design (BUD) provides target crossing spacing for pedestrians based on urban contexts. As part of the target pedestrian crossing spacing guidance within the BUD, a white paper was developed to address the question: "how to determine frequency (spacing) of pedestrian crossings on ODOT highways.

The consultant team recognizes the City of Medford's jurisdictional ownership of the study area streets; however, based on the roadway context and functionality, the consultant team recommends the application of the BUD target pedestrian crossing spacing to identify the location and frequency of pedestrian crossings within the study area. Appendix "B" includes the ODOT whitepaper on Pedestrian Crossing Spacing.

Table 10 summarizes the recommended target crossing spacing based on the applicable urban contexts found in the study area.

Table 10. Target Crossing Spacing

Urban Context	Target Spacing Range (feet)
Traditional Downtown/CBD	250-550
Urban Mix	250-550
Commercial Corridor	500-1,000

Based on a review of development patterns, roadway context, and adjacent land uses, the consultant team recommends Commercial Corridor target spacing of 500 to 1,000 feet south of 10th Street and north of Jackson Street within the study area.

Between Jackson Street and 10th Street, the consult team recommends a mix between Traditional Downtown/Central Business District and Urban Mix target spacing of 250-500 feet within the study area.

Liberty Park Neighborhood Plan

RECOMMENDED CROSSINGS

The LPNP identifies three locations foe enhanced pedestrian crossings including:

- Riverside Avenue at Edwards Street or Austin Street
- Court Street at Manzanita Street
- Central Avenue at Beatty Street

CONNECTIONS TO BEAR CREEK GREENWAY

The LPNP identifies four potential connections between the Liberty Park Neighborhood to the BCG including:

- Manzanita Street
- Alice Street
- Edwards Street, and
- Austin Street.

Rogue Valley Transit District Data

EXISTING TRANSIT STOPS

Sixteen (16) existing transit stops are located within the study area including eight (8) on Riverside Avenue, two (2) on Court Street, and six (6) on Central Avenue.

TRANSIT RIDERSHIP

Average daily boarding and alighting data, as well as average daily activity for existing transit stops is summarized in Table 11.

Table 11: Average Daily Transit Activity

StopDesc	AvgDailyBoards	AvgDailyalights	AvgDaily_Activity
Riverside - North of 6th St	8.989171	2.60592	11.595091
Riverside Ave - North of Jackson	13.574589	14.724075	28.298664
Riverside Ave - South of Liberty St	2.129837	2.756261	4.886098
Riverside Ave - South of Manzanita St	1.854212	8.152896	10.007108
Riverside Ave - South of Ohio St	57.596475	72.921916	130.518391
Court St - South of McAndrews Rd	4.215827	1.415716	5.631543
Court St - South of Manzanita St	5.092819	1.979496	7.072315
Central Ave - South of Edwards St	8.513089	6.627555	15.140644
Central Ave - South of Maple St	2.928527	9.828578	12.757104
Central Ave - South of 2nd St	2.092253	6.33627	8.428523
Riverside Ave - North of Barnett Rd	31.258513	31.709538	62.968051
Riverside Ave - South of Bank St	4.341112	7.476359	11.817471
Riverside Ave - South of 13th St	2.219613	80.243742	82.463355
S Central Ave - South of 11th St	7.711269	1.180806	8.892075
S Central Ave - South of 13th St	5.825734	1.494019	7.319753
S Central Ave - at Bank St	8.581996	6.367591	14.949588

As summarized in Table 11, the top five (5) transit stops with highest levels of average daily activity include:

- Riverside Avenue – South of Ohio Street: 130.5
- Riverside Avenue – South of 13th Street: 82.4
- Riverside Avenue – North of Barnett Road: 62.9
- Riverside Avenue – North of Jackson Street: 28.2
- Central Avenue – South of Edwards Street: 15.1

ESSENTIAL DESTINATIONS

Essential Destinations locations are included in the RVTD Transit Master plan and were reviewed to further understand the pedestrian activity generators and destinations needed for enhanced crossing opportunities.

MULTI-FAMILY AND MOBILE HOME PARKS

Multi-Family and Mobile Home Park locations are included in the RVTD Transit Master plan and were reviewed to further understand the pedestrian activity generators and destinations needed for enhanced crossing opportunities.

Medford Urban Renewal Agency Planned Redevelopment

Two potential redevelopment projects identified by the Medford Urban Renewal Agency (MURA) have been identified for consideration as part of the enhanced pedestrian crossing analysis.

The first potential redevelopment site is located along the east side Riverside Avenue between Liberty Street and Edwards Street. The site has been identified as a future location for a grocery store and new Bear Creek crossing. The second potential redevelopment site is located along the west side of Central Avenue between Beatty Street and E Jackson Street. The site has been identified as a future location for a multifamily development. Concept development plans include a floating bus island with an enhanced pedestrian crossing.

Figure 2 illustrates the recommended LPNP enhanced crossing locations and potential connections to the BCG, existing transit stops, essential destinations and multi-family and mobile home park data extracted from the RVTD 2040 Master Plan, and the planned MURA redevelopment sites. These data references and background information have been used to identify potential locations for enhanced pedestrian crossing within the study area.

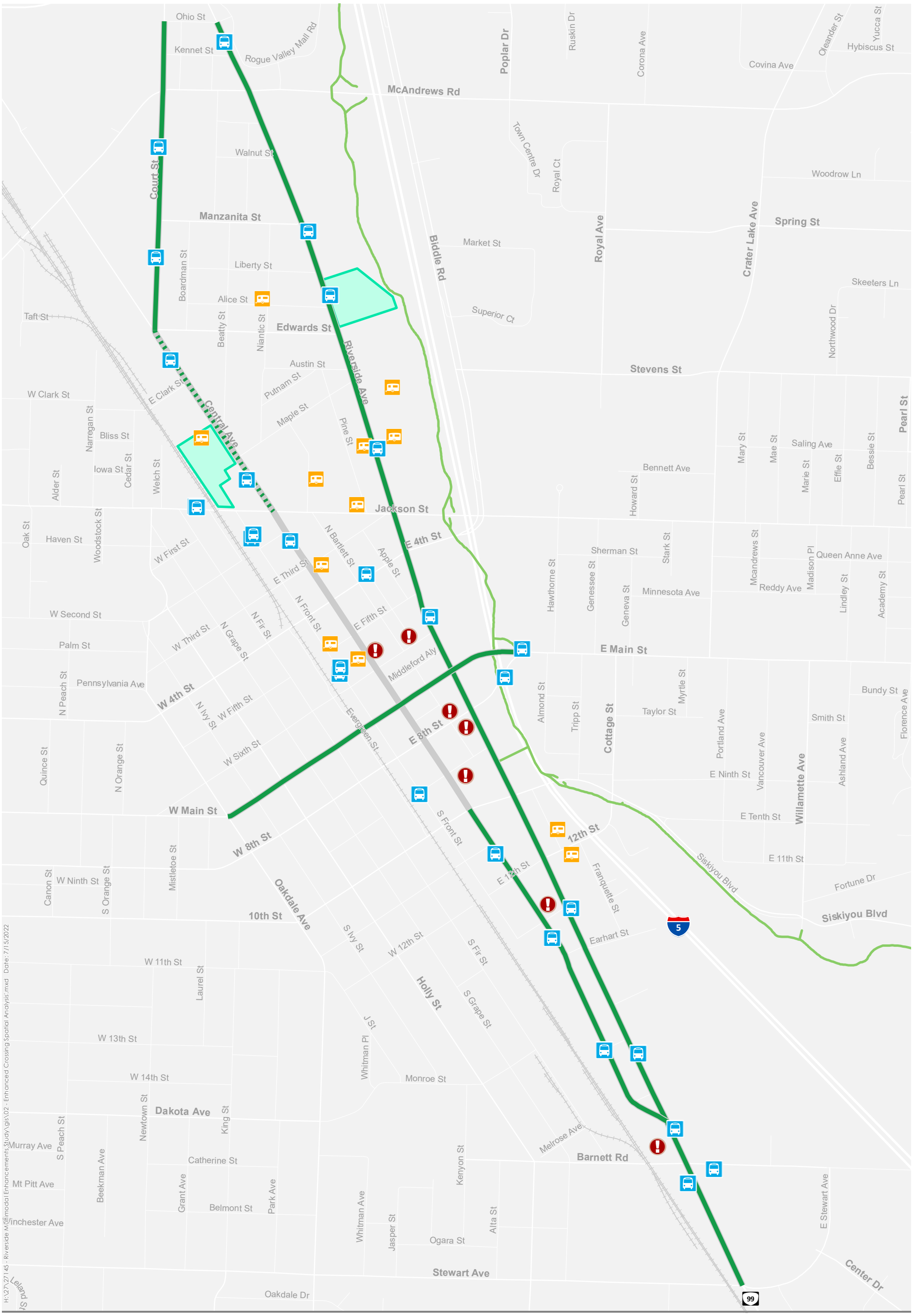


Figure 2

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Enhanced Crossing Spatial Analysis
Medford, Oregon

ENHANCED CROSSING FACILITY TREATMENTS

Determining the appropriate level of separation and enhancement for a pedestrian crossing is driven based on the context of the roadway. Federal Highway Administration (FHWA) *Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations* provides a matrix for pedestrian crash countermeasures by roadway features. The FHWA matrix is illustrated in Figure 3.

Figure 3: FHWA Application of Pedestrian Crash Countermeasures by Roadway Feature

Roadway Configuration	Posted Speed Limit and AADT								
	Vehicle AADT <9,000			Vehicle AADT 9,000–15,000			Vehicle AADT >15,000		
	≤30 mph	35 mph	≥40 mph	≤30 mph	35 mph	≥40 mph	≤30 mph	35 mph	≥40 mph
2 lanes (1 lane in each direction)	● 2 4 5 6	● 5 6 7 9	○ 5 6 ● ●	● 4 5 6	● 5 6 7 9	○ 5 6 ● ●	● 4 5 6 7 9	○ 5 6 7 9	○ 5 6 ●
3 lanes with raised median (1 lane in each direction)	● 2 3 4 5	● ● 5 7 9	○ ● 5 ● ●	○ 3 4 5 7 9	○ ● 5 ● ●	○ ● 5 ● ●	○ ● 4 5 7 9	○ ● 5 ● ●	○ ● 5 ●
3 lanes w/o raised median (1 lane in each direction with a two-way left-turn lane)	● 2 3 4 5 6 7 9	● ● 5 6 7 9	○ ● 5 6 ●	○ 3 4 5 6 7 9	○ ● 5 6 ● ●	○ ● 5 6 ●	○ ● 4 5 6 7 9	○ ● 5 6 ●	○ ● 5 6 ●
4+ lanes with raised median (2 or more lanes in each direction)	● ● 5 7 8 9	● ● 5 7 8 9	○ ● 5 8 ●	○ ● 5 7 8 9	○ ● 5 ● 8 ●	○ ● 5 8 ●	○ ● 5 ● 8 ●	○ ● 5 8 ●	○ ● 5 8 ●
4+ lanes w/o raised median (2 or more lanes in each direction)	● ● 5 6 7 8 9	○ ● 5 ● 7 8 9	○ ● 5 ● 8 ●	○ ● 5 ● 7 8 9	○ ● 5 ● ● 8 ●	○ ● 5 ● 8 ●	○ ● 5 ● 7 8 9	○ ● 5 ● 8 ●	○ ● 5 ● 8 ●

Given the set of conditions in a cell,

- \# Signifies that the countermeasure is a candidate treatment at a marked uncontrolled crossing location.
- ● Signifies that the countermeasure should always be considered, but not mandated or required, based upon engineering judgment at a marked uncontrolled crossing location.
- ○ Signifies that crosswalk visibility enhancements should always occur in conjunction with other identified countermeasures.*

The absence of a number signifies that the countermeasure is generally not an appropriate treatment, but exceptions may be considered following engineering judgment.

1 High-visibility crosswalk markings, parking restrictions on crosswalk approach, adequate nighttime lighting levels, and crossing warning signs
2 Raised crosswalk
3 Advance Yield Here To (Stop Here For) Pedestrians sign and yield (stop) line
4 In-Street Pedestrian Crossing sign
5 Curb extension
6 Pedestrian refuge island
7 Rectangular Rapid-Flashing Beacon (RRFB)**
8 Road Diet
9 Pedestrian Hybrid Beacon (PHB)**

Pedestrian crash countermeasures and enhanced crossing facility treatments were identified based on the unique roadway contexts of Riverside Avenue, Central Avenue, and Court Street.

Traffic Volumes

Based on a review of traffic data collected on Riverside Avenue and Central Avenue in 2019, the appropriate average annual daily traffic (AADT) category to select from based on Figure 3 is 'Vehicle AADT 9,000 – 15,000'. The range of identified volumes are applicable to the one-way streets of Riverside Avenue, Central Avenue, and Court Street; the volumes do not apply to the non-couplet segment of Riverside Avenue approximately 250 feet south of Boyd Street.

Posted Speed

The posted speed on Riverside Avenue, Central Avenue, and Court Street ranges from 20 miles per hour (MPH) to 35 MPH. Based on field observations increased speeds were documented north of Jackson Street on Riverside Avenue and Central Avenue/Court Street. Given the potential for a road reorganization as part of this study and the opportunity to increase parking on one or both sides of the roadway based on the alternatives evaluated, it is expected that vehicular speeds will be reduced. As a result, the recommended operating speed category to select from based on Figure 3 is '35 MPH'.

Roadway Configuration

Roadway configuration varies throughout the corridor, ranging from two (2) to four (4) travel lanes. No pedestrian medians are present throughout the corridor. Considering the opportunity to reduce a travel lane throughout the study corridor as well as the nature of the one-way couplet, the appropriate roadway configuration category to select from based on Figure 3 is '4+ lanes w/o raised median (2 or more lanes in each direction)'.

ENHANCED CROSSING FACILITY SELECTION

Based on traffic volumes, posted and operating speed, as well as roadway configuration, Figure 4 illustrates the recommended pedestrian crash countermeasures based on FHWA Application of Pedestrian Crash Countermeasures by Roadway Feature.

Figure 4: Riverside Avenue/Central Avenue/Court Street Enhanced Crossing Facility Selection[5]

Roadway Configuration	Posted Speed Limit and AADT								
	Vehicle AADT <9,000			Vehicle AADT 9,000–15,000			Vehicle AADT >15,000		
	≤30 mph	35 mph	≥40 mph	≤30 mph	35 mph	≥40 mph	≤30 mph	35 mph	≥40 mph
4+ lanes w/o raised median (2 or more lanes in each direction)	● 3 5 6 7 8 9	○ 3 5 ● 6 7 8 9	○ 3 5 ● 6 8 ● 9	○ 3 5 ● 6 7 8 9	○ 3 5 ● 6 ● 8 ● 9	○ 3 5 ● 6 8 ● 9	○ 3 5 ● 6 ● 8 ● 9	○ 3 5 ● 6 8 ● 9	○ 3 5 ● 6 8 ● 9

Given the set of conditions in a cell,

- # Signifies that the countermeasure is a candidate treatment at a marked uncontrolled crossing location.
- ● Signifies that the countermeasure should always be considered, but not mandated or required, based upon engineering judgment at a marked uncontrolled crossing location.
- ○ Signifies that crosswalk visibility enhancements should always occur in conjunction with other identified countermeasures.*

The absence of a number signifies that the countermeasure is generally not an appropriate treatment, but exceptions may be considered following engineering judgment.

1 High-visibility crosswalk markings, parking restrictions on crosswalk approach, adequate nighttime lighting levels, and crossing warning signs
2 Raised crosswalk
3 Advance Yield Here To (Stop Here For) Pedestrians sign and yield (stop) line
4 In-Street Pedestrian Crossing sign
5 Curb extension
6 Pedestrian refuge island
7 Rectangular Rapid-Flashing Beacon (RRFB)**
8 Road Diet
9 Pedestrian Hybrid Beacon (PHB)**

[5] The operational analysis will explore the feasibility of a road reorganization north of McAndrews Road on Riverside Avenue. If the operational analysis determines that three travel lanes will be required to meet vehicular capacity needs, the project team may consider additional safety countermeasures including a pedestrian hybrid beacon (PHB) or pedestrian half signal.

As summarized in Figure 4, the recommended pedestrian crash countermeasures based on the study area roadway context include:

- High-visibility crosswalk markings, parking restrictions on crosswalk approach, adequate nighttime lighting levels, and crossing warning signs[6]
- **Advance Yield Here To (Stop Here For) Pedestrian sign and yield (stop) line[7]**
- **Pedestrian refuge island[7]**
- **Rectangular Rapid Flashing Beacon (RRFB)[7]**
- **Pedestrian Hybrid Beacon (PHB)[7]**
- Curb extensions[8]
- Road diet[8]

As described in detail within the FHWA *Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations,* "PHB and RRFB are not both installed at the same location". Furthermore, given the nature of the one-way couplet and lack of center turn lanes, a pedestrian refuge island is not recommended within the one-way couplet.

RECOMMENDED ENHANCED CROSSING TREATMENTS & LOCATIONS

Enhanced Crossing Treatments

Based on the roadway context, target pedestrian crossing spacing, and pedestrian crash countermeasure selection identified within the FHWA *Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations,* the consultant team recommends the following pedestrian crash countermeasures be installed at the identified crossing locations illustrated in Figure 5:

- High-visibility crosswalk markings, parking restrictions on crosswalk approach, adequate nighttime lighting levels, and crossing warning signs
- Advance Stop Here For Pedestrian sign and stop line
- Rectangular Rapid Flashing Beacon (RRFB)
- Pedestrian Refuge Island
- Curb extensions

Enhanced Crossing Locations

Figure 5 illustrates the recommended locations for enhanced crossing facilities based on a review of existing crossing opportunities, target pedestrian crossing spacing guidance, review of RVTD ridership data, and spatial analysis of essential destinations as a proxy to pedestrian demand (generators and attractors).

[6] Countermeasure should always occur in conjunction with other identified countermeasures
[7] Countermeasure that should be always be considered
[8] Countermeasure is a candidate treatment

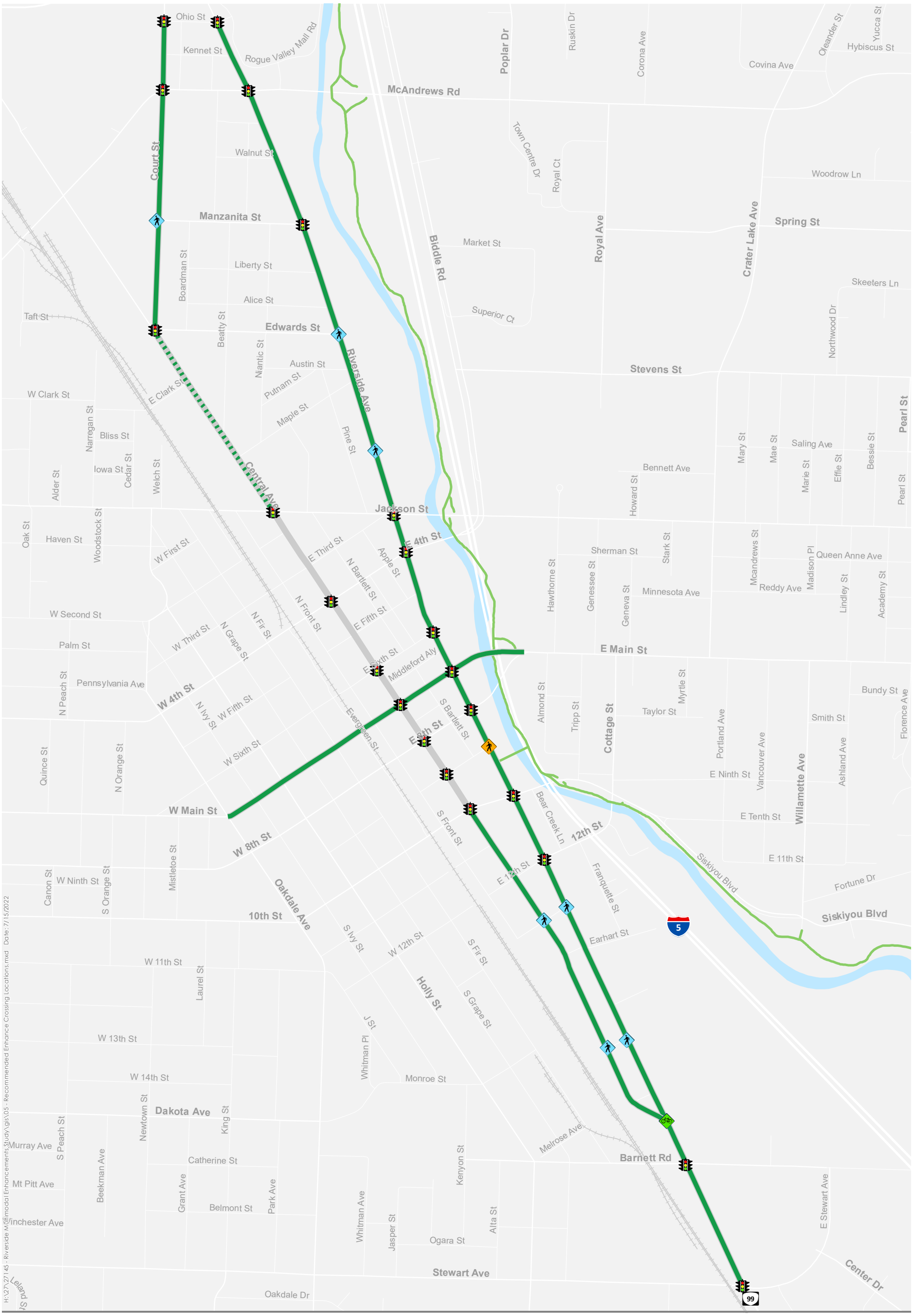


Figure 5

Recommended Enhanced Crossing Locations
Medford, Oregon

KITTELSON & ASSOCIATES

As illustrated in Figure 5, the following locations are recommended for enhanced crossing facilities.

- Bank Street/Riverside Avenue & Central Avenue
- E 13th Street/Riverside Avenue & Central Avenue
- Shirleen Trailer Park Driveway/Riverside Avenue
- Beatty Street/Central Avenue
- Alice Street/Riverside Avenue
- Manzanita Street/Central Avenue

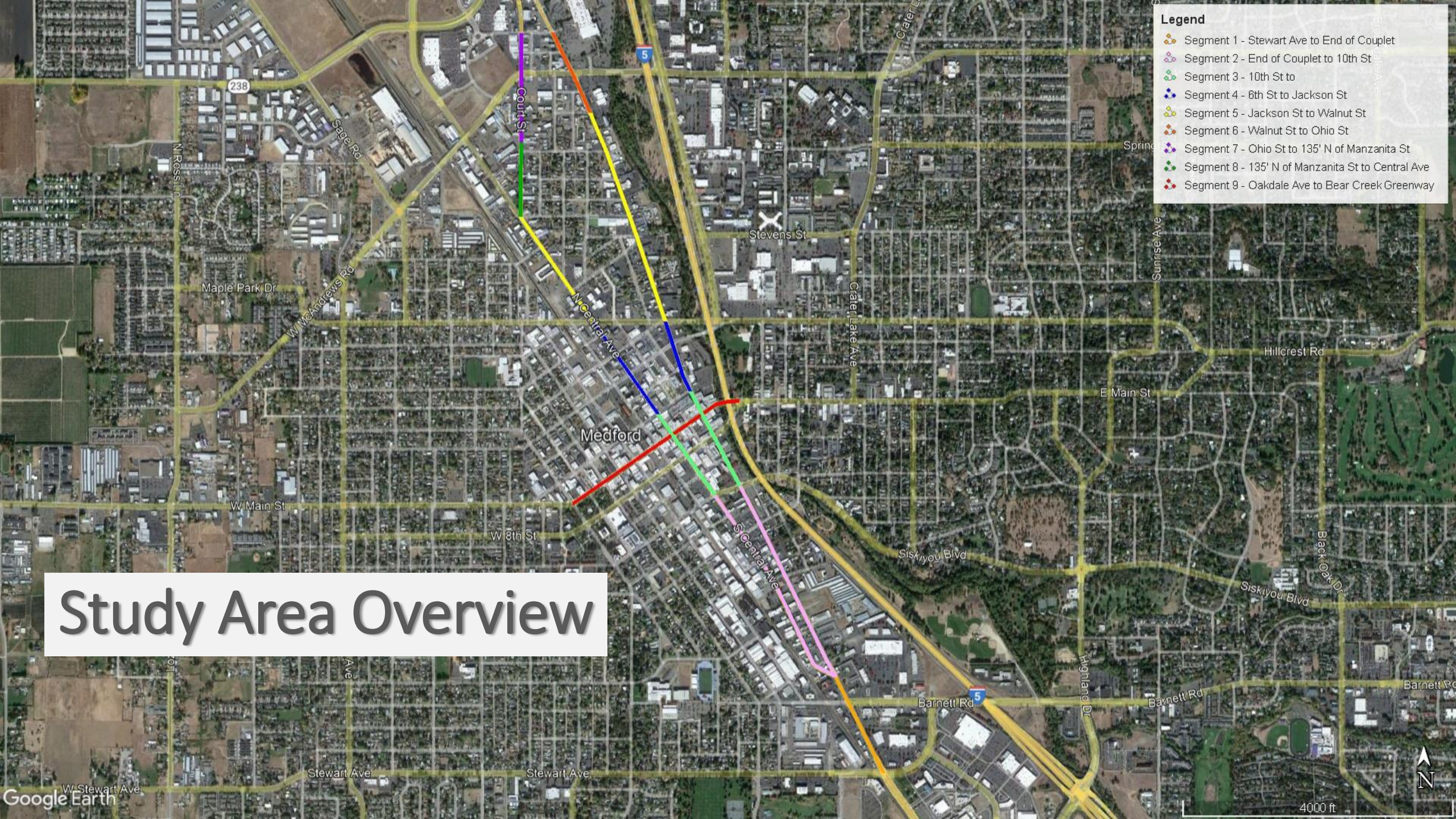
Additionally, the need for a bicycle facility transition zone has been identified approximately 200 feet south of Boyd Street at the merge of the Riverside Avenue and Central Avenue couplet. The need for this transition zone will be further explored as part of the operational analysis and is application to the two-way bicycle facility alternative.

Specific countermeasures including but not limited to curb extensions, confirmation of facility treatment based on cross section concept design, and the exact location of enhanced crossing facilities will be developed as part of the Preferred Concept Design layout and further refined as the knowledge and understanding of the most feasible concept design cross sections are advanced.

Next Steps

The consultant team will proceed with Operational Assessment of the narrowed down list of alternatives to verify options under consideration maintain acceptable mobility.

Appendix A: Cross Section Designs



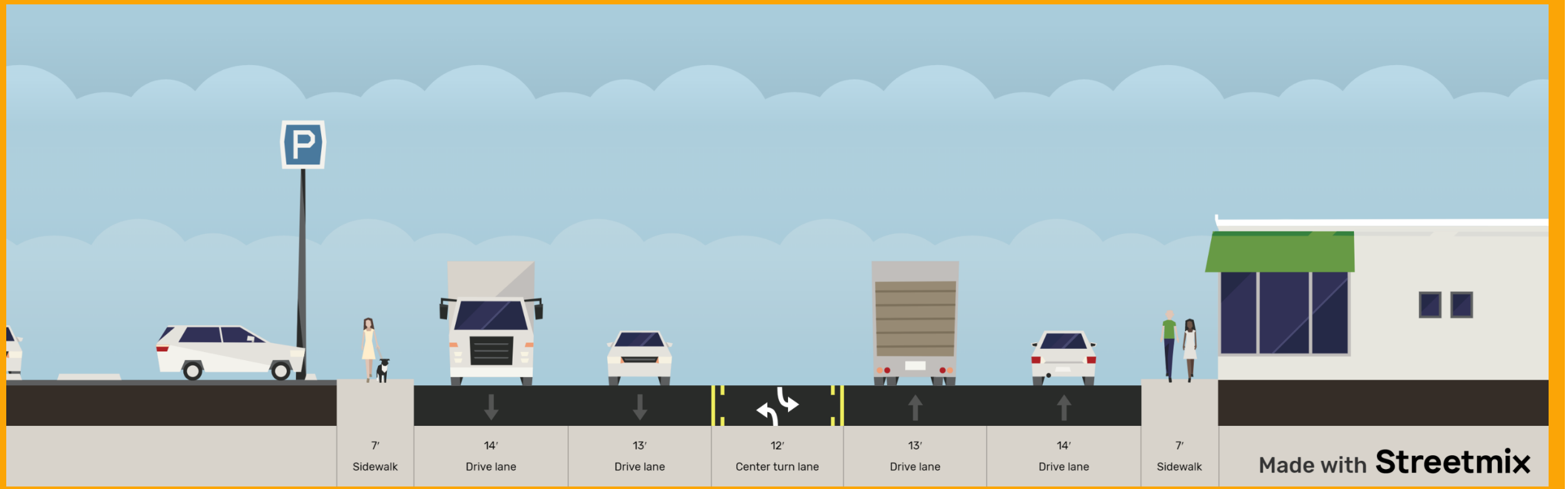
Study Area Overview

Riverside Ave: Stewart Ave – S. End of Couplet



Riverside Ave

Stewart Ave – South End of Couplet: ***Existing Conditions***

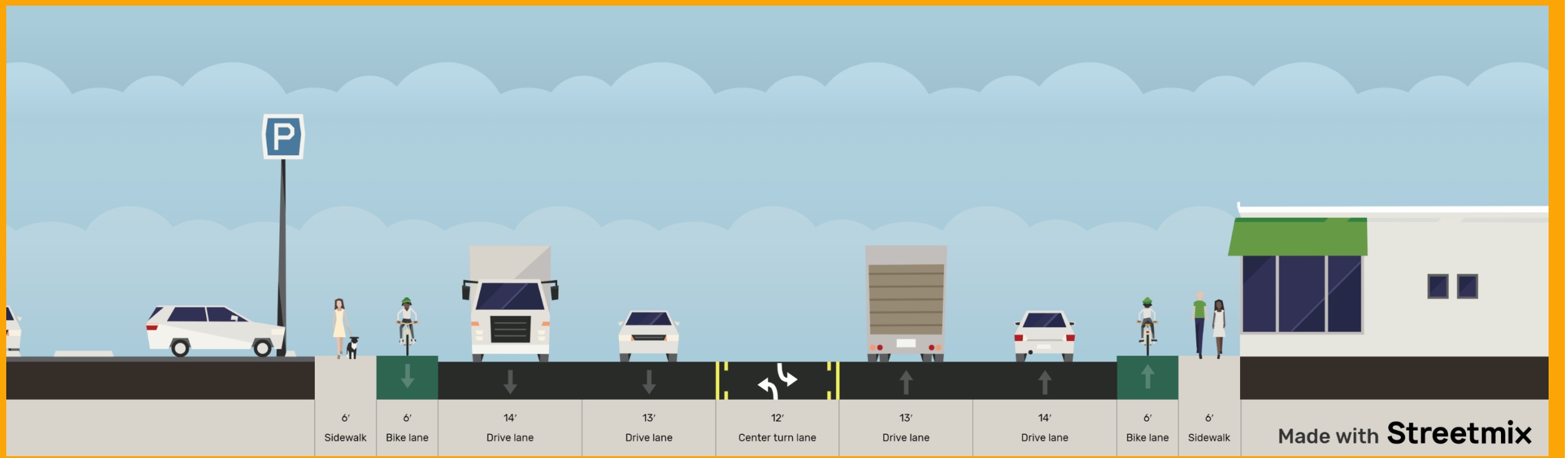


Notes: ROW: ~80’ (ROW is approximate)
Curb-to-curb ~66’

Sidewalk is not continuous on west side
Sidewalk varies from 5’ to 7’ on east side

Riverside Ave

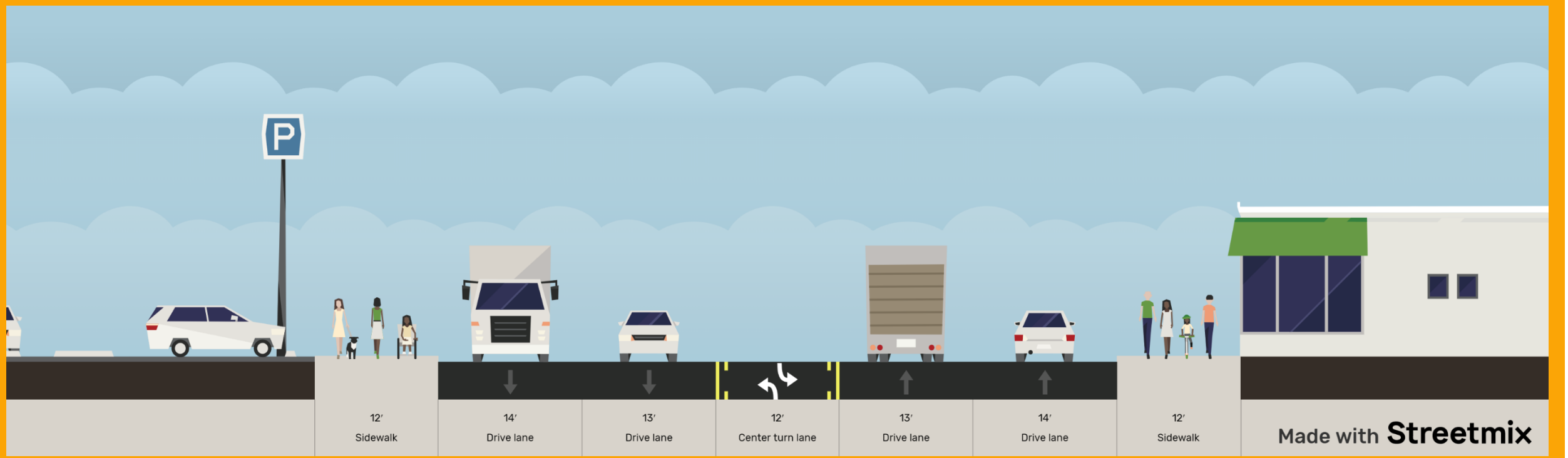
Stewart Ave – South End of Couplet: *Alternative 1*



Notes: Requires ~10’ additional feet of ROW.
ROW is approximate
Maintains existing curbs

Riverside Ave

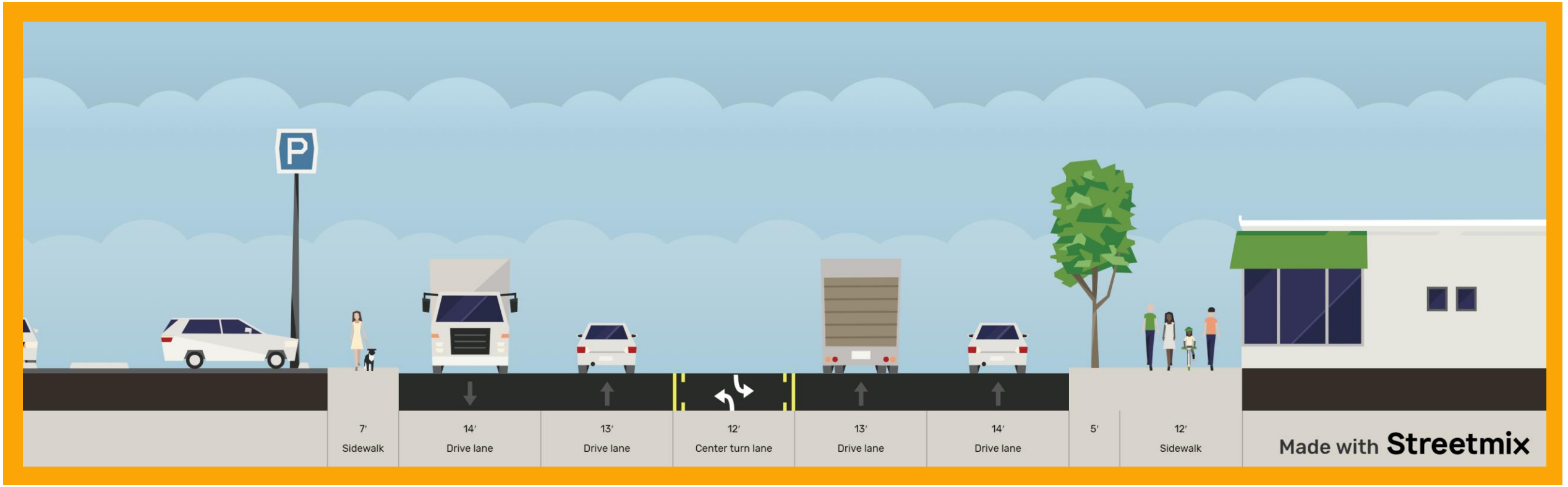
Stewart Ave – South End of Couplet: *Alternative 2*



Notes: Requires ~10’ additional feet of ROW.
ROW is approximate
Maintains existing curbs

Riverside Ave

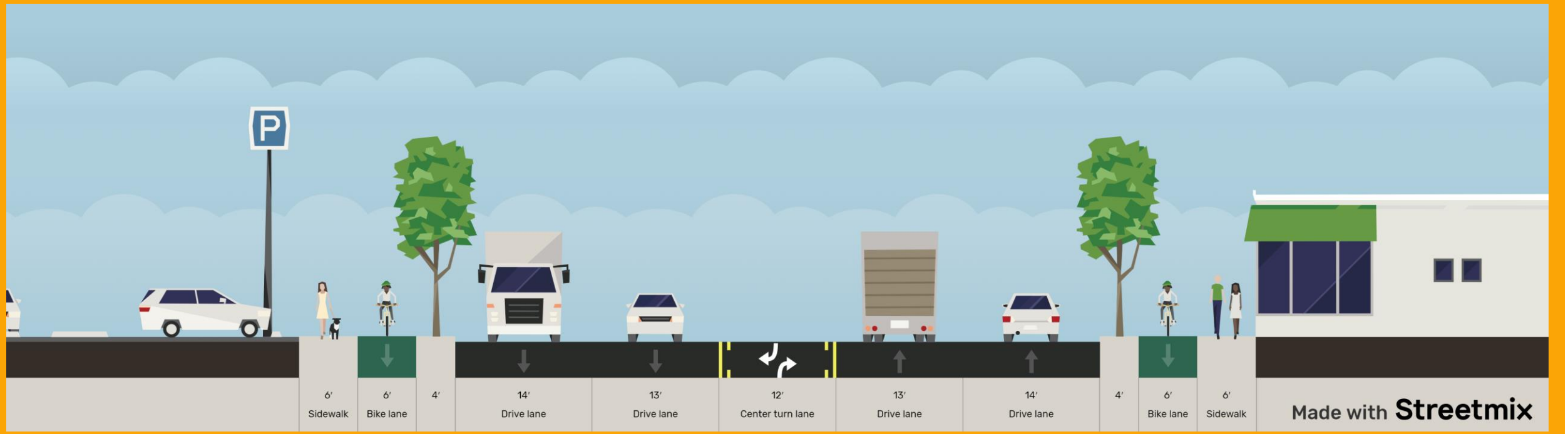
Stewart Ave – South End of Couplet: ***Alternative 3***



Notes: Requires ~10’ additional feet of ROW (on one side).
ROW is approximate
Maintains existing curbs

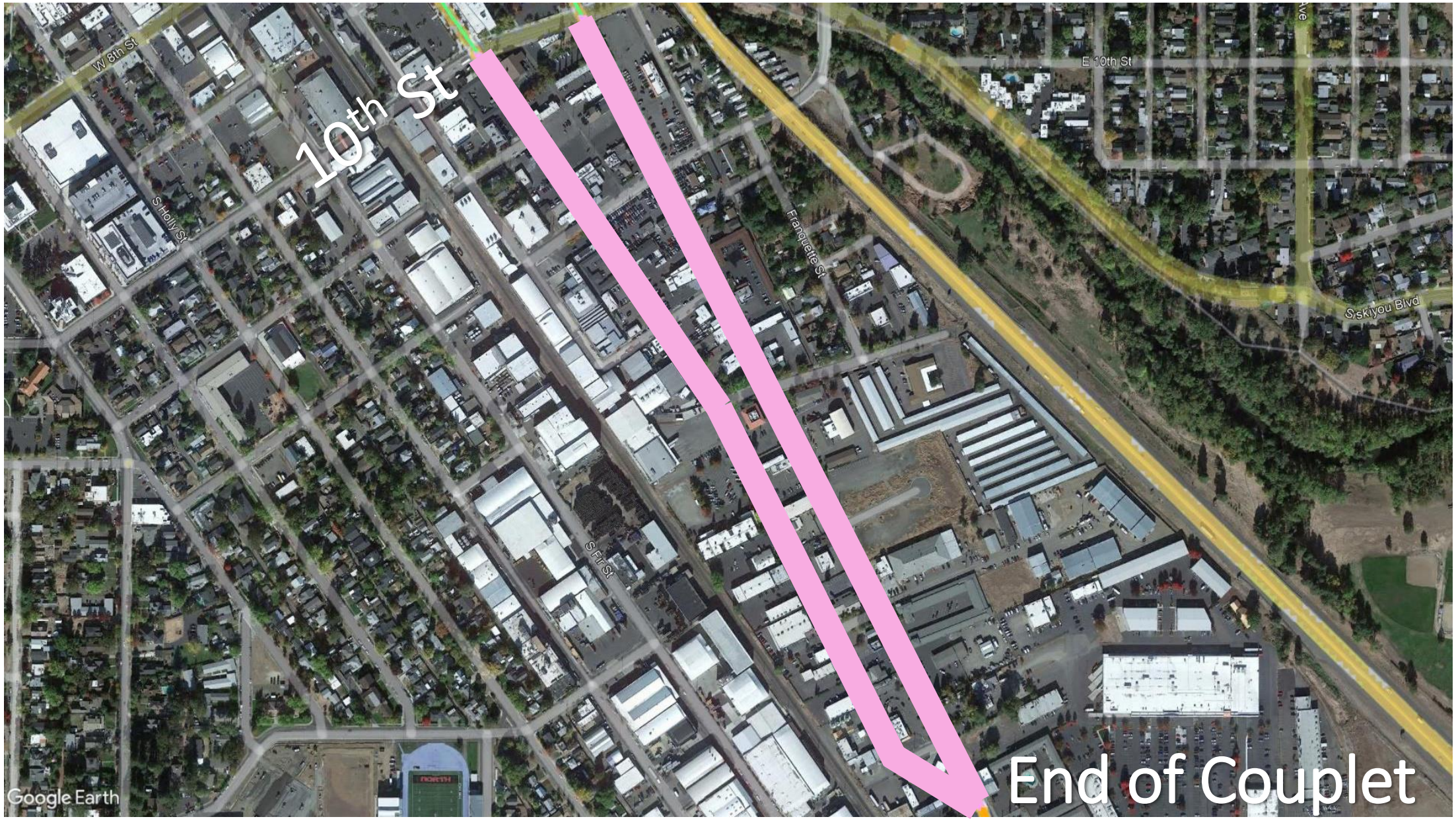
Riverside Ave

Stewart Ave – South End of Couplet: ***Alternative 4***



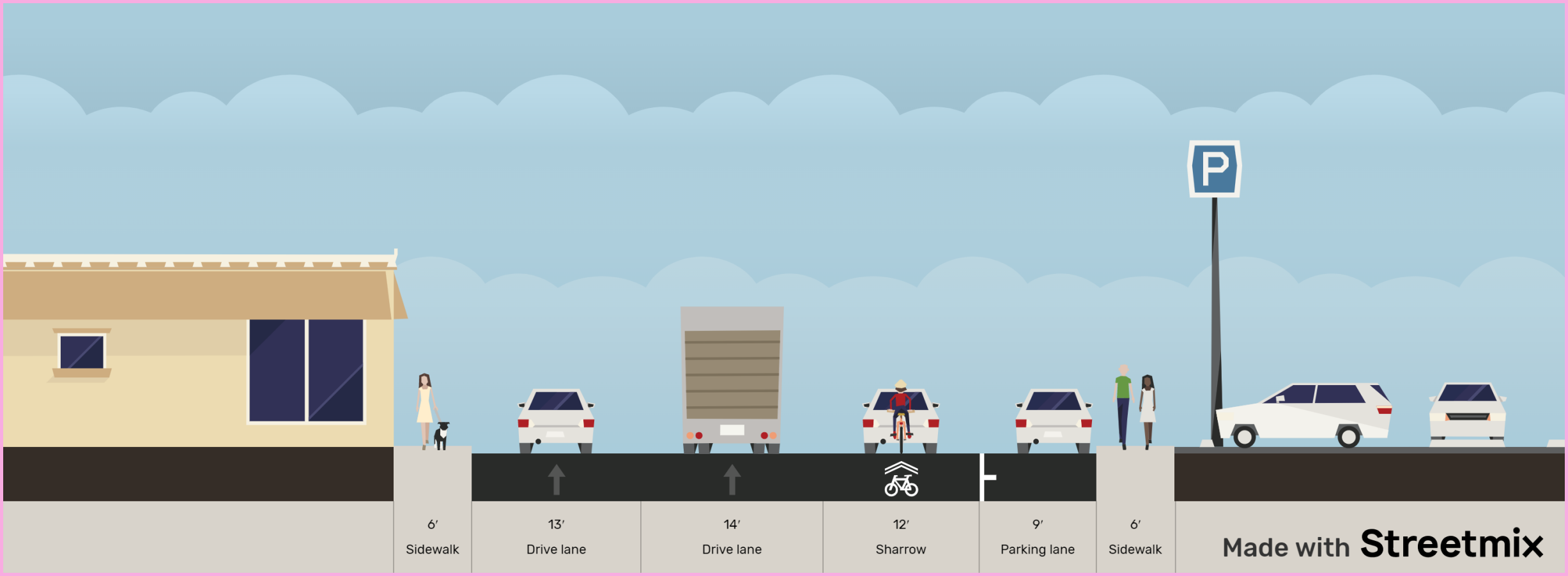
Notes: Requires ~18’ additional feet of ROW.
ROW is approximate
Maintains existing curbs

Riverside Ave/Central Ave: S. End of Couplet – 10th St



Riverside Ave

South End of Couplet – 10th St: *Existing Condition*

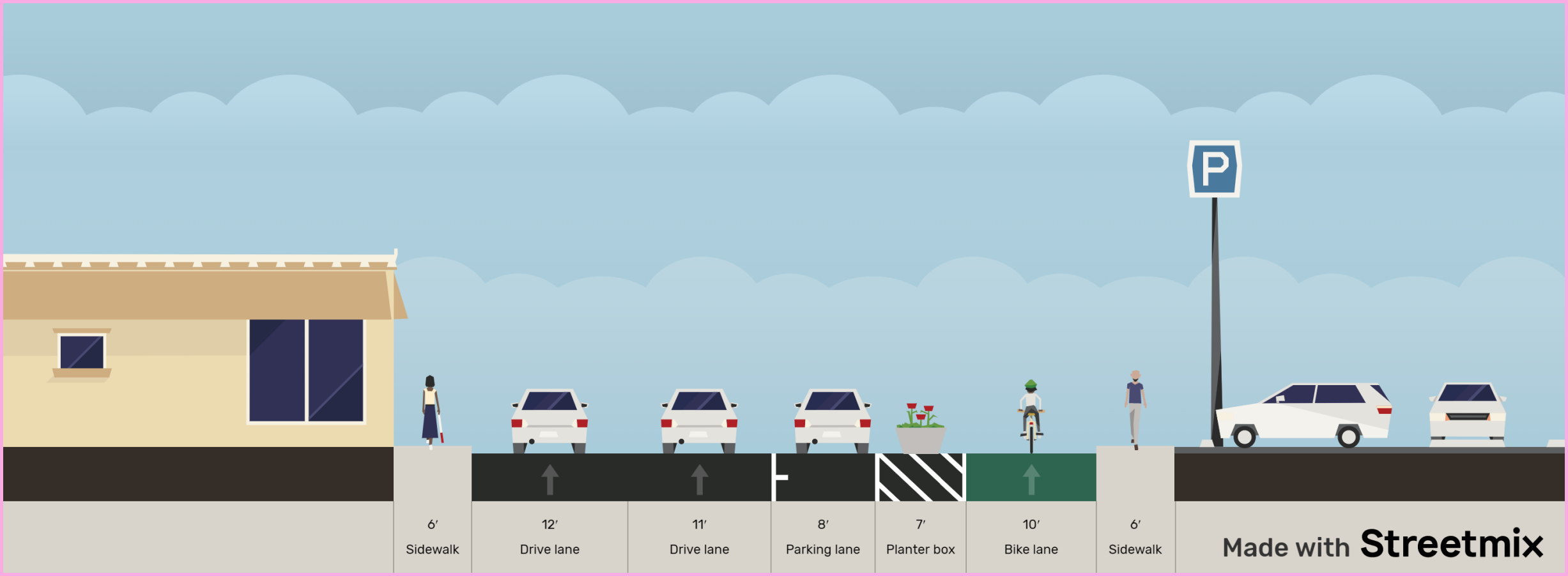


Notes: ROW: ~60’
Curb-to-curb ~48’

Sidewalk is not continuous on the west side

Riverside Ave

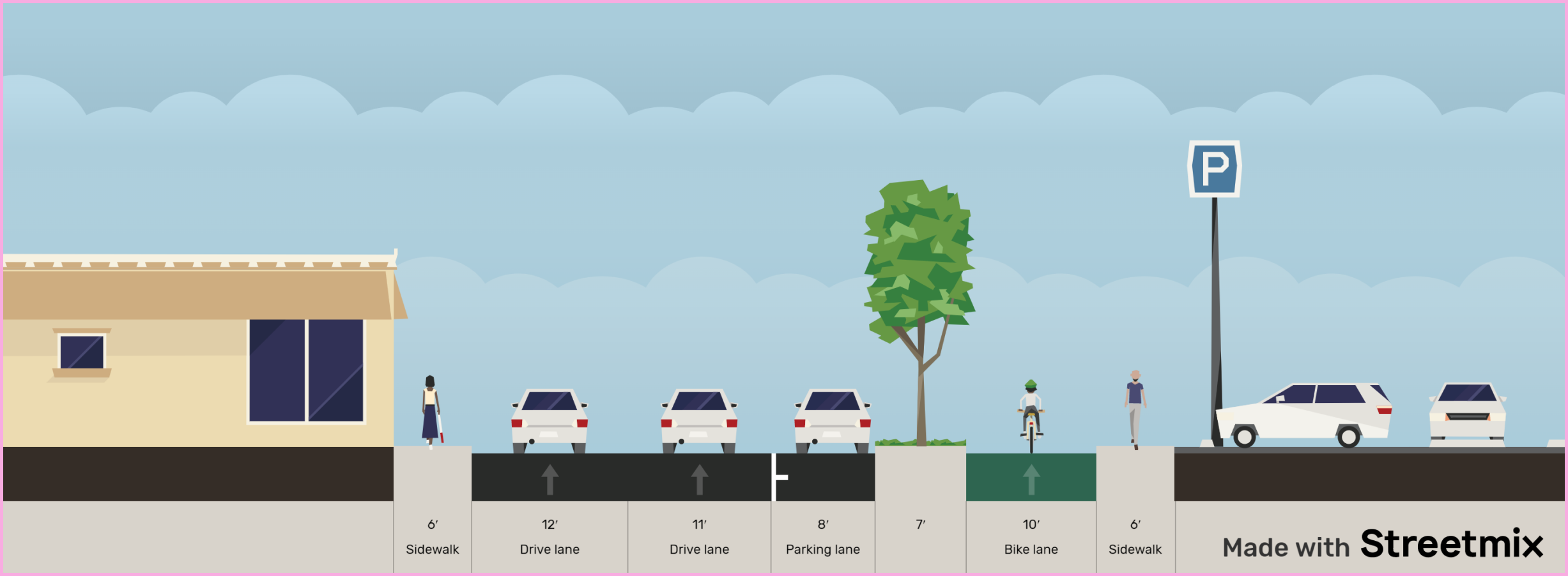
South End of Couplet – 10th St: *Alternative 1*



Notes: Maintains existing ROW
Maintains existing curbs

Riverside Ave

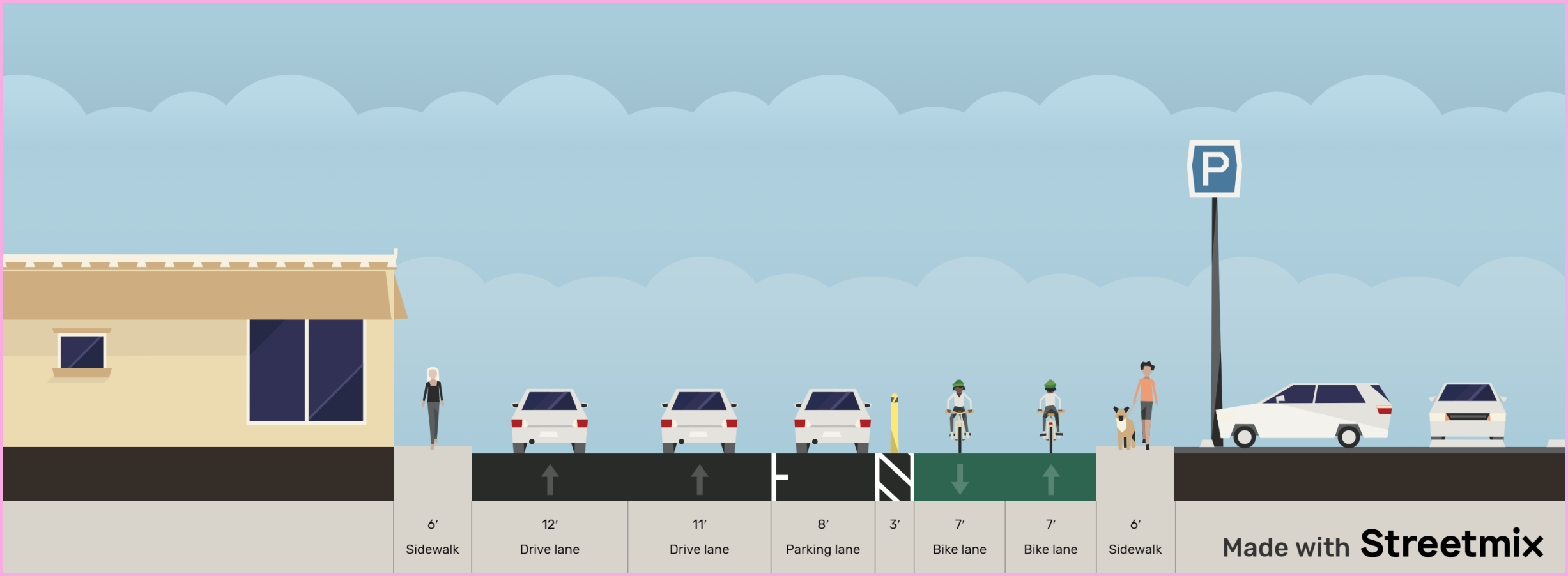
South End of Couplet – 10th St: *Alternative 2*



Notes: Maintains existing ROW
Introduces new curbs (reduces travelway curb-to-curb from 48’ to 31’)

Riverside Ave

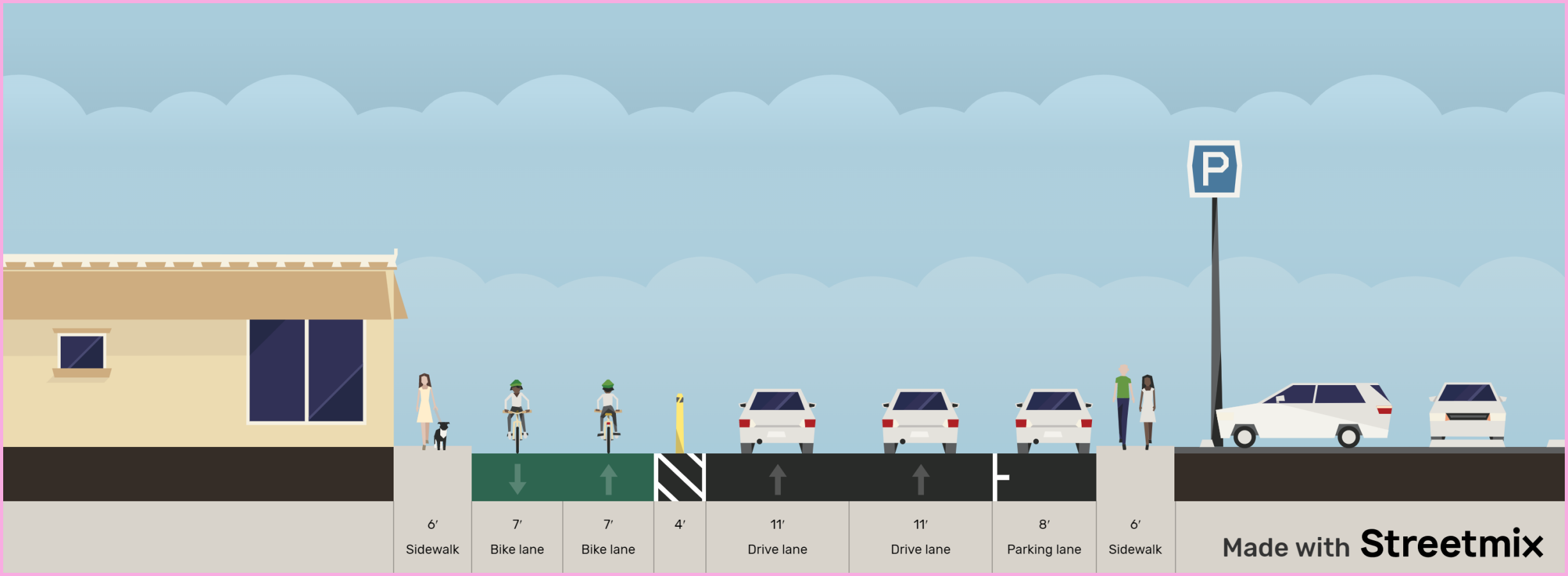
South End of Couplet – 10th St: *Alternative 3*



Notes: Maintains existing ROW
Maintains existing curbs

Riverside Ave

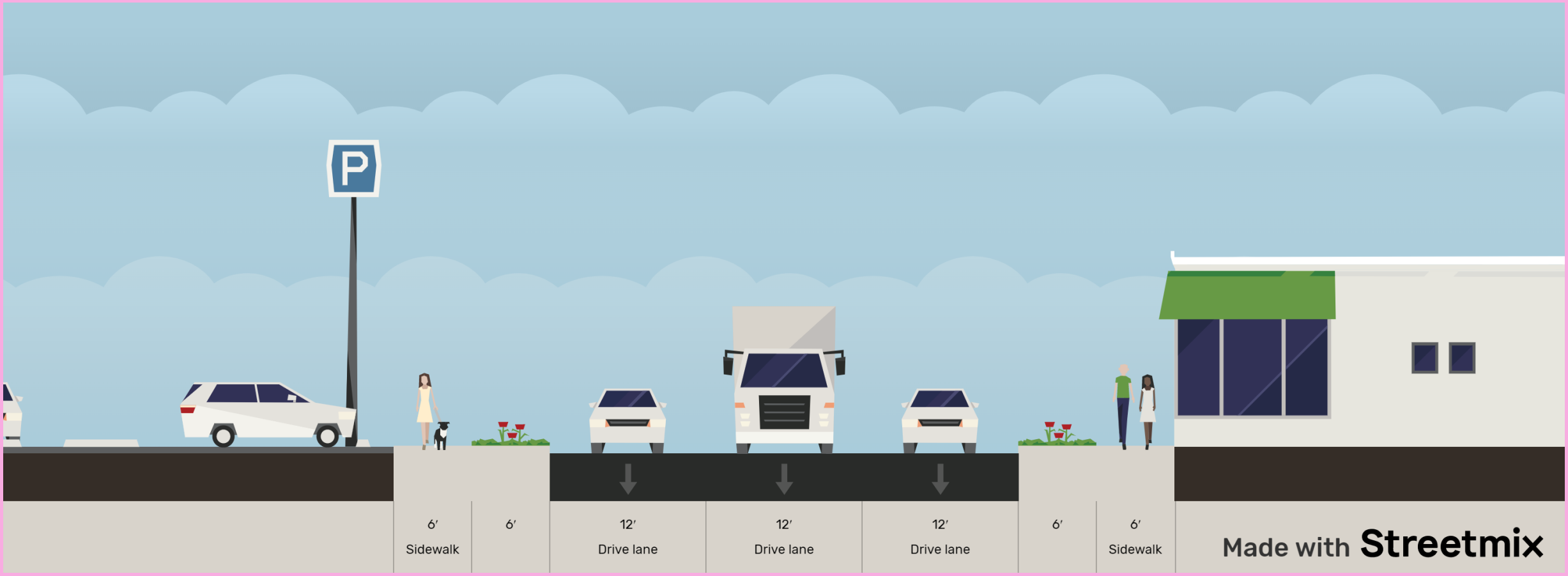
South End of Couplet – 10th St: *Alternative 4*



Notes: Maintains existing ROW
Maintains existing curbs

Central Ave

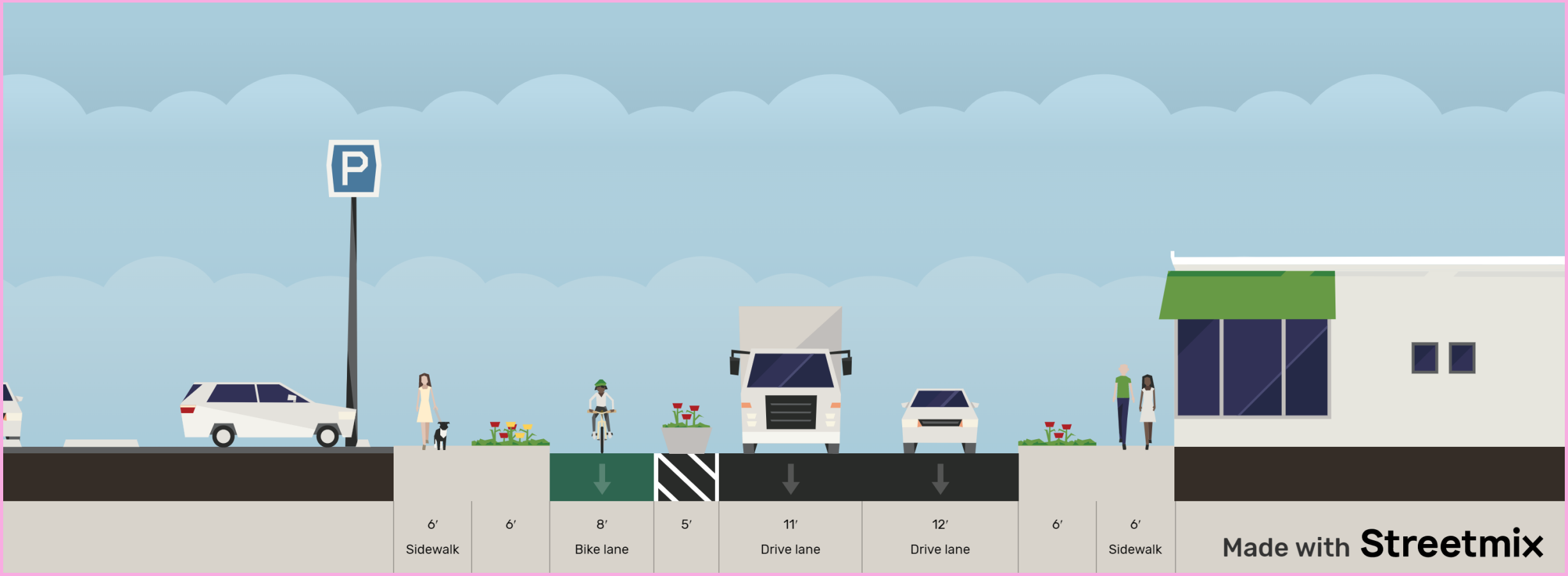
South End of Couplet – 10th St: *Existing Condition*



Notes: ROW: ~60’
Curb-to-curb ~36’
Sidewalk and planter widths vary
Planters replaced with pavers south of 11th on west side

Central Ave

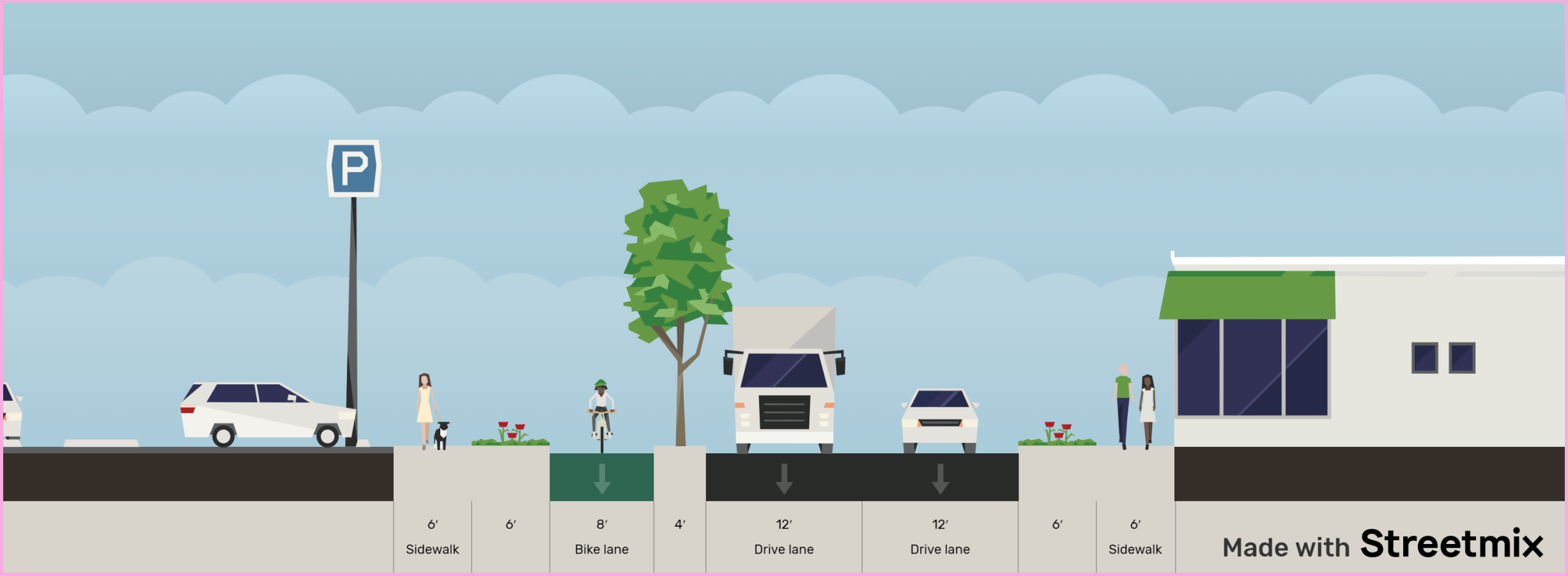
South End of Couplet – 10th St: *Alternative 1*



Notes: Maintains existing ROW
Maintains existing curbs

Central Ave

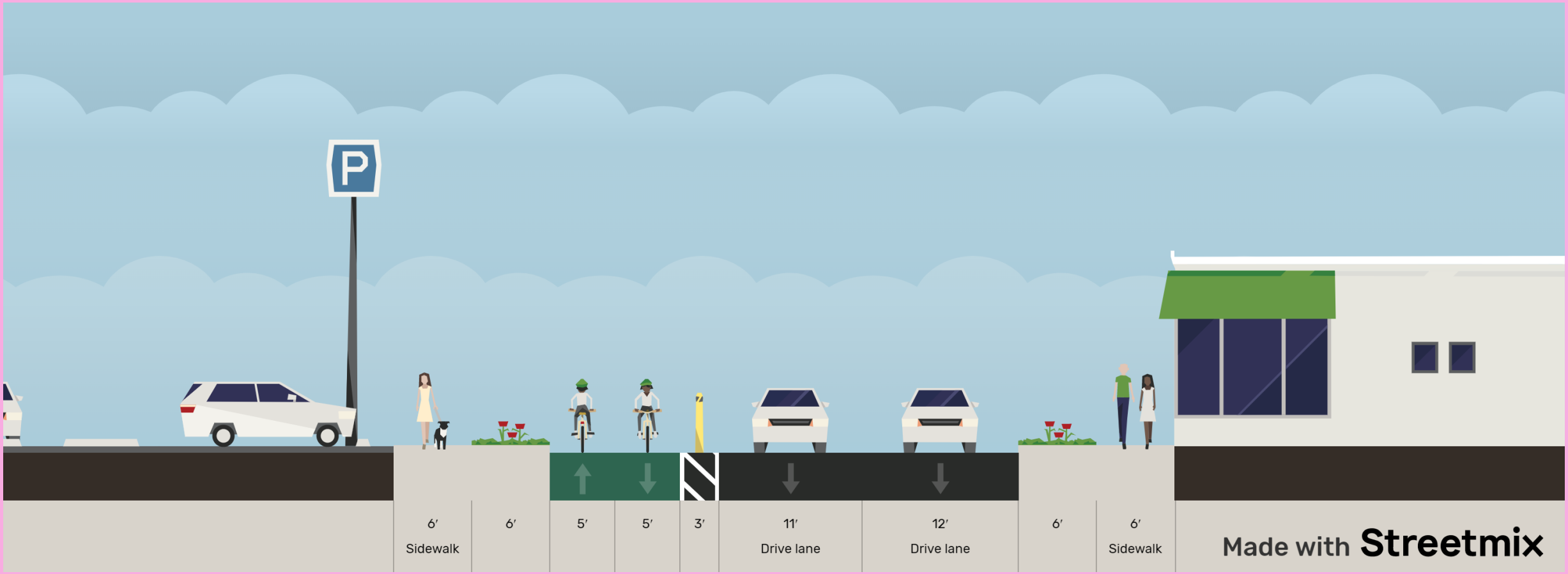
South End of Couplet – 10th St: *Alternative 2*



Notes: Maintains existing ROW
Introduces new curb (reduces travelway curb-to-curb from 36’ to 24’)

Central Ave

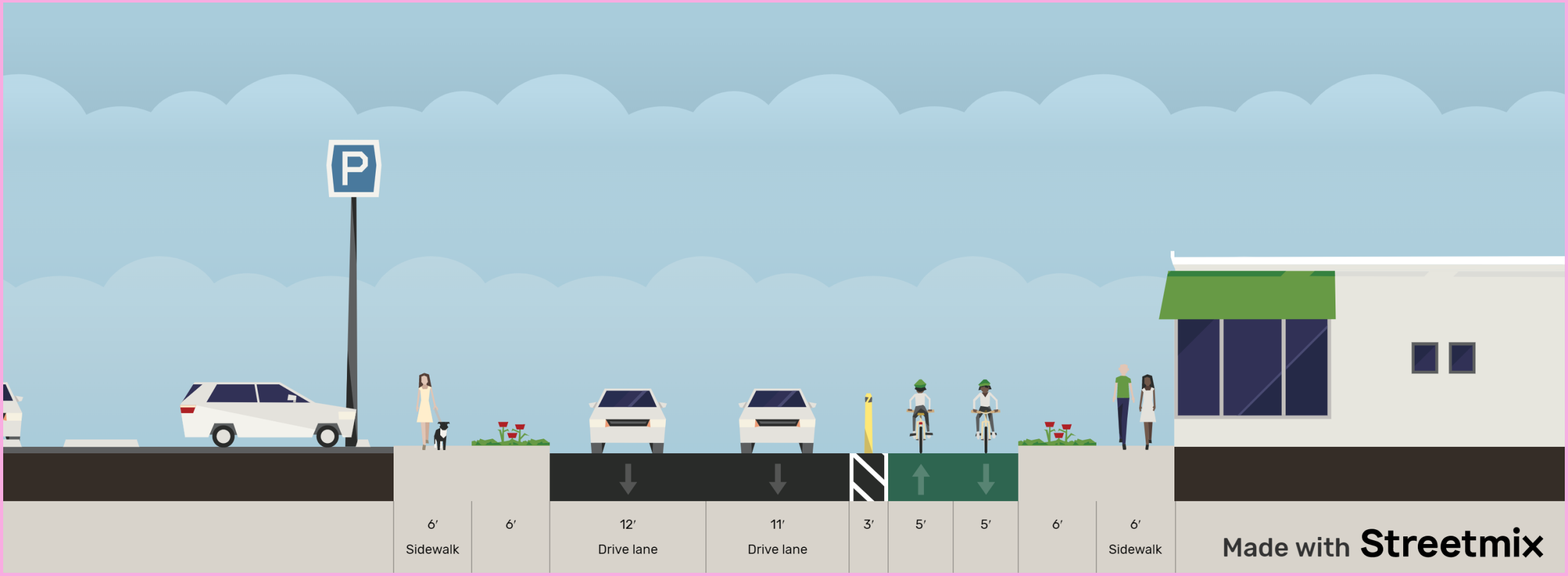
South End of Couplet – 10th St: *Alternative 3*



Notes: Maintains existing ROW
Maintains existing curbs

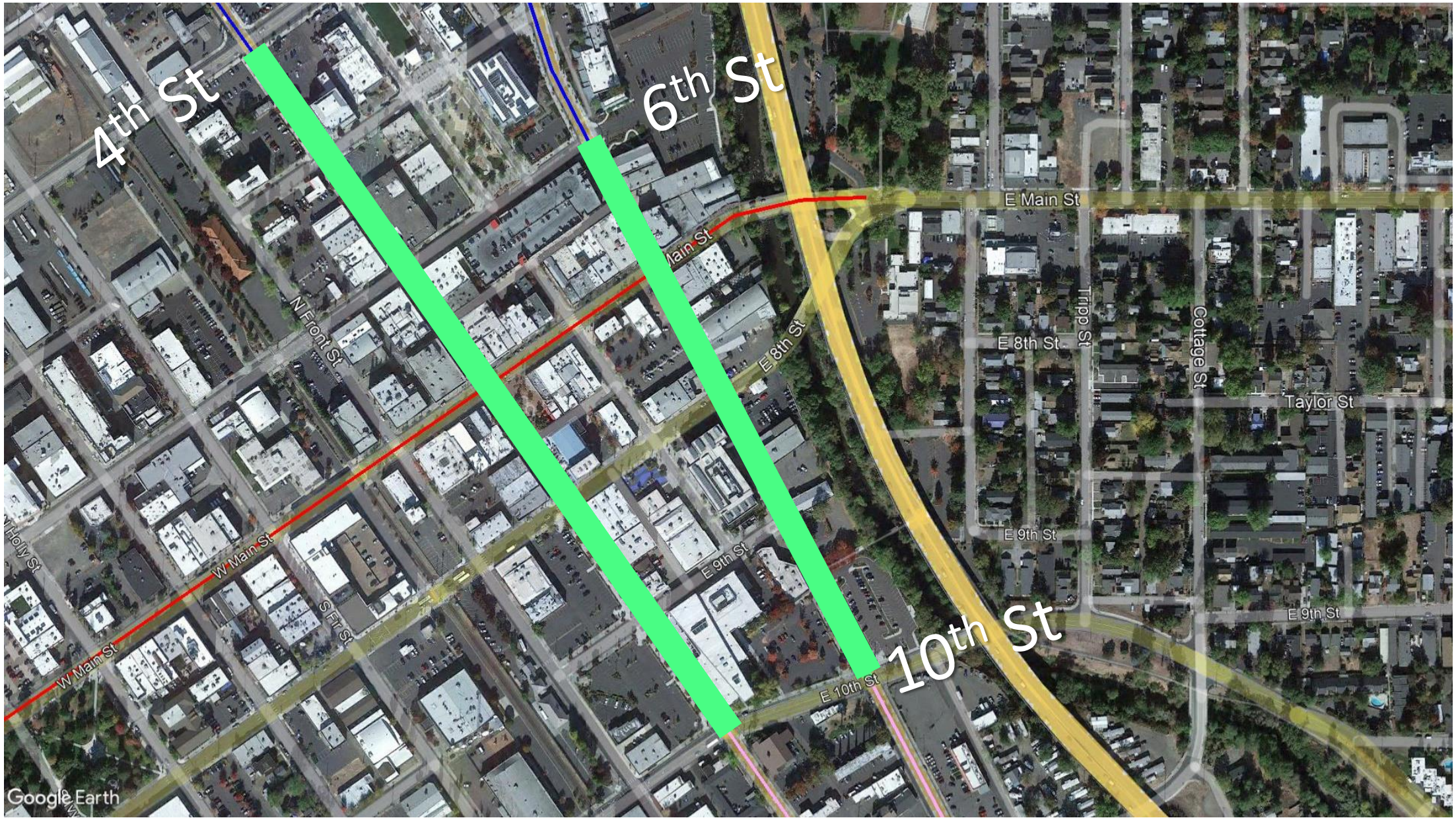
Central Ave

South End of Couplet – 10th St: *Alternative 4*



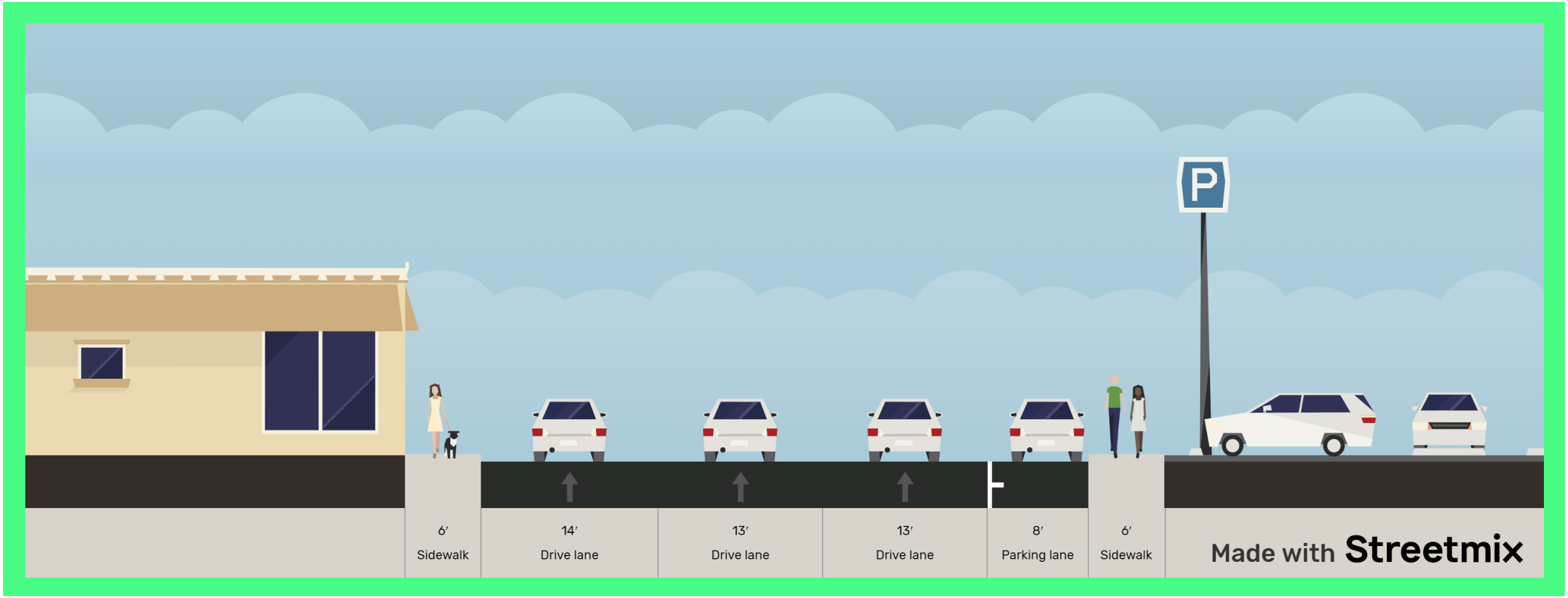
Notes: Maintains existing ROW
Maintains existing curbs

Riverside Ave/Central Ave: 10th St – 4th St/6th St



Riverside Ave

10th St – 6th St: *Existing*

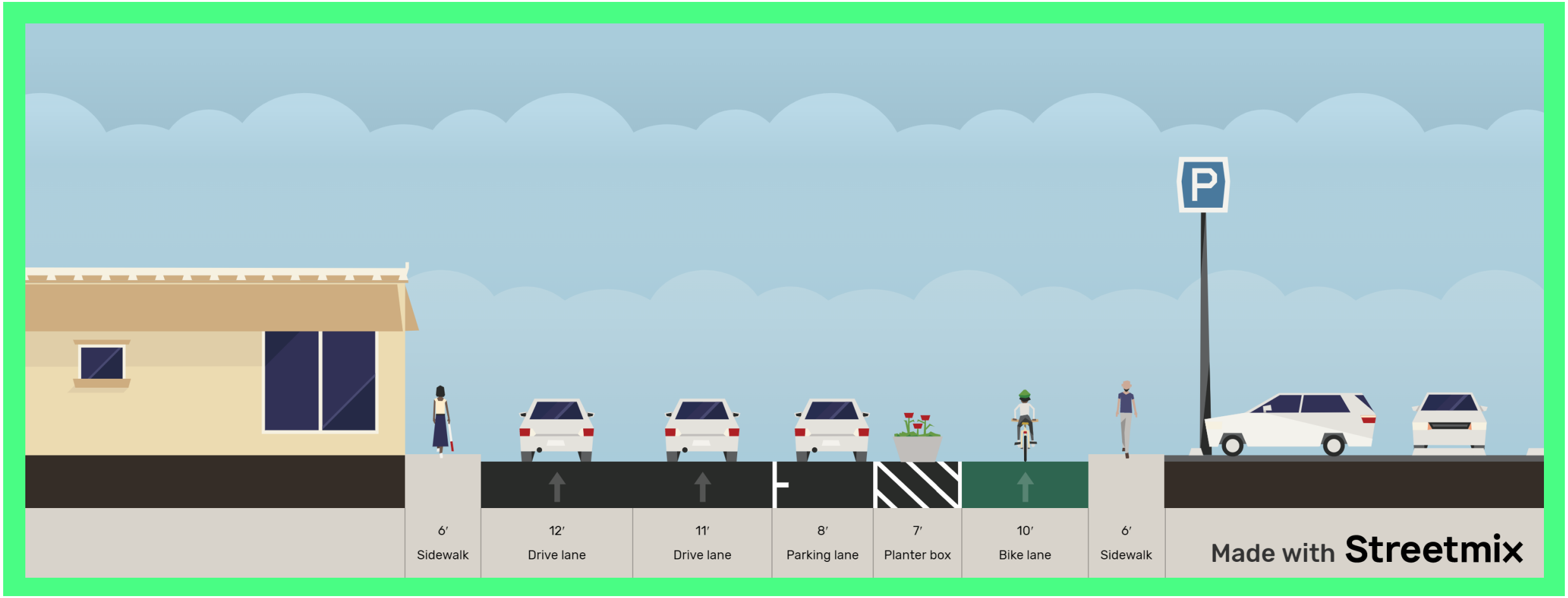


Notes: ROW: ~60’
Curb-to-curb ~48’

Parking lane is also right-turn lane at intersection approaches

Riverside Ave

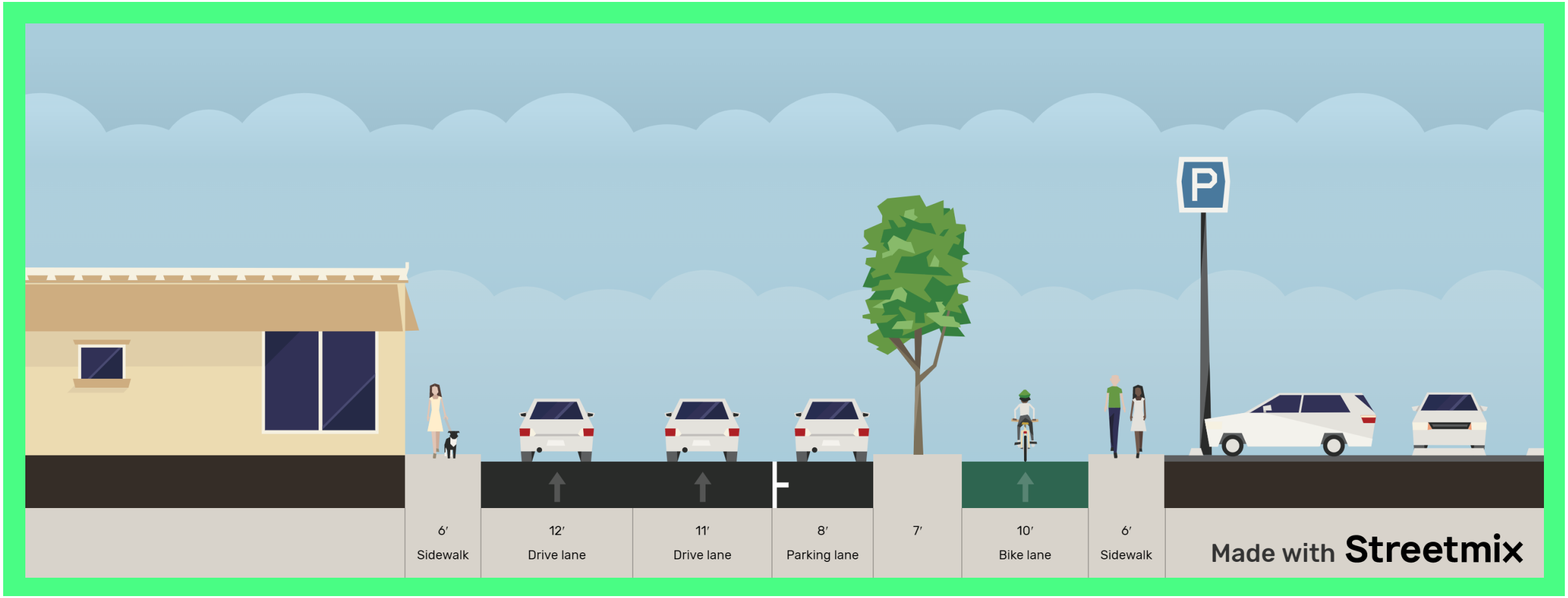
10th St – 6th St: *Alternative 1*



Notes: Maintains existing ROW
Maintains existing curbs

Riverside Ave

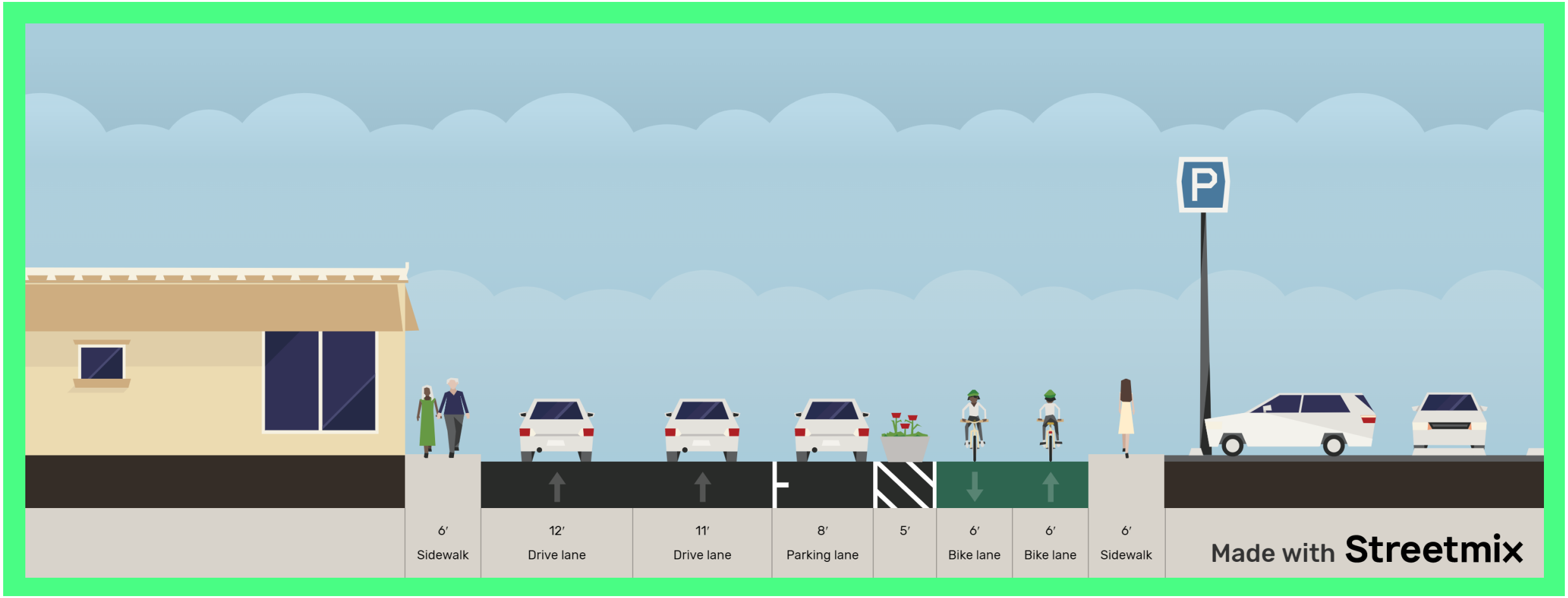
10th St – 6th St: *Alternative 2*



Notes: Maintains existing ROW
Introduces new curbs (reduces travelway curb-to-curb from 48’ to 31’)

Riverside Ave

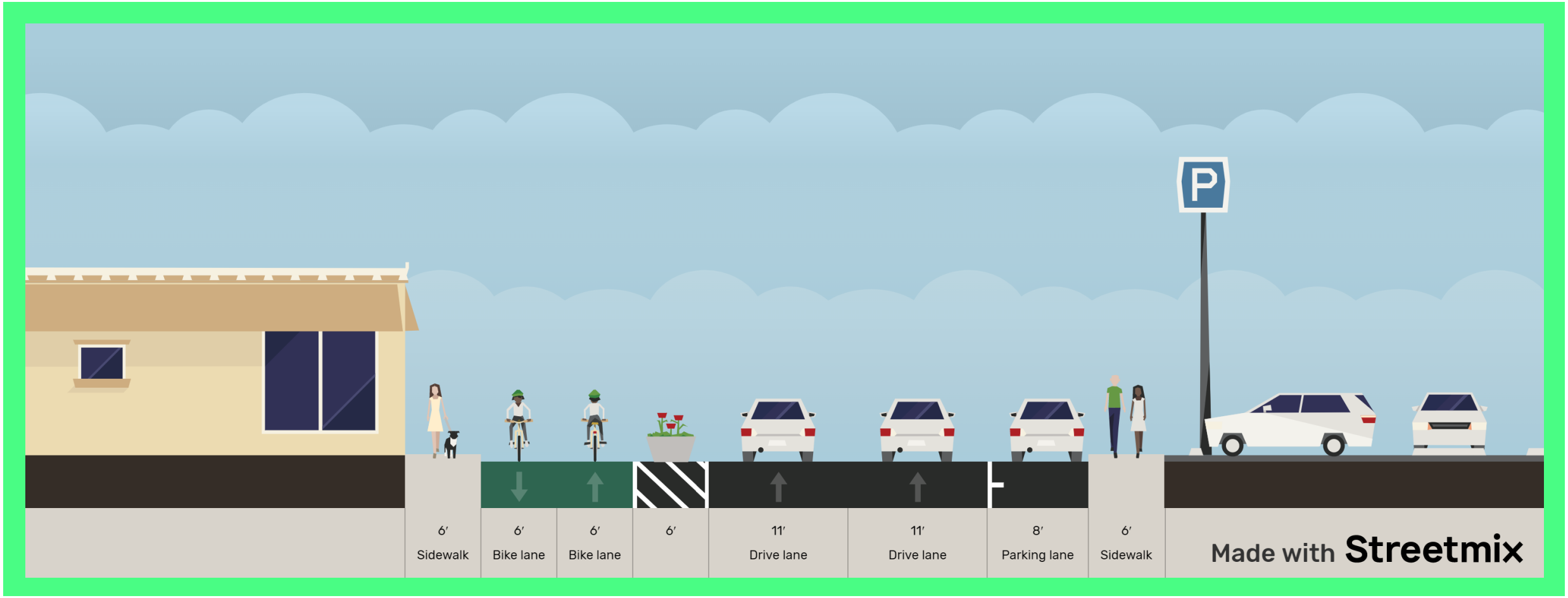
10th St – 6th St: *Alternative 3*



Notes: Maintains existing ROW
Maintains existing curbs

Riverside Ave

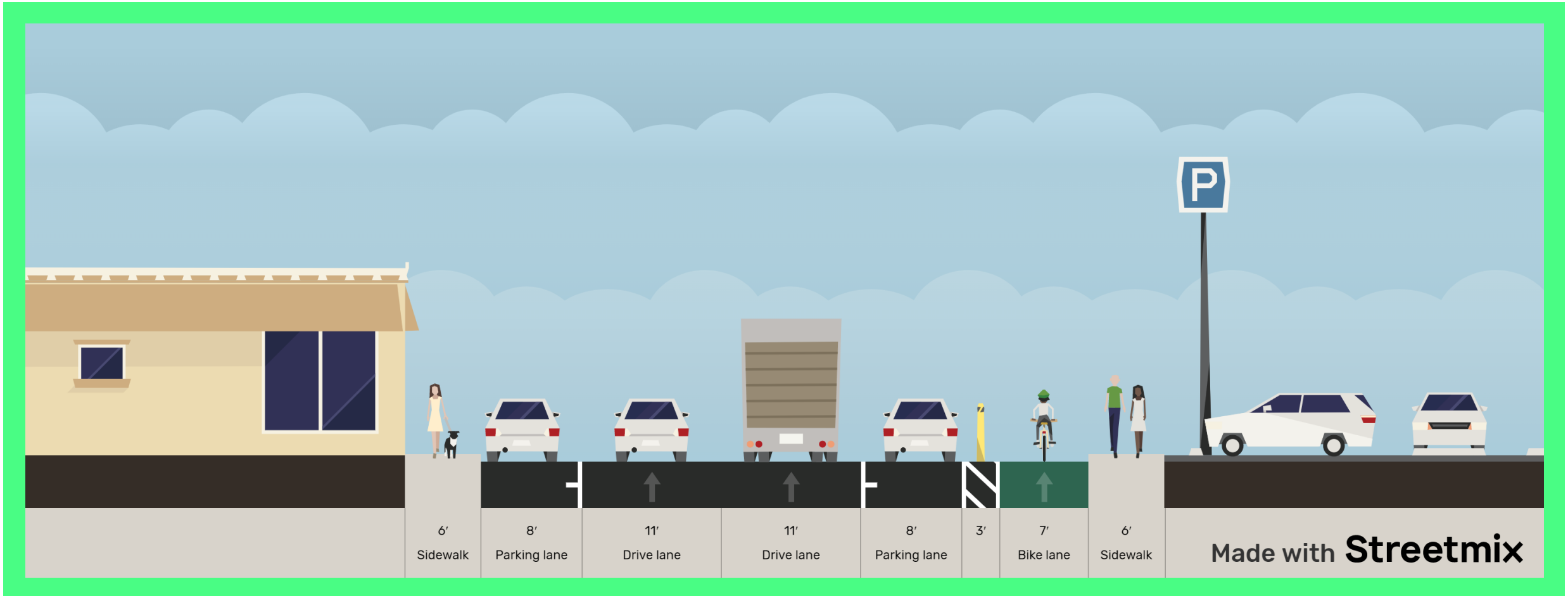
10th St – 6th St: *Alternative 4*



Notes: Maintains existing ROW
Maintains existing curbs

Riverside Ave

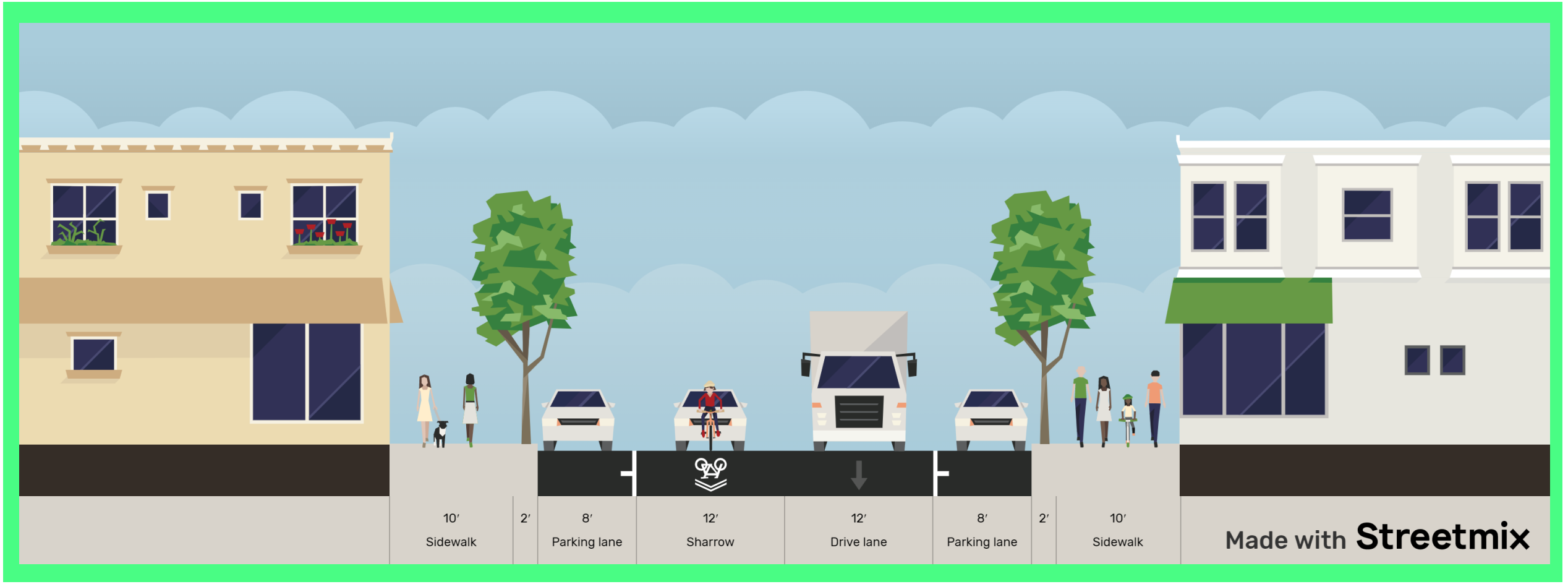
10th St – 6th St: *Alternative 5*



Notes: Maintains existing ROW
Maintains existing curbs

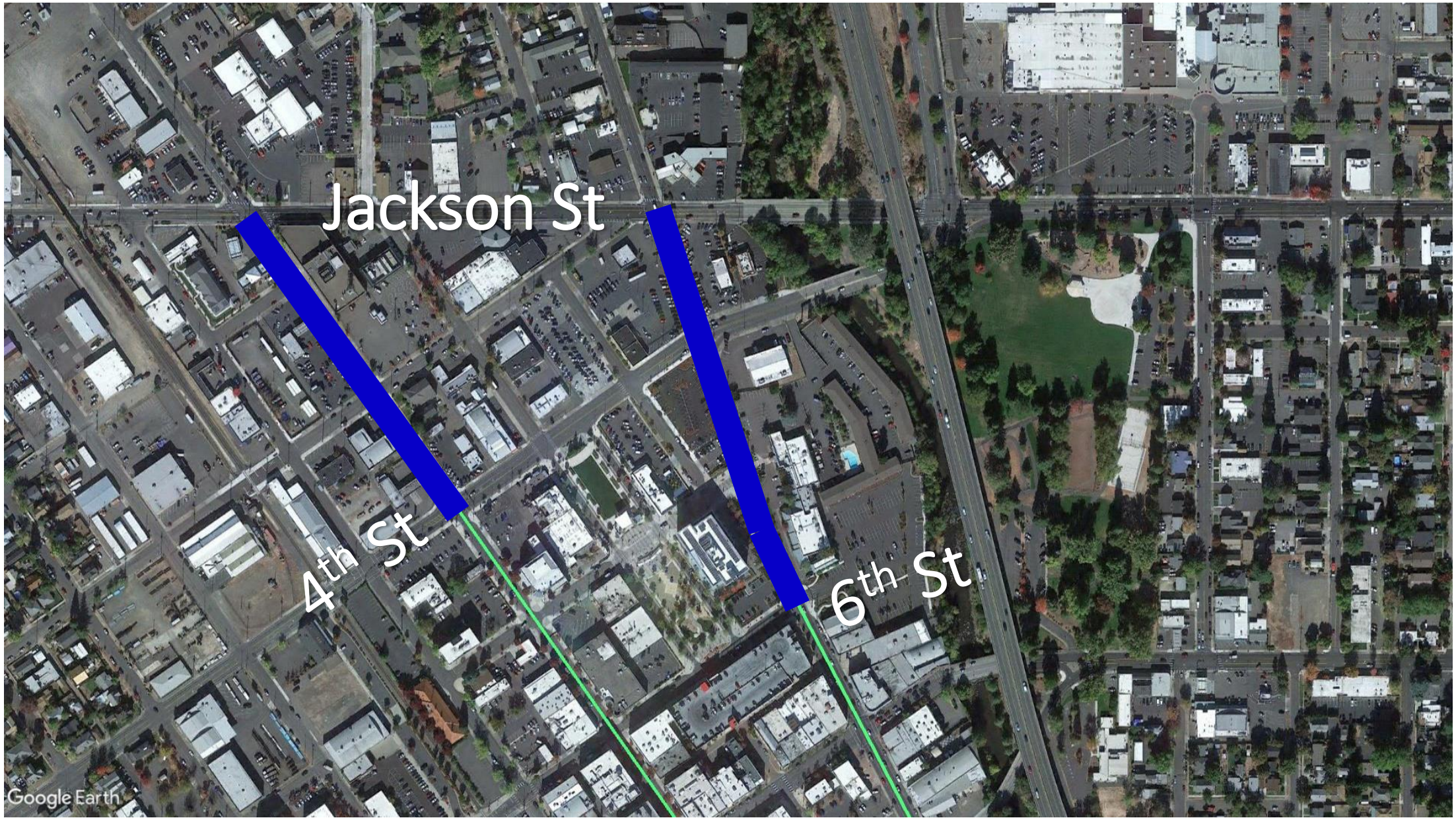
Central Ave

10th St – 4th St: *Existing*



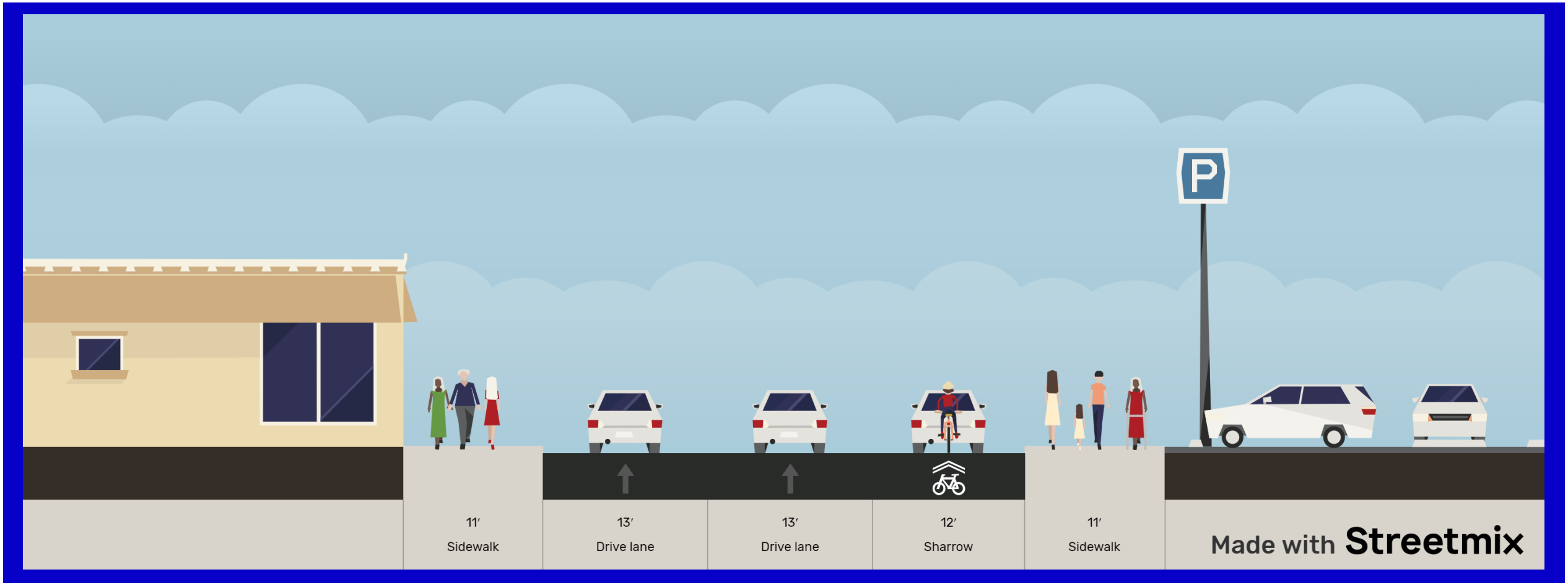
Notes: ROW: ~64’
Curb-to-curb ~40’

Riverside Ave/Central Ave: 4th St/6th St – Jackson St



Riverside Ave

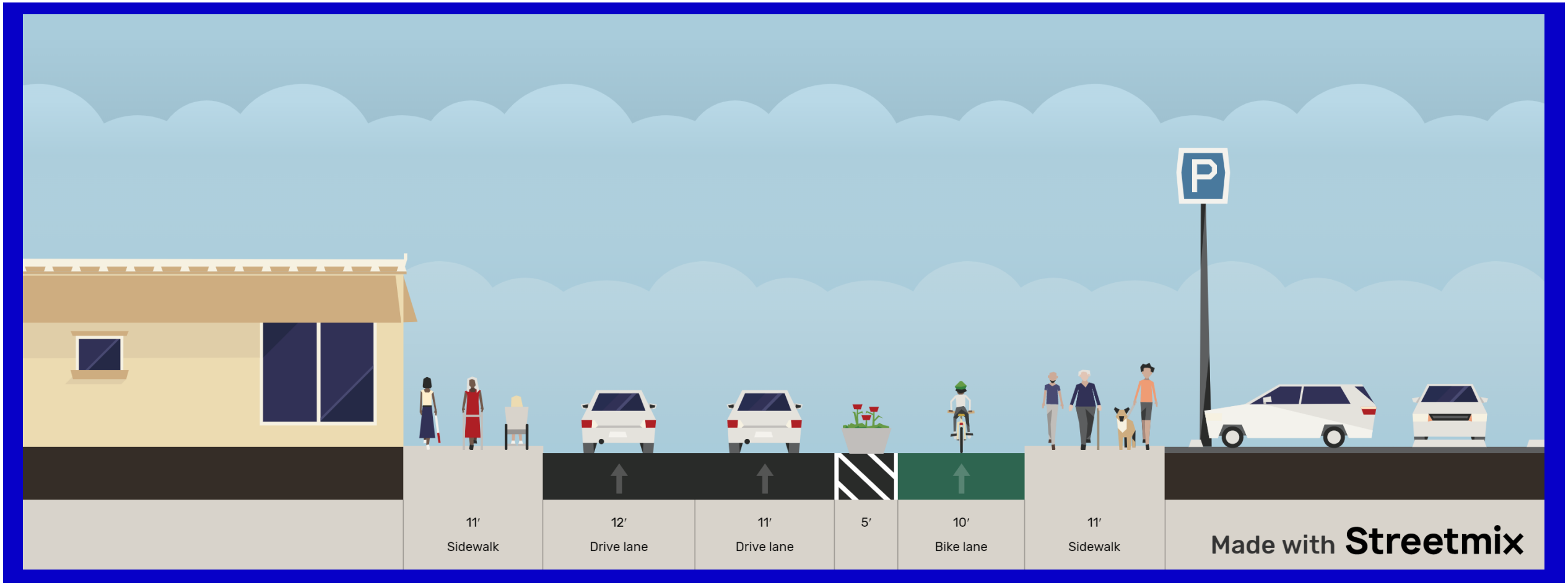
6th St – Jackson St: *Existing*



Notes: ROW: ~60’
Curb-to-curb ~38’

Riverside Ave

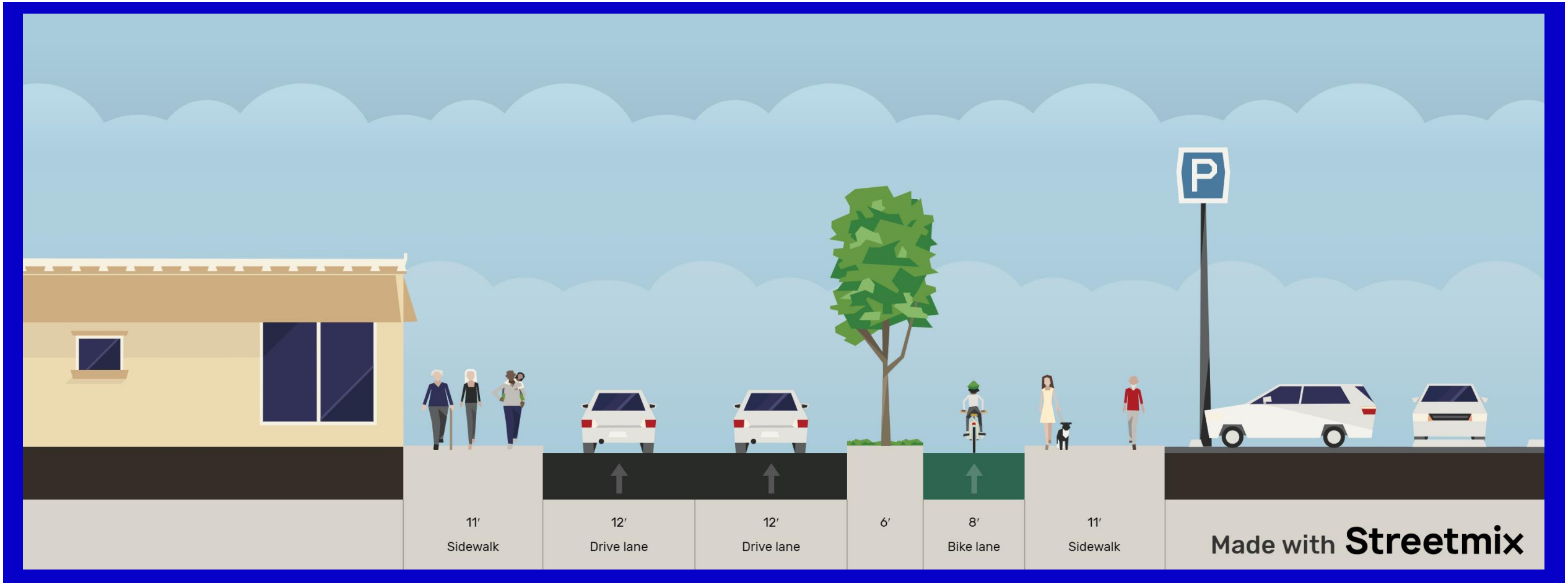
6th St – Jackson St: *Alternative 1*



Notes: *Maintains existing ROW*
Maintains existing curbs

Riverside Ave

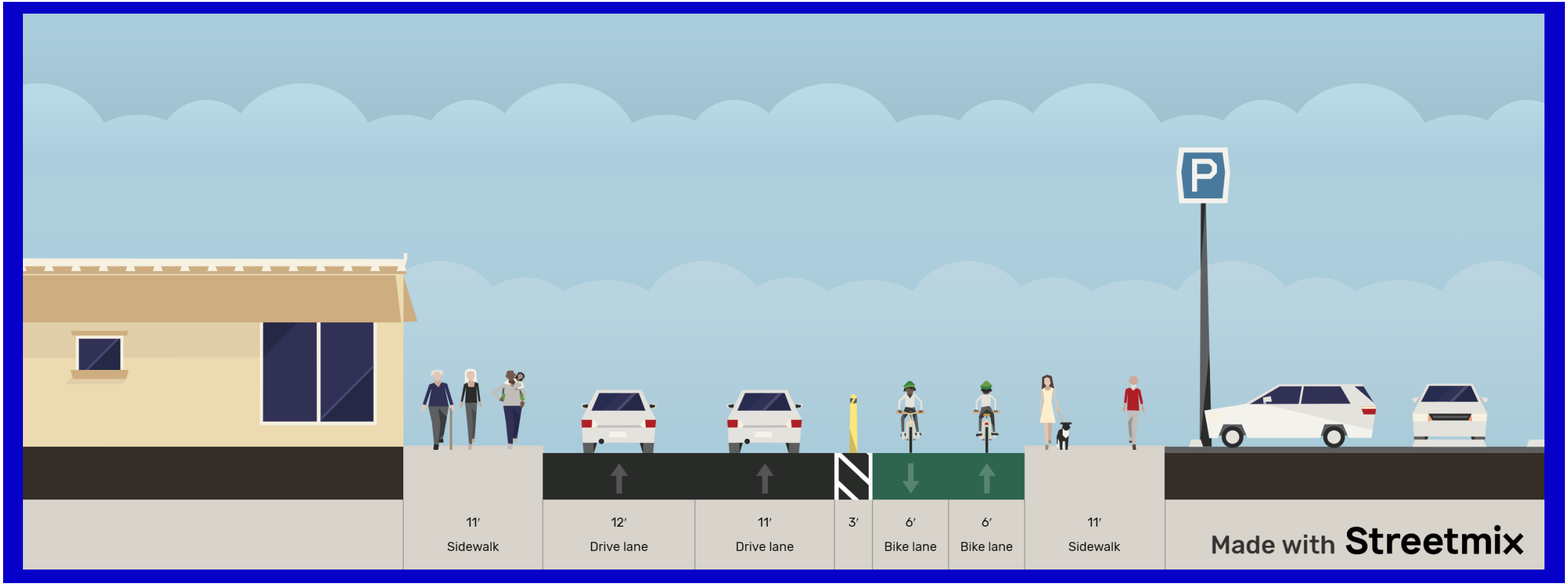
6th St – Jackson St: *Alternative 2*



Notes: Maintains existing ROW
Introduces new curbs (reduces travelway curb-to-curb from 38’ to 24’)

Riverside Ave

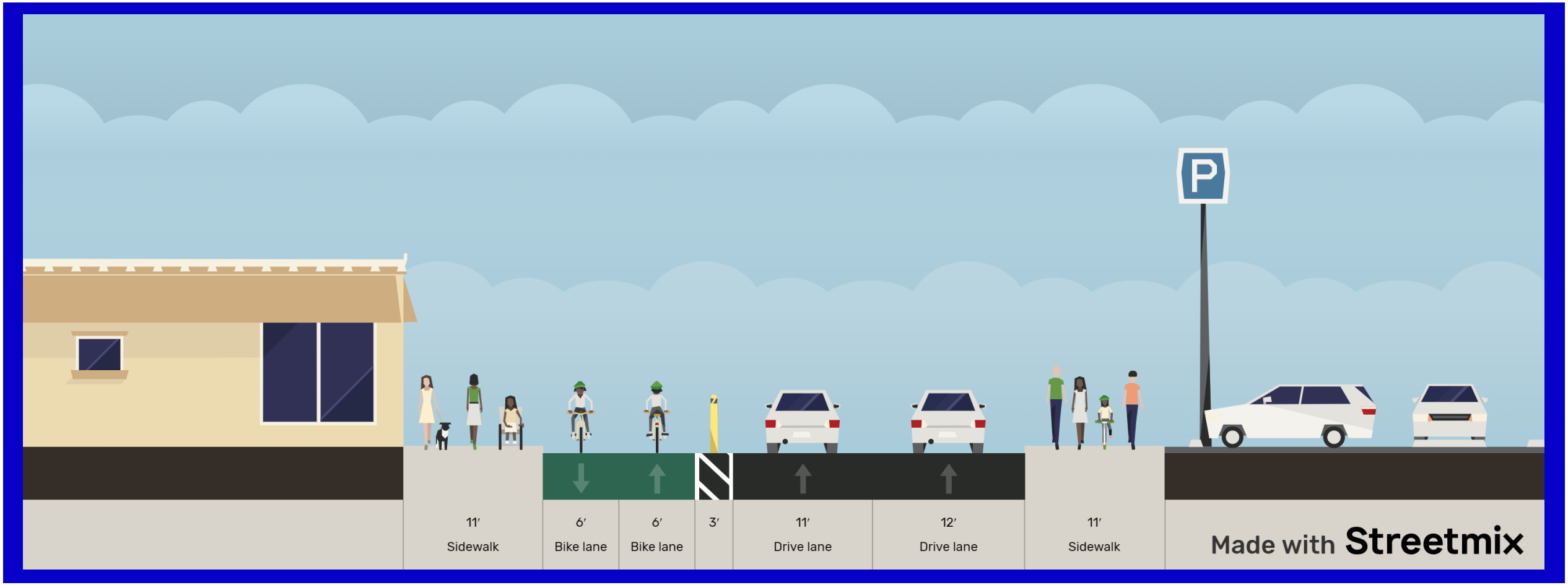
6th St – Jackson St: *Alternative 3*



Notes: *Maintains existing ROW*
Maintains existing curbs

Riverside Ave

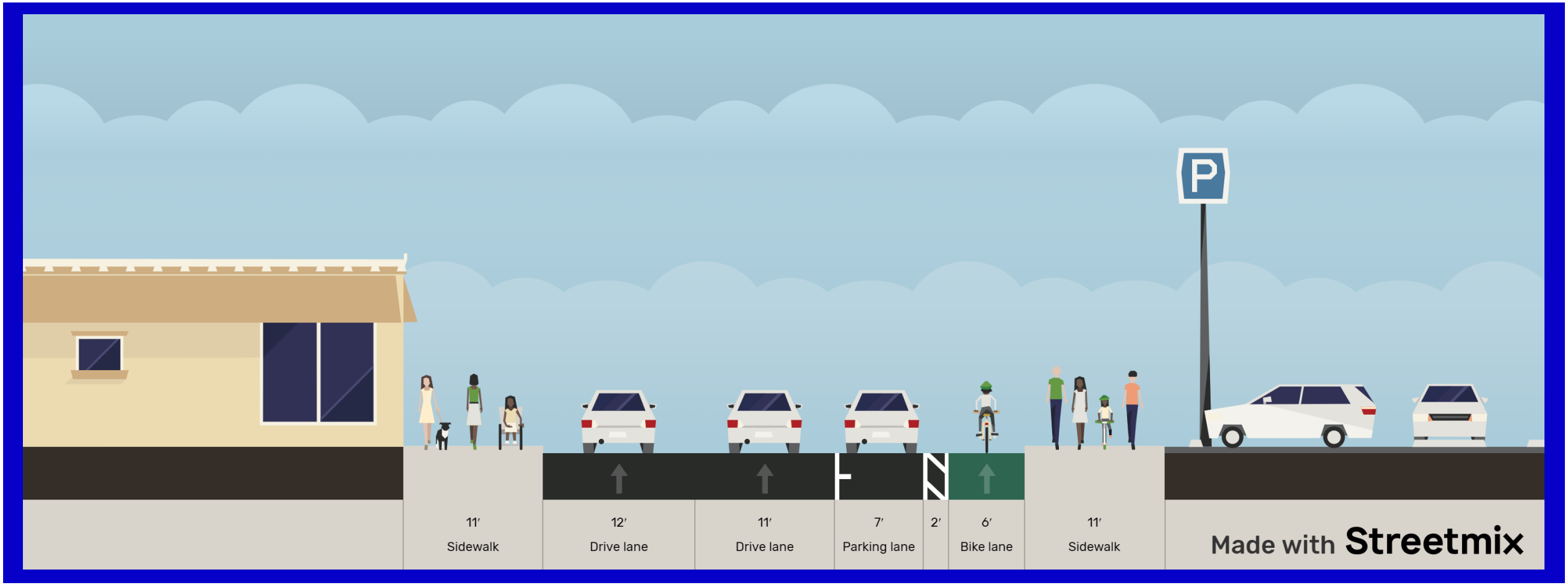
6th St – Jackson St: *Alternative 4*



Notes: *Maintains existing ROW*
Maintains existing curbs

Riverside Ave

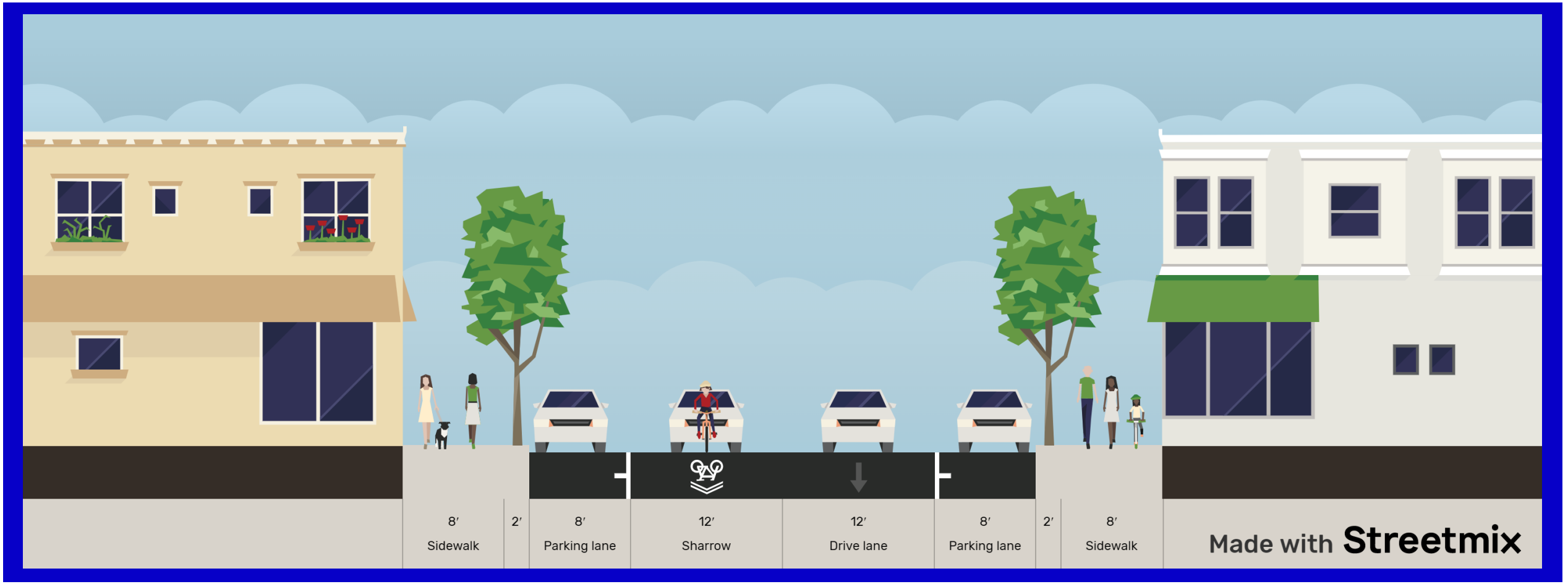
6th St – Jackson St: *Alternative 5*



Notes: Maintains existing ROW
Maintains existing curbs

Central Ave

4th St – Jackson St: *Existing*



Notes: ROW: ~60’
Curb-to-curb ~40’

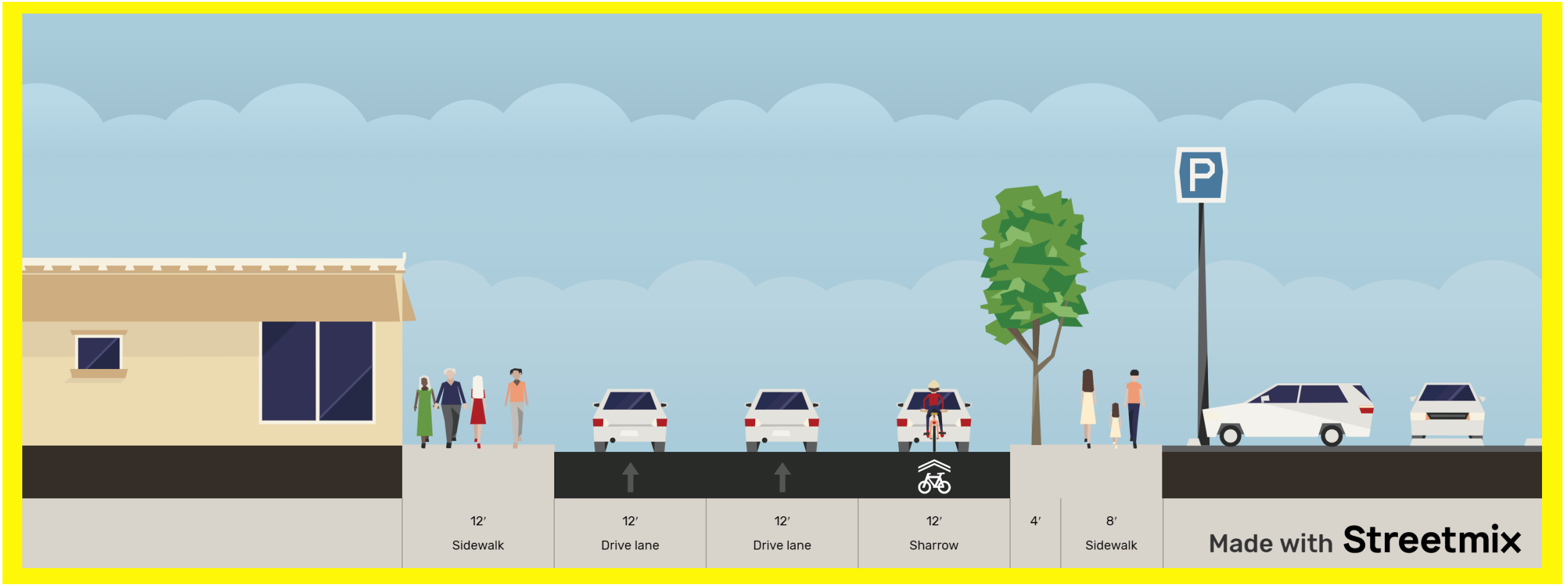
Sidewalk and planter widths vary

Riverside Ave/Central Ave: Jackson St – Walnut St/Edwards St



Riverside Ave

Jackson St – Walnut St: *Existing*

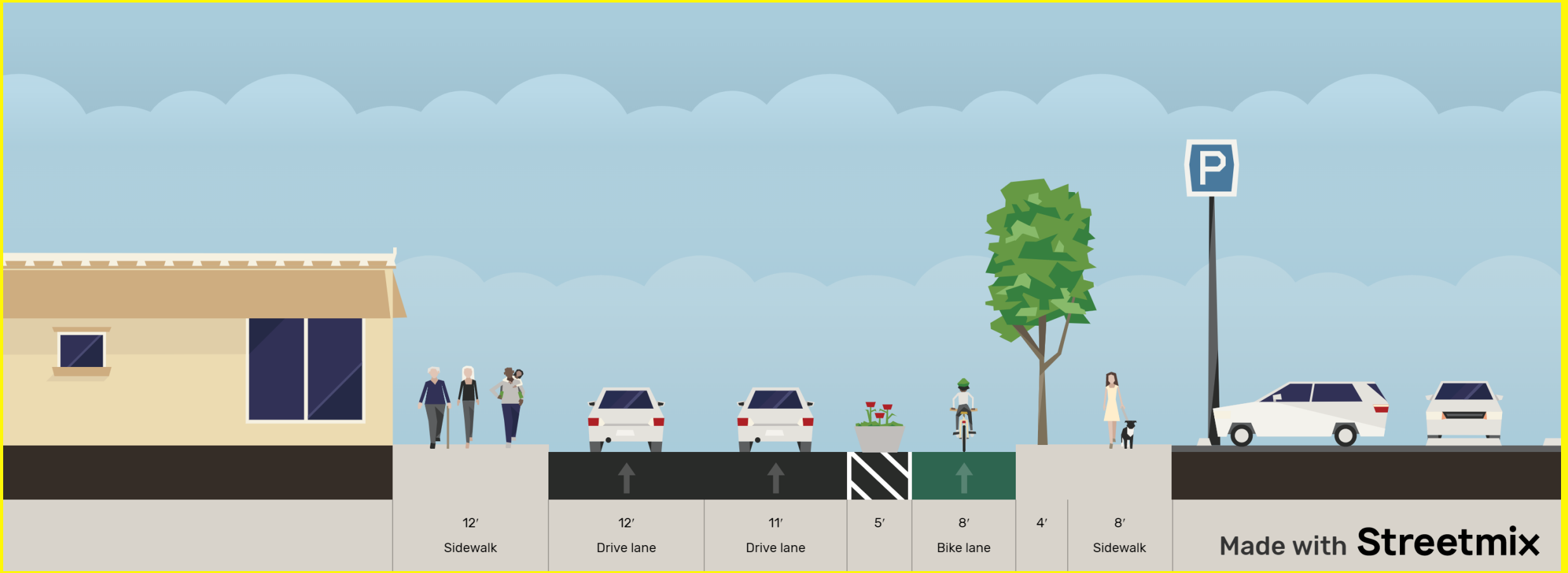


Notes: ROW: ~60’
Curb-to-curb ~36’

Sidewalk and planter widths vary

Riverside Ave

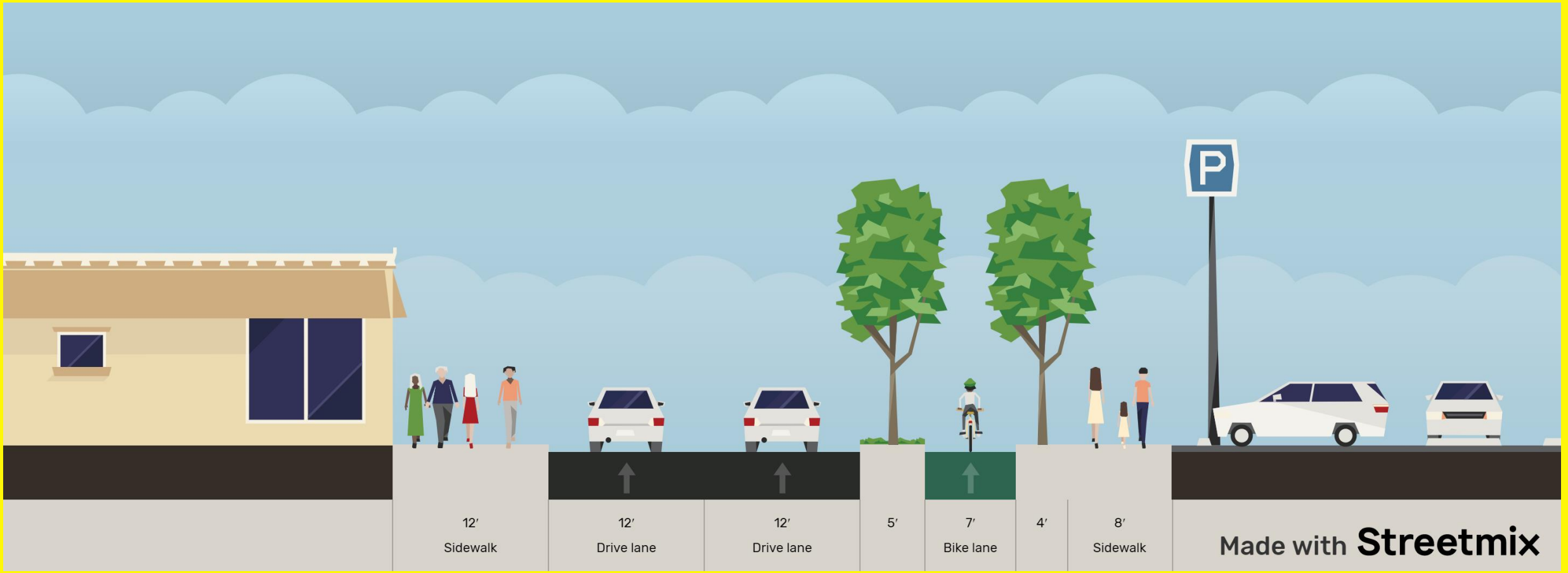
Jackson St – Walnut St: *Alternative 1*



Notes: Maintains existing ROW
Maintains existing curbs

Riverside Ave

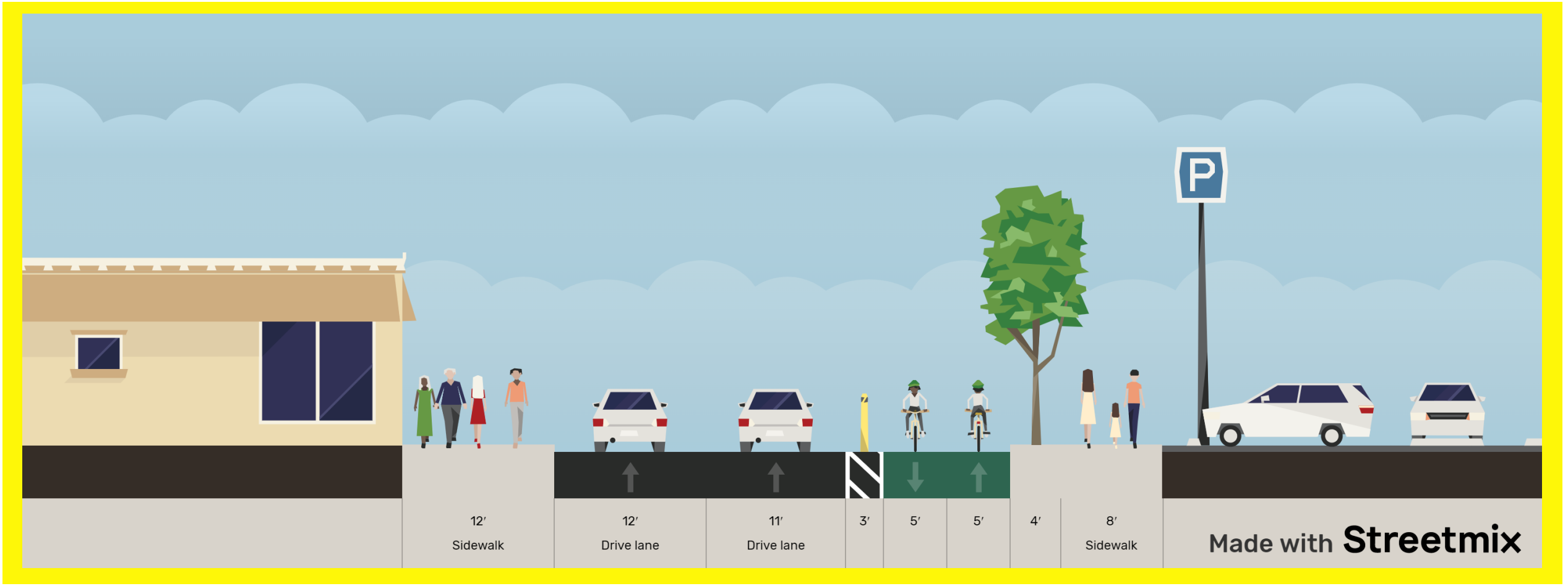
Jackson St – Walnut St: *Alternative 2*



Notes: Maintains existing ROW
Introduces new curbs (reduces travelway curb-to-curb from 36’ to 24’)

Riverside Ave

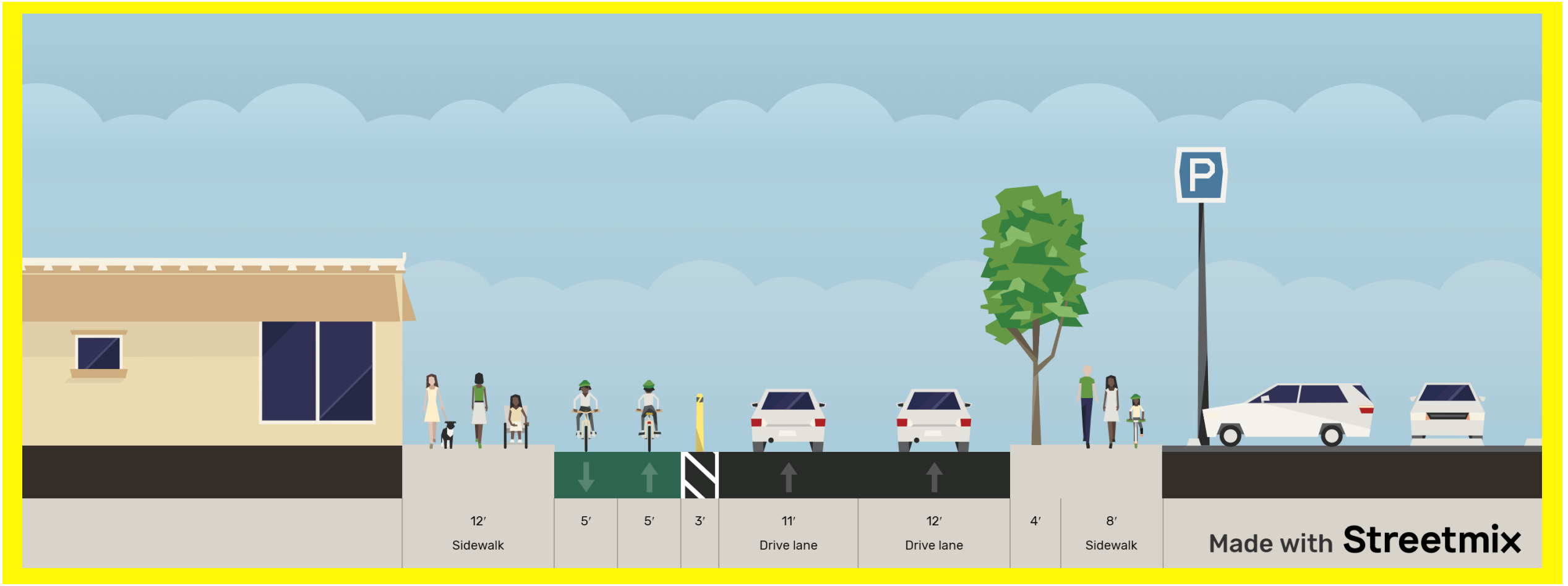
Jackson St – Walnut St: *Alternative 3*



Notes: Maintains existing ROW
Maintains existing curbs

Riverside Ave

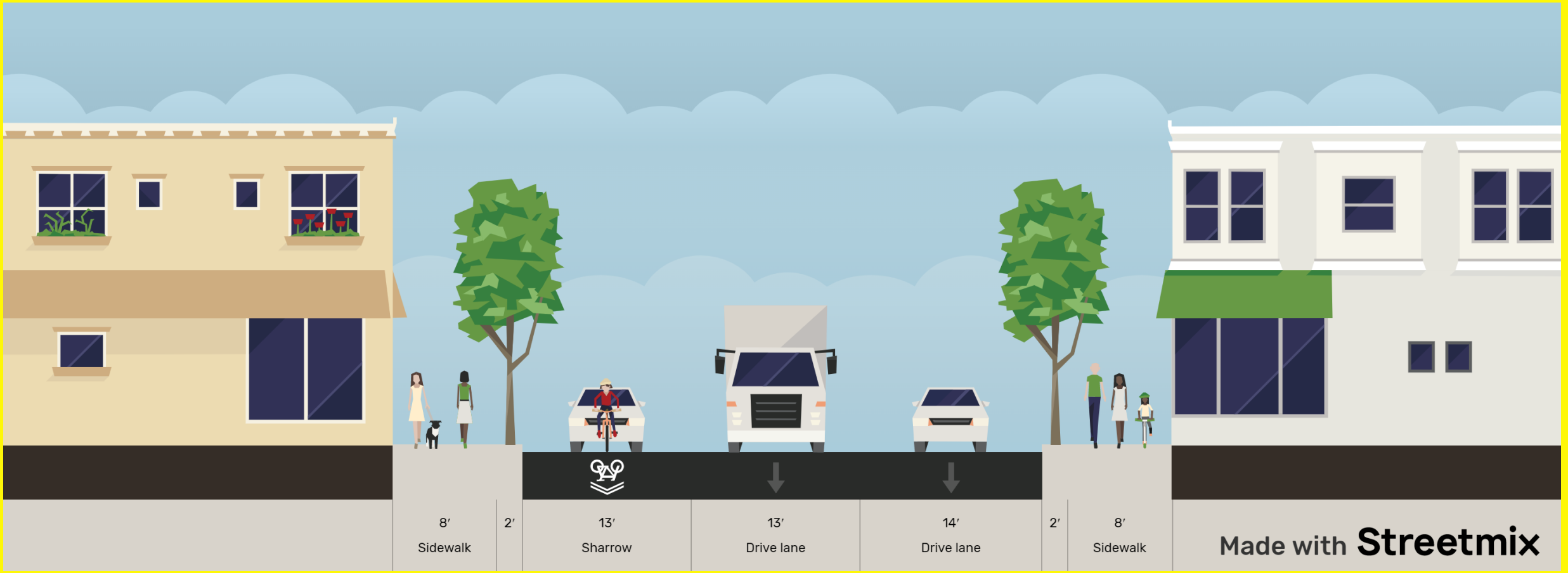
Jackson St – Walnut St: *Alternative 4*



Notes: *Maintains existing ROW*
Maintains existing curbs

Central Ave

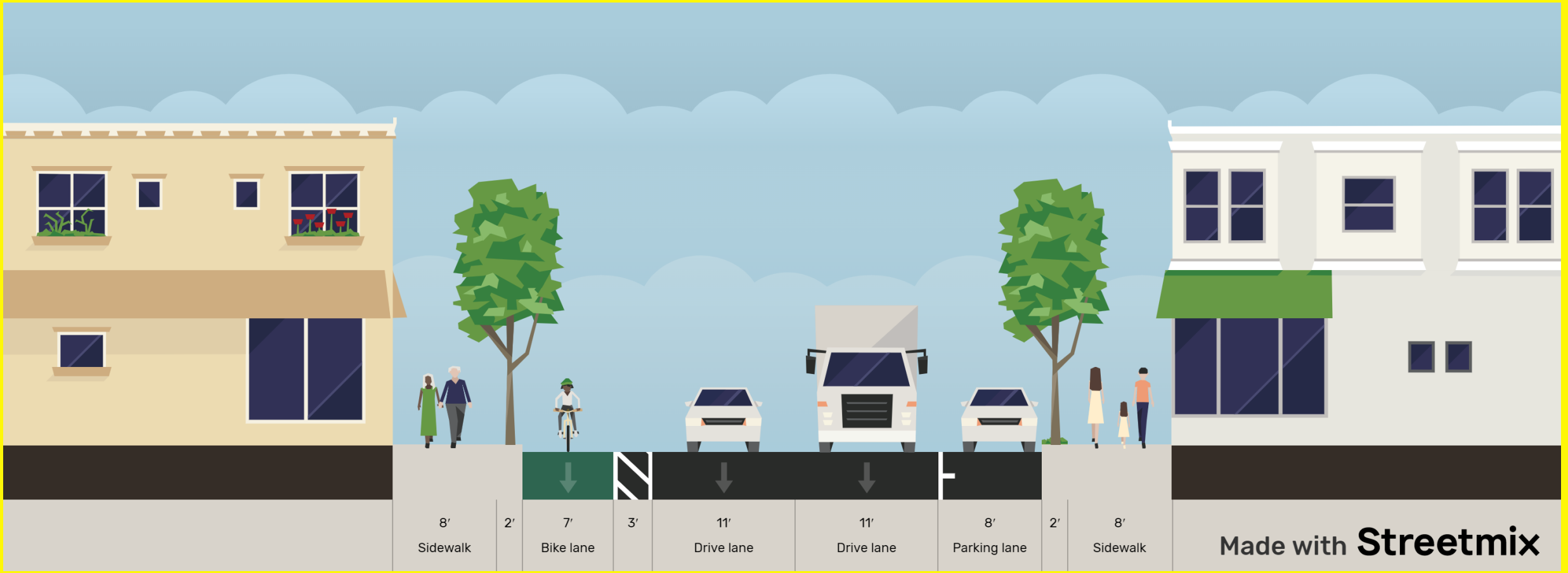
Jackson St – Edwards St: *Existing*



Notes: ROW: ~60’
Curb-to-curb ~40’

Central Ave

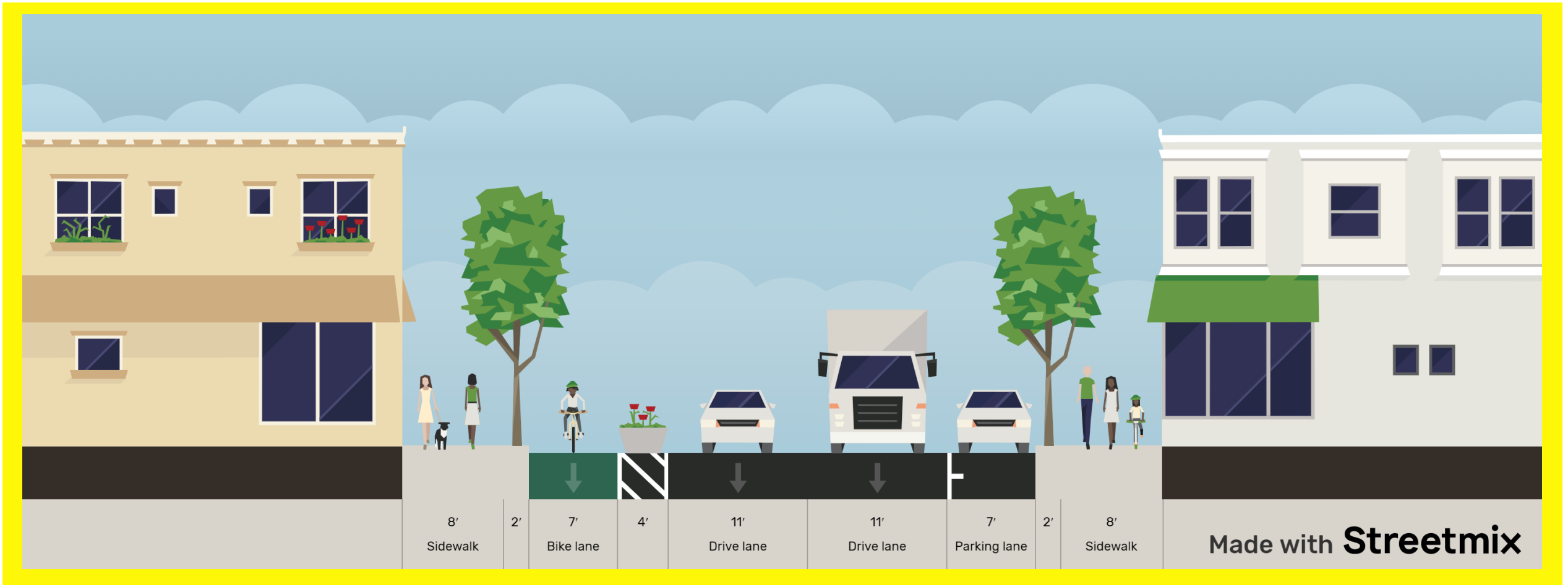
Jackson St – Edwards St: *City Preferred Alternative*



Notes: Maintains existing ROW
Maintains existing curbs

Central Ave

Jackson St – Edwards St: *Alternative 1*



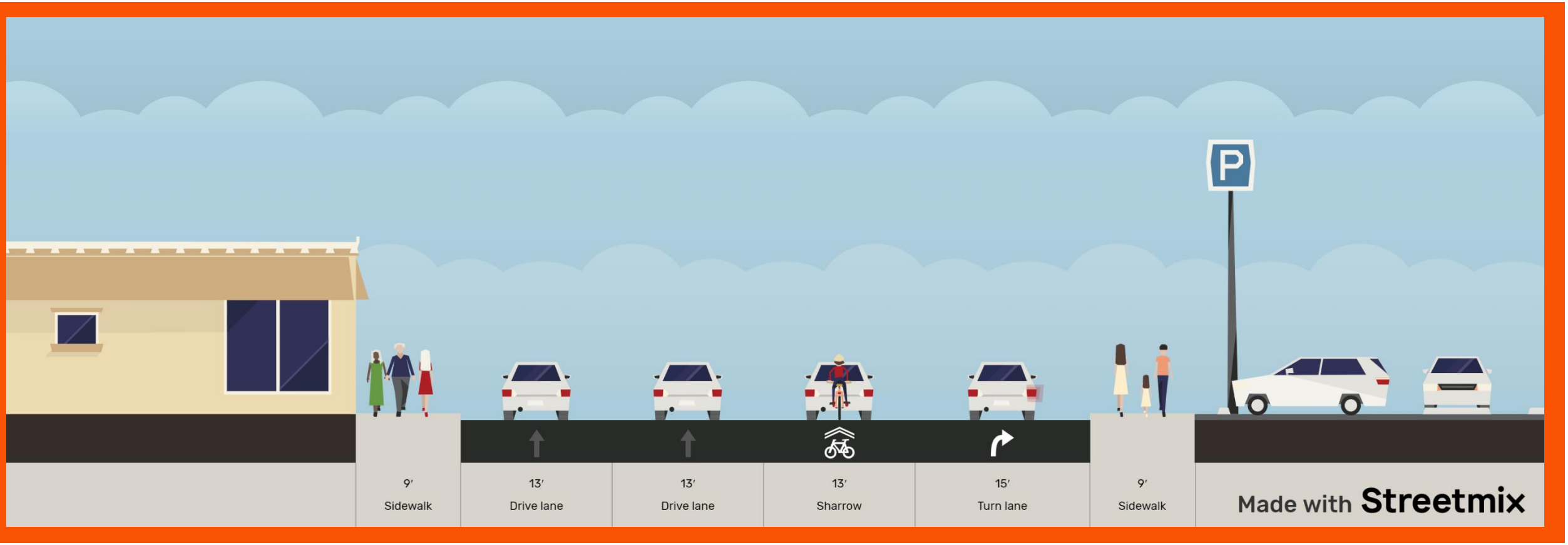
Notes: Maintains existing ROW
Maintains existing curbs

Riverside Ave: Walnut St – Ohio St



Riverside Ave

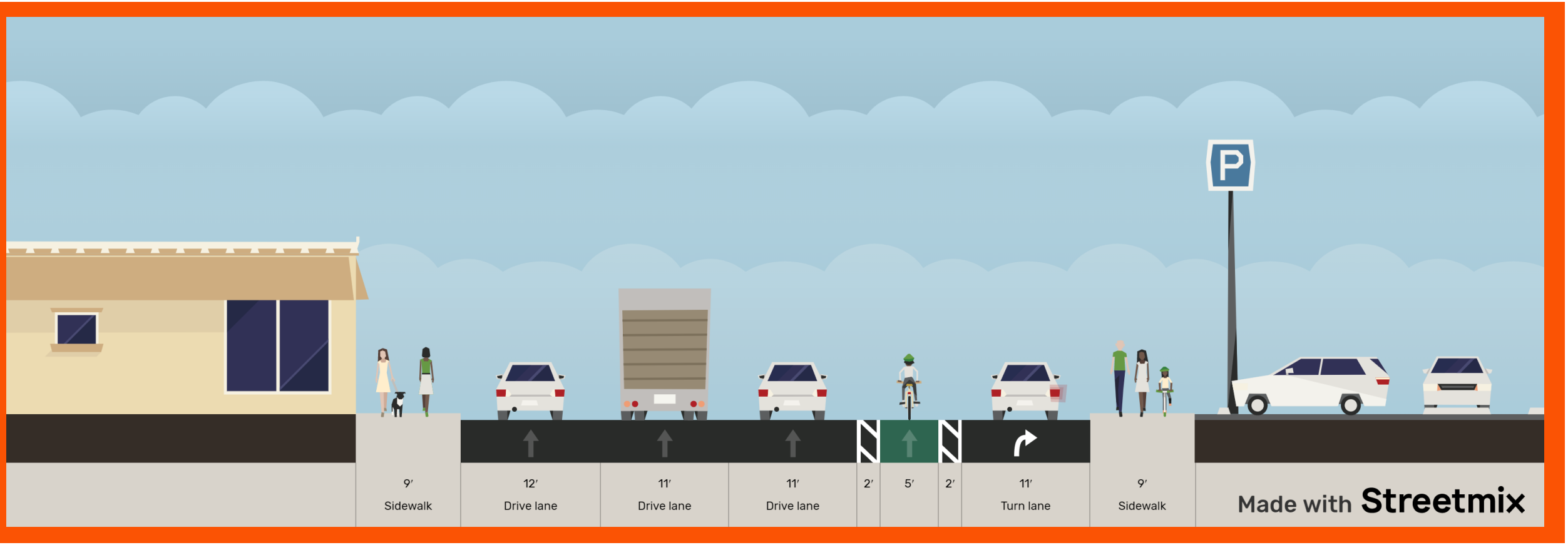
Walnut St – Ohio Street: ***Existing (S*)***



Notes: ROW: ~72’
Curb-to-curb ~54’
** South of McAndrews Rd*

Riverside Ave

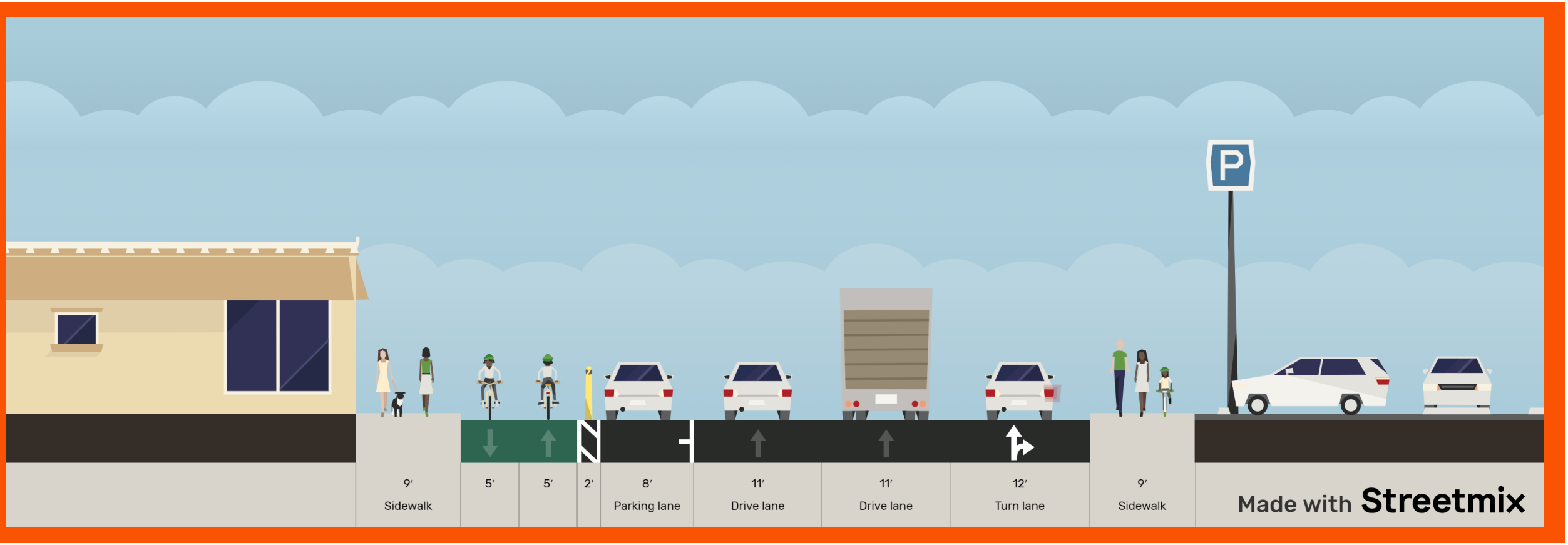
Walnut St – Ohio Street: *Alternative 1 (S)*



Notes: *Maintains existing ROW*
Maintains existing curbs

Riverside Ave

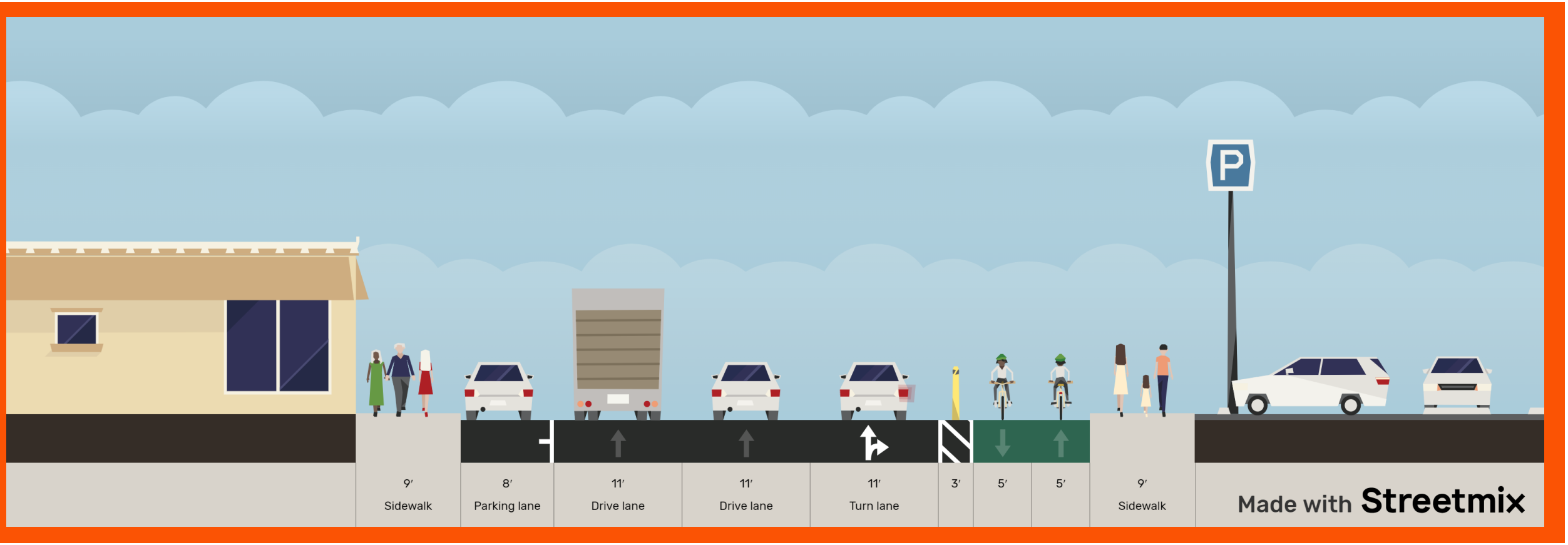
Walnut St – Ohio Street: *Alternative 2 (S)*



Notes: *Maintains existing ROW*
Maintains existing curbs

Riverside Ave

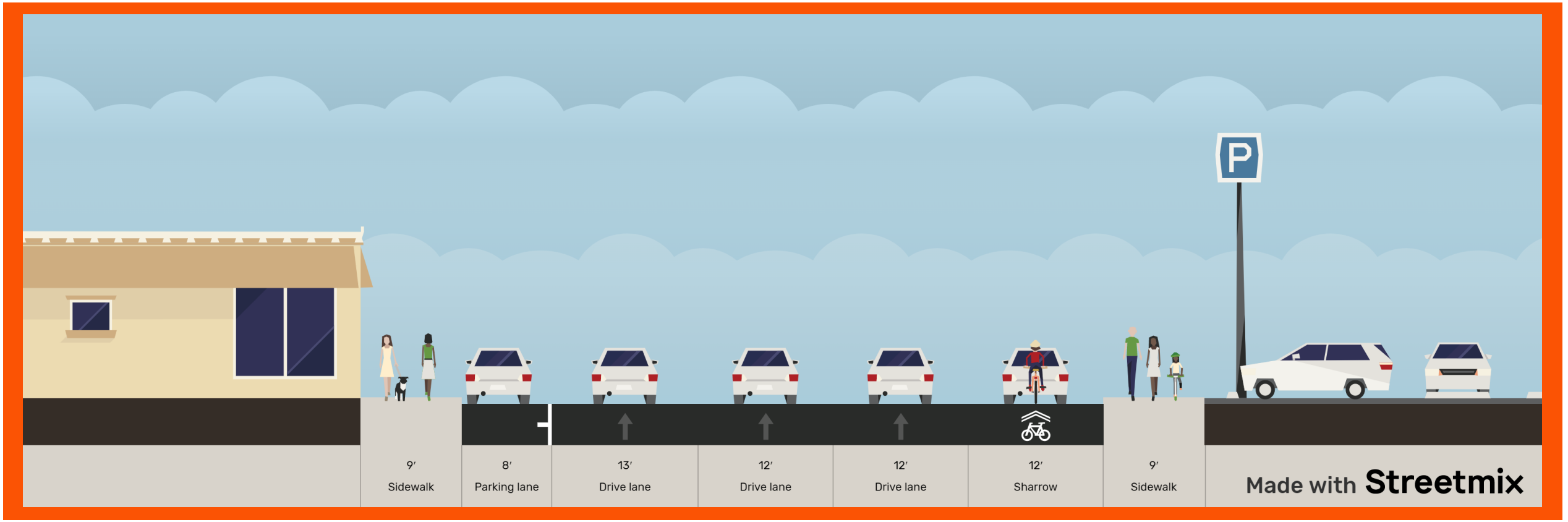
Walnut St – Ohio Street: *Alternative 3 (S)*



Notes: Maintains existing ROW
Maintains existing curbs

Riverside Ave

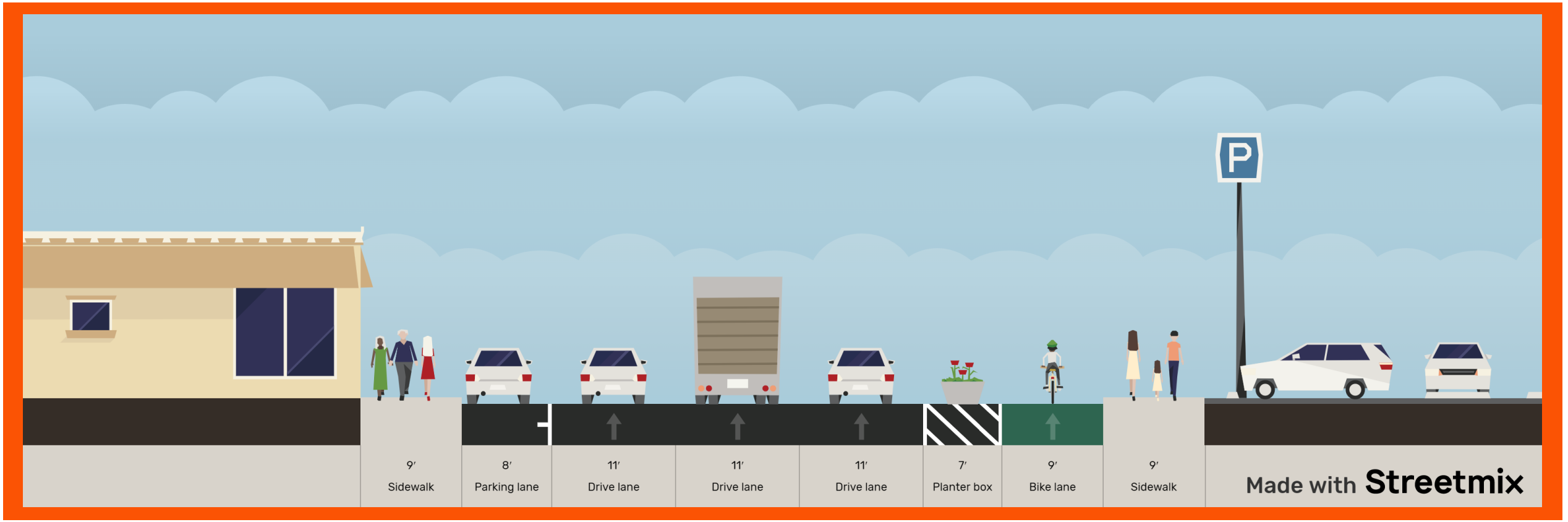
Walnut St – Ohio Street: *Existing (N*)*



Notes: *ROW: ~75’*
Curb-to-curb ~57’
** North of McAndrews Rd*

Riverside Ave

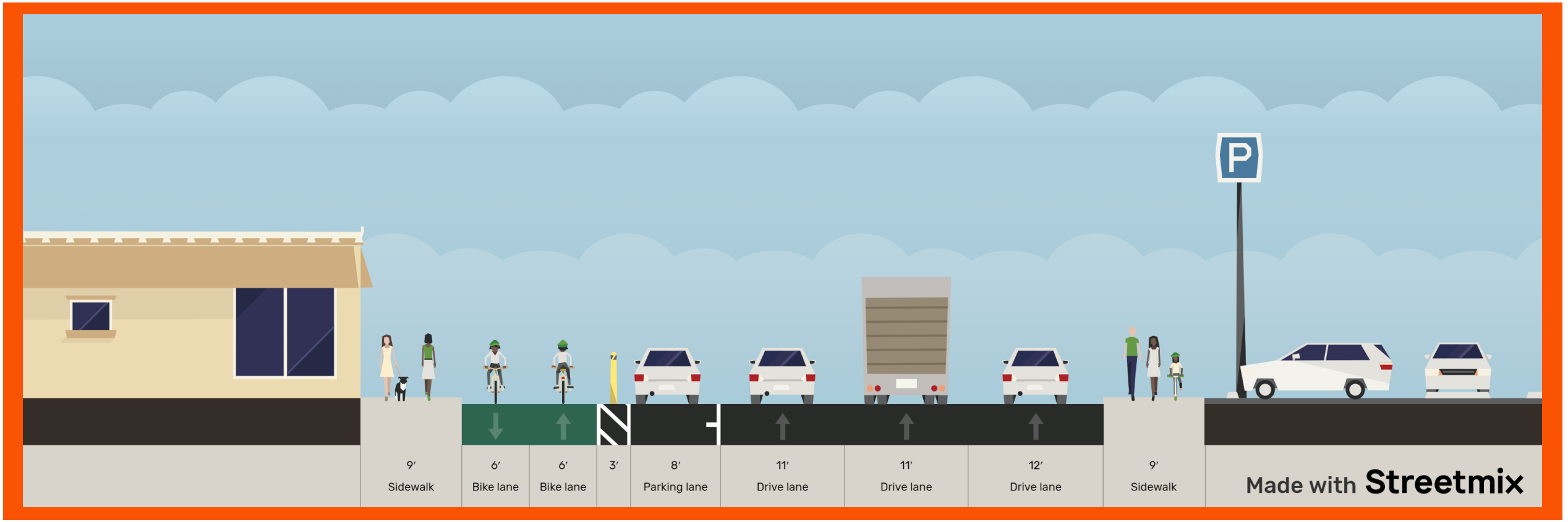
Walnut St – Ohio Street: ***Alternative 1 (N)***



Notes: Maintains existing ROW
Maintains existing curbs

Riverside Ave

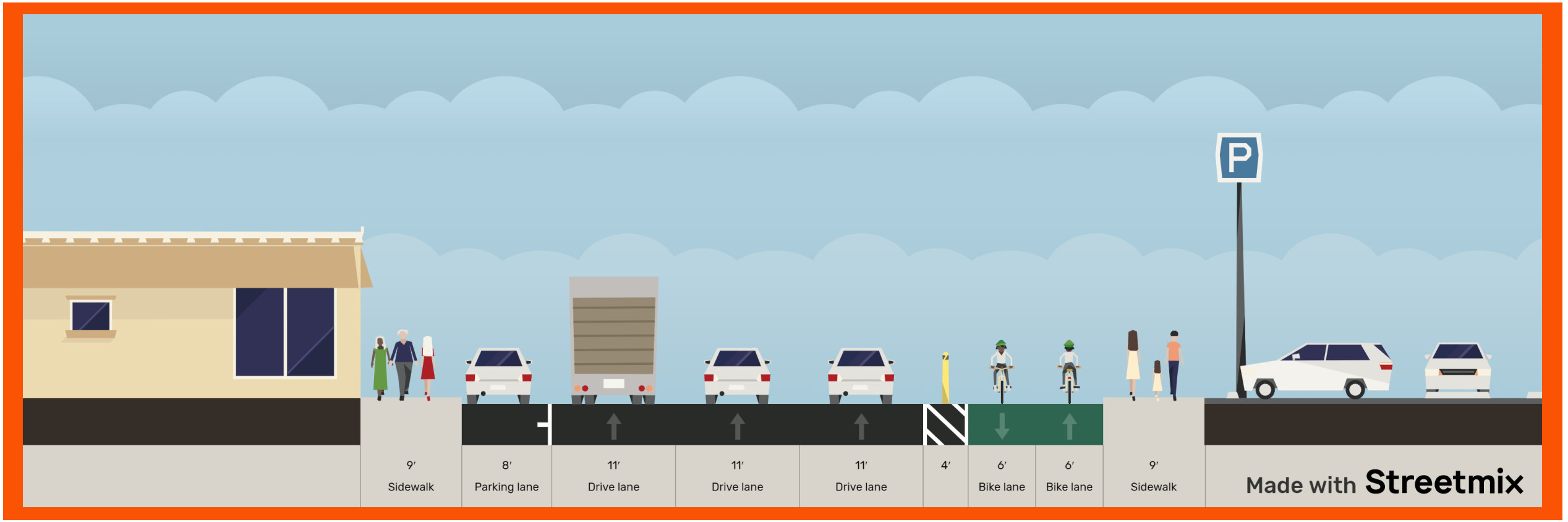
Walnut St – Ohio Street: *Alternative 2 (N)*



Notes: Maintains existing ROW

Riverside Ave

Walnut St – Ohio Street: *Alternative 3 (N)*



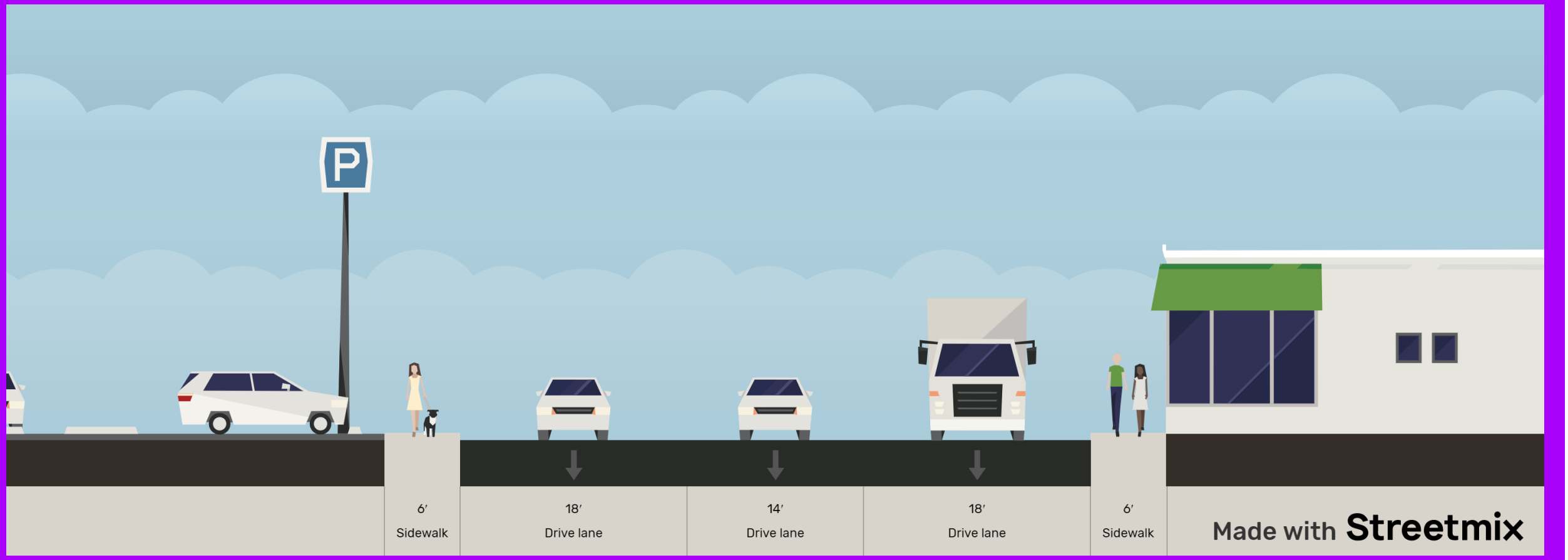
Notes: Maintains existing ROW

Court St: Ohio St – 135’ N of Manzanita St



Court St

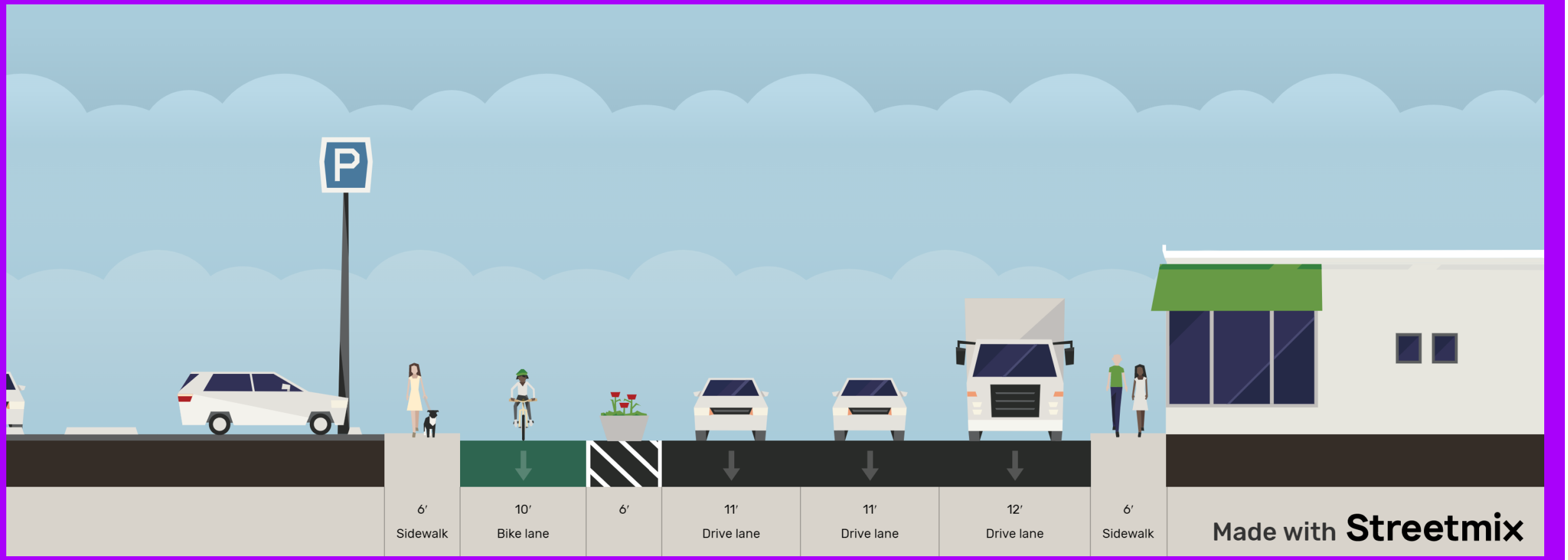
Ohio St – 135’ N of Manzanita St: *Existing*



Notes: *ROW: ~62’*
Curb-to-curb ~50’
Sidewalk widths vary and are not continuous

Court St

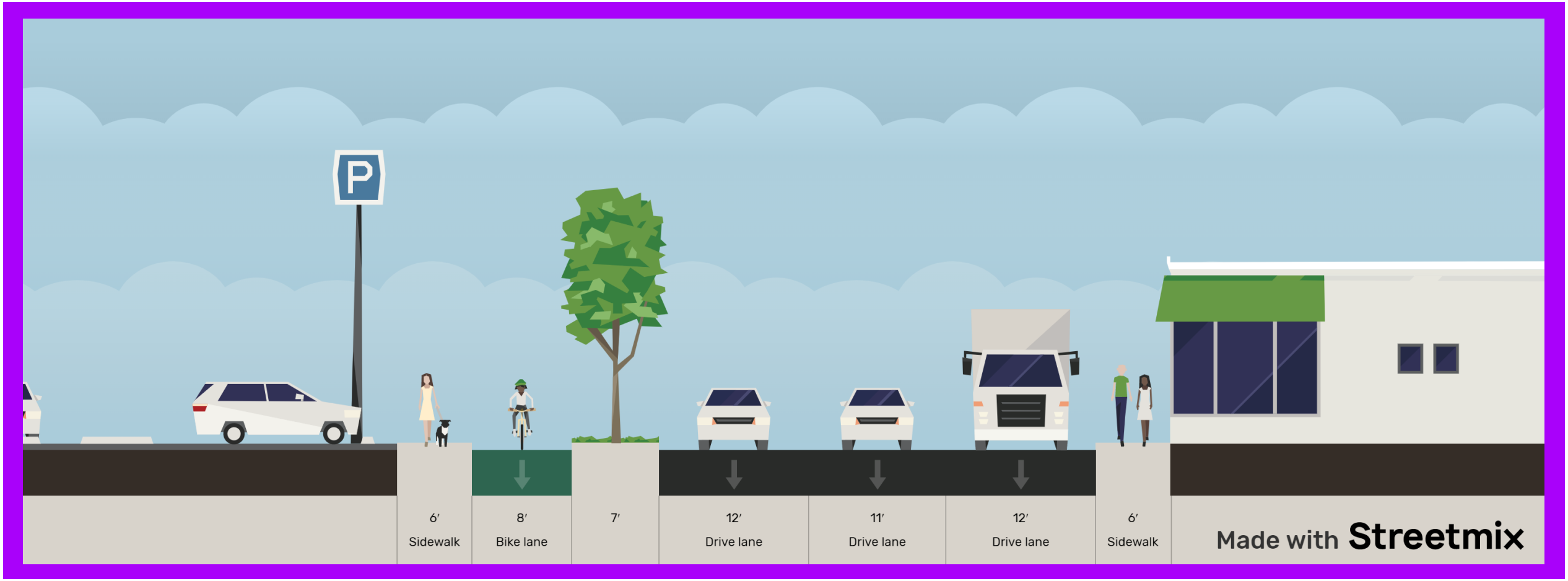
Ohio St – 135’ N of Manzanita St: *Alternative 1*



Notes: *Maintains existing ROW*
Maintains existing curbs

Court St

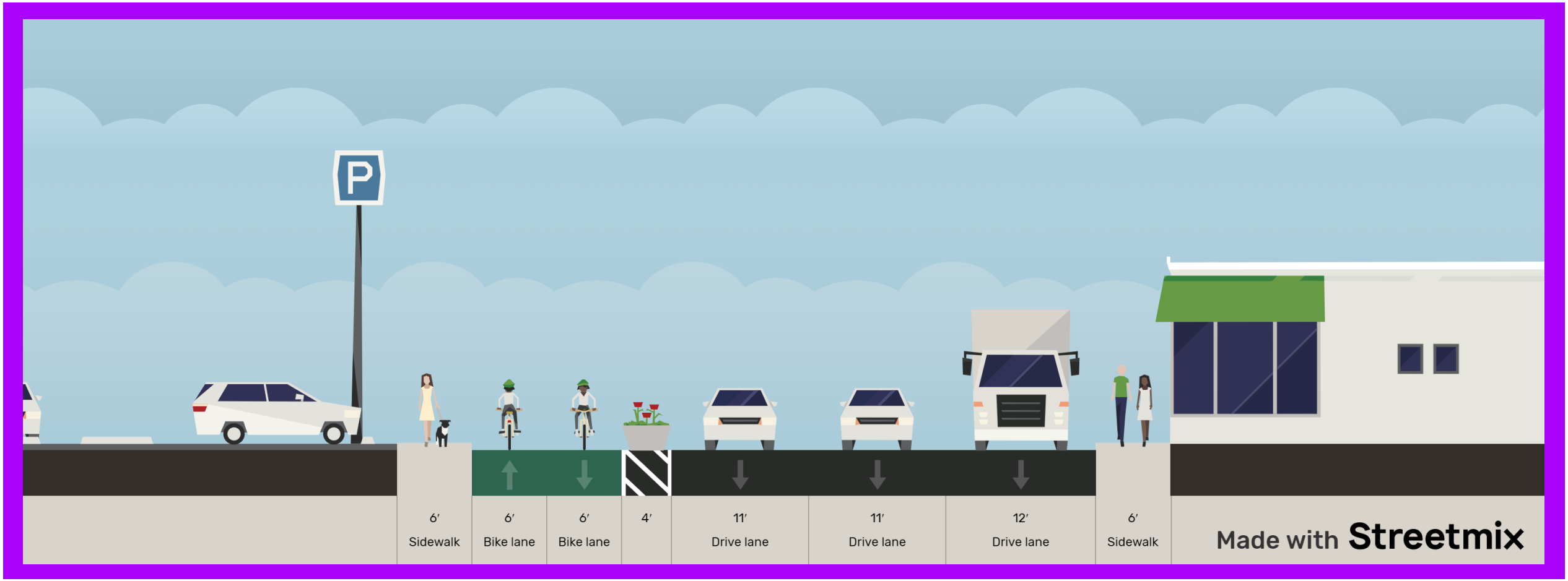
Ohio St – 135’ N of Manzanita St: *Alternative 2*



Notes: Maintains existing ROW
Introduces new curbs (reduces travelway curb-to-curb from ~50’ to ~35’)

Court St

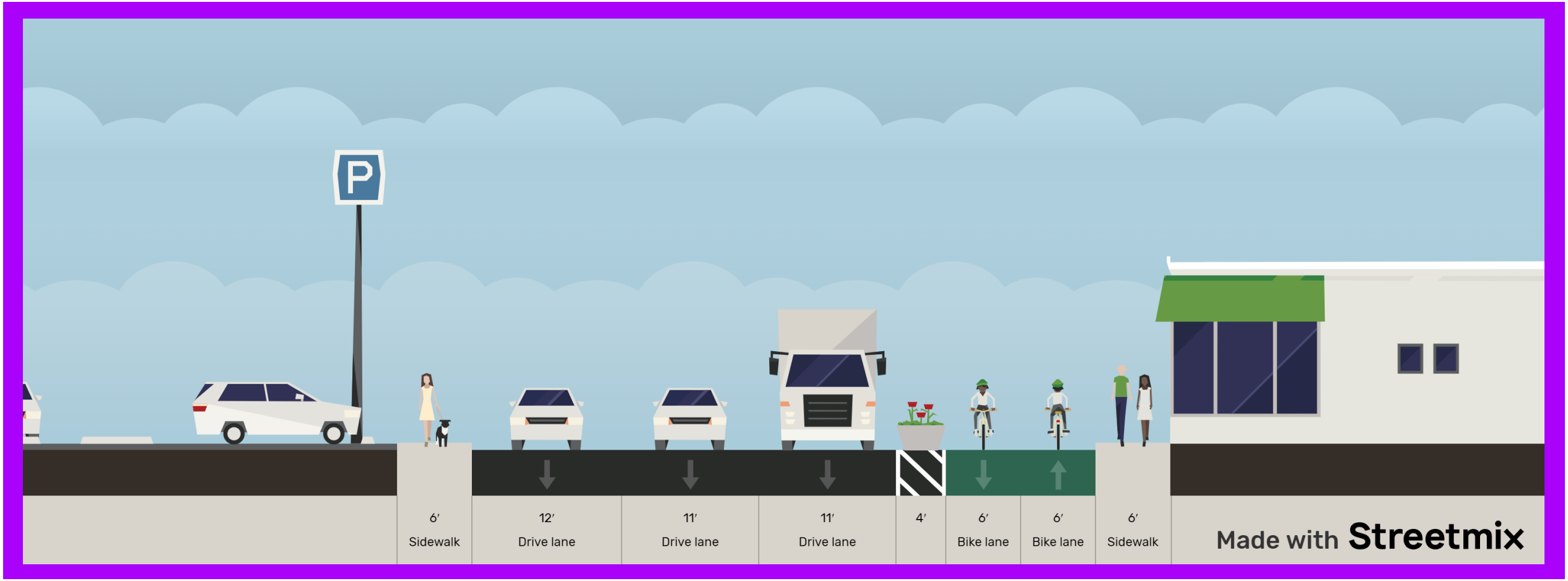
Ohio St – 135’ N of Manzanita St: *Alternative 3*



Notes: *Maintains existing ROW*
Maintains existing curbs

Court St

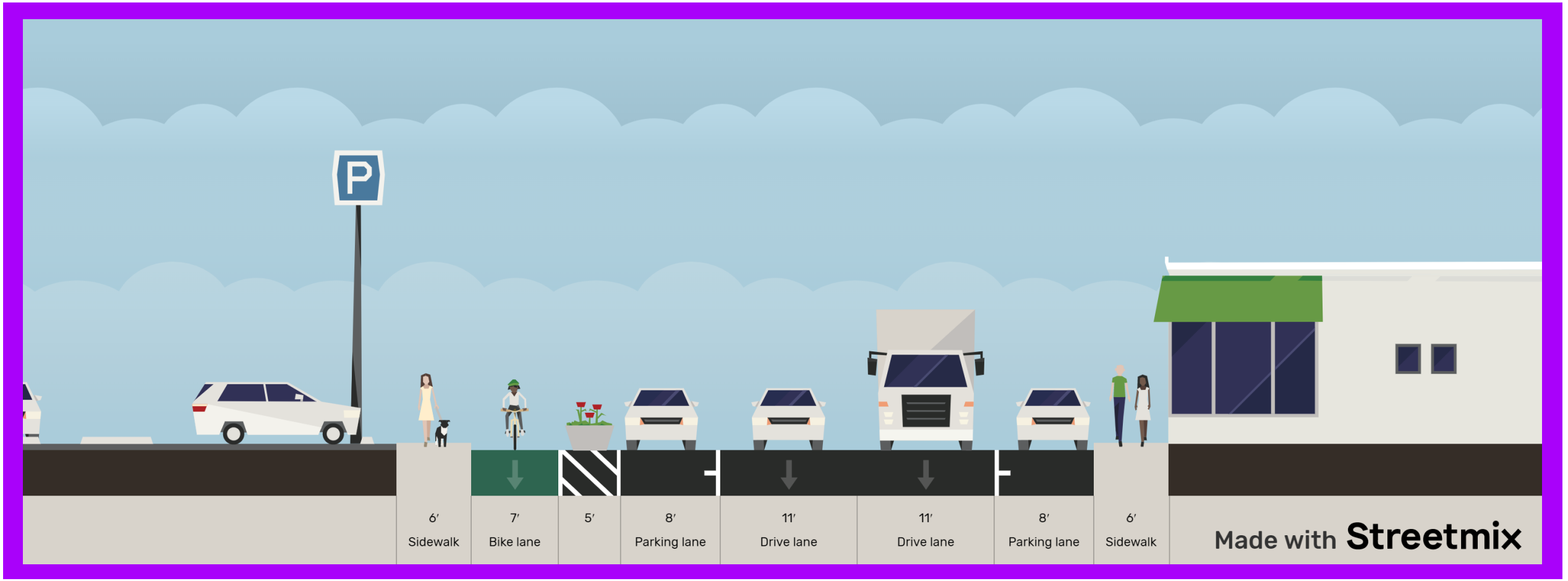
Ohio St – 135’ N of Manzanita St: ***Alternative 4***



Notes: Maintains existing ROW
Introduces new curbs (reduces travelway curb-to-curb from ~50’ to ~24’)

Court St

Ohio St – 135’ N of Manzanita St: *Alternative 5*



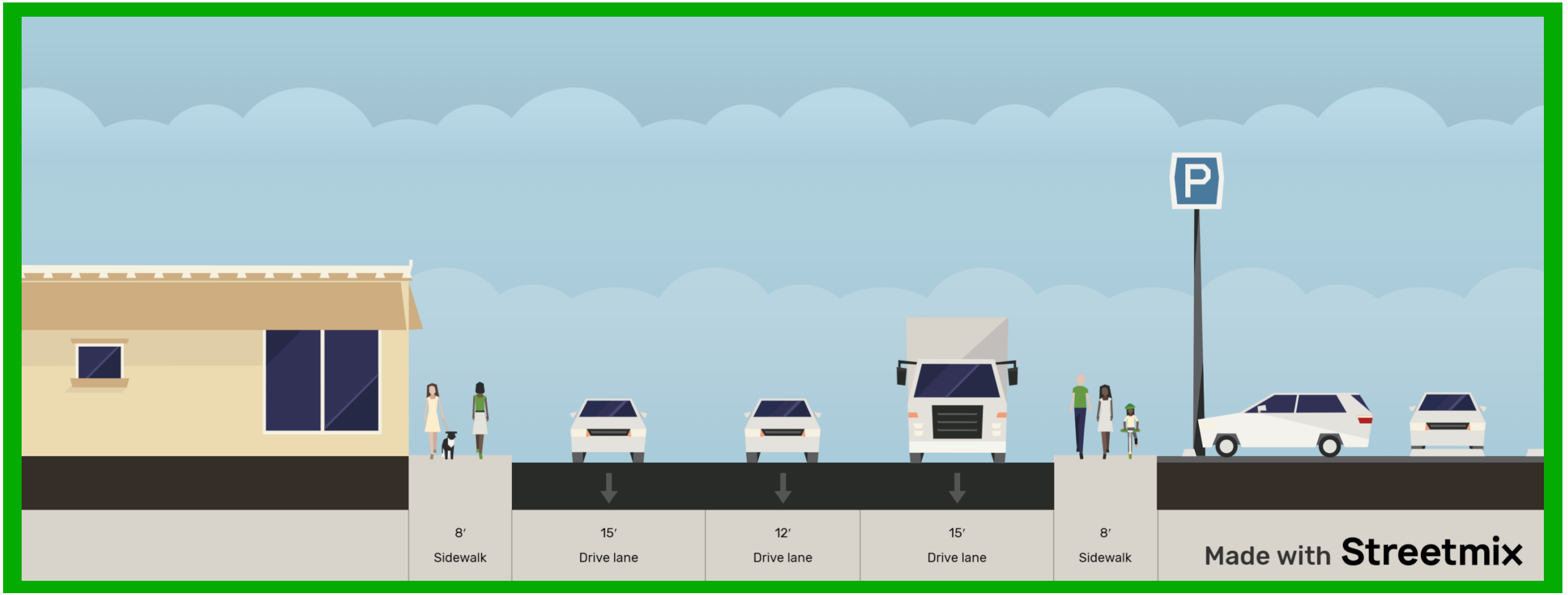
Notes: *Maintains existing ROW*
Maintains existing curbs

Court St: 135’ N of Manzanita St – Central Ave



Court St

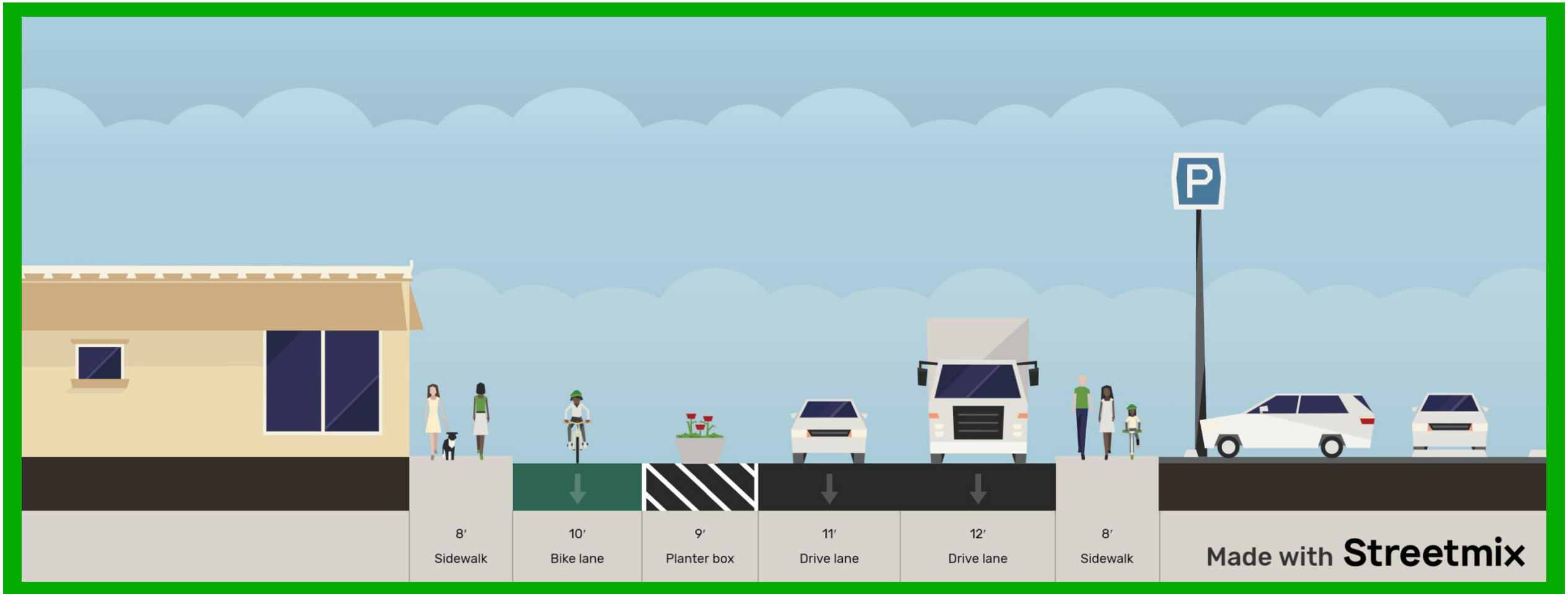
135’ N of Manzanita St – Edwards St: *Existing*



Notes: *ROW: ~58’*
Curb-to-curb ~42’
Sidewalk and planter widths vary

Court St

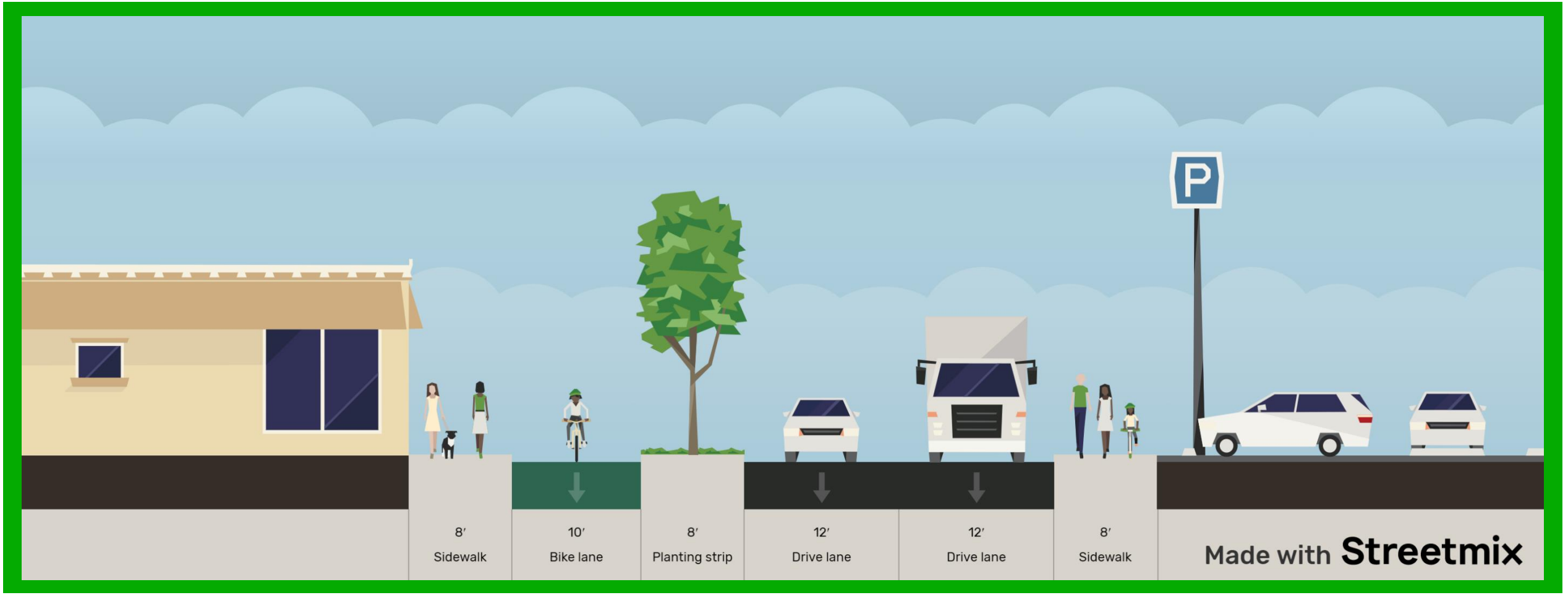
135’ N of Manzanita St – Edwards St: *Alternative 1*



Notes: Maintains existing ROW
Maintains existing curbs

Court St

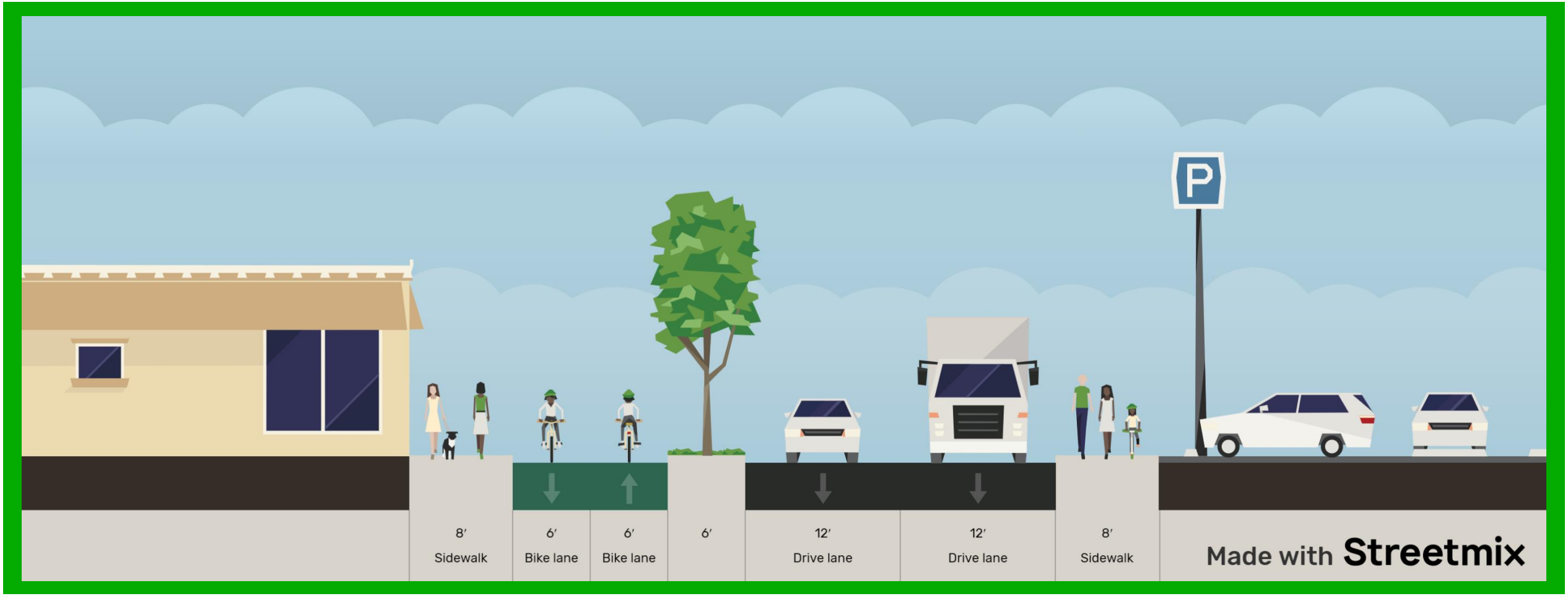
135’ N of Manzanita St – Edwards St: *Alternative 2*



Notes: Maintains existing ROW
Introduces new curbs (reduces travelway curb-to-curb from ~42’ to ~24’)

Court St

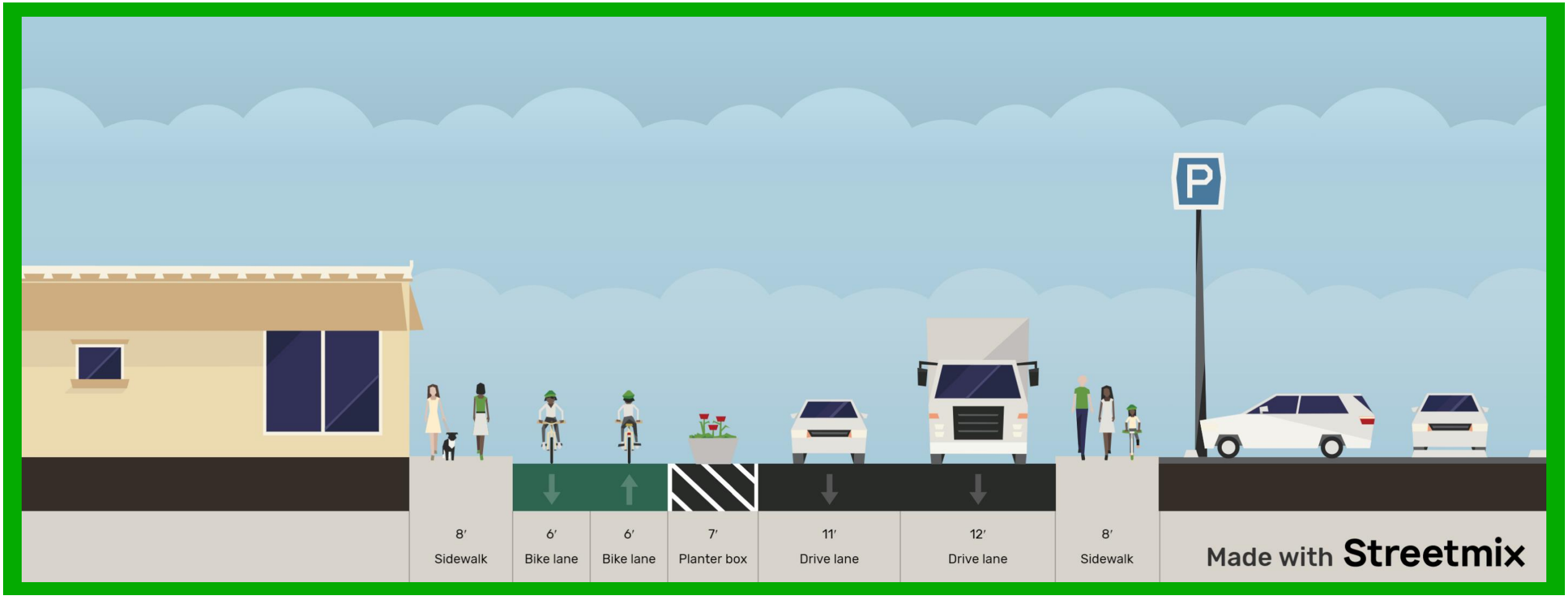
135’ N of Manzanita St – Edwards St: *Alternative 3*



Notes: Maintains existing ROW
Introduces new curbs (reduces travelway curb-to-curb from ~42’ to ~24’)

Court St

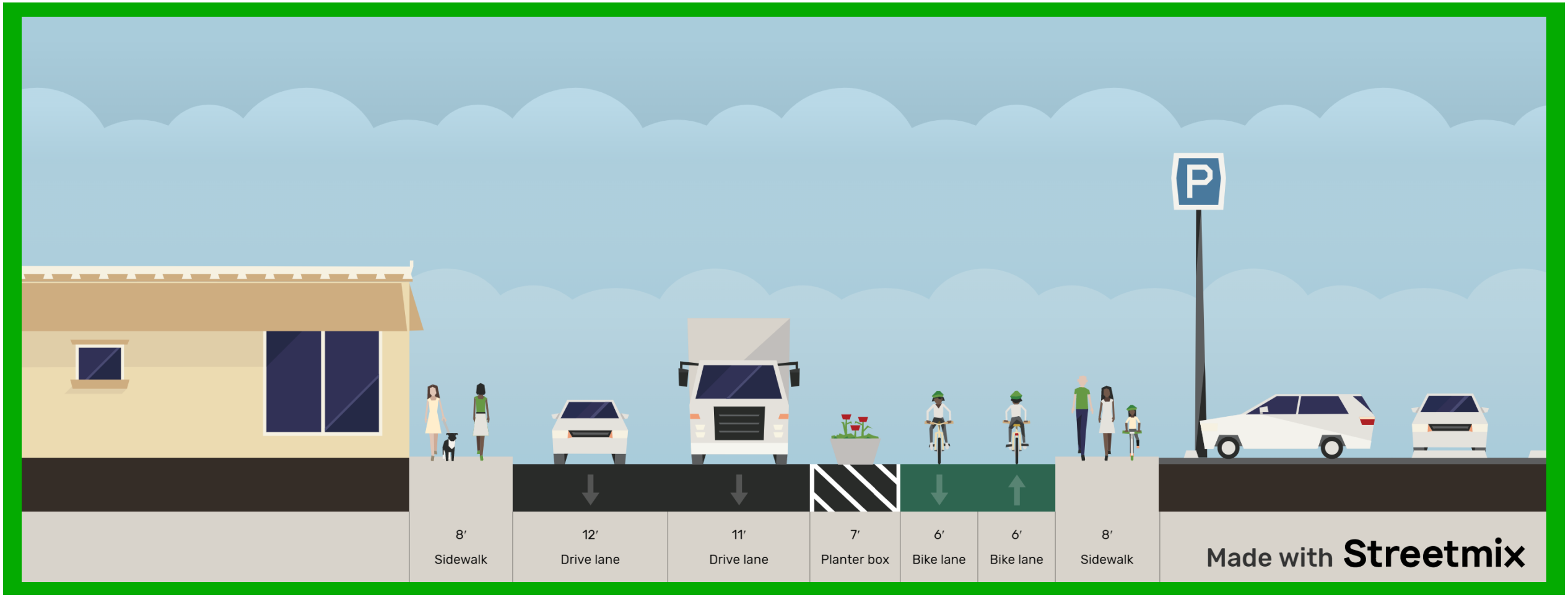
135’ N of Manzanita St – Edwards St: *Alternative 4*



Notes: Maintains existing ROW
Maintains existing curbs

Court St

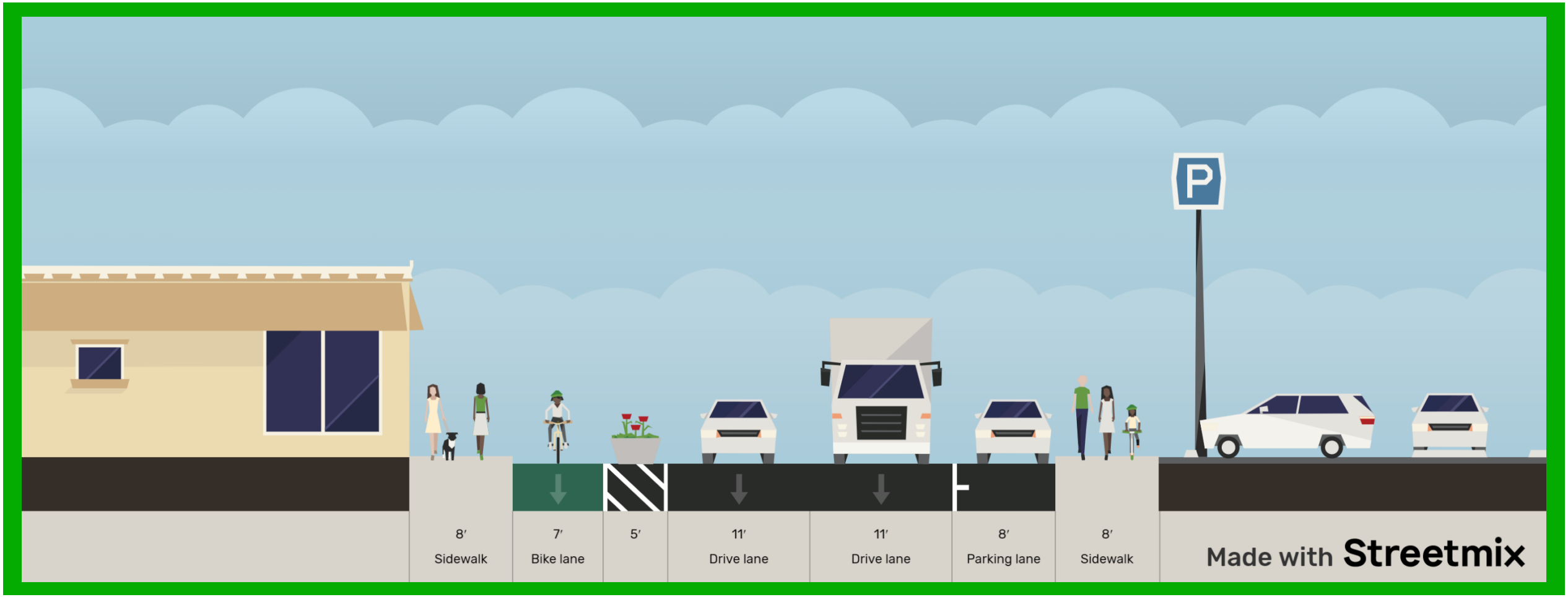
135’ N of Manzanita St – Edwards St: *Alternative 5*



Notes: Maintains existing ROW
Maintains existing curbs

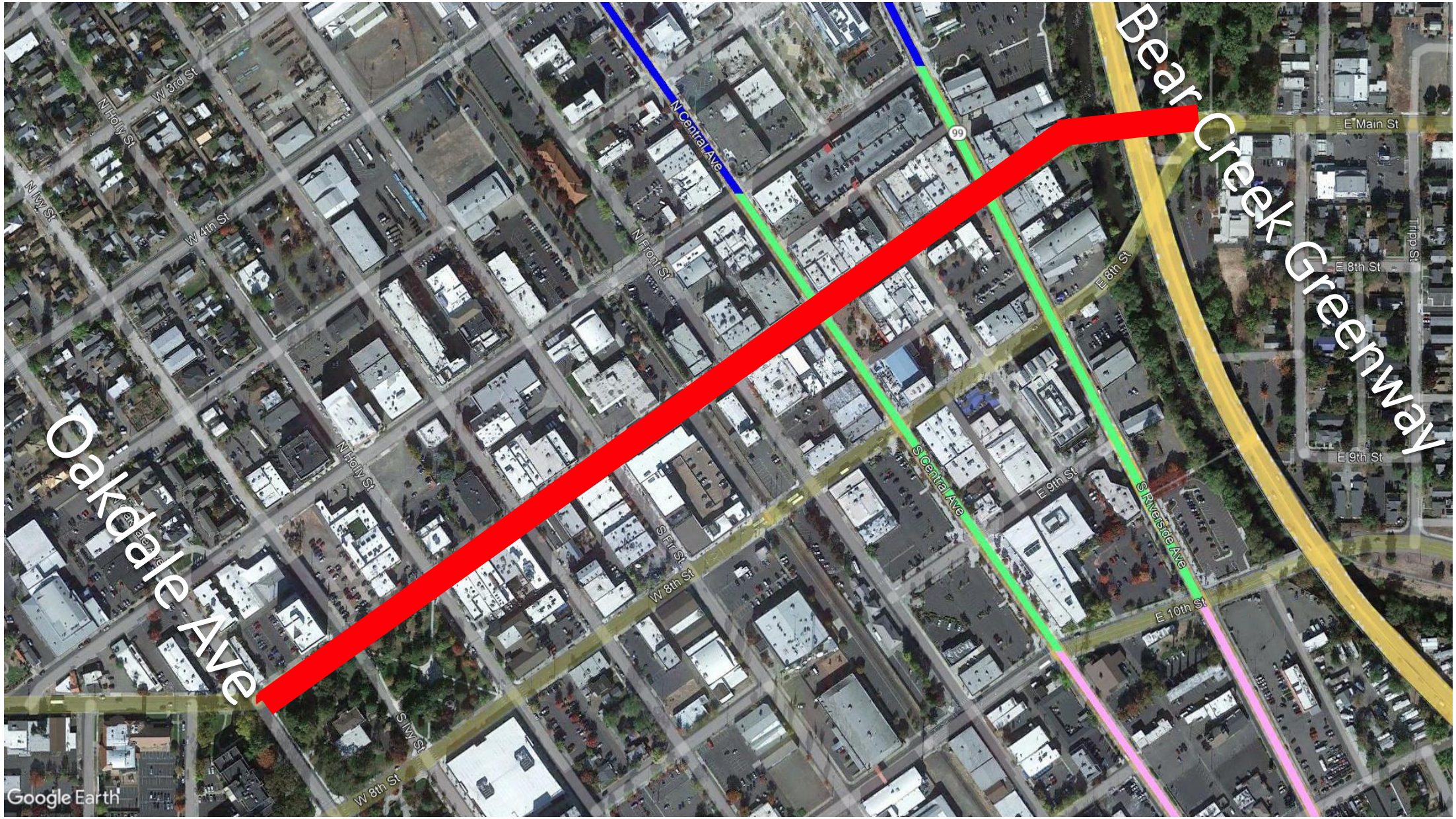
Court St

135’ N of Manzanita St – Edwards St: *Alternative 6*



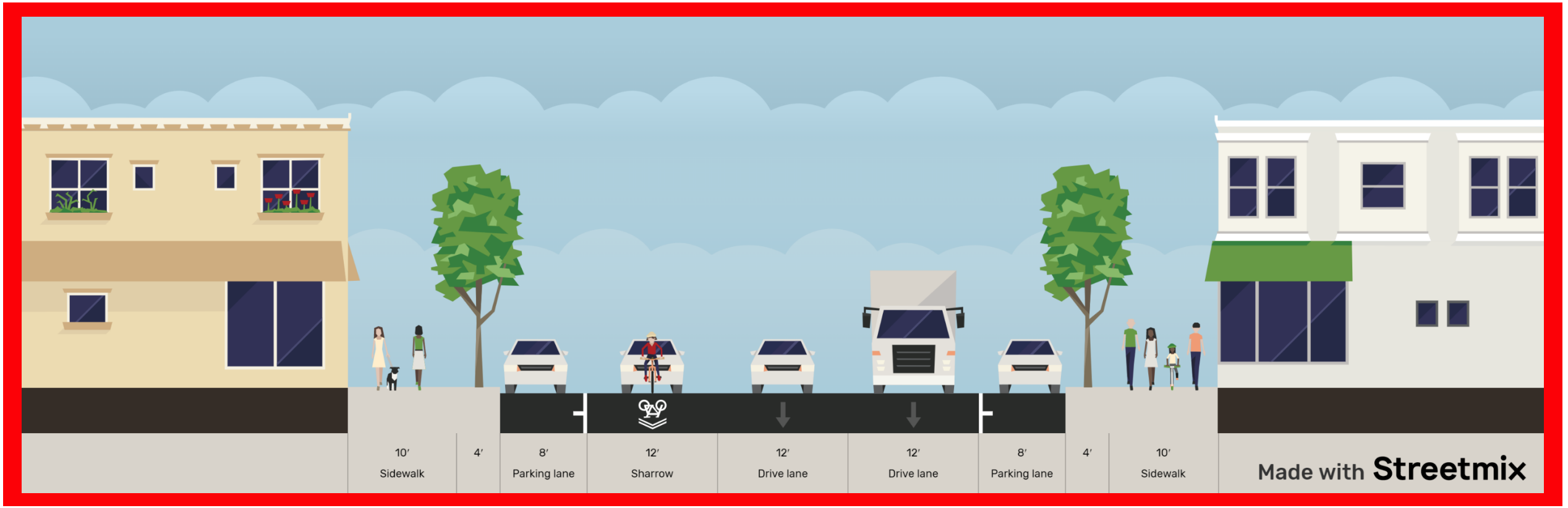
Notes: *Maintains existing ROW*
Maintains existing curbs

E Main St: Oakdale Ave to Bear Creek Greenway



E Main St

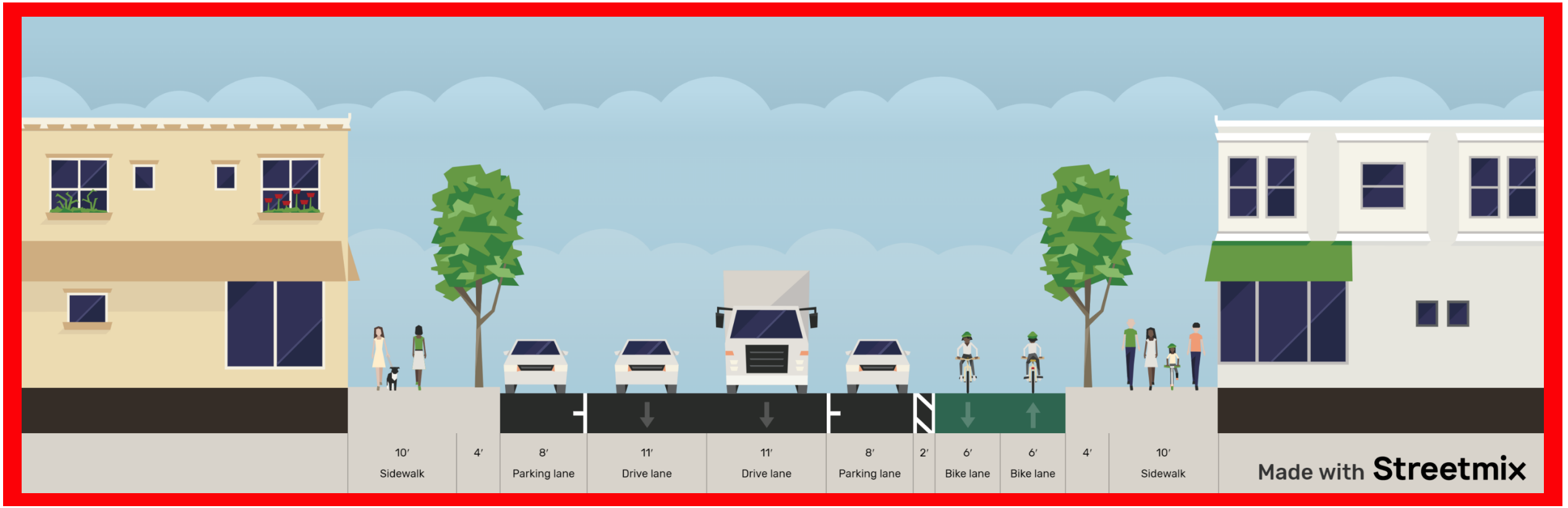
Oakdale Ave to Bear Creek Greenway: *Existing*



Notes: ROW: ~80’
Curb-to-curb ~52’

E Main St

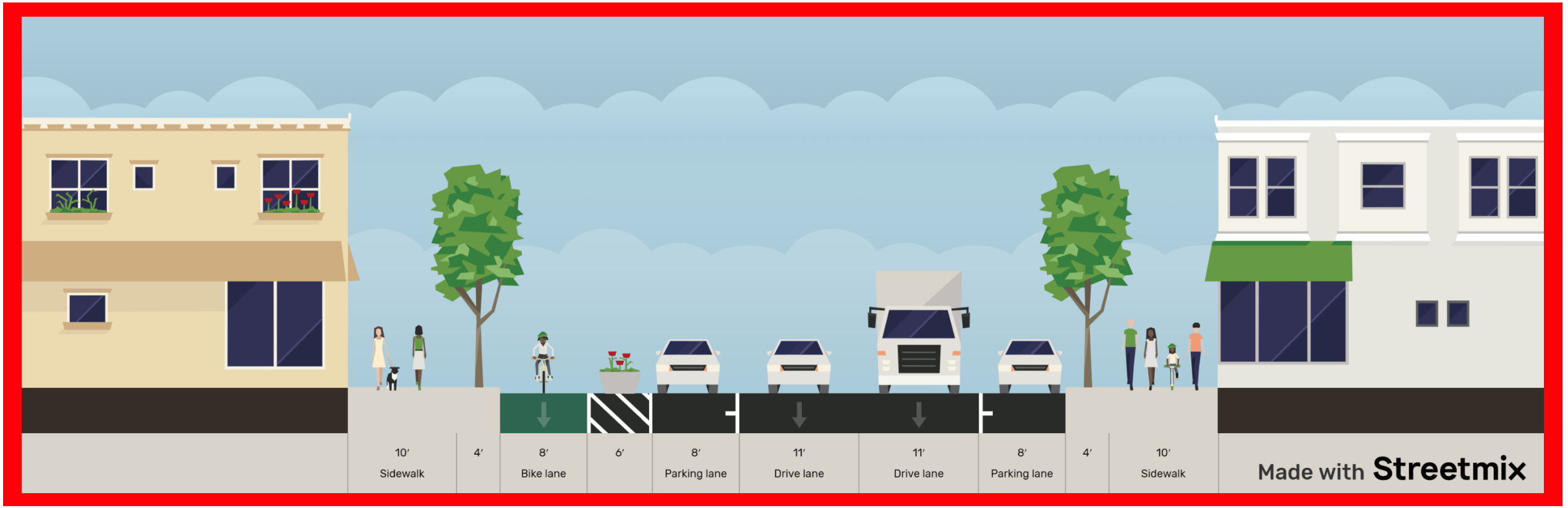
Oakdale Ave to Bear Creek Greenway: *RVATP Alternative*



Notes: Maintains existing ROW
Maintains existing curbs

E Main St

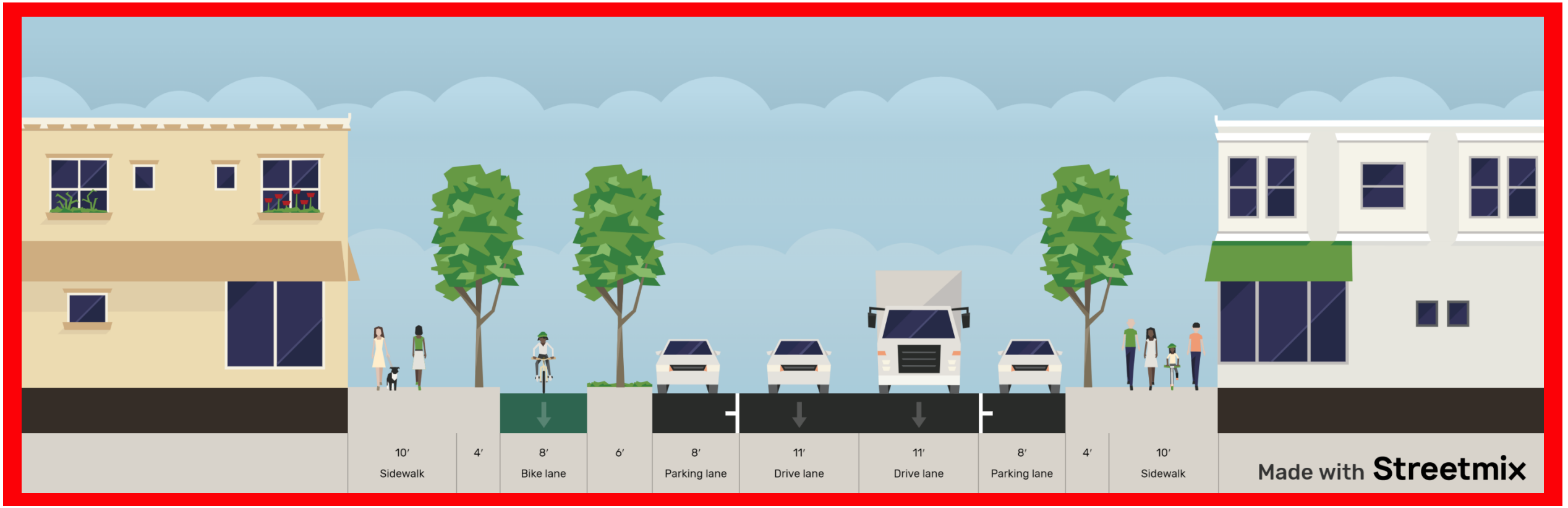
Oakdale Ave to Bear Creek Greenway: *Alternative 1*



Notes: Maintains existing ROW
Maintains existing curbs
Assumes "Super Sharrows" on 8th Street for bi-directional travel

E Main St

Oakdale Ave to Bear Creek Greenway: *Alternative 2*



Notes: Maintains existing ROW
Introduces new curbs (reduces travelway curb-to-curb from ~52’ to ~38’)
Assumes “Super Sharrows” on 8th Street for bi-directional travel

Appendix B: ODOT Pedestrian Crossing Space – White Paper

OREGON DEPARTMENT OF TRANSPORTATION

URBAN DESIGN INITIATIVE

>>> Topical Memorandum: Pedestrian Crossing Spacing

KITTELSON & ASSOCIATES

August 2019

PREFACE

The Pedestrian Crossing Spacing Topical Memorandum is a part of the Oregon Department of Transportation (ODOT) Urban Design Initiative. The purpose of this memorandum is to addresses how to determine frequency (spacing) of pedestrian crossings on ODOT highways. Information from this memorandum has been integrated into the ODOT Blueprint for Urban Design and is included in full as an appendix to the Blueprint for Urban Design.

ODOT Planning and Technical Services Engineering and Active Transportation staff developed the Pedestrian Crossing Spacing Topical Memorandum using a collaborative approach, including multiple disciplines and region staff. Federal Highway Administration (FHWA) Oregon Division and the transportation engineering consulting firm Kittelson & Associates, Inc. provided support to develop this document. The following people contributed to the development of this document:

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EXECUTIVE SUMMARY

This topical memorandum addresses how to determine frequency (spacing) of pedestrian crossings on Oregon Department of Transportation (ODOT) highways. ODOT has some policy guidance related to the topic of pedestrian crossing spacing; however, ODOT can consider providing additional guidance to more specifically outline a target frequency of crossings in urban contexts.

The target spacing of crossings for each urban context is provided in **Table 1**. A range, rather than a single target, is provided for flexibility to adjust based on roadway network characteristics (e.g., frequency and spacing of intersections), pedestrian destinations (e.g., transit stops), and cluster of land uses. For example, within a mixed-use area, development may not be distributed uniformly or practitioners may consider the lower end of the range where the land uses are most intense.

Table 1. Target Crossing Spacing

Urban Context	Target Spacing Range (feet)
Traditional Downtown/CBD	250-550
Urban Mix	250-550
Commercial Corridor	500-1,000
Residential Arterial	500-1,000
Suburban Fringe*	750-1,500
Rural Community	250-750

* The "fringe" context is typically adjacent to rural areas at the edge of urban development, but often is in the process of developing. For projects in the "fringe" context zone, practitioners should consider likely future development and consider applying designs for "residential arterial," "commercial corridor," or "urban mix" contexts if this type of development is likely to occur.

The targets in Table 1 are a starting point. Practitioners should evaluate the density of land uses and pedestrian generators and their locations to determine if a lesser or greater spacing is needed. When considered as part of a larger project, such as a corridor project, ODOT should strive to meet the spacing targets. If the target crossing spacing cannot be met on a project, the project team should document why. Similarly, if a crossing is proposed for removal and would lead to a spacing distance beyond the target range for the context, justification should be provided.

1. DEFINE THE PROBLEM

This topical memorandum will address how to determine frequency (spacing) and location of pedestrian crossings[1] across ODOT facilities.

1.1 Expanded Problem Statement

State highways in urban areas often present barriers for pedestrians and bicyclists seeking to cross them. Increasing the opportunities to cross ODOT's urban facilities can improve access and network connectivity for these modes. ODOT is committed to working with communities to provide connected pedestrian networks, including across state highways.

IN THIS MEMO >>

- ODOT's existing crossings guidance and processes
- Review of other guidance and agency approaches
- Future considerations for crossings of ODOT highways in urban areas

ENHANCED CROSSING >>

Crosswalks with devices and design treatments that enhance the ability of pedestrians to cross the street and the visibility of the crossing location and pedestrians waiting to cross. Treatments may include pavement markings, signage, beacons, and signalization, among others.

Existing guidance could be improved to give clear direction on when and where to provide crossings. Guidance should be based on an overall desired permeability or pedestrian/bicycle network connectivity, rather than existing pedestrian volumes. The Bicycle and Pedestrian Design Guide in the Highway Design Manual does suggest crossings should be provided no more than every ¼ mile on developed, urban state highways; however, this is not currently a requirement and may not be sufficient in all urban contexts.

The agency lacks clear and consistent written guidance on how pedestrian crossing needs along an urban corridor should be identified and prioritized during the planning process and through project delivery and maintenance. ODOT staff and agency partners would like both planning level and scoping guidance on frequency (spacing) and locations for crossings in urban contexts.

The ODOT Traffic Manual includes guidance and resources for determining crossing treatments once the decision is made to provide a crossing at a particular location. Therefore, this memorandum will not address design treatments.

[1] While crossings can be designed for and used by both pedestrians and bicyclists, this memorandum will focus on selecting locations and target spacing of crossings for use by pedestrians. Bicyclists may have different needs due to bicycle networks more frequently aligning with local street networks. The considerations developed in this memorandum may also apply to bicyclists, and bicyclists can also benefit from pedestrian crossings. When the needs of pedestrians and bicyclists differ, the solution should be developed based on the local context and characteristics.

2. OVERVIEW OF POLICY, REGULATORY, AND DESIGN GUIDANCE CONTEXT

2.1 ODOT Policies Related to Crossings

There are a number of laws and administrative rules that govern ODOT policies, guidelines, and procedures related to crossings. These laws and rules:

- Define what a crosswalk is (ORS 801.220);
- Define who has authority to establish or close crosswalks (ORS 810.080);
- Govern the traffic control devices used at crosswalks (ORS 810.200) and define authorities and procedures within ODOT related to those traffic control devices (OAR 734-020);
- Establish the responsibilities of road users at crosswalks (ORS Chapters 811 and 814);
- Set rules and procedures within ODOT related to access management (OAR 734-051);
- Set procedures within ODOT related to road widths for movement of freight (ORS 366.215 and OAR 731-012);
- Mandate development and maintenance of a comprehensive transportation policy and long-range plan for a safe, multimodal transportation system (ORS 184.617);
- Ensure pedestrians with disabilities have an equal opportunity to use the transportation system in an accessible and safe manner (Title II, 42 USC § 12132; 28 CFR Part 35);
- Require a minimum amount of funding dedicated to pedestrian facilities, including crossings (ORS 366.514);
- Allow district school boards to fund pedestrian facility improvements to enhance safe access to and from a school (ORS 332.405); and
- Require transportation system plans (TSPs) include a bicycle and pedestrian plan for a network of bicycle and pedestrian routes throughout a planning area (OAR 660-012-0020[2d]).

[NOTE: ODOT is currently working with Department of Justice (DOJ) to clarify nuances in ORS 801.220, primarily related to what happens when a crosswalk is marked across one leg of an intersection but not the other. This is part of a planned ODOT policy on identifying where crosswalks are located – mostly related to unmarked crosswalks – to help designers locate ADA ramps in the bounds of a crosswalk.]

Within this legal and administrative framework, ODOT is committed to providing a safe and reliable multimodal transportation system that connects people and helps Oregon's communities and economy thrive. Specifically by 2040, the Oregon Bicycle and Pedestrian Plan envisions that people of all ages, incomes, and abilities can access destinations in urban and rural areas on comfortable, safe, well-connected walking routes. The Oregon Bicycle and Pedestrian Plan establishes many policies to fulfill this mission and vision. Some of these policies related to pedestrian crossings include:

- Provide safe and well-designed streets and highways for pedestrian and bicycle users (Policy 1.1);
- Add pedestrian and bicycle infrastructure and street crossings to connect system gaps, understanding the unique needs of urban, suburban, and rural communities (Policy 2.3);
- Improve access to multimodal connections for bicyclists and pedestrians through planning, design, prioritization, and coordination (Policy 2.4);
- Bring about a pedestrian and bicycle network that achieves ease of movement, especially considering the people using these modes are vulnerable users of the system (Policy 3.1);
- Integrate pedestrian and bicycle mobility considerations in planning, design, construction, and maintenance (Policy 3.2);
- Balance pedestrian and bicycle needs and freight mobility needs through planning and design guidance and coordination (Policy 3.3);
- Understand the disparities, barriers, and needs affecting the availability and use of walking and biking options for all Oregonians (Policy 5.2);
- Promote walking to help achieve public health goals to improve air quality, and provide opportunities for physical activity to help reduce risk of chronic diseases and other health issues (Policy 6.1);
- Promote walking and biking to help achieve local, regional, state, and federal environmental goals to reduce vehicle miles traveled, reduce greenhouse gas emissions, and improve air and water quality (Policy 7.1); and
- Invest strategically in the overall pedestrian and bicycle system by preserving existing infrastructure, addressing high need locations, and supporting programmatic investments (Policy 8.2).

The Transportation Safety Action Plan is another plan that establishes policies to fulfill this mission and vision. Some of these policies related to pedestrian crossings include:

- Continually improve and implement design and analysis techniques for safety-related decision-making in transportation planning, programming, design, construction, operations and maintenance for all modes (Policy 2.2);
- Plan, design, construct, operate, and maintain the transportation system to achieve healthy and livable communities and to eliminate fatalities and serious injuries for all modes (Policy 2.3);
- Invest in transportation system enhancements that improve safety and perceptions of security for people while traveling in Oregon (Policy 3.4); and
- Allocate infrastructure safety funds strategically, considering all modes, to maximize total safety benefits (Policy 6.1).

The Transportation Safety Action Plan also includes pedestrian-related action items to reduce fatal and serious injuries. One of those action items is to provide safe facilities and crossings in areas where pedestrians are present or access is needed, prioritizing transit corridors, school areas, multilane streets and highways, and other high-risk areas and facilities (Action 6.8.2).

The ODOT Traffic Manual establishes overall policies and guidelines related to traffic engineering at ODOT, including where to establish marked crosswalks and other enhancements at crosswalks. The most significant Traffic Manual policy related to crossings is the requirement for an engineering study and engineering approval to mark a crosswalk and install other crosswalk enhancements (Section 6.6.2.11). This is intended to ensure the marked crosswalk is placed where needed and with the appropriate level of safety treatments for the context of the crossing.

The Traffic Manual also establishes policies and guidelines for pedestrian-activated warning lights and in-street pedestrian crossing signs to further enhance crosswalks (Rectangular Rapid Flashing Beacons [RRFB], Pedestrian Hybrid Beacons [PHB], standard Warning Beacons, in-roadway lights); criteria for closing or removing crosswalks is also included.

2.2 Current Design Guidance for Implementing Crossings

In 2015, ODOT leadership issued a memorandum encouraging ODOT engineers, planners, and designers to use national and Oregon references to incorporate pedestrian improvements and urban design elements into the agency's projects to help meet ODOT's mission, vision, and policies[2].

ODOT guidance for selecting locations for crossings includes:

- Transportation System Plan (TSP) Guidelines
- Highway Design Manual (HDM)
- Traffic Manual
- Guide to School Area Safety

The TSP Guidelines help guide TSP development to be consistent with other TSPs and the Oregon Transportation Plan and its modal topic plans. When developing or updating a TSP, the Guidelines:

- Require an inventory and assessment of existing pedestrian infrastructure, including enhanced pedestrian crossings;
- Require addressing gaps or inadequacies in the pedestrian network;
- Require a narrative that can discuss pedestrian crossing spacing or location guidelines; and
- Recommend consideration of enhanced pedestrian crossings.

The Guidelines do not discuss what an appropriate crossing frequency is.

The Highway Design Manual, in particular Chapters 6 and 13, the Access Management Standards (Appendix C), and the Bicycle and Pedestrian Design Guide (Appendix L), contains guidance on the following:

- Human factors (e.g., people will take the shortest route to their destination)

[2] https://nacto.org/wp-content/uploads/2015/10/Oregon-DOT-USDG-Endorsement-092515.pdf

- Crossing frequency on developed, urban state highways (should be no further than every ¼ mile)
- Crossing location relative to other signalized crossings (e.g., crossing improvements no closer than 300 feet from nearest signalized crosswalk). It acknowledges planning documents might identify potential crossing locations.
- Access management spacing standards in urban areas
- How signal spacing, access management, location of transit stops, and surrounding land use affect pedestrian demand and where crossings should be located
- Locating crosswalks midblock or at an intersection
- Various types of crossing treatments
- Context and facility type related to crossings (e.g., crossings not appropriate on urban expressways, frequent crossings in STAs and UBAs)
- Median island and curb extension design guidance

The Traffic Manual contains guidance, criteria, and procedures for marking and enhancing crosswalks with traffic control devices primarily based on minimizing risks to pedestrians. It sets minimum distances between mid-block and intersection enhanced crosswalks (300') and minimum distances between different types of traffic control devices (e.g., a minimum distance of 250' between an RRFB enhanced crossing and another crosswalk, traffic signal, or stop sign). However, recommended maximum spacing between crossings is not discussed in the Traffic Manual. The Traffic Manual's guidance, criteria, and procedures are discussed further in the next section.

ODOT's A Guide to School Area Safety provides a reference on school zones and safe travel to and from school. It does not establish policy or standards for ODOT or other road authorities in Oregon. Guidance related to crossings includes:

- What is typically included in an engineering study to determine where a designated school crossing is needed;
- Discussion of how to treat crosswalks once a school crossing is located; and
- Where to locate a school zone and school speed zone relative to designated school crossings.

The considerations listed in the Guide for the engineering study are largely consistent with other ODOT practices with the addition of school-specific considerations such as drop-off and pick-up operations, Safe Routes to School Plan, and input by the school district, traffic safety committees, and other community representatives.

The ODOT Bicycle and Pedestrian Plan includes a cost estimate to complete identified improvements to pedestrian and bicycle facilities in 25 years. Specifically, for crosswalks, this cost estimate was calculated based on the assumption that a crossing would be needed at least every ¼ mile inside urban boundaries, consistent with the Bicycle and Pedestrian Design Guide.

2.3 Current Process for Determining Crossing Needs

Identifying the need for a crossing can begin in system planning, corridor planning, Safe Routes to School Action Plans, engineering studies, project development, community/city/county request, or maintenance request. The variety of starting points reflects the many different ways in which Oregon's transportation system is used and managed. It also means each starting point identifies crossing locations differently.

Regardless of how the location is identified, if the crosswalk will be marked and/or enhanced with other pedestrian-activated traffic control devices (e.g., beacons, RRFBs, PHBs, signal), State Traffic-Roadway Engineer approval is required under OAR 734-020-0410. To obtain approval, the Region Traffic Office investigates the location through an engineering study (unless it is at an intersection where crosswalks are put in as a standard such as a signal or roundabout). The study and approval process are conducted to ensure the crossing is placed where it is needed and with the appropriate level of safety treatments for the context of the crossing.

If reducing the crossing distance is desired on an identified freight route (e.g.: by installing curb extensions or median islands), freight needs must be considered (ORS 366.215 and OAR 731-012). The ORS includes a flow chart[3] to determine if an exception can be granted by the Oregon Transportation Commission to provide curb extensions or median islands for safety considerations when they would reduce the vehicle carrying capacity of the freight route.

2.4 Barriers to Implementing Crossings

Prioritizing Funding

Sometimes, a location is not desirable for a crossing, even if pedestrian demand is high, and the location cannot be made objectively safe with the available treatments and available funding. For example, locations where motor vehicle speeds are high (above 45 mph), where there is not enough sight distance, or where unusual or unexpected motor vehicle conflicts occur might be places where the only way to objectively make a crossing safe is prohibitively expensive.

Crossings along a corridor usually need to be prioritized because there is not enough funding to provide treatments at every crossing identified with a need. The corridor may get fewer treatments; the treatments may be cheaper or less effective; or a combination of both.

[3] https://www.oregon.gov/ODOT/MCT/Documents/ORS366Guidance.pdf

Barriers in Engineering Studies

ODOT's policy to complete an engineering study to determine crossing needs is intended to ensure crossings are placed where needed and with the appropriate level of safety treatments for the context of the crossing.

According to the *Manual on Uniform Traffic Control Devices* (MUTCD), a basic goal for all traffic control devices should be to fulfill a need. Pedestrian volumes are currently used in the engineering study as a primary way to show a need for a crossing. Pedestrian counts ideally capture pedestrian use during a peak travel period. The peak period for pedestrian demand may not align with the traditional peak period for motor vehicle traffic, making it difficult to effectively schedule counts that show a real need. Sometimes, recent pedestrian counts are available, but often not, and if funding or resources are not available to do a count, this can be a barrier to determining crossing needs. Counting pedestrian volumes along a corridor where demands are dispersed can be especially challenging and time-consuming to collect and tabulate.

Using pedestrian volumes to show a need also does not necessarily measure the level of demand for pedestrians to cross a highway. Adding or modifying a crossing changes pedestrian patterns, but this will not be reflected in a change in pedestrian volumes until after the crossing or modifications are built. This positions ODOT to react to how people use the current roadway environment instead of examining where pedestrians need and want to cross.

The cost of conducting an engineering study for crossings on a corridor or city-wide scale can also be a barrier. Funding for studies is often not considered in scoping, and Region investigations staff have limited time and budget to effectively study needs on this scale if locations for crossings have not been previously identified in a plan. When the study is considered in scoping, the funding sources are inconsistent, meaning staff has to be creative to complete each study.

Barriers to Refuge Islands

Motor vehicle mobility, especially freight mobility, is another real and perceived barrier to implementing crossing treatments. An important safety enhancement, especially on multilane approaches, is reducing the crossing distance. This is typically done with a median refuge island and/or curb extension. However, this safety tool is subject to laws and rules governing reductions in "vehicle-carrying capacity of an identified freight route" (ORS 366.215 and OAR 731-012). If a proposed median refuge island and/or curb extension reduces the vehicle-carrying capacity of an identified freight route, there can be an exception made for safety considerations, but this involves a complicated process that results in a decision by the Oregon Transportation Commission. Even if an exception is not needed, freight needs still must be considered on these routes by going through the freight engagement process. This process can be a significant barrier to a project, especially if the treatments are not part of a STIP project.

Proximity to driveways and accesses can be another barrier to installing some safety treatments. For example, a median refuge island might not be installed if a left-turn lane or two-way left-turn lane is

needed for access to and from a driveway or side street. ODOT has the ability to restrict turning movements to and from an existing private approach to provide a staged pedestrian crossing (OAR 734-051-1065). This can lead to sensitive discussions with the property owner, local jurisdiction, freight industry, and other stakeholders where pedestrian safety is weighed against other community or individual goals.

Institutional Barriers

There may be perceived barriers related to federal policies and funding for crossing treatments. To counter these perceptions, USDOT issued a policy statement in 2010 that encourages and recommends transportation agencies to go beyond minimum design standards and requirements to create safe, attractive, sustainable, accessible, and convenient walking networks. In support of this policy statement, Federal Highway Administration (FHWA) also issued guidance in 2013 in support of using resources from American Association of State Highway and Transportation Officials (AASHTO), National Association of City Transportation Official (NACTO), and Institute of Transportation Engineers (ITE) to develop walking networks, particularly in urban areas.

Other institutional barriers can include:

- Safety concerns because of how past studies interpreted results when comparing safety at marked and unmarked crosswalks.
- Safety concerns related to driver human factors (e.g., distraction related to sign clutter if closely spaced crosswalks are all enhanced with signing and markings and speeds are not sufficiently low).
- Long-term maintenance responsibilities. ODOT has historically required local agencies to maintain, or pay ODOT to maintain, enhanced crosswalk treatments. This is typically documented in an Intergovernmental Agreement (IGA).
- Finally, ODOT's policy of requiring approvals for marked crosswalks and other crosswalk enhancements (per OAR 734-020-0410) can be seen as a barrier. While this process often improves the final design, it also adds time to the design process before crosswalk treatments can be installed.

3. NATIONAL GUIDANCE AND CASE STUDIES

The practice of where to install crossings differs considerably from one jurisdiction to another across the United States. A review of existing literature indicates that little guidance exists related to the frequency of pedestrian crossings in various contexts. Engineers have been left to use their own engineering judgment (sometimes influenced by political and/or public pressure) in reaching decisions and to prepare the necessary documentation of their recommendations.

This section provides relevant guidance and examples from a variety of sources with the goal of determining best practices for crossing spacing in urban environments. Across guidance documents and case studies reviewed, the following themes emerged:

- Pedestrian volume is still widely used to locate crossings, but agencies recognize the limitations of this approach and are starting to use other factors.
- Increased pedestrian travel time and delay are tied to likelihood of a pedestrian making a risky crossing behavior, especially among young children.
- Some restrictions to implementing standard crossing spacing exist.
- There are limited examples of documented spacing standards or guidelines.

3.1 Relevant Guidance Documents

There is currently a lack of federal guidance on the specific questions of crossing spacing. This section summarizes the guidance that does exist and related topics, such as:

- Information on typical trip length and accepted "out-of-direction travel;"
- Acceptable levels of delay for pedestrians at intersections; and
- Locating crossings in proximity to specific land uses and transit stops.

AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities

The 2004 AASHTO *Guide for the Planning, Design, and Operation of Pedestrian Facilities* lists considerations when designing pedestrian crossings (page 81). These include:

- "Assume that pedestrians want and need safe access to all destinations that are accessible to motorists."
- "Typical pedestrian generators and destinations include residential neighborhoods, schools, parks, shopping areas, and employment centers. All transit stops require that pedestrians be able to cross the street."
- "Pedestrians must be able to cross streets and highways at regular intervals. Unlike motor vehicles, pedestrians cannot be expected to go a quarter mile or more out of their way to take advantage of a controlled intersection."

ITE Designing Walkable Urban Thoroughfares: A Context Sensitive Approach

ITE provides guidance on crossing spacing in different contexts in its 2010 publication *Designing Walkable Urban Thoroughfares: A Context Sensitive Approach*. It describes a walkable thoroughfare as having "protected pedestrian crossing frequency (pedestrian signals or high-visibility markings at unsignalized crossings)" every 200-600 feet. It also describes vehicle-oriented thoroughfares as having these pedestrian crossings as needed to accommodate pedestrian needs. Other related recommendations include:

- "Pedestrian facilities should be spaced so block lengths in less dense areas (suburban or general urban) do not exceed 600 feet (preferably 200 to 400 feet) and relatively direct routes are available. In the densest urban areas (urban centers and urban cores), block lengths should not exceed 400 feet (preferably 200 to 300 feet) to support higher densities and pedestrian activity" (p. 32).
- "Consider providing a marked midblock crossing when protected intersection crossings are spaced greater than 400 feet or so that crosswalks are located no greater than 200 to 300 feet apart in high pedestrian volume locations" (p. 153).

Manual on Uniform Traffic Control Devices

The 2009 *Manual on Uniform Traffic Control Devices* (MUTCD) includes a Pedestrian Volume warrant for a traffic signal, intended for use in cases where the traffic volume on a major street is so heavy that pedestrians experience excessive crossing delay. The warrant is based on pedestrian and vehicle volume thresholds. The warrant also includes a standard that it shall not be applied at locations where the distance to the nearest traffic control signal or STOP sign controlling the street that pedestrians desire to cross is less than 300 feet, unless the proposed traffic control signal will not restrict the progressive movement of motor vehicle traffic. The requirement to be no closer than 300 feet from another signal is limited to the pedestrian volume and school crossing warrants. Traffic signals can be installed within 300 feet of each other if the intersection meets the vehicular volume or crash experience warrants.

NACTO Urban Street Design Guide

The National Association of City Transportation Official's (NACTO) *Urban Street Design Guide* discusses considerations for applying crosswalk markings in different traffic conditions. The Guide recommends considering land uses, present and future demand, pedestrian compliance, speed, safety, and crash history when judging the application of a crosswalk. The Guide notes that volumes alone are not enough to determine whether or not a particular crossing treatment should be used. It suggests the MUTCD Pedestrian Volume Warrant (MUTCD 4C.05) should be considered alongside land use, future demand, and factors of the built environment. Referring to the common condition that pedestrian crossings should be no closer than 300 feet from the nearest traffic signal or stop-controlled crossing opportunity, the Guide suggests in some cases crossings may be appropriate within 300-feet of each other, and the minimum spacing threshold should be evaluated based on the street network and anticipated crossing demand.

When describing pedestrian crossing spacing, NACTO suggests that there is no absolute rule, and that spacing should consider block length, street width, building entrances, and traffic signal spacing. They claim 120-200 feet has been shown to be sufficient. The Guide states that, in general, if it takes a person more than three minutes to walk to a crosswalk, wait to cross the street, and then resume their journey, they may decide to cross along a more direct, but potentially less safe or unprotected, route. NACTO does not cite specific research for this guidance.

Lastly, NACTO suggests agencies place midblock crosswalks where there is a significant pedestrian desire line. Frequent applications include midblock transit stops, parks, plazas, building entrances, and midblock passageways.

FHWA DRT-04-100 Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations, 2005

FHWA's 2005 *Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations*, was a landmark study that has shaped the current approach agencies are taking for crosswalk placement and treatment.

The Report calls out the following conditions where marked pedestrian crosswalks may be useful to delineate preferred pedestrian paths across roadways:

- At locations with stop signs or traffic signals to direct pedestrians to those crossing locations and to prevent vehicular traffic from blocking the pedestrian path when stopping for a stop sign or red light.
- At unsignalized street crossing locations in designated school zones. Use of adult crossing guards, school signs and markings, and/or traffic signals with pedestrian signals (when warranted) should be considered in conjunction with the marked crosswalk, as needed.
- At unsignalized locations where engineering judgment dictates that the number of motor vehicle lanes, pedestrian exposure, average daily traffic (ADT), posted speed limit, and geometry of the location would make the use of specially designated crosswalks desirable for traffic/pedestrian safety and mobility.

The Report claims marked crosswalks alone (e.g., without traffic-calming treatments, traffic signals and pedestrian signals when warranted, or other substantial crossing improvement) are insufficient under the following conditions:

- Where the speed limit exceeds 40 MPH;
- On a roadway with four or more lanes without a raised median or crossing island with ADT 12,000 or greater; or
- On a roadway with four or more lanes with a raised median or crossing island with ADT 15,000 or greater.

In the Report, FHWA suggests priority for marked crossings should be given to locations where pedestrian volume exceeds 20 per peak hour or 15 or more elderly pedestrians and/or children per peak hour.

TCRP Report 112/NCHRP Report 562: Improving Pedestrian Safety at Unsignalized Intersections, 2006

The TCRP/NCHRP Report on *Improving Pedestrian Safety at Unsignalized Intersections* found a pedestrian's choice of whether to cross at an intersection is affected by the distance to the intersection. Researchers conducted an on-street pedestrian survey at five uncontrolled locations. The data collection sites were urban areas of Austin, TX, Tucson, AZ, and Fort Lauderdale, FL with two to six travel lanes. Researches would ask, "If this crossing was not here, would you walk to the next intersection?" and point to the next intersection. At three of the sites, where the next signalized intersection was 550, 950, or 1,000 feet away, only about 25 percent of the respondents would walk to the next intersection. For the site with a signalized intersection about 200 feet from the crossing, about 50 percent of those interviewed would walk to that crossing. The remaining site where this question was asked did not follow similar findings. Over 65 percent of the respondents indicated that they would walk 600 feet to cross at a signalized crossing. The increased compliance rate was influenced by a higher number of lanes (six), higher traffic volume, and higher speed compared to the other sites.

The Report also cites the U.S. DOT's 1995 Nationwide Personal Transportation Survey, which found that most pedestrian trips (73 percent) are 0.5 mile (2,640 feet) or less. The authors assumed pedestrians might not be willing to increase their trip length by more than 10 percent (264 feet) in order to walk to a different crossing location.

Engineers interviewed during the research project expressed concern about the 2003 MUTCD pedestrian warrant, specifically that the pedestrian volumes are too high to meet. Those that expressed this concern, unanimously agreed the required pedestrian volumes were too high to adequately address many pedestrian crossing issues in their jurisdiction. To address their pedestrian issues, many engineers either installed crossing treatments with fewer application restrictions, modified the existing MUTCD pedestrian warrant, or used a supplementary engineering analysis to justify a traffic signal installation. The 2009 edition of the MUTCD added flexibility to reduce the volume thresholds as much as 50 percent if the 15th-percentile crossing speed of pedestrians is less than 3.5 feet per second.

The Report was also reviewed for possible parallels between accepted pedestrian delay at unsignalized intersections and accepted out-of-direction travel. Shown in **Table 2**, the Report summarized the likelihood of a pedestrian to accept a short gap in traffic at an unsignalized intersection, related to the HCM thresholds for pedestrian level of service. The Report noted that young children, in particular, desire to limit crossing time and can be impulsive and unpredictable.

Table 2: HCM LOS criteria for pedestrians at unsignalized

Level of Service	Average Delay/Pedestrian (s)	Likelihood of Risk-Taking Behavior*
A	< 5	Low
B	≥ 5 – 10	
C	> 10 – 20	Moderate
D	> 20 – 30	
E	> 30 – 45	High
F	> 45	Very High

* Likelihood of acceptance of short gaps.

Source: TCRP Report 112/NCHRP Report 562: *Improving Pedestrian Safety at Unsignalized Intersections*, Table 8

AASHTO Green Book - A Policy on Geometric Design of Highways and Streets, 7th Edition

The American Association of State Highway and Transportation Officials (AASHTO) Green Book was reviewed to understand potential relationships between pedestrian trip lengths and crossing frequency. The Green Book claims the typical pedestrian will not walk over one mile to work or over 0.5 mile to catch a bus, and about 80 percent of the distances traveled by the pedestrian will be less than 0.5 mile. The typical pedestrian is a shopper about 50 percent of the time that he or she is a pedestrian and a commuter about 11 percent of the time. The Green Book goes on to say that pedestrians tend to walk in a path representing the shortest distance between two points. Therefore, crossings in addition to those at corners and signalized intersections may be appropriate at particular locations.

3.2 Case Studies

This section presents case studies of the process used by various agencies to add pedestrian crossings and considerations for crossing spacing and steps taken by agencies to establish such processes.

Portland's PedPDX Crossing Guidance

With the PedPDX Crossing Guidance, Portland became the first city in the United States to establish crosswalk spacing standards[4]. The mission of PedPDX is to make walking a safe, accessible, and attractive experience for everyone in Portland by putting pedestrians at the forefront of City policy, investments, and design. The desired crossing frequencies were established to identify crossing gaps in Portland's pedestrian network. They are intended to identify gaps where further engineering analysis is required.

[4] The City of Missoula, City of Atlanta, Hillsborough Metropolitan Planning Organization, and potentially others are in the process of developing their own crossing spacing standards. If the standards are published before this document is final, they may be included.

The following standards are based on the City's typical 200-foot block network (265-feet center intersection to center intersection) and may vary based on roadway context:

- **Inside Pedestrian Districts:** For streets within designated Pedestrian Districts, the desired crossing frequency is 530 feet. On a street with Portland's standard 200-foot block faces, this results in a marked and/or enhanced pedestrian crossing at a minimum of every other block. Marked pedestrian crossings may be provided at greater frequency, particularly in Pedestrian Districts located in the Center City, where traffic signals are provided at every block. Where blocks are longer than 530 feet, the Guidance recommends mid-block crossings be provided. Demonstrating existing crossing demand is not required to justify new marked crossings.
- **Outside Pedestrian Districts:** On streets outside of and between Pedestrian Districts, the desired crossing spacing is 800 feet. On a street with Portland's standard 200-foot block faces (265-feet center intersection to center intersection), this results in a marked and/or enhanced pedestrian crossing at a minimum of every three blocks (compared with every two blocks in Pedestrian Districts and Main Streets). To ensure that new marked crossings on streets with lower pedestrian volumes do not result in driver disregard of crosswalks, a minimum of 20 pedestrian/bicycle crossings per peak hour are required to provide new marked/enhanced crossings on streets outside of Pedestrian Districts or where there is not a transit stop.
- **Transit stops:** Within the City of Portland, the Guidance states that a marked and/or enhanced crossing will be provided within 100 feet of all transit stops, regardless of street classification. Marked crossing requirements at transit stops may be implemented by providing new marked pedestrian crossings at existing transit stops, and/or by strategically relocating or consolidating transit stops so they are located at existing marked crossings.

The Guidance defines every intersection as a legal crosswalk where motorists are required to yield to pedestrians.

Metro's Regional Transportation Functional Plan

Metro's Regional Transportation Functional Plan (RTFP) provides guidance on street spacing to support walking, bicycling, and access to transit. Metro recommends a network of major arterial streets at one-mile spacing and minor arterial streets or collector streets at half-mile spacing. If proposed residential or mixed-use development of five or more acres involves construction of a new street, Metro suggests the city or county should require full street connections with spacing of no more than 530 feet between connections, where feasible. Where full street connections are not possible, Metro recommends bicycle and pedestrian accessways be placed no more than 330 feet apart. The RTFP also states city and county TSPs shall include a transit plan that includes provision for safe, direct, and logical pedestrian crossings at all transit stops, where practical.

Washington DOT Pedestrian Design Guidance

In their Pedestrian Design Guidance, the Washington Department of Transportation provides the following guidance on where midblock crossings are most valuable:

- High pedestrian crossing volume present with long block spacing
- Evidence of pedestrian-vehicular midblock conflicts (site observations, law enforcement reporting, and city traffic engineers)
- Proposed crossing with a realistic opportunity to channel multiple pedestrian crossings to a single location
- Sight lines that enable sufficient eye contact between motorists and pedestrians
- Community commitment for a successful outcome
- Ability to mitigate risks associated with the location using proven countermeasures such as, but not limited to, refuge islands, rectangular rapid flashing beacons, and/or pedestrian hybrid beacons
- Modal interchange points where high volumes crossing pedestrians occur (e.g., transit stop to apartment complex)

In the *Pedestrian Facilities Guidebook*, Washington DOT limits mid-block crosswalks (unless they are stop-controlled) less than 300 feet from a traffic signal or bus stop where motorists are not expecting pedestrians to cross and within 600 feet of another crossing point, except in central business districts or other locations where there is a well-defined need.

Austin Pedestrian Safety Action Plan

The City of Austin listed the following action item in its Pedestrian Safety Action Plan: "Establish a Pedestrian Crossing Improvement Program to install large numbers of high-impact, cost-effective pedestrian safety treatments throughout Austin."

The Plan explored the characteristics of streets where pedestrian crashes occur and found that streets with long distances between controlled crossing opportunities see more severe crashes. If the distance to the nearest traffic control device is too far out of their path of travel, pedestrians may be more likely to cross the street in risky locations. The Austin crash data shows the further away the pedestrian path of travel is from a traffic control device (either a traffic signal or pedestrian hybrid beacon), the more severe the crash.

The Plan included the development of a Pedestrian Safety Priority Network tool to identify and prioritize locations where countermeasures might have the biggest impact in improving pedestrian safety and creating a more walkable city[5]. Inputs include:

- **Crash Score**: Based on historical pedestrian crash data, with a higher weight given to serious injury and fatal crashes.
- **Demand Score**: Potential for walking demand based on proximity to transit, businesses, or other attractors, with a special focus on prioritizing traditionally underserved communities.

[5] This is consistent with ODOT's Transportation Safety Action Plan which includes an action to add pedestrian crossings as a way to reduce fatal and serious injury crashes. See Section 2.1 for additional information on ODOT's plan.

- **Risk Characteristic Score**: Physical characteristics that are shown to contribute to severe injury and fatal crashes, including high vehicular speeds, wide street widths, long distances between signalized crossings or street lighting, and lack of sidewalks.

FHWA Guidebook for Measuring Multimodal Network Connectivity: Caltrans Case Study

FHWA's *Guidebook for Measuring Multimodal Network Connectivity* recommends measures to evaluate network density (how well the street grid provides options for travel between locations for people who walk and bike) and route directness (variation in trip distance between the route a bicyclist or pedestrian will actually travel versus the shortest available path). The Guidebook includes a specific example in Caltrans District 4. Caltrans assesses network permeability along state highways to understand the barrier that major highways may create. Permeability was assessed considering both the entire roadway network and a low-stress network (determined by level of traffic of stress) to determine the level of out-of-direction travel required to cross the highway via low-stress crossings. Routes were evaluated on a low connectivity to high connectivity scale based on existing crossing locations.

The Guidebook also mentions that some communities have minimum street spacing standards that could serve as a basis for assessing the density of the bicycle and pedestrian network, but it does not provide specific examples.

3.3 Information Gaps

The guidance and examples reviewed provide minimal documentation of how frequently pedestrian crossings should be spaced in urban contexts. The City of Portland and ITE were the only agency and organization to have documented standards or guidelines. Instead, the relevant guidance discusses the factors that should be considered when determining if a crossing is appropriate (e.g., land use, pedestrian demand, proximity to signals).

3.4 Comparable Guidance

Given the lack of existing guidance, this section summarizes alternative considerations that may be relevant in creating pedestrian spacing goals.

Roadway Spacing for Other Modes

Access management and new development guidelines typically include standards for spacing between roadway connections. These roadway spacing standards could be used to inform the maximum desired frequency of pedestrian connections. The approach used by Metro is summarized in Section 3.2. Additional examples include:

- The Oregon Highway Plan includes the following access management spacing standards in Appendix C:

Posted Speed (mph)*	Spacing (ft) AADT less than 5,000 (more than 5,000)		
	Regional & Highways District Highways	Statewide Highways	
	Rural and Urban Areas	Urban Areas	Unincorporated Communities in Rural Areas
≥55	650	1,320 (1,320)	1,320
50	425	1,100 (1,100)	1,100
40-45	360	360 (800)	750
30-35	250	250 (500)	425
≤25	150	150 (350)	350

- Massachusetts Department of Transportation (MassDOT) recommends intersection spacing of around 200 feet in urban areas.
- FDOT's Access Management policy includes standards for street connections and full and directional median openings. Street connections can occur every 125 to 1,320 feet depending on roadway speed and access class.
- American Planning Association has a Time Saver Standard discussing block size. The Standard suggests principal arterials should be located every three to four miles in urban areas, minor arterials should be spaced at around one-mile intervals from other arterials, and other collector streets should be spaced roughly one-half mile from arterials. Local streets complete the network with a block spacing appropriate to the land use – typically 300 to 500 feet.

- Montgomery County, Maryland uses the following table for new intersection spacing in their subdivision regulations:

Road Classification	Locale	Distance Between Intersections (feet)
Tertiary Residential	All	150
Secondary Residential	Urban	200
	Suburban	200
	Rural	200
Primary and Principal Secondary	Urban	300
	Suburban	400
	Rural	400
Business District and Industrial	Urban	300
	Suburban	400
	Rural	400
Country Road		400
Country Arterial		800
Minor Arterial	Urban	300
	Suburban	500
	Rural	800
Arterial	Urban	300
	Suburban	600
	Rural	800
Major Highway	Urban	300
	Suburban	800
	Rural	1,000
Controlled Major Highway	Urban	300
	Suburban	1,000
	Rural	1,000
Parkway	Urban	300
	Suburban	600
	Rural	800

Transit Stop Spacing

Best practice for local transit stop spacing could be used as a guide for the distance pedestrians are willing to travel out-of-direction to get to where they are going. NACTO's *Transit Street Design Guide* recommends stops at every 800 feet for local service. In his Human Transit blog, Jarret Walker observes that in Australia and Europe, local transit stops are typically spaced every ¼-mile, while some transit agencies in the United States stop every 300 feet. Walker's rule of thumb in transit planning is that riders will walk up to ¼-mile for local transit service.

Motorist Delay

Another potential approach is to compare industry-approved delay thresholds for motorists to create guidance for the amount of time (and therefore distance) a pedestrian can be expected to travel to safely cross the street. For example, the Highway Capacity Manual (HCM) LOS F threshold

for vehicle delay at signals is 80 seconds. At a 3.5 feet/second walk speed, a pedestrian could walk 280 feet in the same amount of time. If 280 feet was the total out-of-direction travel we would accept for pedestrians, that would be a crossing every 140 feet, accounting for a pedestrian trying to get somewhere directly across the street. The distance traveled does not account for delay experienced by the pedestrian while waiting at an intersection to cross the street. The intent of the example is to illustrate that if we assume equal "maximum acceptable" delay for the various users (e.g., motorist and pedestrian), then crossings in theory should be provided more often.

Out of Direction Travel

In Section 3.1, the TCRP/NCHRP Report 562 includes survey data on how far pedestrians are willing to walk to a nearby crossing. The report also cited a 1995 Nationwide Personal Transportation Survey in which the authors claimed that pedestrians would not be willing to increase their trip length by more than 10 percent in order to walk to a different crossing location.

Portland State University conducted research for the Oregon Transportation Research and Education Consortium (OTREC) on how far bicyclists are willing to travel out-of-direction in *Understanding and Measuring Bicycling Behavior*. The focus of the project was on travel time and route choice. Researchers found that for half of the trips, bicyclists rode 0.27 miles farther than the shortest path. At an average speed of 10.8 mph, this would be about 1.5 extra minutes. Looking only at the trips 10 miles or shorter, the median difference between the observed route and the shortest path was 0.24 miles, or 1.3 extra minutes.

ODOT could conduct additional research to understand typical pedestrian trip lengths along ODOT highways and select an out-of-direction threshold that would be acceptable in different urban contexts. This information could be used to create guidance on the proximity of pedestrian crossings to pedestrian attractors and generators.

4. CONSIDERATIONS FOR THE BLUEPRINT FOR URBAN DESIGN

Section 2 of this document presented an overview of ODOT's policy and regulatory guidance related to the placement of pedestrian crossings. Section 3 summarized a variety of current best practices related to placement of pedestrian crossings; however, there are limited examples of pedestrian crossing spacing guidelines within the United States and internationally. Considering the lack of documented guidance, Section 3 also summarized alternate types of guidance ODOT could consider in creating spacing goals. This section (Section 4) describes areas of alignment between ODOT and other best practices, as well as areas of opportunity (Section 4.1). It describes a potential approach to establish crossing spacing goals in urban areas, aligning with the emerging multimodal decision-making framework from the Blueprint for Urban Design (Section 4.2 in this memorandum).

4.1 Best Practices: Highlights and Alignment with ODOT

A number of key themes emerged from the best practices review, drawing on both national sources and local examples. ODOT's current policy guidance aligns with many of these themes, but there are opportunities for better alignment within the planning guidance. This section summarizes the key findings from the guidance and case studies reviewed in Section 3, focusing specifically on findings most relevant to ODOT (based on Section 2).

Overall Themes from Best Practice Review

Across guidance documents and case studies reviewed, the following themes emerged:

- **Pedestrian volume is still widely used to locate crossings, but agencies recognize the limitations of this approach and are starting to use other factors.** The MUTCD uses pedestrian volumes as one of two factors in the pedestrian signal warrant. FHWA suggests priority for marked crossings should be given to locations where pedestrian volume exceeds about 20 per peak hour or 15 or more elderly pedestrians and/or children per peak hour. NACTO suggests volumes alone are not enough to determine whether a crossing treatment should be used. It suggests the MUTCD warrant be considered alongside land use, future demand, and factors of the built environment. NACTO recommends placing midblock crosswalk where there is expected pedestrian demand, included near transit stops, parks, plazas, and building entrances. Many agencies are placing crosswalks at school crossing locations and reviewing crash data and pedestrian-vehicle conflicts.
- **Increased pedestrian travel time and delay are tied to likelihood of a pedestrian making a risky crossing behavior, especially among young children.** However, there is limited and inconclusive research on thresholds for out-of-direction travel in various contexts. Most sources reviewed acknowledged that pedestrians will choose the shortest path between their start and end point. NACTO suggests if it takes a person more than three minutes to walk to a crosswalk, wait to cross the street, and then resume their journey, they may decide to cross along a more direct, but less safe or unprotected, route. If you consider a 30-second

delay at the intersection (LOS E), the remaining 2.5 minutes would allow for 525 feet of total out-of-direction travel, assuming a walk speed of 3.5 ft/s. A TCRP/NCRHP Report conducted an on-street survey and generally found beyond 500 feet, pedestrian willingness to walk to a crossing drop to about 25%. The Report tied likelihood of risky crossing behavior to the HCM pedestrian delay thresholds of unsignalized, claiming that above 30 seconds (LOS E), likelihood of risk-taking behavior is high.

- **Some restrictions to implementing standard crossing spacing exist.** The MUTCD restricts pedestrian signals within 300 feet of a traffic signal or STOP sign controlling the street that pedestrians desire to cross. This requirement is limited to the pedestrian volume and school crossing warrants. Traffic signals can be installed within 300 feet of each other if they meet one of the other signal warrants. State DOTs, including WSDOT, refer to this MUTCD guidance in their own guidance documents. NACTO has suggested the 300-foot spacing requirement may be too far in some cases and should be evaluated based on the street network and foreseen crossing demand. However, FHWA, through the MUTCD, has regulatory authority on use of signals. Any proposed treatment not meeting current MUTCD guidance can potentially still be implemented through MUTCD request to experiment process.
- **There are limited examples of documented spacing standards or guidelines.** NACTO claims 120 to 200 feet has been shown to be sufficient, but they do not offer research or specific examples to support the claim. ITE gives recommendations for crossing spacing in different urban contexts. Portland is the first city to establish spacing standards. The City's standards vary by roadway context. The City of Missoula, City of Atlanta, and the Hillsborough (Florida) Metropolitan Planning Organization are in the process of developing their own crossing spacing standards. Other local agencies may also be doing so.

Areas of Alignment and Opportunity within ODOT

ODOT and the State of Oregon's existing policies, plans, and practices (described in Section 2) align with many of the themes identified in the best practices review.

The establishment of crossing spacing targets supports the Transportation System Plan (TSP) Guidelines, which requires TSPs to have a narrative discussing pedestrian crossing spacing or location guidelines. The Guidelines use the term "enhanced pedestrian crossings," requiring their considerations in TSPs.

Chapter 13 of the Highway Design Manual starts to establish a crossing frequency, requiring crossings on developed, urban state highways be no further than every ¼-mile (1,320 ft). The Oregon Bicycle and Pedestrian Plan also cites the ¼-mile spacing threshold when providing a cost estimate to complete identified pedestrian crosswalk improvements. Like other state manuals reviewed, the Highway Design Manual recommends crossings be no closer than 300 feet from the nearest signalized crosswalk.

The Oregon Bicycle and Pedestrian Plan includes a policy to add pedestrian infrastructure that connects system gaps to fill the needs of urban, suburban, and rural communities. This policy

suggests a commitment to improving pedestrian network connectivity and an understanding that pedestrian infrastructure needs vary by land use context. The policy goes on to suggest that multimodal connectivity be considered throughout the project delivery process in planning, design, prioritization, and coordination. Lastly, the policy encourages an understanding of the barriers and needs affecting the availability and use of walking options for all Oregonians. A lack of crossings is such a barrier.

ODOT's Transportation Safety Action Plan includes an action item to provide crossings in areas where pedestrians are present or where access is needed, prioritizing transit corridors, school areas, multi-lane streets and highways, and other high-risk areas and facilities. The Bicycle and Pedestrian Design Guide (Appendix L in the Highway Design Manual) includes guidance on how the location of transit stops and surrounding land use affects pedestrian demand and where crossings should be located. These references further support a land use-based approach to identifying and prioritizing crossings.

In some cases, updates to guidance are needed to align with ODOT policies and national best practices, including:

- **ODOT should coordinate with the school board when implementing crossing treatments near schools to potentially leverage this source of funding.** As noted in Section 2, Oregon Revised Statute (ORS) 332.405 allows district school boards to fund pedestrian facility improvements to enhance safe access to and from a school. This authorization supports the best practice guidance to locate pedestrian crossings in front of schools and along safe routes to school.
- **If ODOT opts to provide crossings at regularly spaced intervals, the minimum review needed for an engineering study should be revisited and clearly defined.** The ODOT Traffic Manual requires an engineering study and an engineer's approval to mark a crosswalk and install other crosswalk treatments. Currently, local jurisdictions may be instructed by ODOT technical staff to avoid showing specific crossing locations in planning documents until they have completed an engineering study (which allows for more detailed evaluation of a potential crossing). This is typically beyond the scope of most planning efforts. Some local jurisdiction plans may specify crossing "needs" without designating a specific location. As a result, when funding is available for crossing improvements, ODOT does not have a list of identified/prioritized local needs. An engineer should continue to review recommended crossings to confirm the appropriate level of safety treatments for the context of the crossing are being used, but the engineering study should not become too high a burden.

4.2 Aligning Policy, Planning, and Implementation of Pedestrian Crossings: A Potential Approach

The information from this topical memorandum (and this approach) is included in the Blueprint for Urban Design.

Proposed Spacing Target Ranges

ODOT has some guidance related to the topic of pedestrian crossing spacing; however, ODOT can consider providing additional guidance to more specifically outline the target frequency of crossings in urban contexts.

Table 3 provides target spacing ranges of crossings in each urban context. A range, rather than a single value, is provided for flexibility to adjust based on roadway network characteristics (e.g., frequency and spacing of intersections), pedestrian destinations (e.g., transit stops), and cluster of land uses. For example, within a mixed-use area, development may not be distributed uniformly, or practitioners may consider the lower end of the range where the land uses are most intense.

Table 3. Target Crossing Spacing

Urban Context	Target Spacing Range (feet)
Traditional Downtown/CBD	250-550
Urban Mix	250-550
Commercial Corridor	500-1,000
Residential Arterial	500-1,000
Suburban Fringe*	750-1,500
Rural Community	250-750

* The "suburban fringe" context is typically adjacent to rural areas at the edge of urban development, but often is in the process of developing. For projects in the "suburban fringe" context zone, practitioners should consider likely future development and consider applying designs for "residential arterial," "commercial corridor," or "urban mix" contexts if this type of development is likely to occur.

The spacing targets are based on existing Oregon documentation including the City of Portland's PedPDX Crossing Guidance and Chapter 13 of the ODOT Highway Design Manual, and recommendations from ITE. While the ranges presented in **Table 3** are documented in City and State guidance documents, there is limited research to support the specific values. ODOT may consider conducting additional research to understand:

- How far pedestrians are willing to travel out of direction in various contexts (including roadway characteristics) and for different purposes;
- What conditions lead to risky crossing decisions (e.g., level of delay or distance to crossing); and
- What types of land uses are most likely to generate pedestrian demand.

The targets in **Table 3** are a starting point. Practitioners should evaluate the density and type of land uses and pedestrian generators and their locations to determine if a lesser or greater spacing is needed. When considered as part of a larger project, such as a corridor project, ODOT should

strive to meet the spacing targets. If the target crossing spacing cannot be met on a project, the project team should document why. Similarly, if a crossing is proposed for removal and would lead to a spacing distance beyond the target maximum, justification should be provided. However, if a crossing is being proposed as a standalone project or as part of a maintenance process, a justification should not be required if the resulting spacing is still outside the target spacing.

Identifying Crossing Locations

Additional analysis will be required to identify appropriate crossing locations within the target spacing. ODOT's current policy is to complete an engineering study for all proposed marked crossings. Pedestrian volumes are currently used in the engineering study as a primary way to show a need for a crossing. However, using pedestrian volumes to show a need does not necessarily measure the level of demand for pedestrians to cross a highway. Where pedestrian counts are not available or do not sufficiently show demand, demand can be assumed based on the presence of pedestrian generating land uses (e.g., transit stops, schools). The cost of conducting an engineering study for crossings on a corridor or city-wide scale can also be a barrier. The minimum level of review needed for an engineering study should be revisited and clearly defined.

At the project level, ODOT should document likely origins and destinations of pedestrian trips in the study area and show how they would be served by a crossing. If a proposed crossing is not located along the expected pedestrian trip path, the project team should document their assumptions about out-of-direction travel and show that pedestrians can be reasonably expected to use another crossing. Locations may need to be prioritized based upon funding or other factors. The prioritization of crossing treatments by location and against other project elements should be determined on a project-by-project basis, considering the project's desired outcomes and input from the community. Additional information on setting project goals and desired outcomes can be found in Chapter 4 of the Blueprint for Urban Design.

At the statewide level, ODOT could conduct a crossings inventory across the state to compare existing crossing spacing against the targets in **Table 3**. ODOT could use this statewide inventory to identify and prioritize areas that may need additional crossings based on their context.

5. PARKING LOT

This section documents elements of this topic that are out of the scope of this topical memorandum but will need to be addressed through future efforts.

a. Unmarked crossings
b. Crossings of limited access highways will not be addressed.
c. Bicycle specific crossings are also not the focus, though we do acknowledge that the two modes often have overlapping needs. In the future, ODOT will need to determine how needs for bicycle and pedestrian crossings in proximate, but not the same, locations should be adjudicated.
d. Identification of appropriate pedestrian/bicycle crossing treatments - NCRHP Report 562 provides guidance, but it may not be consistently applied within ODOT. Clarified guidance may be needed.
e. Pedestrian crossings at multilane roundabouts – design guidance is needed to determine appropriate treatments:
    - NCHRP Report 674: *Crossing Solutions at Roundabouts and Channelized Turn Lanes for Pedestrians with Vision Disabilities*
    - NCHRP Report 834: *Crossing Solutions at Roundabouts and Channelized Turn Lanes for Pedestrians with Vision Disabilities: A Guidebook*
f. Process for determining when to close or remove a marked crossing – this process may be impacted by the outcomes of this memorandum but will not be directly addressed within it.
g. Potential guidance on the maximum thresholds at which ODOT would consider installing an at-grade crossing (versus requiring grade separation)
    - Vehicle speeds, volumes, crossing distance, roadway characteristics, operational factors, and others
h. Guidance on how the specific context will set the bounds for what type of documentation (or engineering study) is needed, with the intention to streamline the process and create a more consistent approach.
    - When, why, how and how much detail should go into the study?
    - Potential form/worksheet to document decision-making and analysis
    - Who pays for the study and completes the work?
i. Discussion of the "design user" and designing for an array of user types, including children, seniors, people with vision/hearing/mobility disabilities, bicyclist
j. Policy and plan driven prioritization of crossings when not able to implement the number of crossings recommended because of funding or other constraints
k. Components of a pedestrian crossing engineering study and cost estimate

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Operational Analysis Memorandum

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Memorandum

October 7, 2022

Project# 27145

To: Christina Charvat, PE
Karl MacNair, PE
City of Medford

From: Nick Gross, Amy Griffiths, Desly Amurao, Susan Wright, PE, Lee Rodegerdts, PE, Matt Bell

RE: Riverside, Central & E Main Multimodal Enhancement Study

OPERATIONAL ANALYSIS MEMORANDUM

Memorandum Overview

The following technical memorandum summarizes the operational analysis performed for the narrowed down list of alternatives established as part of the Concept Design Memorandum (Reference 1). The operational analysis quantifies the impacts of the roadway reorganization and identifies the necessary intersection strategies, including but not limited to, modifications to lane configurations and signal phasing, to successfully implement each alternative.

This memorandum also includes a summary of the benefits to implementing roadway reorganization projects with case study examples of cities and jurisdictions who have successfully implemented similar projects in recent years. Furthermore, this memorandum revisits the active transportation analysis performed in the Concept Design Memorandum to further refine the concepts to improve safety at key intersections and transition zones along the study roadways.

Executive Summary

Two primary alternatives along E Main Street and Riverside Avenue are evaluated in this memorandum including a one-way bike lane (right) and a two-way bike lane (left). Along Central Avenue and Court Street, only one alternative is evaluated: the one-way bike lane (right).

The following recommendations are based on the operational analysis and technical information presented in this memorandum as well as engineering judgement from the consultant team. The consultant team believes the recommended alternatives will best serve the goals, vision, and policies established by the City of Medford for improving active transportation; however, the financial and political realities of implantation may be challenging.

The City will vet these recommendations through advisory committees, interested parties, and the City Council before finalizing the preferred alternative for each street. The decision on a preferred alternative is not only technical. Community input, political input, and financial considerations will all play a role. If needed, Kittelson will develop a concept design for the preferred alternative identified by the City after the input described above is received.

Based on the operational analysis and updated active transportation analysis, the following alternatives are recommended:

E MAIN STREET

- **"Alternative B," the two-way parking-protected bike lane (left)**, is recommended as the preferred alternative for E Main Street.
- The two-way parking protected bike lane (left) is recommended as the preferred alternative primarily due to its ability to provide bi-direction access for people biking, ability to operationally accommodate a lane reduction along E Main Street, safety benefits associated with the physically separated bicycle facility, public support, and consistency with adopted planning documents.
- To implement the two-way parking-protected bike lane (left), protected signal phasing is recommended to provide a dedicated phase for people biking at signalized intersections.
  - Protected signal phases increase access and reduce conflict between people biking and people driving.
  - Bike signals are recommended to be installed as part of the protected signal phasing, particularly to indicate to people biking contraflow (eastbound) that they have a dedicated and protected phase to cross the intersection.
- Removing a through lane on E Main Street does not result in any study intersections exceeding the operational standards for level-of-service (LOS) D under protected or permitted signal phasing.
  - Under 2024 no-build conditions, seven study intersections operate at LOS A.
  - If Alternative B with protected phasing is implemented, four intersections operate at LOS A, two operate at LOS B, and one operates at LOS C.
- A comparison of travel time under existing conditions and with the removal of a travel lane and protected signal phasing for the two-way parking protected bike lane (left) is as follows:
  - 169.2 seconds – 2024 baseline conditions
  - 192.4 seconds – two-way parking protected bike 2024 protected signal phasing conditions
- Vehicular operation impacts are highest at the E Main Street/Riverside Avenue and E Main Street/Central Avenue intersections under the protected signal phasing for people biking:
  - At E Main Street/Riverside Avenue, LOS is reduced from LOS A (existing) to LOS C (two-way parking protected bike lane) under 2024 conditions
  - At E Main Street/Central Avenue, LOS is reduced from LOS A (existing) to LOS C (two-way parking protected bike lane) under 2024 conditions.
- An enhanced crossing is recommended at the E Main Street/E 8th Street (285' west of Almond Street) intersection to increase access to/from the two-way bike lane.
  - Extending and widening the existing sidewalk on the south side of E Main Street to provide continuous access to the Bear Creek Greenway is recommended.
  - The enhanced crossing facility type and location will be further defined as part of the preferred alternative development.

RIVERSIDE AVENUE

- **"Alternative A," the one-way parking protected/buffered bike lane (right)**, is recommended as the preferred alternative for Riverside Avenue primarily due to the ease of transition at the north and south limits of the corridor, and less non-motorized delay compared to the two-way parking protected bike lane (left).

- Removing a through lane on Riverside Avenue does not result in any study intersections exceeding the operational standards for level-of-service (LOS) D under protected or permitted signal phasing.
  - Under 2024 no-build conditions, five study intersections operate at LOS A, four operate at LOS B, and one operates at LOS C
  - If Alternative A with permitted phasing is implemented, three intersections operate at LOS A, five operate at LOS B, and two operates at LOS C
- 95th percentile queues are forecast to exceed storage capacity at Riverside Avenue/4th Street in 2038 under build and no-build scenarios.
- Permitted signal phasing is recommended. It reduces delay for bicyclists and vehicles and does not have forecast operational challenges as described below.
  - Protected phasing
    - 95th percentile queues are forecast to exceed available storage at Riverside Avenue/E Main Street and Riverside Avenue/6th Street; intersection reconfigurations would need to be implemented to accommodate protected signal phasing
    - Protected signal phasing would be recommended to provide a dedicated phase for people biking at signalized intersections if the two-way parking-protected bike lane (left) is implemented.
    - Protected signal phasing is not recommended as a requirement to implement the one-way parking protected/buffered bike lane (right)
- A comparison of travel time under existing conditions and with the removal of a travel lane and permitted signal phasing for the one-way parking protected/buffered bike lane (right) is as follows:
  - 366.7 seconds –2024 baseline conditions
  - 391.6 seconds – one-way parking protected/buffered bike lane (right) 2024 permitted signal phasing conditions

CENTRAL AVENUE

- **"Alternative B," the one-way separated bike lane (right)**, is recommended as the preferred alternative for Central Avenue because it provides safety benefits associated with the physically separated bicycle facility, is supported by the public, and is consistent with local planning documents.
- A buffered bike lane alternative can be implemented as an interim step to the recommended "Alternative A" separated bike lane (right)[1].
- Permitted signal phasing is recommended. It reduces delay for bicyclists and vehicles and does not have forecast operational challenges as described below.
  - Central Avenue/Edwards Street is projected to operate at level-of-service (LOS) F under protected signal phasing in 2038.
- Removing a through lane on Central Avenue does not result in any study intersections exceeding the operational standards for level-of-service (LOS) D under permitted signal phasing.
  - Under 2024 no-build conditions, three study intersections operate at LOS A and five operate at LOS B

[1] The buffered bike lane alternative is anticipated to have less challenges associated with driveway access compared to the separated bike lane alternative, primarily due to the lack of vertical separation (curbs).

- If Alternative B with permitted phasing is implemented, the LOS does not change at any of the intersections in 2024.

- A comparison of travel time under existing conditions and with the removal of a travel lane and permitted signal phasing for the one-way separated bike lane (right) is as follows:
  - 195.7 seconds –2024 baseline conditions
  - 199.4 seconds – one-way separated bike lane (right) 2024 permitted signal phasing conditions
- 95th percentile queues are not forecast to exceed available storage in 2024 or 2038 under permitted signal timing except at the intersection of Central Avenue/4th Street
  - 95th percentile queues are forecast to exceed available storage in 2038 at Central Avenue/4th Street under both build and no-build scenarios.

COURT STREET

- **"Alternative A," the one-way parking-protected bike lane (right)** with parking (both sides), is recommended as the preferred alternative for Court Street because it provides safety benefits associated with the physically separated bicycle facility and increases the amount of on-street parking along the street segment without including the cost of constructing new curbs. It also improves PLTS on both sides of the roadway due to the presence of parking.
- Permitted signal phasing is recommended.
- A comparison of travel time under existing conditions and with the removal of a travel lane and permitted signal phasing for the one-way parking-protected bike lane (right) with parking on both sides is as follows:
  - 135.8 seconds –2024 baseline conditions
  - 144.3 seconds – one-way parking-protected bike lane (right) 2024 permitted signal phasing conditions
- Removing a through lane on Court Street does not result in any study intersections exceeding the operational standards for level-of-service (LOS) D.
  - Under 2024 no-build conditions, one intersection operates at LOS C and one intersection operates at LOS D.
  - If Alternative B with permitted phasing is implemented, the LOS does not change at any of the intersections in 2024.
- 95th percentile queues are not forecast to exceed available storage in 2024 or 2038 under build or no-build scenarios with protected or permitted signal timing.

SOUTH OF COUPLET

- **"Alternative A," the separated bike lanes (with buffer)**, is recommended as the preferred alternative for Riverside Avenue because it provides a greater improvement in PLTS and because open house participants that supported a build alternative prefer facilities with increased width and vertical separation.
- Approximately 9 feet of right-of-way acquisition may be required on both sides of the roadway to implement Alternative A.
  - Physical constraints may require the reduction and/or removal of the buffer in some locations

- Neither the separated bike lanes (with buffer) "Alternative A" or the separated bike lanes (without buffer) "Alternative B" include lane changes or phasing updates. As a result, there are negligible[2] changes in vehicular LOS or travel time south of the couplet.
  - LOS mobility standards are exceeded at Riverside Avenue/Stewart Avenue in 2038 under build and no-build scenarios.
  - 95th percentile queues are forecast to exceed available storage at Riverside Avenue/Barnett Road and Riverside Avenue/Stewart Avenue in 2024 and 2038 under all scenarios.
- The forecast increase in people bicycling behind the curb is projected to increase vehicular travel time by less than 1 second. The LOS does not change at either intersection.

[2] Negligible changes are caused due to differences in signal optimization from the projected increase in number of bicyclists traveling through the intersection (behind the curb).

Memorandum Organization

This memorandum is organized to concentrate key information within the body of the memorandum and supporting technical information included in appendices. Table 1 summarizes each memorandum section and identifies appendices with additional information.

Table 1: Memorandum Organization

Section	Description
Executive Summary and Recommendations	This section provides an executive summary of recommendations for the alternative to be advanced along each segment to design. It also describes the organization of the memorandum and summarizes the analysis conducted to reach the recommendations.
Traffic Calming & Road Reorganizations	In this section, documentation through research papers, case studies, and additional empirical evidence is summarized identifying the economic benefits of implementing active transportation infrastructure as well as the socio, economic, and environmental benefits of traffic calming and roadway reorganizations – **Appendix "A"** provides case study examples of traffic calming and roadway reorganizations
Narrowed Down List of Alternatives	This section describes and illustrates the primary alternatives. It includes the following: – **Primary Alternatives:** This section describes the extents for each unique alterative and illustrates the proposed cross section o **Appendix "B"** includes information about bike signal approval requirements – **Active Transportation Analysis:** The narrowed down list of alternatives is further evaluated for the experience of people walking and biking at key transition zones and the most constrained "pinch point" locations along the corridor. The uniqueness and complexity of these locations as they relate to each primary alternative allow for level of traffic stress and delay analysis to differentiate between alternatives. – **Operational Analysis:** The narrowed down list of alternatives is further evaluated for operations performance measures including travel time, vehicular delay, pedestrian delay, bicycle delay, signal progression, and queuing. o **Appendix "C"** includes figures for 2024 and 2038 operations (showing delay, volume-to-capacity [v/c], and level of service [LOS]) under no-build, Alternative A with permitted phasing, Alternative A with protected phasing, Alternative B with permitted phasing, and Alternative B with protected phasing o **Appendix "D"** includes Synchro 11 Highway Capacity 2000 reports, queue reports, and arterial reports – The **Concept Design Memorandum** evaluated the full list of alternatives for safety, community support, connectivity, user experience, economic opportunity, and feasibility. – The **Volume Development Memorandum**, (Reference 2), provides the methodology for developing Base Year (2024) and Future Year (2038) volumes. It also includes the Base Year and Future Year turning-movements at study intersections.
Next Steps	This section summarizes next steps for the study.

Traffic Calming & Roadway Reorganizations

Many cities and jurisdictions around the country are implementing roadway reorganization projects to improve safety, increase multimodal access, and create more livable communities. The primary attribute impacting safety, access, and livability is vehicular speed. Traffic calming is defined by the Institute of Transportation Engineers (ITE) as "the combinations of measures that reduce the negative effects of motor vehicle use, alter driver behavior, and improve conditions for non-motorized street users."

Traffic calming consists of physical design and other measures put in place on existing roads to reduce vehicle speeds and improve safety for people walking, biking, rolling, and accessing transit. Roadway reorganizations are one approach to traffic calming.

ECONOMIC BENEFITS OF MULTIMODAL STREET IMPROVEMENTS

Research and case studies conducted from around the Country on similar pedestrian and bicycle improvement projects provide analytical and evidence-based data that indicates the installation of multimodal street improvements not only positively contribute to local business but can increase number of customers and their spending habits. Several key findings based on review of research and case studies are summarized below:

- According to the survey results included in the *Bike Lanes, On-street Parking & Business Report* produced by *Toronto Centre of Active Transportation and Clean Air Partnership (Reference 3)*, customers who reported that they usually drive, were found to visit less businesses frequently and spend significantly less money per month in the neighborhood than those who did not drive.
- The *Economic Impacts of Bicycle and Pedestrian Street Improvements* study produced by *The Summit Foundation (Reference 4) analyzed 14 multimodal street improvement projects in 6 different cities to understand the impacts on local business. Based on the study, street improvements had either positive or non-significant impacts on corridor employment and sales.* Food service industry benefits the most and retail industry benefits somewhat from the addition of active transportation infrastructure.
- *Making the Economic Case for Cycling* a study produced by the Institute for Transportation & Development Policy (Reference 5) documents the economic and environmental benefits as well as individual cost savings for active transportation travel options. Several key takeaways from the study include:
  - In North Carolina's Outer Banks, a onetime investment of $6.7 million in cycling infrastructure generates approximately $60 million in economic activity each year through cycle tourism.
  - Cyclists have been found to spend more per trip and to make shopping and dining trips more often than drivers.
  - Improving access by bicycle to commercial areas results in higher retail sales.
  - Data from corridor improvement projects in several US cities shows that both the number of customers and customers pending crease as a result of adding bicycle lanes in commercial areas.
  - Unprotected bike lanes (no physical separation between cyclists and vehicle traffic) are the least expensive to implement; however, unprotected bike lanes do not provide enough safety and comfort for most people who cycle, and thus they do not convince enough people to cycle for everyday trips.

Appendix "A" includes examples of traffic calming, roadway reorganization case studies, and documented research on the benefits of implementing pedestrian and bicycle street improvements projects.

Narrowed Down List of Alternatives

The Concept Design Memorandum established a narrowed down list of alternatives to be advanced as part of this Operational Analysis Memorandum. This list of alternatives was established by developing a broad list of potential concept designs and evaluating them with the study evaluation criteria. The narrowed down "primary alternatives" list is described and illustrated below.

PRIMARY ALTERNATIVES

- E Main Street
  - Alternative A: One-way Parking Protected Bike Lane (Right)
  - **Alternative B: Two-way Parking Protected Bike Lane (Left)**
- Riverside Avenue
  - **Alternative A: One-way Parking Protected/Buffered Bike Lane (Right)**
  - Alternative B: Two-way Parking Protected/Buffered Bike Lane (Left)
- Central Avenue
  - Alternative A: One-way Parking Protected/Buffered Bike Lane (Right)
  - **Alternative B: One-way Separated Bike Lane (Right)**
- Court Street
  - **Alternative A: One-way Parking Protected Bike Lane (Right)** with parking (Both Sides)
  - Alternative B: One-way Buffered Bike Lane (Right)
  - Alternative C: One-way Separated Bike Lane (Right)
- South of Couplet
  - **Alternative A: Separated Bike Lanes (with Buffer)**
  - Alternative B: Separated Bike Lanes (without Buffer)

Figure 1 illustrates the location of varying alternatives based on location within the study area. The recommended preferred alternative for each segment is identified in **bold**.

Alt. A: One-way Parking Protected/Buffered Bike Lane (Right)
Alt. B: Two-way Parking Protected Bike Lane (Left)

Alt. A: One-way Parking Protected Bike Lane (Right)
Alt. B: One-way Buffered Bike Lane (Right)
Alt. C: One-way Separated Bike Lane (Right)

Alt. A: One-way Parking Protected/Buffered Bike Lane (Right)
Alt. B: Two-way Parking Protected Bike Lane (Left)

Alt. A: One-way Buffered Bike Lane (Right)
Alt. B: One-way Separated Bike Lane (Right)

Alt. A: One-way Parking Protected Bike Lane (Right)
Alt. B: Two-way Parking Protected Bike Lane (Left)

Alt. A: One-way Parking Protected/Buffered Bike Lane (Right)
Alt. B: Two-way Parking Protected Bike Lane (Left)

Alt. A: One-way Buffered Bike Lane (Right)
Alt. B: One-way Separated Bike Lane (Right)

Alt. A: Separated Bike Lanes (with Buffer)
Alt. B: Separated Bike Lanes (without) Buffer

Main Street Section
Narrow Section
South of Couplet Section
Typical Sections
Wide Sections

Existing Sharrows
Bear Creek Greenway
Bear Creek

0 1,500 Feet

**Bold text represents preferred alternative*

Figure 1

KITTELSON & ASSOCIATES

Study Area Segments
Medford, Oregon

H:\27\27145 - Riverside Multimodal Enhancements Study\gis\01 - Study Area Segments Ops Memo2.mxd Date: 10/3/2022

OPERATIONS ANALYSIS AND METHODOLOGY

The following sections presents the operations and active transportation analysis of alternatives by segments. In addition to the active transportation analysis, the No-Build, Alternative A, and Alternative B are evaluated with the operational performance measures described in Table 2.

Table 2. Operational Performance Measures

Performance Measure	Description
Motor Vehicle Travel Time	What is the change in travel time for motor vehicles along the main line?
Motor Vehicular Delay	What are the changes to motor vehicle delay?
Pedestrian Delay	What changes to pedestrian delay are experienced?
Bicycle Delay	What changes to bicycle delay are experienced?
Signal Progression	How does the window of opportunity to arrive on green change? How consistent is the quality of travel along the corridor?
Queuing	Do queues spill back to adjacent intersections?

Figure 2 illustrates the lane configurations and traffic control devices as modeled in the City of Medford Transportation System Plan (TSP) and updated to reflect recently implemented projects. Figure 3 and Figure 4 illustrate the assumed lane configurations and traffic control devices for Alternative A and Alternative B, respectively. The volumes used in the operations analysis are included in the Volume Development Memorandum[3].

OPERATIONS ASSUMPTIONS

This section presents the operations assumptions for the analysis presented in this memorandum. Analysis was conducted under build and no-build conditions in the Base Year (2024) and Future Year (2038). Under the no-build scenario, the operations analysis assumes all Transportation System Plan (TSP) projects are constructed before the Base Year. Under the build scenario, the operations analysis assumes all TSP projects are constructed before the Base Year and a through lane is removed to accommodate the multimodal facilities where needed.

[3] 2038 volumes from the Jackson Street & 4th Street Proposed Reclassification to Minor Arterial Traffic Analysis were used in place of volumes from the Volume Development memorandum due to the unrealistic nature of the operations results at this intersection.

SIGNAL ASSUMPTIONS

All alternatives are evaluated under two scenarios:

- Permitted Phasing: This scenario removes a through lane from all segments[4]; bicycle travel occurs concurrently with vehicle phases.
- Protected Phasing: This scenario removes a through lane from all segments[1]; bicycle travel occurs in an additional exclusive protected bicycle phase[5].

Protected Phasing

- Protected phasing was modeled by adding an opposing left turn placeholder phase. This phase was assumed to have 10 seconds of green time and 6 seconds of yellow time.
- It is assumed that no right turns on red (RTOR) would be allowed for movements that would conflict with bicycle movements (e.g., for the right-side facility on Riverside Avenue, northbound and westbound RTOR was not permitted).

Permitted Phasing

- Permitted phasing allowed RTOR for all movements.

Optimization

- Offsets and splits are optimized under 2024 build scenarios at all intersections except Riverside Avenue/Stewart Avenue and Riverside Avenue/Barnett Road
  - Offsets and splits are not optimized under 2024 no-build scenario
- Offsets and splits are optimized under 2038 build and no-build scenarios at all intersections

LANE SETTINGS

- A peak hour factor of 1 was used to provide an hourly analysis.
- The default truck percentage of 2% was assumed.
- An ideal saturated flow rate of 1800 vehicles per hour per lane was assumed.
- Generally, the dedicated through lane was removed. Additional turn lanes were considered where needed to meet mobility standards. There is potential for additional refinement to add or remove turn lanes in later stages of project development.

QUEUING

- 95th percentile queue lengths were assessed for all study intersections based on the queue storage distances set in the Medford Transportation System Plan.

[4] Excluding the segment along Central Avenue between Jackson Street and 10th Street that has planned sharrows, which is assumed to maintain existing lane configurations.
[5] No separated phases are assumed where sharrows are provided along Central Avenue.

SIGNAL PROGRESSION

- Signal progression was assessed along all segments by reviewing Synchro 11 Time-Space Diagrams. Today motor vehicles are generally able to progress through the corridor on green when travelling at the posted speed. Time-Space Diagrams are provided in Appendix "E".
- Under Alternative A and Alternative B, motor vehicles are still able to progress through the corridor on green. Recommended signal progression changes to improve the pedestrian and bicycle environment include:
  - Shortening cycle lengths
  - Updating signal progression
  - Signal progression could be timed for people riding bikes

BICYCLE TRAVEL

- 60 bicycles/hour (1/minute) are included as Conflicting Bicycles in Synchro 11 volume settings to ensure bicycle traffic is reflected in the analysis results. This is not a projection of potential bicycle travel.

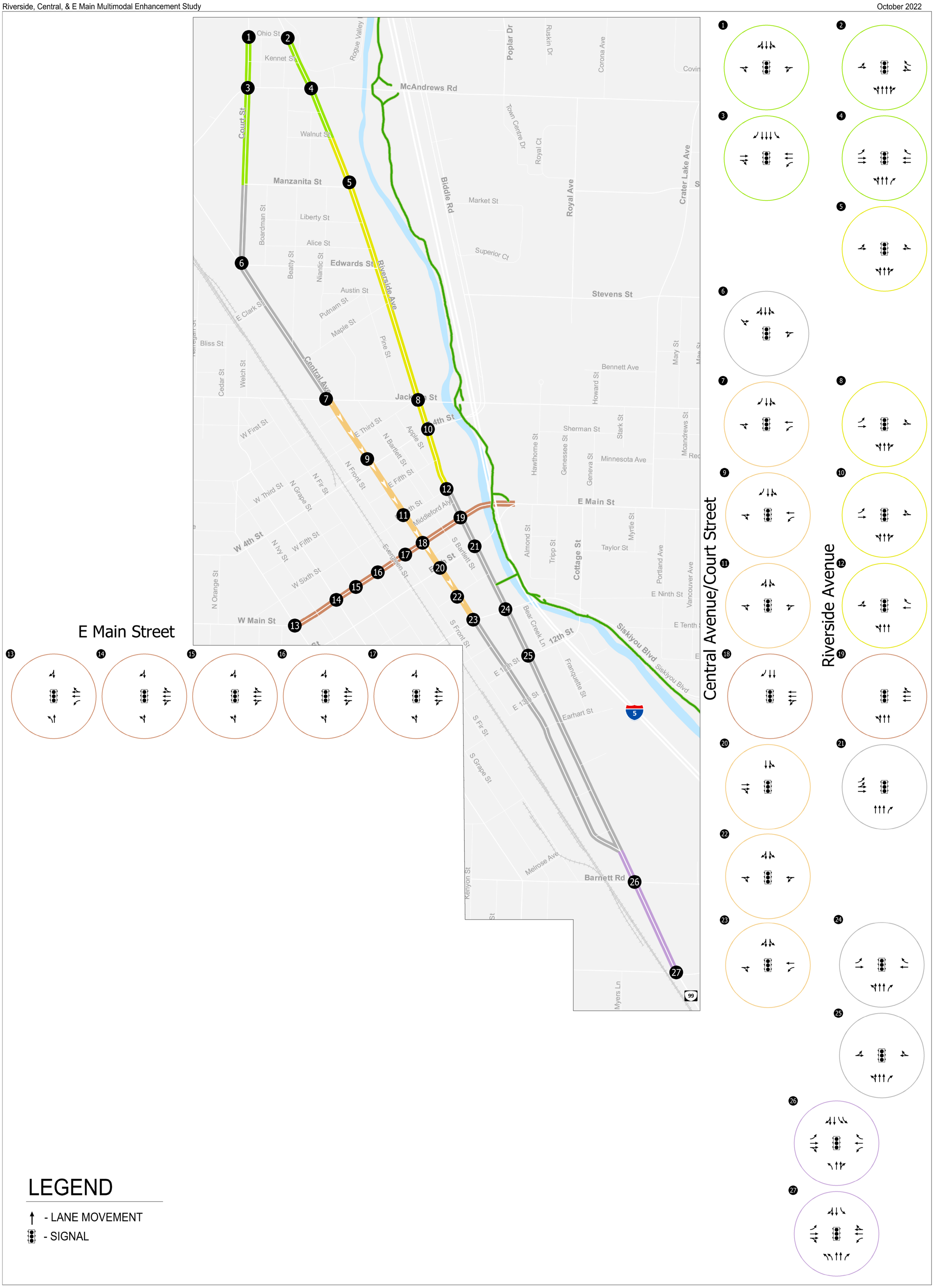


Figure 2 - Existing Lane Configurations

KITTELSON & ASSOCIATES

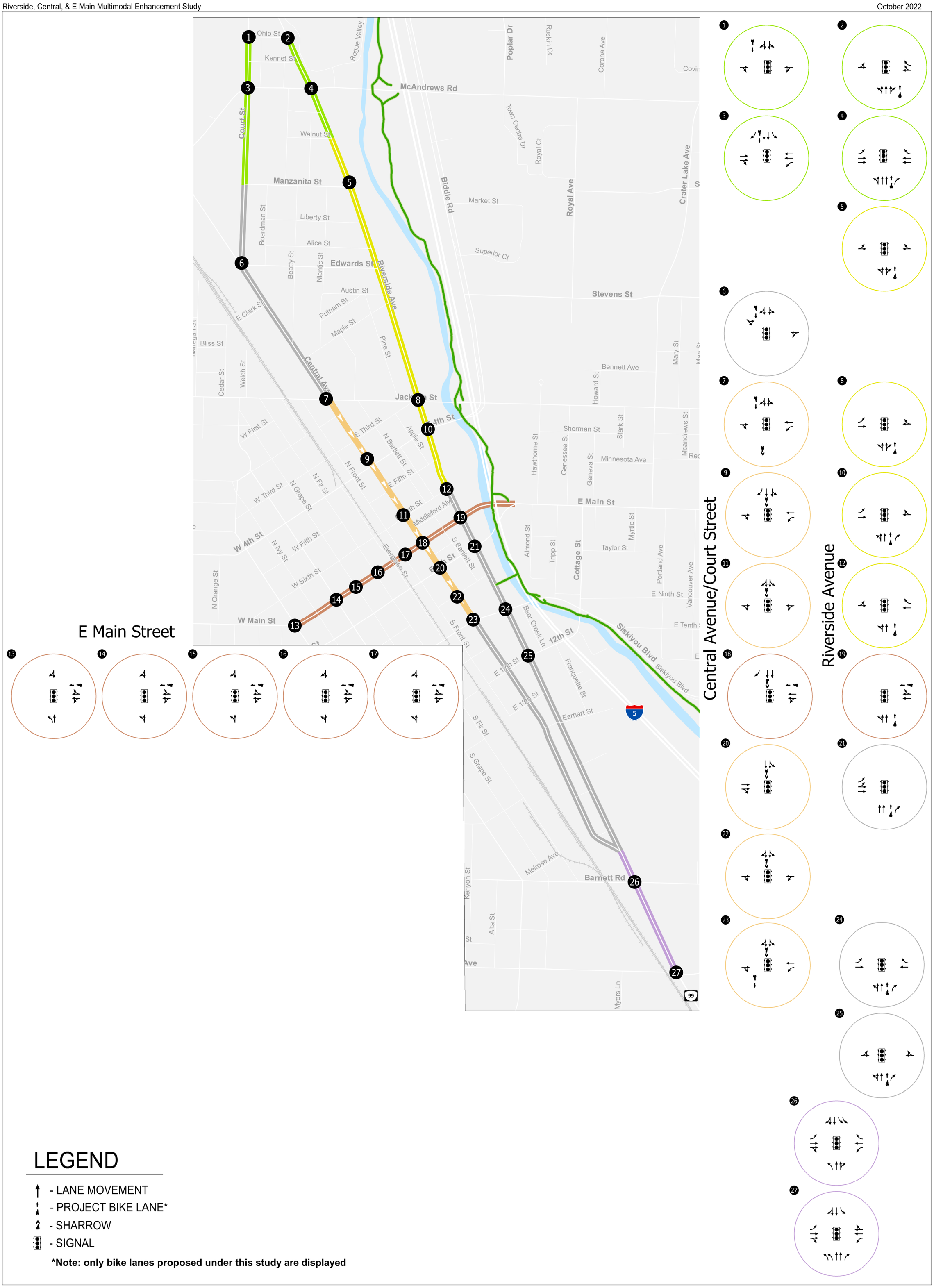


Figure 3 - Proposed Lane Configurations (Alternative A)

KITTELSON & ASSOCIATES

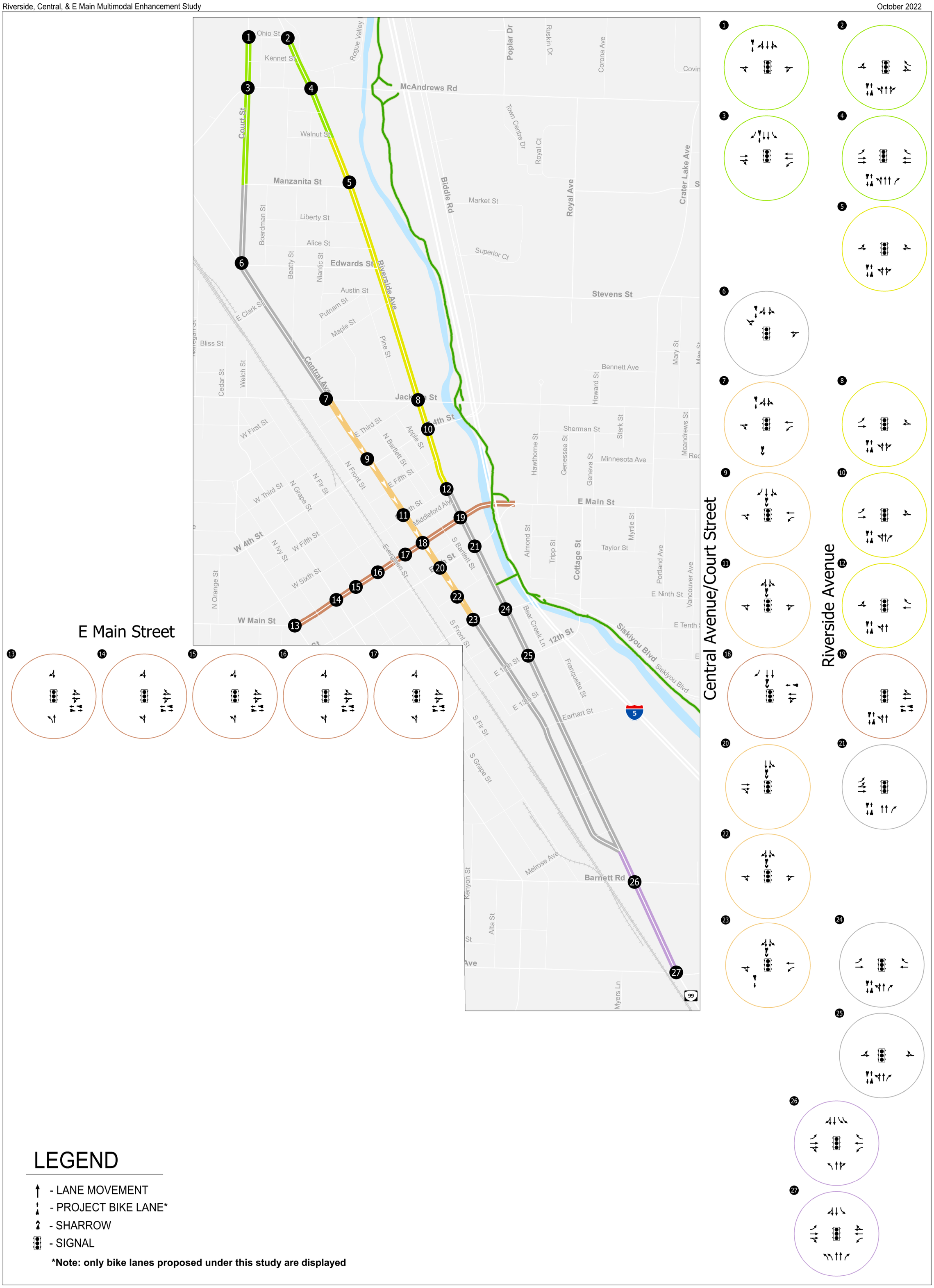


Figure 4 - Proposed Lane Configurations (Alternative B)

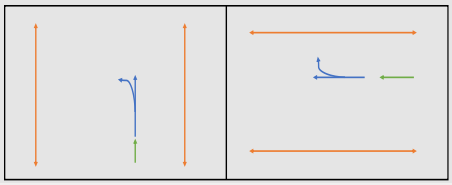
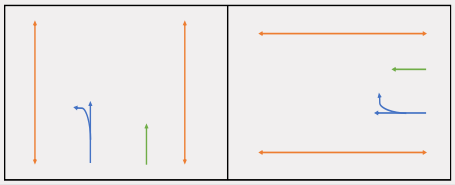
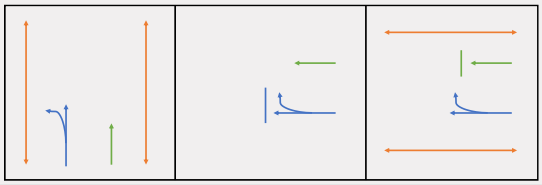
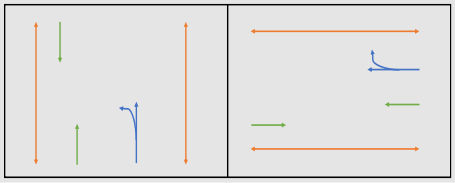
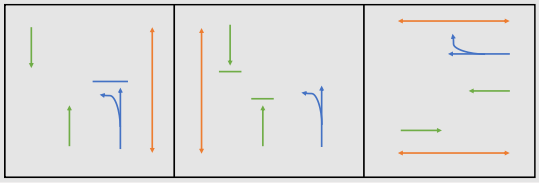
KITTELSON & ASSOCIATES

SIGNAL PHASING

Table 3 summarizes the primary signal phasing options analyzed as part of the operational analysis memorandum for the varying bicycle facility design options. The signal phasing options include:

- Permitting phasing, and
- Protected phasing

Table 3. Signal Phasing Options

Alternative	Permitted	Protected
No-Build		N/A
Alternative A (One-Way Facility on Right Side)		
Alternative B (Two-Way Facility on Left Side[1])		
Legend		

[1]Images are illustrative of general phasing options. Alternative B is a one-way facility on the right side for certain segments.

PERMITTED PHASING

Permitted phasing allows for bicycles to travel simultaneously with vehicle travel. The primary benefit of a permitted phase is that is reduce delay for vehicles, bicycles, and pedestrians.

PROTECTED PHASING

Protected phases, however, provide a safety benefit as there are no conflicting motor vehicle and bicycle movements. The relative safety benefit is higher under the two-way bicycle facility as there are more conflicting movements occurring simultaneously and the conflicting movements are less typically expected. Protected phasing is not applicable under shared lane conditions. *Under interim Federal Highway Administration approval – the protected bicycle phase cannot occur simultaneously with any conflicting vehicle or bicycle movements.*

Appendix "B" provides additional detail on the requirements for providing a protected bicycle phase.

E MAIN STREET

The study segment for E Main Street extends from Oakdale Avenue to the Bear Creek Greenway. Bicycle facility integration and access to/from the Bear Creek Greenway is a critical component to an alternative's success. There are two existing cross sections for E Main Street within the study area: "Typical" and "Bear Creek Bridge". Two primary alternatives are evaluated along E Main Street as part of the Operational Analysis:

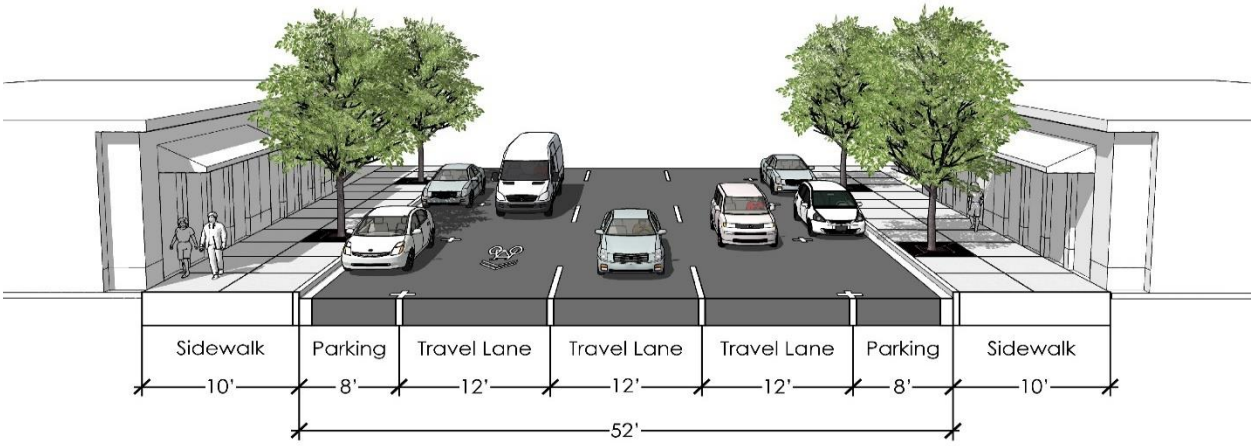
- Alternative A: One-way Parking Protected Bike Lane (Right)
- Alternative B: Two-way Parking Protected Bike Lane (Left)

The following section describes, illustrates, and analyzes the existing cross sections and proposed alternatives along E Main Street.

Existing

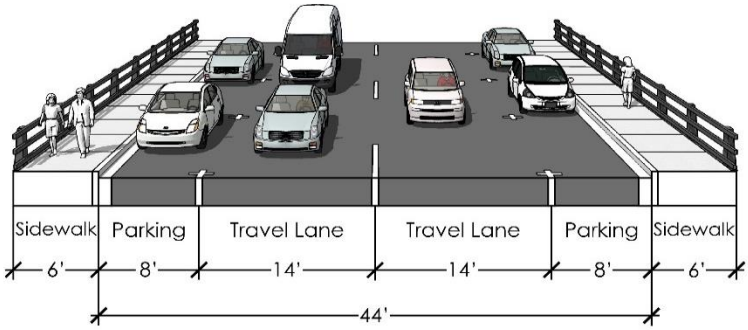
TYPICAL SECTION

Existing conditions along E Main Street include three 12-foot travel lanes, two 8-foot parking lanes, and 10-foot sidewalks on both sides of the street. Shared lane marking "sharrows" are provided for bicycles.



BEAR CREEK BRIDGE SECTION

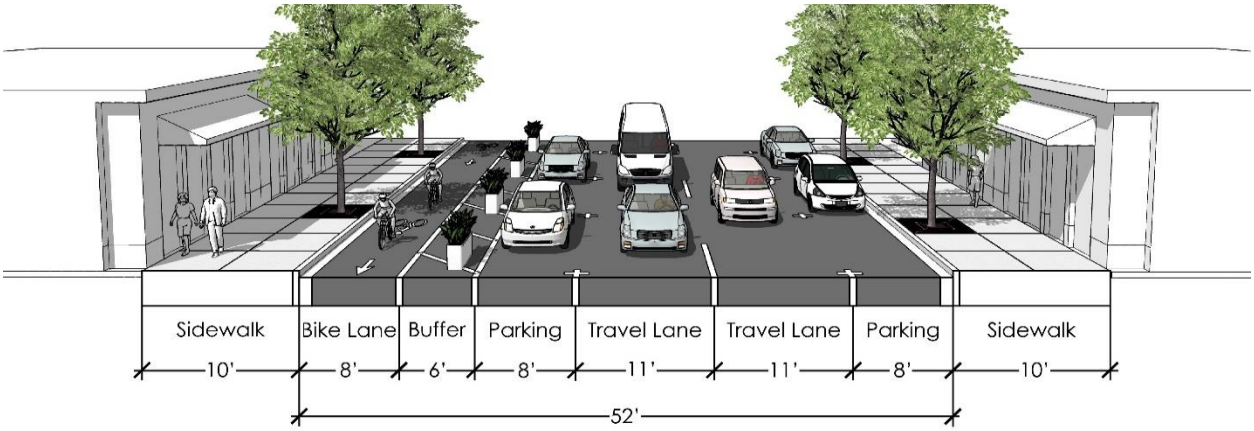
On the Bear Creek Bridge, existing conditions includes two 14-foot travel lanes, two 8-foot parking lane, and 6-foot sidewalks on both sides of the street.



Alternative A: One-way Parking Protected Bike Lane (Right)

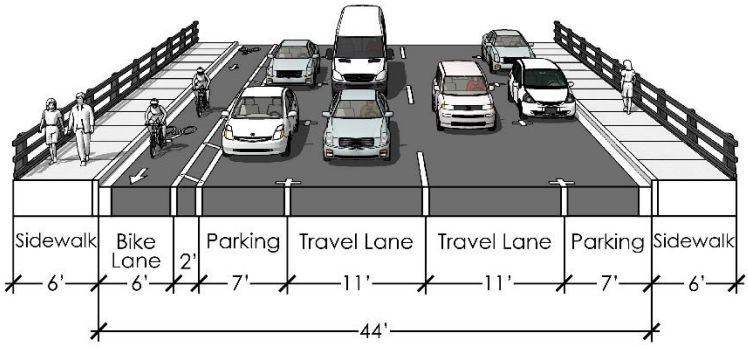
TYPICAL SECTION

Within the typical section, Alternative A includes two 11-foot travel lanes, two 8-foot parking lanes, and 10-foot sidewalks on both sides of the street. A one-way parking protected bike lane along the north side of E Main Street is provided for bicycle access. To fit the bike lane within the existing curb-to-curb a travel lane is removed.



BEAR CREEK BRIDGE SECTION

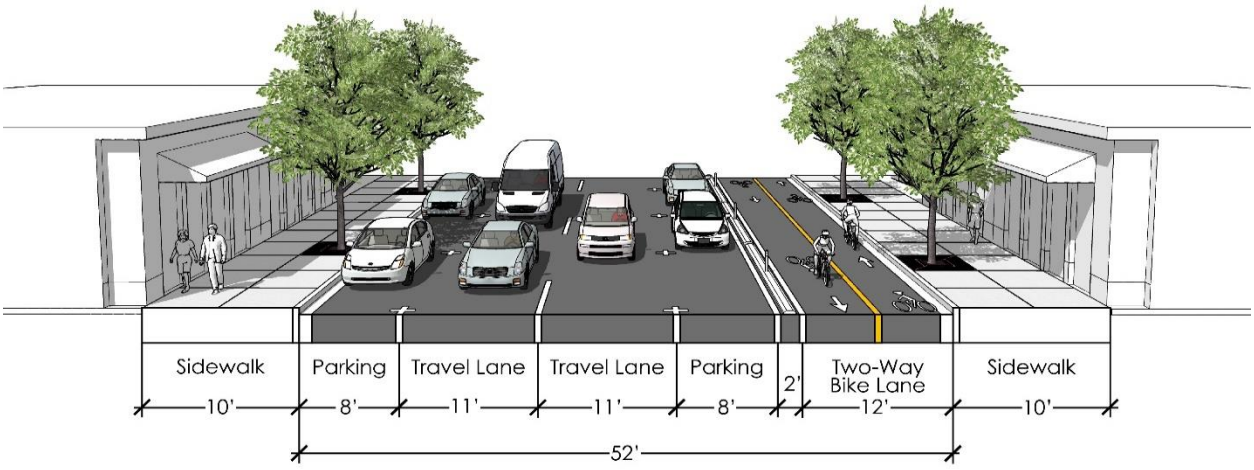
On the Bear Creek Bridge, Alternative A includes two 11-foot travel lanes, two 7-foot parking lanes, and 6-foot sidewalks on both sides of the street. A one-way parking protected bike lane along the north side of E Main Street is provided for bicycle access. To fit the bike lane within the existing curb-to-curb, a travel lane is removed.



Alternative B: Two-way Parking Protected Bike Lane (Left)

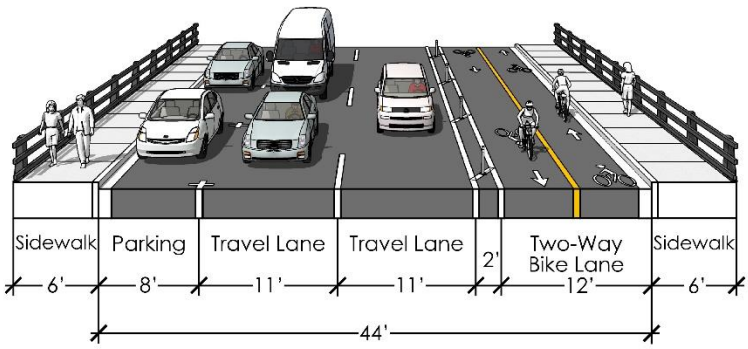
TYPICAL SECTION

Alternative B includes two 11-foot travel lanes, two 8-foot parking lanes, and 10-foot sidewalks on both sides of the street. A two-way parking protected bike lane along the south side of E Main Street is provided for bicycle access. To fit the two-way bike lane within the existing curb-to-curb cross section, a travel lane is removed.



BEAR CREEK BRIDGE SECTION

On the Bear Creek Bridge, Alternative B includes two 11-foot travel lanes, one 8-foot parking lane, and 6-foot sidewalks on both sides of the street. A two-way parking protected bike lane along the south side is provided for bi-directional bicycle access. To fit the bicycle facility within the existing curb-to-curb, a travel lane and a parking lane is removed.



Active Transportation Analysis

LEVEL OF TRAFFIC STRESS

The most constrained section of the E Main Street, the segment on the Bear Creek Bridge, is analyzed for a Level of Traffic Stress (LTS) comparison between alternatives.

Alternative A: One-way Parking Protected Bike Lane

Alternative A improves bicycle level of traffic stress (BLTS) from a score of BLTS 3 (no-build) to a score of BLTS 1 due to the increase in separation. Due to existing parking and associated widths, no changes are made to the pedestrian level of traffic stress (PLTS) score, which remains at PLTS 2[6].

Alternative B: Two-way Parking Protected Bike Lane

Alternative B improves BLTS from a score of BLTS 3 (no-build) to a score of BLTS 1 due to the level of separation and roadway context. Due to existing parking and associated widths, no changes are made to the pedestrian level of traffic stress (PLTS) score, which remains at PLTS 2[4].

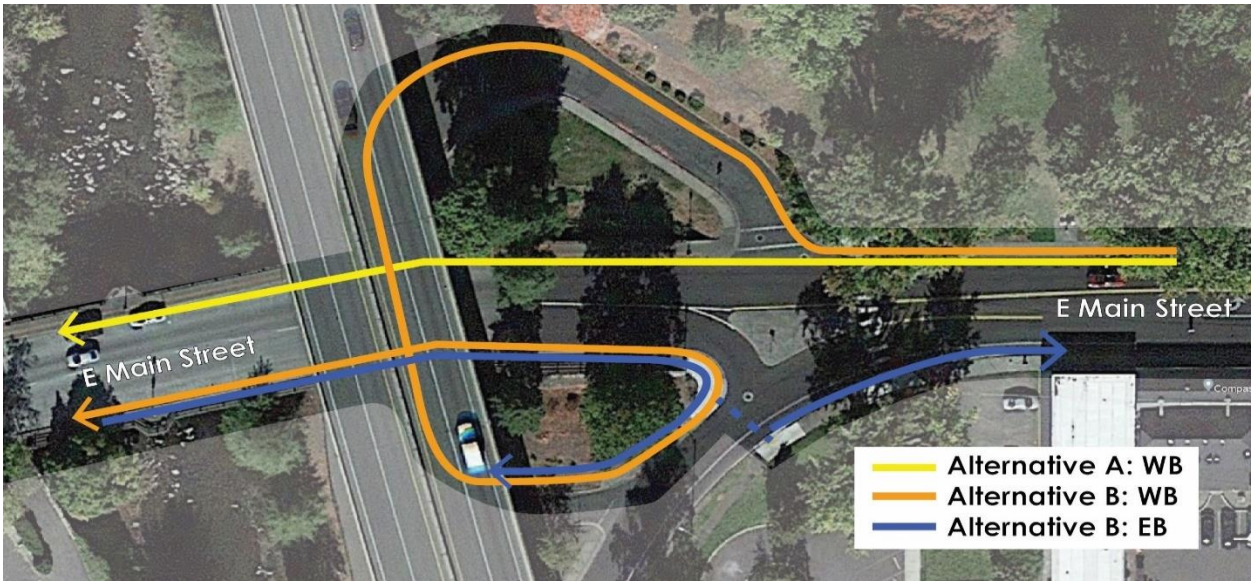
TRANSITION ZONE

Two primary transition zones are evaluated as part of the E Main Street alternative analysis:

- Bear Creek Greenway access point (East)
- Oakdale Avenue transition (West)

The following section describes and illustrates the transition zone challenges, opportunities, and overall comparison between the proposed alternatives.

Bear Creek Greenway Access Point (East)



Note: Options for transition zone refinement, including island improvements, enhanced crossings, and reduction of out-of-direction travel will be refined based on the selection of a preferred alternative.

[6] PLTS 1 can only be achieved with improvements made to sidewalk condition and width.

Alternative A: One-way Parking Protected Bike Lane

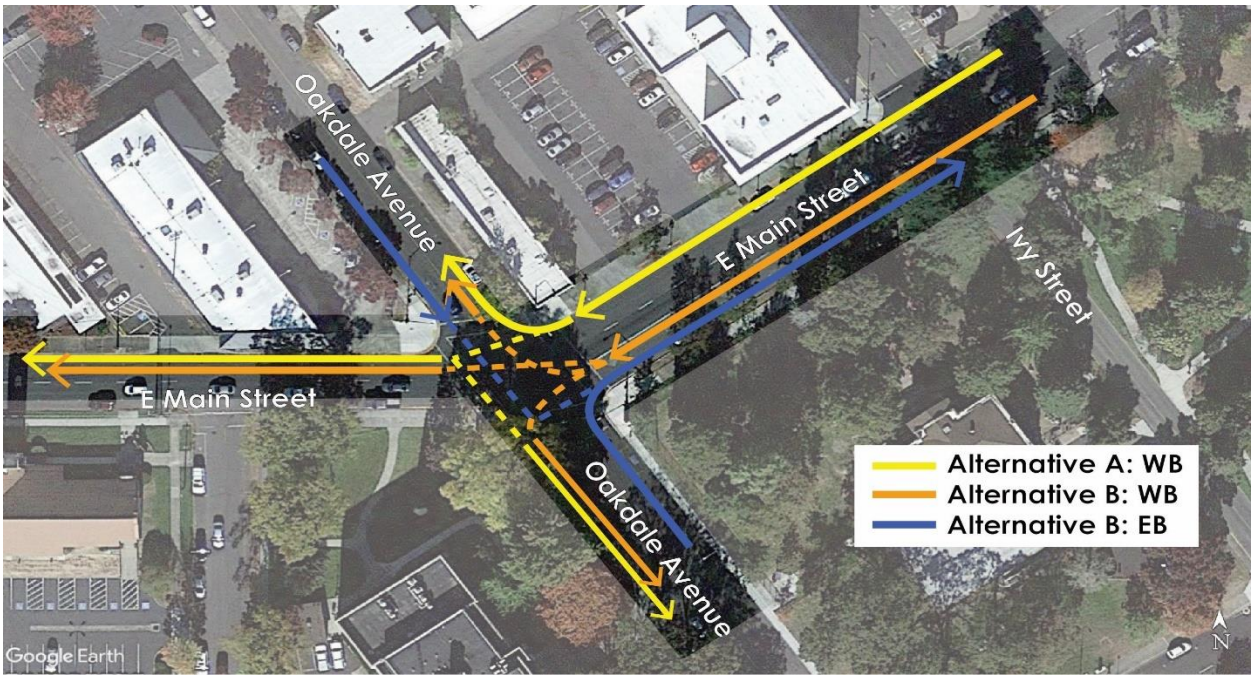
As illustrated above, the westbound (WB) transition from the east is seamless and does not require out of direction travel (delay). Eastbound (EB) travel is not provided in this alternative.

Alternative B: Two-way Buffered Bike Lane

The WB transition from the east requires out of direction travel (delay), reducing conflict points but increasing overall travel time.

The EB two-way bike lane requires minimal out of direction travel to access the BCG but will require the extension and widening of the existing sidewalk to create a continuous and separated connection to the BCG. A new crossing will be required for people biking EB to access points east on E Main Street.

Oakdale Avenue Transition (West)



Alternative A: One-way Parking Protected Bike Lane

As illustrated above, the transition to Oakdale Avenue[7] northbound and E Main Street westbound is relatively seamless and requires little delay, however, access to Oakdale Avenue southbound will require a two-stage left-turn. Eastbound (EB) travel is not provided in this alternative.

Alternative B: Two-way Buffered Bike Lane

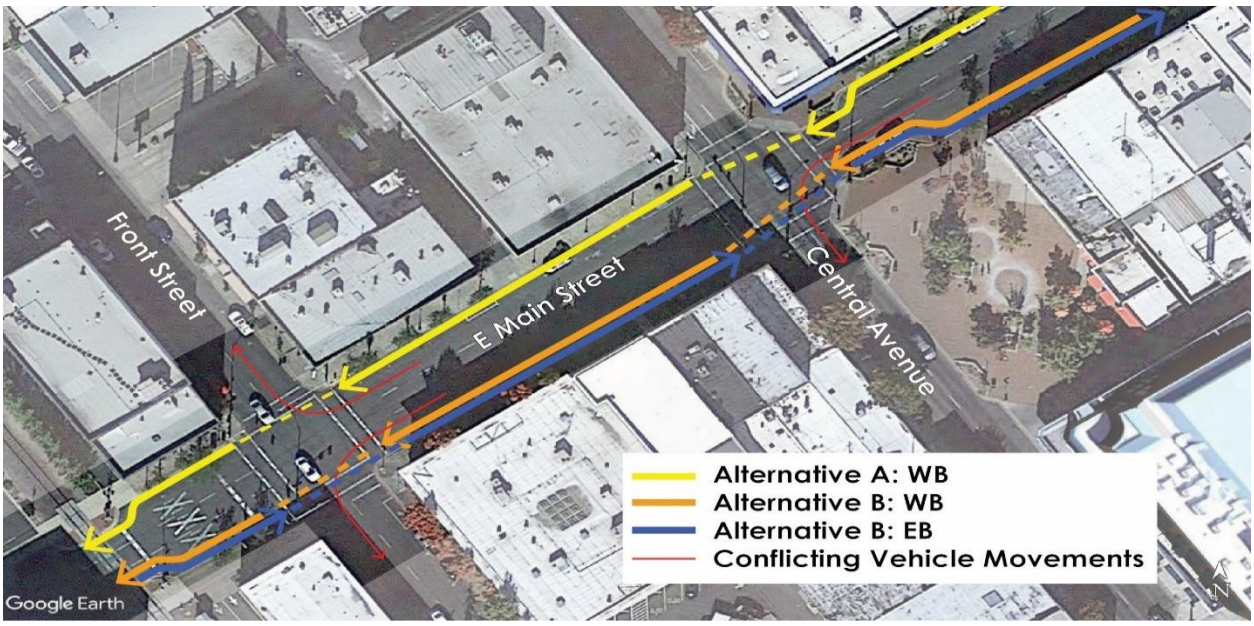
The WB transition from E Main Street to Oakdale Avenue SB is relatively seamless; the transition from E Main Street to Oakdale Avenue NB will require a dedicated queuing space in advance of the NB approach to Oakdale Avenue at E Main Street. E Main Street WB to E Main Street WB will required a separated signal phase to transition people biking from the southside of the road to the northside.

The transition from Oakdale Avenue NB onto E Main Street EB is relatively seamless. The transition from Oakdale Avenue SB onto E Main Street EB is also relatively seamless due to the shared lane nature of Oakdale Avenue allowing people biking to execute a left-turn from the shared travel lane.

[7] Oakdale Avenue was selected for illustrative purposes because it is the edge of the study corridor. The north/south transition could occur at Holly Street (a planned neighborhood greenway) which has lower traffic volume (better for a shared lane) or another north-south street. Treatments at Holly Street should be considered in the next phase.

CONFLICT POINTS

The E Main Street/Central Avenue and E Main Street/Front intersections represent typical signalized intersections along Main Street for people traveling along the corridor.



Alternative A: One-Way Parking Protected Bike Lane (Right)

As illustrated above, conflict points are limited to westbound right-turning vehicles. The queuing space for people biking is recommended to be designed to locate people in advance of the vehicle stop bar. As a result, people biking could cross concurrently with vehicles during a green phase with limited right-turning conflict.

Alternative B: Two-Way Parking Protected Bike Lane (Left)

As illustrated above, conflict points are limited to westbound left-turning vehicles. The queuing space for people biking is recommended to be designed to locate people in advance of the vehicle stop bar; however, people biking contraflow (EB), will have an additional conflict of oncoming left-turning vehicles. Separated phasing is recommended for two-way facilities to reduce conflict points.

ACTIVE TRANSPORTATION ANALYSIS SUMMARY

A summary of the No-Build, Alternative A and Alternative B as it relates to the updated active transportation analysis is described below and summarized in Table 4.

Table 4: E Main Street – Updated Active Transportation Analysis

	No Build	Alternative A	Alternative B
BLTS	Poor (BLTS 3)	Good (BLTS 1)	Good (BLTS 1)
PLTS	Fair (PLTS 2)	Fair (PLTS 2)	Fair (PLTS 2)
Transition Zone	Poor	Good	Fair
Conflict Points	Poor	Fair	Fair

Operational Analysis

TRAVEL TIME

Table 5 summarizes the amount of time it takes motor vehicles to travel along E Main Street from the Bear Creek Greenway to Oakdale Avenue during the peak hour, as reported in Synchro 11. As shown, removing a travel lane impacts motor vehicle travel time along E Main Street by approximately 3-32 seconds (approximately 2-19% increase) depending on phasing assumptions.

Table 5. Peak Hour Motor Vehicle Travel Time Along E Main Street from the Bear Creek Greenway to Oakdale Avenue

Analysis Year	No-Build	Alternative A		Alternative B	
		Protected Phasing	Permitted Phasing	Protected Phasing	Permitted Phasing
Base Year 2024	169.2	201.6	172.6	192.4	173.2
Future Year 2038[1]	174.2	195.9	182.7	189.4	182.1

[1]Operations in some cases improve between base year and future year due to signal optimization and volume development. The volume development between count year and base year was established using a linear growth rate. The volume development for future year 2038 was established by turning movement using NCHRP 255 methodology.

DELAY

Table 6 through Table 9 summarize intersection delay and level-of-service (LOS). LOS is a measurement of flow based on speed, travel time, density, and delay. The City of Medford's mobility standards are set according to LOS. As summarized in these tables, all intersections along Main Street meet City of Medford Mobility Standards in 2024 and 2038. Intersection volume-to-capacity, delay, and LOS are provided in Appendix "C".

Table 6. Peak Hour LOS for Intersections on Main Street (2024)

Intersection	No-Build	Alternative A		Alternative B	
		Protected Phasing	Permitted Phasing	Protected Phasing	Permitted Phasing
Oakdale Avenue	A	B	A	B	A
Holly Street	A	A	A	A	A
Grape Street	A	A	A	A	A
Fir Street	A	A	A	A	A
Front Street	A	A	A	A	A
Central Avenue	A	B	A	B	A
Riverside Avenue	A	C	B	C	B

Table 7. Peak Hour Delay (Seconds) for Intersections on Main Street (2024)

Intersection	No-Build	Alternative A		Alternative B	
		Protected Phasing	Permitted Phasing	Protected Phasing	Permitted Phasing
Oakdale Avenue	9.6	13.5	9.9	13.5	10.0
Holly Street	4.8	6.2	5.4	6.2	5.4
Grape Street	4.3	6.5	5.0	6.5	5.8
Fir Street	6.4	6.4	6.4	6.5	6.2
Front Street	6.1	9.9	7.0	9.6	8.8
Central Avenue	7.7	11.0	8.0	11.5	8.2
Riverside Avenue	8.0	22.9	12.2	21.5	12.2

Table 8. Peak Hour LOS for Intersections on Main Street (2038)

Intersection	No-Build	Alternative A		Alternative B	
		Protected Phasing	Permitted Phasing	Protected Phasing	Permitted Phasing
Oakdale Avenue	A	B	A	B	B
Holly Street	A	A	A	A	A
Grape Street	A	A	A	A	A
Fir Street	A	A	A	A	A
Front Street	A	B	A	B	A
Central Avenue	A	A	A	A	A
Riverside Avenue	A	C	B	C	B

Table 9. Peak Hour Delay (Seconds) for Intersections on Main Street (2038)

Intersection	No-Build	Alternative A		Alternative B	
		Protected Phasing	Permitted Phasing	Protected Phasing	Permitted Phasing
Oakdale Avenue	9.6	13.1	9.9	13.2	10.5
Holly Street	4.9	7.2	5.4	6.5	6.0
Grape Street	5.3	5.2	6.9	5.2	5.3
Fir Street	5.7	7.7	5.8	8.0	5.9
Front Street	8.5	12.0	8.7	11.9	8.8
Central Avenue	7.0	8.6	8.7	9.1	8.1
Riverside Avenue	7.9	28.9	12.4	28.2	11.2

QUEUING

Based on the queuing analysis, 95th percentile queues along E Main Street are not forecast to exceed available storage in 2024 or 2038 under No-Build, Alternative A, or Alternative B.

Synchro queue reports were produced for the assessment and are included in Appendix "D".

E Main Street: Evaluation Matrix

The evaluation performed as part of the Concept Design Memorandum has been brought forward and consolidated to focus on the two primary alternatives with the addition of the operational analysis. The updated Active Transportation Analysis has been incorporated into the matrix below with updates to the Bicycle Level of Traffic Stress (LTS), Pedestrian LTS, Conflict Points, and Transition Zone performance measures. The Public Input performance measure has been updated based on feedback received as part of the second Virtual Public Open House.

Evaluation Criteria	Performance Measure	No Build	Alternative A | One-Way Parking-Protected Bike Lane (Right)	Alternative B | Two-Way Parking-Protected Bike Lane (Left)
Operations Analysis	**Signal Progression**	Fair (+0) – motor vehicles are generally able to progress through the corridor on green when travelling at the posted speed. There is some undesirable opportunity for speeding.	Good (+1) – signal progression can be improved through optimization; cycle lengths and offsets can be updated to better accommodate people walking and biking	Good (+1) – signal progression can be improved through optimization; cycle lengths and offsets can be updated to better accommodate people walking and biking
	Queuing	Good (+1) – queues are anticipated to be accommodated by available storage long Main Street under 2024 and 2038 conditions	Good (+1) – queues are anticipated to continue being accommodated by available storage long Main Street under 2024 and 2038 conditions	Good (+1) – queues are anticipated to continue being accommodated by available storage long Main Street under 2024 and 2038 conditions
	Travel Time	Fair (+0) – existing travel time is relatively fluid without major intersection delays	Fair (+0) – Travel time is projected to remain within 20% of existing travel time	Fair (+0) – Travel time is projected to remain within 20% of existing travel time
	Vehicular Delay	Good (+1) – mobility standards are met at all intersections	Fair (+0) – Removing a travel lane provides a slight increase in delay, but continues to meet mobility standards under both permitted and protected phasing options	Fair (+0) – Removing a travel lane provides a slight increase in delay, but continues to meet mobility standards under both permitted and protected phasing options
Safety	**Crash Reduction Factors[1]**	Poor (-1) – the no-build provides shared lane marking "sharrows" for people biking. Shared lane marking "sharrows" are not a crash reduction factor	Good (+1) – installing cycle tracks[2] (BP23) has a high crash reduction factor (59% reduction in bicycle crashes at all injury severities)	Good (+1) – installing cycle tracks[2] (BP23) has a high crash reduction factor (59% reduction in bicycle crashes at all injury severities)
	Conflict Points	Poor (-1) – the no-build maintains the current number of conflict points	Fair (+0) – the facility provides a relatively equal number of conflict points compared to the other alternative	Fair (+0) – the facility provides a relatively equal number of conflict points compared to the other alternative
Community Support	**Public Input**	Good (+1) – the no-build was supported by the public as part of the Virtual Open House	Fair (+0) – the alternative was supported by the public as part of the first Public Open House and the second Virtual Open House, but not as strongly as other options	Good (+1) – The alternative received mixed response from the public as part of the first Public Open House but was the preferred alternative for the build scenarios based on public input received as part of the second Virtual Open House
	Planning Documents	Poor (-1) – the no-build is not consistent with the TSP recommendation for providing enhanced bicycle facilities	Fair (+0) – the alternative is consistent with the TSP recommendation for providing enhanced bicycle facilities but does not provide the amount of separation desired for the segment across the bridge.	Good (+1) – this alternative is consistent with the RVATP and is in alignment the TSP recommended "protected bike lanes" facility type.
Connectivity	**Access**	Poor (-1) – the no-build provides limited shared lane marking "sharrow" access for people biking	Fair (+0) – the alternative provides one-directional access for people biking	Good (+1) – this alternative provides bi-directional access for people biking
	Transition Zones	Fair (+0) – the no-build makes no changes to transition zones due to the lack of dedicated facilities	Good (+1) – this alternative requires minimal transition challenges along the corridor, particularly at the Bear Creek Greenway access (east) and the Oakdale Avenue intersection (west)	Fair (+0) – this alternative requires addressing challenging transitions along the corridor, particularly near the Bear Creek Greenway access (east) and the Oakdale Avenue intersection (west)
User Experience	**Bicycle Level of Traffic Stress (BLTS)**	Poor (-1) – the no-build makes no improvements to BLTS	Good (+1) – this alternative improves the BLTS by 2 points	Good (+1) – this alternative improves the BLTS by 2 points
	Pedestrian Level of Traffic Stress (PLTS)	Poor (-1) – the no-build makes no improvements to PLTS	Fair (+0) – this alternative improves the PLTS by 1 point	Fair (+0) – this alternative improves the PLTS by 1 point
Economic Opportunity	**Parking**	Fair (+0) – the no-build does not change the amount of on-street parking along the segment	Fair (+0) – the no-build does not change the amount of on-street parking along the segment	Poor (-1) – this alternative reduces the amount of on-street parking available along the bridge section of this segment
Feasibility	**Planning-Level Cost**	Good (+1) – the no-build does not require any cost	Fair (+0) – this alternative has a relative low cost because it only requires restriping the roadway and constructing buffers	Poor (-1) – this alternative has a relative high cost because it requires signal modifications
	Maintenance	Good (+1) – the no-build requires no additional maintenance	Fair (+0) – this design requires maintenance of the buffer; the buffers can be placed so that no special road maintenance equipment is required	Good (+1) – this alternative does not include vertical separation and can be maintained using existing equipment. The painted buffer will require low levels of maintenance
TOTAL		**-1**	**+5**	**+6**

RIVERSIDE AVENUE

The study segment for Riverside Avenue extends from approximately 250 feet south of Boyd Street (merge of couplet) to Ohio Street. Bicycle facility integration at the couplet merge is a critical component to the alternative's success and is further evaluated as part of the active transportation analysis section below.

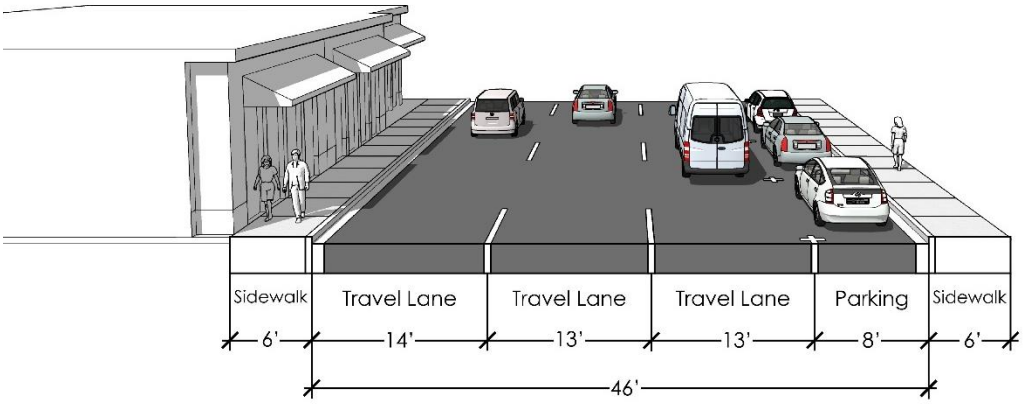
Two primary alternatives are evaluated along Riverside Avenue as part of the Operational Analysis:

- Alternative A: One-way Parking Protected Bike Lane (Right)
- Alternative B: Two-way Parking Protected Bike Lane (Left)

Existing

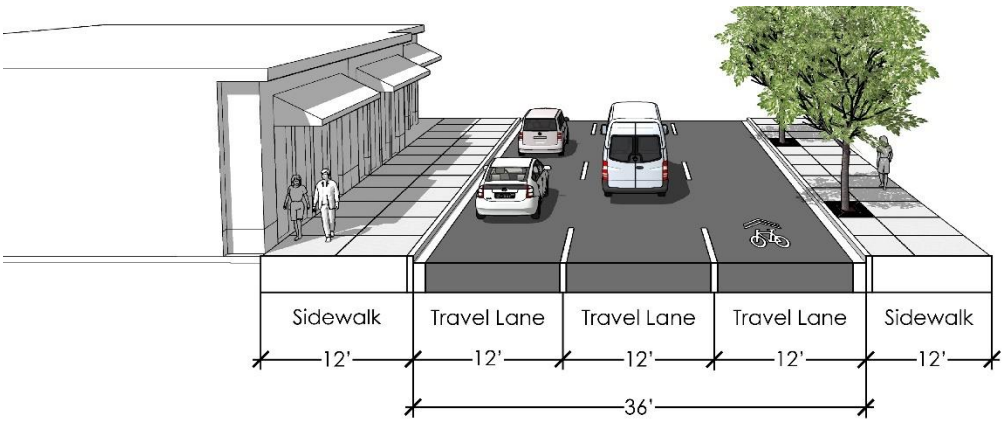
TYPICAL SECTION

Existing typical section conditions along Riverside Avenue include three travel lanes (two 13-foot and one 14-foot) with 8-foot parking lane along the east side of the roadway, and 6-foot sidewalks on both sides of the street. Shared lane marking "sharrows" are provided for bicycle access.



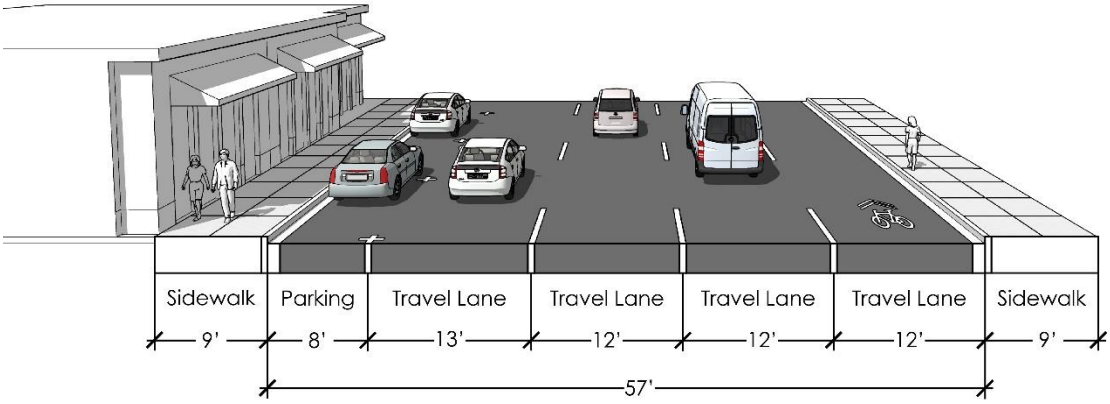
NARROW SECTION

Existing narrow sections conditions along Riverside Avenue include three 12-foot travel lanes, and 12-foot sidewalks on both sides of the street. Shared lane marking "sharrows" are provided for bicycle access.



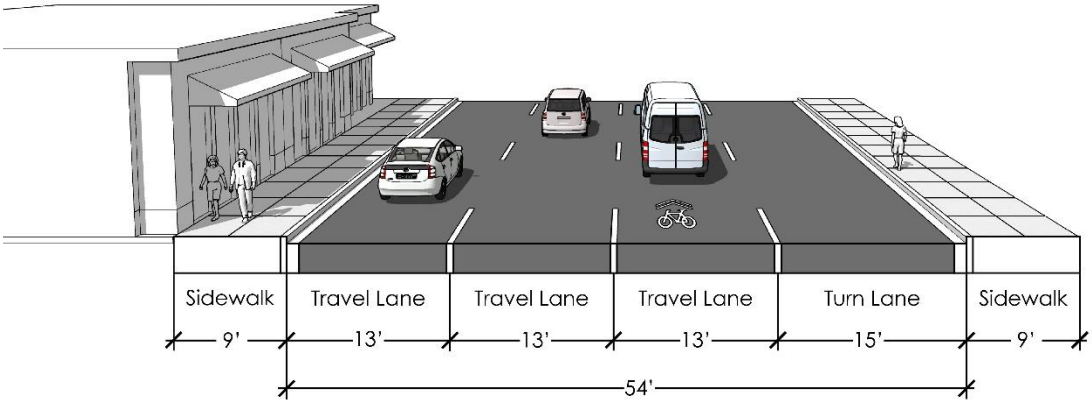
WIDE SECTION (NORTH OF MCANDREWS)

Existing wide section (north of McAndrews) conditions along Riverside Avenue include four travel lanes (three 12-foot and one 13-foot), one 8-foot parking lane along the west side of the roadway, and 9-foot sidewalks on both sides of the street. Shared lane marking "sharrows" are provided for bicycle access.



WIDE SECTION (SOUTH OF MCANDREWS)

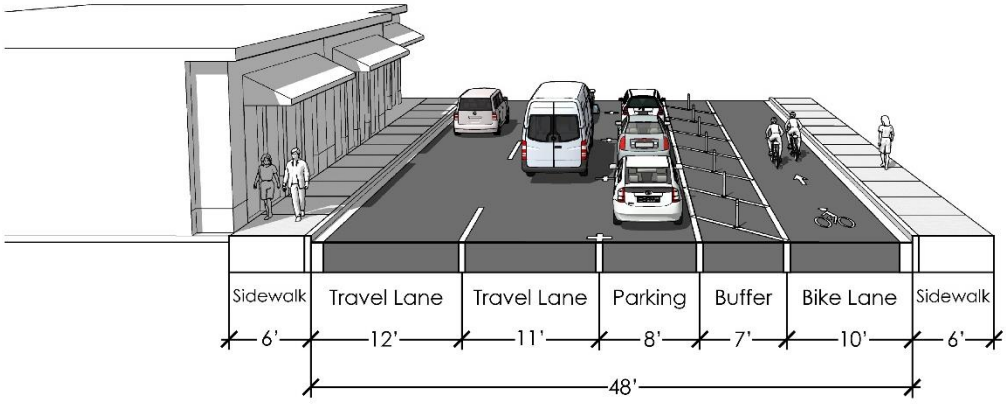
Existing wide section (south of McAndrews) conditions along Riverside Avenue include three 13-foot travel lanes one 15-foot right-turn lane, and 9-foot sidewalks on both sides of the street. Shared lane marking "sharrows" are provided for bicycle access.



Alternative A: One-way Parking Protected/Buffered Bike Lane (Right)

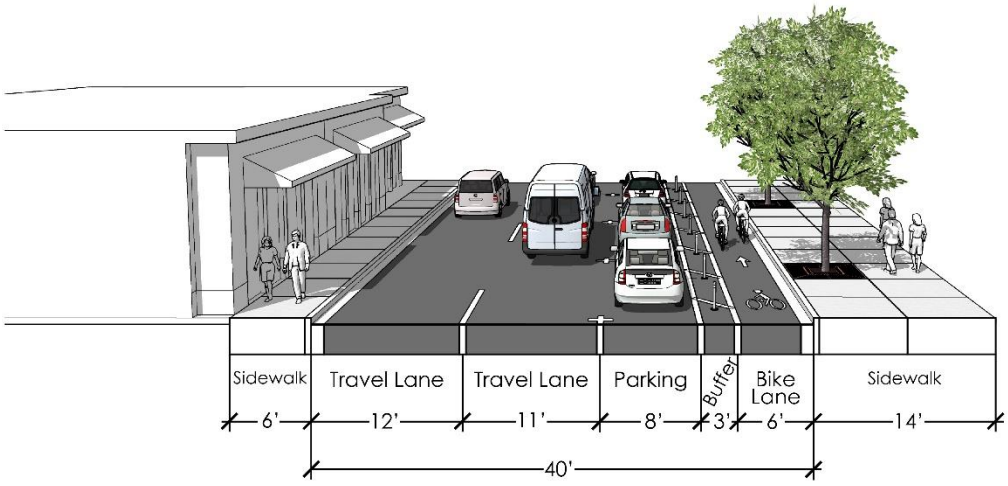
TYPICAL SECTION

Within the typical section, Alternative A includes one 12-foot travel lanes (adjacent to curb), one 11-foot travel lane, one 8-foot parking lane (right), and 6-foot sidewalks on both sides of the street. A 10-foot one-way bike lane with a 7-foot buffer is provided for bicycle access along the right side of the street. To fit the one-way bike lane within the existing curb-to-curb, a travel lane is removed.



TYPICAL SECTION (WIDENED SIDEWALKS)[8]

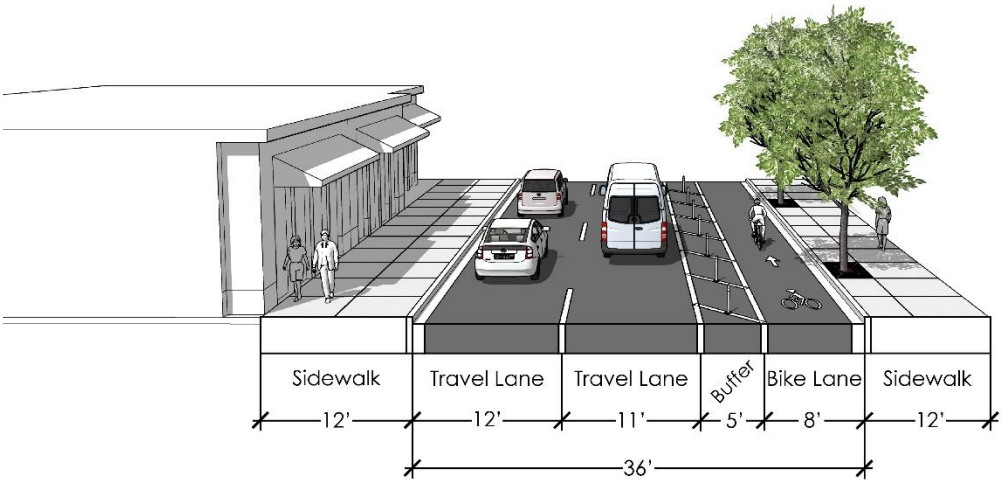
Alternative develop assumes project implementation will occur through roadway resurfacing or restriping that maintains current curb location. However, if curb relocation is feasibility, bicycle facilities including buffers are recommended to be reduced in width to allow for increase sidewalk and placemaking opportunities while still maintaining low-stress experience for people biking. An example of the one-way bike lane with curb relocation resulting in the relocation of existing curb is illustrated below.



[8] The Typical Section (widened Sidewalk) was developed for illustrative purposes and was not evaluated as a unique alternative part of the alternative's analysis.

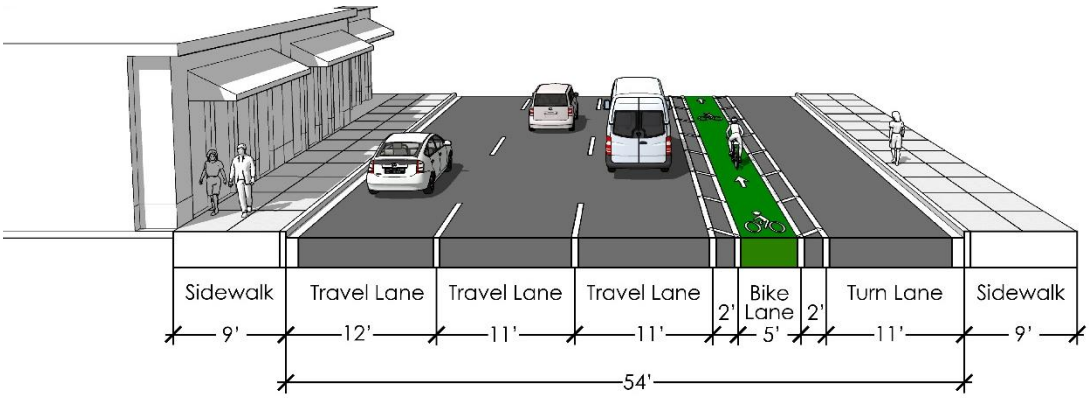
NARROW SECTION

Within the narrow section, Alternative A includes one 12-foot travel lanes (adjacent to curb), one 11-foot travel lane, and 12-foot sidewalks on both sides of the street. An 8-foot one-way bike lane with a 5-foot buffer is provided for bicycle access along the right side of the street. To fit the one-way bike lane within the existing curb-to-curb, a travel lane is removed.



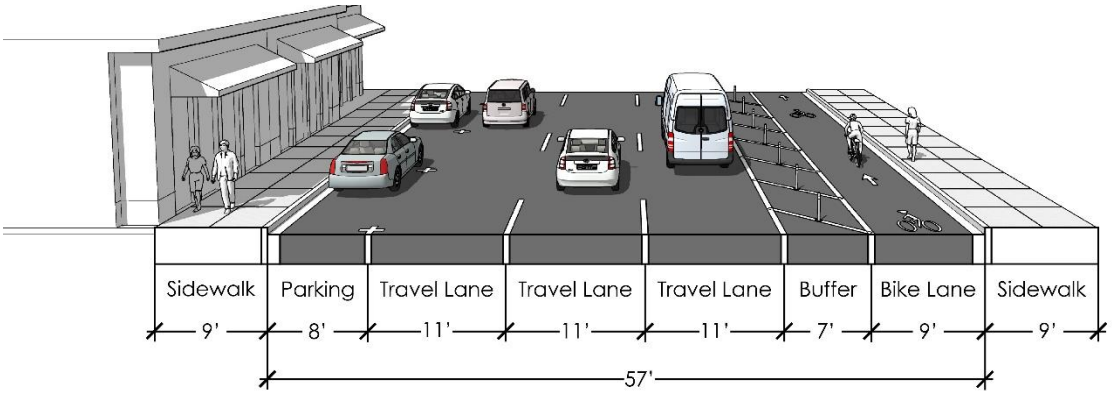
WIDE SECTION (SOUTH OF MCANDREWS)

Within the wide section (south of McAndrews), Alternative A includes one 12-foot travel lane (adjacent to curb), two 11-foot travel lanes, one 11-foot turn lane, and 9-foot sidewalks on both sides of the street. A 5-foot one-way bike lane with a 2-foot buffer on both sides is provided for bicycle access along the right side of the street between the turn lane and the eastern most travel lane. No travel lanes are removed at the approach to McAndrews.



WIDE SECTION (NORTH OF MCANDREWS)

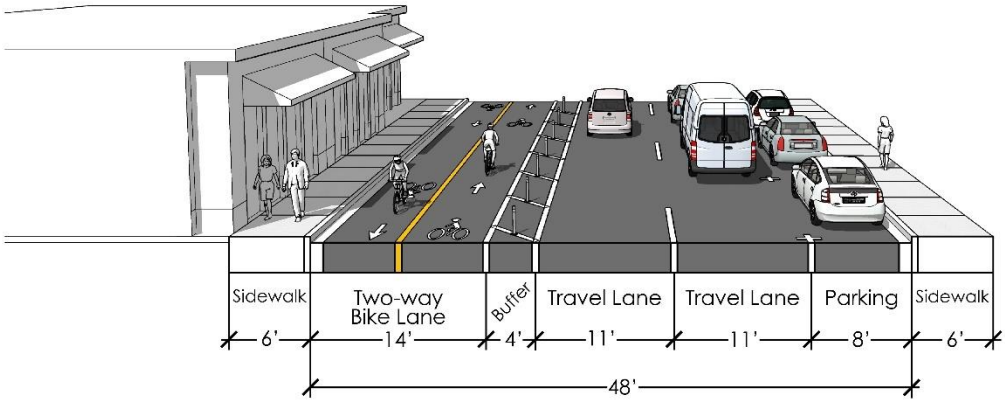
Within the wide section (north of McAndrews), Alternative A includes three 11-foot travel lanes, one 8-foot parking lane (left), and 9-foot sidewalks on both sides of the street. A 9-foot one-way bike lane with a 7-foot buffer on both sides is provided for bicycle access along the right side of the street. To fit the one-way bike lane within the existing curb-to-curb, a travel lane is removed.



Alternative B: Two-way Parking Protected/Buffered Bike Lane (Left)

TYPICAL SECTION

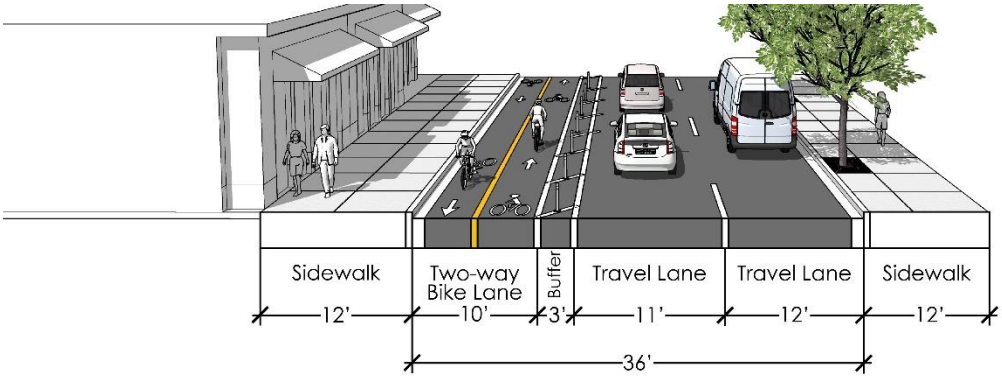
Within the typical section, Alternative B includes two 11-foot travel lanes, one 8-foot parking lane (right), and 6-foot sidewalks on both sides of the street. A 14-foot two-way bike lane with a 4-foot buffer is provided for bicycle access along the left side of the street. To fit the two-way bike lane within the existing curb-to-curb, a travel lane is removed.[9]



[9] The cross section is anticipated to be four lanes (a shared through-left, two through, and a dedicated right turn lane) approaching the intersection of Riverside/McAndrews. The two-way facility is anticipated to ramp onto the sidewalk: this is anticipated to be challenging to accommodate.

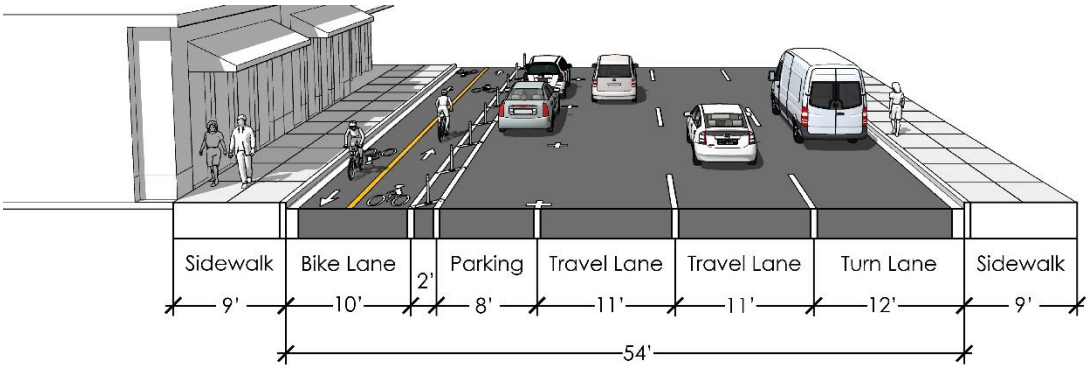
NARROW SECTION

Within the narrow section, Alternative B includes one 11-foot, one 12-foot travel lane (adjacent to curb), and 12-foot sidewalks on both sides of the street. A 10-foot two-way bike lane with a 3-foot buffer is provided for bicycle access along the left side of the street. To fit the two-way bike lane within the existing curb-to-curb, a travel lane is removed.



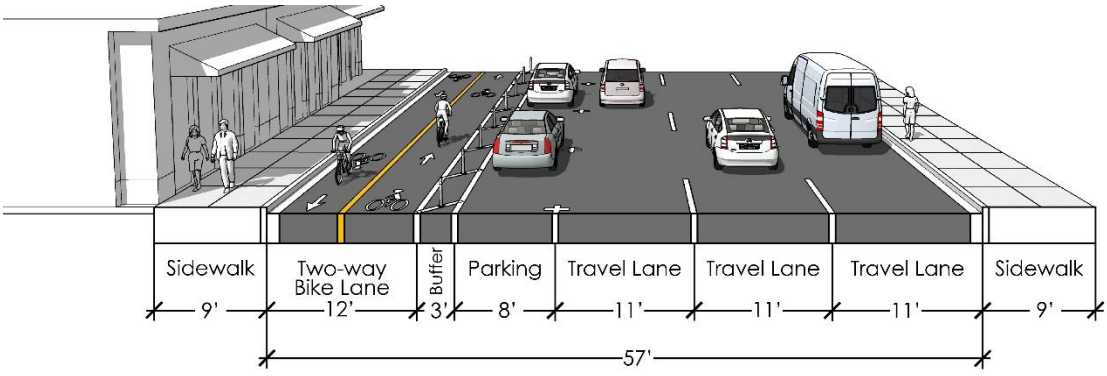
WIDE SECTION (SOUTH OF MCANDREWS)

Within the wide section (south of McAndrews), Alternative B includes two 11-foot travel lanes, one 12-foot turn lane (adjacent to curb), an 8-foot parking lane (left), and 9-foot sidewalks on both sides of the street. A 10-foot two-way bike lane with a 2-foot buffer is provided for bicycle access along the left side of the street.



WIDE SECTION (NORTH OF MCANDREWS)

Within the wide section (north of McAndrews), Alternative B includes three 11-foot travel lanes, an 8-foot parking lane (left), and 9-foot sidewalks on both sides of the street. A 12-foot two-way bike lane with a 3-foot buffer is provided for bicycle access along the left side of the street.



Active Transportation Analysis

LEVEL OF TRAFFIC STRESS

The most constrained section of the Riverside segment is the approach to McAndrews Road. As a result, this segment is analyzed for a LTS comparison between alternatives.

Alternative A: One-way Parking Protected/Buffered Bike Lane (Right)

Alternative A improves BLTS from a score of BLTS 4 (no-build) to a score of BLTS 3. The limited improvement is due to the transition zone requiring people biking to ride between the right-turn lane and the eastern-most travel lane when approaching McAndrews Road. Alternative A improves the PLTS on the one-way bike lane side (right) only. The PLTS is improved from PLTS 3 to PLTS 2[5].

Alternative B: Two-way Parking Protected/Buffered Bike Lane (Left)

Alternative B improves BLTS from a score of BLTS 4 (no-build) to a score of BLTS 1 due to the increase in separation and lack of transition required. At the approach to McAndrews Road, Alternative B will be required to ramp-up to sidewalk level due to the constrained curb-to-curb cross section. Alternative B improves the PLTS on the two-way bike lane side (left) only. The PLTS is reduced from PLTS 3 to PLTS 2[10].

TRANSITION ZONE

Three primary transition zones are evaluated as part of the Riverside Avenue alternatives analysis:

- South of Couplet (south)
- Riverside Avenue at Ohio Street (north)
- Riverside Avenue at 4th Avenue (transition to perpendicular bike lanes)

The following section describes and illustrates the transition zone challenges, opportunities, and overall comparison between the proposed alternatives.

South of Couplet (south)



[10] PLTS 1 can only be achieved with improvements made to sidewalk condition and width.

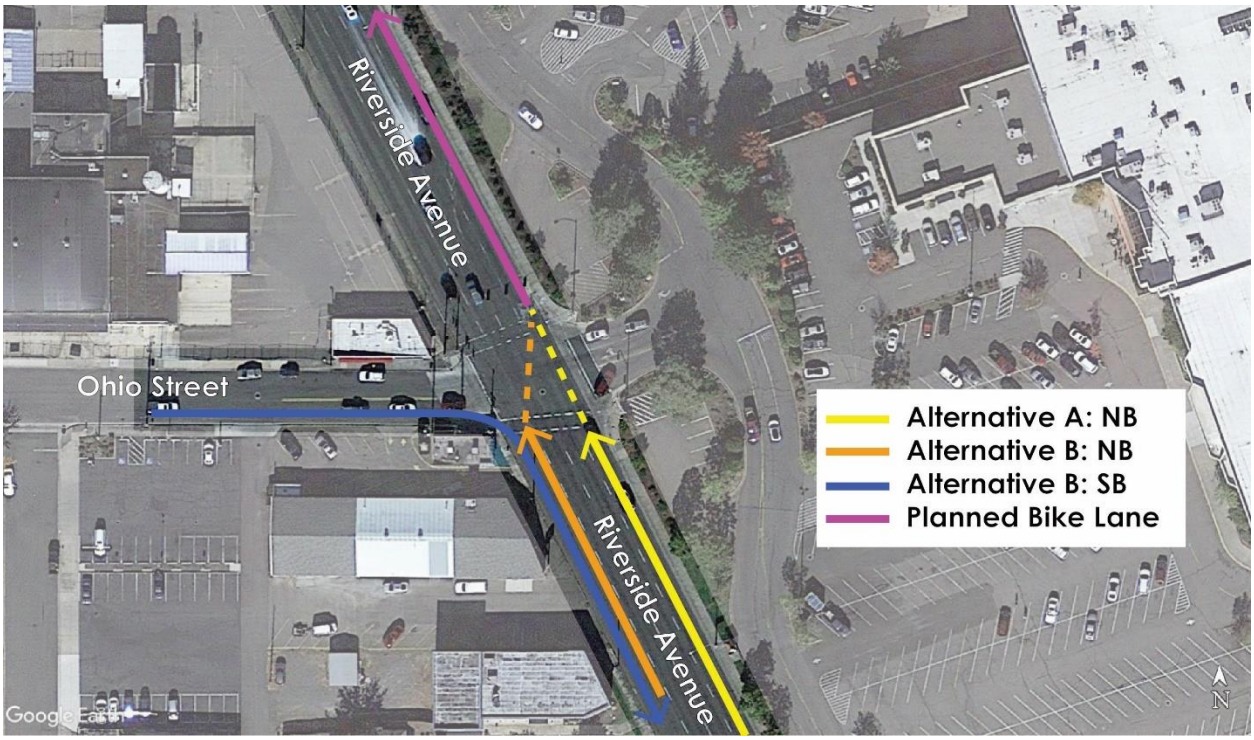
Alternative A: One-way Parking Protected/Buffered Bike Lane (Right)

As illustrated above, the transition is seamless and does not require any transition (delay) to continue NB on Riverside Avenue from the south. SB bicycle access is provided along Central Avenue.

Alternative B: Two-way Parking Protected/Buffered Bike Lane (Left)

The two-way bike lane (left) requires a new crossing to transition people biking NB from the one-way bike lane (right) to the two-way bike lane (left). This crossing increases delay for people biking and introduces a potential new conflict point. The two-way bike lane (left) also requires a new crossing to transition people biking SB from the two-way bike lane (left) to the one-way bike lane right). This crossing increases delay for people biking and introduces a potential new conflict point.

Riverside Avenue at Ohio Street (north)



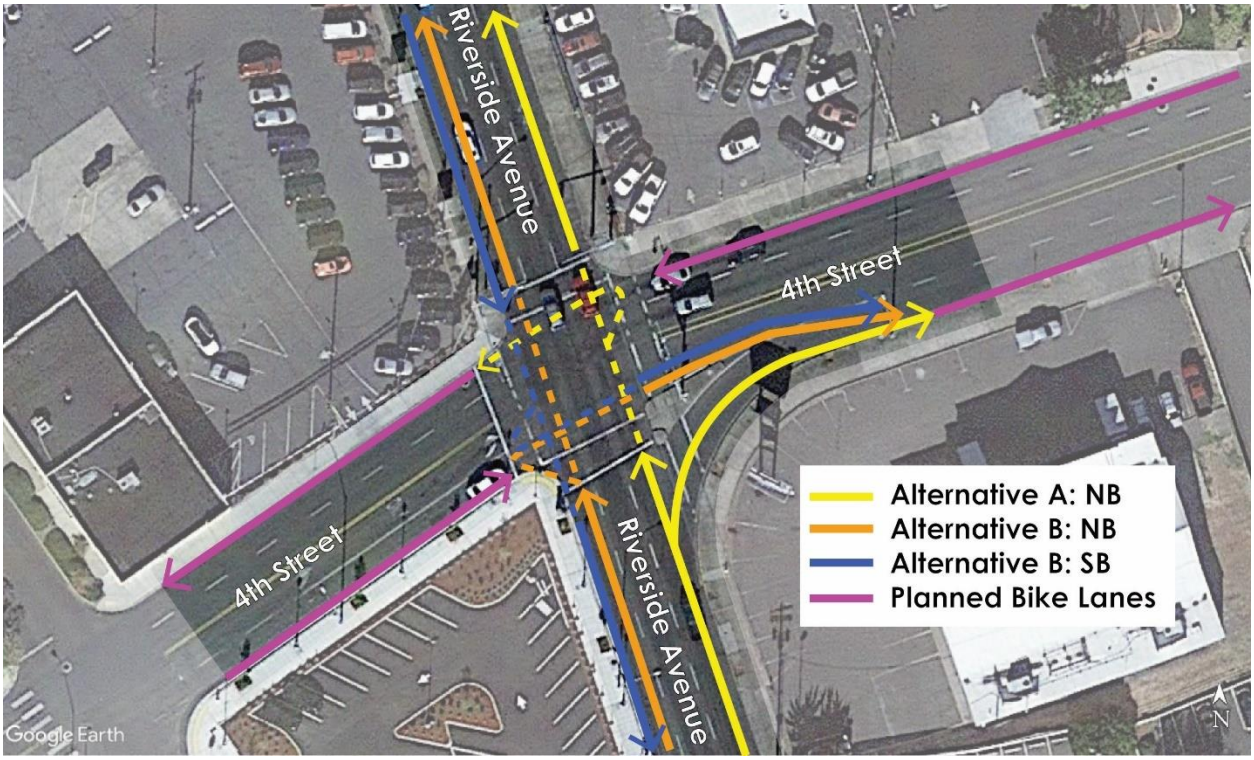
Alternative A: One-way Parking Protected/Buffered Bike Lane (Right)

As illustrated above, the transtion is seamless and does not require any transition (delay) to continue NB on Riverside Avenue. SB bicycle access is provided along Central Avenue.

Alternative B: Two-way Parking Protected/Buffered Bike Lane (Left)

The two-way bike lane (left) requires a new transition to access the planned one-way bike lane (right), north of Ohio Street. Ths transition will require a separated signal phase at the Ohio Street/Riverside Avenue intersection. The separated phase increases separation for people biking; however it also increases delay for people biking.

Riverside Avenue/4th Street[11]



Alternative A: One-way Parking Protected/Buffered Bike Lane (Right)

As illustrated above, the transition NB and EB is relatively seamless; however, the WB transition will require a two-stage left-turn and dedicated queuing space in advance of the WB approach to 4th Street at Riverside Avenue.

Alternative B: Two-way Parking Protected/Buffered Bike Lane (Left)

For people biking NB, the NB and WB transition is relatively seamless; however, the EB transition will require a dedicated queuing space in advance of the EB approach to 4th Street at Riverside Avenue.

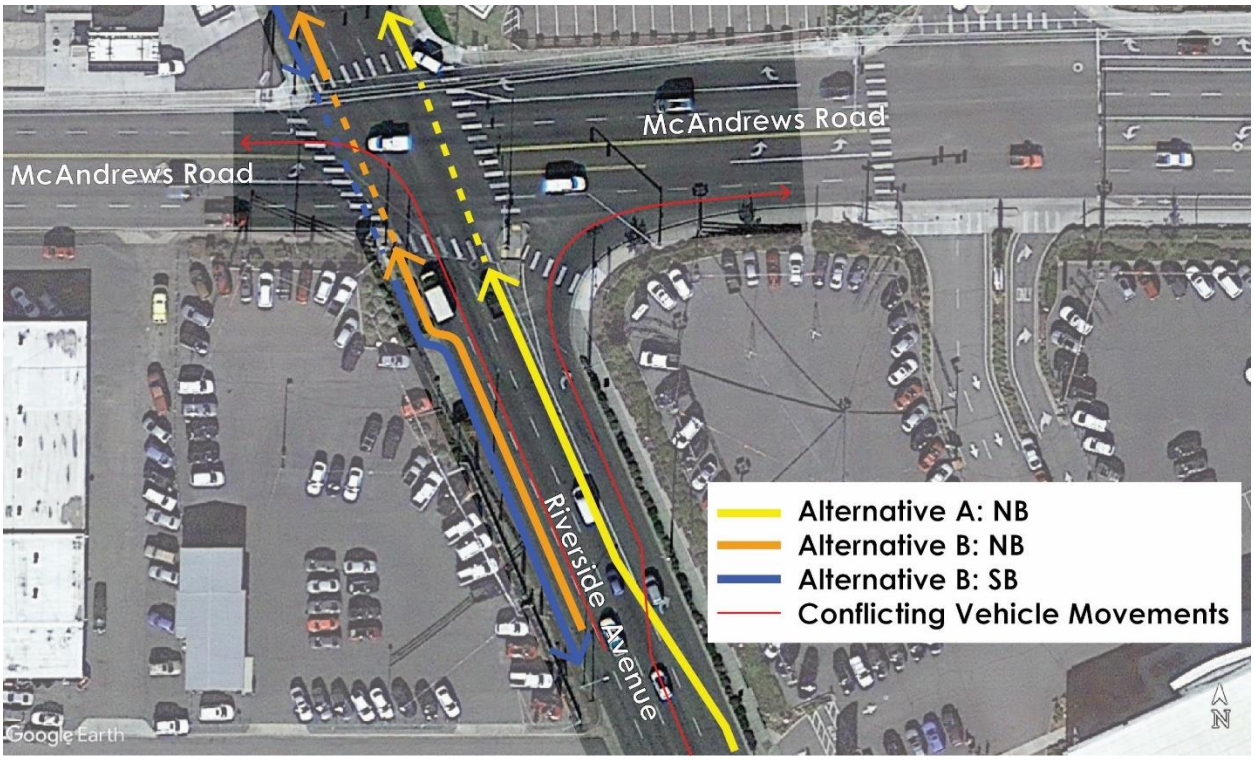
For people biking SB, the SB and WB transition is relatively seamless; however, the transition EB will require a two-stage left-turn and dedicated queuing space in advance of the EB approach to 4th Street at Riverside Avenue.

[11] 4th Avenue is planned to be converted from a 4-lane cross section to a 3-lane cross section with bike lanes on both sides of the roadway.

CONFLICT POINTS

The Riverside Avenue/McAndrews Road intersection represents one of the most challenging intersections along the corridor, particularly due to the right-turn lane, and is a key differentiator between alternatives.

Riverside Avenue/McAndrews Road



Alternative A: One-way Parking Protected/Buffered Bike Lane (Right)

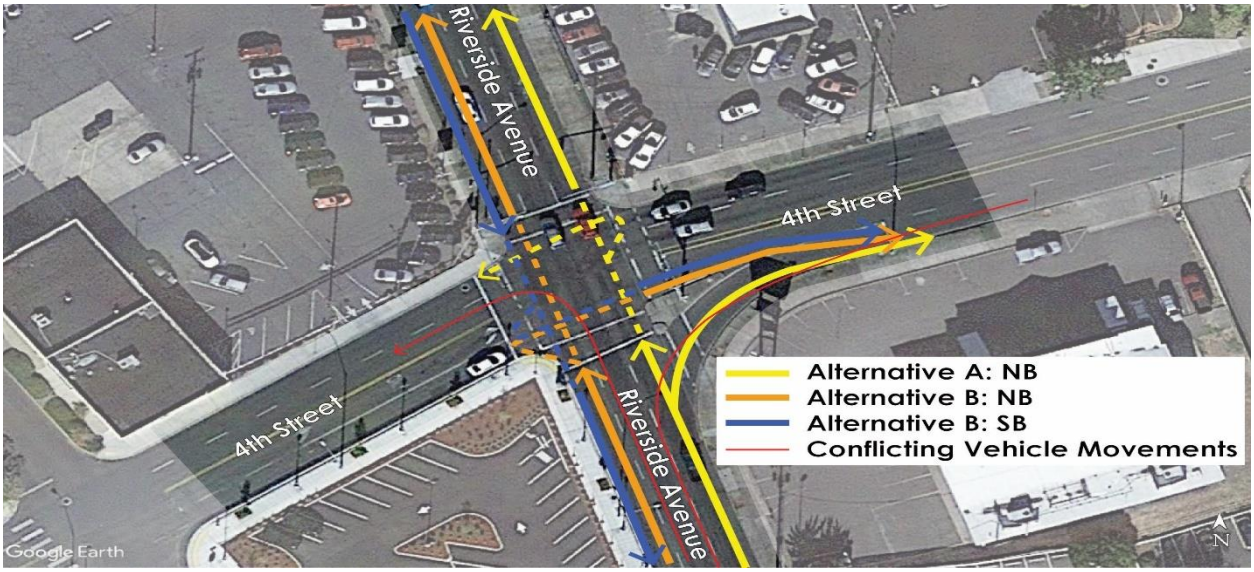
As illustrated above, the primary conflict point is the crossing from the curb-tight bike lane (right) to the left of the dedicated right-turn lane. Once at the intersection, no right-turn conflicts are present. As a result, people biking can cross concurrently with vehicles during a green phase with limited right-turning conflict.

Alternative B: Two-way Parking Protected/Buffered Bike Lane (Left)

As illustrated in above, conflict points are limited to left-turning vehicles. The queuing space for people biking is recommended to be designed to locate people in advance of the vehicle stop bar; however, people biking contraflow (SB), will have an additional conflict of oncoming left-turning vehicles. Separated phasing is recommended for two-way facilities to reduce conflict points.

Riverside Avenue/4th Street

Similar to the Riverside/McAndrews Road intersection, the Riverside Avenue/4th Street intersection represents one of the most challenging intersections along the corridor, particularly due to the right-turn lane, and is a key differentiator between alternatives.



Alternative A: One-way Parking Protected/Buffered Bike Lane (Right)

As illustrated above, the primary conflict point is the interaction between people biking NB and the right-turning vehicles at the NB approach. Transitioning people biking NB to the left of the right-turn lane further south may reduce the potential conflict. Once at the intersection, no right-turn conflicts are present. As a result, people biking can cross concurrently with vehicles during a green phase with limited right-turning conflict.

Alternative B: Two-way Parking Protected/Buffered Bike Lane (Left)

As illustrated in above, conflict points are limited to left-turning vehicles. The queuing space for people biking is recommended to be designed to locate people in advance of the vehicle stop bar; however, people biking contraflow (SB), will have an additional conflict of oncoming left-turning vehicles. Separated phasing is recommended for two-way facilities to reduce conflict points.

ACTIVE TRANSPORTATION ANALYSIS SUMMARY

A summary of the No-Build, Alternative A and Alternative B as it relates to the updated active transportation analysis is described below and summarized in Table 10.

Table 10: Riverside – Updated Active Transportation Analysis

	No Build	Alternative A	Alternative B
BLTS	Poor (BLTS 4)	Fair (BLTS 3)	Good (BLTS 1)
PLTS	Poor (PLTS 3)	Fair (PLTS 2)	Fair (PLTS 2)
Transition Zone	Poor	Good	Fair
Conflict Points	Poor	Fair	Good

Operational Analysis

In addition to the active transportation analysis, the No-Build, Alternative A, and Alternative B are evaluated with the operational performance measures described in *Operations Analysis and Methodology*.

TRAVEL TIME

Table 11 summarizes the amount of time it takes motor vehicles to travel along Riverside Avenue from the end of the Couplet to Ohio Street during the peak hour, as reported in Synchro 11. As shown, removing a travel lane impacts motor vehicle travel time along Riverside Avenue by approximately 13-57 seconds (4-15%) depending on phasing assumptions.

Table 11. Peak Hour Motor Vehicle Travel Time Along Riverside Avenue from end of couplet to Ohio Street

Analysis Year	No-Build	Alternative A		Alternative B	
		Protected Phasing	Permitted Phasing	Protected Phasing	Permitted Phasing
Base Year 2024	366.7	402.8	381.2	400.0	381.1
Future Year 2038	374.3	431.2	391.6	419.3	387.2

DELAY

Table 12 through Table 15 summarize the peak hour Delay and LOS for intersections on Riverside Avenue in Existing Year 2024 and Future Year 2038. As shown, there are moderate changes in LOS between alternatives and the no-build. Mobility standards are met at all intersections under all build and no-build alternatives except for the intersection of Riverside Avenue/4th Street, which is projected to exceed mobility standards in 2024 under build scenarios and in 2038 under both build and no-build scenarios.

Table 12. Peak Hour LOS for Intersections on Riverside Avenue (2024)

Intersection	No-Build	Alternative A		Alternative B	
		Protected Phasing	Permitted Phasing	Protected Phasing	Permitted Phasing
12th Street	A	B	A	B	A
10th Street	B	B	B	B	B
8th Street	A	B	A	B	A
Main Street	A	C	B	C	B
6th Street	A	B	B	B	B
4th Street	B	C	C	C	C
Jackson Street	B	C	B	C	B
Manzanita Street	A	A	A	A	A
McAndrews Road	C	C	C	C	C
Ohio Street	B	B	B	B	B

Table 13. Peak Hour Delay (Seconds) for Intersections on Riverside Avenue (2024)

Intersection	No-Build	Alternative A		Alternative B	
		Protected Phasing	Permitted Phasing	Protected Phasing	Permitted Phasing
12th Street	8.8	13.1	9.4	13.1	9.4
10th Street	15.1	17.4	14.6	17.1	14.6
8th Street	7.1	12.0	5.9	10.8	5.9
Main Street	8.0	22.9	12.2	21.5	12.2
6th Street	8.8	10.8	10.7	11.0	10.7
4th Street	18.9	26.2	21.5	25.1	21.5
Jackson Street	13.5	28.6	17.0	27.2	17.0
Manzanita Street	4.7	8.7	6.0	8.8	6.0
McAndrews Road	25.7	29.4	25.7	28.1	25.7
Ohio Street	13.0	16.6	13.9	16.5	13.9

Table 14. Peak Hour LOS for Intersections on Riverside Avenue (2038)

Intersection	No-Build	Alternative A		Alternative B	
		Protected Phasing	Permitted Phasing	Protected Phasing	Permitted Phasing
12th Street	A	B	A	B	A
10th Street	B	D	C	D	C
8th Street	A	B	A	A	A
Main Street	A	C	B	C	B
6th Street	A	A	A	A	A
4th Street	C	C	C	C	C
Jackson Street	B	D	B	C	B
Manzanita Street	A	A	A	A	A
McAndrews Road	C	C	C	C	C
Ohio Street	B	B	B	B	B

Table 15. Peak Hour Delay (Seconds for Intersections on Riverside Avenue (2038)

Intersection	No-Build	Alternative A		Alternative B	
		Protected Phasing	Permitted Phasing	Protected Phasing	Permitted Phasing
12th Street	8.5	13.7	9.0	13.8	9.0
10th Street	19.7	35.9	25.0	35.6	24.9
8th Street	5.6	10.7	5.4	9.6	4.9
Main Street	7.9	28.9	12.4	28.2	11.2
6th Street	7.3	8.8	9.2	8.7	8.8
4th Street	24.9	24.0[1]	25.2	21.7[1]	25.6
Jackson Street	13.2	37.7	17.5	31.0	18.5
Manzanita Street	3.9	7.0	4.9	7.1	4.9
McAndrews Road	26.9	31.0	27.0	28.4	26.9
Ohio Street	12.7	16.6	13.6	16.5	13.7

[1]Minor improvements to delay at are due to differences in Synchro's automatic offset and split time optimization.

QUEUING

Based on the queuing analysis, the following 95th percentile queues are forecast to exceed available storage:

- Westbound through movement at Riverside Avenue/4th Street under 2038 build and no-build scenarios.
  - This queue is projected to increase under the build scenarios.
- Northbound through movement at Riverside Avenue/E Main Street under 2024 and 2038 build scenarios with protected phasing.
  - 95th percentile queues are not forecast to exceed available storage at this location under 2024 or 2038 no-build or build scenarios with permitted phasing.
- Eastbound through movement at Riverside Avenue/6th Street under 2024 and 2038 build scenarios with protected phasing.
  - Queues are not forecast to spill back to Central Avenue.
  - 95th percentile queues are not forecast to exceed available storage at this location under 2024 or 2038 no-build or build scenarios with permitted phasing.
- Westbound through movement at Riverside Avenue/10th Street under 2038 build and no-build scenarios.

Synchro queue reports were produced for the assessment and are included in Appendix "D".

Riverside Avenue Evaluation Matrix

The evaluation performed as part of the Concept Design Memorandum has been brought forward and consolidated to focus on the two primary alternatives with the addition of the operational analysis. The updated Active Transportation Analysis has been incorporated into the matrix below with updates to the Bicycle Level of Traffic Stress (LTS), Pedestrian LTS, Conflict Points, and Transition Zone performance measures. The Public Input performance measure has been updated based on feedback received as part of the second Virtual Public Open House.

Evaluation Criteria	Performance Measure	No Build	Alternative A | One-way Parking Protected/Buffered Bike Lane (Right)	Alternative B | Two-way Parking Protected/Buffered Bike Lane (Left)
Operations Analysis	**Signal Progression**	Fair (+0) – motor vehicles are generally able to progress through the corridor on green when travelling at the posted speed. There is some undesirable opportunity for speeding.	Good (+1) – signal progression can be improved through optimization; cycle lengths and offsets can be updated to better accommodate people walking and biking	Good (+1) – signal progression can be improved through optimization; cycle lengths and offsets can be updated to better accommodate people walking and biking
	Queuing	Poor (-1) – 95th percentile queues are anticipated to exceed available storage at the westbound and through movements of Riverside Avenue/4th Street and Riverside Avenue/10th Street.	Poor (-1) – 95th percentile queues are anticipated to exceed available storage at the westbound and through movements of Riverside Avenue/4th Street and Riverside Avenue/10th Street. Queues are forecast to increase under the build scenarios. Additional 95th percentile queues are forecast to exceed storage under the protected phasing scenario.	Poor (-1) – at the westbound and through movements of Riverside Avenue/4th Street and Riverside Avenue/10th Street. Additional 95th percentile queues are forecast to exceed storage under the protected phasing scenario.
	Travel Time	Fair (+0) – existing travel time is relatively fluid without major intersection delays at most intersections	Fair (+0) -- Travel time is projected to remain within 20% of existing travel time.	Fair (+0) -- Travel time is projected to remain within 20% of existing travel time.
	Vehicular Delay	Good (+1) – mobility standards are met at all intersections	Fair (+0) – Removing a travel lane provides a slight increase in delay, but continues to meet mobility standards under both permitted and protected phasing options	Fair (+0) – Removing a travel lane provides a slight increase in delay, but continues to meet mobility standards under both permitted and protected phasing options
Safety	**Crash Reduction Factors**[1]	Poor (-1) – the no-build provides shared lane marking "sharrows" for people biking. Shared lane marking "sharrows" are not a crash reduction factor	Good (+1) – installing cycle tracks (BP23) has a high crash reduction factor (59% reduction in bicycle crashes at all injury severities)	Fair (+0) – installing buffered bike lanes[2] (BP24) has a moderate crash reduction factor (47% reduction in bicycle crashes at all injury severities)
	Conflict Points	Poor (-1) – the no-build maintains the current number of conflict points	Fair (+0) – this alternative provides more conflict points compared to the other alternative, primarily due to the conflict points at right-turn lanes	Good (+1) – this alternative provides less conflict points compared to the other alternative, primarily due to the lack of conflict points at right-turn lanes
Community Support	**Public Input**	Good (+1) – the no-build was supported by the public as part of the Virtual Open House	Good (+1) – this alternative was a preferred facility type in the first Public Open House and was the preferred alternative for the build scenarios based on public input received as part of the second Virtual Open House	Fair (+0) – this alternative received mixed responses from the public and was supported by the public as part of the second Virtual Open House, but not as strongly as other options
	Planning Documents	Poor (-1) – the no-build is not consistent with the TSP recommendation for providing enhanced bicycle facilities	Good (+1) –this alternative is consistent with the recommended low-stress "protected bike lane" facility treatment identified in the TSP	Good (+1) –this alternative is consistent with the recommended low-stress "protected bike lane" facility treatment identified in the TSP
Connectivity	**Access**	Poor (-1) – the no-build provides limited shared lane marking "sharrow" access for people biking	Fair (+0) – this alternative provides one-directional access	Good (+1) – this alternative provides bi-directional access
	Transition Zones	Fair (+0) – the no-build makes no changes to transition zones due to the lack of dedicated facilities	Good (+1) – this alternative requires minimal transition challenges along the corridor, particularly at the South of Couplet (south), Riverside Avenue at Ohio Street (north), and Riverside Avenue at 4th Avenue (transition to perpendicular bike lanes)	Fair (+0) – this alternative requires addressing challenging transitions along the corridor, particularly at the South of Couplet (south) and Riverside Avenue at Ohio Street (north)
User Experience	**Bicycle Level of Traffic Stress (BLTS)**	Poor (-1) – the no-build makes no improvements to BLTS	Fair (+0) – this alternative improves the BLTS by 1 point	Good (+1) – this alternative improves the BLTS by 2 points
	Pedestrian Level of Traffic Stress (PLTS)	Poor (-1) – the no-build makes no improvements to PLTS	Fair (+0) – this alternative reduces the PLTS by 1 point on the right and left sides of the roadway	Fair (+0) – this alternative reduces the PLTS by 2 points on the left side of the roadway and makes no change to the PLTS on the right side of the roadway
Economic Opportunity	**Parking**	Fair (+0) – the no-build does not change the amount of on-street parking along the segment	Fair (+0) – this alternative does not change the amount of on-street parking along the segment	Fair (+0) – this alternative does not change the amount of on-street parking along the segment
Feasibility	**Planning-Level Cost**	Good (+1) – the no-build does not require any cost	Fair (+0) – this alternative has a relative low cost because it only requires restriping the roadway and constructing buffers	Poor (-1) – this alternative has a relative high cost because it requires signal modifications
	Maintenance	Good (+1) – the no-build requires no additional maintenance	Fair (+0) – this alternative requires maintenance of the buffer; the buffers can be placed so that no special road maintenance equipment is required	Fair (+0) – this alternative requires maintenance of the buffer; the buffers can be placed so that no special road maintenance equipment is required
TOTAL		**-3**	**+4**	**+3**

CENTRAL AVENUE

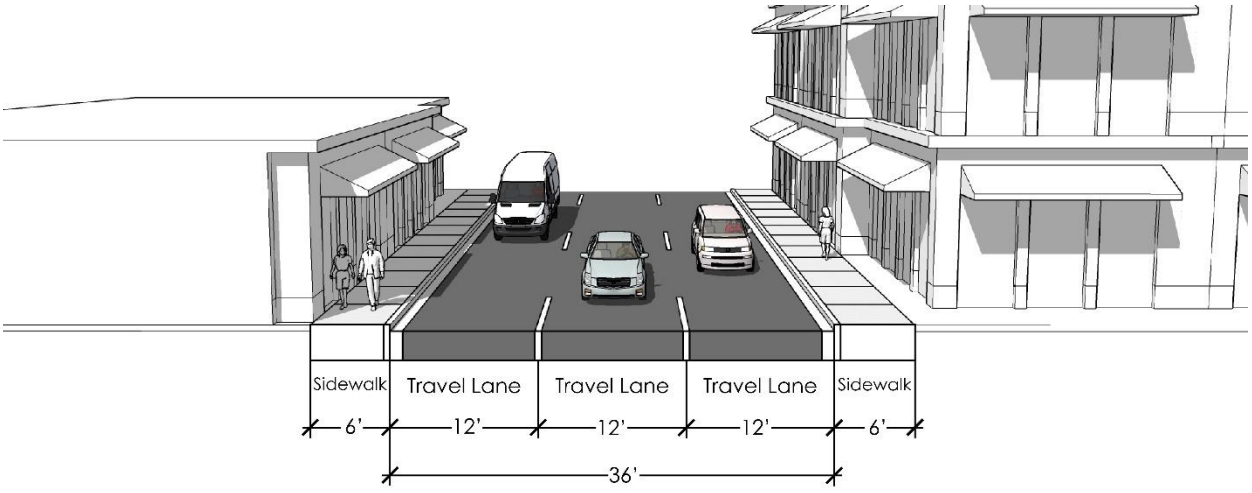
The study segment for Central Avenue extends from approximately 250 feet south of Boyd Street (merge of couplet) to Manzanita Street. Plans for shared lane marking "sharrows" are identified between Jackson Street to 10th Street along Central Avenue and therefore, no additional bicycle facility design options will be evaluated for that segment. Two primary alternatives are evaluated along the typical section of Central Avenue as part of the Operational Analysis:

- Alternative A: One-way Separated Bike Lane (Right) – Typical Sections
- Alternative B: One-way Buffered Bike Lane (Right) – Typical Sections

Existing

TYPICAL SECTION

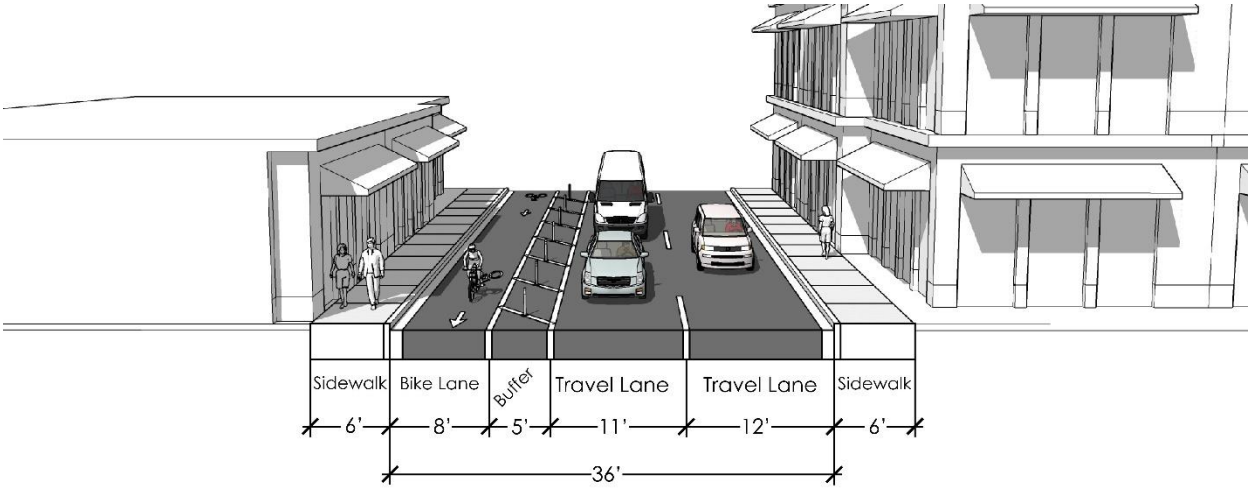
Existing typical section conditions along Central Avenue include three 12-foot travel lanes, and 6-foot sidewalks on both sides of the street. Shared lane marking "sharrows" are provided for bicycle access.



Alternative A: One-way Buffered Bike Lane (Right)

TYPICAL SECTION

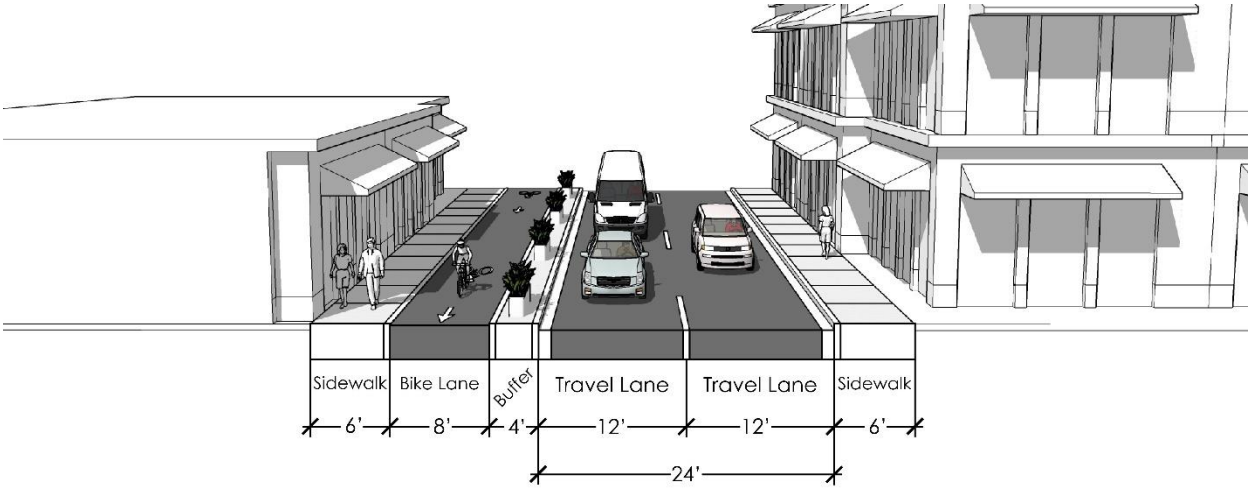
Within the typical section, Alternative A includes one 11-foot travel lane, one 12-foot travel lane (adjacent to curb), and 6-foot sidewalks on both sides of the street. An 8-foot one-way bike lane with a 5-foot buffer is provided for bicycle access along the right side of the street. To fit the one-way bike lane within the existing curb-to-curb, a travel lane is removed.



Alternative B: One-way Separated Bike Lane (Right)

TYPICAL SECTION

Within the typical section, Alternative B includes two 12-foot travel lanes and 6-foot sidewalks on both sides of the street. An 8-foot one-way curb separated bike lane with a 4-foot raised buffer is provided for bicycle access along the right side of the street. To fit the one-way bike lane within the existing curb-to-curb, a travel lane is removed.



Active Transportation Analysis

LEVEL OF TRAFFIC STRESS

The most constrained section of the Central Avenue segment is the southern segment south of E 12th Street. As a result, this segment is analyzed for a LTS comparison between alternatives.

Alternative A: One-way Buffered Bike Lane (Right)

Alternative A improves BLTS from a score of BLTS 4 (no-build) to a score of BLTS 1. Though Alternative A does not provide full separation, the combination of the width of the bike lane and the width of the buffer achieves a BLTS 1. Alternative A improves the PLTS on the one-way bike lane side (right) only. The PLTS is improved from PLTS 3 to PLTS 2[2].

Alternative B: One-way Separated Bike Lane (Right)

Alternative B improves BLTS from a score of BLTS 4 (no-build) to a score of BLTS 1 due to the increase in separation. Alternative B provides full separation resulting in BLTS 1. Alternative A improves the PLTS on the one-way bike lane side (right) only. The PLTS is improved from PLTS 3 to PLTS 2[2].

TRANSITION ZONE

Due to the nature of the one-way bicycle facility, transition zone challenges are minimized compared to the bi-directional, two-way bicycle facility on Riverside Avenue. The transition zone criteria is not a differentiating factor between Alternative A and Alternative B for the Central Avenue segment.

CONFLICT POINTS



Alternative A: Buffered Bike Lane (Right)

As illustrated above, conflict points are limited to right-turning vehicles. The queuing space for people biking is recommended to be designed to locate people in advance of the vehicle stop bar. As a result, people biking can cross concurrently with vehicles during a green phase with limited right-turning conflict.

Alternative B: Separated Bike Lane (Right)

As illustrated above, conflict points are limited to right-turning vehicles. The queuing space for people biking is recommended to be designed to locate people in advance of the vehicle stop bar. As a result, people biking can cross concurrently with vehicles during a green phase with limited right-turning conflict.

ACTIVE TRANSPORTATION ANALYSIS SUMMARY

A summary of the No-Build, Alternative A and Alternative B as it relates to the updated active transportation analysis is described below and summarized in Table 16.

Table 16: Central Avenue – Updated Active Transportation Analysis

	No Build	Alternative A	Alternative B
BLTS	Very Poor (BLTS 4)	Good (BLTS 1)	Good (BLTS 1)
PLTS	Poor (PLTS 3)	Fair (PLTS 2)	Fair (PLTS 2)
Transition Zone	Poor	Good	Good
Conflict Points	Poor	Good	Good

Operational Analysis

In addition to the active transportation analysis, the No-Build, Alternative A, and Alternative B are evaluated with the operational performance measures described in *Operations Analysis and Methodology*.

TRAVEL TIME

Table 17 summarizes the amount of time it takes motor vehicles to travel along Central Avenue from Edwards Street to 10th Street during the peak hour, as reported in Synchro 11. As shown, removing a travel lane impacts motor vehicle travel time along Central Avenue by approximately 1 to 7 seconds (1-3% increase) in the future year depending on phasing assumptions. In Base Year, operations are shown to increase as this project would include a signal timing component that could result in signal optimization.

Table 17. Peak Hour Motor Vehicle Travel Time Along Central Avenue from Edwards Street to 10th Street

Analysis Year	No-Build	Alternative A		Alternative B	
		Protected Phasing	Permitted Phasing	Protected Phasing	Permitted Phasing
Base Year 2024	195.7	202.3	199.4	202.0	199.2
Future Year 2038	199.3	200.8	202.3	204.5	205.1

DELAY

Table 18 through Table 21 summarize the peak hour delay and LOS for intersections on Central Avenue in Existing Year 2024 and Future Year 2038. As shown, there are moderate changes in LOS between alternatives and the no-build. Mobility standards are met at all intersections under all build and no-build alternatives except for the intersection of Central Avenue/Edwards Street, which is projected to exceed mobility standards in 2038 under protected phasing scenarios.

Table 18. Peak Hour LOS for Intersections on Central Avenue (2024)

Intersection	No-Build	Alternative A		Alternative B	
		Protected Phasing	Permitted Phasing	Protected Phasing	Permitted Phasing
Edwards Street	B	C	B	C	B
Jackson Street	B	B	B	B	B
4th Street	B	B	B	B	B
6th Street	A	A	A	A	A
Main Street	A	B	A	B	A
8th Street	B	B	B	B	B
9th Street	A	A	A	A	A
10th Street	B	B	B	B	B

Table 19. Peak Hour Delay (Seconds) for Intersections on Central Avenue (2024)

Intersection	No-Build	Alternative A		Alternative B	
		Protected Phasing	Permitted Phasing	Protected Phasing	Permitted Phasing
Edwards Street	14.1	31.3	15.3	31.3	15.3
Jackson Street	16.2	17.2	16.5	17.5	16.5
4th Street	13.9	13.7	13.9	14.2	13.9
6th Street	6.6	6.6	6.8	6.7	6.8
Main Street	7.7	11.0	8.0	11.5	8.2
8th Street	14.3	11.8	13.8	11.8	13.6
9th Street	4.1	3.4	3.5	3.3	3.5
10th Street	11.0	11.3	12.7	11.3	12.5

Table 20. Peak Hour LOS for Intersections on Central Avenue (2038)

Intersection	No-Build	Alternative A		Alternative B	
		Protected Phasing	Permitted Phasing	Protected Phasing	Permitted Phasing
Edwards Street	C	F	C	F	C
Jackson Street	B	B	B	B	B
4th Street	B	B	B	B	B
6th Street	A	A	A	A	A
Main Street	A	A	A	A	A
8th Street	B	B	B	B	B
9th Street	A	A	A	A	A
10th Street	B	B	B	B	B

Table 21. Peak Hour Delay (Seconds) for Intersections on Central Avenue (2038)

Intersection	No-Build	Alternative A		Alternative B	
		Protected Phasing	Permitted Phasing	Protected Phasing	Permitted Phasing
Edwards Street	21.6	>80	24.5	>80	24.5
Jackson Street	17.2	14.9	17.1	15.6	17.1
4th Street	18.1	17.4[1]	18.8	19.1	18.0
6th Street	5.9	6.1	6.1	5.9	6.6
Main Street	7.0	8.6	8.7	9.1	8.1
8th Street	15.3	13.4[1]	14.6[1]	13.5[1]	14.8[1]
9th Street	3.5	3.5	3.7[1]	3.5	3.6[1]
10th Street	12.3	12.2[1]	12.2[1]	12.3	13.5[1]

[1]Minor improvements to delay are due to differences in Synchro's automatic offset and split time optimization.

QUEUING

Based on the queuing analysis, the following 95th percentile queues are forecast to exceed available storage:

- Eastbound through movement at Central Avenue/10th Street under 2038 build and no-build scenarios.
  - Queues are not forecast to spill back to the adjacent railroad tracks.

Synchro queue reports were produced for the assessment and are included in Appendix "D".

Central Avenue Evaluation Matrix

The evaluation performed as part of the Concept Design Memorandum has been brought forward and consolidated to focus on the two primary alternatives with the addition of the operational analysis. The updated Active Transportation Analysis has been incorporated into the matrix below with updates made to the Bicycle Level of Traffic Stress, Pedestrian LTS, Conflict Points, and Transition Zone performance measures. The Public Input performance measure has been updated based on feedback received as part of the second Virtual Public Open House.

Evaluation Criteria	Performance Measure	No Build	Alternative A | One-way Buffered Bike Lane (Right)	Alternative B | One-way Separated Bike Lane (Right)
Operations Analysis	**Signal Progression**	Fair (+0) – motor vehicles are generally able to progress through the corridor on green when travelling at the posted speed. There is some undesirable opportunity for speeding.	Good (+1) – signal progression can be improved through optimization; cycle lengths and offsets can be updated to better accommodate people walking and biking	Good (+1) – signal progression can be improved through optimization; cycle lengths and offsets can be updated to better accommodate people walking and biking
	Queuing	Poor (-1) – 95th percentile queues are anticipated to exceed available storage at the eastbound leg of Central Avenue/10th Street	Poor (-1) – 95th percentile queues are anticipated to exceed available storage at the eastbound leg of Central Avenue/10th Street	Poor (-1) – 95th percentile queues are anticipated to exceed available storage at the eastbound leg of Central Avenue/10th Street
	Travel Time	Fair (+0) – existing travel time is relatively fluid without major intersection delays	Fair (+0) -- Travel time is projected to remain within approximately 5% of existing travel time	Fair (+0) – Travel time is projected to remain within 5% of existing travel time
	Vehicular Delay	Good (+1) – mobility standards are met at all intersections	Fair (+0) – Removing a travel lane provides a moderate increase in delay but continues to meet mobility standards under permitted phasing. Protected phasing would likely cause the intersection of Riverside/Edwards Street to exceed mobility standards in 2038.	Fair (+0) – Removing a travel lane provides a moderate increase in delay but continues to meet mobility standards under permitted phasing. Protected phasing would likely cause the intersection of Riverside/Edwards Street to exceed mobility standards in 2038.
Safety	**Crash Reduction Factors**[1]	Poor (-1) – the no-build provides shared lane marking "sharrows" for people biking. Shared lane marking "sharrows" are not a crash reduction factor	Fair (+0) – installing buffered bike lanes[2] (BP24) has a moderate crash reduction factor (47% reduction in bicycle crashes at all injury severities)	Good (+1) – installing cycle tracks (BP23) has a high crash reduction factor (59% reduction in bicycle crashes at all injury severities)
	Conflict Points	Poor (-1) – the no-build maintains the current number of conflict points	Fair (+0) – this alternative provides a relatively equal number of conflict points compared to the other alternative	Fair (+0) – this alternative provides a relatively equal number of conflict points compared to the other alternative
Community Support	**Public Input**	Good (+1) – the no-build was supported by the public as part of the Virtual Open House	Fair (+0) – this alternative was supported by the public as part of the first Public Open House, but was not the preferred build alternative as part of the second Virtual Public Open House	Good (+1) – this alternative was a preferred facility type in the first Public Open House and was the preferred alternative for the build scenarios based on public input received as part of the second Virtual Open House
	Planning Documents	Poor (-1) – the no-build is not consistent with the TSP recommendation for providing enhanced bicycle facilities	Fair (+0) – this alternative is consistent with the TSP recommendation for providing enhanced bicycle facilities, but does not provide the amount of separation desired for the segment	Good (+1) –this alternative is consistent with the recommended low-stress "protected bike lane" facility treatment identified in the TSP
Connectivity	**Access**	Poor (-1) – the no-build provides limited shared lane marking "sharrow" access for people biking	Fair (+0) – this alternative provides one-directional access	Fair (+0) – this alternative provides one-directional access
User Experience	**Bicycle Level of Traffic Stress (BLTS)**	Poor (-1) – the no-build makes no improvements to BLTS	Good (+1) – this alternative improves the BLTS by 3 points	Good (+1) – this alternative improves the BLTS by 3 points
	Pedestrian Level of Traffic Stress (PLTS)	Poor (-1) – the no-build makes no improvements to PLTS	Good (+1) – this alternative reduces the PLTS on the right side of the roadway by 2 points and the left side of the roadway by 1 point	Fair (+0) – this alternative reduces the PLTS by 1 point on the right and left sides of the roadway
Economic Opportunity	**Parking**	Fair (+0) – the no-build does not change the amount of on-street parking along the segment	Fair (+0) – this alternative does not change the amount of on-street parking along the segment	Fair (+0) – this alternative does not change the amount of on-street parking along the segment
Feasibility	**Planning-Level Cost**	Good (+1) – the no-build does not require any cost	Fair (0) – this alternative has a relative low cost because it only requires restriping the roadway and constructing buffers	Poor (-1) – this alternative has a relative high cost because it requires construction of new curbs
	Maintenance	Good (+1) – the no-build requires no additional maintenance	Fair (+0) – this alternative requires maintenance of the buffer; the buffers can be placed so that no special road maintenance equipment is required	Poor (-1) – this alternative may require special maintenance equipment
TOTAL		**-3**	**+1**	**+2**

COURT STREET (WIDE)

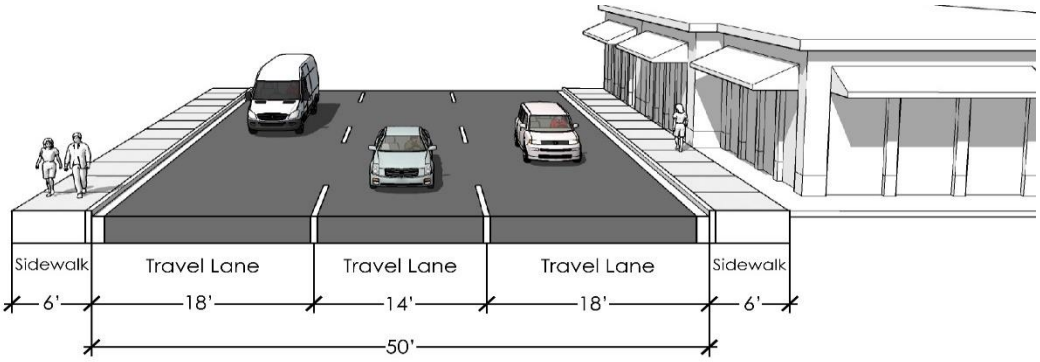
The study segment for Court Street (Wide) extends from Manzanita Street to Ohio Street. Three primary alternatives are evaluated along Court Street as part of the Operational Analysis:

- Alternative A: Parking Protected Bike Lane (Right) Parking Both Sides
- Alternative B: Buffered Bike Lane (Right) No Parking
- Alternative C: Separated Bike Lane (Right) No Parking

Existing

WIDE SECTION

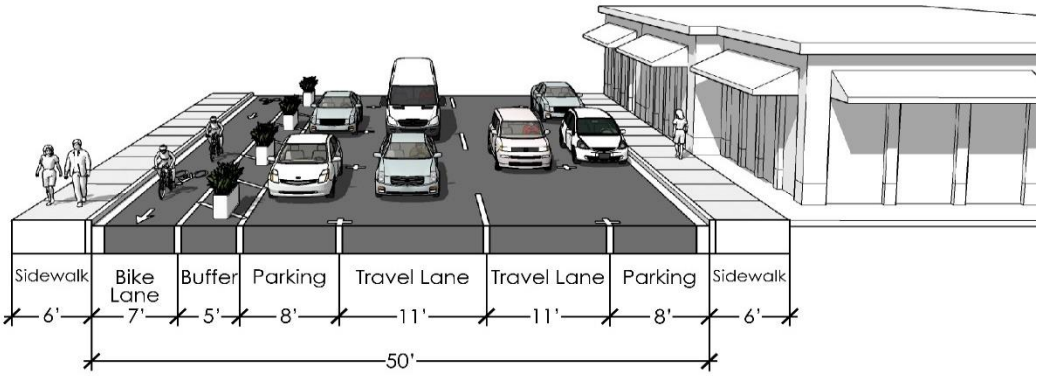
Existing Court Street (wide section) conditions include three travel lanes (two 18-foot and one 14-foot), and 6-foot sidewalks on both sides of the street. No bicycle access is provided.



Alternative A: One-way Parking Protected Bike Lane (Right)
Parking Both Sides

WIDE SECTION

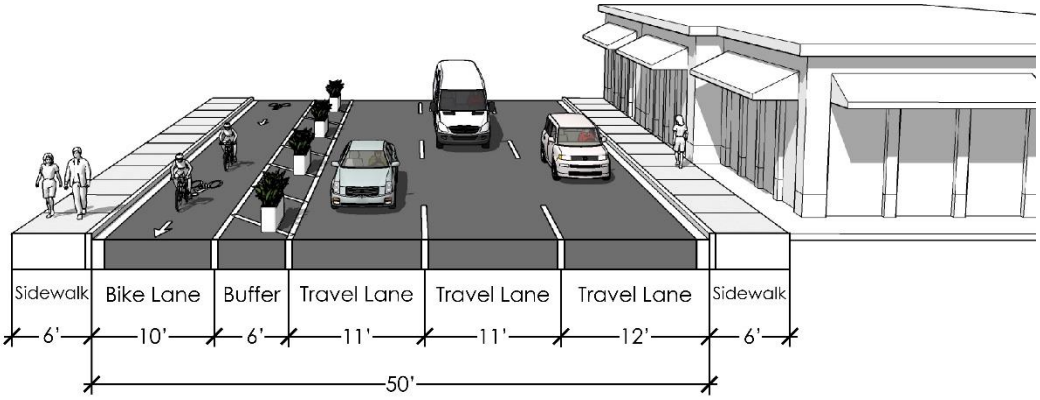
Alternative A include two 11-foot travel lanes, 8-foot parking on both sides of the street, and 6-foot sidewalks on both sides of the street. A one-way 7-foot bike lane with a 5-foot buffer is provided for bicycle access along the right side of the street.



Alternative B: One-way Buffered Bike Lane (Right)

WIDE SECTION

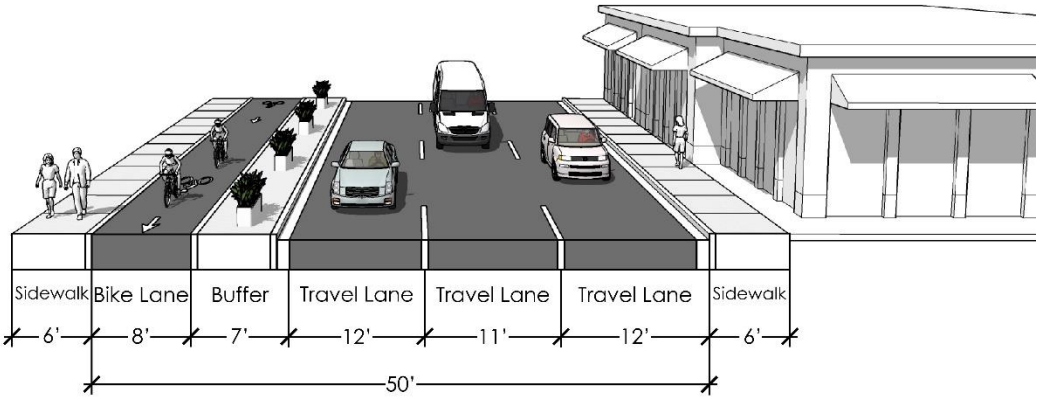
Alternative B include two 11-foot travel lanes one 12-foot travel lane (adjacent to curb), and 6-foot sidewalks on both sides of the street. A one-way 10-foot bike lane with a 6-foot buffer is provided for bicycle access along the right side of the street.



Alternative C: One-way Separated Bike Lane (Right)

WIDE SECTION

Alternative C Court Street (wide section) include two 12-foot travel lanes (adjacent to curb), one 11-foot travel lane, and 6-foot sidewalks on both sides of the street. A one-way 8-foot separated bike lane with a 7-foot curb separated buffer is provided for bicycle access along the right side of the street.



Active Transportation Analysis

LEVEL OF TRAFFIC STRESS

Court Street (Wide) between Manzanita Street to Ohio Street does not have a uniquely constrained pinch point. As a result, the LTS analysis performed in the Concept Design Memorandum will be brought forward and used as part of the updated Active Transportation Analysis.

TRANSITION ZONE

Due to the nature of the one-way bicycle facility, transition zone challenges are minimized compared to the bi-directional, two-way bicycle facility on Riverside. The transition zone criterion is not a differentiating factor between Alternative A, Alternative B, and Alternative C for the Court Street segment.

CONFLICTS POINTS

Within the Court Street segment, all alternatives are located along the right side of the roadway, with no intersecting streets between McAndrews and Central Avenue/Edward Street. As a result, potential conflicts are limited to driveway access points and are not a differentiating factor between Alternative A, Alternative B, and Alternative C for the Court Street segment.

ACTIVE TRANSPORTATION ANALYSIS SUMMARY

A summary of the No-Build, Alternative A and Alternative B as it relates to the updated active transportation analysis is described below and summarized in Table 22.

Table 22: Court Street – Updated Active Transportation Analysis

	No Build	Alternative A	Alternative B	Alternative C
BLTS	Very Poor (BLTS 4)	Good (BLTS 1)	Good (BLTS 1)	Good (BLTS 1)
PLTS	Poor (PLTS 3)	Good (PLTS 2)	Fair (PLTS 2)	Fair (PLTS 2)
Transition Zone	Poor	Good	Good	Good
Conflict Points	Poor	Good	Good	Good

Note: Alternative A improves PLTS on both sides of the roadway due to the presence of parking

Operational Analysis

In addition to the active transportation analysis, the No-Build, Alternative A, and Alternative B are evaluated with the operational performance measures described in *Operations Analysis and Methodology*.

Note: The vehicular operational results of Alternative C are represented by Alternative B.

TRAVEL TIME

Table 23 summarizes the amount of time it takes motor vehicles to travel along Court Street from Ohio Street to Edwards Street during the peak hour, as reported in Synchro 11. As shown, removing a travel lane impacts motor vehicle travel time along Court Street by approximately 6-18 seconds (approximately 4-13% increase) depending on phasing assumptions.

Table 23. Peak Hour Motor Vehicle Travel Time Along Court Street from Ohio Street to Edwards Street

Analysis Year	No-Build	Alternative A		Alternative B	
		Protected Phasing	Permitted Phasing	Protected Phasing	Permitted Phasing
Base Year 2024	135.8	153.9	144.3	151.5	142.1
Future Year 2038[1]	134.4	151.9	141.4	150.1	140.0

DELAY

Table 24 through Table 27 summarize the peak hour delay and LOS for intersections on Court Street in Existing Year 2024 and Future Year 2038. As shown, there are minor changes in LOS between alternatives and the no-build. Mobility standards are met at all intersections under all build and no-build alternatives.

Table 24. Peak Hour LOS for Intersections on Court Street (2024)

Intersection	No-Build	Alternative A		Alternative B	
		Protected Phasing	Permitted Phasing	Protected Phasing	Permitted Phasing
Ohio Street	D	D	D	D	D
McAndrews Road	C	C	C	C	C

[1]Minor improvements to delay at Court Avenue/Ohio Street are due to differences in Synchro's automatic offset and split time optimization.

Table 25. Peak Hour Delay (Seconds) for Intersections on Court Street (2024)

Intersection	No-Build	Alternative A		Alternative B	
		Protected Phasing	Permitted Phasing	Protected Phasing	Permitted Phasing
Ohio Street	50.2	35.5[1]	39.4	40.8[1]	50.1
McAndrews Road	24.8	26.6	25.7	26.7	25.7

[1]Minor improvements to delay at Court Avenue/Ohio Street are due to differences in Synchro's automatic offset and split time optimization.

Table 26. Peak Hour LOS for Intersections on Court Street (2038)

Intersection	No-Build	Alternative A		Alternative B	
		Protected Phasing	Permitted Phasing	Protected Phasing	Permitted Phasing
Ohio Street	D	C[1]	D	C[1]	D
McAndrews Road	C	C	C	C	C

[1]Minor improvements to delay at Court Avenue/Ohio Street are due to differences in Synchro's automatic offset and split time optimization.

Table 27. Peak Hour Delay (Seconds) for Intersections on Court Street (2038)

Intersection	No-Build	Alternative A		Alternative B	
		Protected Phasing	Permitted Phasing	Protected Phasing	Permitted Phasing
Ohio Street	37.5	28.9[1]	35.5	26.5[1]	37.5
McAndrews Road	23.9	25.9	24.4	25.9	24.4

[1]Minor improvements to delay at Court Avenue/Ohio Street are due to differences in Synchro's automatic offset and split time optimization.

QUEUING

Based on the queueing analysis, 95th percentile queues are not forecast to exceed available storage in 2024 or 2039 under No-Build, Alternative A, or Alternative B.

Synchro queue reports were produced for this assessment and are included in Appendix "D".

Court Street Evaluation Matrix

The evaluation performed as part of the Concept Design Memorandum has been brought forward and consolidated to focus on the three primary alternatives with the addition of the operational analysis. The updated Active Transportation Analysis has been incorporated into the matrix below with updates made to the Bicycle Level of Traffic Stress, Pedestrian LTS, Conflict Points, and Transition Zone performance measures. The Public Input performance measure has been updated based on feedback received as part of the second Virtual Public Open House.

Evaluation Criteria	Performance Measure	No Build	Alternative A | One-Way Parking Protected Bike Lane (Right) Parking Both Sides	Alternative B | One-way Buffered Bike Lane (Right)	Alternative C | One-way Separated Bike Lane (Right)
Operations Analysis	Signal Progression	Fair (+0) – motor vehicles are generally able to progress through the corridor on green when travelling at the posted speed. There is some undesirable opportunity for speeding.	Good (+1) – signal progression can be improved through optimization; cycle lengths and offsets can be updated to better accommodate people walking and biking	Good (+1) – signal progression can be improved through optimization; cycle lengths and offsets can be updated to better accommodate people walking and biking	Good (+1) – signal progression can be improved through optimization; cycle lengths and offsets can be updated to better accommodate people walking and biking
	Queuing	Good (+1) – queues are anticipated to be accommodated by available storage under 2024 and 2038 conditions	Good (+1) – queues are anticipated to be accommodated by available storage under 2024 and 2038 conditions	Good (+1) – queues are anticipated to be accommodated by available storage under 2024 and 2038 conditions	Good (+1) – queues are anticipated to be accommodated by available storage under 2024 and 2038 conditions
	Travel Time	Fair (+0) – existing travel time is relatively fluid without major intersection delays	Fair (+0) -- Travel time is projected to remain within 15% of existing travel time	Fair (+0) – Travel time is projected to remain within 15% of existing travel time	Fair (+0) – Travel time is projected to remain within 15% of existing travel time
	Vehicular Delay	Good (+1) – mobility standards are met at all intersections	Fair (+0) – Removing a travel lane provides a slight increase in delay, but continues to meet mobility standards under both permitted and protected phasing options	Fair (+0) – Removing a travel lane provides a slight increase in delay, but continues to meet mobility standards under both permitted and protected phasing options	Fair (+0) – Removing a travel lane provides a slight increase in delay, but continues to meet mobility standards under both permitted and protected phasing options
Safety	Crash Reduction Factors[1]	Poor (-1) – the no-build provides shared lane marking "sharrows" for people biking. Shared lane marking "sharrows" are not a crash reduction factor	Good (+1) – Installing cycle tracks (BP23) has a high crash reduction factor (59% reduction in bicycle crashes at all injury severities)	Fair (+0) – Installing buffered bike lanes (BP24) has a moderate crash reduction factor (47% reduction in bicycle crashes at all injury severities)	Good (+1) – Installing cycle tracks (BP23) has a high crash reduction factor (59% reduction in bicycle crashes at all injury severities)
	Conflict Points	Poor (-1) – the no-build maintains the current number of conflict points	Fair (+0) – this alternative provides a relatively equal number of conflict points compared to the other alternative	Fair (+0) – this alternative provides a relatively equal number of conflict points compared to the other alternative	Fair (+0) – this alternative provides a relatively equal number of conflict points compared to the other alternative
Community Support	Public Input	Good (+1) – the no-build was supported by the public as part of the Virtual Open House	Fair (+0) – this alternative was supported by the public as part of the first Public Open House, but was not the preferred build alternative as part of the second Virtual Public Open House	Fair (+0) – this alternative was supported by the public as part of the first Public Open House, but was not the preferred build alternative as part of the second Virtual Public Open House	Good (+1) – this alternative was a preferred facility type in the first Public Open House and was the preferred alternative for the build scenarios based on public input received as part of the second Virtual Open House
	Planning Documents	Poor (-1) – the no-build is not consistent with the TSP recommendation for providing enhanced bicycle facilities	Good (+1) – this alternative is consistent with the recommended low-stress "protected bike lane" facility treatment identified in the TSP	Fair (+0) – this alternative is consistent with the TSP recommendation for providing enhanced bicycle facilities, but does not provide the amount of separation desired for the segment	Good (+1) – this alternative is consistent with the recommended low-stress "protected bike lane" facility treatment identified in the TSP
Connectivity	Access	Poor (-1) – the no-build provides limited shared lane marking "sharrow" access for people biking	Fair (+0) – this alternative provides one-directional access	Fair (+0) – this alternative provides one-directional access	Fair (+0) – this alternative provides one-directional access
User Experience	Bicycle Level of Traffic Stress (BLTS)	Poor (-1) – the no-build makes no improvements to BLTS	Good (+1) – this alternative improves the BLTS by 3 points	Good (+1) – this alternative improves the BLTS by 3 points	Good (+1) – this alternative improves the BLTS by 3 points
	Pedestrian Level of Traffic Stress (PLTS)	Poor (-1) – the no-build makes no improvements to PLTS	Good (+1) – this alternative reduces PLTS on the right side of the roadway by 2 points and the left side of the roadway by 1 point	Fair (+0) – this alternative reduces PLTS on the right side of the roadway by 2 points; it does not change the PLTS on the left side of the roadway	Fair (+0) – this alternative reduces PLTS on the right side of the roadway by 2 points; it does not change 1 left side of the roadway
Economic Opportunity	Parking	Fair (+0) – the no-build does not change the amount of on-street parking along the segment	Good (+1) – this alternative increases the amount of on-street parking along the segment	Fair (+0) – this alternative does not change the amount of on-street parking along the segment	Fair (+0) – this alternative does not change the amount of on-street parking along the segment
Feasibility	Planning-Level Cost	Good (+1) – the no-build does not require any cost	Fair (+0) – this alternative has a low cost because it only requires restriping the roadway and constructing buffers	Fair (+0) – this alternative has a low cost because it only requires restriping the roadway and constructing buffers	Poor (-1) – this alternative has a high cost because it requires construction of new curbs
	Maintenance	Good (+1) – the no-build requires no additional maintenance	Fair (+0) – this alternative requires maintenance of the buffer; the buffers can be placed so that no special road maintenance equipment is required	Fair (+0) – this alternative requires maintenance of the buffer; the buffers can be placed so that no special road maintenance equipment is required	Poor (-1) – this alternative may require special maintenance equipment
TOTAL		**-1**	**+7**	**+3**	**+4**

SOUTH OF COUPLET

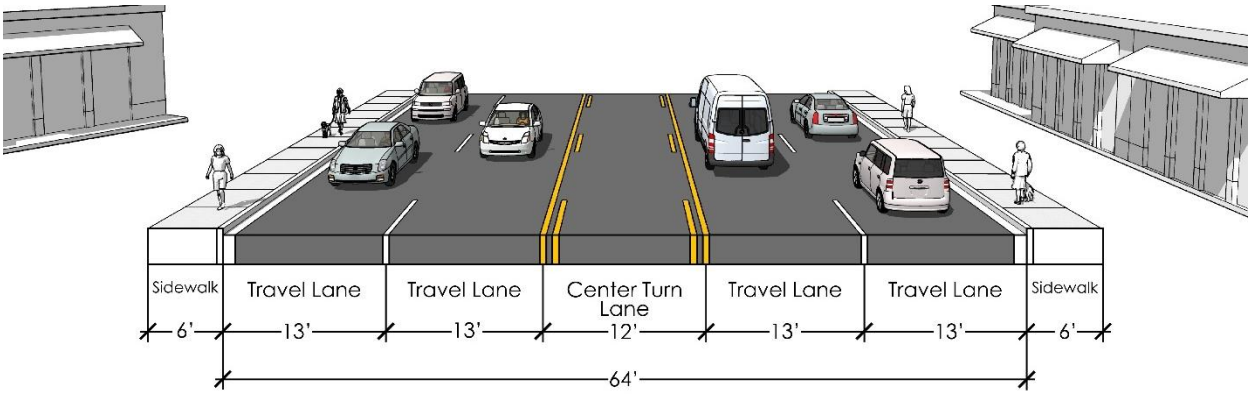
The study segment for South of Couplet extends from approximately 250 feet south of Boyd Street (merge of couplet) to Stewart Street. While modifications are proposed within the existing curb-to-curb cross sections along E Main Street, Riverside Avenue, Central Avenue, and Court Street, the existing curb-to-curb cross section within this segment will be maintained. Separated bike lanes are evaluated outside the curbs. Two primary alternatives are evaluated for the South of Couplet section as part of the Operational Analysis:

- Alternative A: Separated Bike Lanes (with Buffer)
- Alternative B: Separated Bike Lanes (No Buffer)

Existing

TYPICAL SECTION

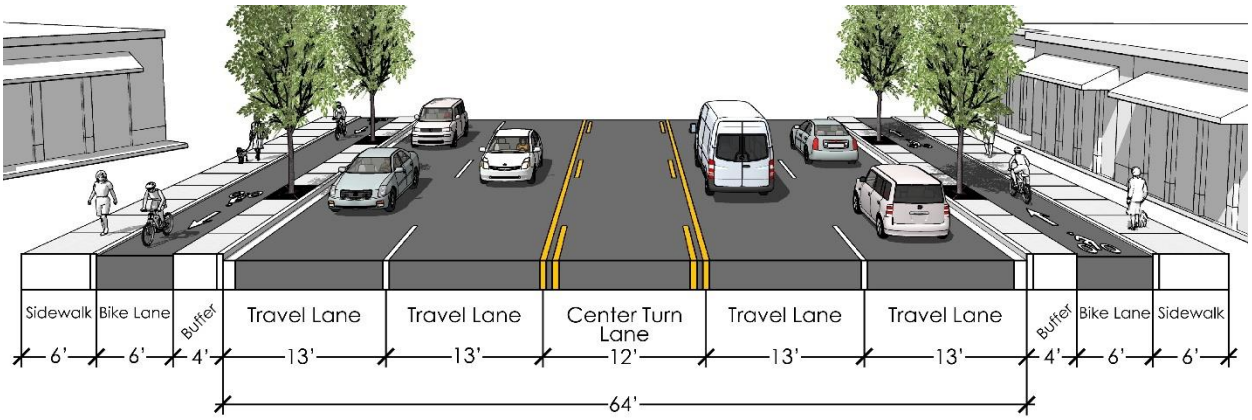
Existing typical section conditions South of Couplet include four 13-foot travel lanes, a 12-foot center turn lane, and 6-foot sidewalks on both sides of the street. No bicycle access is provided.



Alternative A: Separated Bike Lanes (with Buffer)

TYPICAL SECTION

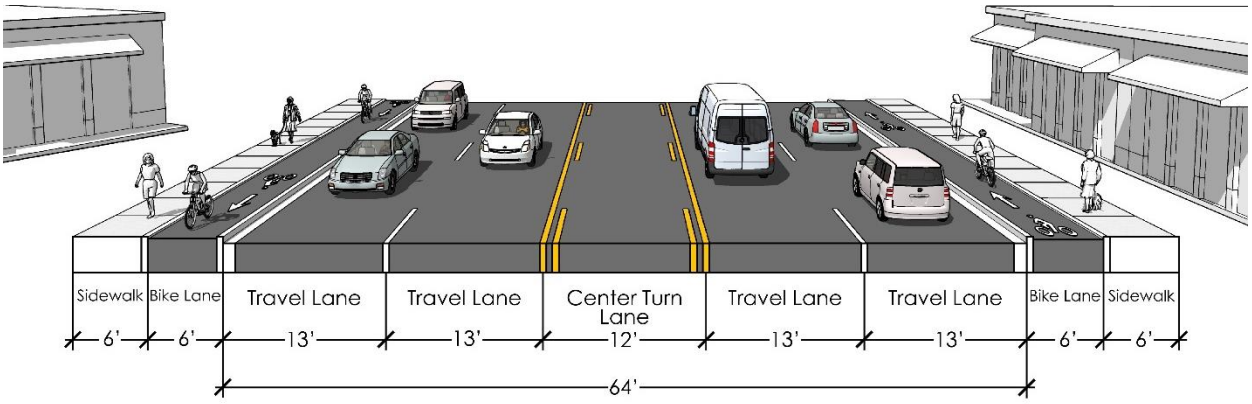
Alternative A maintains the existing curb to curb cross section. 6-foot one-way separated bike lanes with 4-foot raised landscape buffers are provided for bicycle access along both sides of the street. Approximately 9 feet of right-of-way acquisition may be required on both sides of the roadway to implement the Alternative A.



Alternative B: Separated Bike Lanes (without Buffer)

TYPICAL SECTION

Alternative B maintains the existing curb to curb cross section. 6-foot one-way separated bike lanes are provided for bicycle access along both sides of the street. Approximately 5 feet of right-of-way acquisition may be required on both sides of the roadway to implement the Alternative B.



Active Transportation Analysis

LEVEL OF TRAFFIC STRESS

The South of Couplet segment is consistent and does not have a uniquely constrained pinch point or conflict area differentiating between alternatives. As a result, the LTS analysis performed in the Concept Design Memorandum will be brought forward and used as part of the updated Active Transportation Analysis.

TRANSITION ZONE

The primary transition occurring at the end of the couplet is analyzed as part of the Riverside Avenue transition zone sections, described previously.

CONFLICTS POINTS

Within the South of Couplet segment, both alternatives are located behind the curb, vertically separated from vehicular traffic. As a result, potential conflicts are limited to driveway access points and are not a differentiating factor between Alternative A and Alternative B for the South of Couplet segment.

ACTIVE TRANSPORTATION ANALYSIS SUMMARY

A summary of the No-Build, Alternative A and Alternative B as it relates to the updated active transportation analysis is described below and summarized in Table 28.

Table 28: South of Couplet – Updated Active Transportation Analysis

	No Build	Alternative A	Alternative B
BLTS	Very Poor (BLTS 4)	Good (BLTS 1)	Good (BLTS 1)
PLTS	Poor (PLTS 3)	Fair (PLTS 2)	Poor (PLTS 3)
Transition Zone	Poor	Good	Good
Conflict Points	Poor	Good	Good

Operational Analysis

In addition to the active transportation analysis, the No-Build, Alternative A, and Alternative B are evaluated with the operational performance measures described in *Operations Analysis and Methodology*. Neither Alternative A or Alternative B include lane changes or phasing updates[12]. As a result, there are negligible changes in operations south of the couplet. Minor changes are shown due to different signal optimization between scenarios.

TRAVEL TIME

Table 29 summarizes the amount of time it takes motor vehicles to travel along Riverside Avenue from Barnett Road to Stewart Avenue during the peak hour, as reported in Synchro 11. As shown, each alternative has a negligible impact on travel time, likely due to differences in signal optimization caused by the projected increase in number of bicyclists traveling through the intersection (behind the curb).

Table 29. Peak Hour Motor Vehicle Travel Time Along Riverside Avenue, southbound from Barnett to Stewart

Analysis Year	No-Build	Alternative A		Alternative B	
		Protected Phasing	Permitted Phasing	Protected Phasing	Permitted Phasing
Base Year 2024	167.3	167.8	167.8	169.0	167.8
Future Year 2038	191.7	192.6	192.6	193.8	192.6

[12] Signal offsets and splits are optimized under 2038 build and no-build scenarios.

DELAY

Table 30 and Table 33 summarize the peak hour delay and LOS for intersections on Riverside Avenue South of Couplet in Existing Year 2024 and Future Year 2038. As shown, there are no changes in LOS between alternatives. Mobility standards are exceeded at Riverside Avenue/Stewart Avenue in 2038 under build and no-build scenarios.

Note: Project # I-17 in the City's TSP identifies intersection improvements for the South Pacific Highway (Riverside Avenue) & Stewart Avenue. The intersection improvements include a second southbound left and a second eastbound left-turn. These improvements are planned to address the deficiency at the Riverside Avenue/Stewart Avenue intersection.

Table 30. Peak Hour LOS for Intersections on Riverside Avenue South of Couplet (2024)

Intersection	No-Build	Alternative A	Alternative B
Barnett Road	D	D	D
Stewart Avenue	D	D	D

Table 31. Peak Hour Delay (Seconds) for Intersections on Riverside Avenue South of Couplet (2024)

Intersection	No-Build	Alternative A	Alternative B
Barnett Road	40.5	40.6	40.6
Stewart Avenue	47.4	47.5	48.4

Table 32. Peak Hour LOS for Intersections on Riverside Avenue South of Couplet (2038)

Intersection	No-Build	Alternative A	Alternative B
Barnett Road	D	D	D
Stewart Avenue	F	F	F

Table 33. Peak Hour Delay (Seconds) for Intersections on Riverside Avenue South of Couplet (2038)

Intersection	No-Build	Alternative A	Alternative B
Barnett Road	50.0	50.2	50.2
Stewart Avenue	>80	>80	>80

QUEUING

Based on the queuing analysis, 95th percentile queues are forecast to exceed available storage at Riverside Avenue/Barnett Road and Riverside Avenue/Stewart Avenue in 2024 and 2038 under all scenarios.

Synchro queue reports were produced for the assessment and are included in Appendix "D".

SIGNAL PROGRESSION

Signal progression was assessed Riverside Avenue by reviewing Synchro 11 Time-Space Diagrams. Today Riverside Avenue/Stewart Avenue and Riverside Avenue/Barnett Road are coordinated. Time-Space Diagrams are provided in Appendix "E".

No changes to signal progression south of the couplet are assumed between build and no-build scenarios.

South of Couplet Evaluation Matrix

The evaluation performed as part of the Concept Design Memorandum has been brought forward and consolidated to focus on the two primary alternatives with the addition of the operational analysis. The updated Active Transportation Analysis has been incorporated into the matrix below with updates made to the Bicycle Level of Traffic Stress, Pedestrian Level of Traffic Stress, Conflict Points, and Transition Zone performance measures. The Public Input performance measure has been updated based on feedback

Evaluation Criteria	Performance Measure	No Build	Alternative A | Separated Bike Lanes (with Buffer)	Alternative B | Separated Bike Lanes (without Buffer)
Operations Analysis	**Signal Progression**	Fair (+0) – Riverside Avenue/Stewart Avenue and Riverside Avenue/Barnett Road are coordinated	Fair (+0) – Riverside Avenue/Stewart Avenue and Riverside Avenue/Barnett Road are coordinated. There are no changes in signal progression between build and no-build scenarios	Fair (+0) – Riverside Avenue/Stewart Avenue and Riverside Avenue/Barnett Road are coordinated. There are no changes in signal progression between build and no-build scenarios
	Queuing	Poor (-1) – 95th percentile queues are anticipated to exceed available storage at Riverside Avenue/Barnette Street	Poor (-1) – 95th percentile queues are anticipated to exceed available storage at Riverside Avenue/Barnette Street. However, queues match no-build baseline operations	Poor (-1) – 95th percentile queues are anticipated to exceed available storage at Riverside Avenue/Barnette Street. However, queues match no-build baseline operations
	Travel Time	Poor (-1) – travel time is impeded by delay at signals	Poor (-1) – travel time is impeded by delay at signals. However, travel time is not changed between build and no-build alternatives	Poor (-1) – travel time is impeded by delay at signals. However, travel time is not changed between build and no-build alternatives
	Vehicular Delay	Poor (-1) – mobility standards are not met in 2038 at Riverside Avenue/Stewart Avenue	Poor (-1) – mobility standards are not met in 2038 at Riverside Avenue/Stewart Avenue. However, operations match no-build baseline operations	Poor (-1) – mobility standards are not met in 2038 at Riverside Avenue/Stewart Avenue. However, operations match no-build baseline operations
Safety	**Crash Reduction Factors**[1]	Poor (-1) – the no-build does not provide bicycle facilities	Good (+1) – installing cycle tracks (BP23) has a high crash reduction factor (59% reduction in bicycle crashes at all injury severities)	Good (+1) – installing cycle tracks (BP23) has a high crash reduction factor (59% reduction in bicycle crashes at all injury severities)
	Conflict Points	Poor (-1) – the no-build maintains the current number of conflict points	Good (+1) – this alternative reduces potential for conflicts between modes	Good (+1) – this alternative reduces potential for conflicts between modes
Community Support	**Public Input**	Good (+1) – the no-build was supported by the public as part of the Virtual Open House	Good (+1) – this alternative was a preferred facility type in the first Public Open House and was the preferred alternative for the build scenarios based on public input received as part of the second Virtual Open House	Fair (+0) – this alternative was a preferred facility type in the first Public Open House, but was not the preferred build alternative as part of the second Virtual Public Open House
	Planning Documents	Poor (-1) – the no-build is not consistent with the TSP recommendation for providing enhanced bicycle facilities	Good (+1) – this alternative is consistent with the recommended low-stress "protected bike lane" facility treatment identified in the TSP	Good (+1) – this alternative is consistent with the recommended low-stress "protected bike lane" facility treatment identified in the TSP
Connectivity	**Access**	Poor (-1) – the no-build provides limited shared lane marking "sharrow" access for people biking	Fair (+0) – this alternative provides one-directional access on both sides of the roadway	Fair (+0) – this alternative provides one-directional access on both sides of the roadway
User Experience	**Bicycle Level of Traffic Stress (BLTS)**	Poor (-1) – the no-build makes no improvements to BLTS	Good (+1) – this alternative improves the BLTS by 3 points	Good (+1) – this alternative improves the BLTS by 3 points
	Pedestrian Level of Traffic Stress (PLTS)	Poor (-1) – the no-build makes no improvements to PLTS	Good (+1) – this alternative improves PLTS by 2 points on both sides of the roadway	Fair (+0) – this alternative improves PLTS by 1 point on both sides of the roadway
Economic Opportunity	**Parking**	Fair (+0) – the no-build does not change the amount of on-street parking along the segment	Fair (+0) – this alternative does not change the amount of on-street parking along the segment	Fair (+0) – this alternative does not change the amount of on-street parking along the segment
Feasibility	**Planning-Level Cost**	Good (+1) – the no-build does not require any cost	Poor (-1) – this alternative requires approximately 18' of ROW	Fair (+0) – this alternative requires approximately 10' of ROW
	Maintenance	Good (+1) – the no-build requires no additional maintenance	Good (+1) – this alternative requires relative low levels of maintenance	Good (+1) – this alternative requires relative low levels of maintenance
TOTAL		**-6**	**+3**	**+2**

Next Steps

The recommendations included in this technical memorandum are based on the operational analysis findings, engineering judgement, and technical analysis for incorporating multimodal features into the study area streets, performed by the consultant team.

The City will vet these recommendations through advisory committees, interested parties, and the City Council before finalizing the preferred alternative for each street. The decision on a preferred alternative is not only technical. Community input, political input, and financial considerations will all play a role. If needed, Kittelson will develop a concept design for the preferred alternative identified by the City after the input described above is received.

References

1. *Concept Design Memorandum, 2022. Kittelson & Associates, Inc.*
2. *Volume Development Memorandum, 2022. Kittelson & Associates, Inc.*
3. *Bike Lanes, On-Street Parking & Business, 2010. Toronto Centre for Active Transportation & Clean Air Partnership*
4. *Economic Impacts of Street Improvements. The Summit Foundation.*
5. *Making the Economic Case for Cycling. Institute for Transportation & Development Policy.*

Appendix A
Road Reorganization Case Study Examples

Roadway Reorganization Case Studies

According to the Federal Highway Administration (FHWA), the safety and operational benefits of a roadway reorganization project for vehicles and pedestrians include:

- Decreasing vehicle travel lanes for pedestrians to cross,
- Improving safety for bicyclists when bicycle lanes are added,
- Providing an opportunity for on-street parking (which also serves as a buffer between pedestrians and vehicles),
- Reducing rear-end and side-swipe crashes,
- Improving speed limit compliance, and
- Decreasing crash severity when crashes do occur.

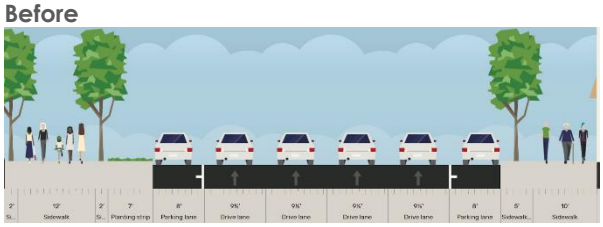
The following section provides roadway reorganization case study examples from around the Country based on similar projects and contexts.

San Francisco, CA – Roadway Reorganization

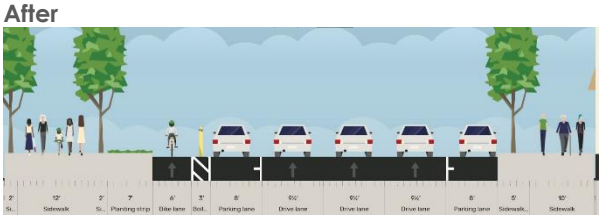
The SFMTA recently implemented a parking protected bikeway on Fell Street between Baker Street and Shrader Street to provide relief to crowding and support social distancing on the Panhandle Path.

Fell Street is one-way westbound with four travel lanes and unmetered parking on both sides of the street. The roadway reorganization improvements involve repurposing a travel lane in order to fit a parking protected westbound bikeway on the south side of Fell Street. The protected bikeway is located curbside, with a three-foot access aisle to access the floating parking. The cross sections below detail the existing and proposed conditions for the corridor.

Before



After



Evaluation Findings Post Construction

- Post-project vehicle speeds have dropped (between 5-14%) on Fell Street from preproject conditions.
- Data collected demonstrates bicyclists diverting (27% on average) from the northern Panhandle Path to the new Fell Street protected bike lane, allowing for more social distancing and less pedestrian-bicyclist conflicts on the northern Panhandle Path.
- Vehicle travel time decreased up to 4 seconds on the weekdays and increased up to 12 seconds on the weekends after the new protected bike lane was installed. Afternoon peak queues in the left turn pocket at Fell Street at Masonic Avenue were not observed to be continuous and most queues fully flushed out every traffic signal cycle

- Among all observations of people biking on Fell Street rather than on the Northern Panhandle Path, 98% of people biking biked in the bike lane or in the buffer zone versus the vehicle travel lane or sidewalk.

New York, NY – Roadway Reorganization

In 2007, New York City Department of Transportation (NYCDOT) implemented a road reorganization that completely redesigned Ninth Avenue. Prior to the reconfiguration, Ninth Avenue, a one-way street, consisted of four through lanes with parking on both sides, but no bicycle facilities and few pedestrian safety features. The redesign included three through lanes, a separated bicycle path located between the parking lane and sidewalk, and pedestrian refuge islands.

Evaluation Findings Post Construction

- The design has created a safe, comfortable, and unique street that has experienced a 58 percent decrease in injuries to all street users.

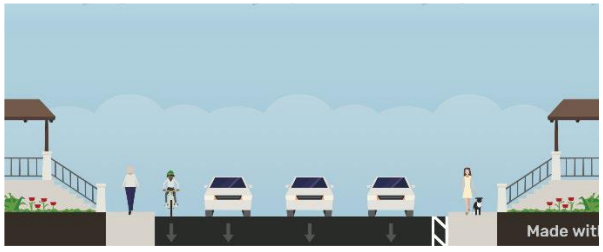
Sacramento, CA – Roadway Reorganization

The City of Sacramento, CA has been implementing roadway reorganization projects to calm traffic, improve pedestrian crossings, provide parking protected bikeways, and making streets more inviting for travel as well as spending time on the corridor. The City of Sacramento has implemented several recent roadway reorganization project including on J Street, P Street, Q Street, 9th Street, and 10 Street with plans for further implementation on 12th Street.

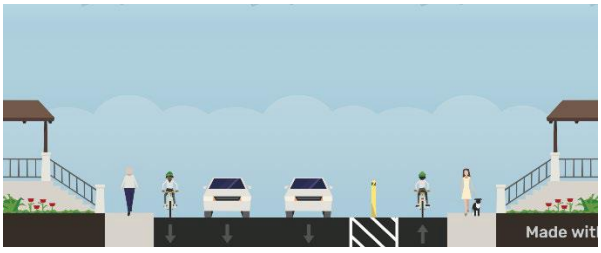
Tampa, FL – Roadway Reorganization

In 2019, the Florida Department of Transportation (FDOT) implemented a road reorganization project on N Highland Avenue in Tampa, Florida. The reorganization project converted a three-lane, one-way street to a two-lane, with a standard bike lane and buffered contraflow bike lane. The posted speed was also reduced from 40 mph to 35mph.

A**Before**



B**After**



After implementation, the average crash count decrease by 38% on Highway Avenue. Furthermore, travel times increased slightly despite a decrease in volumes on N Highland Avenue. One interpretation of the data is that the reduced roadway cross-section and posted speed limit are leading to reduced motor vehicle speeds. Travel time differences are summarized in the table below.

Segment	Time	Before (sec)	After (sec)	Difference (sec)	Difference (%)
N Highland - Southbound	0: All Day (12am-12am)	103	106	3	3%
N Highland - Southbound	2: Peak AM (6am-10am)	99	105	6	6%
N Highland - Southbound	4: Peak PM (3pm-7pm)	105	110	5	5%

Note: Segment distance on study corridors is 0.63 miles.

Seattle, WA – Traffic Calming Program

Between 2007 and 2010, more than 54,000 traffic-related crashes occurred on Seattle's streets, where speed contributed to 42% of the city's fatal crashes. The Seattle Department of Transportation (SDOT) set a goal of zero traffic-related fatalities by 2030 in its 2012 Road Safety Action Plan. The agency identified speed reduction as one of the priority areas to reach that goal. As part of the speed reduction strategy, SDOT has made changes to the roadway environment. These include improving placement and visibility of speed limit signs, engaging neighborhood organizations and community associations in implementing SDOT's Arterial and Neighborhood Traffic Calming Programs, and upgrading speed-related signage in school zones. Preliminary evidence suggests that these speed reduction efforts are reducing crashes and improving traffic safety in Seattle.



BIKE LANES, ON-STREET PARKING & BUSINESS

Year 2 Report: A Study of Bloor Street in Toronto's Bloor West Village

tcat
toronto centre for active transportation

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Transport Canada Transports Canada

TORONTO COMMUNITY FOUNDATION

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Clean Air Partnership (CAP) is a registered charity that works in partnership to promote and coordinate actions to improve local air quality and reduce greenhouse gases for healthy communities. Our applied research on municipal policies strives to broaden and improve access to public policy debate on air pollution and climate change issues. Our social marketing programs focus on energy conservation activities that motivate individuals, government, schools, utilities, businesses and communities to take action to clean the air.

Foreword

By Eva Ligeti

Executive Director, Clean Air Partnership

It is with great pleasure that Clean Air Partnership presents the findings of our second study of Bike Lanes, On-Street Parking and Business.

Common public perception is that on-street parking is vital to business along Toronto's major arterials such as the Bloor-Danforth corridor, and that bike lanes and other infrastructure for active transportation will hurt commercial activity if introduced at the expense of parking. This perception is not born out by the two research studies we have conducted to date. Nevertheless it is often used as a justification for choosing not to make the changes to our streets that could provide greater space, comfort and increased safety for pedestrians and cyclists.

Our research demonstrates that bike lanes and other infrastructure for active transportation is a benefit to local commerce and support for active transportation infrastructure is high among both merchants and city residents.

As the City of Toronto moves forward with the implementation of its Bike Plan and Walking Strategy, and as communities work towards more complete streets that balance the needs of all roads users, we hope that this research sheds much needed light on perceptions and misconceptions about the contributions of bike lanes, pedestrians and on-street parking to the vitality of neighbourhoods along major arterial streets.

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Executive Summary

The reallocation of street use from on-street parking to active transportation infrastructure such as widened sidewalks or bike lanes has become a controversial issue in many cities over the past several decades. Opposition to such changes is often based on the assumption that on-street parking is vital to business and that removing on-street parking will decrease customer numbers and therefore commercial activity. However, cities are becoming increasingly interested in providing space for active transportation, citing the health, safety and environmental benefits as primary catalysts.

Bike Lanes, On-Street Parking and Business was conceived as a research study to investigate the attitudes of merchants to the reallocation of street use from on-street parking to active transportation infrastructure, to test assumptions about modal share and economic activity, and to gauge merchants' and residents' preferences for changes in street use allocation.

This report presents the findings of surveys of 96 merchants and 510 visitors in Bloor West Village. Among the findings:

- 4 out of 5 people surveyed do not usually drive to the area
- Merchants overestimated the percentage of people who drive to Bloor West Village and yet more than half of merchants surveyed believed that reducing on-street parking by 50% and adding a bike lane or widening sidewalks would either increase or have no impact on their daily number of customers
- People who arrive by transit, foot, and bicycle visit more often and report spending more money than those who drive
- People who preferred to see street use reallocated for widened sidewalks or a bike lane were significantly more likely to spend more than $100 per month than those who preferred no change.
- The majority of people surveyed (58%) preferred to see street use reallocated for widened sidewalks or a bike lane, even if on-street parking were reduced by 50%

In this neighbourhood, the majority of merchants predicted that reducing on street parking in favour of widened sidewalks or a bike lane would either not impact or increase their daily customer numbers, and therefore do not believe it will negatively affect commercial activity. The large percentage of visitors arriving by transit, bicycle or foot, combined with their spending habits and preference for widened sidewalks or a bike lane, suggests that changes in the use of street space may not necessarily have a negative impact on commercial activity. Both results contrast the common perception that removing on-street parking is "bad for business".

This study was conducted as a follow up to similar research conducted in the summer of 2008 in the Bloor Annex neighbourhood in Toronto. Overall support for changes in street use allocation was greater in the Bloor Annex neighbourhood than Bloor West Village. However in both neighbourhoods, the majority of merchants believed that changes to accommodate an increase in pedestrian or cyclist infrastructure would increase or would not change their daily number of customers.

In both neighbourhoods, walking is the dominant mode of travel (46% of the visitors surveyed in both study areas). Bicycling is more common in the Annex, and driving is more common in Bloor West Village. In terms of preferences in street use allocation changes, bike lanes are preferred over widened sidewalks in both neighbourhoods. In Bloor West Village, the preference of change to no change is almost equal, whereas in the Bloor Annex neighbourhood, surveyed visitors preferred change by a ratio of nearly 4 to1.

1. Introduction

Main streets in urban areas serve many different functions, and deciding on the best way to allocate space is a complex balancing act. Toronto's Bloor-Danforth corridor (Bloor Street and Danforth Avenue) is no exception. The Bloor-Danforth corridor is an east-west transportation artery stretching more than 20 kilometres that provides city residents and visitors with access to diverse neighbourhoods which are characterized by numerous businesses, schools and cultural institutions.

One of the current allocations of street space along the Bloor-Danforth corridor, and on most major arterials in downtown Toronto, is for on-street parking. While many merchants and city residents believe that on-street parking in commercial districts is vital to the economic success of business, there is a growing body of research to suggest that the importance of and desire for on-street parking has been overestimated. Moreover, removing sections of on-street parking would increase the amount of space available for active transportation infrastructure such as bike lanes and widened sidewalks.

The City of Toronto's Bike Plan (City of Toronto, 2001) and Walking Strategy (City of Toronto, 2009) are policy documents built upon the principle that encouraging residents to cycle and walk more often will contribute significantly to achieving Toronto's public health and greenhouse gas emission reduction targets and will improve the liveability of the City. "Achieving the vision will involve some difficult trade-offs, but will also yield significant environmental, economic, social equity and health benefits to individuals and to the City as a whole." (City of Toronto, 2001, 1-2).

An increase in the amount of space allocated for other forms of active transportation may also lead to increased comfort and safety for cyclists and pedestrians. According to the Toronto Bicycle/Motor-Vehicle Collision Study (2003), the most frequently reported type of bicycle/motor-vehicle collision in central Toronto involves a motorist opening a vehicle door into the path of a passing cyclist. Almost all cases of "dooring" occur on arterial roads in central Toronto that have high-turnover curb-side parking. The resulting injuries sustained are often more severe than other bicycle/motor vehicle collisions (City of Toronto, 2003)

The reallocation of street space to accommodate a bike lane and to increase the safety of cyclists may require the removal of some on-street parking. To date, many proposals to introduce a bike lane on major arterials such as College/Carlton Street and Annette Street, have met with opposition, sometimes by merchants who fear the loss of on-street parking spaces to a bike lane.

At the time of writing, the City of Toronto is proceeding with the implementation of the Bike Plan, and has issued a Request for Proposal (RFP) for a Bloor Street/Danforth Avenue Class Environmental Assessment Study for "the establishment of a new bikeway on Bloor Street and Danforth Avenue from Resurrection Road (west of Islington Avenue) to Kingston Road". It is timely, therefore, to conduct an investigation into the perceived importance of on-street parking to business and the preferences of both merchants and visitors for alternative street use allocations along major transportation corridors where bike lanes and other active transportation infrastructure are being considered.

In the summer of 2008, Clean Air Partnership conducted an assessment of the modal share and consumer behaviour of patrons, and the perceived importance and preferences for on-street parking in the Bloor Annex neighbourhood, a neighbourhood along the Bloor-Danforth corridor where the introduction of a bike lane would require the removal of sections of on-street parking on Bloor Street. The research revealed some surprising results: only 10% of patrons drive to the Bloor Annex neighbourhood; patrons arriving by foot and bicycle visited the most often and spent the most money per month; and 75% of merchants surveyed thought that a bike lane or widened sidewalk would improve or have no effect on business (Clean Air Partnership, 2009).

In the summer of 2009, Clean Air Partnership repeated the study, this time in Bloor West Village, another neighbourhood along the Bloor-Danforth corridor, about 6.5 kilometres west of Toronto's downtown core. In this case study, on-street parking on Bloor Street is provided in parking bays on the south side, and in a travel/parking lane on the north side. The width of Bloor Street in this area is sufficient to accommodate a bike lane without the removal of on-street parking, however travel lanes would be impacted. This second study continues to test the common assumption that merchants are opposed to changes in street use allocation that remove on-street parking because they perceive doing so will negatively impact their business. This study also contributes to understanding the travel patterns and street use preferences of merchants, visitors and residents along this important transportation corridor.

1.1 Study Purpose

The purpose of this study was two-fold: first to determine the current assumptions of merchants in Bloor West Village about the travel modes of their customers, and their perceptions of how changes in street use allocation might impact their business; and second, to determine the actual modal share and consumer behaviour of visitors and residents in Bloor West Village, and their preferences for changes in street use allocation such as widened sidewalks or a bike lane.

1.2 Study Description

This study was initiated as a follow-up to a 2008 research study in Toronto's Bloor Annex neighbourhood, which produced the report *Bike Lanes, On-Street Parking and Business: A Study of Bloor Street in Toronto's Annex Neighbourhood* (Clean Air Partnership, 2009). Data collection for this follow-up study involved two surveys, one for merchants and one for visitors. The survey design and administration followed a similar procedure as that used in the Bloor Annex neighbourhood study, which drew on 2006 research documenting the importance of various modes of transportation on Prince Street in New York City (Transportation Alternatives & Schaller Consulting, 2006).

The surveys were designed to collect data about:

a) the assumptions of Bloor West Village merchants about the modes of transportation used by their customers, and about the potential impact of changes in street use allocation to accommodate active transportation on their daily number of customers; and

b) the modes of travel that visitors in Bloor West Village usually use to access the area, their consumer behaviour in the neighbourhood, and their preferences for different types of street use allocations on Bloor Street in the area.

Additional data about merchants' business types and visitors' postal codes were also collected. On-street parking capacity and private parking capacity in Bloor West Village were estimated during a site visit in February 2010, and municipal pay-parking lot capacity data were retrieved from the Toronto Parking Authority's website.

1.3 Study Area: Bloor West Village

Clean Air Partnership's initial proposal to Transport Canada in 2007 recommended a two-part research study in one location, Bloor Street West in the Bloor Annex neighbourhood. The proposal was a before-and-after study design. Data collection in the first year would be similar to that outlined above. Assuming that the City would install a bike lane on Bloor St. in the interim, data collection in the second year would measure the differences in transportation modal share and would test perceptions about the impacts on business activity after the intervention. However, at the time of the second study, the City of Toronto had not yet installed a bike lane on Bloor Street, and therefore the impacts on businesses of a new bike lane could not be studied.

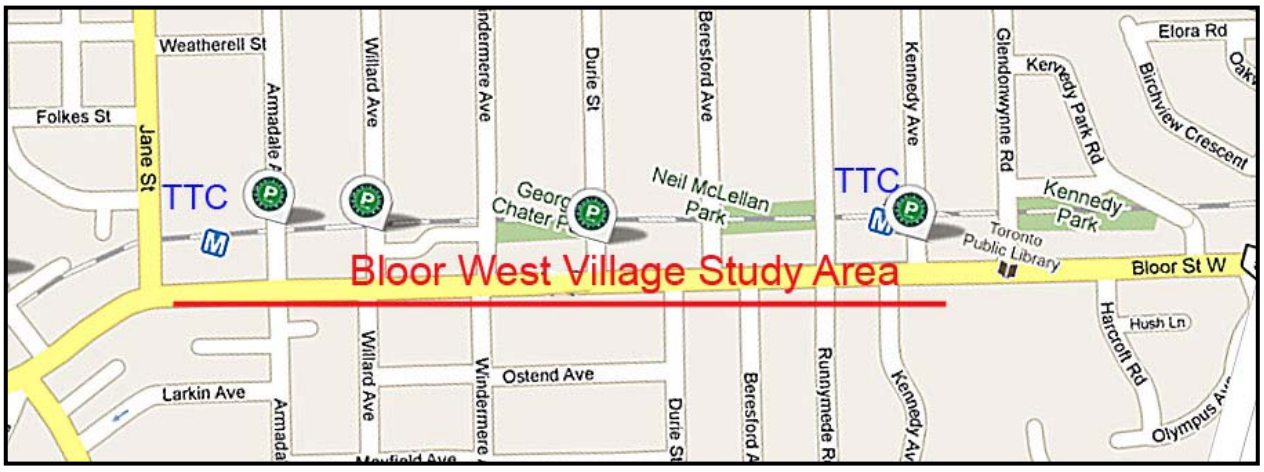
Consequently, Clean Air Partnership decided to replicate the first study in a new study area. The study team looked for a location with a comparable level of commercial activity to the Bloor Annex neighbourhood, similar on-street and off-street parking capacity, access to public transit, and pedestrian and cycling activity. This proved to be quite difficult as no single location stood out as ideal. Following deliberations among

advisory committee members and Clean Air Partnership staff, the Bloor West Village was selected as for the second study. The replication of the study enabled the testing of the prevalence and validity of the assumption that removing on-street parking is, or is perceived as, "bad for business" in a different context along a proposed route for a continuous bike lane.

The Bloor West Village study area was defined as the section of Bloor Street between Kennedy Avenue and Jane Street (Figure 1). This area is located in Toronto's Ward 13 (Parkdale-High Park), and straddles the High Park-Swansea and Runnymede-Bloor West Village neighbourhoods. The average household in Ward 13 is composed of 1-2 persons, with an average income of $97,091 (City of Toronto, 2006a). The travel habits reported by Ward residents involve a smaller percentage of work trips made by car than by Toronto residents as a whole (55% versus 62%), and greater percentage of work trips are made by public transit (38% versus 30%). However, Ward residents make the same percentage of non-work trips by car (71%) as the average Torontonian (City of Toronto, 2006a).

Described by the local Business Improvement Association as "A Small Village in a Big City", Bloor West Village is a diverse neighbourhood with Central and Eastern European immigrant roots. The street-level businesses are a mix of retail stores, services and restaurants.

Figure 1: Bloor West Village Study area, Green P Municipal Parking Lots and TTC Subway Stations, modified from Google Maps



The typical layout of Bloor Street in the study area is illustrated in Figure 2; from north to south it is composed of a sidewalk fronting the buildings, a westbound travel/parking lane, a westbound travel lane, an eastbound travel lane, an eastbound travel/parking lane, a parking bay (in some sections), and a sidewalk fronting the buildings. The typical street width (including the parking bays on the south side) is 16.5 metres.

Figure 2: Typical Bloor West Village Streets Layout, from Google Maps



The study area is located on Toronto's main east-west subway line. The Jane and Runnymede subway stations, and seven bus routes provide public transit access to the study area. According to a survey conducted by the City of Toronto Traffic Data Centre & Safety Bureau, prior to this study, the total 8-hour pedestrian volume entering and exiting the study area at the intersection of Bloor Street and Jane Street on Thursday June 25, 2009, was 3482 pedestrians.

Cycling infrastructure in the area surrounding the study area consists of a north-south bike lane on Runnymede Road north of Bloor, and shared roadway on Runnymede Road and Kennedy Avenue (Bikeway number 19) south of Bloor. There is currently no bike lane on Bloor Street in the study area. However, ring and post bicycle stands are installed along both the north and south sides of the street.

For those who drive to and park in the study area, Jane Street (north of Bloor Street), South Kingsway (south of Bloor Street), and Runnymede Road (north and south of Bloor Street) are the major north-south roads, and Bloor Street provides the major east-west access. As a major arterial road, Bloor Street is designed to carry an average daily motor vehicle traffic volume greater than 20,000 vehicles per day (City of Toronto, 2007). According to a survey conducted by the City of Toronto Traffic Data Centre & Safety Bureau, the total 8-hour vehicle volume through the intersection of Bloor Street and Jane Street on Thursday June 25, 2009, was 19,029 vehicles.

Parking infrastructure in the area consists of on-street parking in parking/travel lanes and parking bays, municipal pay-parking lots, side street parking and private parking in laneways, boulevards and private parking lots. On-street parking on the north side of Bloor Street is located in a travel/parking lane, requires payment during daytime hours, and is subject to rush hour restrictions from 4-6 pm. On-street parking on the south side of Bloor Street is located in parking bays and designated sections of the travel/parking lane, and requires payment during daytime hours. The maximum on-street parking capacity in the study area is approximately 100 spaces. Free one-hour parking between 10:00am and 10:00pm and 24-hour permit parking for neighbourhood residents is available on most of the side streets running north and south of Bloor Street. During a site visit in February 2010, researchers estimated that there are an additional 190 private parking spaces located in boulevards, alleys and adjacent to or behind buildings on Bloor Street in the study area. Researchers were unable to determine how these private parking spaces were allocated among ground floor businesses, upper floor businesses, and private residences.

Within the study area there are four municipal pay parking lots ("Green P" lots) which are managed by the Toronto Parking Authority (Figure 1), and one large private pay parking lot at the south-east corner of Jane St and Bloor St. The total capacity of the four municipal pay parking lots is 447 spaces, and the estimated capacity of the private parking lot is 50 spaces.

2. Methodology

2.1 Surveys

Data collection for this study employed two surveys administered over a ten day period, from July 20 through August 01, 2009: firstly a survey of ground level businesses along Bloor Street between Kennedy Avenue and Jane Street; and an additional survey of visitors walking on Bloor Street between Kennedy Avenue and Jane Street.

Surveyors from the University of Toronto were hired and trained to carry out the surveys. Merchant survey data collection took place Monday July 20 through Wednesday July 22, 2009. Visitor survey data collection took place Monday July 20 through Saturday August 01, 2009. The merchant and visitor surveys are included as Appendices A and B.

2.1.1 Merchant Survey

Surveyors approached 158 ground floor merchants located on both the north and south sides of Bloor Street between Kennedy Avenue and Jane Street during off-peak shopping/dining hours from July 20 through July 22, 2009. The surveyors were instructed to interview only the business owner or manager, and if neither were available, to inquire about an appropriate time to return. Surveyors made up to 2 visits to each business.

In total, 96 of the 158 ground floor merchants (60%) completed the survey. Of those who did not complete the survey, 30 refused and 32 were unavailable. Those who did not complete the survey included businesses that were closed during off-peak hours, closed for vacation, owners or managers who were unavailable or on vacation, owners or managers who were too busy, or who had English language barriers. The majority of completed surveys (85 of 96) were conducted on Monday July 20 and Tuesday July 21, 2009.

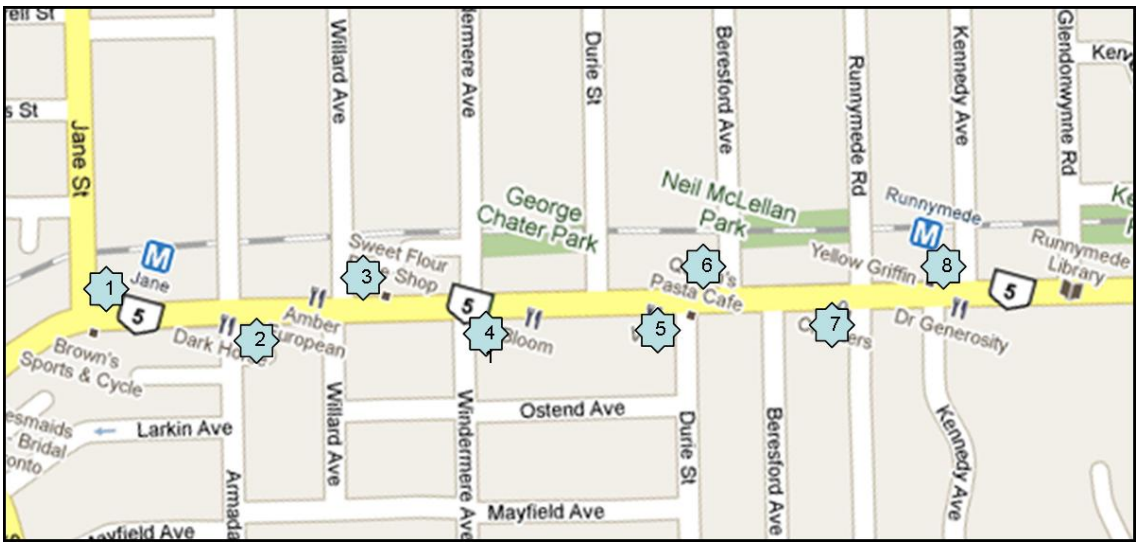
2.1.2 Visitor Survey

The visitor survey targeted people walking along Bloor Street between Kennedy Avenue and Jane Street (Figure 1) between the hours of 10:00am and 8:00pm, from July 20 through August 01, 2009. Eight locations were selected throughout the study location at which to intercept visitors (Figure 3). Surveyors were assigned one side (north or south) of Bloor Street and were instructed to rotate hourly among the 4 locations on that side. Some effort was made by the surveyors to approach a balance of different genders and ages. In total, 510 visitors were surveyed over the 10 day period.

Visitor surveys were conducted on eight weekdays and two Saturdays. Between 24 and 56 responses were completed on weekdays, with the exception of Thursday July 30 when 124 visitors completed the survey. On Saturday July 25, 2009, 45 visitors completed the survey, and 60 respondents completed the survey on Saturday August 1.

The distribution of the completed visitor surveys amongst the interception locations was relatively even, with no less than 8% (43) and no more than 16.5% (85) of the total number of responses gathered at each of the eight locations.

Figure 3: Bloor West Village Visitor Survey Intercept Locations, modified from Google Maps



2.2 Study Limitations

There were a few limitations to the data collection in this study. First, the study was conducted over a period of ten days in July, one of the most popular months for walking and cycling. While merchants and visitors were asked to estimate average or typical behaviour, there are potential seasonal variations in travel and consumer behaviour that may not have been captured in this study. Second, because visitors to the Bloor West Village were intercepted at street corners, visitors who drove and were able to park immediately in front of or behind their intended destination may not have been captured by the survey. This may lend a slight bias of the visitor survey towards visitors who did not drive. Third, unlike the Bloor Annex neighbourhood study, this study does not include an analysis of the use of on-street or municipal pay parking lots during the study period. Therefore, conclusions about the capacity of side street and pay parking lots to accommodate the demand for parking in the case of the removal of on-street parking were not made.

This study followed the protocol set forth in its predecessor study *Bike Lanes, On-Street Parking and Business*. One recommended improvement for future studies of this kind is to ensure that questions asked of merchants and visitors collect data that is more easily compared. For example, visitors should be asked to indicate not only their preference in street use allocation, but also how a reallocation would change their frequency of visits and the amount of money spent in the area.

3. Findings

3.1 Businesses in Bloor West Village

3.1.1 Business Types and Response Rate

Of the 158 businesses approached more than half were retail stores (91 of 158 or 58%), 24 (15%) were restaurant/bars, 27 (17%) were services, 10 (6%) were a combination of store and service, and 6 (4%) were a combination of restaurant and store (Table 1).

The distribution of completed merchant surveys (96) amongst the types of businesses reflects this composition; 62 (66%) of the completed surveys were from retail stores, 10 (10%) were from restaurants/bars, 11 (11%) were from services, 8 a combination of store and service, and 5 a combination of restaurant and store (Table 1).

Table 1: Response Rate by Merchant Type

Merchant Type	Total Number Approached	Total Survey Response	Response Percentage
Store	91	62	68%
Restaurant	24	10	42%
Service	27	11	40%
Store/Service	10	8	80%
Store/Restaurant	6	5	83%
Total	**158**	**96**	**100%**

3.1.2 Number of Weekday and Weekend Customers

Merchants were asked to estimate how many customers they served on weekdays and on weekend days. Almost 70% (64 of 93) of merchants reported that they served less than 100 customers on a weekday; just over 30% (29 of 93) reported that they served more than 100 on a weekday. Three merchants did not estimate weekday customer numbers (Table 2).

On the weekends, the number of customers served by each merchant generally increased and nearly 50% (41 of 91) of merchants reported that they served more than 100 customers on a weekend day. Five merchants did not estimate weekend customer numbers.

Table 2: Number of Customers Served, by Weekday and Weekend		
	Number of Merchants	
Number of Customers	Weekday	Weekend
<25	17	14
25-49	25	14
50-99	22	20
100-199	11	18
>200	18	25
Total	93	91

3.2 Merchant Perceptions of Customer Travel Behaviour

Merchants were asked to estimate the percentage of their customers that drive to, and park in, the Bloor West Village area. Nine merchants did not estimate their customers' travel behaviour.

According to the survey data, 69% of merchants (60 of 87) believe that 20% or more of their customers drive to and park in Bloor West Village and 31% of merchants (27 of 87) believe that 20% or less of their customers drive to and park in the Bloor West Village (Table 3).

Table 3: Merchant Estimates of % of Customers Who Drive to Bloor West Village		
Percentage of customers that drive to and park in Bloor West Village	Frequency	Percent share of response
0-20	27	31%
21-50	38	44%
51-75	11	13%
76-100	11	13%
Total	87	100%

3.3 Merchant Perceptions of the Impacts of Street Use Allocation Changes

Merchants were asked to project the impact of changes in the street use allocation, including the removal of half of the on-street parking, on their daily number of customers. In the Bloor West Village, the removal of on-street parking is not necessary in order to accommodate either a bike lane or widened sidewalks, making the framing of this question a 'worst-case' scenario consistent with the Bloor Annex neighbourhood study.

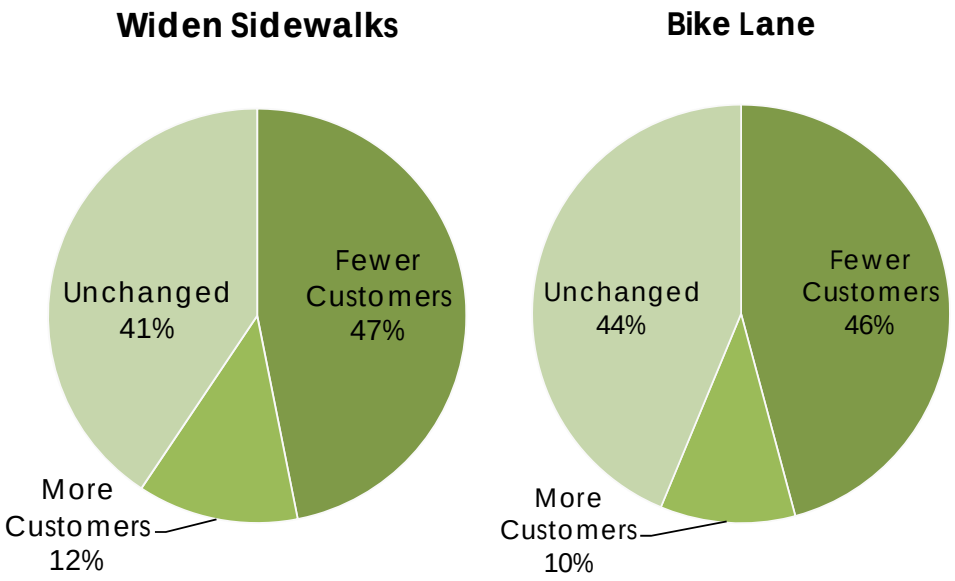
Merchants were also asked about the possible impact of including a bike lane on Bloor Street and reducing the on-street parking to half the current number of spaces. Of the merchants who completed the survey, 44% (42 of 96) believed there would be no impact on their daily number of customers, 10% (10 of 96) believed that they would see an increase in the daily number of customers, and 46% (44 of 96) believed they would experience a reduction in the daily number of customers. Therefore, more than half of merchants surveyed (54%) believed they would experience no change or an increase in their daily number of customers if a bike lane were added to Bloor Street in Bloor West Village (Figure 4).

Merchants were asked about the possible impact of widening the sidewalks and reducing the on-street parking to half the current number of spaces. Of the 96 merchants who completed the survey, 41% (39 of 96) believed that there would be no impact on their daily number of customers, 13% (12 of 96) believed that they would see an increase in the daily number of customers and 47% (45 of 96) believed they would experience a reduction in the daily number of customers. Therefore, more than half of merchants surveyed, 54% (51 of 96), believed they would experience no change or an increase in their daily number of customers if sidewalks were widened on Bloor Street in Bloor West Village (Figure 4).

3.4 Visitors in Bloor West Village

Between July 20 and August 1, 2009, 510 visitors in Bloor West Village completed the visitor survey. Visitors were asked to specifically identify where they lived, by postal code or major intersection. If respondents asked how the Bloor West Village was defined, the surveyors were instructed to describe it as Bloor Street between Kennedy and Jane Street. Of those surveyed, 358 (70%) reported that they lived or worked in the Bloor West Village area, and 152 (30%) reported that they did not live in the Bloor West Village area.

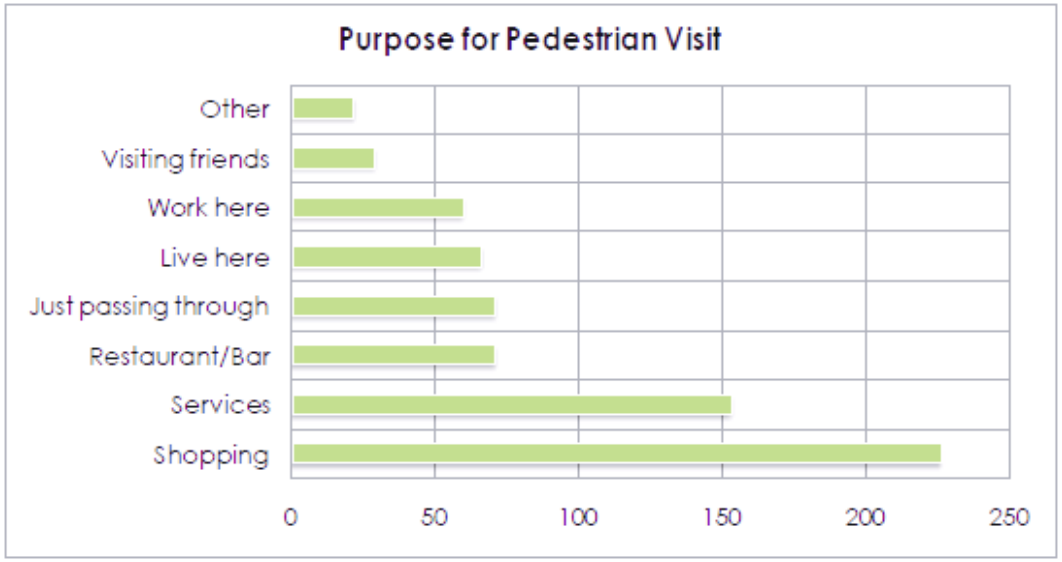
Figure 4: Merchants' Perception of the Impact on Business of Reduced Parking on Daily Number of Customers



3.5 Visitor Consumption and Travel Behaviour

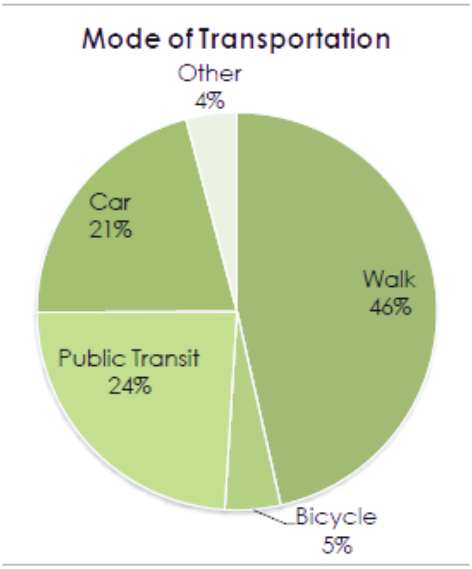
Visitors were asked the purpose(s) of their visit to Bloor West Village. The most common purpose of visit was shopping (226 responses), followed by services (153 responses), restaurants (71 responses), and 'just passing through' (71 responses) (Figure 5). In total, 88% of survey respondents (450 of 510) were in the Bloor West Village to purchase goods or services.

Figure 5. Visitor Survey Respondents' Purpose of Visit to Bloor West Village



Visitors were asked to generalize about their travel and consumption habits in Bloor West Village, and were then asked how they usually get to Bloor West Village. For the most part, the visitors surveyed do not usually drive to Bloor West Village; 46% (237 of 510) reported that they usually walk, 24% (122 of 510) take public transit, and 5% cycle (23 of 510). Only 21% (107 of 510) reported that their usual mode of transportation to Bloor West Village was by car (Figure 6).

Figure 6. Transportation Mode Share of Visitor Survey Respondents in Bloor West Village



Visitors were asked to estimate how many days in a typical month they visited Bloor West Village. Overall, 69% (350 of 510) of visitors surveyed reported visiting Bloor West Village more than once per week; 31% (160 of 510) visited up to once per week. In a typical month, 30% of visitors surveyed visited Bloor West Village daily (Table 4). A chi-square analysis was performed, revealing that visitors who usually do not drive to Bloor West Village are significantly more likely to visit the area 3 times or more per week than those who usually drive ($p<0.000$).

Table 4: Frequency of Visits to Bloor West Village

Visits per month	Usually Drive	Usually Do Not Drive	Total Number of Responses
Up to once per week	57	103	160
2-3 times per week	28	67	95
3-5 times per week	16	87	103
Daily	6	146	152

Visitors were asked how they usually get to Bloor West Village. Overall, the most common mode of transportation for visitors who responded to the survey was walking (47%), followed by public transit (24%), and by car (21%) (Table 5).

Table 5: Typical Travel Mode to Bloor West Village		
Travel Mode	**Frequency**	**Percentage of Responses**
Walk	237	47%
Bicycle	23	4%
Public Transit	122	24%
Car	107	21%
Other	21	4%
Total	**510**	**100%**

Visitors were asked to estimate how much money they spent in Bloor West Village in a typical month. Two respondents did not answer the question. The majority of survey respondents (296 of 508 or 58%) estimated that they spend over $100 per month, and 42% (221 of 508) estimated that they spend less than $100 per month (Table 6).

Table 6: Estimated Monthly Spending in Bloor West Village		
Estimated Monthly Spending	**Frequency**	**Percentage of Responses**
Less than $25	82	16%
$26-99	130	26%
$100-499	244	48%
More than $500	52	10%
Total	**508**	**100%**

The travel mode survey data were combined into 2 categories: visitors who drive and therefore are likely to require parking, and those who do not drive to Bloor West Village. The estimated monthly spending data were also combined into two categories: less than $100 per month and more than $100 per month (Table 7). A chi-square analysis was performed, revealing that visitors who usually do not drive to Bloor West Village are significantly more likely to spend more than $100 in a month than those who usually drive ($p<0.000$).

Table 7: Monthly Spending by Travel Mode		
Estimated Monthly Spending	**Usually Drive**	**Usually Do Not Drive**
Less than $100	66	40
More than $100	146	256

3.6 Visitor Preferences for Street Use Allocation Changes

Visitors were asked to indicate which, if any, changes in street use allocation on Bloor Street they would prefer in Bloor West Village. Visitors were given the choice of widened sidewalks on Bloor Street, a bike lane on Bloor Street, or no change. In order to be consistent with the Bloor Annex neighbourhood study, visitors were informed that either change would require the removal of half of the on-street parking. However, it should be noted that the Bloor West Village section of Bloor Street would be able to accommodate either widened sidewalks or a bike lane, without the removal of any on-street parking, although peak hour traffic lanes would be impacted.

Overall, given the choice between no change and an expansion of pedestrian or cyclist infrastructure (with reduced parking), 58% of survey respondents (293 of 509) preferred changes to be made. Of the 509 visitors who answered the question, 15% (75 of 509) preferred widened sidewalks, 43% (218 of 509) preferred a bike lane, and 42% (216) preferred no change (Figure 7).

Figure 7: Visitor Survey Respondents Preferences in Changes to Street Use Allocation

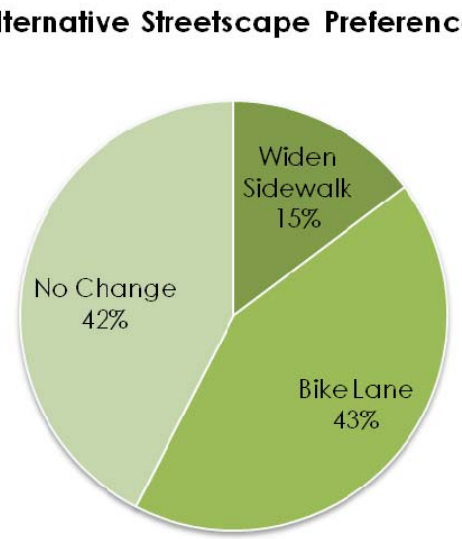


Table 8 presents visitors' preferences for change according to usual travel mode. Of those visitors who reported walking to Bloor West Village, 15% indicated that they would prefer widened sidewalks, 43% would prefer a bike lane, and 42% would prefer no change. Of those who bicycle, 91% indicated that they would prefer a bike lane and only 2 reported that they would prefer no change.

Of those who reported taking public transit, 16% indicated they would prefer wider sidewalks, 43% would prefer a bike lane and 41% would prefer no change.

Of those who reported that they usually drive to Bloor West Village, nearly half (48%) stated that they would prefer to see a more pedestrian- or cyclist- oriented street, in spite of the fact that they were told that this choice would remove half of the on-street parking.

Table 8: Travel Mode by Preferences in Changes to Street Use Allocation

	Widen Sidewalks	New Bike Lane	No Change
Walk	35	102	99
Bicycle	0	21	2
Public Transit	20	52	50
Car	15	36	56
Other	5	7	9
Total	**75**	**218**	**216**

The travel mode survey data were combined into 2 categories: visitors who drive and therefore are likely to require parking, and those who do not drive. The street use allocation preference data were also combined into two categories: widen sidewalk or new bike lane, and no change (Table 9). A chi-square analysis was performed, revealing that visitors who usually do not drive to Bloor West Village are significantly more likely to prefer widened sidewalks or a new bike lane than those who usually drive ($p=0.02$).

Table 9: Preference in Change to Street Use Allocation by Travel Mode

Preference in Changes to Street Use Allocation	Usually Drive	Usually Do Not Drive
Widen sidewalks or new bike lane	51	242
No change	56	160

The estimated monthly spending data of the travel mode groups was compared with the preferences for street use allocation changes (Table 10). A chi-square analysis was performed, revealing that visitors who usually spend more than $100 per month in the Bloor West Village are significantly more likely to prefer widened sidewalks or a new bike lane than those who usually drive (p=0.037).

Table 10: Preference in Change to Street Use Allocation by Estimated Monthly Spending

Preference in Changes to Street Use Allocation	Less than $100 per month	More than $100 per month
Widen sidewalks or add bike lane	110	183
No change	101	115

4. Discussion

4.1 Merchant Perceptions versus Reported Travel Modes of Visitors

One of the interesting findings of this study is the difference between merchant perceptions of their customer travel modes and the travel modes reported by visitors in the neighbourhood. According to the visitor survey data, nearly 80% of visitors to Bloor West Village do not usually drive to Bloor West Village. Only 21% of those surveyed reported that they usually drive, and yet most of the merchants believe the opposite; the majority of merchants who responded to the survey, 69%, believed that more than 20% of their customers drove to Bloor West Village.

As noted earlier, some visitors may be able to find parking immediately in front of or behind the stores or offices they are visiting, and therefore may not have been intercepted by the surveyors. However, the visitor intercepts were conducted at the intersections nearest to 3 of the 4 municipal pay parking lots in the study area with the explicit goal of including those visitors who drove to the area in the survey.

4.2 Merchant versus Visitor Preferences in Street Use Allocation Changes

Although merchants and visitors were not asked precisely the same questions about their preferences in street use allocation changes, some generalization based on merchants' perceptions of the impact of street use allocation changes and visitor preferences can be made.

Almost 60% of visitors preferred street use reallocation to create a more pedestrian- or cyclist- oriented street. Merchants, on the other hand, were not explicitly asked about their preferences with respect to changes in street use allocation. However, more than 50% of merchants believed that changes to the street use allocation in favour of a bike lane or widened sidewalks would result in no change or an increase in their daily number of customers. It is reasonable to infer that merchants would support changes in street use allocation that would result in an increase or no change in their daily number of customers, particularly if they were informed that the majority of their customers also supported such changes.

The majority of visitors who indicated a preference for a change in street use allocation, preferred bike lanes over widened sidewalks. Merchants, however, anticipated similar impacts from either a bike lane or widened sidewalks on their daily number of customers, indicative of no preference between the two choices.

4.3 Comparison with Bloor Annex Neighbourhood Study (2008)

This study was conducted as a follow up to similar research conducted in the summer of 2008 in the Bloor Annex neighbourhood in Toronto. The two study areas are notably different in terms of streetscape and characteristics of the local population. In the Bloor Annex neighbourhood, the width of Bloor Street is typically 12.2 metres, and on-street parking is provided during off-peak hours in the curb side travel lane. Reallocating street use for widened sidewalks or a bike lane in this section of Bloor Street would require the removal of some on-street parking. However, in the Bloor West Village, the width of Bloor Street is typically 16.5 metres, and on-street parking is provided during off-peak hours in the curb side travel lane on the north side, and in curb side parking bays on the south side. Widening sidewalks or adding a bike lane would not necessarily require the removal on on-street parking, although in order to maintain parking, travel lanes would be impacted.

The population characteristics of the two Wards in which the study areas are located are also different. Average household income, percentage of work and non-work trips made by automobile are higher in Ward 13 which includes Bloor West Village, and household density is lower (City of Toronto, 2006a,b)

A summary of similarities and differences of merchant and visitor survey results is presented in Tables 11 and 12.

Overall support for changes in street use allocation was greater in the Bloor Annex neighbourhood than Bloor West Village. However in both neighbourhoods, the majority of merchants believed that changes to accommodate an increase in pedestrian or cyclist infrastructure would increase or would not change their daily number of customers.

A smaller percentage of Bloor West Village merchants expected that the removal of on-street parking in order to widen sidewalks or to add a bike lane would increase their daily number of customers than in the Annex neighbourhood. This difference is not unexpected, given that 25% of Bloor West Village merchants believe that more than 50% of their customers drive to the area, as compared to only 4% of Annex merchants.

A few differences and similarities between the results of the visitor surveys conducted in the two neighbourhoods stand out (Table 12). First, in both neighbourhoods, walking is the dominant mode of travel (46% of the visitors surveyed in both study areas). Bicycling is more common in the Annex, and driving is more common in Bloor West Village.

Table 11: Comparison of Annex and Bloor West Village Merchant Perceptions of the Impacts of Street Use Allocation Changes on Number of Customers Served (reported as percent merchant response)		
	Annex	**Bloor West Village**
Number of Completed Surveys	61	96
Widen Sidewalks		
Increase Customers	35%	13%
No Change	40%	41%
Decrease Customers	25%	46%
Bike Lane		
Increase Customers	30%	11%
No Change	44%	44%
Decrease Customers	25%	46%

In terms of preferences in street use allocation changes, bike lanes are preferred over widened sidewalks in both neighbourhoods. In Bloor West Village, the preference of change to no change is almost equal, whereas in the Bloor Annex neighbourhood, surveyed visitors preferred change by a ratio of nearly 4 to1.

Table 12: Comparison of Annex and Bloor West Village Visitor Survey Results (reported as percent response)		
	Annex	**Bloor West Village**
Number of Surveys	538	510
Live or Work in Area		
Yes	55%	70%
No	45%	30%
Mode of Travel		
Walk	46%	46%
Bicycle	12%	5%
Public Transit	32%	24%
Car	10%	21%
Preferences in Changes to Street Use Allocation		
Widen Sidewalks	16%	15%
Bike Lane	62%	43%
No Change	22%	42%

5. Conclusions and Recommendations

This study was initiated to understand the current assumptions of merchants in the Bloor West Village about the travel modes of their customers and the potential impacts of changes in street use allocation on their businesses, and to determine the actual modal share and consumer behaviour of visitors and residents of Bloor West Village, and their preferences for changes in street use allocation such as the addition of a bike lane or the widening of sidewalks.

The data presented in this report indicate that in the Bloor West Village neighbourhood there is both visitor/resident and merchant support for changes in street use allocation to support active transportation such as installing a bike lane or widening sidewalks, and that the removal of half of the on-street parking to accommodate such changes would be unlikely to negatively impact commercial activity.

The dominant mode of transportation in the Bloor West Village is walking, followed by public transit. Only 1 in 5 of visitors surveyed reported driving to the neighbourhood and parking there. The visitor survey data indicate that the majority (58%) support changes to the street use allocation. Curiously, cycling is the least frequent mode of transportation in this neighbourhood, and yet nearly 75% of those visitors who preferred a change in street use allocation would prefer the addition of a bike lane.

Visitor survey respondents who reported that they usually drive, were found to visit less frequently and spend significantly less money per month in the neighbourhood than those who did not drive. Visitors who preferred changes in street use allocation spend significantly more in the neighbourhood than those who prefer no change.

In terms of merchant perceptions of the impacts of changes in street use allocation, 54% of merchants in Bloor West Village indicated that they would expect no change or an increase in their number of daily customers as a result of either a bike lane or widened sidewalks, even if half of the on-street parking were to be removed in order to accommodate the changes.

The results of this study, combined with the results of the previous study in the Bloor Annex neighbourhood, suggest that the assumption that reducing on-street parking to accommodate active transportation is "bad for business" may not be true for at least two different neighbourhoods along the Bloor-Danforth corridor.

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ID #

Appendix A – Merchant Survey

1. On average, about how many customers do you serve per day? (Choose one per question)

(1) Weekday:	(2) Weekend:
☐ [1] Less than 25	[1] Less than 25
☐ [2] 25-49	[2] 25-49
☐ [3] 50-99	[3] 50-99
☐ [4] 100-199	[4] 100-199
☐ [5] 200 or more	[5] 200 or more

3. What percentage of your customers or clients would you estimate drive to the Bloor West Village area and park in the area?

[1] ____%

4. If Bloor Street had wider sidewalks and half the on-street parking was removed, would you expect to have: (choose one)

☐ [1] Fewer customers or clients daily?

☐ [2] More customers or clients daily?

☐ [3] A similar number of customers or clients daily?

5. If Bloor Street had a bike lane and half the on-street parking was removed, would you expect to have: (choose one)

[1] Fewer customers or clients daily?

[2] More customers or clients daily?

[3] A similar number of customers or clients daily?

Appendix B – Pedestrian Survey

1. Do you live or work in the area?

- [1] Yes
- [2] No

2. In a typical month, how many days do you visit this area of Bloor Street?

_____

3. About how much money do you spend in Bloor West Village in a typical month?

- [1] Less than $25
- [2] $25-99
- [3] $100-499
- [4] $500-999
- [5] $1,000 or more

4. What is the purpose of your trip to the Bloor West Village today? (Check all that apply)

- [A] Shopping
- [B] Restaurant/Bar
- [C] Services (e.g., copy centre, medical or legal)
- [D] Visiting friends
- [E] I live here
- [F] I work here
- [G] I'm just passing through
- [H] Other _____

5. How do you usually get to the Bloor West Village? (choose one)

- [A] Walk
- [B] Bicycle
- [C] Public Transit
- [D] Taxi
- [E] Car: Where did you park? [intersection/block or Green P lot] _____
- [F] Other _____

7. If the City was considering changes to the street, which of the following would you prefer? (choose one only)

- [1] Widened sidewalks on Bloor Street even if that means less on-street parking;
- [2] A bike lane on Bloor Street even if that means less on-street parking.
- [3] No change

8. Where do you live?

- [A] Nearest intersection_____
- [B] Postal Code _____

Date: _____, 2009

Time: ___:___

Survey Location Number: _____

Interviewer: _____

ECONOMIC IMPACTS OF BICYCLE AND PEDESTRIAN STREET IMPROVEMENTS

OVERVIEW

This research project explores the economic impacts of bicycle and pedestrian street improvements in the United States using multiple data sources and analytical approaches. Building on studies in New York City and San Francisco, researchers examined before-and-after data for street improvements on 14 corridors in six cities: Indianapolis, Memphis, Minneapolis, Portland (OR), San Francisco, and Seattle.

WHY DO THIS STUDY?

To make cities more livable and in response to growing concerns over climate change and rising social inequality, cities across the country are promoting active transportation, and advocates are arguing for robust bicycle and pedestrian infrastructure. While studies have shown how such upgrades improve traffic safety, quality of life, and mobility for city residents, the question remains how such infrastructure improvements affect economic outcomes.

A frequent argument against bicycle and pedestrian infrastructure improvements is the concern that bike lanes could discourage customers and reduce revenues.

In 2013, the New York City Department of Transportation commissioned a first-of-its-kind study prepared by Bennett Midland, using sales tax data to evaluate the economic effects of street improvements, examining 7 improved corridors and 19 control corridors in three boroughs.[1] The study found "convincing evidence that improved accessibility and a more welcoming street environment created by these projects generate increases in retail sales in the project areas." In 2014, the San Francisco Municipal Transportation Agency used a similar methodology focused on sales tax data to conclude that "streetscape improvements are associated with improved economic performance for the locations studied."

This current study builds on past work by examining additional cities and incorporating new research methods and data sources.

WHAT DID WE STUDY?

For the 14 corridors that received active transportation street improvements, as well as 14 control corridors for comparison, we looked at before-and-after metrics related to business activity. We examined data on retail and food sales, as well as retail and food service employment and wages. We excluded businesses that are specifically geared toward cars, such as gas stations, and concentrated rather on the types of business establishments that could be frequented by any type of road user.

WHAT DID WE LEARN?

This study provides policymakers and planners with a robust analytical framework and evidence to support non-motorized transportation infrastructure investment. Overall, the study found very little evidence of active transportation street improvements having a negative impact on business or economic outcomes. In many cases, improved bicycle and pedestrian infrastructure was shown to have positive impacts on sales and employment in the retail and food service sectors.

IN GENERAL WE FOUND:

- ***Street improvements had either positive or non-significant impacts on corridor employment and sales.***
- ***The food service industry seems to benefit the most from the addition of active transportation infrastructure. Even in cases where a motor vehicle travel lane or parking was removed to make room for a bike lane, food sales and employment tended to go up.***
- ***The retail industry benefits somewhat from the addition of active transportation infrastructure. In nine of our 14 case studies, retail sales and/or employment were positively impacted by the street improvements. Two case studies showed no impact, and three of the case studies generated mixed results, with some positive and some negative impacts on retail. Further study is needed to isolate causes and effects of these impacts.***

1. To view the 2013 New York City Department of Transportation study prepared by Bennett Midland, using sales tax data to evaluate the economic effects of street improvements, visit: http://www.nyc.gov/html/dot/downloads/pdf/dot-economic-benefits-of-sustainable-streets.pdf

OUR APPROACH

We used a variety of data sources and analysis methods to address the challenges of conducting research in this field. Each of our data sources includes variables that represent a different element of economic activity, such as **wages, employment, and sales tax receipts from nearby businesses**. These are all components of business activity, but they can shift or grow in different ways depending on the situation.

For example, an increase in sales revenue could be interpreted in two different ways.

1. An increase in the number of people shopping and buying in the establishment, resulting in greater overall sales volume.

2. An increase in the price of each product sold, potentially due to rising lease costs, rather than increased consumer activity.

Similarly, while data on employment and wages is a strong indicator of economic activity in the long term, it is not an effective measure of immediate shifts in consumer activity, which can be affected by changes in travel patterns, like street improvements.

By using several different data sources and analytic approaches, we sought to counteract these challenges and provide a holistic picture of the complex dynamics of business activity. For the same reason, we did our analysis in six cities rather than just one, in the hopes of uncovering some more or less "universal" trends among the complexity.

MULTIPLE DATA SOURCES:

We examined before-and-after effects of each street improvement using:

- ***LEHD (longitudinal employer-household dynamics) employment data***
- ***QCEW (Quarterly Census of Employment and Wages) employment and wages data***
- ***NETS (National Establishment Time Series) employment and sales data***
- ***Retail sales tax data***

MULTIPLE ANALYTIC METHODS:

We used three different methods of econometric analysis to understand the impacts of street improvements on retail and food service sales, employment, and neighborhood economics. For more detail on how these methods worked, refer to our final report. The three methods were:

- ***Aggregated trend analysis***
- ***DID (Difference-in-difference) analysis***
- ***ITS (Interrupted time series) analysis***

RESULTS SUMMARY: *NATIONAL STREET IMPROVEMENT STUDY*

KEY:

- POSITIVE, SIGNIFICANT IMPACT
- NO SIGNIFICANT IMPACT
- NEGATIVE, SIGNIFICANT IMPACT
- Motor vehicle travel lane(s) reduced
- On-street parking removed
- On-street parking removed
- New bike infrastructure
- New pedestrian infrastructure

IMPROVEMENT TYPE		KEY FINDINGS
INDIANAPOLIS		
MASSACHUSETTS AVENUE (2009)		
	RETAIL	While growth in retail employment and sales revenue was observed in the years following the construction of the protected bike lane on Massachusetts Avenue, we are unable to calculate pre- and post-construction growth rates due to zero retail employment in some of the years. However, the DID and ITS approaches both indicate that the bike lane installation **did not significantly impact retail employment, either positively or negatively**, along this corridor.
	FOOD SERVICE	**Significant positive impact on food services employment** following protected bike lane construction, indicating an improvement in business vitality. Food services employment growth significantly outpaced growth in Indianapolis as a whole.
VIRGINIA AVENUE (2009)		
	RETAIL	Bike lane installation **did not significantly impact retail employment, either positively or negatively.**
	FOOD SERVICE	The corridor shows significant and **substantial growth in all food service industry metrics**—employment, sales, and wages—indicating a positive effect on business vitality following the street improvements.
MEMPHIS		
MADISON AVENUE (2011)		
	RETAIL	**Positive and statistically significant improvement in retail sales.** A slight increase in retail employment after the 2011 installation was followed by decreases in retail employment. Madison performed worse than two of the three control corridors and worse than city-wide, indicating that the street improvement on Madison may have had a **negative impact on retail employment.**
	FOOD SERVICE	**Significant positive impact on food employment:** After bike lane installation, food employment dropped significantly in level, but dramatically recovered & surpassed previous levels over the next two years.
BROAD AVENUE (2010)		
	RETAIL	Contradictory data patterns: Some sources show increase in retail sales and employment, but **results are not conclusive.**
	FOOD SERVICE	**Strong positive impact on food employment,** supported by the aggregated trend analysis and ITS estimation results across both the LEHD and QCEW employment data sources.

IMPROVEMENT TYPE		KEY FINDINGS
MINNEAPOLIS		
CENTRAL AVENUE (2012)		
	RETAIL	**Retail employment increased:** The ITS approach shows a positive growth trend from the bike lane construction using LEHD data and QCEW wages data.
	FOOD SERVICE	**Dramatic increase in restaurant sales, along with increase in food service employment** following installation (confirmed by both trend analysis and the ITS approach).
FRANKLIN AVENUE (2011)		
	RETAIL	Retail employment and total wages in the retail sector appear to be growing at a faster pace in the improvement corridor, possibly indicating a shift in the type of retail businesses in the area. However, evidence from the ITS approach shows a **statistically non-significant causal relationship** between bike lane installation and employment growth.
	FOOD SERVICE	**Food employment greatly increased** two years after bike lane installation, exceeding the growth rate of both the control corridor and greater city trends.
RIVERSIDE AVENUE (2009)		
	RETAIL	LEHD data analysis shows increase of retail service employment, but the ITS approach suggests that this increase is because of economic growth in the region and not because of the street improvement. Retail service-related sales dropped while restaurant sales grew. We suspect a shift from retail business toward more food service businesses after the street improvement. **Given mixed results, analysis was inconclusive.**
	FOOD SERVICE	Restaurant sales increased and food service employment grew, but rigorous econometric approaches indicate that these increases may not be caused directly by the street improvement on this corridor. Given mixed results, the analysis was inconclusive.
LYNDALE AVENUE SOUTH (2008)		
	RETAIL	**All three approaches indicate a significant positive impact on retail sales in the improvement corridor.**
	FOOD SERVICE	**Food service employment increased gradually after the street improvements.**
NORTH SECOND STREET (2011)		
	RETAIL	**No causal impact of bike lane construction on retail employment.** The corridor saw a **dramatic jump in retail sales** immediately after bike lane installation, indicating a positive impact of bike lanes on retail sales. However, the great jump could also be related to other one-time changes, such as a large new store opening. **Further investigation needed.**
	FOOD SERVICE	**Positive and significant impact of bike lane installation on food employment.**

RESULTS SUMMARY: *NATIONAL STREET IMPROVEMENT STUDY*

IMPROVEMENT TYPE		KEY FINDINGS
SAN FRANCISCO		
POLK STREET CORRIDOR (2000, 2009)		
	RETAIL	NETS data and retail sales data analysis consistently indicate **positive significant impacts of the Polk Street corridor street improvement on retail employment and sales**, while analysis of LEHD data **did not yield significant results.**
	FOOD SERVICE	Analysis consistently reveals **positive significant impact of the street improvement on food sales** tax receipts when compared with the Van Ness Avenue control corridor.
17 STREET (2011)		
	RETAIL	Analysis of the NETS and LEHD data showed slightly different results. We generally find that there were either **positive impacts** or **non-significant impacts** of the bike lane installation on retail service employment and sales on 17th Street.
	FOOD SERVICE	Analysis of the NETS and LEHD data showed slightly different results. We generally find that there were **negative or no impacts** on food services.
SEATTLE		
SECOND AVENUE (2014)		
	RETAIL	We can conclude that the protected two-way bike lane **positively contributed to higher employment and improved business vitality in the retail sector** on the Second Avenue corridor.
	FOOD SERVICE	For the food services sector; analyses indicate that the protected bike lane **did not have a statistically significantly impact.**
BROADWAY (2014)		
	RETAIL	The data show **retail employment growth** after the street improvement, but ITS analysis indicates this could be the result of a continuous pattern of growth along Broadway and **not necessarily an impact of the protected bike lane.**
	FOOD SERVICE	The protected bike lane on Broadway triggered a **significant employment increase in the food services industry** after installation, indicating an improvement in business vitality as a result.
PORTLAND		
STARK & OAK CORRIDOR (2009)		
	RETAIL	Aggregated trend analysis and ITS analysis of QCEW and NETS data all consistently show that the street improvement on the Stark and Oak corridor had **positive and significant impacts on retail employment and sales revenue.**
	FOOD SERVICE	Three data sources indicated either no impact or positive impacts on employment and sales in the food services sector. Analysis of the LEHD data showed **no impact of the street improvement on food employment.**

REPLICATE THIS STUDY IN YOUR CITY

For those interested in exploring economic outcomes in their own city, we hope the methodology we have developed will prove helpful. Street-facing businesses are the entities most directly affected by active infrastructure improvements. By focusing on corridor-level economic evaluation, it is possible to capture the most direct economic impacts of street improvement.

The first step is selecting street improvement corridors that are located in business districts as treatment corridors, and corresponding control corridors that are similar to treatment corridors except for the street improvement. The selection process can be data-driven or guided by local experts with knowledge and understanding of regional conditions. In our project, with the exception of San Francisco and Portland, city partners participated in the project to choose the corridors and give other input.

Choosing data sources can be complex and depends on the availability of data and the limitations of your project. To understand trends in employment and retail sales in tightly defined geographic areas, retail sales tax data would be the most appropriate data source, when available. See the "data" section of the final report for further considerations.

Selecting an analytic approach: In general, we found that the ITS analysis provided more robust results than the other approaches. However, this approach generally requires more data points post-intervention to achieve meaningful and valid impact estimations. Depending on your needs and scope, other methods may serve best. A detailed discussion of the tradeoffs and limitations of each analytic method can be found in our final report.

For more detailed information about how to replicate this study in your city, please find a guidebook by PeopleForBikes here [add final link.]

ABOUT THIS PROJECT

This report is part of a National Street Improvements Study by Portland State University, Bennett Midland, and PeopleForBikes, with generous support from the Summit Foundation and the National Institute for Transportation and Communities.

PeopleForBikes is leading a movement to make riding better for everyone. By collaborating with millions of individual riders, businesses, community leaders, and elected officials, PeopleForBikes has created a powerful, united voice for bicycling and its benefits.

Portland State University is home to the Toulan School of Urban Studies and Planning, the nation's oldest continuously operating program in urban studies. PSU is also home to the Transportation Research and Education Center (TREC), an interdisciplinary center that houses the National Institute for Transportation and Communities (NITC).

Bennett Midland is a management consulting firm that works exclusively in the civic sector. In 2013, Bennett Midland prepared a first-of-its-kind study for the New York City Department of Transportation using sales tax data to evaluate the economic effects of street improvements, examining 7 improved corridors and 19 control corridors in three boroughs.[2] The study has been cited for its original methodology and its implication for city planning nationwide.

This project is sponsored in large part by **The Summit Foundation** - a private family foundation, who seeks to promote the health and well-being of the planet – its people and its natural environment – by achieving gender equality, protecting the earth's biodiversity and making cities livable.

2. To view the 2013 New York City Department of Transportation study prepared by Bennett Midland, using sales tax data to evaluate the economic effects of street improvements, visit: http://www.nyc.gov/html/dot/downloads/pdf/dot-economic-benefits-of-sustainable-streets.pdf

peopleforbikes | BENNETTMIDLAND | Portland State UNIVERSITY | THE SUMMIT FOUNDATION



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Cycling Cities | ITDP | Institute for Transportation & Development Policy

Making the Economic Case for Cycling



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Introduction



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Introduction

"Riding bicycles will not only benefit the individual doing it but the world at large."



— Udo E. Simonis,

economist and global environmental policy advocate

Unlocking economic benefits of cycling

Cycling has significant economic benefits—for individuals, cities, and society—and functions as a low-cost, high-yield, scalable solution to climate and equity issues. Investments in cycling infrastructure also create jobs and opportunities to expand existing industries or develop new ones. While many cities have seen firsthand the benefits of investing in infrastructure and other street design improvements that support safe, direct, and connected cycling trips, other cities are not convinced that such investments yield enough economic value to equal or exceed the upfront costs. In this brief, we make the economic case for cycling and demonstrate how investments in cycling infrastructure are the key to unlocking economic and other benefits.



In Part 1, we explore how a larger share of trips made by bicycle reduces costs for individuals and society and can generate revenue for cities. We also analyze how increased demand for bicycles and cycling trips creates jobs and economic opportunities. In Part 2, we discuss the type and scale of investment needed to maximize the economic benefits of cycling.

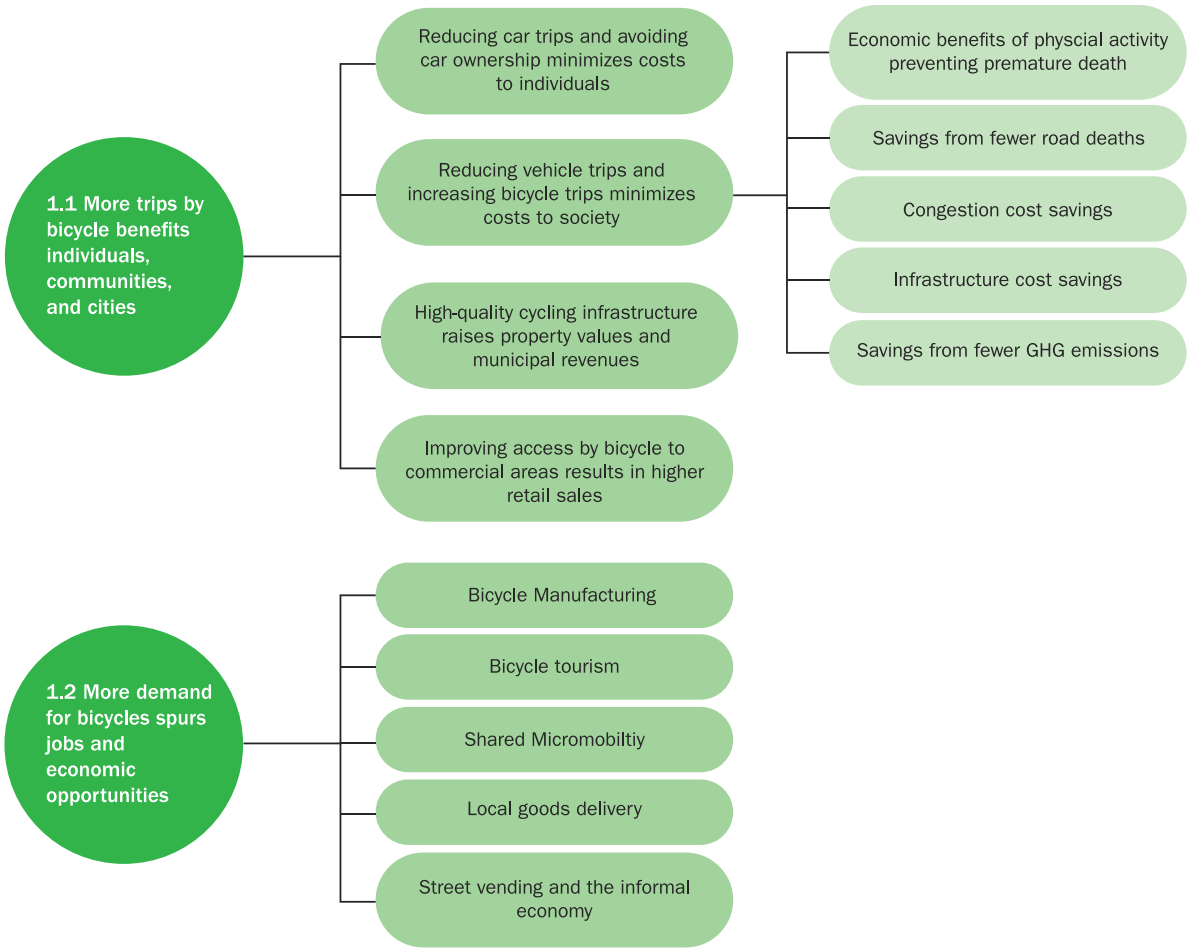
Why now?

The Sixth Assessment Report of the United Nations Intergovernmental Panel on Climate Change (IPCC), released in August 2021, emphasizes the need for a large-scale system change in how people around the world travel in order to reduce the extreme consequences of climate change. This system change would mean reducing reliance on fossil fuels in the transportation sector to zero. There are indeed technology-based solutions that can support this transition, including electrification of private and public vehicles. However, these solutions are not yet affordable, accessible, or deployable at a large scale in many parts of the world.

Fortunately, we do not have to wait until electrification technology becomes more affordable or the logistics around range and charging infrastructure make widespread uptake of both private and public electric vehicles more realistic.

A significant shift toward cycling would reduce harmful emissions and slow the negative impacts of climate change, but this shift requires coordinated, comprehensive investment.
Source: cktravels.com via shutterstock

Economic Opportunities from Expanded Investment and Access to Cycling



Instead, we can prioritize and finance the infrastructure and access to bicycles needed to shift a significant share of trips from private vehicles to cycling right now. Unlike electric cars, bicycles are already widely available in most places, and infrastructure to support them can be built quickly and at a much lower cost than vehicle infrastructure. This significant shift toward cycling is essential to reduce harmful emissions and pollutants that threaten human health and to slow the negative impacts of climate change.

This will require sizable investments from national governments, multilateral development banks, philanthropy, and other major stakeholders in a much more coordinated and comprehensive way than we have seen in the past. These investments would deliver not only the physical infrastructure needed to make cycling and walking safer and more attractive to more people but they would also generate cost savings and returns as a result of improved health outcomes and local economic development. In addition, they have the potential to spark new industries and entrepreneurial opportunities. Most importantly, the scale of investment needed to achieve systemic change and have a real impact on climate change is comparatively small and presents one of the highest returns on investment.

Part I: Economic Benefits of Cycling



Source: withGod via Shutterstock

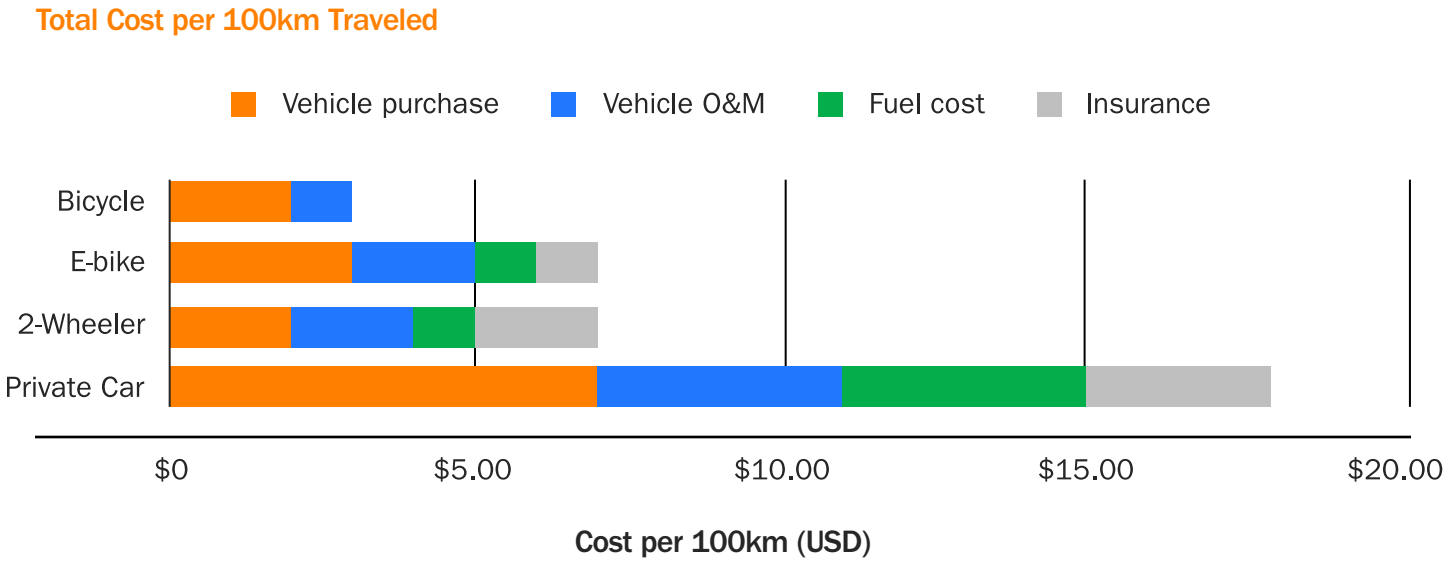
1.1 More trips by bicycle benefits individuals, businesses, and cities

Investments in cycling infrastructure contribute to cost savings for individuals and society. They also generate local economic development that benefits governments (through increased property values and municipal revenues) and businesses (increased commercial retail sales).

1.1.1 Reducing car trips and avoiding car ownership minimizes costs to individuals

Average household spending on transportation in lower-density, car-centric neighborhoods is twice as much as spending on transportation in walkable and bikeable neighborhoods, according to the US Department of Housing and Urban Development.[1] Owning a vehicle entails more costs for individuals than just the purchase price: It presents recurring expenses like maintenance, fuel, parking, and insurance, but it can also lead owners to believe that using the vehicle for more trips is the best way to maximize their investment.

Because the majority of vehicle ownership costs are paid upfront (purchase) or on a scheduled basis (insurance, loan, or lease payment) and are not tied to the actual use of the vehicle, the marginal cost of each trip is low, which creates an incentive to maximize the benefit of those initial expenditures by using the vehicle more often. In most parts of the world, a new car costs more than the average annual household income; bicycles and even electric bicycles (e-bikes), on the other hand, cost less than 6% of annual income to purchase.[2] While bicycles do involve some maintenance costs, they are significantly less expensive than vehicle maintenance, and fuel, parking, and insurance costs are relatively low or even zero (in the case of pedal bicycles). Purchase, operations and maintenance, fuel, and insurance costs for a bicycle total approximately $3.00 per 100km traveled; a private car is six times more expensive, at approximately $18.00 per 100km.[3]



1. Creating Walkable & Bikeable Communities.
2. The Electric Assist.
3. The Compact City Scenario—Electrified.

In addition to saving money, individuals can also save time when shifting trips from vehicles to bicycles, especially during peak commute times when vehicle traffic congestion is highest, and where protected cycle lanes and other bicycle-friendly streets separate cyclists from vehicle traffic. This creates more reliable, virtually traffic-free trips for cyclists. In Mexico City, cycle lanes save users 11.5 minutes and 5.40 pesos per trip on average compared to using a different transport mode.[4]



In Patna, India, a 15% increase in trips made by bicycle would reduce premature mortality by 755 lives per year, and save the city $166 million. Source: arun sambhu mishra via Shutterstock

1.1.2 Reducing vehicle trips and increasing bicycle trips minimizes costs to society

Replacing vehicle trips with bicycle trips improves health outcomes, reduces air pollution and greenhouse gas emissions, reduces congestion, and yields other societal benefits, most of which can be quantified:

A dramatic increase in cycling worldwide could save society $24 trillion cumulatively between 2015 and 2050.[5]

Every kilometer cycled generates €0.16 ($0.18) in economic gains to society, and every kilometer driven costs society €0.15 ($0.16).

This is according to a cost–benefit analysis framework developed in Copenhagen, Denmark, and includes 6 costs (and benefits) associated with air pollution, climate change, noise, congestion, trip time, traffic crashes, health, vehicle and infrastructure operation and maintenance, and tourism.

Evaluations of the return on investment (ROI) of cycling infrastructure and other factors that increase cycling mode share demonstrate overall societal cost savings and increased economic productivity across several sectors, as discussed below.[7] Some of these benefits are non-local, which suggests that regional or even national strategies aimed at reducing demand for vehicles and expanding bicycle use may be effective.[8]

▶ Savings from fewer premature deaths

Physically inactive lifestyles are a major cause of death: noncommunicable diseases associated with lack of exercise are increasingly prevalent in modern society. By promoting moderate everyday physical activity, cycling infrastructure contributes major benefits to public health, reducing premature mortality among the cycling population. This effect is especially meaningful among people older than 50, who are typically less likely to cycle without protected infrastructure.[9]

4. ITDP, internal report. Project Evaluation: Mexico City Bike Lanes.
5. ITDP. A global high shift cycling scenario.
6.Transport transitions in Copenhagen: Comparing the cost of cars and bicycles.
7. Is the widespread use of urban land for cycling promotion policies cost effective? A cost-benefit analysis of the case of Seville.
8. Cost-benefit of bicycle infrastructure with e-bikes and cycle superhighways.
9. NACTO, Designing for All Ages & Abilities: Contextual Guidance for High-Comfort Bicycle Facilities.

The World Health Organization's Health Economic Assessment Tool (HEAT) can be used to predict the economic impacts of increased walking or cycling on reductions in premature mortality. Of course, public health improvements from increased cycling will also have benefits in reduced healthcare costs and increased quality of life, but the HEAT model does not include those effects.

In Patna, India, a 15% increase in cycling mode share equates to 755 lives saved per year due to increased physical activity and $166 million per year in healthcare savings.[10]

In Toledo, Spain, a 5% increase in cycling mode share would contribute $250,000 per year to the economy as a result of lives saved from noncommunicable disease.[11]

Cost savings from the health sector also include fewer premature deaths as a result of better air quality.[12] Vehicles with internal combustion engines produce smog and soot that is harmful to human health, and they emit greenhouse gasses that contribute to climate change. Outdoor air pollution is a serious concern, especially in low- and middle-income countries, which account for 91% of premature deaths from air pollution.[13] The World Health Organization recommends expanding cycling and walking networks as a key strategy to reducing air pollution and the associated burden of disease.

Air pollution costs Indian businesses at least $95 billion, or about 3% of GDP,[15] **which could be reduced with fewer vehicle trips and more trips by bicycle.**

The global cost of air pollution as a result of premature mortality, disability, pre-term births, and sick leave is estimated at $2.9 trillion, or 3.3% of global GDP.[14]

► Savings from fewer road deaths

Traffic crashes involving cyclists and vehicles also contribute to premature mortality and disability, which present economic costs to society. Segregated cycle lanes and intersections that separate cyclists from vehicle traffic help to reduce serious crashes and associated economic costs, even as cycling makes up a larger share of all trips. For example, in Bogota, Colombia, despite a significant increase in bicycle use from 0.2% of trips in 2000 to 7% in 2019, the city's cycle lane network decreased cycle-related deaths by 34% and injuries by 8%. An analysis of 16 European countries conducted by the International Transport Forum (ITF) shows that higher rates of cycling are associated with lower cyclist fatality rates (see graph on next page).[17]

10. Quantifying Health & Economic Benefits of Bicycle Superhighway: Evidence from Patna.
11. Spain: Toledo uses HEAT to calculate benefits of new cycle path.
12. Dutch cycling: Quantifying the health and related economic benefits.
13. Ambient (outdoor) air pollution.
14. Quantifying the Economic Costs of Air Pollution from Fossil Fuels.
15. Upadhyay, Reecha. "Air Pollution and its Impact on Business and the Economy".
16. Cyclist Safety: An Information Resource for Decision-Makers and Practitioners.
17. Exposure-Adjusted Road Fatality Rates for Cycling and Walking in European Countries.

Rate of Cyclist Fatalities by Exposure



*From the ITF's "Exposure-Adjusted Road Fatality Rates for Cycling and Walking in European Countries"

Fatalities and serious injuries caused by inadequate cycling and walking facilities in African cities cost $49 billion, approximately 2% of Africa's total GDP.

Reducing road crash mortality and morbidity by 50% over 24 years would increase GDP by as much as 7% in Tanzania and the Philippines, 14% in India, 15% in China, and 22% in Thailand.[18]

► Savings from fewer greenhouse gas emissions

Cycling, including e-bike use, could feasibly increase worldwide from its current roughly 5% share of urban passenger trips to 18% by 2050. This increase, along with proportionate increases in walking and public transit, would reduce CO_2-equivalent emissions by about two gigatonnes annually which is more than half of the sector's emissions in 2015.[19] At the current global social cost of carbon, this reduction would be valued at $836 billion annually.[20]

18. The High Toll of Traffic Injuries.
19. The Compact City Scenario - Electrified.
20. Country-level Social Cost of Carbon explorer.

Achieving 15% of passenger miles traveled (PMT) by e-bike would reduce CO_2 emissions by 12%. An average reduction of 225 kg CO_2 emitted per year—valued at $94—could be achieved per e-bike.[21]

The cost of air pollution and CO_2 for every 10 kilometers driven by car is €0.30, nearly 10 times the cost per 10 kilometers cycled, at €0.04.[22]



In Jakarta, a city known for its congestion, protected cycle lanes give people an alternative to losing time sitting in traffic. Source: ITDP Indonesia

► Savings from reduced congestion

The major costs to society posed by traffic congestion are delays and lost time for both private and freight vehicles, which reduce economic productivity. Urban traffic congestion costs the US freight sector approximately $66 billion annually,[23] and major US cities like New York City and Los Angeles lost $11 billion and $8 billion, respectively, due to traffic congestion (including private vehicles) in 2019.[24] Similarly, in Egypt, the estimated direct congestion costs for the Greater Cairo metropolitan area is between EGP13 and EGP14 billion (US$827–$890 million).[25] Congestion also contributes to air pollution (due to vehicles idling) as well as noise pollution and traffic crashes. While studies evaluating the direct impacts of increased cycling and walking on traffic congestion are minimal, improving facilities for cycling and walking is a low-cost, quick-to-implement approach to reducing congestion compared to alternatives like installing intelligent transportation systems (ITS) or expanding public transport capacity or service.[26] Impacts on congestion are anticipated to be greater when cycle lanes and pedestrian facilities are implemented together, offering more benefits as a network that can support trips between many different origins and destinations.

In Washington, DC, Capital Bikeshare reduces neighborhood traffic congestion by 4%, which is valued at approximately $120,000 in lost time saved.[27]

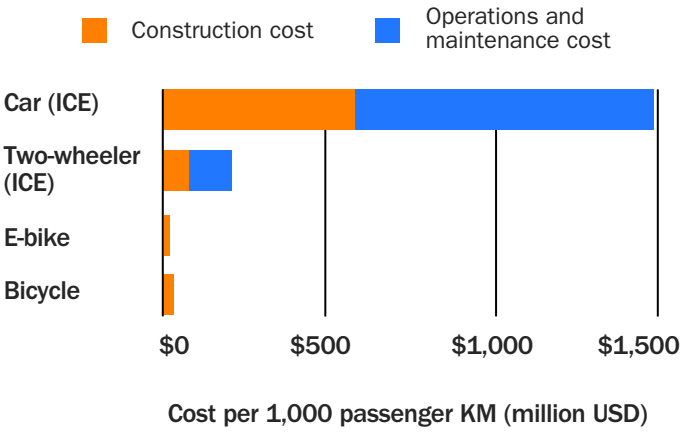
► Savings from less car Infrastructure

Car-specific infrastructure like parking garages, surface parking lots, signals, etc., presents construction and maintenance costs as well as societal costs, such as sprawl.

When it is not necessary to build and maintain new roads, car parking, and other vehicle supportive infrastructure, that frees up budget for other uses.

Infrastructure construction and maintenance for cars costs nearly $1.5 billion per 1,000 passenger kilometers (PKM) globally, compared to bicycles at $10.4 million per 1,000 PKM.[28]

21. The E-Bike Potential: Estimating regional e-bike impacts on greenhouse gas emissions.
22. Buehler and Pucher, 2021. Cycling for Sustainable Cities. p.151.
23. Bottlenecks/ Congestion/ Infrastructure Funding.
24. Global Traffic Scorecard.
25. Cairo Traffic Congestion Study.
26. The Role of Walking and Cycling in Reducing Congestion.
27. Bicycle infrastructure and traffic congestion: Evidence from DC's Capital Bikeshare, Inrix 2020 Global Traffic Scorecard.





Less car infrastructure can open spaces for social recreation. Source: ITDP Brazil

1.1.3 High-quality cycling infrastructure raises property values and municipal revenues

Residential property values have been used to signal preference for amenities such as parks and green space, showing that current and potential homeowners are typically willing to pay more to live near these amenities. Similarly, the presence of cycling infrastructure in urban neighborhoods has been shown to impact property values. A study conducted using home values in Tempe, Arizona, in the US found that areas with a higher density of bicycle infrastructure also have higher home sale prices.[29]

In that study, proximity to cycle infrastructure that separates cyclists completely from vehicle traffic, such as off-street trails, was associated with higher home values compared to proximity to on-street cycle lanes. Studies from Portland State University, the University of Cincinnati, and the University of Delaware show that property values rise the closer homes are to high-quality cycle infrastructure networks and that the density of infrastructure is linked to higher values for all property types (not just residential).[30]

This benefits homeowners by increasing the value of their home, but it also generates more property tax revenue for cities, which is especially beneficial when such revenue supports public services like education, water, and sewage services.

However, increased property values do not positively impact all groups—renters and some long-time homeowners lose out, for example. Cities that assess property taxes typically do so based on property value, and these taxes can become unaffordable if property values rise too much, too quickly. This can lead to displacement, particularly of vulnerable groups like renters. However, this does not mean that installing bicycle infrastructure leads to displacement: A study published in 2021 of 29 US cities found no significant relationship between the presence of bicycle lanes and socioeconomic or demographic changes to neighborhoods, leading researchers to suggest that installing cycle lanes is not linked to displacement.[31]

28. The Compact City Scenario - Electrified.
29. The Association between Residential Housing Prices, Bicycle Infrastructure and Ridership Volumes.
30. Liu & Shi, Impact of bike facilities on residential property prices; Karadeniz, Exploring active transportation investments and associated benefits for municipal budgets: a scoping review; Racca & Dhanju, Property Value/Desirability Effects of Bike Paths Adjacent to Residential Areas.
31. Bicycling facility inequalities and the causality dilemma with socioeconomic/sociodemographic change.

1.1.4 Improving access by bicycle to commercial areas results in higher retail sales

Pedestrians and cyclists spend more per month, especially at food service businesses, than drivers do. In fact, cyclists have been found to spend more per trip and to make shopping and dining trips more often than drivers.[32] Shared e-scooter programs in cities have been linked to statistically significant increases in unplanned spending (at a rate of more than $900 per e-scooter) by riders at local quick-serve restaurants and stores that sell food and beverages.[33] This is contrary to the perception of many local business owners that customers who drive (and park close) to their businesses account for the highest percentage of their sales.[34] It is also contrary to the perception that reducing access to local businesses by car, such as by reducing or removing vehicle parking, will translate to financial losses.[35]

Data from corridor improvement projects in several US cities and Toronto shows that both the number of customers and customer spending increase (or there is no significant impact) as a result of adding bicycle lanes in commercial areas.[36] Similarly, in Seoul, South Korea, after Yonsei-ro, once a heavily congested four-lane road, was redesigned as a pedestrian-priority and bus-only corridor, commercial businesses saw an 11% increase in revenue-generating transactions and a 4% increase in total revenues compared to when the street was designed for cars.[37] Cities in Germany, Denmark, France, and the United Kingdom have also reported retail sales increasing after pedestrianization and cycle-supportive redesigns.[38] It is important to note, however, that other variables aside from the street design may have contributed to reported changes in retail sales. Still, it appears that costs incurred from reallocating space from cars to cyclists and pedestrians are, for the most part, outweighed by more sustainable transport trips that generate equivalent or higher revenues compared to car trips.



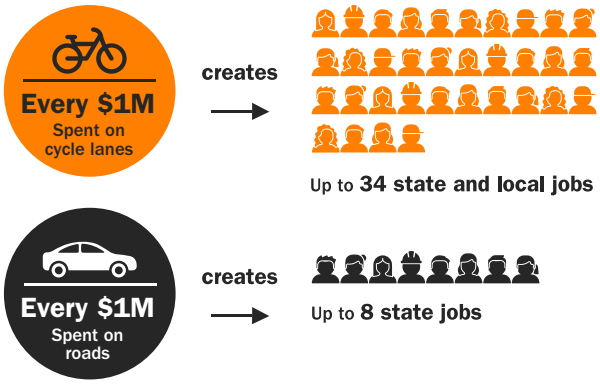
Cyclists are good for business - they make more frequent shopping and dining trips, and spend more per trip, compared to drivers. Source: Shawn Goldberg via Shutterstock

Increased retail sales are not only beneficial for local businesses but also for governments that rely on revenue from consumption taxes (which includes value added tax and sales tax). Consumption taxes make up approximately one-third of the total revenue raised on average by countries with free-market economies (OECD countries), but they can make up a much larger share of total revenue raised, as is the case in Chile, where consumption taxes account for 53% of federal revenue.[39] Therefore, investments in cycle infrastructure can be helpful in growing national budgets, especially when those budgets are linked to revenues from consumption.

32. Bicyclists as Consumers: Mode Choice and Spending Behavior in Downtown Davis, California.
33. Wheels to Meals: Measuring the Economic Impact of Micromobility on the Local Economy.
34. Reallocation of road space.
35. The Business Case for Active Transportation: The Economic Benefits of Walking and Cycling.
36. Liu & Shi; Volker & Handy; Arancibia et al.
37. Yonsei-ro, Seoul's First Transit Mall.
38. The Business Case for Active Transportation: The Economic Benefits of Walking and Cycling.
39. Income Taxes in Chile.

1.2 More demand for bicycles spurs jobs and economic opportunities

Bicycle-related industries provide jobs, especially in regions where demand for cycling is relatively high. Jobs in the cycling sector can be grouped into the following categories: bicycle and parts manufacturing; retail, including sales, repair, and services; infrastructure, including shared micromobility; and bicycle tourism. In Europe, where data on bicycle industries is widely available, bicycle tourism makes up the largest share of cycling sector jobs, accounting for approximately four out of every five bicycle-related jobs.[40] The bicycle tourism sector has grown in places where bicycle-friendly environments (i.e., connected, protected cycle lanes) and positive attitudes toward—and demand for—cycling have been achieved.[41] Higher demand for and use of bicycles as a result of cities building high-quality cycle infrastructure can also cultivate new markets and economic growth. Indeed, there are currently an estimated 1.8 billion bicycles in use globally, serving an urban population of 3.9 billion. There is certainly potential to expand this market.[42]



Demand for bicycles fuels market growth and creates jobs in these and related industries. Economic impact analyses show that investments in cycling infrastructure generate employment opportunities, but the extent of these vary significantly by project type and location. Estimates from the US suggest 10 to 23 jobs at the state level and 8 to 11 at the municipal level could be generated for every $1 million spent on cycling and walking infrastructure projects. The International Energy Agency (IEA) presents similar estimates: between 8 and 24 jobs per $1 million invested in cycling and pedestrian infrastructure.[43] Comparatively, for every $1 million spent on road projects, an average of eight state-level jobs are created. For bicycle infrastructure projects, a large portion of the budget is spent on labor-intensive planning and design work carried out by engineers and construction workers, while road project budgets focus more on construction equipment and materials, like asphalt or concrete.

Bicycle infrastructure projects also yield more direct jobs (as opposed to indirect or induced jobs) than roads and even pedestrian and trail projects.[44] Additionally, there is potential for employment as a result of increased retail spending on cycling-related products, parts, and services. An estimated 11 to 26 jobs at the state level could be generated for every $1 million in revenue from bicycle-oriented businesses.[45]

1.2.1 Bicycle manufacturing

Investment in cycle infrastructure and services expands the market for bicycle manufacturing. In the European Union, a doubling in bicycle mode share would increase jobs in bicycle manufacturing and wholesale by 42%.[46] This presents an economic opportunity for national economies, in terms of job creation and also revenue from product sales and exports. Markets for bicycles, e-bikes, and cargo bikes, in particular, are growing. Industry forecasts estimate that the value of the global bicycle market could reach $34.6 billion by 2027, up from $29.2 billion in 2020.[47] Growing markets lead to higher sales revenues, which in turn create jobs. Furthermore, jobs manufacturing "durable goods"—like bicycles and any other goods with a life span of more than three years—help generate additional jobs in the supply chain, as well as indirect jobs supported by the re-spending of income.[48]

40. Economic Benefits of Increased Cycling
41. Urban cycling mobility: Management and urban institutional arrangements to support bicycle tourism activities—case study from Curitiba, Brazil.
42. The Compact City Scenario—Electrified.
43. Employment multipliers for investment in the transport sector.
44. Pedestrian and Bicycle Infrastructure: A National Study Of Employment Impacts.
45. Brown et al., Economic Impacts of Active Transportation in New Jersey; Economic impact of bicycling and walking in Vermont; Venegas, Economic Impact of Recreational Trail Use in Different Regions of Minnesota.
46. Economic benefits of increased cycling.
47. Bicycles—Global Market Trajectory & Analytics.
48. Updated employment multipliers for the US economy.



The value of the global bicycle market could reach $34.6 billion by 2027, an 18% increase from 2020. Source: Bamboocycles

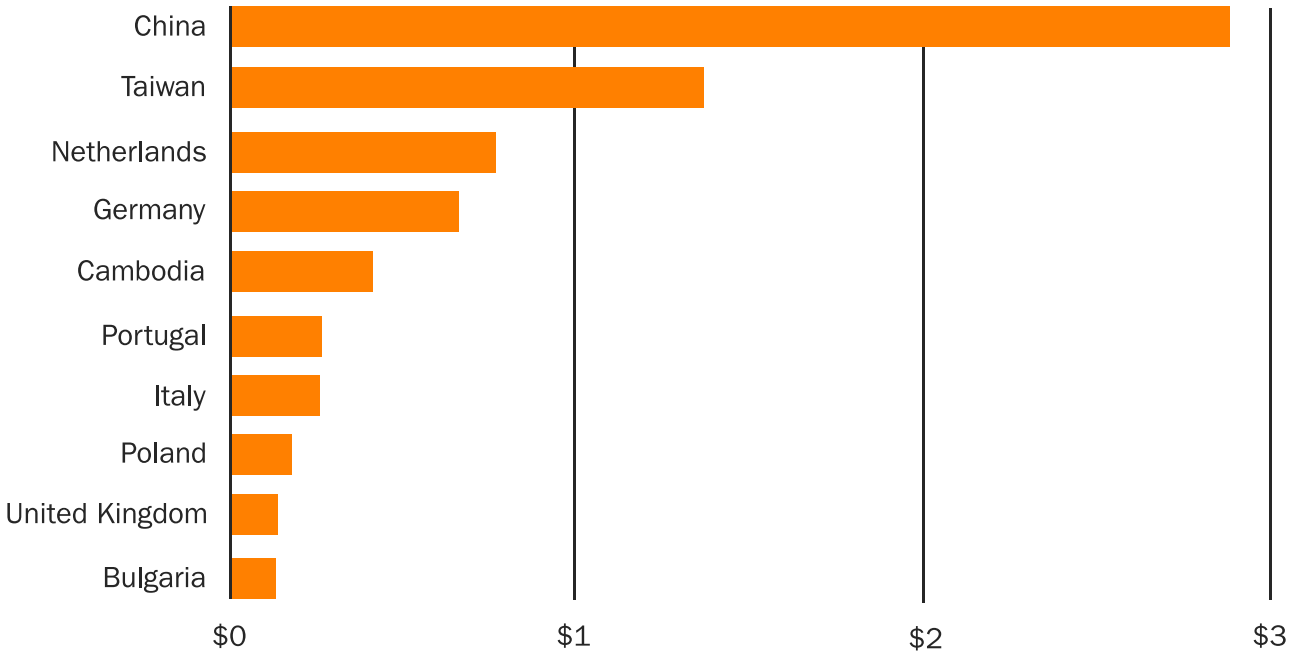
In 2018, the global market for bicycle imports and exports, not including bicycle parts or accessories, was $9 billion; the market was less than $4 billion in 2000.[49] China and Taiwan, the top two bicycle exporters in the world, generate nearly $3 billion and $1.3 billion in bicycle exports, respectively.[50]

Brazil produces 2.5 million bicycles per year, which makes it the largest producer in Latin America.[51] The industry generated $379 million in revenue in 2017 (1.8% of GDP), and it is forecast to generate nearly $410 million per year by 2023.[52]

In Europe, bicycle and e-bike sales as a whole have remained relatively stable over the past decade, hovering around 20 million units per year. In recent years, however, e-bikes have been making up a larger share of overall bicycle sales, reaching 17% of bicycle sales and surpassing 3 million sold between 2018 and 2019.[53]

In 2020, demand for bicycles and accessories was the highest it has been in decades due to restrictions on other travel modes as a result of the COVID-19 pandemic. In fact, demand for bicycles in Europe during the first half of 2020 increased more than 50% compared to the same period in 2019. Bicycle sales skyrocketed to the point where retailers were struggling to meet demand. Caloi, a bicycle manufacturer based in Brazil, saw record numbers of orders.[54]

Value of Bicycle Exports (in billions), 2019



49. Access to Affordable Bicycles: Summary of the Findings from the Literature Review and Key Informant Interviews.
50. UN Comtrade.
51. Dados do Setor 2021.
52. Forecast: Industry revenue of "Manufacture of bicycles and tricycles, not motorised" in Brazil 2011–2023.
53. A New Era for Cycling in the Post Covid-19 Outbreak.
54. Inside The Call: Dorel Sees Heightened Interest In Cycling as the "New Normal."

Demand for bicycles was further supported by local and national policies that offered financial subsidies or stipends toward the purchase of a new bicycle or e-bike, or even bicycle maintenance.[55] In some cities, bicycle retail and repair businesses were categorized as essential, allowing them to remain open during the public health emergency when other businesses were forced to close. Temporary cycling infrastructure that facilitated safe, direct, uncrowded trips further encouraged demand. Electric cargo bikes, built to carry goods or additional passengers, also saw an uptick in sales, especially in Europe.[56]

The increased demand for bicycles also presents opportunities for jump-starting local bicycle manufacturing. Since bicycles require fewer parts and are less complicated to assemble, production is notably less expensive than for other modes, specifically cars. The cost to manufacture a $300 bicycle (the average purchase price of a new bicycle) ranges from $80 to $100 (up to 33% of the purchase price), while manufacturing a $50,000 automobile could cost anywhere from $35,000 to $40,000 (up to 80%).[57]

1.2.2 Bicycle tourism

Expanded infrastructure supporting cycling and access to bicycles also cultivates new economic opportunities like bicycle tourism, which is typically recreational in purpose and features multiday trips where noncompetitive cycling is a fundamental part of the trip.[58] In the Outer Banks of North Carolina in the US, a coastal area known for its beaches, a one-time investment of $6.7 million into cycling infrastructure generates roughly $60 million in economic activity each year through cycle tourism.[59] Cycle tourism has similarly become popular in Europe: The cycle tourism sector is worth €44 billion per year, which is 16% more than the European cruise sector.[60]



Amateur cycling races become tourist events for host cities. Source: Raul Dominguez via Flickr.

Infrastructure to support cycle tourism is key to unlocking this market. For example, the EuroVelo initiative, a network of 17 long-distance cycle routes connecting the whole European continent and spanning more than 90,000 kilometers, supports over 2.3 billion cycle tourism trips each year.[61] Notably, most cycle tourism happens outside of urban contexts—traveling long distances across several cities or countries—however, there is growing interest in urban cycle tourism as a unique way to experience cities.[62] Safe cycle infrastructure combined with placemaking and lively public space initiatives can draw tourists as well as support everyday cycling for local residents.

The cycle tourism industry has had a positive impact in both the United Kingdom and France. In the UK, the industry contributes 650 million annually to the economy and generates almost 36,000 jobs. The country's cost-benefit ratio for investing in cycle infrastructure is 13:1, largely as a result of cycle tourism.[63] Meanwhile, in France, bicycle tourists spend on average €68 a day, which is €13 more than other tourists.

55. Bernhard, A. The great bicycle boom of 2020.
56. European Cargo Bike Industry Survey Results 2021.
57. Internal calculations conducted by authors.
58. Cycle Tourism Information Pack.
59. Bicycling Means Business: The Economic Benefits of Bicycle Infrastructure.
60. Economic benefits of cycling in EU 27.
61. Discover Europe by bike!
62. Urban bicycle tourism: path dependencies and innovation in Greater Copenhagen.
63. Cycling UK, Economic Benefits of Cycle Tourism.

This generates €5.1 billion per year, which is an increase of 46% over the last 10 years as new cycling infrastructure has been added.[64] Cities like Curitiba in Brazil have also begun to invest in cycle tourism as a way to attract new tourists and raise awareness around everyday cycling in the city.[65]

As cycle tourism becomes more popular, cities are seeing greater demand for supportive industries too, like long-term bicycle rentals. In France, it is estimated that the market for tourist bicycle rentals is €178 million per year.[66] Both cycle tourism and long-term bicycle rentals could expand as cities invest in local and even regional cycle lane networks.



In Kigali, residents participate in a Car Free Day by riding shared bicycles from Guraride, a Rwanda-based bike- and scooter-share operator. Source: Rwanda Walk & Cycle Campaign

1.2.3 Private investment in shared micromobility

Shared micromobility is a rapidly growing industry where private companies operate a fleet of bicycles (or other small, lightweight vehicles like electric scooters [e-scooters]) that residents and tourists alike can rent for a single trip, a day, a week, or more. Bikeshare has been referred to as "the fastest growing mode of transportation" in history[67] since experiencing widespread uptake starting in 2011. E-scooter share also experienced swift adoption by users following its arrival in cities in 2017, faster than carshare and station-based bikeshare.[68] Currently there are more than 1,800 bikeshare programs worldwide,[69] and that number is growing in every region. In 2021, Kigali, Rwanda, launched its first bikeshare program, with other African cities like Cairo looking to do the same in the near future.[70]

In 2017, a new business model for shared micro-mobility emerged: operation of shared fleets by private "startup" companies supported financially by significant amounts of venture capital. This meant that companies could spend a lot upfront to gain users and market share without worrying about generating revenue. Several companies quickly achieved valuations of over $1 billion. More shared micromobility vehicles on city streets meant more people riding shared bicycles and e-scooters—total rides taken on e-scooters has grown by 140% each year, presenting a significant opportunity for growth, especially as new models and vehicle types are introduced to the market.[71] And while venture capital investment in shared micromobility has waned, particularly following widespread and severe drops in ridership due to COVID-19 travel restrictions,[72] the industry rebounded faster than other transportation modes like public buses and metros, and it is still growing. In fact, it is estimated that the global market potential for shared micromobility could reach $500 billion by 2030.[73]

64. Impact économique et potentiel de développement des usages du vélo en France en 2020.
65. Urban Cycling and Mobility.
66. Impact économique et potentiel de développement des usages du vélo en France en 2020.
67. Bike Sharing Goes Global
68. The Micromobility Revolution: The Introduction and Adoption of Electric Scooters in the United States.
69. The Meddin Bike-Sharing World Map.
70. Rwanda Launches Africa's First Bike-Share Transport System
71. The future of micromobility. How VCs and e-scooters kicked off the future of micromobility.
72. The future of micromobility: Ridership and revenue after a crisis.
73. Sizing the micro mobility market.

The shared micromobility industry has also spurred job creation at city agencies, operating companies, equipment suppliers, etc. Approximately 5,000 full-time-equivalent jobs are attributed to the micromobility industry in North America, or one job for every 30 vehicles.[74]

Investments in cycle infrastructure can help attract existing shared micromobility operators to offer their services, but it can also encourage private investment in locally based shared micromobility companies. Cities with established cycle infrastructure can provide safe, comfortable riding environments for people using shared micromobility, and especially users who may not cycle regularly. By expanding their cycle infrastructure, cities in nascent shared micromobility markets like Africa could capitalize on investment interest in the micromobility industry. Infrastructure expansions could also expand domestic manufacturing to meet demand for shared and personal bicycles.[75]



E-bikes can deliver packages at 50% fewer miles traveled per package compared to delivery vans.
Source: David Fuentes Prieto

1.2.4 Improved logistics for local goods delivery

Improving cycle infrastructure can help support and expand viability for local goods delivery while also reducing emissions and road safety concerns posed by large, fossil fuel–powered delivery vehicles. Local deliveries are typically carried out using trucks or vans, which contribute inequitably to congestion, air pollution, and unsafe streets for cyclists and pedestrians. The “last mile” in urban freight delivery often poses the highest delivery costs and is where delays in shipping typically occur.

E-bikes and cargo bikes, with or without electric pedal-assist, are growing in popularity in dense urban areas as replacements for both high volume (such as mail and large commercial deliveries) and low-volume (such as food or small goods deliveries) delivery vehicles. In France, La Poste (the postal service) has invested in 30,000 e-bikes for last-mile deliveries.[76] Meanwhile, pilot projects in Croatia, Italy, and the United States have found e-bikes to be significantly more efficient and cost effective than traditional delivery by van. A pilot in Seattle, Washington found e-cargobikes delivered packages at 50% fewer miles traveled per package, and one e-cargobike mile replaced 1.4 delivery truck miles.[77] Efficiencies and cost savings free up capital to hire more employees, contributing further to the local economy.[78] This could also be particularly impactful with adapting to the rise in e-commerce. The global same-day delivery service market is anticipated to increase to $11.43 billion by 2025, up from $4.49 billion reported in 2020.[79]

On the low-volume side, Asian and Latin American cities are experiencing more local deliveries by bicycle and e-bike. Across Chinese cities, more than 10 million people are employed as food or goods delivery workers, and many of them are using bicycles or e-bikes.

74. Shared Micromobility State of the Industry Report: 2020.
75. Rwanda Launches Africa’s First Public Bike-Share Transport System.
76. Pro E-Bike, A New Move for Business: Electric Cycle Logistics in European Cities.
77. The Seattle Neighborhood Delivery Hub Pilot Project: An Evaluation of the Operational Impacts of a Neighborhood Delivery Hub Model on Last-Mile Delivery.
78. Economic Analysis of Cargo Cycles for Urban Mail Delivery.
79. Rapid Expansion of the Ecommerce Industry Drives the Same-Day Delivery Services Market as per the Business Research Company’s Same-Day Delivery Services Global Market Report 2021.

In Guangzhou, 60% of e-bike riders use their e-bikes to deliver food or goods locally.[80] In Rio de Janeiro, cargo bikes have had a huge impact on the economy. A survey of cargobike use in the Copacabana neighborhood of Rio de Janeiro showed that 372 businesses used cargo bikes for local deliveries, with each business supporting at least two full-time cycle delivery workers making around 30 trips per day.[81] Business owners expressed that cargo bikes were crucial to the profitability and viability of their businesses.[82] In addition to cost savings, replacing delivery trucks and vans with cargo bikes enables faster delivery times, especially where there is infrastructure to support cycling. Businesses and individuals also benefit from expanding the employee pool beyond those who have access to a vehicle.[83] Additionally, decreased congestion and fewer serious injuries or fatalities from crashes with cyclists and pedestrians yields economic benefits (see section 1.1).



Bicycle-supported street vending enables vendors to maximize revenue by moving to different locations throughout the day. Source: PradeepGaurs/Shutterstock.com

1.2.5 Street vending and the informal economy

Finally, cycling infrastructure and access to bicycles, especially traditional and electric cargo bikes and tricycles that can hold large, heavy goods, supports the street vending economy in cities where informal vending is prevalent. It is difficult to estimate the size of informal vending sectors or to what extent they contribute to local and national economies; however, the number of street vendors tends to be higher in places where trading accounts for a significant portion of the economy. In Lima, Peru, 9% of the urban employed population are street vendors; in Hanoi, Vietnam, the share is 11%, and in Dakar, Senegal, it is 13%. In these cities and others, street vending is dominated by women.[84]

In Mexico City, street vendors often use carts and bicycles to move goods to their vending location or to different sites throughout the day to maximize revenue, some even selling directly from their bicycles.[85] Safe cycle infrastructure would encourage more vendors to transport their goods via bicycle as opposed to using vehicles, which present high purchase and maintenance costs, parking challenges, and lost time due to traffic. Government subsidies to purchase cargo bikes and e-cargo bikes,[86] which are typically more expensive and difficult to find compared to road or commuter bicycles, could also encourage a shift to cycle-based informal vending. In India, replacing older tricycles used for deliveries with electric cargo bikes could boost supply chains and logistics businesses run by small-time vendors.[87] Enabling safe, comfortable bicycle transport for street vending not only benefits the vendors themselves but ensures that vulnerable groups like the urban poor and those who are food insecure continue to have access to food outlets provided by informal vendors, which are more affordable than grocery stores.[88]

80. Data gathered internally by ITDP China.
81. The Benefits of Cargo Bikes in Rio De Janeiro: A Case Study.
82. The Benefits of Cargo Bikes in Rio De Janeiro: A Case Study.
83. E-Bikes Are Changing the Way Companies do Business.
84. Street vendors and cities.
85. Insights from Mexico City: The Right to Mobility and Work in Public Space.
86. A database of financial incentives to purchase bicycles in European countries is available at: https://ecf.com/resources/financial-incentives.
87. Potential of E-Cargo Bikes in India.
88. Street vendors and cities.

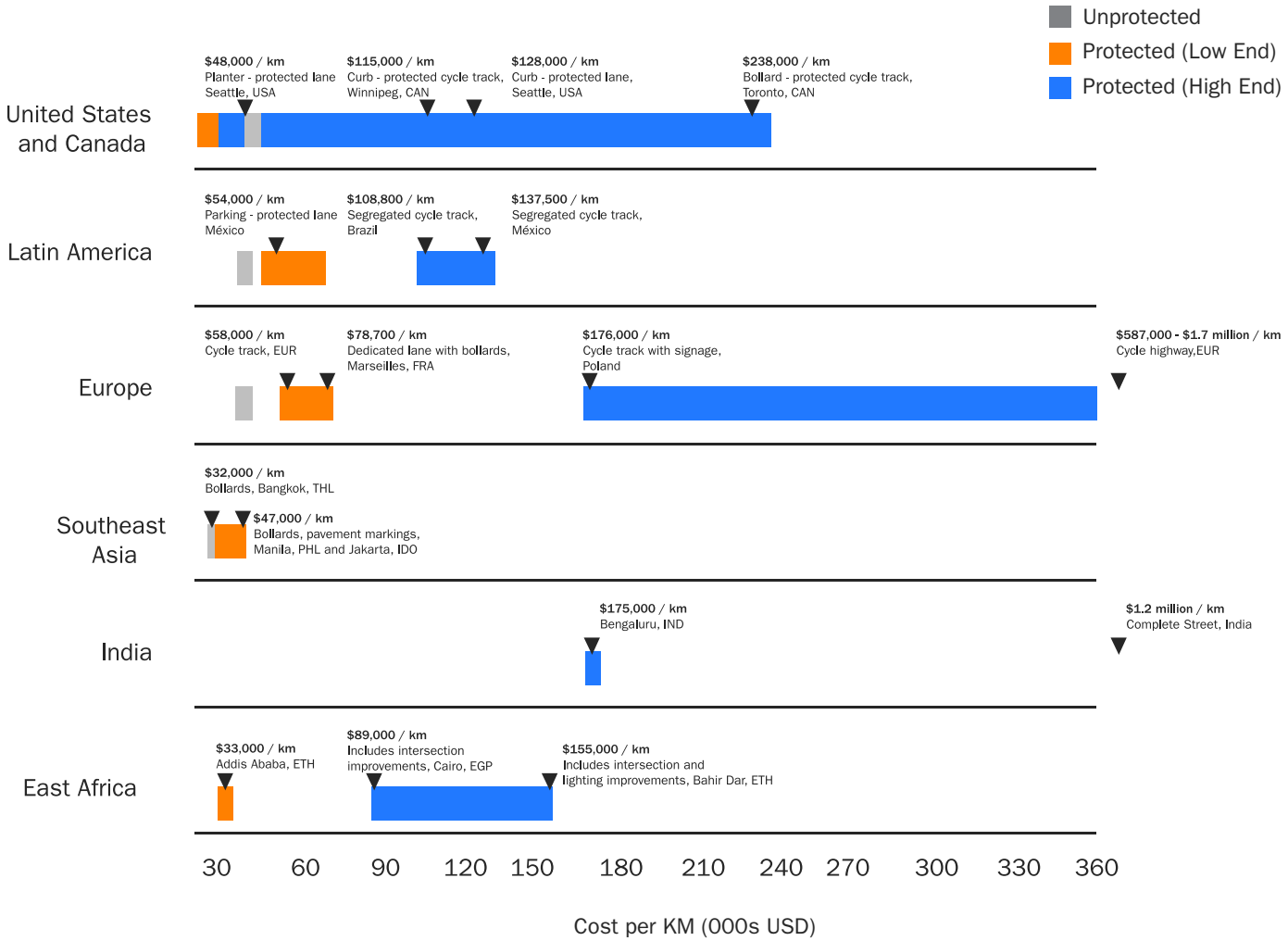
Part II: Unlocking the economic benefits of cycling



To realize the benefits described in Part I, cities must dedicate funding to build and maintain a connected network of cycle infrastructure or seek investment from external sources like development banks or philanthropy to do so. Some infrastructure projects, like cycle highways or building out a cycle lane network, require significant investment, and other projects require more targeted, tactical funding. While some investments will be more impactful than others, the return on investment for a network of safe and convenient bicycle infrastructure is high.

It is also important to note that in addition to high-quality cycle lanes, supportive infrastructure and policies that expand access to bicycles will be needed to maximize benefits. The upfront purchase cost of a bicycle is, in many cities, a significant barrier to cycling, especially in countries where domestic manufacturing of bicycles is limited and imported bicycles are subject to high value added taxes (VAT).[89] Not knowing how to ride a bicycle, which is especially prevalent among women, is also a major barrier regardless of cost. Investments in supportive infrastructure like bikeshare can help to reduce these barriers to accessing a bicycle as well as eliminate the need to purchase accessories like a helmet or lock. Bikeshare also shifts both the cost and responsibility for maintenance from the individual to the system operator. Analyses of public bikeshare systems in Europe show that every euro invested generates health and economic gains valued between €1.37 and €1.72.[90] Furthermore, financial subsidies to individuals to help bring down the cost of purchasing a bicycle can also help encourage more everyday cycling.

Cycle Lane Costs per Kilometer, by Type and Region



89. View of Bicycling in Addis Ababa, Ethiopia: Opportunities and challenges.
90. The Economic Impact of Bike Sharing in European Cities.



A temporary cycle lane installed in response to the COVID-19 pandemic in San Luis Potosi, Mexico provides minimal protection for cyclists from vehicular traffic.
Source: Mirell Betanzo

The costs of building cycling infrastructure vary significantly across regions, largely due to differences in the cost of materials and labor. Unprotected cycle lanes—those with no physical separation between cyclists and vehicle traffic—are the least expensive to implement, simply requiring paint and relatively minimal labor to install. However, unprotected lanes do not provide enough safety and comfort for most people who cycle, and thus they do not convince enough people to cycle for everyday trips.[91] In other words, while the cost to implement is low, the return on investment is also low: Installing unprotected bicycle lanes can be counterproductive, costing cities more in public backlash and political capital when there is no visible increase in the number of people using the infrastructure and/or no fewer traffic crashes involving cyclists.

A study conducted in Victoria, Australia, showed that the passing distance between vehicles and cyclists was closer (and therefore cyclists were at higher risk) on streets with unprotected cycle lanes than on streets with no cycle infrastructure at all.[92]

Installing and maintaining cycling infrastructure is much less expensive compared to other transport infrastructure like roadways (at least $1 million/lane km), metros (at least $50 million/km),[93] or even bus rapid transit (at least $700,000/lane km).[94] However, a network of high-quality, protected bicycle lanes can be a significant investment especially when considering supportive infrastructure and comprehensive street redesigns. Tying investments in bicycle parking improvements and bikeshare to a cycle lane network build-out addresses related security and access barriers in addition to providing safe spaces to ride. Secure parking infrastructure, especially for more expensive e-bikes, is particularly important since riders are less likely to purchase a bicycle and cycle regularly if they fear their bicycle will be stolen. Therefore, designated and secure bicycle parking is crucial to support the large-scale uptake of e-bikes needed to achieve the improved health and climate outcomes described in Part 1.

Including intersection improvements and redesigning key streets within the cycle lane network as Complete Streets—ones that shift priority away from motorized vehicles and reallocate space to transit, cycling, walking, and public space—also require significant investment. In some cases, Complete Streets redesigns require relaying or diverting utility (including stormwater, drainage, sewage, electricity, etc.) lines, which presents additional costs.[95]

91. Diversifying and normalising cycling in London, UK: An exploratory study on the influence of infrastructure.
92. How much space do drivers provide when passing cyclists? Understanding the impact of motor vehicle and infrastructure characteristics on passing distance
93. Comparison of Capital Costs per Route-Kilometer in Urban Rail.
94. BRT Planning Guide Sample Operator Contract and Infrastructure Cost Calculator.
95. Complete Streets Best Practices | Complete Streets Toolkit: Volume VII, p. 25.

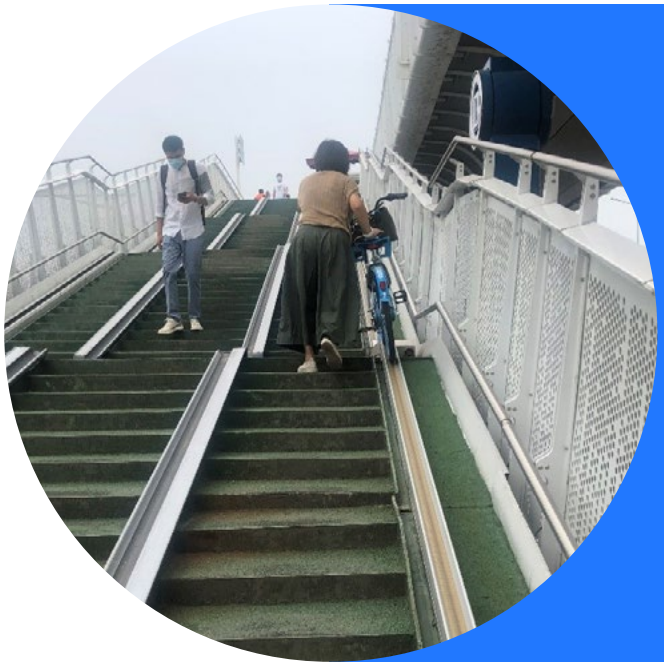


A complete Street in Quito, Ecuador.
Source: Ecuadorpostales via Shutterstock

For example, in India, "completing" a street by adding a dedicated cycle track, pedestrian space, signage, lighting, and other public space elements costs approximately $1.2 million per kilometer, compared to the estimated $175,000 per kilometer cost to install a dedicated cycle lane.

While this type of comprehensive approach to implementing cycling infrastructure poses high upfront costs, the return on investment is much higher than smaller one-off or low-quality cycle lane projects. Protected cycle lanes can be double the cost per kilometer of unprotected lanes, but they provide much more safety and comfort. An analysis of Seville, Spain's protected cycle lane network, installed in 2006 at a cost of approximately €17 million, shows a net value of €557 million and an internal rate of return (the annual growth rate of an investment) of more than 130% by 2032.[96] Copenhagen, Denmark's cycle superhighway network plan is expected to have an internal rate of return of up to 23%.[97] Lima, Peru's cycling infrastructure plan, estimated to cost $313,000 to implement, is expected to generate $5.56 million in benefits by 2050.[98] These rates are high compared to large roadway projects, which have rates of return between 8% and 10%.[99]

Cost-benefit analyses of cycle lanes often include a future scenario where cycling mode share increases significantly and benefits grow as a result. This is because a network of cycle lanes provides access for many people to many different destinations, compared to disconnected lanes that only provide access for a few people to a few destinations. Thus, the return on investment for cycle infrastructure projects increases with more connections and greater use. Protected, connected, and direct cycle lanes present the highest potential for use, and these can generate significant increases in cycling, as was seen during the COVID-19 pandemic when cities implemented temporary cycle lanes.



Beijing's bicycle expressway is elevated above the street and features stairs with wheel ramps at entry points.
Source: ITDP China

96. Is the widespread use of urban land for cycling promotion policies cost effective? A cost-benefit analysis of the case of Seville.
97. Cost-benefit of bicycle infrastructure with e-bikes and cycle superhighways.
98. What would happen if the bike was used more in Lima?
99. Meta-analysis of rate of return on road projects.

Streets designed to be accessible by mode in Mexico City



Cars, two-wheelers, cabs



Bicycles

In Jakarta, pop-up protected cycle lanes on Sudirman-Thamrin Street, a main thoroughfare that also supports the TransJakarta BRT, helped increase cyclist counts by 46% at the Dukah Atas station and 28% at the Karet station.

The temporary protected lane on Av. Insurgentes in Mexico City supported a 275% increase in cyclists during the pandemic and is being made permanent.[100] In addition to Bogotá's existing 550 km network of cycle lanes, 75 km (47 miles) of temporary lanes implemented over the course of a few days early on in the pandemic encouraged Transmilenio BRT riders to shift to cycling to reduce crowding, and they supported about 400,000 daily bicycle trips (down from more than 880,000 before the pandemic).[101] Investing in cycling infrastructure is an investment in the resiliency of the transportation system.

Unanticipated health, climate, and natural disasters threaten the ability to travel by car and by public transportation if damage blocks key roadways and power and telecommunications systems are disrupted. We saw this most recently with the COVID-19 pandemic, but cities have experienced these types of disruptions before: Notably, following the earthquake in Mexico City in 2017, bicycles served not only as a mobility option but as a way to quickly deliver medicines and other essential goods and to survey damage before cleanup equipment and crews arrived.[102] Bicycles are an adaptable, flexible transport mode when other modes fail, keeping people and commerce moving and minimizing costs associated with an economic standstill. Cycling is both a means to avoid the worst climate impacts and a means of adapting to these impacts. We can unlock the economic, climate, and health benefits of cycling by strategically investing in cycling now.

100. SEMOVI to Install Permanent Bike Lane on Insurgentes.
101. To Tame Traffic, Bogotá Bets Big on Bike Lanes.
102. Parks and Bicycles Were Lifelines After Mexico City's Earthquake.

Appendix B
Bike Signal Requirements & Interim Approval

This section presents background research on national guidance related to signal phasing strategies for separated one-way and two-way bicycle facilities.

The Federal Highway Administration (FHWA) Manual on Uniform Traffic Control Devices for Highways and Streets (MUTCD) is silent on the use of bicycle signal phases or displays (FHWA 2022). FHWA issued an Interim Approval for the optional use of a bicycle signal face with Interim Approval IA-16 in 2013. This Interim Approval allows the use of bicycle signal faces for a specific set of applications (items relevant to this project are in **bold**):

1. Bicyclist non-compliance with the previous traffic control;
2. Providing a leading or lagging bicycle interval;
3. Continue the bicycle lane on the right-hand side of an exclusive turn lane that would otherwise be in non-compliance with [MUTCD] Paragraph 6 of Section 9C.04;
4. **Augment the design of a segregated counter-flow bicycle facility;**
5. Provide an increased level of safety by facilitating unusual or unexpected arrangements of the bicycle movement through complex intersections, conflict areas, or signal control. (FHWA 2013)

The Interim Approval requires that if bicycle signal faces are used, they are limited to situations where bicycles moving on a green or yellow signal indication are not in conflict with any simultaneous motor vehicle movements, including right (or left) turns on red. The Interim Approval does not allow the use of exclusive bicycle phases that permit "scramble" phases, which would allow bicyclists to enter the intersection simultaneously from all directions to go in all directions. As with all Interim Approvals, an agency wishing to implement the Interim Approval must comply with the conditions of the Interim Approval.

The NACTO *Urban Bikeway Design Guide, Second Edition*, discusses design guidance for the use of bicycle signal heads (NACTO 2014). The guidance largely mirrors that included in the FHWA Interim Approval, including the restriction on right turns on red for motor vehicles when a bicycle signal phase is used. As a practical matter, this requires right-turning (or left turning) vehicles to be in a separate turn lane to avoid unnecessarily impeding through motor vehicles. This would allow the phase for turning motor vehicles to be short relative to the phase serving through motor vehicles and bicyclists.

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Federal Highway Administration (FHWA). *Manual on Uniform Traffic Control Devices for Highways and Streets,* 2009 Edition, including Revision 1 dated May 2012, Revision 2 dated May 2012, and Revision 3 dated July 2022. FHWA, Washington, DC, 2022.

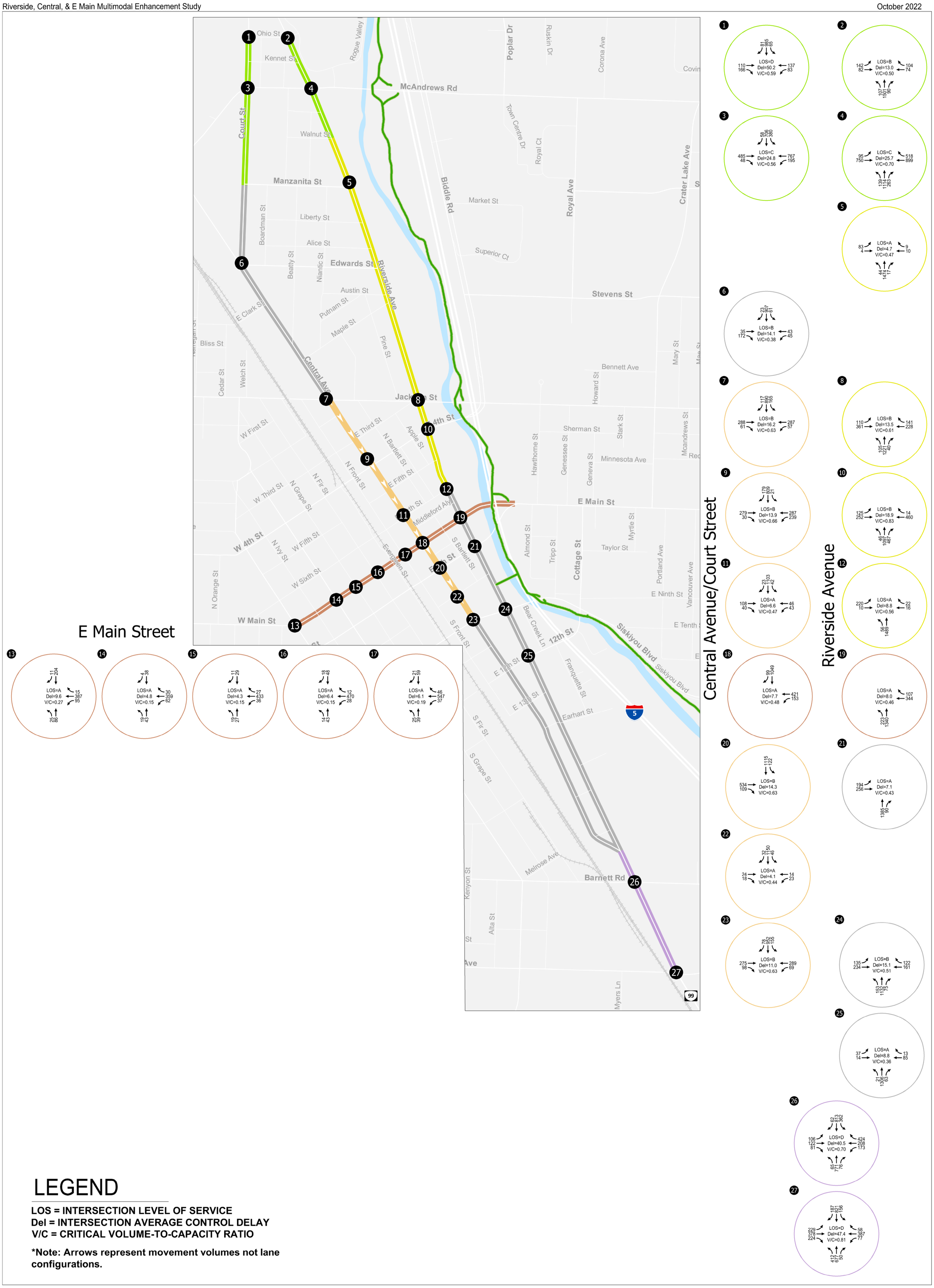
Federal Highway Administration (FHWA). "Interim Approval for Optional Use of a Bicycle Signal Face (IA-16)." FHWA, Washington, DC, December 24, 2013. https://mutcd.fhwa.dot.gov/resources/interim_approval/ia16/index.htm (As of September 6, 2022).

Kittelson & Associates, Inc., Northeastern University, Accessible Design for the Blind, and Wayne State University. *NCHRP Research Report 969: Traffic Signal Control Strategies for Pedestrians and Bicyclists.* National Cooperative Highway Research Program, Transportation Research Board, Washington, DC, 2022.

National Association of City Transportation Officials (NACTO). *Urban Bikeway Design Guide, Second Edition.* NACTO, Island Press, Washington, DC, 2014.

Sanders, R., B. Schultheiss, B. Judelman, R. Burchfield, K. Nordback, D. Gelinne, L. Thomas, D. Carter, C. Zegeer, C. Semler, M. Sanders, H. Steyn, P. Ryus, W. Hunter, and P. Koonce. *NCHRP Research Report 926: Guidance to Improve Pedestrian and Bicyclist Safety at Intersections.* National Cooperative Highway Research Program, Transportation Research Board, Washington, DC, 2020.

Appendix C
2024 & 2038 Operational Analysis Results



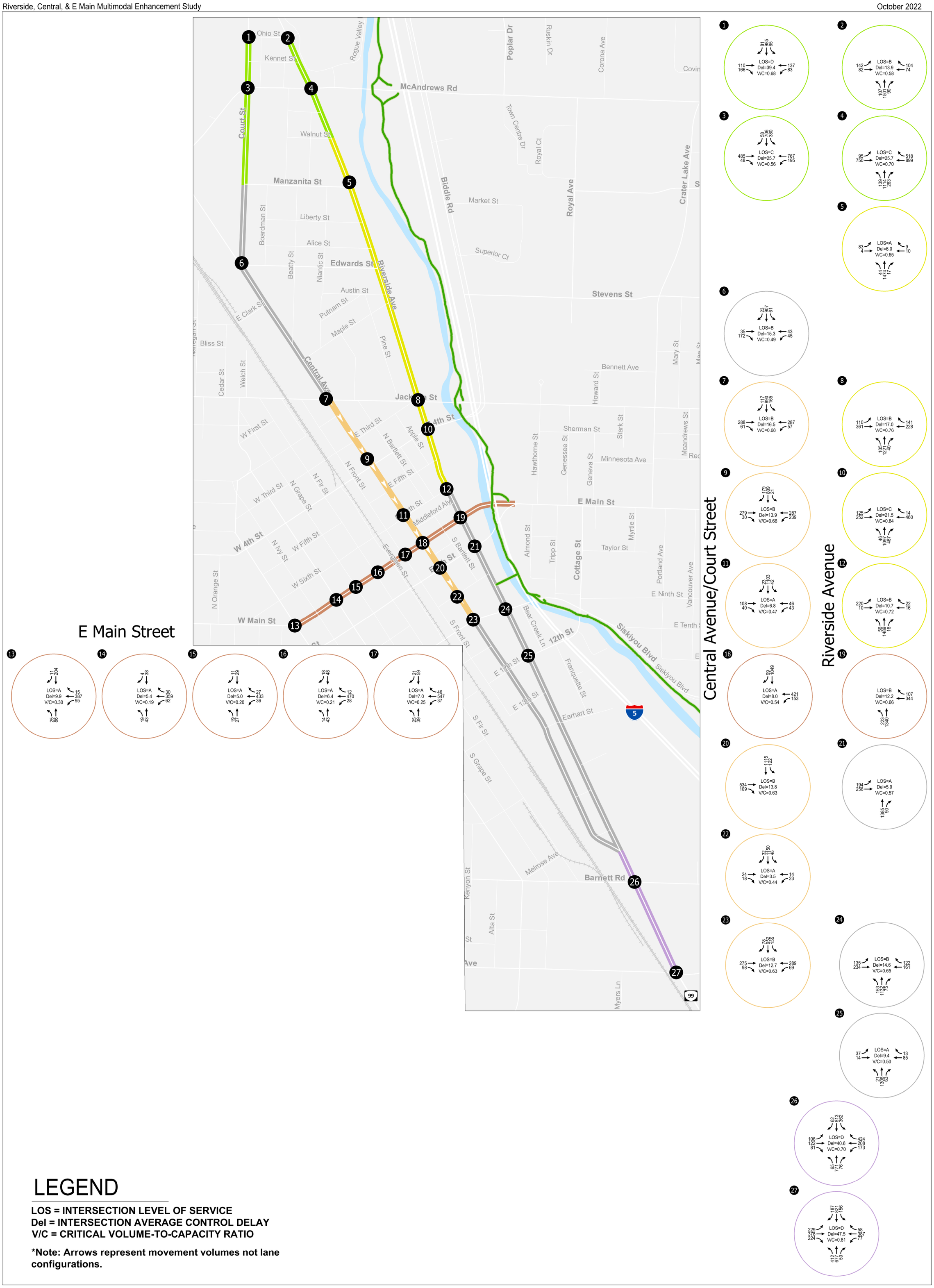
LEGEND

LOS = INTERSECTION LEVEL OF SERVICE
Del = INTERSECTION AVERAGE CONTROL DELAY
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

***Note: Arrows represent movement volumes not lane configurations.**

2024 Operations (No-Build)*

KITTELSON & ASSOCIATES



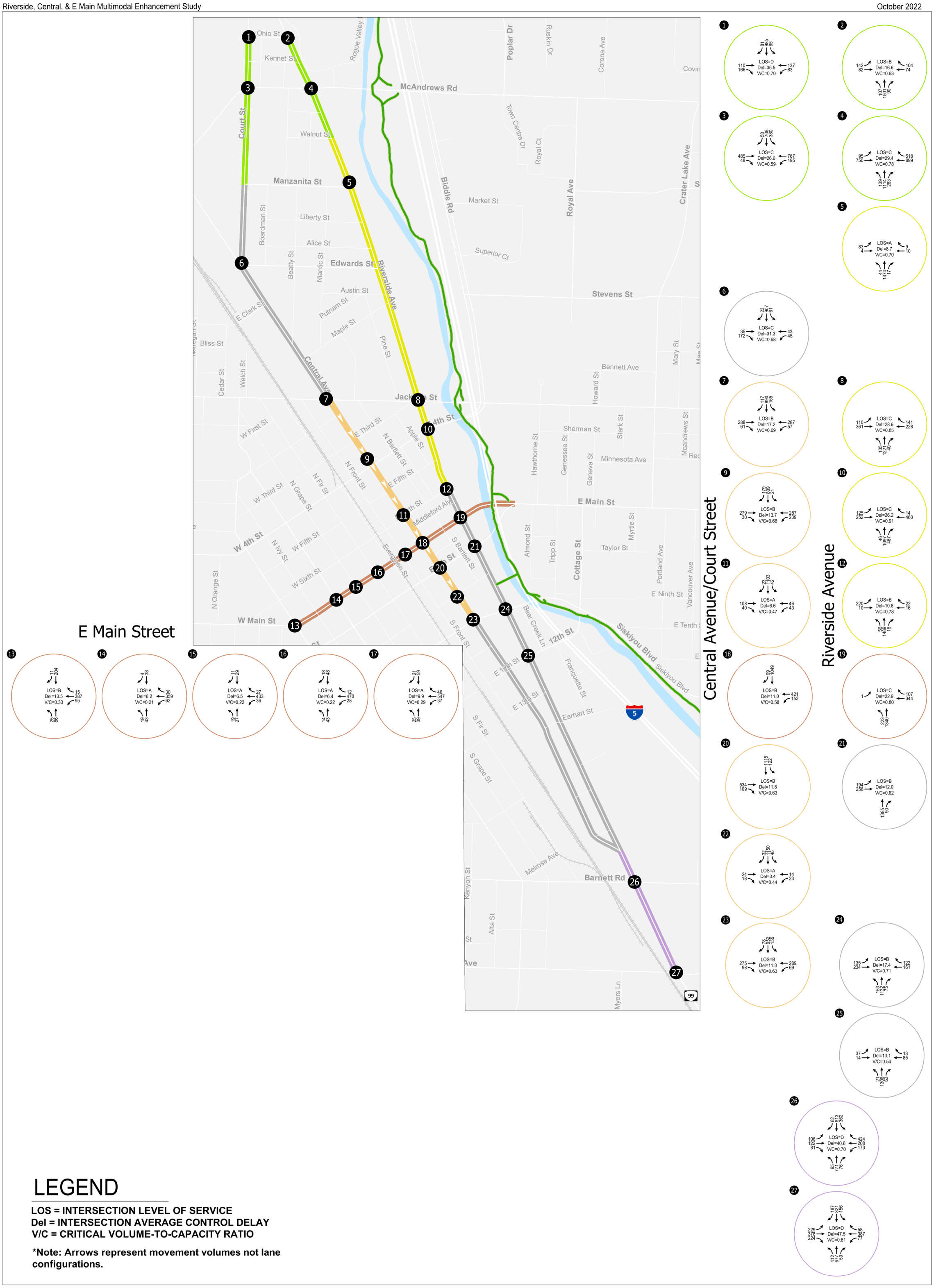
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2024 Operations (Alternative A - Permitted Phasing)*

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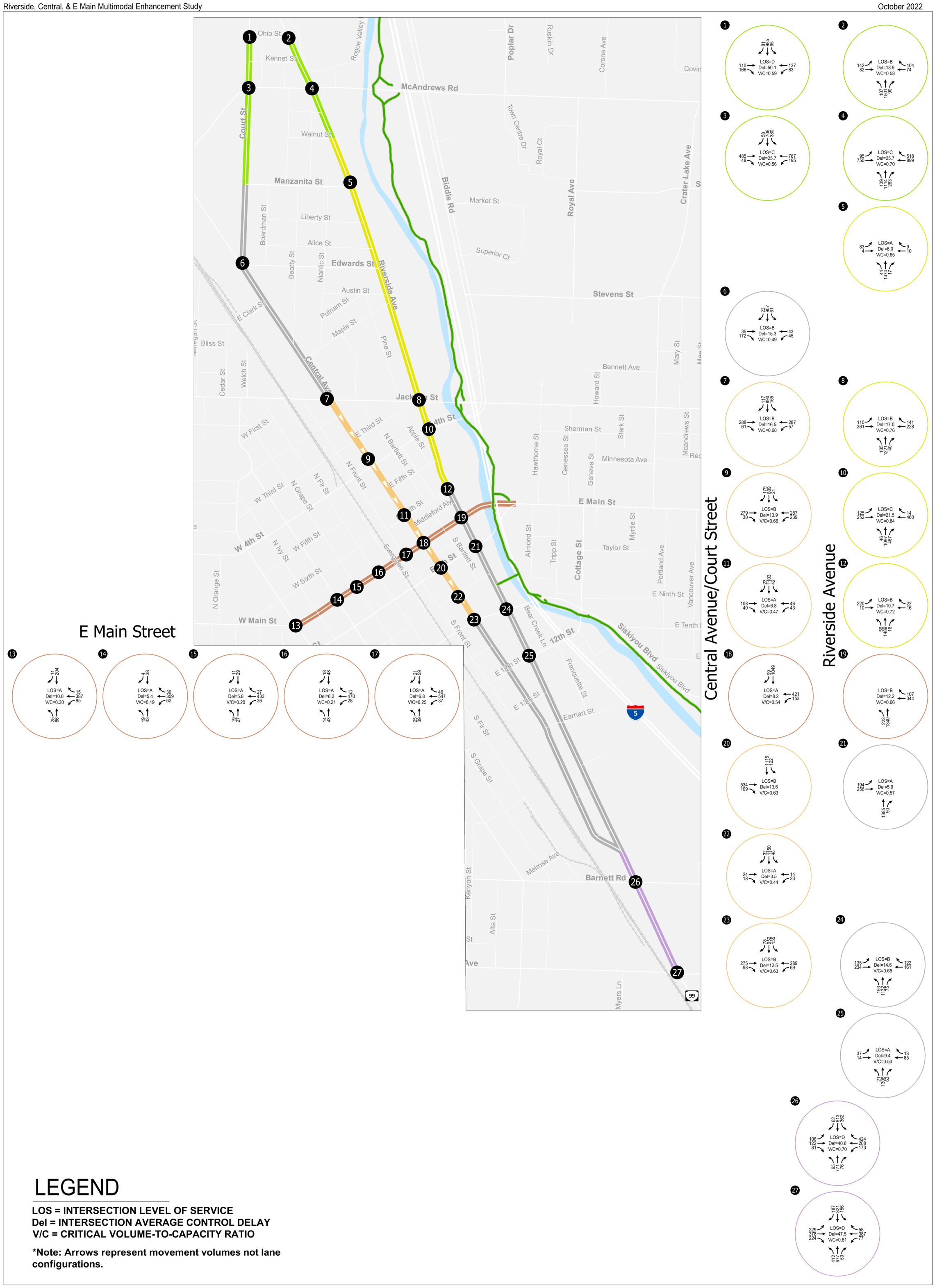
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2024 Operations (Alternative A - Protected Phasing)*

KITTELSON & ASSOCIATES



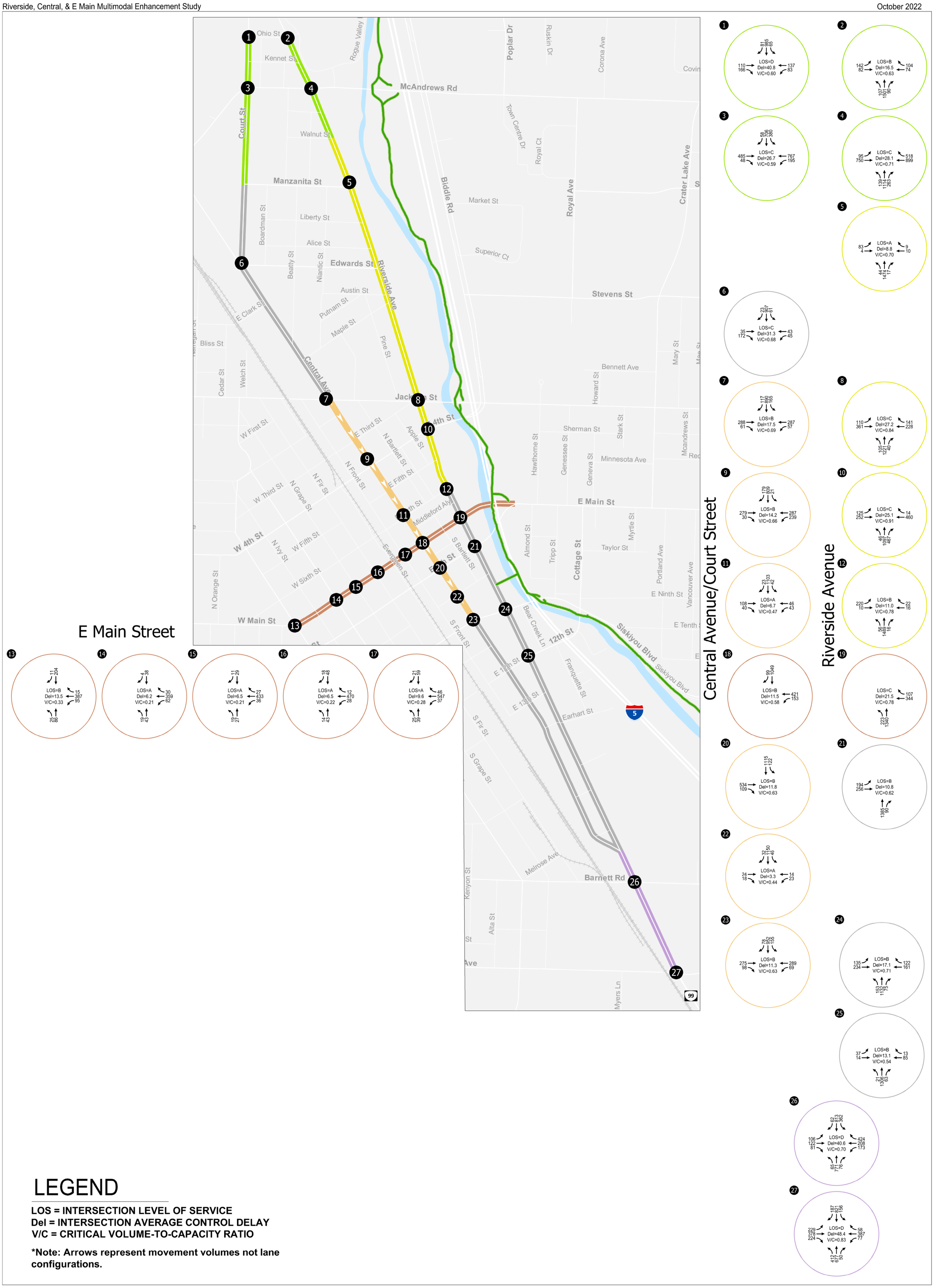
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2024 Operations (Alternative B - Permitted Phasing)*

KITTELSON & ASSOCIATES



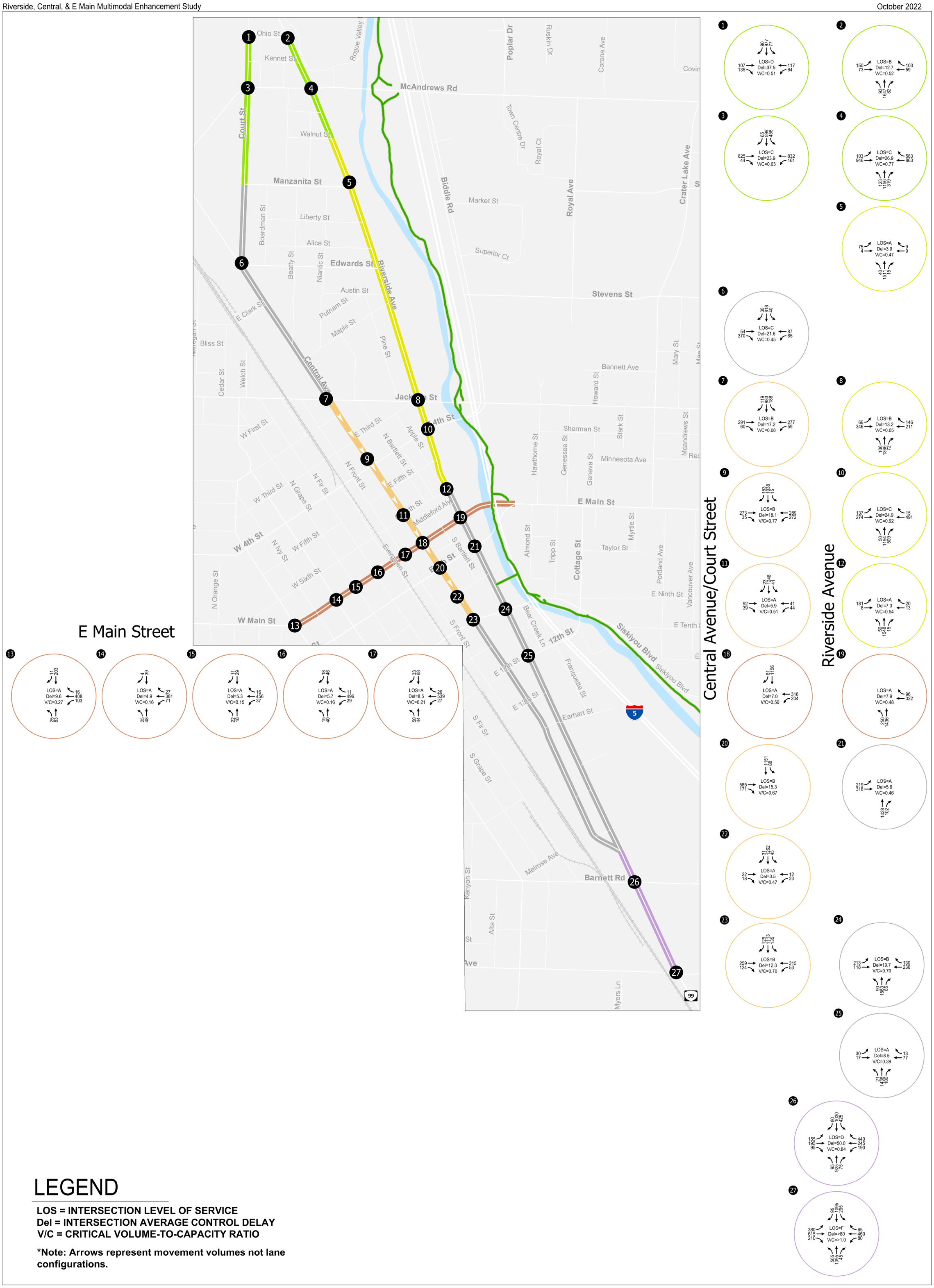
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***Note: Arrows represent movement volumes not lane configurations.**

2024 Operations (Alternative B - Protected Phasing)*

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E Main Street

Central Avenue/Court Street

Riverside Avenue

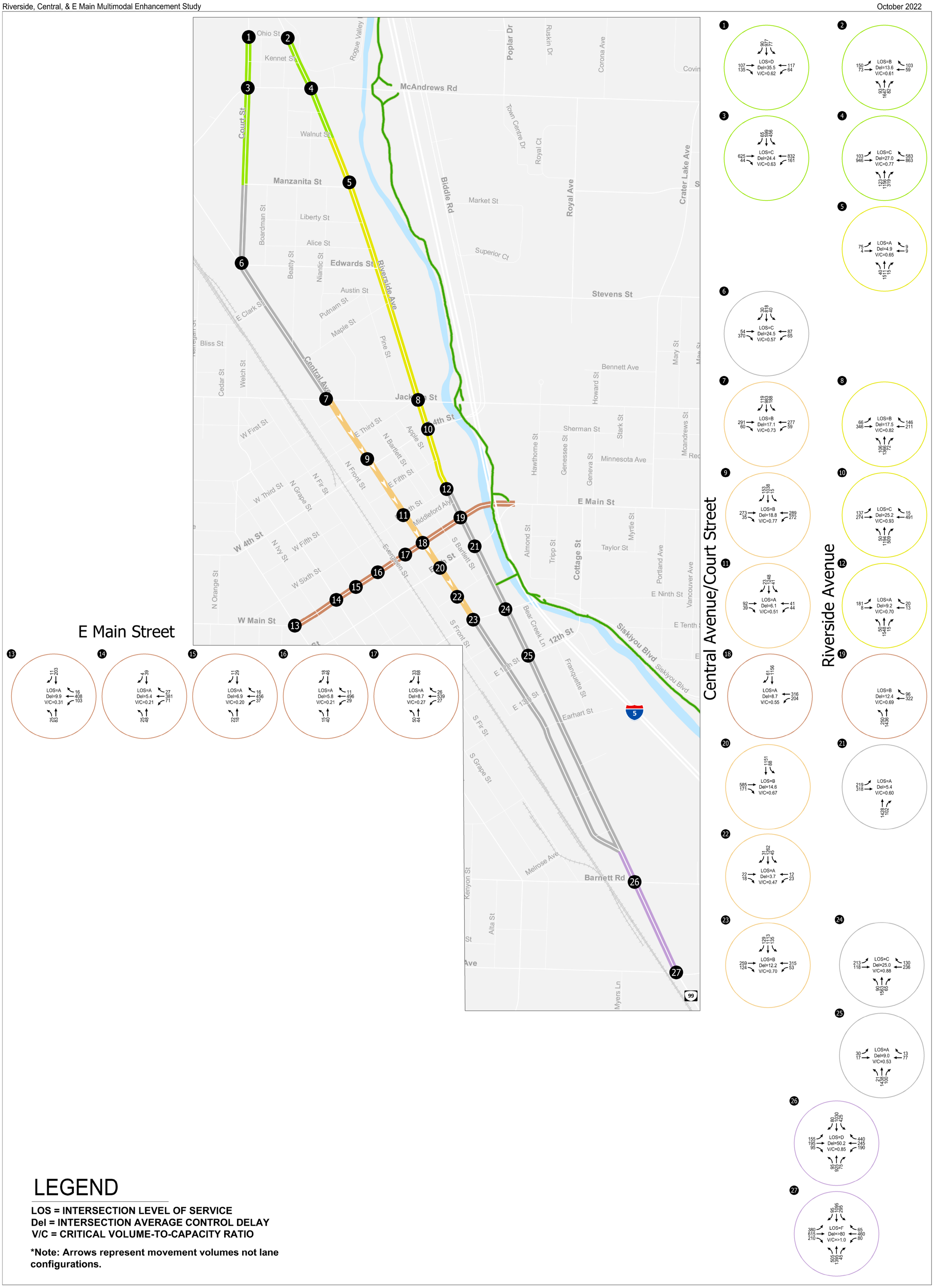
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***Note: Arrows represent movement volumes not lane configurations.**

2038 Operations (No-Build)*

KITTELSON & ASSOCIATES



E Main Street

Central Avenue/Court Street

Riverside Avenue

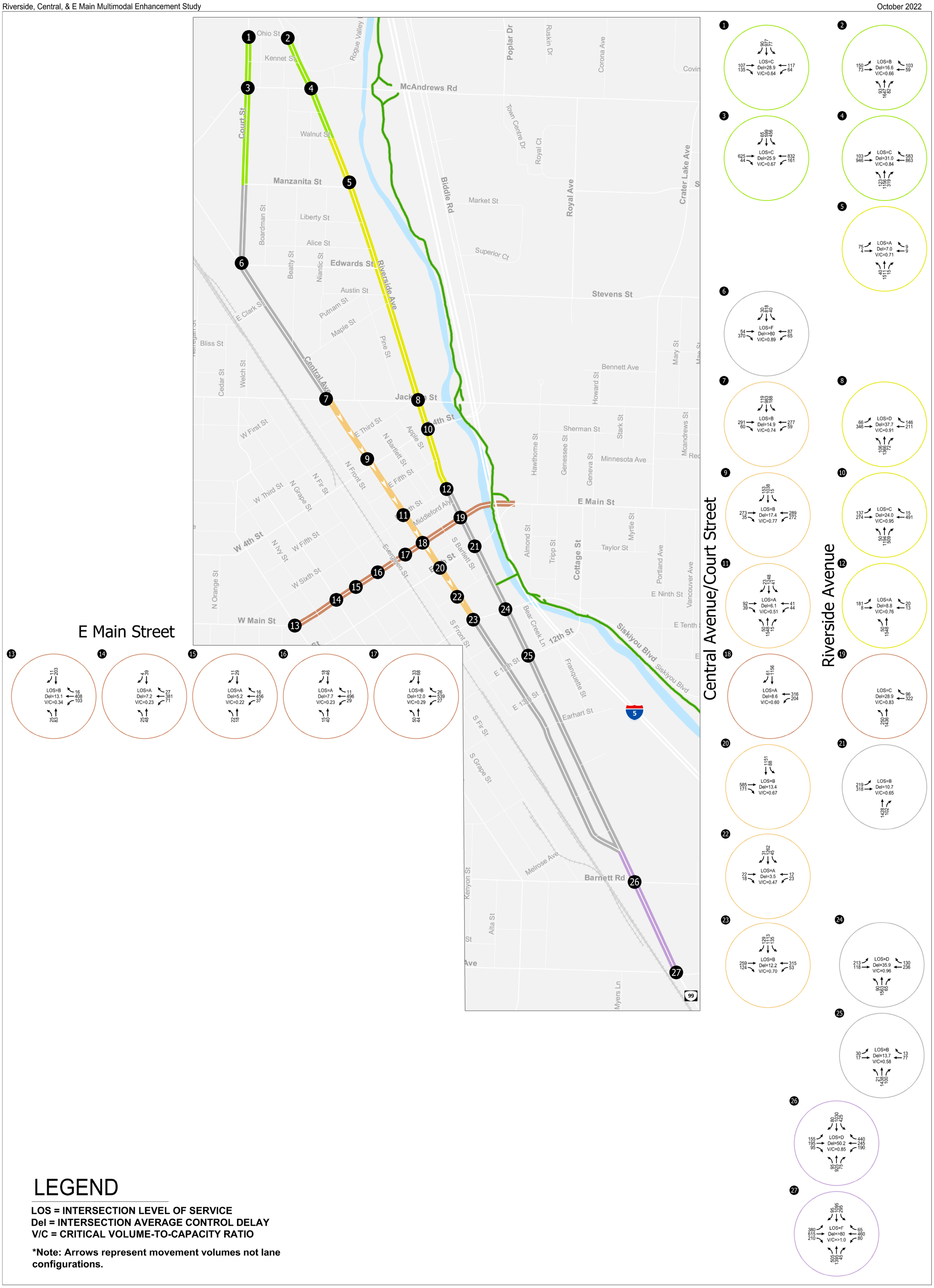
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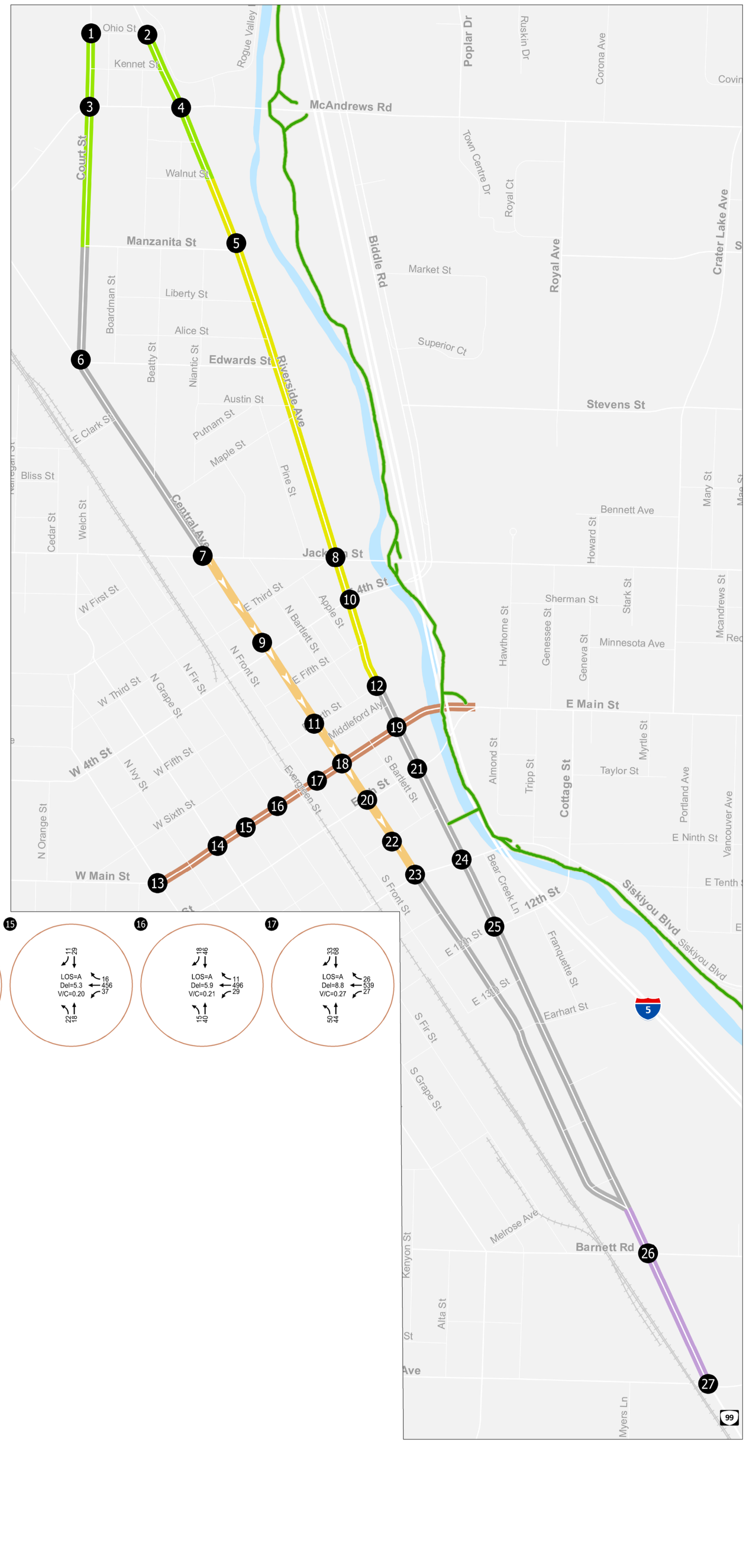
2038 Operations (Alternative A - Permitted Phasing)*

KITTELSON & ASSOCIATES

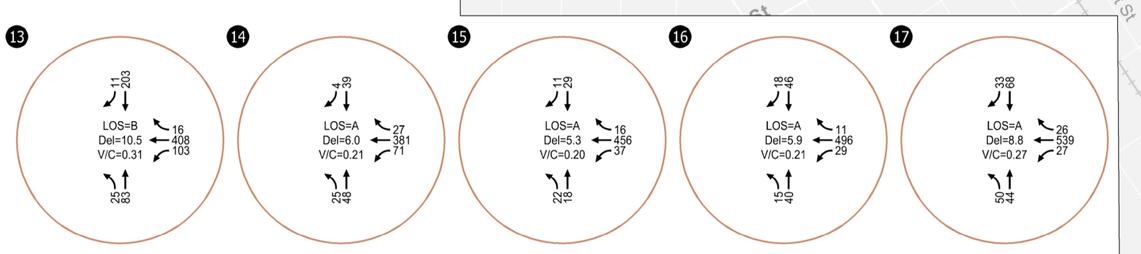


2038 Operations (Alternative A - Protected Phasing)*

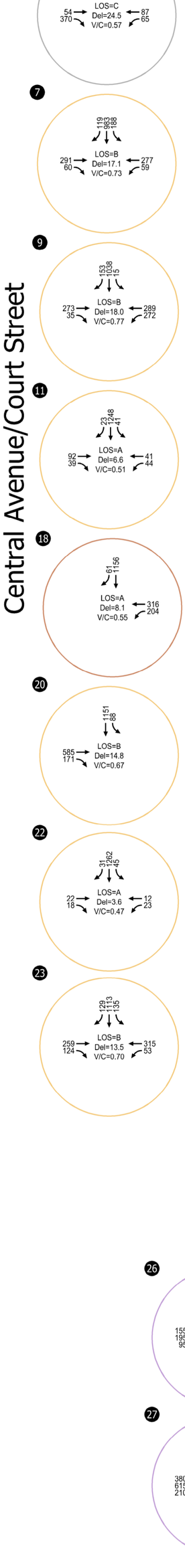
KITTELSON & ASSOCIATES



E Main Street



Central Avenue/Court Street



River Avenue



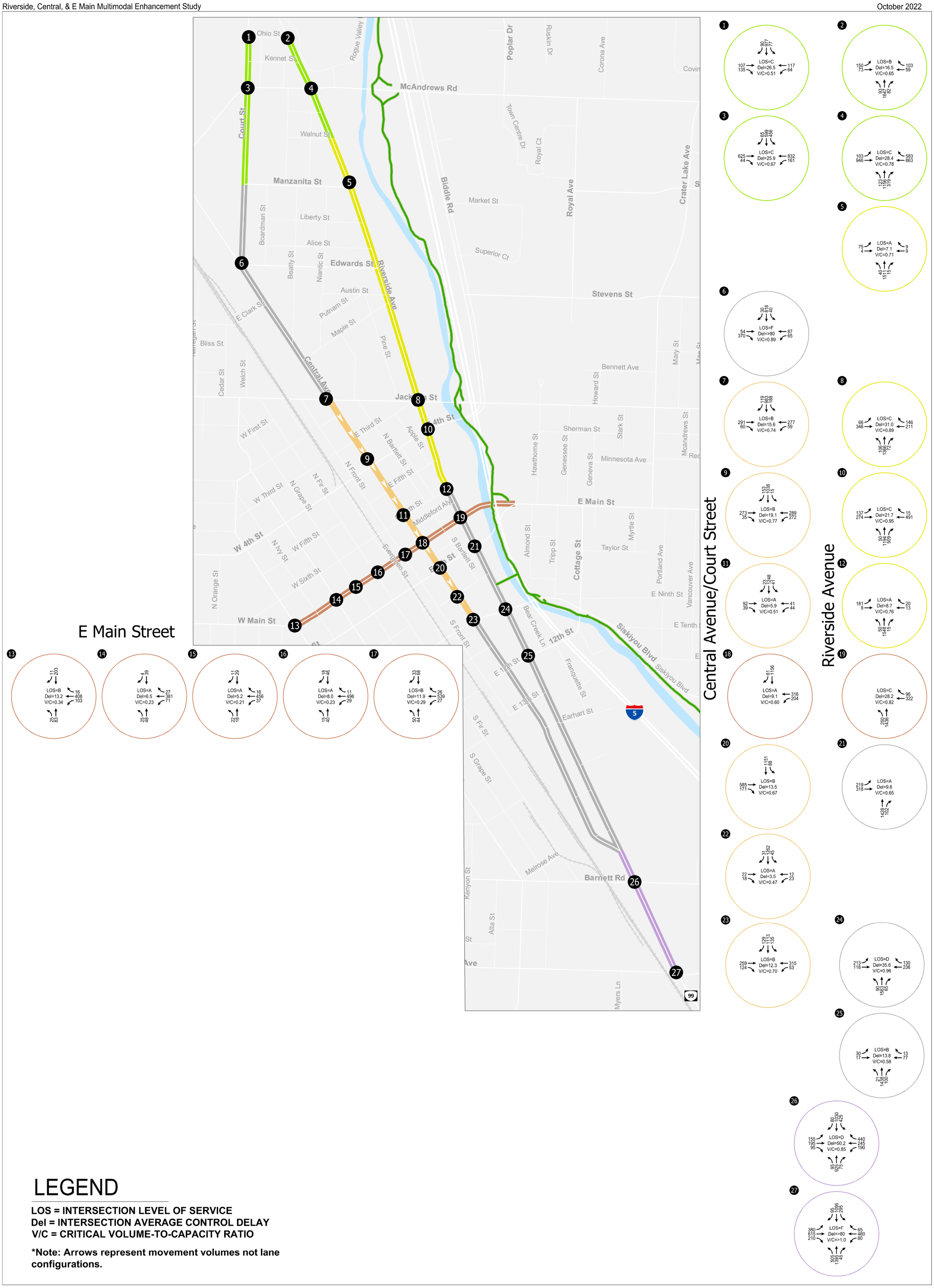
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2038 Operations (Alternative B - Permitted Phasing)*

KITTELSON & ASSOCIATES



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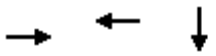
***Note: Arrows represent movement volumes not lane configurations.**

2038 Operations (Alternative B - Protected Phasing)*

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Appendix D
Synchro Reports

2024 No-Build

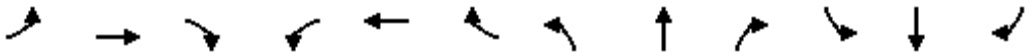


Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	276	220	1131
v/c Ratio	0.72	1.50	0.33
Control Delay	36.8	286.0	6.1
Queue Delay	0.0	0.0	0.0
Total Delay	36.8	286.0	6.1
Queue Length 50th (ft)	120	~179	83
Queue Length 95th (ft)	190	#307	140
Internal Link Dist (ft)	872	380	781
Turn Bay Length (ft)			
Base Capacity (vph)	715	304	3395
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.39	0.72	0.33

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



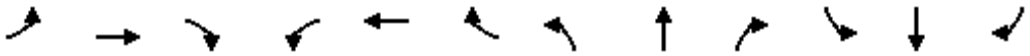
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	110	166	83	137	0	0	0	0	65	985	81
Future Volume (vph)	0	110	166	83	137	0	0	0	0	65	985	81
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						0.91	
Frpb, ped/bikes		0.99			1.00						1.00	
Flpb, ped/bikes		1.00			1.00						1.00	
Frt		0.92			1.00						0.99	
Flt Protected		1.00			0.98						1.00	
Satd. Flow (prot)		1598			1728						4730	
Flt Permitted		1.00			0.41						1.00	
Satd. Flow (perm)		1598			725						4730	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	110	166	83	137	0	0	0	0	65	985	81
RTOR Reduction (vph)	0	60	0	0	0	0	0	0	0	0	5	0
Lane Group Flow (vph)	0	216	0	0	220	0	0	0	0	0	1126	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		20.8			20.8						71.7	
Effective Green, g (s)		20.3			20.3						71.7	
Actuated g/C Ratio		0.20			0.20						0.72	
Clearance Time (s)		3.5			3.5						4.0	
Vehicle Extension (s)		2.0			2.0						4.0	
Lane Grp Cap (vph)		324			147						3391	
v/s Ratio Prot		0.14										
v/s Ratio Perm					c0.30						0.24	
v/c Ratio		0.67			1.50						0.33	
Uniform Delay, d1		36.7			39.9						5.3	
Progression Factor		1.00			0.91						1.00	
Incremental Delay, d2		4.0			255.2						0.3	
Delay (s)		40.7			291.4						5.5	
Level of Service		D			F						A	
Approach Delay (s)		40.7			291.4			0.0			5.5	
Approach LOS		D			F			A			A	

Intersection Summary			
HCM 2000 Control Delay	50.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	68.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



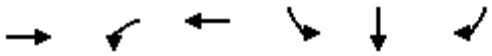
Lane Group	EBT	WBT	WBR	NBT
Lane Group Flow (vph)	224	95	83	1698
v/c Ratio	0.80	0.26	0.26	0.41
Control Delay	47.8	26.3	25.4	7.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	47.8	26.3	25.4	7.7
Queue Length 50th (ft)	93	43	35	119
Queue Length 95th (ft)	149	81	71	184
Internal Link Dist (ft)	380	321		579
Turn Bay Length (ft)				
Base Capacity (vph)	516	647	561	4135
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.43	0.15	0.15	0.41

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	142	82	0	0	74	104	107	1501	90	0	0	0
Future Volume (vph)	142	82	0	0	74	104	107	1501	90	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.5			4.5	4.5		5.0				
Lane Util. Factor		1.00			0.95	0.95		0.86				
Frpb, ped/bikes		1.00			0.99	0.98		1.00				
Flpb, ped/bikes		0.99			1.00	1.00		1.00				
Frt		1.00			0.97	0.85		0.99				
Flt Protected		0.97			1.00	1.00		1.00				
Satd. Flow (prot)		1700			1613	1392		5991				
Flt Permitted		0.74			1.00	1.00		1.00				
Satd. Flow (perm)		1306			1613	1392		5991				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	142	82	0	0	74	104	107	1501	90	0	0	0
RTOR Reduction (vph)	0	0	0	0	13	15	0	5	0	0	0	0
Lane Group Flow (vph)	0	224	0	0	82	68	0	1693	0	0	0	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Turn Type	Perm	NA			NA	Perm	Split	NA				
Protected Phases		4			8		2	2				
Permitted Phases	4					8						
Actuated Green, G (s)		22.1			22.1	22.1		69.4				
Effective Green, g (s)		21.6			21.6	21.6		68.9				
Actuated g/C Ratio		0.22			0.22	0.22		0.69				
Clearance Time (s)		4.0			4.0	4.0		4.5				
Vehicle Extension (s)		2.5			2.5	2.5		2.0				
Lane Grp Cap (vph)		282			348	300		4127				
v/s Ratio Prot					0.05			c0.28				
v/s Ratio Perm		c0.17				0.05						
v/c Ratio		0.79			0.23	0.23		0.41				
Uniform Delay, d1		37.1			32.4	32.3		6.7				
Progression Factor		0.77			1.00	1.00		1.00				
Incremental Delay, d2		13.5			0.3	0.3		0.3				
Delay (s)		42.1			32.6	32.6		7.0				
Level of Service		D			C	C		A				
Approach Delay (s)		42.1			32.6			7.0			0.0	
Approach LOS		D			C			A			A	

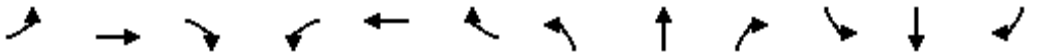
Intersection Summary			
HCM 2000 Control Delay	13.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.5
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	533	195	767	380	706	58
v/c Ratio	0.48	0.50	0.38	0.69	0.44	0.11
Control Delay	34.0	31.2	4.6	41.0	31.8	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.0	31.2	4.6	41.0	31.8	6.5
Queue Length 50th (ft)	172	137	45	247	152	0
Queue Length 95th (ft)	241	m209	54	337	178	28
Internal Link Dist (ft)	690		672		521	
Turn Bay Length (ft)		110		175		175
Base Capacity (vph)	1118	391	2024	642	1846	602
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.50	0.38	0.59	0.38	0.10

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	485	48	195	767	0	0	0	0	380	706	58
Future Volume (vph)	0	485	48	195	767	0	0	0	0	380	706	58
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0		4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.95		1.00	0.95					1.00	0.91	1.00
Frpb, ped/bikes		1.00		1.00	1.00					1.00	1.00	0.99
Flpb, ped/bikes		1.00		1.00	1.00					1.00	1.00	1.00
Frt		0.99		1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		3303		1676	3353					1676	4818	1478
Flt Permitted		1.00		0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		3303		1676	3353					1676	4818	1478
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	485	48	195	767	0	0	0	0	380	706	58
RTOR Reduction (vph)	0	6	0	0	0	0	0	0	0	0	0	39
Lane Group Flow (vph)	0	527	0	195	767	0	0	0	0	380	706	19
Confl. Peds. (#/hr)	2		2	2		2	2		1	1		2
Turn Type		NA		Prot	NA					Split	NA	Perm
Protected Phases		4		3	8					6	6	
Permitted Phases												6
Actuated Green, G (s)		40.5		29.0	72.5					39.5	39.5	39.5
Effective Green, g (s)		40.5		28.0	72.5					39.5	39.5	39.5
Actuated g/C Ratio		0.34		0.23	0.60					0.33	0.33	0.33
Clearance Time (s)		4.0		3.0	4.0					4.0	4.0	4.0
Vehicle Extension (s)		4.0		2.0	4.0					5.0	5.0	5.0
Lane Grp Cap (vph)		1114		391	2025					551	1585	486
v/s Ratio Prot		c0.16		c0.12	0.23					c0.23	0.15	
v/s Ratio Perm												0.01
v/c Ratio		0.47		0.50	0.38					0.69	0.45	0.04
Uniform Delay, d1		31.3		39.9	12.2					34.9	31.6	27.4
Progression Factor		1.00		0.68	0.31					1.00	1.00	1.00
Incremental Delay, d2		1.4		0.3	0.4					4.6	0.4	0.1
Delay (s)		32.8		27.3	4.3					39.5	32.1	27.4
Level of Service		C		C	A					D	C	C
Approach Delay (s)		32.8			9.0			0.0			34.3	
Approach LOS		C			A			A			C	

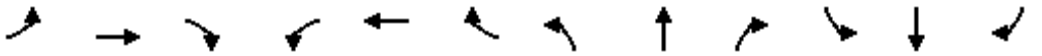
Intersection Summary			
HCM 2000 Control Delay	24.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	76.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Group Flow (vph)	95	750	899	518	1253	263
v/c Ratio	0.65	0.36	0.53	0.66	0.79	0.43
Control Delay	75.0	1.9	22.0	23.2	40.5	12.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.0	1.9	22.0	23.2	40.5	12.5
Queue Length 50th (ft)	64	25	243	241	319	45
Queue Length 95th (ft)	m123	22	314	384	378	119
Internal Link Dist (ft)		672	539		1193	
Turn Bay Length (ft)	130					150
Base Capacity (vph)	181	2069	1690	781	1596	607
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.36	0.53	0.66	0.79	0.43

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



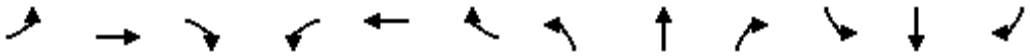
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	95	750	0	0	899	518	139	1114	263	0	0	0
Future Volume (vph)	95	750	0	0	899	518	139	1114	263	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	3.0			3.0	3.0		3.0	3.0			
Lane Util. Factor	1.00	0.95			0.95	1.00		0.91	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	0.97		1.00	0.97			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.99	1.00			
Satd. Flow (prot)	1676	3353			3353	1456		4791	1461			
Flt Permitted	0.95	1.00			1.00	1.00		0.99	1.00			
Satd. Flow (perm)	1676	3353			3353	1456		4791	1461			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	95	750	0	0	899	518	139	1114	263	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	47	0	0	120	0	0	0
Lane Group Flow (vph)	95	750	0	0	899	471	0	1253	143	0	0	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	7	4			8		2	2				
Permitted Phases						8			2			
Actuated Green, G (s)	10.5	73.1			59.6	59.6		38.9	38.9			
Effective Green, g (s)	10.5	74.1			60.6	60.6		39.9	39.9			
Actuated g/C Ratio	0.09	0.62			0.51	0.51		0.33	0.33			
Clearance Time (s)	3.0	4.0			4.0	4.0		4.0	4.0			
Vehicle Extension (s)	2.0	4.0			4.0	4.0		4.0	4.0			
Lane Grp Cap (vph)	146	2070			1693	735		1593	485			
v/s Ratio Prot	c0.06	0.22			0.27			c0.26				
v/s Ratio Perm						c0.32			0.10			
v/c Ratio	0.65	0.36			0.53	0.64		0.79	0.29			
Uniform Delay, d1	53.0	11.3			20.1	21.7		36.2	29.6			
Progression Factor	1.10	0.13			1.00	1.00		1.00	1.00			
Incremental Delay, d2	6.6	0.4			1.2	4.3		2.8	0.5			
Delay (s)	64.7	1.9			21.3	26.0		39.0	30.1			
Level of Service	E	A			C	C		D	C			
Approach Delay (s)		9.0			23.0			37.5			0.0	
Approach LOS		A			C			D			A	

Intersection Summary			
HCM 2000 Control Delay	25.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	76.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBT	NBT
Lane Group Flow (vph)	87	19	1535
v/c Ratio	0.33	0.05	0.53
Control Delay	31.5	19.1	3.0
Queue Delay	0.0	0.0	0.0
Total Delay	31.5	19.1	3.0
Queue Length 50th (ft)	39	4	35
Queue Length 95th (ft)	81	22	55
Internal Link Dist (ft)	550	165	918
Turn Bay Length (ft)			
Base Capacity (vph)	267	348	2915
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.33	0.05	0.53

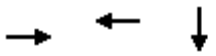
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	83	4	0	0	10	9	44	1474	17	0	0	0
Future Volume (vph)	83	4	0	0	10	9	44	1474	17	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0			4.0				
Lane Util. Factor		1.00			1.00			0.91				
Frpb, ped/bikes		1.00			0.99			1.00				
Flpb, ped/bikes		0.98			1.00			1.00				
Frt		1.00			0.94			1.00				
Flt Protected		0.95			1.00			1.00				
Satd. Flow (prot)		1483			1469			4321				
Flt Permitted		0.74			1.00			1.00				
Satd. Flow (perm)		1151			1469			4321				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	83	4	0	0	10	9	44	1474	17	0	0	0
RTOR Reduction (vph)	0	0	0	0	7	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	87	0	0	12	0	0	1534	0	0	0	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Turn Type	Perm	NA			NA		Split	NA				
Protected Phases		4			8		2	2				
Permitted Phases	4											
Actuated Green, G (s)		20.0			20.0			58.0				
Effective Green, g (s)		20.0			20.0			58.0				
Actuated g/C Ratio		0.23			0.23			0.67				
Clearance Time (s)		4.0			4.0			4.0				
Lane Grp Cap (vph)		267			341			2914				
v/s Ratio Prot					0.01			c0.35				
v/s Ratio Perm		c0.08										
v/c Ratio		0.33			0.04			0.53				
Uniform Delay, d1		27.4			25.5			7.1				
Progression Factor		1.00			1.00			0.33				
Incremental Delay, d2		3.2			0.2			0.6				
Delay (s)		30.6			25.7			2.9				
Level of Service		C			C			A				
Approach Delay (s)		30.6			25.7			2.9			0.0	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	4.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.1%	ICU Level of Service	B
Analysis Period (min)	15		

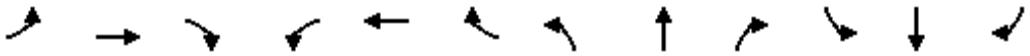
c Critical Lane Group



Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	207	88	991
v/c Ratio	0.71	0.44	0.35
Control Delay	23.0	38.3	9.6
Queue Delay	0.0	0.0	0.0
Total Delay	23.0	38.3	9.6
Queue Length 50th (ft)	18	48	71
Queue Length 95th (ft)	80	m74	184
Internal Link Dist (ft)	7	1528	2014
Turn Bay Length (ft)			
Base Capacity (vph)	439	414	2815
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.47	0.21	0.35

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	35	172	45	43	0	0	0	0	61	907	23
Future Volume (vph)	0	35	172	45	43	0	0	0	0	61	907	23
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						0.91	
Frpb, ped/bikes		0.97			1.00						1.00	
Flpb, ped/bikes		1.00			1.00						1.00	
Frt		0.89			1.00						1.00	
Flt Protected		1.00			0.98						1.00	
Satd. Flow (prot)		1361			1549						4303	
Flt Permitted		1.00			0.98						1.00	
Satd. Flow (perm)		1361			1549						4303	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	35	172	45	43	0	0	0	0	61	907	23
RTOR Reduction (vph)	0	155	0	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	52	0	0	88	0	0	0	0	0	989	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Turn Type		NA		Split	NA					Split	NA	
Protected Phases		7		8	8					6	6	
Permitted Phases												
Actuated Green, G (s)		8.5			10.1						55.4	
Effective Green, g (s)		8.5			10.1						55.4	
Actuated g/C Ratio		0.10			0.12						0.64	
Clearance Time (s)		4.0			4.0						4.0	
Vehicle Extension (s)		2.0			2.0						4.0	
Lane Grp Cap (vph)		134			181						2771	
v/s Ratio Prot		c0.04			c0.06						c0.23	
v/s Ratio Perm												
v/c Ratio		0.39			0.49						0.36	
Uniform Delay, d1		36.3			35.5						7.1	
Progression Factor		1.00			0.99						1.00	
Incremental Delay, d2		0.7			0.7						0.4	
Delay (s)		37.0			36.0						7.4	
Level of Service		D			D						A	
Approach Delay (s)		37.0			36.0			0.0			7.4	
Approach LOS		D			D			A			A	

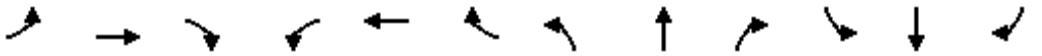
Intersection Summary			
HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	59.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBL	WBT	SBT	SBR
Lane Group Flow (vph)	349	57	287	1055	117
v/c Ratio	0.62	0.26	0.50	0.64	0.15
Control Delay	27.4	15.7	17.3	13.6	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	27.4	15.7	17.3	13.6	2.0
Queue Length 50th (ft)	147	14	69	226	6
Queue Length 95th (ft)	239	m23	128	61	1
Internal Link Dist (ft)	1450		992	1806	
Turn Bay Length (ft)		250			
Base Capacity (vph)	565	220	572	1636	759
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.62	0.26	0.50	0.64	0.15

Intersection Summary

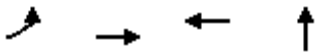
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	288	61	57	287	0	0	0	0	165	890	117
Future Volume (vph)	0	288	61	57	287	0	0	0	0	165	890	117
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0		4.0	4.0						4.0	4.0
Lane Util. Factor		1.00		1.00	1.00						0.95	1.00
Frpb, ped/bikes		1.00		1.00	1.00						1.00	0.96
Flpb, ped/bikes		1.00		1.00	1.00						1.00	1.00
Frt		0.98		1.00	1.00						1.00	0.85
Flt Protected		1.00		0.95	1.00						0.99	1.00
Satd. Flow (prot)		1545		1502	1588						2994	1293
Flt Permitted		1.00		0.39	1.00						0.99	1.00
Satd. Flow (perm)		1545		612	1588						2994	1293
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	288	61	57	287	0	0	0	0	165	890	117
RTOR Reduction (vph)	0	9	0	0	0	0	0	0	0	0	0	53
Lane Group Flow (vph)	0	340	0	57	287	0	0	0	0	0	1055	64
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		15
Turn Type		NA		Perm	NA					Split	NA	Perm
Protected Phases		4			8					6	6	
Permitted Phases				8								6
Actuated Green, G (s)		31.0		31.0	31.0						47.0	47.0
Effective Green, g (s)		31.0		31.0	31.0						47.0	47.0
Actuated g/C Ratio		0.36		0.36	0.36						0.55	0.55
Clearance Time (s)		4.0		4.0	4.0						4.0	4.0
Lane Grp Cap (vph)		556		220	572						1636	706
v/s Ratio Prot		c0.22			0.18						c0.35	
v/s Ratio Perm				0.09								0.05
v/c Ratio		0.61		0.26	0.50						0.64	0.09
Uniform Delay, d1		22.6		19.4	21.5						13.7	9.3
Progression Factor		1.00		0.65	0.67						0.84	0.77
Incremental Delay, d2		5.0		2.3	2.6						1.9	0.2
Delay (s)		27.5		14.9	16.9						13.3	7.4
Level of Service		C		B	B						B	A
Approach Delay (s)		27.5			16.6			0.0			12.7	
Approach LOS		C			B			A			B	

Intersection Summary			
HCM 2000 Control Delay	16.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	77.8%	ICU Level of Service	D
Analysis Period (min)	15		

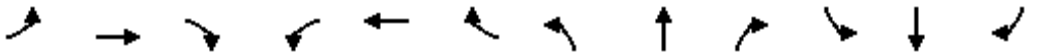
c Critical Lane Group



Lane Group	EBL	EBT	WBT	NBT
Lane Group Flow (vph)	110	361	369	1366
v/c Ratio	0.39	0.53	0.57	0.67
Control Delay	25.5	25.7	21.1	7.5
Queue Delay	0.0	0.0	0.0	0.3
Total Delay	25.5	25.7	21.1	7.8
Queue Length 50th (ft)	48	169	134	56
Queue Length 95th (ft)	m83	251	222	64
Internal Link Dist (ft)		992	302	277
Turn Bay Length (ft)	200			
Base Capacity (vph)	279	683	652	2048
Starvation Cap Reductn	0	0	0	205
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.39	0.53	0.57	0.74

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	361	0	0	228	141	105	1221	40	0	0	0
Future Volume (vph)	110	361	0	0	228	141	105	1221	40	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0			4.0			4.0				
Lane Util. Factor	1.00	1.00			1.00			0.91				
Frpb, ped/bikes	1.00	1.00			0.98			1.00				
Flpb, ped/bikes	0.99	1.00			1.00			1.00				
Frt	1.00	1.00			0.95			1.00				
Flt Protected	0.95	1.00			1.00			1.00				
Satd. Flow (prot)	1488	1588			1481			4288				
Flt Permitted	0.42	1.00			1.00			1.00				
Satd. Flow (perm)	650	1588			1481			4288				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	110	361	0	0	228	141	105	1221	40	0	0	0
RTOR Reduction (vph)	0	0	0	0	16	0	0	4	0	0	0	0
Lane Group Flow (vph)	110	361	0	0	353	0	0	1362	0	0	0	0
Confl. Peds. (#/hr)	18		12	12		18	37		32	32		37
Turn Type	Perm	NA			NA		Split	NA				
Protected Phases		4			8		2	2				
Permitted Phases	4											
Actuated Green, G (s)	37.0	37.0			37.0			41.0				
Effective Green, g (s)	37.0	37.0			37.0			41.0				
Actuated g/C Ratio	0.43	0.43			0.43			0.48				
Clearance Time (s)	4.0	4.0			4.0			4.0				
Lane Grp Cap (vph)	279	683			637			2044				
v/s Ratio Prot		0.23			c0.24			c0.32				
v/s Ratio Perm	0.17											
v/c Ratio	0.39	0.53			0.55			0.67				
Uniform Delay, d1	16.8	18.1			18.3			17.3				
Progression Factor	1.23	1.25			1.00			0.36				
Incremental Delay, d2	3.3	2.3			3.5			1.2				
Delay (s)	24.0	24.9			21.8			7.5				
Level of Service	C	C			C			A				
Approach Delay (s)		24.7			21.8			7.5			0.0	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	13.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	77.8%	ICU Level of Service	D
Analysis Period (min)	15		

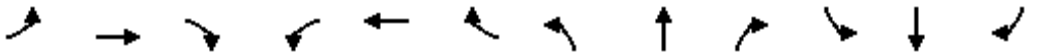
c Critical Lane Group



Lane Group	EBT	WBL	WBT	SBT	SBR
Lane Group Flow (vph)	309	239	287	830	179
v/c Ratio	0.67	0.55	0.35	0.70	0.28
Control Delay	34.9	10.7	9.0	11.6	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	34.9	10.7	9.0	11.6	0.9
Queue Length 50th (ft)	144	72	99	55	0
Queue Length 95th (ft)	235	m80	m109	72	m3
Internal Link Dist (ft)	282		688	858	
Turn Bay Length (ft)		250			
Base Capacity (vph)	458	434	812	1191	641
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.67	0.55	0.35	0.70	0.28

Intersection Summary

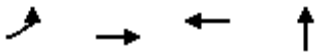
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	279	30	239	287	0	0	0	0	21	809	179
Future Volume (vph)	0	279	30	239	287	0	0	0	0	21	809	179
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0		4.0	4.0						4.0	4.0
Lane Util. Factor		1.00		1.00	1.00						0.95	1.00
Frpb, ped/bikes		1.00		1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00						1.00	1.00
Frt		0.99		1.00	1.00						1.00	0.85
Flt Protected		1.00		0.95	1.00						1.00	1.00
Satd. Flow (prot)		1563		1506	1588						3014	1350
Flt Permitted		1.00		0.32	1.00						1.00	1.00
Satd. Flow (perm)		1563		512	1588						3014	1350
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	279	30	239	287	0	0	0	0	21	809	179
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	0	0	0	108
Lane Group Flow (vph)	0	305	0	239	287	0	0	0	0	0	830	71
Confl. Peds. (#/hr)	6		11	11		6			2	2		
Turn Type		NA		pm+pt	NA					Split	NA	Prot
Protected Phases		4		3	8					6	6	6
Permitted Phases				8	8							
Actuated Green, G (s)		25.0		44.0	44.0						34.0	34.0
Effective Green, g (s)		25.0		44.0	44.0						34.0	34.0
Actuated g/C Ratio		0.29		0.51	0.51						0.40	0.40
Clearance Time (s)		4.0		4.0	4.0						4.0	4.0
Lane Grp Cap (vph)		454		435	812						1191	533
v/s Ratio Prot		c0.20		c0.10	0.18						c0.28	0.05
v/s Ratio Perm				0.19								
v/c Ratio		0.67		0.55	0.35						0.70	0.13
Uniform Delay, d1		26.9		13.5	12.5						21.7	16.6
Progression Factor		1.00		0.62	0.64						0.41	0.03
Incremental Delay, d2		7.7		2.9	0.7						2.7	0.4
Delay (s)		34.6		11.3	8.8						11.5	0.9
Level of Service		C		B	A						B	A
Approach Delay (s)		34.6			9.9			0.0			9.6	
Approach LOS		C			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	13.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	85.8%	ICU Level of Service	E
Analysis Period (min)	15		

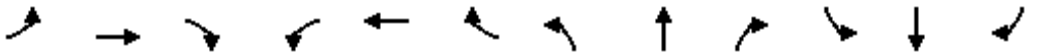
c Critical Lane Group



Lane Group	EBL	EBT	WBT	NBT
Lane Group Flow (vph)	125	252	474	1610
v/c Ratio	0.65	0.37	0.93	0.80
Control Delay	23.3	10.6	54.8	10.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	23.3	10.6	54.8	10.9
Queue Length 50th (ft)	30	108	235	70
Queue Length 95th (ft)	m39	m138	#399	102
Internal Link Dist (ft)		688	289	661
Turn Bay Length (ft)	250			
Base Capacity (vph)	195	757	571	2025
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.64	0.33	0.83	0.80

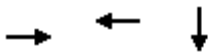
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



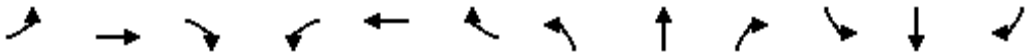
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	252	0	0	460	14	46	1097	467	0	0	0
Future Volume (vph)	125	252	0	0	460	14	46	1097	467	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0			4.0			4.0				
Lane Util. Factor	1.00	1.00			1.00			0.91				
Frpb, ped/bikes	1.00	1.00			1.00			0.99				
Flpb, ped/bikes	1.00	1.00			1.00			1.00				
Frt	1.00	1.00			1.00			0.96				
Flt Protected	0.95	1.00			1.00			1.00				
Satd. Flow (prot)	1509	1588			1581			4121				
Flt Permitted	0.16	1.00			1.00			1.00				
Satd. Flow (perm)	248	1588			1581			4121				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	125	252	0	0	460	14	46	1097	467	0	0	0
RTOR Reduction (vph)	0	0	0	0	1	0	0	79	0	0	0	0
Lane Group Flow (vph)	125	252	0	0	473	0	0	1531	0	0	0	0
Confl. Peds. (#/hr)	4		5	5		4	5		4	4		5
Turn Type	pm+pt	NA			NA		Split	NA				
Protected Phases	7	4			8		2	2				
Permitted Phases	4											
Actuated Green, G (s)	37.4	37.4			27.6			40.6				
Effective Green, g (s)	36.4	37.4			27.6			40.6				
Actuated g/C Ratio	0.42	0.43			0.32			0.47				
Clearance Time (s)	3.0	4.0			4.0			4.0				
Vehicle Extension (s)	2.0	0.2			0.2			0.2				
Lane Grp Cap (vph)	190	690			507			1945				
v/s Ratio Prot	c0.04	0.16			c0.30			c0.37				
v/s Ratio Perm	0.23											
v/c Ratio	0.66	0.37			0.93			0.79				
Uniform Delay, d1	18.6	16.3			28.3			19.1				
Progression Factor	0.60	0.59			1.00			0.42				
Incremental Delay, d2	5.3	0.1			23.9			2.7				
Delay (s)	16.3	9.7			52.2			10.7				
Level of Service	B	A			D			B				
Approach Delay (s)		11.9			52.2			10.7			0.0	
Approach LOS		B			D			B			A	

Intersection Summary			
HCM 2000 Control Delay	18.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	85.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	148	89	1168
v/c Ratio	0.37	0.27	0.52
Control Delay	26.9	29.7	2.0
Queue Delay	0.0	0.0	0.0
Total Delay	26.9	29.7	2.0
Queue Length 50th (ft)	58	40	21
Queue Length 95th (ft)	111	81	41
Internal Link Dist (ft)	137	79	634
Turn Bay Length (ft)			
Base Capacity (vph)	404	330	2244
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.37	0.27	0.52

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	108	40	43	46	0	0	0	0	42	1103	23
Future Volume (vph)	0	108	40	43	46	0	0	0	0	42	1103	23
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						0.95	
Frpb, ped/bikes		0.98			1.00						1.00	
Flpb, ped/bikes		1.00			0.98						1.00	
Frt		0.96			1.00						1.00	
Flt Protected		1.00			0.98						1.00	
Satd. Flow (prot)		1672			1691						3327	
Flt Permitted		1.00			0.82						1.00	
Satd. Flow (perm)		1672			1424						3327	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	108	40	43	46	0	0	0	0	42	1103	23
RTOR Reduction (vph)	0	15	0	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	133	0	0	89	0	0	0	0	0	1166	0
Confl. Peds. (#/hr)	22		24	24		22	14		20	20		14
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		20.0			20.0						58.0	
Effective Green, g (s)		20.0			20.0						58.0	
Actuated g/C Ratio		0.23			0.23						0.67	
Clearance Time (s)		4.0			4.0						4.0	
Lane Grp Cap (vph)		388			331						2243	
v/s Ratio Prot		c0.08										
v/s Ratio Perm					0.06						0.35	
v/c Ratio		0.34			0.27						0.52	
Uniform Delay, d1		27.5			27.0						7.0	
Progression Factor		1.00			1.00						0.18	
Incremental Delay, d2		2.4			2.0						0.7	
Delay (s)		29.9			29.0						2.0	
Level of Service		C			C						A	
Approach Delay (s)		29.9			29.0			0.0			2.0	
Approach LOS		C			C			A			A	

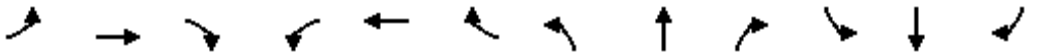
Intersection Summary			
HCM 2000 Control Delay	6.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	67.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBT	WBT	WBR	NBT
Lane Group Flow (vph)	230	16	22	1561
v/c Ratio	0.49	0.02	0.04	0.61
Control Delay	25.2	17.4	7.6	6.4
Queue Delay	0.0	0.0	0.0	0.1
Total Delay	25.2	17.4	7.6	6.5
Queue Length 50th (ft)	94	5	0	87
Queue Length 95th (ft)	163	18	15	100
Internal Link Dist (ft)	175	153		287
Turn Bay Length (ft)				
Base Capacity (vph)	469	656	571	2565
Starvation Cap Reductn	0	0	0	152
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.49	0.02	0.04	0.65

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	220	10	0	0	16	22	56	1489	16	0	0	0
Future Volume (vph)	220	10	0	0	16	22	56	1489	16	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0	4.0		4.0				
Lane Util. Factor		1.00			1.00	1.00		0.91				
Frpb, ped/bikes		1.00			1.00	1.00		1.00				
Flpb, ped/bikes		0.99			1.00	1.00		1.00				
Frt		1.00			1.00	0.85		1.00				
Flt Protected		0.95			1.00	1.00		1.00				
Satd. Flow (prot)		1663			1765	1500		4798				
Flt Permitted		0.72			1.00	1.00		1.00				
Satd. Flow (perm)		1261			1765	1500		4798				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	220	10	0	0	16	22	56	1489	16	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	14	0	1	0	0	0	0
Lane Group Flow (vph)	0	230	0	0	16	8	0	1560	0	0	0	0
Confl. Peds. (#/hr)	10		10				10					10
Turn Type	Perm	NA			NA	Perm	Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4					8	2					
Actuated Green, G (s)		32.0			32.0	32.0		46.0				
Effective Green, g (s)		32.0			32.0	32.0		46.0				
Actuated g/C Ratio		0.37			0.37	0.37		0.53				
Clearance Time (s)		4.0			4.0	4.0		4.0				
Lane Grp Cap (vph)		469			656	558		2566				
v/s Ratio Prot					0.01							
v/s Ratio Perm		c0.18				0.01		0.33				
v/c Ratio		0.49			0.02	0.01		0.61				
Uniform Delay, d1		20.7			17.1	17.0		13.8				
Progression Factor		1.00			1.00	1.00		0.39				
Incremental Delay, d2		3.6			0.1	0.0		1.0				
Delay (s)		24.4			17.2	17.1		6.3				
Level of Service		C			B	B		A				
Approach Delay (s)		24.4			17.1			6.3			0.0	
Approach LOS		C			B			A			A	

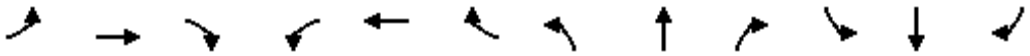
Intersection Summary			
HCM 2000 Control Delay	8.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	95	402	25	86	215
v/c Ratio	0.12	0.27	0.06	0.11	0.27
Control Delay	6.1	6.2	13.7	14.0	15.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	6.1	6.2	13.7	14.0	15.5
Queue Length 50th (ft)	11	24	7	26	68
Queue Length 95th (ft)	21	34	21	53	116
Internal Link Dist (ft)		479		105	1243
Turn Bay Length (ft)					
Base Capacity (vph)	760	1511	449	800	793
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.13	0.27	0.06	0.11	0.27

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	95	387	15	25	86	0	0	204	11
Future Volume (vph)	0	0	0	95	387	15	25	86	0	0	204	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)				4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor				1.00	0.95		1.00	1.00			1.00	
Frpb, ped/bikes				1.00	1.00		1.00	1.00			1.00	
Flpb, ped/bikes				1.00	1.00		0.96	1.00			1.00	
Frt				1.00	0.99		1.00	1.00			0.99	
Flt Protected				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)				1676	3328		1608	1765			1746	
Flt Permitted				0.95	1.00		0.59	1.00			1.00	
Satd. Flow (perm)				1676	3328		991	1765			1746	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	95	387	15	25	86	0	0	204	11
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	0	0	95	399	0	25	86	0	0	213	0
Confl. Peds. (#/hr)	15		46	46		15	35		34	34		35
Turn Type				Split	NA		Perm	NA			NA	
Protected Phases				8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)				39.0	39.0		39.0	39.0			39.0	
Effective Green, g (s)				39.0	39.0		39.0	39.0			39.0	
Actuated g/C Ratio				0.45	0.45		0.45	0.45			0.45	
Clearance Time (s)				4.0	4.0		4.0	4.0			4.0	
Lane Grp Cap (vph)				760	1509		449	800			791	
v/s Ratio Prot				0.06	c0.12			0.05			c0.12	
v/s Ratio Perm							0.03					
v/c Ratio				0.12	0.26		0.06	0.11			0.27	
Uniform Delay, d1				13.6	14.6		13.2	13.5			14.6	
Progression Factor				0.42	0.40		1.00	1.00			1.00	
Incremental Delay, d2				0.3	0.4		0.2	0.3			0.8	
Delay (s)				6.0	6.2		13.4	13.8			15.5	
Level of Service				A	A		B	B			B	
Approach Delay (s)		0.0			6.2			13.7			15.5	
Approach LOS		A			A			B			B	

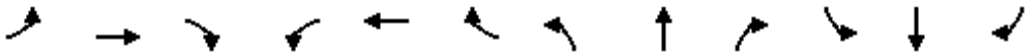
Intersection Summary			
HCM 2000 Control Delay	9.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	WBT	NBT	SBT
Lane Group Flow (vph)	451	62	42
v/c Ratio	0.17	0.11	0.07
Control Delay	1.6	19.0	17.2
Queue Delay	0.0	0.0	0.0
Total Delay	1.6	19.0	17.2
Queue Length 50th (ft)	5	22	13
Queue Length 95th (ft)	7	48	35
Internal Link Dist (ft)	199	104	1901
Turn Bay Length (ft)			
Base Capacity (vph)	2584	590	627
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.17	0.11	0.07

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	62	359	30	19	43	0	0	38	4
Future Volume (vph)	0	0	0	62	359	30	19	43	0	0	38	4
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.0			4.0			4.0	
Lane Util. Factor					0.91			1.00			1.00	
Frpb, ped/bikes					0.99			1.00			1.00	
Flpb, ped/bikes					1.00			0.99			1.00	
Frt					0.99			1.00			0.99	
Flt Protected					0.99			0.98			1.00	
Satd. Flow (prot)					4712			1723			1735	
Flt Permitted					0.99			0.94			1.00	
Satd. Flow (perm)					4712			1638			1735	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	62	359	30	19	43	0	0	38	4
RTOR Reduction (vph)	0	0	0	0	10	0	0	0	0	0	3	0
Lane Group Flow (vph)	0	0	0	0	441	0	0	62	0	0	39	0
Confl. Peds. (#/hr)	26		30	30		26	18		66	66		18
Turn Type				Split	NA		Perm	NA			NA	
Protected Phases				8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)					47.0			31.0			31.0	
Effective Green, g (s)					47.0			31.0			31.0	
Actuated g/C Ratio					0.55			0.36			0.36	
Clearance Time (s)					4.0			4.0			4.0	
Lane Grp Cap (vph)					2575			590			625	
v/s Ratio Prot					c0.09						0.02	
v/s Ratio Perm								c0.04				
v/c Ratio					0.17			0.11			0.06	
Uniform Delay, d1					9.8			18.3			18.0	
Progression Factor					0.16			1.00			1.00	
Incremental Delay, d2					0.1			0.4			0.2	
Delay (s)					1.7			18.6			18.2	
Level of Service					A			B			B	
Approach Delay (s)		0.0			1.7			18.6			18.2	
Approach LOS		A			A			B			B	

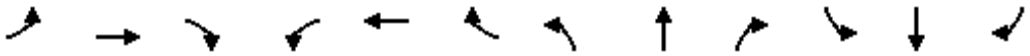
Intersection Summary			
HCM 2000 Control Delay	4.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.15		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	34.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	WBT	NBT	SBT
Lane Group Flow (vph)	496	46	40
v/c Ratio	0.18	0.09	0.07
Control Delay	1.6	20.1	15.8
Queue Delay	0.0	0.0	0.0
Total Delay	1.6	20.1	15.8
Queue Length 50th (ft)	13	17	11
Queue Length 95th (ft)	18	40	32
Internal Link Dist (ft)	202	103	244
Turn Bay Length (ft)			
Base Capacity (vph)	2710	541	575
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.18	0.09	0.07

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	36	433	27	19	27	0	0	29	11
Future Volume (vph)	0	0	0	36	433	27	19	27	0	0	29	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.0			4.0			4.0	
Lane Util. Factor					0.91			1.00			1.00	
Frpb, ped/bikes					1.00			1.00			0.99	
Flpb, ped/bikes					1.00			0.99			1.00	
Frt					0.99			1.00			0.96	
Flt Protected					1.00			0.98			1.00	
Satd. Flow (prot)					4746			1717			1686	
Flt Permitted					1.00			0.92			1.00	
Satd. Flow (perm)					4746			1607			1686	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	36	433	27	19	27	0	0	29	11
RTOR Reduction (vph)	0	0	0	0	7	0	0	0	0	0	7	0
Lane Group Flow (vph)	0	0	0	0	489	0	0	46	0	0	33	0
Confl. Peds. (#/hr)	17		15	15		17	10		19	19		10
Turn Type				Split	NA		Perm	NA			NA	
Protected Phases				8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)					49.0			29.0			29.0	
Effective Green, g (s)					49.0			29.0			29.0	
Actuated g/C Ratio					0.57			0.34			0.34	
Clearance Time (s)					4.0			4.0			4.0	
Lane Grp Cap (vph)					2704			541			568	
v/s Ratio Prot					c0.10						0.02	
v/s Ratio Perm								c0.03				
v/c Ratio					0.18			0.09			0.06	
Uniform Delay, d1					8.9			19.4			19.3	
Progression Factor					0.17			1.00			1.00	
Incremental Delay, d2					0.1			0.3			0.2	
Delay (s)					1.7			19.8			19.5	
Level of Service					A			B			B	
Approach Delay (s)		0.0			1.7			19.8			19.5	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	4.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.15		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	34.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	WBT	NBT	SBT
Lane Group Flow (vph)	510	57	66
v/c Ratio	0.20	0.09	0.10
Control Delay	3.7	18.2	14.3
Queue Delay	0.0	0.0	0.0
Total Delay	3.7	18.2	14.3
Queue Length 50th (ft)	14	20	17
Queue Length 95th (ft)	17	44	43
Internal Link Dist (ft)	315	175	240
Turn Bay Length (ft)			
Base Capacity (vph)	2559	620	637
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.20	0.09	0.10

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	28	470	12	14	43	0	0	48	18
Future Volume (vph)	0	0	0	28	470	12	14	43	0	0	48	18
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.0			4.0			4.0	
Lane Util. Factor					0.91			1.00			1.00	
Frpb, ped/bikes					1.00			1.00			0.99	
Flpb, ped/bikes					1.00			0.99			1.00	
Frt					1.00			1.00			0.96	
Flt Protected					1.00			0.99			1.00	
Satd. Flow (prot)					4783			1733			1682	
Flt Permitted					1.00			0.95			1.00	
Satd. Flow (perm)					4783			1667			1682	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	28	470	12	14	43	0	0	48	18
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	0	0	11	0
Lane Group Flow (vph)	0	0	0	0	507	0	0	57	0	0	55	0
Confl. Peds. (#/hr)	10		24	24		10	15		12	12		15
Turn Type				Split	NA		Perm	NA			NA	
Protected Phases				8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)					46.0			32.0			32.0	
Effective Green, g (s)					46.0			32.0			32.0	
Actuated g/C Ratio					0.53			0.37			0.37	
Clearance Time (s)					4.0			4.0			4.0	
Lane Grp Cap (vph)					2558			620			625	
v/s Ratio Prot					c0.11						0.03	
v/s Ratio Perm								c0.03				
v/c Ratio					0.20			0.09			0.09	
Uniform Delay, d1					10.4			17.6			17.5	
Progression Factor					0.34			1.00			1.00	
Incremental Delay, d2					0.2			0.3			0.3	
Delay (s)					3.7			17.8			17.8	
Level of Service					A			B			B	
Approach Delay (s)		0.0			3.7			17.8			17.8	
Approach LOS		A			A			B			B	

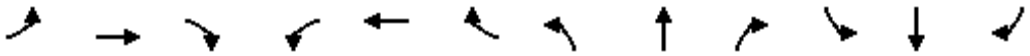
Intersection Summary			
HCM 2000 Control Delay	6.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.15		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	34.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	WBT	NBT	SBT
Lane Group Flow (vph)	630	64	80
v/c Ratio	0.24	0.11	0.13
Control Delay	3.1	19.1	14.9
Queue Delay	0.3	0.0	0.0
Total Delay	3.4	19.1	14.9
Queue Length 50th (ft)	14	23	21
Queue Length 95th (ft)	23	50	51
Internal Link Dist (ft)	188	104	107
Turn Bay Length (ft)			
Base Capacity (vph)	2589	568	619
Starvation Cap Reductn	1266	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.48	0.11	0.13

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	37	547	46	25	39	0	0	59	21
Future Volume (vph)	0	0	0	37	547	46	25	39	0	0	59	21
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.0			4.0			4.0	
Lane Util. Factor					0.91			1.00			1.00	
Frpb, ped/bikes					0.99			1.00			0.99	
Flpb, ped/bikes					1.00			0.99			1.00	
Frt					0.99			1.00			0.96	
Flt Protected					1.00			0.98			1.00	
Satd. Flow (prot)					4720			1710			1681	
Flt Permitted					1.00			0.90			1.00	
Satd. Flow (perm)					4720			1575			1681	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	37	547	46	25	39	0	0	59	21
RTOR Reduction (vph)	0	0	0	0	10	0	0	0	0	0	13	0
Lane Group Flow (vph)	0	0	0	0	620	0	0	64	0	0	67	0
Confl. Peds. (#/hr)	36		25	25		36	26		32	32		26
Turn Type				Split	NA		Perm	NA			NA	
Protected Phases				8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)					47.0			31.0			31.0	
Effective Green, g (s)					47.0			31.0			31.0	
Actuated g/C Ratio					0.55			0.36			0.36	
Clearance Time (s)					4.0			4.0			4.0	
Lane Grp Cap (vph)					2579			567			605	
v/s Ratio Prot					c0.13						0.04	
v/s Ratio Perm								c0.04				
v/c Ratio					0.24			0.11			0.11	
Uniform Delay, d1					10.2			18.3			18.3	
Progression Factor					0.29			1.00			1.00	
Incremental Delay, d2					0.2			0.4			0.4	
Delay (s)					3.2			18.7			18.7	
Level of Service					A			B			B	
Approach Delay (s)		0.0			3.2			18.7			18.7	
Approach LOS		A			A			B			B	

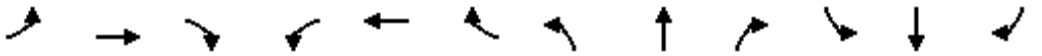
Intersection Summary			
HCM 2000 Control Delay	6.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.19		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	40.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	WBT	SBT	SBR
Lane Group Flow (vph)	575	1049	99
v/c Ratio	0.45	0.49	0.10
Control Delay	18.4	2.6	0.2
Queue Delay	0.0	0.1	0.0
Total Delay	18.4	2.7	0.2
Queue Length 50th (ft)	62	25	0
Queue Length 95th (ft)	79	34	0
Internal Link Dist (ft)	467	296	
Turn Bay Length (ft)			
Base Capacity (vph)	1271	2144	959
Starvation Cap Reductn	0	205	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.45	0.54	0.10

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	153	421	1	0	0	0	0	1049	99
Future Volume (vph)	0	0	0	153	421	1	0	0	0	0	1049	99
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.0						4.0	4.0
Lane Util. Factor					0.91						0.95	1.00
Frpb, ped/bikes					1.00						1.00	0.96
Flpb, ped/bikes					1.00						1.00	1.00
Frt					1.00						1.00	0.85
Flt Protected					0.99						1.00	1.00
Satd. Flow (prot)					4753						3353	1444
Flt Permitted					0.99						1.00	1.00
Satd. Flow (perm)					4753						3353	1444
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	153	421	1	0	0	0	0	1049	99
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	36
Lane Group Flow (vph)	0	0	0	0	575	0	0	0	0	0	1049	63
Confl. Peds. (#/hr)	12		16	16		12	17		16	16		17
Turn Type				Split	NA						NA	Perm
Protected Phases				8	8						6	
Permitted Phases												6
Actuated Green, G (s)					23.0						55.0	55.0
Effective Green, g (s)					23.0						55.0	55.0
Actuated g/C Ratio					0.27						0.64	0.64
Clearance Time (s)					4.0						4.0	4.0
Lane Grp Cap (vph)					1271						2144	923
v/s Ratio Prot					c0.12						c0.31	
v/s Ratio Perm												0.04
v/c Ratio					0.45						0.49	0.07
Uniform Delay, d1					26.3						8.1	5.8
Progression Factor					0.65						0.23	0.00
Incremental Delay, d2					1.1						0.7	0.1
Delay (s)					18.2						2.6	0.1
Level of Service					B						A	A
Approach Delay (s)		0.0			18.2			0.0			2.4	
Approach LOS		A			B			A			A	

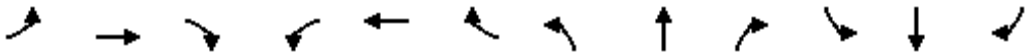
Intersection Summary			
HCM 2000 Control Delay	7.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	52.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	WBT	NBT
Lane Group Flow (vph)	451	1563
v/c Ratio	0.38	0.49
Control Delay	23.9	2.4
Queue Delay	0.0	0.0
Total Delay	23.9	2.4
Queue Length 50th (ft)	62	39
Queue Length 95th (ft)	92	39
Internal Link Dist (ft)	230	290
Turn Bay Length (ft)		
Base Capacity (vph)	1177	3170
Starvation Cap Reductn	0	12
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.38	0.49

Intersection Summary



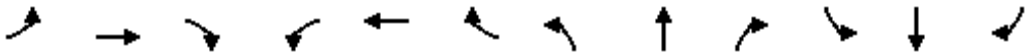
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	344	107	223	1340	0	0	0	0
Future Volume (vph)	0	0	0	0	344	107	223	1340	0	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.0			4.0				
Lane Util. Factor					0.91			0.91				
Frpb, ped/bikes					0.99			1.00				
Flpb, ped/bikes					1.00			1.00				
Frt					0.96			1.00				
Flt Protected					1.00			0.99				
Satd. Flow (prot)					4609			4784				
Flt Permitted					1.00			0.99				
Satd. Flow (perm)					4609			4784				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	0	344	107	223	1340	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	52	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	399	0	0	1563	0	0	0	0
Confl. Peds. (#/hr)	10		10	10		12	10		15	10		10
Turn Type					NA		Split	NA				
Protected Phases					8		2	2				
Permitted Phases												
Actuated Green, G (s)					21.0			57.0				
Effective Green, g (s)					21.0			57.0				
Actuated g/C Ratio					0.24			0.66				
Clearance Time (s)					4.0			4.0				
Lane Grp Cap (vph)					1125			3170				
v/s Ratio Prot					c0.09			c0.33				
v/s Ratio Perm												
v/c Ratio					0.35			0.49				
Uniform Delay, d1					26.9			7.3				
Progression Factor					1.00			0.25				
Incremental Delay, d2					0.9			0.5				
Delay (s)					27.8			2.3				
Level of Service					C			A				
Approach Delay (s)		0.0			27.8			2.3			0.0	
Approach LOS		A			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	52.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	SBT
Lane Group Flow (vph)	643	1237
v/c Ratio	0.62	0.64
Control Delay	27.2	7.4
Queue Delay	0.0	0.0
Total Delay	27.2	7.4
Queue Length 50th (ft)	147	100
Queue Length 95th (ft)	205	102
Internal Link Dist (ft)	289	290
Turn Bay Length (ft)		
Base Capacity (vph)	1030	1932
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.62	0.64

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	534	109	0	0	0	0	0	0	122	1115	0
Future Volume (vph)	0	534	109	0	0	0	0	0	0	122	1115	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0									4.0	
Lane Util. Factor		0.95									0.95	
Frpb, ped/bikes		0.98									1.00	
Flpb, ped/bikes		1.00									0.98	
Frt		0.97									1.00	
Flt Protected		1.00									1.00	
Satd. Flow (prot)		3217									3259	
Flt Permitted		1.00									1.00	
Satd. Flow (perm)		3217									3259	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	534	109	0	0	0	0	0	0	122	1115	0
RTOR Reduction (vph)	0	20	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	623	0	0	0	0	0	0	0	0	1237	0
Confl. Peds. (#/hr)	33		38	38		33	38		109	109		38
Turn Type		NA								Perm	NA	
Protected Phases		4									6	
Permitted Phases										6		
Actuated Green, G (s)		27.0									51.0	
Effective Green, g (s)		27.0									51.0	
Actuated g/C Ratio		0.31									0.59	
Clearance Time (s)		4.0									4.0	
Lane Grp Cap (vph)		1009									1932	
v/s Ratio Prot		c0.19										
v/s Ratio Perm											0.38	
v/c Ratio		0.62									0.64	
Uniform Delay, d1		25.1									11.5	
Progression Factor		1.00									0.50	
Incremental Delay, d2		2.8									1.5	
Delay (s)		27.9									7.2	
Level of Service		C									A	
Approach Delay (s)		27.9			0.0			0.0			7.2	
Approach LOS		C			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	62.7%	ICU Level of Service	B
Analysis Period (min)	15		

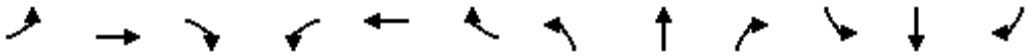
c Critical Lane Group



Lane Group	EBL	EBT	NBT	NBR
Lane Group Flow (vph)	145	305	1385	90
v/c Ratio	0.29	0.29	0.50	0.11
Control Delay	8.2	7.6	7.4	0.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	8.2	7.6	7.4	0.6
Queue Length 50th (ft)	20	21	114	0
Queue Length 95th (ft)	m31	30	59	2
Internal Link Dist (ft)		417	764	
Turn Bay Length (ft)				100
Base Capacity (vph)	496	1037	2745	829
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.29	0.29	0.50	0.11

Intersection Summary

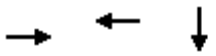
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	194	256	0	0	0	0	0	1385	90	0	0	0
Future Volume (vph)	194	256	0	0	0	0	0	1385	90	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0						5.0	5.0			
Lane Util. Factor	0.91	0.91						0.91	1.00			
Frpb, ped/bikes	1.00	1.00						1.00	0.93			
Flpb, ped/bikes	1.00	1.00						1.00	1.00			
Frt	1.00	1.00						1.00	0.85			
Flt Protected	0.95	0.99						1.00	1.00			
Satd. Flow (prot)	1526	3186						4818	1391			
Flt Permitted	0.95	0.99						1.00	1.00			
Satd. Flow (perm)	1526	3186						4818	1391			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	194	256	0	0	0	0	0	1385	90	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	37	0	0	0
Lane Group Flow (vph)	145	305	0	0	0	0	0	1385	53	0	0	0
Confl. Peds. (#/hr)	10		11	10		25	10		36	10		10
Turn Type	Split	NA						NA	Perm			
Protected Phases	4	4						2				
Permitted Phases									2			
Actuated Green, G (s)	28.0	28.0						49.0	49.0			
Effective Green, g (s)	28.0	28.0						49.0	49.0			
Actuated g/C Ratio	0.33	0.33						0.57	0.57			
Clearance Time (s)	4.0	4.0						5.0	5.0			
Lane Grp Cap (vph)	496	1037						2745	792			
v/s Ratio Prot	0.10	c0.10						c0.29				
v/s Ratio Perm									0.04			
v/c Ratio	0.29	0.29						0.50	0.07			
Uniform Delay, d1	21.6	21.6						11.2	8.3			
Progression Factor	0.32	0.32						0.60	0.14			
Incremental Delay, d2	1.2	0.6						0.6	0.2			
Delay (s)	8.0	7.5						7.3	1.3			
Level of Service	A	A						A	A			
Approach Delay (s)		7.7			0.0			6.9			0.0	
Approach LOS		A			A			A			A	

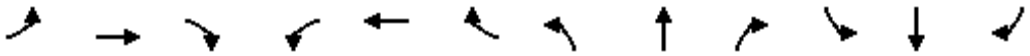
Intersection Summary			
HCM 2000 Control Delay	7.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	102.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	42	37	1228
v/c Ratio	0.14	0.14	0.51
Control Delay	20.9	30.9	2.4
Queue Delay	0.0	0.0	0.5
Total Delay	20.9	30.9	2.9
Queue Length 50th (ft)	11	17	9
Queue Length 95th (ft)	38	44	40
Internal Link Dist (ft)	69	99	279
Turn Bay Length (ft)			
Base Capacity (vph)	310	264	2390
Starvation Cap Reductn	0	0	628
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.14	0.14	0.70

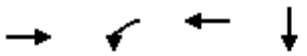
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	24	18	23	14	0	0	0	0	46	1150	32
Future Volume (vph)	0	24	18	23	14	0	0	0	0	46	1150	32
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						0.95	
Frpb, ped/bikes		0.96			1.00						0.99	
Flpb, ped/bikes		1.00			0.95						1.00	
Frt		0.94			1.00						1.00	
Flt Protected		1.00			0.97						1.00	
Satd. Flow (prot)		1592			1623						3314	
Flt Permitted		1.00			0.85						1.00	
Satd. Flow (perm)		1592			1424						3314	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	24	18	23	14	0	0	0	0	46	1150	32
RTOR Reduction (vph)	0	15	0	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	27	0	0	37	0	0	0	0	0	1226	0
Confl. Peds. (#/hr)	80		41	41		80	59		101	101		59
Turn Type		NA		Perm	NA					Split	NA	
Protected Phases		4			8					6	6	
Permitted Phases				8								
Actuated Green, G (s)		16.0			16.0						62.0	
Effective Green, g (s)		16.0			16.0						62.0	
Actuated g/C Ratio		0.19			0.19						0.72	
Clearance Time (s)		4.0			4.0						4.0	
Lane Grp Cap (vph)		296			264						2389	
v/s Ratio Prot		0.02									c0.37	
v/s Ratio Perm					c0.03							
v/c Ratio		0.09			0.14						0.51	
Uniform Delay, d1		29.0			29.3						5.3	
Progression Factor		1.00			1.00						0.34	
Incremental Delay, d2		0.6			1.1						0.6	
Delay (s)		29.6			30.4						2.4	
Level of Service		C			C						A	
Approach Delay (s)		29.6			30.4			0.0			2.4	
Approach LOS		C			C			A			A	

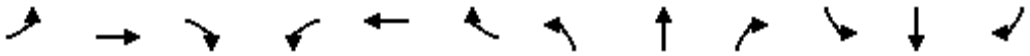
Intersection Summary			
HCM 2000 Control Delay	4.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBT	WBL	WBT	SBT
Lane Group Flow (vph)	373	69	289	1185
v/c Ratio	0.58	0.29	0.44	0.67
Control Delay	24.5	16.0	15.9	5.1
Queue Delay	0.0	0.0	0.0	0.1
Total Delay	24.5	16.0	15.9	5.2
Queue Length 50th (ft)	148	23	115	33
Queue Length 95th (ft)	238	45	178	33
Internal Link Dist (ft)	174		323	277
Turn Bay Length (ft)				
Base Capacity (vph)	643	240	656	1763
Starvation Cap Reductn	0	0	0	49
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.58	0.29	0.44	0.69

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	275	98	69	289	0	0	0	0	155	952	78
Future Volume (vph)	0	275	98	69	289	0	0	0	0	155	952	78
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0		4.0	4.0						4.0	
Lane Util. Factor		1.00		1.00	1.00						0.95	
Frpb, ped/bikes		0.99		1.00	1.00						1.00	
Flpb, ped/bikes		1.00		0.99	1.00						1.00	
Frt		0.96		1.00	1.00						0.99	
Flt Protected		1.00		0.95	1.00						0.99	
Satd. Flow (prot)		1689		1665	1765						3284	
Flt Permitted		1.00		0.37	1.00						0.99	
Satd. Flow (perm)		1689		647	1765						3284	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	275	98	69	289	0	0	0	0	155	952	78
RTOR Reduction (vph)	0	15	0	0	0	0	0	0	0	0	6	0
Lane Group Flow (vph)	0	358	0	69	289	0	0	0	0	0	1179	0
Confl. Peds. (#/hr)	10		10	10		27	10		10	10		21
Turn Type		NA		Perm	NA					Split	NA	
Protected Phases		4			8					6	6	
Permitted Phases				8								
Actuated Green, G (s)		32.0		32.0	32.0						46.0	
Effective Green, g (s)		32.0		32.0	32.0						46.0	
Actuated g/C Ratio		0.37		0.37	0.37						0.53	
Clearance Time (s)		4.0		4.0	4.0						4.0	
Lane Grp Cap (vph)		628		240	656						1756	
v/s Ratio Prot		c0.21			0.16						c0.36	
v/s Ratio Perm				0.11								
v/c Ratio		0.57		0.29	0.44						0.67	
Uniform Delay, d1		21.5		19.0	20.3						14.5	
Progression Factor		1.00		0.65	0.67						0.23	
Incremental Delay, d2		3.7		2.8	2.0						1.8	
Delay (s)		25.2		15.2	15.6						5.1	
Level of Service		C		B	B						A	
Approach Delay (s)		25.2			15.5			0.0			5.1	
Approach LOS		C			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	11.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	77.1%	ICU Level of Service	D
Analysis Period (min)	15		

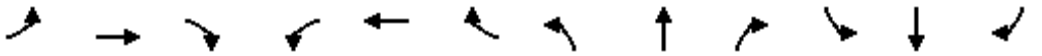
c Critical Lane Group



Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Group Flow (vph)	135	234	161	122	1285	75
v/c Ratio	0.69	0.43	0.62	0.38	0.45	0.08
Control Delay	49.7	30.4	44.5	9.7	6.4	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.7	30.4	44.5	9.7	6.4	1.0
Queue Length 50th (ft)	72	116	83	0	42	1
Queue Length 95th (ft)	m118	m170	135	43	219	3
Internal Link Dist (ft)		323	183		528	
Turn Bay Length (ft)						100
Base Capacity (vph)	311	800	389	417	2857	919
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.29	0.41	0.29	0.45	0.08

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	135	234	0	0	161	122	153	1132	75	0	0	0
Future Volume (vph)	135	234	0	0	161	122	153	1132	75	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Lane Util. Factor	1.00	1.00			1.00	1.00		0.91	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	0.97		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.99	1.00			
Satd. Flow (prot)	1676	1765			1765	1460		4789	1500			
Flt Permitted	0.95	1.00			1.00	1.00		0.99	1.00			
Satd. Flow (perm)	1676	1765			1765	1460		4789	1500			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	135	234	0	0	161	122	153	1132	75	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	104	0	0	25	0	0	0
Lane Group Flow (vph)	135	234	0	0	161	18	0	1285	50	0	0	0
Confl. Peds. (#/hr)	8					8	5					5
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	7	4			8		2	2				
Permitted Phases						8			2			
Actuated Green, G (s)	11.1	26.7			12.6	12.6		51.3	51.3			
Effective Green, g (s)	10.1	26.7			12.6	12.6		51.3	51.3			
Actuated g/C Ratio	0.12	0.31			0.15	0.15		0.60	0.60			
Clearance Time (s)	3.0	4.0			4.0	4.0		4.0	4.0			
Vehicle Extension (s)	2.0	2.5			2.5	2.5		0.2	0.2			
Lane Grp Cap (vph)	196	547			258	213		2856	894			
v/s Ratio Prot	c0.08	0.13			c0.09			c0.27				
v/s Ratio Perm						0.01			0.03			
v/c Ratio	0.69	0.43			0.62	0.08		0.45	0.06			
Uniform Delay, d1	36.4	23.6			34.5	31.7		9.6	7.2			
Progression Factor	0.99	1.29			1.00	1.00		0.54	0.19			
Incremental Delay, d2	6.2	0.3			4.0	0.1		0.5	0.1			
Delay (s)	42.1	30.7			38.5	31.8		5.7	1.5			
Level of Service	D	C			D	C		A	A			
Approach Delay (s)		34.9			35.6			5.4			0.0	
Approach LOS		C			D			A			A	

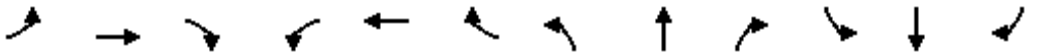
Intersection Summary			
HCM 2000 Control Delay	15.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	77.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBT	NBT	NBR
Lane Group Flow (vph)	51	98	1327	63
v/c Ratio	0.15	0.23	0.42	0.06
Control Delay	27.0	25.6	7.0	1.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	27.0	25.6	7.0	1.5
Queue Length 50th (ft)	22	39	103	0
Queue Length 95th (ft)	51	80	128	m11
Internal Link Dist (ft)	93	517	2424	
Turn Bay Length (ft)				100
Base Capacity (vph)	336	427	3190	1015
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.15	0.23	0.42	0.06

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	14	0	0	85	13	21	1306	63	0	0	0
Future Volume (vph)	37	14	0	0	85	13	21	1306	63	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0			4.0	4.0			
Lane Util. Factor		1.00			1.00			0.91	1.00			
Frpb, ped/bikes		1.00			0.99			1.00	1.00			
Flpb, ped/bikes		0.98			1.00			1.00	1.00			
Frt		1.00			0.98			1.00	0.85			
Flt Protected		0.96			1.00			1.00	1.00			
Satd. Flow (prot)		1673			1724			4814	1500			
Flt Permitted		0.80			1.00			1.00	1.00			
Satd. Flow (perm)		1380			1724			4814	1500			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	37	14	0	0	85	13	21	1306	63	0	0	0
RTOR Reduction (vph)	0	0	0	0	6	0	0	0	21	0	0	0
Lane Group Flow (vph)	0	51	0	0	92	0	0	1327	42	0	0	0
Confl. Peds. (#/hr)	15		12	12		15	10		19	19		10
Turn Type	custom	NA			NA		Split	NA	Prot			
Protected Phases					8		2	2	2			
Permitted Phases	4	4										
Actuated Green, G (s)		21.0			21.0			57.0	57.0			
Effective Green, g (s)		21.0			21.0			57.0	57.0			
Actuated g/C Ratio		0.24			0.24			0.66	0.66			
Clearance Time (s)		4.0			4.0			4.0	4.0			
Lane Grp Cap (vph)		336			420			3190	994			
v/s Ratio Prot					c0.05			c0.28	0.03			
v/s Ratio Perm		0.04										
v/c Ratio		0.15			0.22			0.42	0.04			
Uniform Delay, d1		25.5			26.0			6.8	5.0			
Progression Factor		1.00			1.00			0.97	0.95			
Incremental Delay, d2		1.0			1.2			0.4	0.1			
Delay (s)		26.5			27.1			7.0	4.9			
Level of Service		C			C			A	A			
Approach Delay (s)		26.5			27.1			6.9			0.0	
Approach LOS		C			C			A			A	

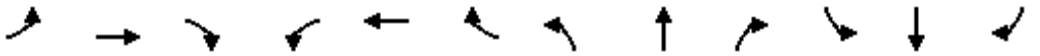
Intersection Summary			
HCM 2000 Control Delay	8.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	106	203	173	208	424	65	847	362	875
v/c Ratio	0.69	0.44	0.84	0.76	0.69	0.17	0.60	0.55	0.66
Control Delay	81.8	34.5	88.4	69.9	20.6	47.1	33.3	50.4	34.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.8	34.5	88.4	69.9	20.6	47.1	33.3	50.4	34.8
Queue Length 50th (ft)	87	49	144	169	151	45	288	138	301
Queue Length 95th (ft)	167	96	244	270	231	101	455	219	458
Internal Link Dist (ft)		595		272			1059		378
Turn Bay Length (ft)	175		300			135			
Base Capacity (vph)	227	693	334	465	828	374	1405	805	1830
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.29	0.52	0.45	0.51	0.17	0.60	0.45	0.48

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	106	122	81	173	208	424	65	771	76	362	813	62
Future Volume (vph)	106	122	81	173	208	424	65	771	76	362	813	62
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95		0.97	0.95	
Frt	1.00	0.94		1.00	1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1676	3152		1676	1765	1500	1676	3308		3252	3317	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1676	3152		1676	1765	1500	1676	3308		3252	3317	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	106	122	81	173	208	424	65	771	76	362	813	62
RTOR Reduction (vph)	0	71	0	0	0	81	0	5	0	0	4	0
Lane Group Flow (vph)	106	132	0	173	208	343	65	842	0	362	871	0
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8	1 8	5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	11.7	15.9		16.7	19.9	45.6	28.5	53.9		25.7	51.1	
Effective Green, g (s)	11.7	15.9		15.7	19.9	45.6	28.5	53.9		25.7	51.1	
Actuated g/C Ratio	0.09	0.12		0.12	0.16	0.36	0.22	0.42		0.20	0.40	
Clearance Time (s)	4.0	4.0		3.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	1.5	1.5		1.0	1.5		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	154	394		206	276	537	375	1401		657	1332	
v/s Ratio Prot	0.06	0.04		c0.10	c0.12	0.23	0.04	c0.25		0.11	c0.26	
v/s Ratio Perm												
v/c Ratio	0.69	0.34		0.84	0.75	0.64	0.17	0.60		0.55	0.65	
Uniform Delay, d1	56.0	50.8		54.5	51.3	33.9	39.8	28.3		45.6	30.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.8	0.2		23.9	9.9	2.5	1.0	1.9		1.0	1.2	
Delay (s)	65.7	51.0		78.4	61.2	36.4	40.8	30.3		46.6	32.0	
Level of Service	E	D		E	E	D	D	C		D	C	
Approach Delay (s)		56.1			51.8			31.0			36.3	
Approach LOS		E			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	40.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	127.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	15		

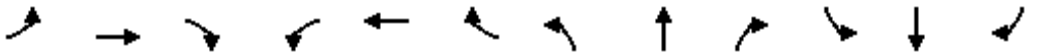
c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	229	602	77	445	412	677	50	156	1008
v/c Ratio	0.94	0.61	0.65	0.67	0.95	0.50	0.06	0.81	0.79
Control Delay	94.7	33.5	77.9	48.0	84.6	29.8	3.2	80.4	37.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	94.7	33.5	77.9	48.0	84.6	29.8	3.2	80.4	37.8
Queue Length 50th (ft)	177	180	59	164	165	204	0	119	351
Queue Length 95th (ft)	#328	234	108	207	#264	301	17	189	#514
Internal Link Dist (ft)		1448		174		1573			1059
Turn Bay Length (ft)	250		250		275		300	150	
Base Capacity (vph)	251	1026	167	831	433	1364	839	251	1282
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.59	0.46	0.54	0.95	0.50	0.06	0.62	0.79

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	229	378	224	77	387	58	412	677	50	156	821	187
Future Volume (vph)	229	378	224	77	387	58	412	677	50	156	821	187
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95	1.00	1.00	0.95	
Frt	1.00	0.94		1.00	0.98		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	3166		1676	3287		3252	3353	1500	1676	3260	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1676	3166		1676	3287		3252	3353	1500	1676	3260	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	229	378	224	77	387	58	412	677	50	156	821	187
RTOR Reduction (vph)	0	73	0	0	10	0	0	0	25	0	15	0
Lane Group Flow (vph)	229	529	0	77	435	0	412	677	25	156	993	0
Turn Type	Prot	NA		Prot	NA		Prot	NA	pt+ov	Prot	NA	
Protected Phases	7	4		3	8		5	2	2 3	1	6	
Permitted Phases												
Actuated Green, G (s)	18.5	34.4		8.5	24.4		17.0	48.2	60.7	14.9	46.1	
Effective Green, g (s)	17.5	34.4		7.5	24.4		16.0	48.2	60.7	13.9	46.1	
Actuated g/C Ratio	0.15	0.29		0.06	0.20		0.13	0.40	0.51	0.12	0.38	
Clearance Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.5	3.0		2.0	4.0		2.0	3.5		2.0	3.5	
Lane Grp Cap (vph)	244	907		104	668		433	1346	758	194	1252	
v/s Ratio Prot	c0.14	0.17		0.05	c0.13		c0.13	0.20	0.02	0.09	c0.30	
v/s Ratio Perm												
v/c Ratio	0.94	0.58		0.74	0.65		0.95	0.50	0.03	0.80	0.79	
Uniform Delay, d1	50.7	36.7		55.3	43.9		51.6	26.9	14.9	51.7	32.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	40.6	1.0		21.7	2.5		30.8	1.3	0.0	19.9	5.2	
Delay (s)	91.3	37.6		76.9	46.4		82.4	28.3	14.9	71.6	38.0	
Level of Service	F	D		E	D		F	C	B	E	D	
Approach Delay (s)		52.4			50.9			47.3			42.5	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	47.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	82.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Arterial Level of Service: SB Central Avenue

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Central Avenue	III	30	22.0	0.0	22.0	0.16	26.8	B
Jackson Street	III	30	45.4	13.6	59.0	0.36	21.8	C
E 4th Street	III	30	22.6	11.6	34.2	0.18	18.7	C
6th Street	III	30	18.1	2.0	20.1	0.14	24.2	B
Main Street	III	30	11.0	2.6	13.6	0.07	18.9	C
8th Street	III	30	10.9	7.4	18.3	0.07	13.8	E
9th Street	III	30	10.5	2.4	12.9	0.07	19.0	C
10th	III	30	10.5	5.1	15.6	0.07	15.6	D
Total	III		151.0	44.7	195.7	1.11	20.4	C

Arterial Level of Service: SB Court Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Ohio Street	III	30	21.9	6.1	28.0	0.16	21.0	C
E McAndrews Road	III	30	16.0	31.8	47.8	0.11	8.6	F
Central Avenue	III	30	50.4	9.6	60.0	0.40	23.8	C
Total	III		88.3	47.5	135.8	0.67	17.9	D

Arterial Level of Service: WB Main Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Riverside Avenue	IV	30	20.4	23.9	44.3	0.11	9.2	D
Central Avenue	IV	30	18.6	18.4	37.0	0.10	10.1	D
Front Street	IV	30	11.5	3.1	14.6	0.05	12.5	D
Fir Street	IV	30	17.0	3.7	20.7	0.07	13.0	C
Grape Street	IV	30	12.1	1.6	13.7	0.05	14.0	C
Holly Street	IV	30	12.0	1.6	13.6	0.05	14.0	C
Oakdale Avenue	IV	30	19.1	6.2	25.3	0.11	15.1	C
Total	IV		110.7	58.5	169.2	0.55	11.8	D

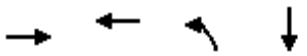
Arterial Level of Service: NB Riverside Avenue

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Barnett Road	III	30	27.4	33.3	60.7	0.22	12.8	E
12th Street	III	30	67.3	7.0	74.3	0.56	27.2	B
10th Street	III	30	16.2	6.4	22.6	0.12	18.3	C
8th Street	III	30	21.4	7.4	28.8	0.16	20.0	C
Main Street	III	30	10.9	2.4	13.3	0.07	19.0	C
	III	30	10.8	6.4	17.2	0.07	14.5	D
4th Street	III	30	18.8	10.9	29.7	0.14	17.0	D
Jackson Street	III	30	10.5	7.5	18.0	0.07	13.5	E
Manzanita Street	III	30	63.4	3.0	66.4	0.50	27.1	B
McAndrews Road	III	30	30.6	40.5	71.1	0.24	12.2	E
Mall Access	III	30	17.6	7.7	25.3	0.12	17.8	D
Total	III		294.9	132.5	427.4	2.26	19.1	C

Arterial Level of Service: SB Riverside Avenue

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Barnett Road	III	30	67.3	34.8	102.1	0.56	19.8	C
Stewart Avenue	III	30	27.4	37.8	65.2	0.22	11.9	E
Total	III		94.7	72.6	167.3	0.78	16.7	D

2024 Alternative A
Protected Phasing

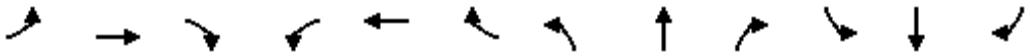


Lane Group	EBT	WBT	NBL	SBT
Lane Group Flow (vph)	276	220	1	1131
v/c Ratio	0.77	1.16	0.01	0.51
Control Delay	49.7	145.6	46.0	11.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	49.7	145.6	46.0	11.1
Queue Length 50th (ft)	166	~151	1	155
Queue Length 95th (ft)	228	#267	6	354
Internal Link Dist (ft)	1754	380		781
Turn Bay Length (ft)				
Base Capacity (vph)	511	271	89	2212
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.54	0.81	0.01	0.51

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	110	166	83	137	0	1	0	0	65	985	81
Future Volume (vph)	0	110	166	83	137	0	1	0	0	65	985	81
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0		6.0				4.0	
Lane Util. Factor		1.00			1.00		1.00				0.95	
Frpb, ped/bikes		0.99			1.00		1.00				0.99	
Flpb, ped/bikes		1.00			1.00		1.00				1.00	
Frt		0.92			1.00		1.00				0.99	
Flt Protected		1.00			0.98		0.95				1.00	
Satd. Flow (prot)		1598			1728		1668				3284	
Flt Permitted		1.00			0.48		0.95				1.00	
Satd. Flow (perm)		1598			849		1668				3284	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	110	166	83	137	0	1	0	0	65	985	81
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	276	0	0	220	0	1	0	0	0	1131	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)												60
Turn Type		NA		Perm	NA		Prot			Perm	NA	
Protected Phases		4			8		5				6	
Permitted Phases				8						6		
Actuated Green, G (s)		23.0			23.0		0.9				62.6	
Effective Green, g (s)		22.5			22.5		0.9				62.6	
Actuated g/C Ratio		0.22			0.22		0.01				0.63	
Clearance Time (s)		3.5			3.5		6.0				4.0	
Vehicle Extension (s)		2.0			2.0		3.0				4.0	
Lane Grp Cap (vph)		359			191		15				2055	
v/s Ratio Prot		0.17					c0.00					
v/s Ratio Perm					c0.26						0.34	
v/c Ratio		0.77			1.15		0.07				0.55	
Uniform Delay, d1		36.3			38.8		49.1				10.7	
Progression Factor		1.00			0.90		1.00				1.00	
Incremental Delay, d2		8.6			110.7		1.9				1.1	
Delay (s)		44.9			145.7		51.0				11.7	
Level of Service		D			F		D				B	
Approach Delay (s)		44.9			145.7			51.0			11.7	
Approach LOS		D			F			D			B	

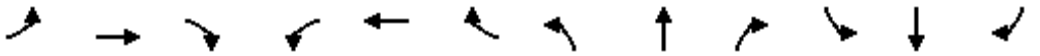
Intersection Summary			
HCM 2000 Control Delay	35.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	76.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBT	WBT	WBR	NBT	SBL
Lane Group Flow (vph)	224	95	83	1698	1
v/c Ratio	0.81	0.28	0.28	0.53	0.01
Control Delay	43.5	32.8	33.1	11.0	45.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	43.5	32.8	33.1	11.0	45.0
Queue Length 50th (ft)	77	53	46	168	1
Queue Length 95th (ft)	131	90	83	353	6
Internal Link Dist (ft)	380	1230		579	
Turn Bay Length (ft)					
Base Capacity (vph)	398	491	424	3177	90
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.56	0.19	0.20	0.53	0.01

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	142	82	0	0	74	104	107	1501	90	1	0	0
Future Volume (vph)	142	82	0	0	74	104	107	1501	90	1	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.5			4.5	4.5		5.0		6.0		
Lane Util. Factor		1.00			0.95	0.95		0.91		1.00		
Frpb, ped/bikes		1.00			0.99	0.98		1.00		1.00		
Flpb, ped/bikes		0.99			1.00	1.00		1.00		1.00		
Frt		1.00			0.97	0.85		0.99		1.00		
Flt Protected		0.97			1.00	1.00		1.00		0.95		
Satd. Flow (prot)		1700			1613	1392		4746		1676		
Flt Permitted		0.74			1.00	1.00		1.00		0.95		
Satd. Flow (perm)		1305			1613	1392		4746		1676		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	142	82	0	0	74	104	107	1501	90	1	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	224	0	0	95	83	0	1698	0	1	0	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)									60			
Turn Type	Perm	NA			NA	Perm	Split	NA		Prot		
Protected Phases		4			8		2	2		1		
Permitted Phases	4					8						
Actuated Green, G (s)		21.9			21.9	21.9		62.6		1.0		
Effective Green, g (s)		21.4			21.4	21.4		62.1		1.0		
Actuated g/C Ratio		0.21			0.21	0.21		0.62		0.01		
Clearance Time (s)		4.0			4.0	4.0		4.5		6.0		
Vehicle Extension (s)		2.5			2.5	2.5		2.0		3.0		
Lane Grp Cap (vph)		279			345	297		2947		16		
v/s Ratio Prot					0.06			c0.36		c0.00		
v/s Ratio Perm		c0.17				0.06						
v/c Ratio		0.80			0.28	0.28		0.58		0.06		
Uniform Delay, d1		37.3			32.8	32.9		11.2		49.0		
Progression Factor		0.64			1.00	1.00		1.00		1.00		
Incremental Delay, d2		13.9			0.3	0.4		0.8		1.6		
Delay (s)		37.9			33.1	33.2		12.0		50.7		
Level of Service		D			C	C		B		D		
Approach Delay (s)		37.9			33.2			12.0			50.7	
Approach LOS		D			C			B			D	

Intersection Summary			
HCM 2000 Control Delay	16.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBT	WBL	WBT	NBL	SBL	SBR
Lane Group Flow (vph)	533	195	767	1	380	706	58
v/c Ratio	0.45	0.58	0.39	0.02	0.70	0.65	0.13
Control Delay	32.7	35.1	3.2	57.0	42.4	37.3	27.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.7	35.1	3.2	57.0	42.4	37.3	27.4
Queue Length 50th (ft)	165	145	40	1	248	237	31
Queue Length 95th (ft)	250	m225	52	7	356	300	62
Internal Link Dist (ft)	1762		672			521	
Turn Bay Length (ft)		110			175		175
Base Capacity (vph)	1185	335	1986	55	598	1198	507
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.58	0.39	0.02	0.64	0.59	0.11

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	485	48	195	767	0	1	0	0	380	706	58
Future Volume (vph)	0	485	48	195	767	0	1	0	0	380	706	58
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0		4.0	4.0		6.0			4.0	4.0	4.0
Lane Util. Factor		0.95		1.00	0.95		1.00			1.00	0.95	1.00
Frpb, ped/bikes		1.00		1.00	1.00		1.00			1.00	1.00	0.94
Flpb, ped/bikes		1.00		1.00	1.00		1.00			1.00	1.00	1.00
Frt		0.99		1.00	1.00		1.00			1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00		0.95			0.95	1.00	1.00
Satd. Flow (prot)		3303		1676	3353		1675			1676	3353	1416
Flt Permitted		1.00		0.95	1.00		0.95			0.95	1.00	1.00
Satd. Flow (perm)		3303		1676	3353		1675			1676	3353	1416
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	485	48	195	767	0	1	0	0	380	706	58
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	533	0	195	767	0	1	0	0	380	706	58
Confl. Peds. (#/hr)	2		2	2		2	2		1	1		2
Confl. Bikes (#/hr)												60
Turn Type		NA		Prot	NA		Prot			Split	NA	Perm
Protected Phases		4		3	8		5			6	6	
Permitted Phases												6
Actuated Green, G (s)		38.3		25.0	66.3		0.8			38.9	38.9	38.9
Effective Green, g (s)		38.3		24.0	66.3		0.8			38.9	38.9	38.9
Actuated g/C Ratio		0.32		0.20	0.55		0.01			0.32	0.32	0.32
Clearance Time (s)		4.0		3.0	4.0		6.0			4.0	4.0	4.0
Vehicle Extension (s)		4.0		2.0	4.0		3.0			5.0	5.0	5.0
Lane Grp Cap (vph)		1054		335	1852		11			543	1086	459
v/s Ratio Prot		c0.16		c0.12	0.23		c0.00			c0.23	0.21	
v/s Ratio Perm												0.04
v/c Ratio		0.51		0.58	0.41		0.09			0.70	0.65	0.13
Uniform Delay, d1		33.2		43.5	15.6		59.2			35.4	34.7	28.6
Progression Factor		1.00		0.66	0.19		1.00			1.00	1.00	1.00
Incremental Delay, d2		1.7		1.3	0.6		3.6			5.0	1.9	0.3
Delay (s)		34.9		30.0	3.5		62.8			40.4	36.6	28.8
Level of Service		C		C	A		E			D	D	C
Approach Delay (s)		34.9			8.9			62.8			37.5	
Approach LOS		C			A			E			D	

Intersection Summary			
HCM 2000 Control Delay	26.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	58.1%	ICU Level of Service	B
Analysis Period (min)	15		

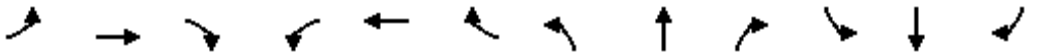
c Critical Lane Group



Lane Group	EBL	EBT	WBT	WBR	NBT	NBR	SBL
Lane Group Flow (vph)	95	750	899	518	1253	263	1
v/c Ratio	0.68	0.39	0.57	0.76	0.73	0.53	0.02
Control Delay	65.2	5.8	25.3	35.6	37.1	35.9	57.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.2	5.8	25.3	35.6	37.1	35.9	57.0
Queue Length 50th (ft)	77	128	265	329	293	153	1
Queue Length 95th (ft)	m#149	60	331	483	398	271	7
Internal Link Dist (ft)		672	692		1193		
Turn Bay Length (ft)	130					150	
Base Capacity (vph)	139	1935	1571	682	1706	497	55
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.39	0.57	0.76	0.73	0.53	0.02

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	95	750	0	0	899	518	139	1114	263	1	0	0
Future Volume (vph)	95	750	0	0	899	518	139	1114	263	1	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	3.0			3.0	3.0		3.0	3.0	6.0		
Lane Util. Factor	1.00	0.95			0.95	1.00		0.91	1.00	1.00		
Frpb, ped/bikes	1.00	1.00			1.00	0.97		1.00	0.94	1.00		
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00	1.00		
Frt	1.00	1.00			1.00	0.85		1.00	0.85	1.00		
Flt Protected	0.95	1.00			1.00	1.00		0.99	1.00	0.95		
Satd. Flow (prot)	1676	3353			3353	1456		4791	1406	1672		
Flt Permitted	0.95	1.00			1.00	1.00		0.99	1.00	0.95		
Satd. Flow (perm)	1676	3353			3353	1456		4791	1406	1672		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	95	750	0	0	899	518	139	1114	263	1	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	95	750	0	0	899	518	0	1253	263	1	0	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)									60			
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm	Prot		
Protected Phases	7	4			8		2	2		1		
Permitted Phases						8			2			
Actuated Green, G (s)	10.0	63.4			50.4	50.4		41.8	41.8	0.8		
Effective Green, g (s)	10.0	64.4			51.4	51.4		42.8	42.8	0.8		
Actuated g/C Ratio	0.08	0.54			0.43	0.43		0.36	0.36	0.01		
Clearance Time (s)	3.0	4.0			4.0	4.0		4.0	4.0	6.0		
Vehicle Extension (s)	2.0	4.0			4.0	4.0		4.0	4.0	3.0		
Lane Grp Cap (vph)	139	1799			1436	623		1708	501	11		
v/s Ratio Prot	c0.06	0.22			0.27			c0.26		c0.00		
v/s Ratio Perm						c0.36			0.19			
v/c Ratio	0.68	0.42			0.63	0.83		0.73	0.52	0.09		
Uniform Delay, d1	53.5	16.6			26.8	30.5		33.6	30.6	59.2		
Progression Factor	0.81	0.37			1.00	1.00		1.00	1.00	1.00		
Incremental Delay, d2	9.1	0.6			2.1	12.3		1.8	1.3	3.6		
Delay (s)	52.2	6.8			28.9	42.7		35.4	31.8	62.8		
Level of Service	D	A			C	D		D	C	E		
Approach Delay (s)		11.9			33.9			34.8			62.8	
Approach LOS		B			C			C			E	

Intersection Summary			
HCM 2000 Control Delay	29.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	76.1%	ICU Level of Service	D
Analysis Period (min)	15		

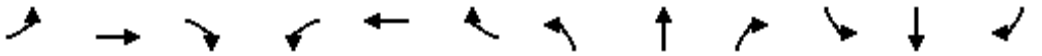
c Critical Lane Group



Lane Group	EBT	WBT	NBT	SBL
Lane Group Flow (vph)	87	19	1535	1
v/c Ratio	0.56	0.09	0.78	0.01
Control Delay	49.6	33.6	6.3	40.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	49.6	33.6	6.3	40.0
Queue Length 50th (ft)	45	9	100	1
Queue Length 95th (ft)	#101	29	m112	6
Internal Link Dist (ft)	550	165	918	
Turn Bay Length (ft)				
Base Capacity (vph)	156	204	1957	70
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.56	0.09	0.78	0.01

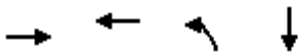
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	83	4	0	0	10	9	44	1474	17	1	0	0
Future Volume (vph)	83	4	0	0	10	9	44	1474	17	1	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0			4.0		6.0		
Lane Util. Factor		1.00			1.00			0.95		1.00		
Frpb, ped/bikes		1.00			0.98			1.00		1.00		
Flpb, ped/bikes		0.98			1.00			1.00		1.00		
Frt		1.00			0.94			1.00		1.00		
Flt Protected		0.95			1.00			1.00		0.95		
Satd. Flow (prot)		1483			1463			3006		1509		
Flt Permitted		0.72			1.00			1.00		0.95		
Satd. Flow (perm)		1122			1463			3006		1509		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	83	4	0	0	10	9	44	1474	17	1	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	87	0	0	19	0	0	1535	0	1	0	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)									60			
Turn Type	Perm	NA			NA		Split	NA		Prot		
Protected Phases		4			8		2	2		1		
Permitted Phases	4											
Actuated Green, G (s)		12.0			12.0			56.0		4.0		
Effective Green, g (s)		12.0			12.0			56.0		4.0		
Actuated g/C Ratio		0.14			0.14			0.65		0.05		
Clearance Time (s)		4.0			4.0			4.0		6.0		
Lane Grp Cap (vph)		156			204			1957		70		
v/s Ratio Prot					0.01			c0.51		c0.00		
v/s Ratio Perm		c0.08										
v/c Ratio		0.56			0.09			0.78		0.01		
Uniform Delay, d1		34.5			32.3			10.7		39.1		
Progression Factor		1.00			1.00			0.37		1.00		
Incremental Delay, d2		13.6			0.9			2.1		0.4		
Delay (s)		48.1			33.2			6.1		39.5		
Level of Service		D			C			A		D		
Approach Delay (s)		48.1			33.2			6.1			39.5	
Approach LOS		D			C			A			D	

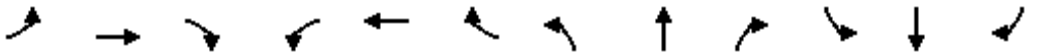
Intersection Summary			
HCM 2000 Control Delay	8.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	68.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBT	NBL	SBT
Lane Group Flow (vph)	207	88	1	991
v/c Ratio	1.00	0.44	0.01	0.57
Control Delay	102.3	30.8	39.0	17.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	102.3	30.8	39.0	17.2
Queue Length 50th (ft)	113	45	1	153
Queue Length 95th (ft)	#251	m51	6	#423
Internal Link Dist (ft)	7	1528		2014
Turn Bay Length (ft)				
Base Capacity (vph)	207	414	92	1728
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.00	0.21	0.01	0.57

Intersection Summary

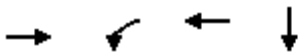
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	35	172	45	43	0	1	0	0	61	907	23
Future Volume (vph)	0	35	172	45	43	0	1	0	0	61	907	23
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0		6.0				4.0	
Lane Util. Factor		1.00			1.00		1.00				0.95	
Frpb, ped/bikes		0.97			1.00		1.00				1.00	
Flpb, ped/bikes		1.00			1.00		0.99				1.00	
Frt		0.89			1.00		1.00				1.00	
Flt Protected		1.00			0.98		0.95				1.00	
Satd. Flow (prot)		1373			1549		1501				2992	
Flt Permitted		1.00			0.98		0.95				1.00	
Satd. Flow (perm)		1373			1549		1501				2992	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	35	172	45	43	0	1	0	0	61	907	23
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	207	0	0	88	0	1	0	0	0	991	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)												60
Turn Type		NA		Split	NA		Prot			Split	NA	
Protected Phases		7		8	8		5			6	6	
Permitted Phases												
Actuated Green, G (s)		13.0			10.1		0.8				44.1	
Effective Green, g (s)		13.0			10.1		0.8				44.1	
Actuated g/C Ratio		0.15			0.12		0.01				0.51	
Clearance Time (s)		4.0			4.0		6.0				4.0	
Vehicle Extension (s)		2.0			2.0		3.0				4.0	
Lane Grp Cap (vph)		207			181		13				1534	
v/s Ratio Prot		c0.15			c0.06		c0.00				c0.33	
v/s Ratio Perm												
v/c Ratio		1.00			0.49		0.08				0.65	
Uniform Delay, d1		36.5			35.5		42.2				15.3	
Progression Factor		1.00			0.79		1.00				1.00	
Incremental Delay, d2		62.6			0.6		2.5				2.1	
Delay (s)		99.1			28.7		44.8				17.4	
Level of Service		F			C		D				B	
Approach Delay (s)		99.1			28.7			44.8			17.4	
Approach LOS		F			C			D			B	

Intersection Summary			
HCM 2000 Control Delay	31.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	67.2%	ICU Level of Service	C
Analysis Period (min)	15		

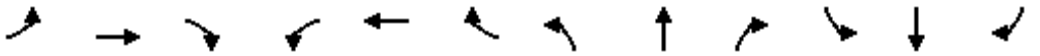
c Critical Lane Group



Lane Group	EBT	WBL	WBT	SBT
Lane Group Flow (vph)	349	57	287	1172
v/c Ratio	0.63	0.26	0.50	0.73
Control Delay	28.8	9.2	9.7	16.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	28.8	9.2	9.7	16.7
Queue Length 50th (ft)	154	10	54	281
Queue Length 95th (ft)	246	m12	m63	m23
Internal Link Dist (ft)	1450		992	1806
Turn Bay Length (ft)		250		
Base Capacity (vph)	556	220	572	1599
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.63	0.26	0.50	0.73

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	288	61	57	287	0	0	0	0	165	890	117
Future Volume (vph)	0	288	61	57	287	0	0	0	0	165	890	117
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0		4.0	4.0						4.0	
Lane Util. Factor		1.00		1.00	1.00						0.95	
Frpb, ped/bikes		1.00		1.00	1.00						0.99	
Flpb, ped/bikes		1.00		1.00	1.00						1.00	
Frt		0.98		1.00	1.00						0.99	
Flt Protected		1.00		0.95	1.00						0.99	
Satd. Flow (prot)		1545		1502	1588						2927	
Flt Permitted		1.00		0.39	1.00						0.99	
Satd. Flow (perm)		1545		612	1588						2927	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	288	61	57	287	0	0	0	0	165	890	117
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	349	0	57	287	0	0	0	0	0	1172	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		15
Confl. Bikes (#/hr)												60
Turn Type		NA		Perm	NA					Split	NA	
Protected Phases		4			8					6	6	
Permitted Phases				8								
Actuated Green, G (s)		31.0		31.0	31.0						47.0	
Effective Green, g (s)		31.0		31.0	31.0						47.0	
Actuated g/C Ratio		0.36		0.36	0.36						0.55	
Clearance Time (s)		4.0		4.0	4.0						4.0	
Lane Grp Cap (vph)		556		220	572						1599	
v/s Ratio Prot		c0.23			0.18						c0.40	
v/s Ratio Perm				0.09								
v/c Ratio		0.63		0.26	0.50						0.73	
Uniform Delay, d1		22.7		19.4	21.5						14.8	
Progression Factor		1.00		0.38	0.37						0.94	
Incremental Delay, d2		5.3		1.4	1.6						2.4	
Delay (s)		28.0		8.7	9.5						16.3	
Level of Service		C		A	A						B	
Approach Delay (s)		28.0			9.4			0.0			16.3	
Approach LOS		C			A			A			B	

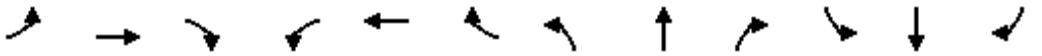
Intersection Summary			
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	85.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	NBT	SBL
Lane Group Flow (vph)	110	361	369	1366	1
v/c Ratio	0.84	0.78	0.86	0.92	0.01
Control Delay	72.9	42.6	50.0	18.0	40.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	72.9	42.6	50.0	18.0	40.0
Queue Length 50th (ft)	60	194	188	76	1
Queue Length 95th (ft)	m#118	m#314	#343	m#477	6
Internal Link Dist (ft)		992	302	277	
Turn Bay Length (ft)	200				
Base Capacity (vph)	131	461	430	1491	70
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.84	0.78	0.86	0.92	0.01

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	361	0	0	228	141	105	1221	40	1	0	0
Future Volume (vph)	110	361	0	0	228	141	105	1221	40	1	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0			4.0			4.0		6.0		
Lane Util. Factor	1.00	1.00			1.00			0.95		1.00		
Frpb, ped/bikes	1.00	1.00			0.98			1.00		1.00		
Flpb, ped/bikes	0.99	1.00			1.00			1.00		1.00		
Frt	1.00	1.00			0.95			1.00		1.00		
Flt Protected	0.95	1.00			1.00			1.00		0.95		
Satd. Flow (prot)	1491	1588			1481			2981		1509		
Flt Permitted	0.29	1.00			1.00			1.00		0.95		
Satd. Flow (perm)	451	1588			1481			2981		1509		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	110	361	0	0	228	141	105	1221	40	1	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	110	361	0	0	369	0	0	1366	0	1	0	0
Confl. Peds. (#/hr)	18		12	12		18	37		32	32		37
Confl. Bikes (#/hr)									60			
Turn Type	Perm	NA			NA		Split	NA		Prot		
Protected Phases		4			8		2	2		1		
Permitted Phases	4											
Actuated Green, G (s)	25.0	25.0			25.0			43.0		4.0		
Effective Green, g (s)	25.0	25.0			25.0			43.0		4.0		
Actuated g/C Ratio	0.29	0.29			0.29			0.50		0.05		
Clearance Time (s)	4.0	4.0			4.0			4.0		6.0		
Lane Grp Cap (vph)	131	461			430			1490		70		
v/s Ratio Prot		0.23			c0.25			c0.46		c0.00		
v/s Ratio Perm	0.24											
v/c Ratio	0.84	0.78			0.86			0.92		0.01		
Uniform Delay, d1	28.6	28.0			28.8			19.8		39.1		
Progression Factor	1.12	1.12			1.00			0.46		1.00		
Incremental Delay, d2	36.6	9.8			19.4			7.6		0.4		
Delay (s)	68.5	41.2			48.2			16.7		39.5		
Level of Service	E	D			D			B		D		
Approach Delay (s)		47.6			48.2			16.7			39.5	
Approach LOS		D			D			B			D	

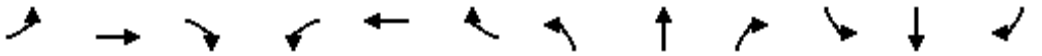
Intersection Summary			
HCM 2000 Control Delay	28.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	91.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBL	WBT	SBT	SBR
Lane Group Flow (vph)	309	239	287	830	179
v/c Ratio	0.67	0.55	0.35	0.70	0.28
Control Delay	34.9	9.0	8.1	11.9	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	34.9	9.0	8.1	11.9	1.1
Queue Length 50th (ft)	144	54	74	117	0
Queue Length 95th (ft)	235	m65	m89	143	m0
Internal Link Dist (ft)	282		688	858	
Turn Bay Length (ft)		250			
Base Capacity (vph)	458	434	812	1191	641
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.67	0.55	0.35	0.70	0.28

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	279	30	239	287	0	0	0	0	21	809	179
Future Volume (vph)	0	279	30	239	287	0	0	0	0	21	809	179
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0		4.0	4.0						4.0	4.0
Lane Util. Factor		1.00		1.00	1.00						0.95	1.00
Frpb, ped/bikes		1.00		1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00						1.00	1.00
Frt		0.99		1.00	1.00						1.00	0.85
Flt Protected		1.00		0.95	1.00						1.00	1.00
Satd. Flow (prot)		1563		1506	1588						3014	1350
Flt Permitted		1.00		0.32	1.00						1.00	1.00
Satd. Flow (perm)		1563		512	1588						3014	1350
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	279	30	239	287	0	0	0	0	21	809	179
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	0	0	0	108
Lane Group Flow (vph)	0	305	0	239	287	0	0	0	0	0	830	71
Confl. Peds. (#/hr)	6		11	11		6			2	2		
Confl. Bikes (#/hr)												60
Turn Type		NA		pm+pt	NA					Split	NA	Prot
Protected Phases		4		3	8					6	6	6
Permitted Phases				8	8							
Actuated Green, G (s)		25.0		44.0	44.0						34.0	34.0
Effective Green, g (s)		25.0		44.0	44.0						34.0	34.0
Actuated g/C Ratio		0.29		0.51	0.51						0.40	0.40
Clearance Time (s)		4.0		4.0	4.0						4.0	4.0
Lane Grp Cap (vph)		454		435	812						1191	533
v/s Ratio Prot		c0.20		c0.10	0.18						c0.28	0.05
v/s Ratio Perm				0.19								
v/c Ratio		0.67		0.55	0.35						0.70	0.13
Uniform Delay, d1		26.9		13.5	12.5						21.7	16.6
Progression Factor		1.00		0.58	0.59						0.43	0.10
Incremental Delay, d2		7.7		1.8	0.4						2.4	0.4
Delay (s)		34.6		9.5	7.9						11.7	2.1
Level of Service		C		A	A						B	A
Approach Delay (s)		34.6			8.6			0.0			10.0	
Approach LOS		C			A			A			A	

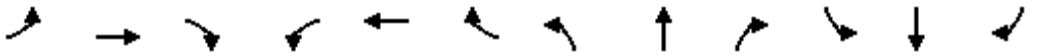
Intersection Summary			
HCM 2000 Control Delay	13.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	75.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	NBT	NBR	SBL
Lane Group Flow (vph)	125	252	474	1143	467	1
v/c Ratio	0.86	0.40	0.99	0.78	0.75	0.01
Control Delay	58.8	14.6	71.9	10.9	14.1	40.0
Queue Delay	0.0	0.0	0.0	0.7	0.0	0.0
Total Delay	58.8	14.6	71.9	11.6	14.1	40.0
Queue Length 50th (ft)	51	125	254	78	57	1
Queue Length 95th (ft)	m#105	m204	#451	m#436	m#338	6
Internal Link Dist (ft)		688	289	661		
Turn Bay Length (ft)	250					
Base Capacity (vph)	146	627	477	1471	625	70
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	100	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.40	0.99	0.83	0.75	0.01

Intersection Summary

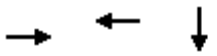
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	252	0	0	460	14	46	1097	467	1	0	0
Future Volume (vph)	125	252	0	0	460	14	46	1097	467	1	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0			4.0			4.0	4.0	6.0		
Lane Util. Factor	1.00	1.00			1.00			0.95	1.00	1.00		
Frpb, ped/bikes	1.00	1.00			1.00			1.00	0.95	1.00		
Flpb, ped/bikes	1.00	1.00			1.00			1.00	1.00	1.00		
Frt	1.00	1.00			1.00			1.00	0.85	1.00		
Flt Protected	0.95	1.00			1.00			1.00	1.00	0.95		
Satd. Flow (prot)	1509	1588			1581			3012	1285	1507		
Flt Permitted	0.14	1.00			1.00			1.00	1.00	0.95		
Satd. Flow (perm)	219	1588			1581			3012	1285	1507		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	125	252	0	0	460	14	46	1097	467	1	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	125	252	0	0	474	0	0	1143	467	1	0	0
Confl. Peds. (#/hr)	4		5	5		4	5		4	4		5
Confl. Bikes (#/hr)									60			
Turn Type	pm+pt	NA			NA		Split	NA	Perm	Prot		
Protected Phases	7	4			8		2	2		1		
Permitted Phases	4								2			
Actuated Green, G (s)	34.0	34.0			26.0			37.2	37.2	0.8		
Effective Green, g (s)	33.0	34.0			26.0			37.2	37.2	0.8		
Actuated g/C Ratio	0.38	0.40			0.30			0.43	0.43	0.01		
Clearance Time (s)	3.0	4.0			4.0			4.0	4.0	6.0		
Vehicle Extension (s)	2.0	0.2			0.2			0.2	0.2	3.0		
Lane Grp Cap (vph)	144	627			477			1302	555	14		
v/s Ratio Prot	c0.04	0.16			c0.30			c0.38		c0.00		
v/s Ratio Perm	0.29								0.36			
v/c Ratio	0.87	0.40			0.99			0.88	0.84	0.07		
Uniform Delay, d1	23.5	18.7			29.9			22.3	21.8	42.2		
Progression Factor	0.71	0.68			1.00			0.36	0.36	1.00		
Incremental Delay, d2	33.5	0.1			39.3			4.8	8.1	2.2		
Delay (s)	50.3	12.8			69.2			12.8	16.0	44.4		
Level of Service	D	B			E			B	B	D		
Approach Delay (s)		25.2			69.2			13.7			44.4	
Approach LOS		C			E			B			D	

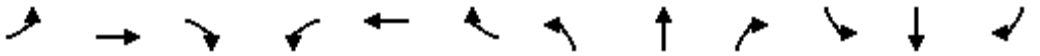
Intersection Summary			
HCM 2000 Control Delay	26.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	84.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	148	89	1168
v/c Ratio	0.37	0.27	0.52
Control Delay	26.9	29.7	2.0
Queue Delay	0.0	0.0	0.0
Total Delay	26.9	29.7	2.0
Queue Length 50th (ft)	58	40	21
Queue Length 95th (ft)	111	81	41
Internal Link Dist (ft)	137	79	634
Turn Bay Length (ft)			
Base Capacity (vph)	404	330	2243
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.37	0.27	0.52

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	108	40	43	46	0	0	0	0	42	1103	23
Future Volume (vph)	0	108	40	43	46	0	0	0	0	42	1103	23
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						0.95	
Frpb, ped/bikes		0.98			1.00						1.00	
Flpb, ped/bikes		1.00			0.98						1.00	
Frt		0.96			1.00						1.00	
Flt Protected		1.00			0.98						1.00	
Satd. Flow (prot)		1672			1691						3325	
Flt Permitted		1.00			0.82						1.00	
Satd. Flow (perm)		1672			1424						3325	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	108	40	43	46	0	0	0	0	42	1103	23
RTOR Reduction (vph)	0	15	0	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	133	0	0	89	0	0	0	0	0	1166	0
Confl. Peds. (#/hr)	22		24	24		22	14		20	20		14
Confl. Bikes (#/hr)												60
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		20.0			20.0						58.0	
Effective Green, g (s)		20.0			20.0						58.0	
Actuated g/C Ratio		0.23			0.23						0.67	
Clearance Time (s)		4.0			4.0						4.0	
Lane Grp Cap (vph)		388			331						2242	
v/s Ratio Prot		c0.08										
v/s Ratio Perm					0.06						0.35	
v/c Ratio		0.34			0.27						0.52	
Uniform Delay, d1		27.5			27.0						7.0	
Progression Factor		1.00			1.00						0.19	
Incremental Delay, d2		2.4			2.0						0.7	
Delay (s)		29.9			29.0						2.0	
Level of Service		C			C						A	
Approach Delay (s)		29.9			29.0			0.0			2.0	
Approach LOS		C			C			A			A	

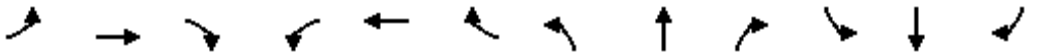
Intersection Summary			
HCM 2000 Control Delay	6.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	67.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBT	WBR	NBT	SBL
Lane Group Flow (vph)	230	16	22	1561	1
v/c Ratio	0.75	0.04	0.06	0.86	0.01
Control Delay	47.2	25.2	25.6	5.9	40.0
Queue Delay	0.0	0.0	0.0	1.1	0.0
Total Delay	47.2	25.2	25.6	7.0	40.0
Queue Length 50th (ft)	115	7	9	50	1
Queue Length 95th (ft)	#226	22	28	m57	6
Internal Link Dist (ft)	175	153		287	
Turn Bay Length (ft)					
Base Capacity (vph)	307	430	366	1822	77
Starvation Cap Reductn	0	0	0	97	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.75	0.04	0.06	0.90	0.01

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



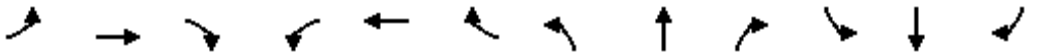
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	220	10	0	0	16	22	56	1489	16	1	0	0
Future Volume (vph)	220	10	0	0	16	22	56	1489	16	1	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0	4.0		4.0		6.0		
Lane Util. Factor		1.00			1.00	1.00		0.95		1.00		
Frpb, ped/bikes		1.00			1.00	1.00		1.00		1.00		
Flpb, ped/bikes		0.99			1.00	1.00		1.00		1.00		
Frt		1.00			1.00	0.85		1.00		1.00		
Flt Protected		0.95			1.00	1.00		1.00		0.95		
Satd. Flow (prot)		1663			1765	1500		3337		1676		
Flt Permitted		0.72			1.00	1.00		1.00		0.95		
Satd. Flow (perm)		1261			1765	1500		3337		1676		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	220	10	0	0	16	22	56	1489	16	1	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	230	0	0	16	22	0	1561	0	1	0	0
Confl. Peds. (#/hr)	10		10				10					10
Confl. Bikes (#/hr)									60			
Turn Type	Perm	NA			NA	Perm	Perm	NA		Prot		
Protected Phases		4			8			2		1		
Permitted Phases	4					8	2					
Actuated Green, G (s)		21.0			21.0	21.0		47.0		4.0		
Effective Green, g (s)		21.0			21.0	21.0		47.0		4.0		
Actuated g/C Ratio		0.24			0.24	0.24		0.55		0.05		
Clearance Time (s)		4.0			4.0	4.0		4.0		6.0		
Lane Grp Cap (vph)		307			430	366		1823		77		
v/s Ratio Prot					0.01					c0.00		
v/s Ratio Perm		c0.18				0.01		0.47				
v/c Ratio		0.75			0.04	0.06		0.86		0.01		
Uniform Delay, d1		30.1			24.8	24.9		16.6		39.1		
Progression Factor		1.00			1.00	1.00		0.15		1.00		
Incremental Delay, d2		15.4			0.2	0.3		2.8		0.3		
Delay (s)		45.5			25.0	25.2		5.4		39.4		
Level of Service		D			C	C		A		D		
Approach Delay (s)		45.5			25.1			5.4			39.4	
Approach LOS		D			C			A			D	

Intersection Summary			
HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	83.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



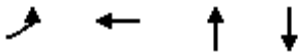
Lane Group	EBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	1	497	25	86	215
v/c Ratio	0.01	0.38	0.08	0.14	0.35
Control Delay	36.0	8.3	19.7	20.0	22.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	36.0	8.3	19.7	20.0	22.9
Queue Length 50th (ft)	1	34	9	31	85
Queue Length 95th (ft)	6	45	26	64	143
Internal Link Dist (ft)		479		105	1243
Turn Bay Length (ft)					
Base Capacity (vph)	155	1303	324	615	609
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.01	0.38	0.08	0.14	0.35

Intersection Summary



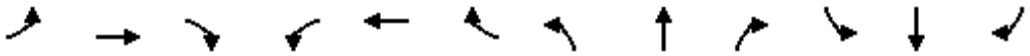
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	0	95	387	15	25	86	0	0	204	11
Future Volume (vph)	1	0	0	95	387	15	25	86	0	0	204	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0				4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00				0.95		1.00	1.00			1.00	
Frpb, ped/bikes	1.00				1.00		1.00	1.00			1.00	
Flpb, ped/bikes	1.00				1.00		0.96	1.00			1.00	
Frt	1.00				1.00		1.00	1.00			0.99	
Flt Protected	0.95				0.99		0.95	1.00			1.00	
Satd. Flow (prot)	1676				3296		1611	1765			1746	
Flt Permitted	0.95				0.99		0.55	1.00			1.00	
Satd. Flow (perm)	1676				3296		930	1765			1746	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	0	0	95	387	15	25	86	0	0	204	11
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	1	0	0	0	497	0	25	86	0	0	215	0
Confl. Peds. (#/hr)	15		46	46		15	35		34	34		35
Confl. Bikes (#/hr)						60						
Turn Type	Prot			Split	NA		Perm	NA			NA	
Protected Phases	7			8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)	8.0				34.0		30.0	30.0			30.0	
Effective Green, g (s)	8.0				34.0		30.0	30.0			30.0	
Actuated g/C Ratio	0.09				0.40		0.35	0.35			0.35	
Clearance Time (s)	6.0				4.0		4.0	4.0			4.0	
Lane Grp Cap (vph)	155				1303		324	615			609	
v/s Ratio Prot	c0.00				c0.15			0.05			c0.12	
v/s Ratio Perm							0.03					
v/c Ratio	0.01				0.38		0.08	0.14			0.35	
Uniform Delay, d1	35.4				18.5		18.7	19.2			20.8	
Progression Factor	1.00				0.40		1.00	1.00			1.00	
Incremental Delay, d2	0.1				0.8		0.5	0.5			1.6	
Delay (s)	35.5				8.2		19.2	19.6			22.4	
Level of Service	D				A		B	B			C	
Approach Delay (s)		35.5			8.2			19.5			22.4	
Approach LOS		D			A			B			C	

Intersection Summary			
HCM 2000 Control Delay	13.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



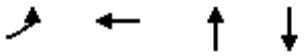
Lane Group	EBL	WBT	NBT	SBT
Lane Group Flow (vph)	1	451	62	42
v/c Ratio	0.01	0.30	0.14	0.09
Control Delay	34.0	1.9	25.1	24.4
Queue Delay	0.0	0.2	0.0	0.0
Total Delay	34.0	2.1	25.1	24.4
Queue Length 50th (ft)	1	8	26	17
Queue Length 95th (ft)	5	12	56	42
Internal Link Dist (ft)		199	104	1901
Turn Bay Length (ft)				
Base Capacity (vph)	194	1482	435	464
Starvation Cap Reductn	0	409	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.01	0.42	0.14	0.09

Intersection Summary



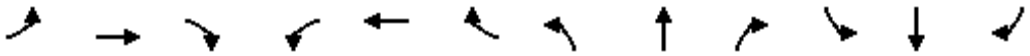
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	0	62	359	30	19	43	0	0	38	4
Future Volume (vph)	1	0	0	62	359	30	19	43	0	0	38	4
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0				4.0			4.0			4.0	
Lane Util. Factor	1.00				0.95			1.00			1.00	
Frpb, ped/bikes	1.00				0.99			1.00			1.00	
Flpb, ped/bikes	1.00				1.00			0.99			1.00	
Frt	1.00				0.99			1.00			0.99	
Flt Protected	0.95				0.99			0.98			1.00	
Satd. Flow (prot)	1676				3269			1723			1735	
Flt Permitted	0.95				0.99			0.93			1.00	
Satd. Flow (perm)	1676				3269			1628			1735	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	0	0	62	359	30	19	43	0	0	38	4
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	1	0	0	0	451	0	0	62	0	0	42	0
Confl. Peds. (#/hr)	26		30	30		26	18		66	66		18
Confl. Bikes (#/hr)						60						
Turn Type	Prot			Split	NA		Perm	NA			NA	
Protected Phases	7			8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)	10.0				39.0			23.0			23.0	
Effective Green, g (s)	10.0				39.0			23.0			23.0	
Actuated g/C Ratio	0.12				0.45			0.27			0.27	
Clearance Time (s)	6.0				4.0			4.0			4.0	
Lane Grp Cap (vph)	194				1482			435			464	
v/s Ratio Prot	c0.00				c0.14						0.02	
v/s Ratio Perm								c0.04				
v/c Ratio	0.01				0.30			0.14			0.09	
Uniform Delay, d1	33.6				14.9			24.0			23.6	
Progression Factor	1.00				0.09			1.00			1.00	
Incremental Delay, d2	0.0				0.5			0.7			0.4	
Delay (s)	33.6				1.9			24.7			24.0	
Level of Service	C				A			C			C	
Approach Delay (s)		33.6			1.9			24.7			24.0	
Approach LOS		C			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	6.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.21		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	34.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



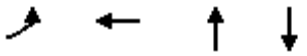
Lane Group	EBL	WBT	NBT	SBT
Lane Group Flow (vph)	1	496	46	40
v/c Ratio	0.01	0.32	0.12	0.10
Control Delay	34.0	3.2	26.4	26.1
Queue Delay	0.0	0.2	0.0	0.0
Total Delay	34.0	3.4	26.4	26.1
Queue Length 50th (ft)	1	10	19	17
Queue Length 95th (ft)	5	13	47	42
Internal Link Dist (ft)		202	103	244
Turn Bay Length (ft)				
Base Capacity (vph)	194	1570	388	411
Starvation Cap Reductn	0	437	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.01	0.44	0.12	0.10

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	0	36	433	27	19	27	0	0	29	11
Future Volume (vph)	1	0	0	36	433	27	19	27	0	0	29	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0				4.0			4.0			4.0	
Lane Util. Factor	1.00				0.95			1.00			1.00	
Frpb, ped/bikes	1.00				0.99			1.00			0.99	
Flpb, ped/bikes	1.00				1.00			0.99			1.00	
Frt	1.00				0.99			1.00			0.96	
Flt Protected	0.95				1.00			0.98			1.00	
Satd. Flow (prot)	1676				3295			1717			1686	
Flt Permitted	0.95				1.00			0.91			1.00	
Satd. Flow (perm)	1676				3295			1593			1686	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	0	0	36	433	27	19	27	0	0	29	11
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	1	0	0	0	496	0	0	46	0	0	40	0
Confl. Peds. (#/hr)	17		15	15		17	10		19	19		10
Confl. Bikes (#/hr)						60						
Turn Type	Prot			Split	NA		Perm	NA			NA	
Protected Phases	7			8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)	10.0				41.0			21.0			21.0	
Effective Green, g (s)	10.0				41.0			21.0			21.0	
Actuated g/C Ratio	0.12				0.48			0.24			0.24	
Clearance Time (s)	6.0				4.0			4.0			4.0	
Lane Grp Cap (vph)	194				1570			388			411	
v/s Ratio Prot	c0.00				c0.15						0.02	
v/s Ratio Perm								c0.03				
v/c Ratio	0.01				0.32			0.12			0.10	
Uniform Delay, d1	33.6				13.9			25.3			25.2	
Progression Factor	1.00				0.19			1.00			1.00	
Incremental Delay, d2	0.0				0.5			0.6			0.5	
Delay (s)	33.6				3.2			25.9			25.6	
Level of Service	C				A			C			C	
Approach Delay (s)		33.6			3.2			25.9			25.6	
Approach LOS		C			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	6.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.22		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	34.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

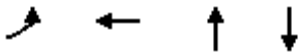


Lane Group	EBL	WBT	NBT	SBT
Lane Group Flow (vph)	1	510	57	66
v/c Ratio	0.01	0.31	0.12	0.14
Control Delay	35.0	2.2	24.1	24.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	35.0	2.2	24.1	24.3
Queue Length 50th (ft)	1	12	23	27
Queue Length 95th (ft)	6	16	52	58
Internal Link Dist (ft)		315	175	240
Turn Bay Length (ft)				
Base Capacity (vph)	165	1622	463	469
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.01	0.31	0.12	0.14

Intersection Summary

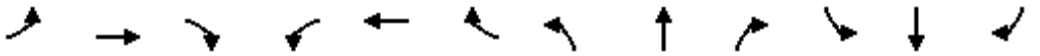
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	0	28	470	12	14	43	0	0	48	18
Future Volume (vph)	1	0	0	28	470	12	14	43	0	0	48	18
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.5				4.0			4.0			4.0	
Lane Util. Factor	1.00				0.95			1.00			1.00	
Frpb, ped/bikes	1.00				1.00			1.00			0.99	
Flpb, ped/bikes	1.00				1.00			0.99			1.00	
Frt	1.00				1.00			1.00			0.96	
Flt Protected	0.95				1.00			0.99			1.00	
Satd. Flow (prot)	1676				3325			1733			1682	
Flt Permitted	0.95				1.00			0.95			1.00	
Satd. Flow (perm)	1676				3325			1660			1682	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	0	0	28	470	12	14	43	0	0	48	18
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	1	0	0	0	510	0	0	57	0	0	66	0
Confl. Peds. (#/hr)	10		24	24		10	15		12	12		15
Confl. Bikes (#/hr)						60						
Turn Type	Prot			Split	NA		Perm	NA			NA	
Protected Phases	7			8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)	8.5				42.0			24.0			24.0	
Effective Green, g (s)	8.5				42.0			24.0			24.0	
Actuated g/C Ratio	0.10				0.49			0.28			0.28	
Clearance Time (s)	3.5				4.0			4.0			4.0	
Lane Grp Cap (vph)	165				1623			463			469	
v/s Ratio Prot	c0.00				c0.15						c0.04	
v/s Ratio Perm								0.03				
v/c Ratio	0.01				0.31			0.12			0.14	
Uniform Delay, d1	34.9				13.3			23.1			23.3	
Progression Factor	1.00				0.12			1.00			1.00	
Incremental Delay, d2	0.1				0.5			0.5			0.6	
Delay (s)	35.0				2.1			23.7			23.9	
Level of Service	D				A			C			C	
Approach Delay (s)		35.0			2.1			23.7			23.9	
Approach LOS		D			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	6.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.22		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	11.5
Intersection Capacity Utilization	34.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



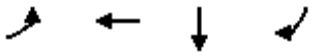
Lane Group	EBL	WBT	NBT	SBT
Lane Group Flow (vph)	1	630	64	80
v/c Ratio	0.01	0.40	0.15	0.18
Control Delay	36.0	6.5	25.3	25.6
Queue Delay	0.0	0.3	0.0	0.0
Total Delay	36.0	6.8	25.3	25.6
Queue Length 50th (ft)	1	40	26	33
Queue Length 95th (ft)	6	55	58	69
Internal Link Dist (ft)		188	104	107
Turn Bay Length (ft)				
Base Capacity (vph)	155	1560	417	449
Starvation Cap Reductn	0	377	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.01	0.53	0.15	0.18

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	0	37	547	46	25	39	0	0	59	21
Future Volume (vph)	1	0	0	37	547	46	25	39	0	0	59	21
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0				4.0			4.0			4.0	
Lane Util. Factor	1.00				0.95			1.00			1.00	
Frpb, ped/bikes	1.00				0.99			1.00			0.99	
Flpb, ped/bikes	1.00				1.00			0.99			1.00	
Frt	1.00				0.99			1.00			0.96	
Flt Protected	0.95				1.00			0.98			1.00	
Satd. Flow (prot)	1676				3275			1710			1681	
Flt Permitted	0.95				1.00			0.90			1.00	
Satd. Flow (perm)	1676				3275			1562			1681	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	0	0	37	547	46	25	39	0	0	59	21
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	1	0	0	0	630	0	0	64	0	0	80	0
Confl. Peds. (#/hr)	36		25	25		36	26		32	32		26
Confl. Bikes (#/hr)						60						
Turn Type	Prot			Split	NA		Perm	NA			NA	
Protected Phases	7			8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)	8.0				41.0			23.0			23.0	
Effective Green, g (s)	8.0				41.0			23.0			23.0	
Actuated g/C Ratio	0.09				0.48			0.27			0.27	
Clearance Time (s)	6.0				4.0			4.0			4.0	
Lane Grp Cap (vph)	155				1561			417			449	
v/s Ratio Prot	c0.00				c0.19						c0.05	
v/s Ratio Perm								0.04				
v/c Ratio	0.01				0.40			0.15			0.18	
Uniform Delay, d1	35.4				14.6			24.1			24.2	
Progression Factor	1.00				0.39			1.00			1.00	
Incremental Delay, d2	0.1				0.7			0.8			0.9	
Delay (s)	35.5				6.4			24.8			25.1	
Level of Service	D				A			C			C	
Approach Delay (s)		35.5			6.4			24.8			25.1	
Approach LOS		D			A			C			C	

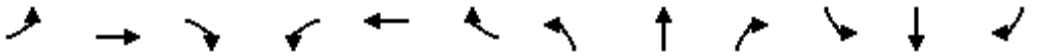
Intersection Summary			
HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	41.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	WBT	SBT	SBR
Lane Group Flow (vph)	1	575	1049	99
v/c Ratio	0.01	0.60	0.63	0.14
Control Delay	40.0	13.2	10.4	7.8
Queue Delay	0.0	0.0	0.2	0.0
Total Delay	40.0	13.2	10.6	7.8
Queue Length 50th (ft)	1	72	86	15
Queue Length 95th (ft)	6	m83	91	25
Internal Link Dist (ft)		467	296	
Turn Bay Length (ft)				
Base Capacity (vph)	77	961	1676	703
Starvation Cap Reductn	0	0	126	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.01	0.60	0.68	0.14

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	0	153	421	1	0	0	0	0	1049	99
Future Volume (vph)	1	0	0	153	421	1	0	0	0	0	1049	99
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0				4.0						4.0	4.0
Lane Util. Factor	1.00				0.95						0.95	1.00
Frpb, ped/bikes	1.00				1.00						1.00	0.94
Flpb, ped/bikes	1.00				1.00						1.00	1.00
Frt	1.00				1.00						1.00	0.85
Flt Protected	0.95				0.99						1.00	1.00
Satd. Flow (prot)	1676				3307						3353	1406
Flt Permitted	0.95				0.99						1.00	1.00
Satd. Flow (perm)	1676				3307						3353	1406
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	0	0	153	421	1	0	0	0	0	1049	99
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	1	0	0	0	575	0	0	0	0	0	1049	99
Confl. Peds. (#/hr)	12		16	16		12	17		16	16		17
Confl. Bikes (#/hr)						60						60
Turn Type	Prot			Split	NA						NA	Perm
Protected Phases	7			8	8						6	
Permitted Phases												6
Actuated Green, G (s)	4.0				25.0						43.0	43.0
Effective Green, g (s)	4.0				25.0						43.0	43.0
Actuated g/C Ratio	0.05				0.29						0.50	0.50
Clearance Time (s)	6.0				4.0						4.0	4.0
Lane Grp Cap (vph)	77				961						1676	703
v/s Ratio Prot	c0.00				c0.17						c0.31	
v/s Ratio Perm												0.07
v/c Ratio	0.01				0.60						0.63	0.14
Uniform Delay, d1	39.1				26.2						15.6	11.6
Progression Factor	1.00				0.45						0.55	0.63
Incremental Delay, d2	0.3				1.2						1.6	0.4
Delay (s)	39.4				13.0						10.2	7.7
Level of Service	D				B						B	A
Approach Delay (s)		39.4			13.0			0.0			10.0	
Approach LOS		D			B			A			A	

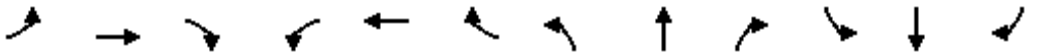
Intersection Summary			
HCM 2000 Control Delay	11.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	54.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	WBT	NBT	SBL
Lane Group Flow (vph)	1	451	1563	1
v/c Ratio	0.01	0.88	0.92	0.01
Control Delay	40.0	55.6	15.1	40.0
Queue Delay	0.0	0.0	0.6	0.0
Total Delay	40.0	55.6	15.7	40.0
Queue Length 50th (ft)	1	126	105	1
Queue Length 95th (ft)	6	#211	#545	6
Internal Link Dist (ft)		230	290	
Turn Bay Length (ft)				
Base Capacity (vph)	77	512	1703	77
Starvation Cap Reductn	0	0	4	0
Spillback Cap Reductn	0	0	24	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.01	0.88	0.93	0.01

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

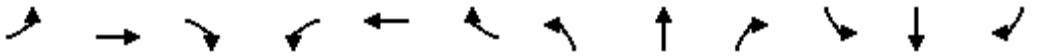


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	0	0	344	107	223	1340	0	1	0	0
Future Volume (vph)	1	0	0	0	344	107	223	1340	0	1	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0				4.0			4.0		6.0		
Lane Util. Factor	1.00				0.95			0.95		1.00		
Frpb, ped/bikes	1.00				0.97			1.00		1.00		
Flpb, ped/bikes	1.00				1.00			1.00		1.00		
Frt	1.00				0.96			1.00		1.00		
Flt Protected	0.95				1.00			0.99		0.95		
Satd. Flow (prot)	1676				3147			3329		1676		
Flt Permitted	0.95				1.00			0.99		0.95		
Satd. Flow (perm)	1676				3147			3329		1676		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	0	0	0	344	107	223	1340	0	1	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	1	0	0	0	451	0	0	1563	0	1	0	0
Confl. Peds. (#/hr)	10		10	10		12	10		15	10		10
Confl. Bikes (#/hr)						60			60			
Turn Type	Prot				NA		Split	NA		Prot		
Protected Phases	7				8		2	2		1		
Permitted Phases												
Actuated Green, G (s)	4.0				14.0			44.0		4.0		
Effective Green, g (s)	4.0				14.0			44.0		4.0		
Actuated g/C Ratio	0.05				0.16			0.51		0.05		
Clearance Time (s)	6.0				4.0			4.0		6.0		
Lane Grp Cap (vph)	77				512			1703		77		
v/s Ratio Prot	c0.00				c0.14			c0.47		c0.00		
v/s Ratio Perm												
v/c Ratio	0.01				0.88			0.92		0.01		
Uniform Delay, d1	39.1				35.2			19.3		39.1		
Progression Factor	1.00				1.00			0.37		1.00		
Incremental Delay, d2	0.3				19.2			6.7		0.3		
Delay (s)	39.4				54.3			13.9		39.4		
Level of Service	D				D			B		D		
Approach Delay (s)		39.4			54.3			13.9			39.4	
Approach LOS		D			D			B			D	

Intersection Summary			
HCM 2000 Control Delay	22.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	SBT
Lane Group Flow (vph)	643	1237
v/c Ratio	0.62	0.64
Control Delay	27.2	3.4
Queue Delay	0.0	0.0
Total Delay	27.2	3.4
Queue Length 50th (ft)	147	34
Queue Length 95th (ft)	205	48
Internal Link Dist (ft)	289	290
Turn Bay Length (ft)		
Base Capacity (vph)	1030	1932
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.62	0.64

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	534	109	0	0	0	0	0	0	122	1115	0
Future Volume (vph)	0	534	109	0	0	0	0	0	0	122	1115	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0									4.0	
Lane Util. Factor		0.95									0.95	
Frpb, ped/bikes		0.98									1.00	
Flpb, ped/bikes		1.00									0.98	
Frt		0.97									1.00	
Flt Protected		1.00									1.00	
Satd. Flow (prot)		3217									3259	
Flt Permitted		1.00									1.00	
Satd. Flow (perm)		3217									3259	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	534	109	0	0	0	0	0	0	122	1115	0
RTOR Reduction (vph)	0	20	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	623	0	0	0	0	0	0	0	0	1237	0
Confl. Peds. (#/hr)	33		38	38		33	38		109	109		38
Confl. Bikes (#/hr)												60
Turn Type		NA								Perm	NA	
Protected Phases		4									6	
Permitted Phases										6		
Actuated Green, G (s)		27.0									51.0	
Effective Green, g (s)		27.0									51.0	
Actuated g/C Ratio		0.31									0.59	
Clearance Time (s)		4.0									4.0	
Lane Grp Cap (vph)		1009									1932	
v/s Ratio Prot		c0.19										
v/s Ratio Perm											0.38	
v/c Ratio		0.62									0.64	
Uniform Delay, d1		25.1									11.5	
Progression Factor		1.00									0.18	
Incremental Delay, d2		2.8									1.3	
Delay (s)		27.9									3.4	
Level of Service		C									A	
Approach Delay (s)		27.9			0.0			0.0			3.4	
Approach LOS		C			A			A			A	

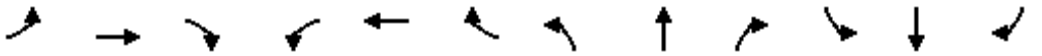
Intersection Summary			
HCM 2000 Control Delay	11.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	NBT	NBR	SBL
Lane Group Flow (vph)	145	305	1385	90	1
v/c Ratio	0.39	0.39	0.77	0.12	0.01
Control Delay	13.0	11.7	12.8	5.1	40.0
Queue Delay	0.0	0.0	0.3	0.0	0.0
Total Delay	13.0	11.7	13.0	5.1	40.0
Queue Length 50th (ft)	25	26	337	12	1
Queue Length 95th (ft)	m39	38	102	m15	6
Internal Link Dist (ft)		417	764		
Turn Bay Length (ft)				100	
Base Capacity (vph)	372	777	1793	725	77
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	70	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.39	0.39	0.80	0.12	0.01

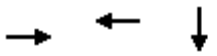
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



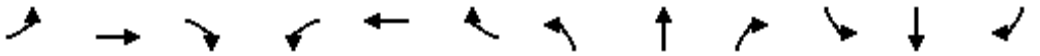
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	194	256	0	0	0	0	0	1385	90	1	0	0
Future Volume (vph)	194	256	0	0	0	0	0	1385	90	1	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0						5.0	5.0	6.0		
Lane Util. Factor	0.91	0.91						0.95	1.00	1.00		
Frpb, ped/bikes	1.00	1.00						1.00	0.90	1.00		
Flpb, ped/bikes	1.00	1.00						1.00	1.00	1.00		
Frt	1.00	1.00						1.00	0.85	1.00		
Flt Protected	0.95	0.99						1.00	1.00	0.95		
Satd. Flow (prot)	1526	3186						3353	1357	1676		
Flt Permitted	0.95	0.99						1.00	1.00	0.95		
Satd. Flow (perm)	1526	3186						3353	1357	1676		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	194	256	0	0	0	0	0	1385	90	1	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	145	305	0	0	0	0	0	1385	90	1	0	0
Confl. Peds. (#/hr)	10		11	10		25	10		36	10		10
Confl. Bikes (#/hr)									60			
Turn Type	Split	NA						NA	Perm	Prot		
Protected Phases	4	4						2		1		
Permitted Phases									2			
Actuated Green, G (s)	21.0	21.0						46.0	46.0	4.0		
Effective Green, g (s)	21.0	21.0						46.0	46.0	4.0		
Actuated g/C Ratio	0.24	0.24						0.53	0.53	0.05		
Clearance Time (s)	4.0	4.0						5.0	5.0	6.0		
Lane Grp Cap (vph)	372	777						1793	725	77		
v/s Ratio Prot	0.10	c0.10						c0.41		c0.00		
v/s Ratio Perm									0.07			
v/c Ratio	0.39	0.39						0.77	0.12	0.01		
Uniform Delay, d1	27.1	27.2						15.9	10.0	39.1		
Progression Factor	0.38	0.38						0.62	0.47	1.00		
Incremental Delay, d2	2.4	1.2						2.7	0.3	0.3		
Delay (s)	12.7	11.6						12.5	5.0	39.4		
Level of Service	B	B						B	A	D		
Approach Delay (s)		12.0			0.0			12.0			39.4	
Approach LOS		B			A			B			D	

Intersection Summary			
HCM 2000 Control Delay	12.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



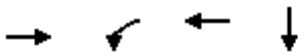
Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	42	37	1228
v/c Ratio	0.14	0.14	0.51
Control Delay	20.9	30.9	1.7
Queue Delay	0.0	0.0	0.3
Total Delay	20.9	30.9	1.9
Queue Length 50th (ft)	11	17	18
Queue Length 95th (ft)	38	44	26
Internal Link Dist (ft)	69	99	279
Turn Bay Length (ft)			
Base Capacity (vph)	310	264	2389
Starvation Cap Reductn	0	0	488
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.14	0.14	0.65

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	24	18	23	14	0	0	0	0	46	1150	32
Future Volume (vph)	0	24	18	23	14	0	0	0	0	46	1150	32
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						0.95	
Frpb, ped/bikes		0.96			1.00						0.99	
Flpb, ped/bikes		1.00			0.95						1.00	
Frt		0.94			1.00						1.00	
Flt Protected		1.00			0.97						1.00	
Satd. Flow (prot)		1592			1623						3312	
Flt Permitted		1.00			0.85						1.00	
Satd. Flow (perm)		1592			1424						3312	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	24	18	23	14	0	0	0	0	46	1150	32
RTOR Reduction (vph)	0	15	0	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	27	0	0	37	0	0	0	0	0	1226	0
Confl. Peds. (#/hr)	80		41	41		80	59		101	101		59
Confl. Bikes (#/hr)												60
Turn Type		NA		Perm	NA					Split	NA	
Protected Phases		4			8					6	6	
Permitted Phases				8								
Actuated Green, G (s)		16.0			16.0						62.0	
Effective Green, g (s)		16.0			16.0						62.0	
Actuated g/C Ratio		0.19			0.19						0.72	
Clearance Time (s)		4.0			4.0						4.0	
Lane Grp Cap (vph)		296			264						2387	
v/s Ratio Prot		0.02									c0.37	
v/s Ratio Perm					c0.03							
v/c Ratio		0.09			0.14						0.51	
Uniform Delay, d1		29.0			29.3						5.3	
Progression Factor		1.00			1.00						0.19	
Incremental Delay, d2		0.6			1.1						0.6	
Delay (s)		29.6			30.4						1.6	
Level of Service		C			C						A	
Approach Delay (s)		29.6			30.4			0.0			1.6	
Approach LOS		C			C			A			A	

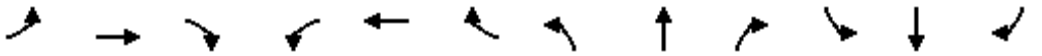
Intersection Summary			
HCM 2000 Control Delay	3.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBL	WBT	SBT
Lane Group Flow (vph)	373	69	289	1185
v/c Ratio	0.58	0.29	0.44	0.67
Control Delay	24.5	17.2	17.4	5.2
Queue Delay	0.0	0.0	0.0	0.1
Total Delay	24.5	17.2	17.4	5.3
Queue Length 50th (ft)	148	26	112	101
Queue Length 95th (ft)	238	m34	199	122
Internal Link Dist (ft)	174		323	277
Turn Bay Length (ft)				
Base Capacity (vph)	643	240	656	1758
Starvation Cap Reductn	0	0	0	47
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.58	0.29	0.44	0.69

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	275	98	69	289	0	0	0	0	155	952	78
Future Volume (vph)	0	275	98	69	289	0	0	0	0	155	952	78
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0		4.0	4.0						4.0	
Lane Util. Factor		1.00		1.00	1.00						0.95	
Frpb, ped/bikes		0.99		1.00	1.00						0.99	
Flpb, ped/bikes		1.00		0.99	1.00						1.00	
Frt		0.96		1.00	1.00						0.99	
Flt Protected		1.00		0.95	1.00						0.99	
Satd. Flow (prot)		1689		1665	1765						3275	
Flt Permitted		1.00		0.37	1.00						0.99	
Satd. Flow (perm)		1689		647	1765						3275	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	275	98	69	289	0	0	0	0	155	952	78
RTOR Reduction (vph)	0	15	0	0	0	0	0	0	0	0	6	0
Lane Group Flow (vph)	0	358	0	69	289	0	0	0	0	0	1179	0
Confl. Peds. (#/hr)	10		10	10		27	10		10	10		21
Confl. Bikes (#/hr)												60
Turn Type		NA		Perm	NA					Split	NA	
Protected Phases		4			8					6	6	
Permitted Phases				8								
Actuated Green, G (s)		32.0		32.0	32.0						46.0	
Effective Green, g (s)		32.0		32.0	32.0						46.0	
Actuated g/C Ratio		0.37		0.37	0.37						0.53	
Clearance Time (s)		4.0		4.0	4.0						4.0	
Lane Grp Cap (vph)		628		240	656						1751	
v/s Ratio Prot		c0.21			0.16						c0.36	
v/s Ratio Perm				0.11								
v/c Ratio		0.57		0.29	0.44						0.67	
Uniform Delay, d1		21.5		19.0	20.3						14.5	
Progression Factor		1.00		0.73	0.75						0.23	
Incremental Delay, d2		3.7		2.6	1.8						1.8	
Delay (s)		25.2		16.4	17.0						5.2	
Level of Service		C		B	B						A	
Approach Delay (s)		25.2			16.9			0.0			5.2	
Approach LOS		C			B			A			A	

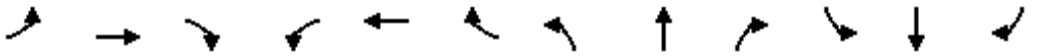
Intersection Summary			
HCM 2000 Control Delay	11.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	80.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	WBR	NBT	NBR	SBL
Lane Group Flow (vph)	135	234	161	122	1285	75	1
v/c Ratio	0.74	0.45	0.67	0.62	0.65	0.09	0.01
Control Delay	56.2	29.6	48.9	48.1	7.0	3.4	40.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.2	29.6	48.9	48.1	7.0	3.4	40.0
Queue Length 50th (ft)	72	107	83	63	34	4	1
Queue Length 95th (ft)	m#143	m183	144	116	400	m14	6
Internal Link Dist (ft)		323	183		528		
Turn Bay Length (ft)						100	
Base Capacity (vph)	205	586	289	238	1970	826	77
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.40	0.56	0.51	0.65	0.09	0.01

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	135	234	0	0	161	122	153	1132	75	1	0	0
Future Volume (vph)	135	234	0	0	161	122	153	1132	75	1	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0	4.0	6.0		
Lane Util. Factor	1.00	1.00			1.00	1.00		0.95	1.00	1.00		
Frpb, ped/bikes	1.00	1.00			1.00	0.97		1.00	0.94	1.00		
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00	1.00		
Frt	1.00	1.00			1.00	0.85		1.00	0.85	1.00		
Flt Protected	0.95	1.00			1.00	1.00		0.99	1.00	0.95		
Satd. Flow (prot)	1676	1765			1765	1460		3333	1408	1676		
Flt Permitted	0.95	1.00			1.00	1.00		0.99	1.00	0.95		
Satd. Flow (perm)	1676	1765			1765	1460		3333	1408	1676		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	135	234	0	0	161	122	153	1132	75	1	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	135	234	0	0	161	122	0	1285	75	1	0	0
Confl. Peds. (#/hr)	8					8	5					5
Confl. Bikes (#/hr)									60			
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm	Prot		
Protected Phases	7	4			8		2	2		1		
Permitted Phases						8			2			
Actuated Green, G (s)	10.4	25.2			11.8	11.8		46.0	46.0	0.8		
Effective Green, g (s)	9.4	25.2			11.8	11.8		46.0	46.0	0.8		
Actuated g/C Ratio	0.11	0.29			0.14	0.14		0.53	0.53	0.01		
Clearance Time (s)	3.0	4.0			4.0	4.0		4.0	4.0	6.0		
Vehicle Extension (s)	2.0	2.5			2.5	2.5		0.2	0.2	3.0		
Lane Grp Cap (vph)	183	517			242	200		1782	753	15		
v/s Ratio Prot	c0.08	0.13			c0.09			c0.39		c0.00		
v/s Ratio Perm						0.08			0.05			
v/c Ratio	0.74	0.45			0.67	0.61		0.72	0.10	0.07		
Uniform Delay, d1	37.1	24.8			35.2	34.9		15.1	9.8	42.2		
Progression Factor	0.99	1.13			1.00	1.00		0.39	0.32	1.00		
Incremental Delay, d2	10.1	0.4			6.1	4.4		2.0	0.2	1.9		
Delay (s)	46.7	28.4			41.3	39.3		8.0	3.3	44.1		
Level of Service	D	C			D	D		A	A	D		
Approach Delay (s)		35.1			40.5			7.7			44.1	
Approach LOS		D			D			A			D	

Intersection Summary			
HCM 2000 Control Delay	17.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		

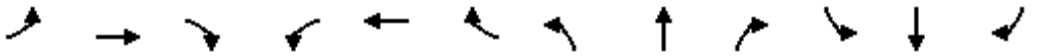
c Critical Lane Group



Lane Group	EBT	WBT	NBT	NBR	SBL
Lane Group Flow (vph)	51	98	1327	63	1
v/c Ratio	0.24	0.35	0.63	0.07	0.01
Control Delay	34.6	36.0	11.2	6.4	40.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	34.6	36.0	11.2	6.4	40.0
Queue Length 50th (ft)	24	48	201	12	1
Queue Length 95th (ft)	57	94	262	m25	6
Internal Link Dist (ft)	93	517	2424		
Turn Bay Length (ft)				100	
Base Capacity (vph)	217	280	2103	941	77
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.24	0.35	0.63	0.07	0.01

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	14	0	0	85	13	21	1306	63	1	0	0
Future Volume (vph)	37	14	0	0	85	13	21	1306	63	1	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0			4.0	4.0	6.0		
Lane Util. Factor		1.00			1.00			0.95	1.00	1.00		
Frpb, ped/bikes		1.00			0.99			1.00	1.00	1.00		
Flpb, ped/bikes		0.98			1.00			1.00	1.00	1.00		
Frt		1.00			0.98			1.00	0.85	1.00		
Flt Protected		0.96			1.00			1.00	1.00	0.95		
Satd. Flow (prot)		1673			1724			3350	1500	1676		
Flt Permitted		0.77			1.00			1.00	1.00	0.95		
Satd. Flow (perm)		1334			1724			3350	1500	1676		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	37	14	0	0	85	13	21	1306	63	1	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	51	0	0	98	0	0	1327	63	1	0	0
Confl. Peds. (#/hr)	15		12	12		15	10		19	19		10
Confl. Bikes (#/hr)									60			
Turn Type	custom	NA			NA		Split	NA	Prot	Prot		
Protected Phases					8		2	2	2	1		
Permitted Phases	4	4										
Actuated Green, G (s)		14.0			14.0			54.0	54.0	4.0		
Effective Green, g (s)		14.0			14.0			54.0	54.0	4.0		
Actuated g/C Ratio		0.16			0.16			0.63	0.63	0.05		
Clearance Time (s)		4.0			4.0			4.0	4.0	6.0		
Lane Grp Cap (vph)		217			280			2103	941	77		
v/s Ratio Prot					c0.06			c0.40	0.04	c0.00		
v/s Ratio Perm		0.04										
v/c Ratio		0.24			0.35			0.63	0.07	0.01		
Uniform Delay, d1		31.3			32.0			9.9	6.2	39.1		
Progression Factor		1.00			1.00			0.97	0.98	1.00		
Incremental Delay, d2		2.5			3.4			1.5	0.1	0.3		
Delay (s)		33.9			35.4			11.0	6.2	39.4		
Level of Service		C			D			B	A	D		
Approach Delay (s)		33.9			35.4			10.8			39.4	
Approach LOS		C			D			B			D	

Intersection Summary			
HCM 2000 Control Delay	13.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	57.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	106	203	173	208	424	65	847	362	875
v/c Ratio	0.69	0.44	0.84	0.76	0.69	0.17	0.61	0.55	0.66
Control Delay	81.8	34.5	88.4	69.9	20.6	47.1	33.4	50.4	34.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.8	34.5	88.4	69.9	20.6	47.1	33.4	50.4	34.9
Queue Length 50th (ft)	87	49	144	169	151	45	288	138	301
Queue Length 95th (ft)	167	96	244	270	231	101	455	219	459
Internal Link Dist (ft)		595		272			1059		378
Turn Bay Length (ft)	175		300			135			
Base Capacity (vph)	227	693	334	465	828	374	1399	805	1821
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.29	0.52	0.45	0.51	0.17	0.61	0.45	0.48

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	106	122	81	173	208	424	65	771	76	362	813	62
Future Volume (vph)	106	122	81	173	208	424	65	771	76	362	813	62
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95		0.97	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1676	3152		1676	1765	1500	1676	3295		3252	3300	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1676	3152		1676	1765	1500	1676	3295		3252	3300	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	106	122	81	173	208	424	65	771	76	362	813	62
RTOR Reduction (vph)	0	71	0	0	0	81	0	5	0	0	4	0
Lane Group Flow (vph)	106	132	0	173	208	343	65	842	0	362	871	0
Confl. Bikes (#/hr)									60			60
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8	1 8	5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	11.7	15.9		16.7	19.9	45.6	28.5	53.9		25.7	51.1	
Effective Green, g (s)	11.7	15.9		15.7	19.9	45.6	28.5	53.9		25.7	51.1	
Actuated g/C Ratio	0.09	0.12		0.12	0.16	0.36	0.22	0.42		0.20	0.40	
Clearance Time (s)	4.0	4.0		3.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	1.5	1.5		1.0	1.5		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	154	394		206	276	537	375	1396		657	1325	
v/s Ratio Prot	0.06	0.04		c0.10	c0.12	0.23	0.04	c0.26		0.11	c0.26	
v/s Ratio Perm												
v/c Ratio	0.69	0.34		0.84	0.75	0.64	0.17	0.60		0.55	0.66	
Uniform Delay, d1	56.0	50.8		54.5	51.3	33.9	39.8	28.4		45.6	30.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.8	0.2		23.9	9.9	2.5	1.0	1.9		1.0	1.2	
Delay (s)	65.7	51.0		78.4	61.2	36.4	40.8	30.3		46.6	32.1	
Level of Service	E	D		E	E	D	D	C		D	C	
Approach Delay (s)		56.1			51.8			31.1			36.3	
Approach LOS		E			D			C			D	

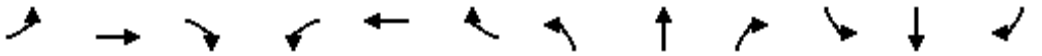
Intersection Summary			
HCM 2000 Control Delay	40.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	127.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	229	602	77	445	412	677	50	156	1008
v/c Ratio	0.94	0.61	0.65	0.67	0.95	0.50	0.06	0.81	0.79
Control Delay	94.7	33.5	77.9	48.0	84.6	29.8	3.2	80.4	38.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	94.7	33.5	77.9	48.0	84.6	29.8	3.2	80.4	38.2
Queue Length 50th (ft)	177	180	59	164	165	204	0	119	353
Queue Length 95th (ft)	#328	234	108	207	#264	301	17	189	#518
Internal Link Dist (ft)		1448		174		1573			1059
Turn Bay Length (ft)	250		250		275		300	150	
Base Capacity (vph)	251	1026	167	831	433	1364	839	251	1270
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.59	0.46	0.54	0.95	0.50	0.06	0.62	0.79

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	229	378	224	77	387	58	412	677	50	156	821	187
Future Volume (vph)	229	378	224	77	387	58	412	677	50	156	821	187
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.94		1.00	0.98		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	3166		1676	3287		3252	3353	1500	1676	3231	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1676	3166		1676	3287		3252	3353	1500	1676	3231	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	229	378	224	77	387	58	412	677	50	156	821	187
RTOR Reduction (vph)	0	73	0	0	10	0	0	0	25	0	15	0
Lane Group Flow (vph)	229	529	0	77	435	0	412	677	25	156	993	0
Confl. Bikes (#/hr)									60			60
Turn Type	Prot	NA		Prot	NA		Prot	NA	pt+ov	Prot	NA	
Protected Phases	7	4		3	8		5	2	2 3	1	6	
Permitted Phases												
Actuated Green, G (s)	18.5	34.4		8.5	24.4		17.0	48.2	60.7	14.9	46.1	
Effective Green, g (s)	17.5	34.4		7.5	24.4		16.0	48.2	60.7	13.9	46.1	
Actuated g/C Ratio	0.15	0.29		0.06	0.20		0.13	0.40	0.51	0.12	0.38	
Clearance Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.5	3.0		2.0	4.0		2.0	3.5		2.0	3.5	
Lane Grp Cap (vph)	244	907		104	668		433	1346	758	194	1241	
v/s Ratio Prot	c0.14	0.17		0.05	c0.13		c0.13	0.20	0.02	0.09	c0.31	
v/s Ratio Perm												
v/c Ratio	0.94	0.58		0.74	0.65		0.95	0.50	0.03	0.80	0.80	
Uniform Delay, d1	50.7	36.7		55.3	43.9		51.6	26.9	14.9	51.7	32.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	40.6	1.0		21.7	2.5		30.8	1.3	0.0	19.9	5.5	
Delay (s)	91.3	37.6		76.9	46.4		82.4	28.3	14.9	71.6	38.3	
Level of Service	F	D		E	D		F	C	B	E	D	
Approach Delay (s)		52.4			50.9			47.3			42.8	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	47.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	82.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Arterial Level of Service: NB Central Avenue

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Edwards Street	III	30	45.4	39.0	84.4	0.36	15.2	D
Total	III		45.4	39.0	84.4	0.36	15.2	D

Arterial Level of Service: SB Central Avenue

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Central Avenue	III	30	22.0	0.0	22.0	0.16	26.8	B
Jackson Street	III	30	45.4	16.7	62.1	0.36	20.7	C
E 4th Street	III	30	22.6	11.9	34.5	0.18	18.5	C
6th Street	III	30	18.1	2.0	20.1	0.14	24.2	B
Main Street	III	30	11.0	10.4	21.4	0.07	12.0	E
8th Street	III	30	10.9	3.4	14.3	0.07	17.6	D
9th Street	III	30	10.5	1.7	12.2	0.07	20.1	C
10th	III	30	10.5	5.2	15.7	0.07	15.5	D
Total	III		151.0	51.3	202.3	1.11	19.8	C

Arterial Level of Service: NB Court Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
McAndrews Road	III	30	50.4	57.0	107.4	0.40	13.3	E
Ohio Street	III	30	16.0	46.0	62.0	0.11	6.6	F
Total	III		66.4	103.0	169.4	0.51	10.8	E

Arterial Level of Service: SB Court Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Ohio Street	III	30	21.9	11.1	33.0	0.16	17.8	D
E McAndrews Road	III	30	16.0	37.3	53.3	0.11	7.7	F
Central Avenue	III	30	50.4	17.2	67.6	0.40	21.1	C
Total	III		88.3	65.6	153.9	0.67	15.8	D

Arterial Level of Service: EB Main Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Oakdale Avenue	IV	30	17.4	36.0	53.4	0.10	6.5	F
Holly Street	IV	30	19.1	34.0	53.1	0.11	7.2	E
Grape Street	IV	30	12.0	34.0	46.0	0.05	4.1	F
Fir Street	IV	30	12.1	35.0	47.1	0.05	4.1	F
Front Street	IV	30	17.0	36.0	53.0	0.07	5.1	F
Central Avenue	IV	30	11.5	40.0	51.5	0.05	3.5	F
Riverside Avenue	IV	30	18.6	40.0	58.6	0.10	6.4	F
Total	IV		107.7	255.0	362.7	0.54	5.3	F

Arterial Level of Service: WB Main Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Riverside Avenue	IV	30	20.4	55.6	76.0	0.11	5.4	F
Central Avenue	IV	30	18.6	13.2	31.8	0.10	11.7	D
Front Street	IV	30	11.5	6.5	18.0	0.05	10.2	D
Fir Street	IV	30	17.0	2.2	19.2	0.07	14.0	C
Grape Street	IV	30	12.1	3.2	15.3	0.05	12.6	D
Holly Street	IV	30	12.0	1.9	13.9	0.05	13.7	C
Oakdale Avenue	IV	30	19.1	8.3	27.4	0.11	13.9	C
Total	IV		110.7	90.9	201.6	0.55	9.9	D

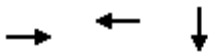
Arterial Level of Service: NB Riverside Avenue

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Barnett Road	III	30	27.4	33.4	60.8	0.22	12.8	E
12th Street	III	30	67.3	11.2	78.5	0.56	25.7	B
10th Street	III	30	16.2	7.0	23.2	0.12	17.9	D
8th Street	III	30	21.4	12.8	34.2	0.16	16.8	D
Main Street	III	30	10.9	15.1	26.0	0.07	9.7	F
	III	30	10.8	5.9	16.7	0.07	15.0	D
4th Street	III	30	18.8	10.9	29.7	0.14	17.0	D
Jackson Street	III	30	10.5	18.0	28.5	0.07	8.5	F
Manzanita Street	III	30	63.4	6.3	69.7	0.50	25.8	B
McAndrews Road	III	30	30.6	37.1	67.7	0.24	12.8	E
Mall Access	III	30	17.6	11.0	28.6	0.12	15.7	D
Total	III		294.9	168.7	463.6	2.26	17.6	D

Arterial Level of Service: SB Riverside Avenue

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Ohio Street	III	30	23.0	45.0	68.0	0.18	9.6	F
McAndrews Road	III	30	17.6	57.0	74.6	0.12	6.0	F
Manzanita Street	III	30	30.6	40.0	70.6	0.24	12.3	E
Jackson Street	III	30	63.4	40.0	103.4	0.50	17.4	D
4th Street	III	30	10.5	40.0	50.5	0.07	4.8	F
6th Street	III	30	18.8	40.0	58.8	0.14	8.6	F
Main Street	III	30	10.8	40.0	50.8	0.07	4.9	F
8th Street	III	30	10.9	40.0	50.9	0.07	5.0	F
10th Street	III	30	21.4	40.0	61.4	0.16	9.4	F
12th Street	III	30	16.2	40.0	56.2	0.12	7.4	F
Barnett Road	III	30	67.3	34.9	102.2	0.56	19.8	C
Stewart Avenue	III	30	27.4	38.2	65.6	0.22	11.8	E
Total	III		317.9	495.1	813.0	2.45	10.8	E

2024 Alternative A
Permissive Phasing

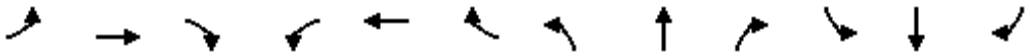


Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	276	220	1131
v/c Ratio	0.68	1.31	0.49
Control Delay	32.1	204.1	8.3
Queue Delay	0.0	0.0	0.0
Total Delay	32.1	204.1	8.3
Queue Length 50th (ft)	112	~165	146
Queue Length 95th (ft)	178	#286	257
Internal Link Dist (ft)	1754	380	781
Turn Bay Length (ft)			
Base Capacity (vph)	630	284	2321
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.44	0.77	0.49

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	110	166	83	137	0	0	0	0	65	985	81
Future Volume (vph)	0	110	166	83	137	0	0	0	0	65	985	81
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						0.95	
Frpb, ped/bikes		0.99			1.00						0.99	
Flpb, ped/bikes		1.00			1.00						1.00	
Frt		0.92			1.00						0.99	
Flt Protected		1.00			0.98						1.00	
Satd. Flow (prot)		1598			1728						3285	
Flt Permitted		1.00			0.45						1.00	
Satd. Flow (perm)		1598			790						3285	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	110	166	83	137	0	0	0	0	65	985	81
RTOR Reduction (vph)	0	67	0	0	0	0	0	0	0	0	4	0
Lane Group Flow (vph)	0	209	0	0	220	0	0	0	0	0	1127	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)												60
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		21.9			21.9						70.6	
Effective Green, g (s)		21.4			21.4						70.6	
Actuated g/C Ratio		0.21			0.21						0.71	
Clearance Time (s)		3.5			3.5						4.0	
Vehicle Extension (s)		2.0			2.0						4.0	
Lane Grp Cap (vph)		341			169						2319	
v/s Ratio Prot		0.13										
v/s Ratio Perm					c0.28						0.34	
v/c Ratio		0.61			1.30						0.49	
Uniform Delay, d1		35.6			39.3						6.6	
Progression Factor		1.00			0.91						1.00	
Incremental Delay, d2		2.3			171.1						0.7	
Delay (s)		37.9			206.7						7.3	
Level of Service		D			F						A	
Approach Delay (s)		37.9			206.7			0.0			7.3	
Approach LOS		D			F			A			A	

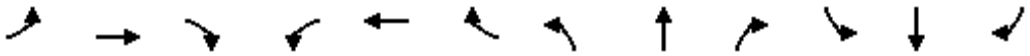
Intersection Summary			
HCM 2000 Control Delay	39.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	80.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBT	WBT	WBR	NBT
Lane Group Flow (vph)	224	95	83	1698
v/c Ratio	0.80	0.26	0.26	0.52
Control Delay	48.7	26.7	22.5	8.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	48.7	26.7	22.5	8.9
Queue Length 50th (ft)	95	44	30	168
Queue Length 95th (ft)	164	81	66	266
Internal Link Dist (ft)	380	1230		579
Turn Bay Length (ft)				
Base Capacity (vph)	450	566	498	3277
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.50	0.17	0.17	0.52

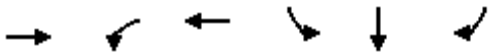
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	142	82	0	0	74	104	107	1501	90	0	0	0
Future Volume (vph)	142	82	0	0	74	104	107	1501	90	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.5			4.5	4.5		5.0				
Lane Util. Factor		1.00			0.95	0.95		0.91				
Frpb, ped/bikes		1.00			0.99	0.98		1.00				
Flpb, ped/bikes		0.99			1.00	1.00		1.00				
Frt		1.00			0.97	0.85		0.99				
Flt Protected		0.97			1.00	1.00		1.00				
Satd. Flow (prot)		1700			1613	1392		4747				
Flt Permitted		0.74			1.00	1.00		1.00				
Satd. Flow (perm)		1306			1613	1392		4747				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	142	82	0	0	74	104	107	1501	90	0	0	0
RTOR Reduction (vph)	0	0	0	0	13	22	0	4	0	0	0	0
Lane Group Flow (vph)	0	224	0	0	82	61	0	1694	0	0	0	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)									60			
Turn Type	Perm	NA			NA	Perm	Split	NA				
Protected Phases		4			8		2	2				
Permitted Phases	4					8						
Actuated Green, G (s)		22.0			22.0	22.0		69.5				
Effective Green, g (s)		21.5			21.5	21.5		69.0				
Actuated g/C Ratio		0.22			0.22	0.22		0.69				
Clearance Time (s)		4.0			4.0	4.0		4.5				
Vehicle Extension (s)		2.5			2.5	2.5		2.0				
Lane Grp Cap (vph)		280			346	299		3275				
v/s Ratio Prot					0.05			c0.36				
v/s Ratio Perm		c0.17				0.04						
v/c Ratio		0.80			0.24	0.20		0.52				
Uniform Delay, d1		37.2			32.5	32.2		7.5				
Progression Factor		0.80			1.00	1.00		1.00				
Incremental Delay, d2		14.0			0.3	0.2		0.6				
Delay (s)		43.6			32.7	32.5		8.1				
Level of Service		D			C	C		A				
Approach Delay (s)		43.6			32.6			8.1			0.0	
Approach LOS		D			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	13.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.5
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		

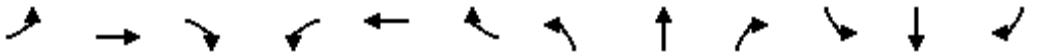
c Critical Lane Group



Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	533	195	767	380	706	58
v/c Ratio	0.48	0.50	0.38	0.68	0.64	0.11
Control Delay	34.1	31.2	4.7	40.8	36.1	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.1	31.2	4.7	40.8	36.1	6.6
Queue Length 50th (ft)	172	137	45	247	236	0
Queue Length 95th (ft)	241	m209	54	337	283	28
Internal Link Dist (ft)	1762		672		521	
Turn Bay Length (ft)		110		175		175
Base Capacity (vph)	1112	391	2018	642	1285	582
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.50	0.38	0.59	0.55	0.10

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	485	48	195	767	0	0	0	0	380	706	58
Future Volume (vph)	0	485	48	195	767	0	0	0	0	380	706	58
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0		4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.95		1.00	0.95					1.00	0.95	1.00
Frpb, ped/bikes		1.00		1.00	1.00					1.00	1.00	0.95
Flpb, ped/bikes		1.00		1.00	1.00					1.00	1.00	1.00
Frt		0.99		1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		3303		1676	3353					1676	3353	1418
Flt Permitted		1.00		0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		3303		1676	3353					1676	3353	1418
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	485	48	195	767	0	0	0	0	380	706	58
RTOR Reduction (vph)	0	6	0	0	0	0	0	0	0	0	0	39
Lane Group Flow (vph)	0	527	0	195	767	0	0	0	0	380	706	19
Confl. Peds. (#/hr)	2		2	2		2	2		1	1		2
Confl. Bikes (#/hr)												60
Turn Type		NA		Prot	NA					Split	NA	Perm
Protected Phases		4		3	8					6	6	
Permitted Phases												6
Actuated Green, G (s)		40.2		29.0	72.2					39.8	39.8	39.8
Effective Green, g (s)		40.2		28.0	72.2					39.8	39.8	39.8
Actuated g/C Ratio		0.34		0.23	0.60					0.33	0.33	0.33
Clearance Time (s)		4.0		3.0	4.0					4.0	4.0	4.0
Vehicle Extension (s)		4.0		2.0	4.0					5.0	5.0	5.0
Lane Grp Cap (vph)		1106		391	2017					555	1112	470
v/s Ratio Prot		c0.16		c0.12	0.23					c0.23	0.21	
v/s Ratio Perm												0.01
v/c Ratio		0.48		0.50	0.38					0.68	0.63	0.04
Uniform Delay, d1		31.6		39.9	12.3					34.7	33.9	27.2
Progression Factor		1.00		0.68	0.31					1.00	1.00	1.00
Incremental Delay, d2		1.5		0.3	0.5					4.5	1.7	0.1
Delay (s)		33.0		27.3	4.3					39.2	35.6	27.2
Level of Service		C		C	A					D	D	C
Approach Delay (s)		33.0			9.0			0.0			36.4	
Approach LOS		C			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	25.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	76.1%	ICU Level of Service	D
Analysis Period (min)	15		

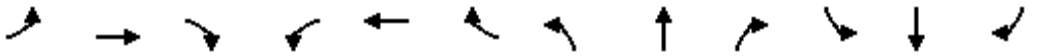
c Critical Lane Group



Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Group Flow (vph)	95	750	899	518	1253	263
v/c Ratio	0.65	0.36	0.53	0.66	0.79	0.45
Control Delay	75.0	1.9	22.0	23.2	40.5	12.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.0	1.9	22.0	23.2	40.5	12.7
Queue Length 50th (ft)	64	25	243	241	319	45
Queue Length 95th (ft)	m123	22	314	384	378	121
Internal Link Dist (ft)		672	692		1193	
Turn Bay Length (ft)	130					150
Base Capacity (vph)	181	2069	1690	781	1596	587
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.36	0.53	0.66	0.79	0.45

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	95	750	0	0	899	518	139	1114	263	0	0	0
Future Volume (vph)	95	750	0	0	899	518	139	1114	263	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	3.0			3.0	3.0		3.0	3.0			
Lane Util. Factor	1.00	0.95			0.95	1.00		0.91	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	0.97		1.00	0.93			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.99	1.00			
Satd. Flow (prot)	1676	3353			3353	1456		4791	1402			
Flt Permitted	0.95	1.00			1.00	1.00		0.99	1.00			
Satd. Flow (perm)	1676	3353			3353	1456		4791	1402			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	95	750	0	0	899	518	139	1114	263	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	47	0	0	120	0	0	0
Lane Group Flow (vph)	95	750	0	0	899	471	0	1253	143	0	0	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)									60			
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	7	4			8		2	2				
Permitted Phases						8			2			
Actuated Green, G (s)	10.5	73.1			59.6	59.6		38.9	38.9			
Effective Green, g (s)	10.5	74.1			60.6	60.6		39.9	39.9			
Actuated g/C Ratio	0.09	0.62			0.51	0.51		0.33	0.33			
Clearance Time (s)	3.0	4.0			4.0	4.0		4.0	4.0			
Vehicle Extension (s)	2.0	4.0			4.0	4.0		4.0	4.0			
Lane Grp Cap (vph)	146	2070			1693	735		1593	466			
v/s Ratio Prot	c0.06	0.22			0.27			c0.26				
v/s Ratio Perm						c0.32			0.10			
v/c Ratio	0.65	0.36			0.53	0.64		0.79	0.31			
Uniform Delay, d1	53.0	11.3			20.1	21.7		36.2	29.8			
Progression Factor	1.10	0.13			1.00	1.00		1.00	1.00			
Incremental Delay, d2	6.6	0.4			1.2	4.3		2.8	0.5			
Delay (s)	64.7	1.9			21.3	26.0		39.0	30.3			
Level of Service	E	A			C	C		D	C			
Approach Delay (s)		9.0			23.0			37.5			0.0	
Approach LOS		A			C			D			A	

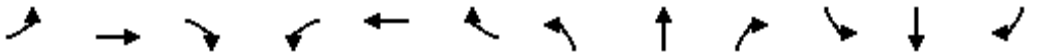
Intersection Summary			
HCM 2000 Control Delay	25.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	76.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



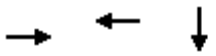
Lane Group	EBT	WBT	NBT
Lane Group Flow (vph)	87	19	1535
v/c Ratio	0.45	0.07	0.70
Control Delay	40.0	22.3	3.9
Queue Delay	0.0	0.0	0.0
Total Delay	40.0	22.3	3.9
Queue Length 50th (ft)	43	5	84
Queue Length 95th (ft)	89	23	80
Internal Link Dist (ft)	550	165	918
Turn Bay Length (ft)			
Base Capacity (vph)	195	263	2202
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.45	0.07	0.70

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	83	4	0	0	10	9	44	1474	17	0	0	0
Future Volume (vph)	83	4	0	0	10	9	44	1474	17	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0			4.0				
Lane Util. Factor		1.00			1.00			0.95				
Frpb, ped/bikes		1.00			0.99			1.00				
Flpb, ped/bikes		0.98			1.00			1.00				
Frt		1.00			0.94			1.00				
Flt Protected		0.95			1.00			1.00				
Satd. Flow (prot)		1483			1466			3006				
Flt Permitted		0.72			1.00			1.00				
Satd. Flow (perm)		1122			1466			3006				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	83	4	0	0	10	9	44	1474	17	0	0	0
RTOR Reduction (vph)	0	0	0	0	7	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	87	0	0	12	0	0	1534	0	0	0	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)									60			
Turn Type	Perm	NA			NA		Split	NA				
Protected Phases		4			8		2	2				
Permitted Phases	4											
Actuated Green, G (s)		15.0			15.0			63.0				
Effective Green, g (s)		15.0			15.0			63.0				
Actuated g/C Ratio		0.17			0.17			0.73				
Clearance Time (s)		4.0			4.0			4.0				
Lane Grp Cap (vph)		195			255			2202				
v/s Ratio Prot					0.01			c0.51				
v/s Ratio Perm		c0.08										
v/c Ratio		0.45			0.05			0.70				
Uniform Delay, d1		31.8			29.5			6.3				
Progression Factor		1.00			1.00			0.39				
Incremental Delay, d2		7.2			0.3			1.4				
Delay (s)		39.0			29.9			3.8				
Level of Service		D			C			A				
Approach Delay (s)		39.0			29.9			3.8			0.0	
Approach LOS		D			C			A			A	

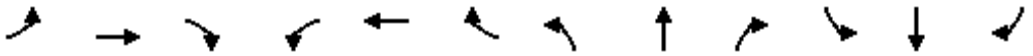
Intersection Summary			
HCM 2000 Control Delay	6.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	207	88	991
v/c Ratio	0.72	0.44	0.50
Control Delay	23.9	37.4	11.6
Queue Delay	0.0	0.0	0.0
Total Delay	23.9	37.4	11.6
Queue Length 50th (ft)	18	49	119
Queue Length 95th (ft)	82	m64	311
Internal Link Dist (ft)	7	1528	2014
Turn Bay Length (ft)			
Base Capacity (vph)	367	414	1965
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.56	0.21	0.50

Intersection Summary

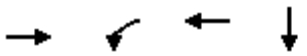
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	35	172	45	43	0	0	0	0	61	907	23
Future Volume (vph)	0	35	172	45	43	0	0	0	0	61	907	23
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						0.95	
Frpb, ped/bikes		0.96			1.00						1.00	
Flpb, ped/bikes		1.00			1.00						1.00	
Frt		0.89			1.00						1.00	
Flt Protected		1.00			0.98						1.00	
Satd. Flow (prot)		1360			1549						2993	
Flt Permitted		1.00			0.98						1.00	
Satd. Flow (perm)		1360			1549						2993	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	35	172	45	43	0	0	0	0	61	907	23
RTOR Reduction (vph)	0	156	0	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	51	0	0	88	0	0	0	0	0	990	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)												60
Turn Type		NA		Split	NA					Split	NA	
Protected Phases		7		8	8					6	6	
Permitted Phases												
Actuated Green, G (s)		8.2			10.1						55.7	
Effective Green, g (s)		8.2			10.1						55.7	
Actuated g/C Ratio		0.10			0.12						0.65	
Clearance Time (s)		4.0			4.0						4.0	
Vehicle Extension (s)		2.0			2.0						4.0	
Lane Grp Cap (vph)		129			181						1938	
v/s Ratio Prot		c0.04			c0.06						c0.33	
v/s Ratio Perm												
v/c Ratio		0.40			0.49						0.51	
Uniform Delay, d1		36.6			35.5						8.0	
Progression Factor		1.00			0.98						1.00	
Incremental Delay, d2		0.7			0.6						1.0	
Delay (s)		37.3			35.5						8.9	
Level of Service		D			D						A	
Approach Delay (s)		37.3			35.5			0.0			8.9	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	15.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.6%	ICU Level of Service	C
Analysis Period (min)	15		

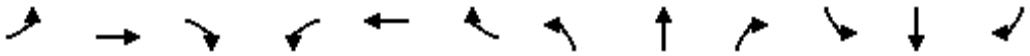
c Critical Lane Group



Lane Group	EBT	WBL	WBT	SBT
Lane Group Flow (vph)	349	57	287	1172
v/c Ratio	0.64	0.27	0.52	0.71
Control Delay	28.8	15.2	16.0	13.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	28.8	15.2	16.0	13.2
Queue Length 50th (ft)	150	13	69	258
Queue Length 95th (ft)	244	m21	m104	63
Internal Link Dist (ft)	1450		992	1806
Turn Bay Length (ft)		250		
Base Capacity (vph)	547	208	553	1643
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.64	0.27	0.52	0.71

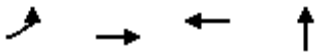
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	288	61	57	287	0	0	0	0	165	890	117
Future Volume (vph)	0	288	61	57	287	0	0	0	0	165	890	117
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0		4.0	4.0						4.0	
Lane Util. Factor		1.00		1.00	1.00						0.95	
Frpb, ped/bikes		1.00		1.00	1.00						0.99	
Flpb, ped/bikes		1.00		1.00	1.00						1.00	
Frt		0.98		1.00	1.00						0.99	
Flt Protected		1.00		0.95	1.00						0.99	
Satd. Flow (prot)		1545		1502	1588						2928	
Flt Permitted		1.00		0.38	1.00						0.99	
Satd. Flow (perm)		1545		597	1588						2928	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	288	61	57	287	0	0	0	0	165	890	117
RTOR Reduction (vph)	0	9	0	0	0	0	0	0	0	0	10	0
Lane Group Flow (vph)	0	340	0	57	287	0	0	0	0	0	1162	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		15
Confl. Bikes (#/hr)												60
Turn Type		NA		Perm	NA					Split	NA	
Protected Phases		4			8					6	6	
Permitted Phases				8								
Actuated Green, G (s)		30.0		30.0	30.0						48.0	
Effective Green, g (s)		30.0		30.0	30.0						48.0	
Actuated g/C Ratio		0.35		0.35	0.35						0.56	
Clearance Time (s)		4.0		4.0	4.0						4.0	
Lane Grp Cap (vph)		538		208	553						1634	
v/s Ratio Prot		c0.22			0.18						c0.40	
v/s Ratio Perm				0.10								
v/c Ratio		0.63		0.27	0.52						0.71	
Uniform Delay, d1		23.4		20.2	22.3						13.9	
Progression Factor		1.00		0.60	0.59						0.77	
Incremental Delay, d2		5.6		2.3	2.4						2.4	
Delay (s)		28.9		14.4	15.6						13.1	
Level of Service		C		B	B						B	
Approach Delay (s)		28.9			15.4			0.0			13.1	
Approach LOS		C			B			A			B	

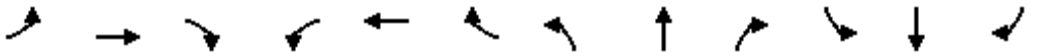
Intersection Summary			
HCM 2000 Control Delay	16.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	91.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	NBT
Lane Group Flow (vph)	110	361	369	1366
v/c Ratio	0.57	0.65	0.68	0.82
Control Delay	37.8	33.0	28.7	8.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	37.8	33.0	28.7	8.2
Queue Length 50th (ft)	54	184	150	59
Queue Length 95th (ft)	m89	m273	251	74
Internal Link Dist (ft)		992	302	277
Turn Bay Length (ft)	200			
Base Capacity (vph)	193	553	542	1667
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.57	0.65	0.68	0.82

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	361	0	0	228	141	105	1221	40	0	0	0
Future Volume (vph)	110	361	0	0	228	141	105	1221	40	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0			4.0			4.0				
Lane Util. Factor	1.00	1.00			1.00			0.95				
Frpb, ped/bikes	1.00	1.00			0.98			1.00				
Flpb, ped/bikes	0.99	1.00			1.00			1.00				
Frt	1.00	1.00			0.95			1.00				
Flt Protected	0.95	1.00			1.00			1.00				
Satd. Flow (prot)	1490	1588			1481			2981				
Flt Permitted	0.35	1.00			1.00			1.00				
Satd. Flow (perm)	554	1588			1481			2981				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	110	361	0	0	228	141	105	1221	40	0	0	0
RTOR Reduction (vph)	0	0	0	0	26	0	0	3	0	0	0	0
Lane Group Flow (vph)	110	361	0	0	343	0	0	1363	0	0	0	0
Confl. Peds. (#/hr)	18		12	12		18	37		32	32		37
Confl. Bikes (#/hr)									60			
Turn Type	Perm	NA			NA		Split	NA				
Protected Phases		4			8		2	2				
Permitted Phases	4											
Actuated Green, G (s)	30.0	30.0			30.0			48.0				
Effective Green, g (s)	30.0	30.0			30.0			48.0				
Actuated g/C Ratio	0.35	0.35			0.35			0.56				
Clearance Time (s)	4.0	4.0			4.0			4.0				
Lane Grp Cap (vph)	193	553			516			1663				
v/s Ratio Prot		0.23			c0.23			c0.46				
v/s Ratio Perm	0.20											
v/c Ratio	0.57	0.65			0.66			0.82				
Uniform Delay, d1	22.8	23.6			23.7			15.5				
Progression Factor	1.15	1.16			1.00			0.31				
Incremental Delay, d2	9.0	4.6			6.6			3.3				
Delay (s)	35.3	32.0			30.4			8.0				
Level of Service	D	C			C			A				
Approach Delay (s)		32.8			30.4			8.0			0.0	
Approach LOS		C			C			A			A	

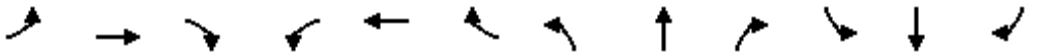
Intersection Summary			
HCM 2000 Control Delay	17.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	91.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBL	WBT	SBT	SBR
Lane Group Flow (vph)	309	239	287	830	179
v/c Ratio	0.67	0.55	0.35	0.70	0.28
Control Delay	34.9	9.9	8.3	12.1	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	34.9	9.9	8.3	12.1	1.0
Queue Length 50th (ft)	144	64	86	90	0
Queue Length 95th (ft)	235	m70	m96	142	m0
Internal Link Dist (ft)	282		688	858	
Turn Bay Length (ft)		250			
Base Capacity (vph)	458	434	812	1191	641
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.67	0.55	0.35	0.70	0.28

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	279	30	239	287	0	0	0	0	21	809	179
Future Volume (vph)	0	279	30	239	287	0	0	0	0	21	809	179
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0		4.0	4.0						4.0	4.0
Lane Util. Factor		1.00		1.00	1.00						0.95	1.00
Frpb, ped/bikes		1.00		1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00						1.00	1.00
Frt		0.99		1.00	1.00						1.00	0.85
Flt Protected		1.00		0.95	1.00						1.00	1.00
Satd. Flow (prot)		1563		1506	1588						3014	1350
Flt Permitted		1.00		0.32	1.00						1.00	1.00
Satd. Flow (perm)		1563		512	1588						3014	1350
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	279	30	239	287	0	0	0	0	21	809	179
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	0	0	0	108
Lane Group Flow (vph)	0	305	0	239	287	0	0	0	0	0	830	71
Confl. Peds. (#/hr)	6		11	11		6			2	2		
Confl. Bikes (#/hr)												60
Turn Type		NA		pm+pt	NA					Split	NA	Prot
Protected Phases		4		3	8					6	6	6
Permitted Phases				8	8							
Actuated Green, G (s)		25.0		44.0	44.0						34.0	34.0
Effective Green, g (s)		25.0		44.0	44.0						34.0	34.0
Actuated g/C Ratio		0.29		0.51	0.51						0.40	0.40
Clearance Time (s)		4.0		4.0	4.0						4.0	4.0
Lane Grp Cap (vph)		454		435	812						1191	533
v/s Ratio Prot		c0.20		c0.10	0.18						c0.28	0.05
v/s Ratio Perm				0.19								
v/c Ratio		0.67		0.55	0.35						0.70	0.13
Uniform Delay, d1		26.9		13.5	12.5						21.7	16.6
Progression Factor		1.00		0.58	0.59						0.44	0.08
Incremental Delay, d2		7.7		2.7	0.7						2.5	0.4
Delay (s)		34.6		10.4	8.1						11.9	1.7
Level of Service		C		B	A						B	A
Approach Delay (s)		34.6			9.2			0.0			10.1	
Approach LOS		C			A			A			B	

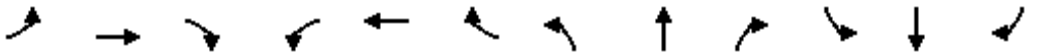
Intersection Summary			
HCM 2000 Control Delay	13.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	84.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	NBT	NBR
Lane Group Flow (vph)	125	252	474	1143	467
v/c Ratio	0.65	0.37	0.94	0.80	0.55
Control Delay	24.6	11.2	56.3	17.8	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	24.6	11.2	56.3	17.8	2.6
Queue Length 50th (ft)	34	118	234	169	2
Queue Length 95th (ft)	m44	m158	#410	#322	m27
Internal Link Dist (ft)		688	289	661	
Turn Bay Length (ft)	250				250
Base Capacity (vph)	194	738	552	1427	854
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.64	0.34	0.86	0.80	0.55

Intersection Summary

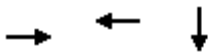
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	252	0	0	460	14	46	1097	467	0	0	0
Future Volume (vph)	125	252	0	0	460	14	46	1097	467	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0			4.0			4.0	4.0			
Lane Util. Factor	1.00	1.00			1.00			0.95	1.00			
Frpb, ped/bikes	1.00	1.00			1.00			1.00	0.95			
Flpb, ped/bikes	1.00	1.00			1.00			1.00	1.00			
Frt	1.00	1.00			1.00			1.00	0.85			
Flt Protected	0.95	1.00			1.00			1.00	1.00			
Satd. Flow (prot)	1509	1588			1581			3012	1289			
Flt Permitted	0.15	1.00			1.00			1.00	1.00			
Satd. Flow (perm)	246	1588			1581			3012	1289			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	125	252	0	0	460	14	46	1097	467	0	0	0
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	246	0	0	0
Lane Group Flow (vph)	125	252	0	0	473	0	0	1143	221	0	0	0
Confl. Peds. (#/hr)	4		5	5		4	5		4	4		5
Confl. Bikes (#/hr)									60			
Turn Type	pm+pt	NA			NA		Split	NA	Perm			
Protected Phases	7	4			8		2	2				
Permitted Phases	4								2			
Actuated Green, G (s)	37.3	37.3			27.5			40.7	40.7			
Effective Green, g (s)	36.3	37.3			27.5			40.7	40.7			
Actuated g/C Ratio	0.42	0.43			0.32			0.47	0.47			
Clearance Time (s)	3.0	4.0			4.0			4.0	4.0			
Vehicle Extension (s)	2.0	0.2			0.2			0.2	0.2			
Lane Grp Cap (vph)	189	688			505			1425	610			
v/s Ratio Prot	c0.04	0.16			c0.30			c0.38				
v/s Ratio Perm	0.23								0.17			
v/c Ratio	0.66	0.37			0.94			0.80	0.36			
Uniform Delay, d1	18.7	16.4			28.4			19.2	14.4			
Progression Factor	0.63	0.62			1.00			0.69	0.55			
Incremental Delay, d2	5.6	0.1			24.6			3.2	1.1			
Delay (s)	17.3	10.3			53.0			16.4	9.0			
Level of Service	B	B			D			B	A			
Approach Delay (s)		12.6			53.0			14.3			0.0	
Approach LOS		B			D			B			A	

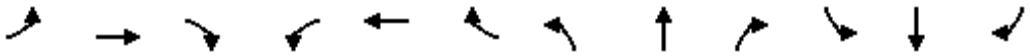
Intersection Summary			
HCM 2000 Control Delay	21.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	84.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	148	89	1168
v/c Ratio	0.37	0.27	0.52
Control Delay	26.9	29.7	2.2
Queue Delay	0.0	0.0	0.0
Total Delay	26.9	29.7	2.2
Queue Length 50th (ft)	58	40	21
Queue Length 95th (ft)	111	81	40
Internal Link Dist (ft)	137	79	634
Turn Bay Length (ft)			
Base Capacity (vph)	404	330	2243
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.37	0.27	0.52

Intersection Summary



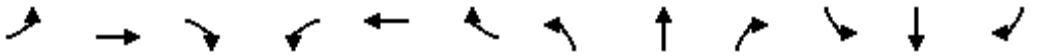
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	108	40	43	46	0	0	0	0	42	1103	23
Future Volume (vph)	0	108	40	43	46	0	0	0	0	42	1103	23
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						0.95	
Frpb, ped/bikes		0.98			1.00						1.00	
Flpb, ped/bikes		1.00			0.98						1.00	
Frt		0.96			1.00						1.00	
Flt Protected		1.00			0.98						1.00	
Satd. Flow (prot)		1672			1691						3325	
Flt Permitted		1.00			0.82						1.00	
Satd. Flow (perm)		1672			1424						3325	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	108	40	43	46	0	0	0	0	42	1103	23
RTOR Reduction (vph)	0	15	0	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	133	0	0	89	0	0	0	0	0	1166	0
Confl. Peds. (#/hr)	22		24	24		22	14		20	20		14
Confl. Bikes (#/hr)												60
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		20.0			20.0						58.0	
Effective Green, g (s)		20.0			20.0						58.0	
Actuated g/C Ratio		0.23			0.23						0.67	
Clearance Time (s)		4.0			4.0						4.0	
Lane Grp Cap (vph)		388			331						2242	
v/s Ratio Prot		c0.08										
v/s Ratio Perm					0.06						0.35	
v/c Ratio		0.34			0.27						0.52	
Uniform Delay, d1		27.5			27.0						7.0	
Progression Factor		1.00			1.00						0.21	
Incremental Delay, d2		2.4			2.0						0.7	
Delay (s)		29.9			29.0						2.2	
Level of Service		C			C						A	
Approach Delay (s)		29.9			29.0			0.0			2.2	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	6.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	67.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBT	WBR	NBT
Lane Group Flow (vph)	230	16	22	1561
v/c Ratio	0.60	0.03	0.05	0.77
Control Delay	33.5	21.5	9.5	7.4
Queue Delay	0.0	0.0	0.0	0.4
Total Delay	33.5	21.5	9.5	7.8
Queue Length 50th (ft)	106	6	0	151
Queue Length 95th (ft)	183	21	17	238
Internal Link Dist (ft)	175	153		287
Turn Bay Length (ft)				
Base Capacity (vph)	381	533	468	2017
Starvation Cap Reductn	0	0	0	115
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.60	0.03	0.05	0.82

Intersection Summary



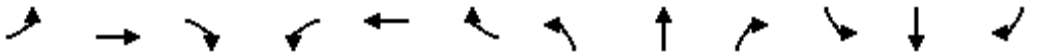
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	220	10	0	0	16	22	56	1489	16	0	0	0
Future Volume (vph)	220	10	0	0	16	22	56	1489	16	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0	4.0		4.0				
Lane Util. Factor		1.00			1.00	1.00		0.95				
Frpb, ped/bikes		1.00			1.00	1.00		1.00				
Flpb, ped/bikes		0.99			1.00	1.00		1.00				
Frt		1.00			1.00	0.85		1.00				
Flt Protected		0.95			1.00	1.00		1.00				
Satd. Flow (prot)		1663			1765	1500		3337				
Flt Permitted		0.72			1.00	1.00		1.00				
Satd. Flow (perm)		1261			1765	1500		3337				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	220	10	0	0	16	22	56	1489	16	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	15	0	1	0	0	0	0
Lane Group Flow (vph)	0	230	0	0	16	7	0	1560	0	0	0	0
Confl. Peds. (#/hr)	10		10				10					10
Confl. Bikes (#/hr)									60			
Turn Type	Perm	NA			NA	Perm	Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4					8	2					
Actuated Green, G (s)		26.0			26.0	26.0		52.0				
Effective Green, g (s)		26.0			26.0	26.0		52.0				
Actuated g/C Ratio		0.30			0.30	0.30		0.60				
Clearance Time (s)		4.0			4.0	4.0		4.0				
Lane Grp Cap (vph)		381			533	453		2017				
v/s Ratio Prot					0.01							
v/s Ratio Perm		c0.18				0.00		0.47				
v/c Ratio		0.60			0.03	0.01		0.77				
Uniform Delay, d1		25.6			21.1	21.0		12.6				
Progression Factor		1.00			1.00	1.00		0.39				
Incremental Delay, d2		6.9			0.1	0.1		2.3				
Delay (s)		32.5			21.2	21.1		7.2				
Level of Service		C			C	C		A				
Approach Delay (s)		32.5			21.1			7.2			0.0	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	10.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	83.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	497	25	86	215
v/c Ratio	0.32	0.06	0.11	0.29
Control Delay	5.8	15.0	15.3	16.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	5.8	15.0	15.3	16.9
Queue Length 50th (ft)	29	8	27	72
Queue Length 95th (ft)	40	22	55	122
Internal Link Dist (ft)	479		105	1243
Turn Bay Length (ft)				
Base Capacity (vph)	1574	421	759	753
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.32	0.06	0.11	0.29

Intersection Summary



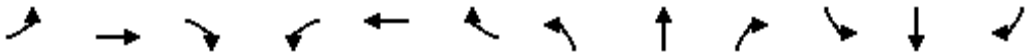
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	95	387	15	25	86	0	0	204	11
Future Volume (vph)	0	0	0	95	387	15	25	86	0	0	204	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.0		4.0	4.0			4.0	
Lane Util. Factor					0.95		1.00	1.00			1.00	
Frpb, ped/bikes					1.00		1.00	1.00			1.00	
Flpb, ped/bikes					1.00		0.96	1.00			1.00	
Frt					1.00		1.00	1.00			0.99	
Flt Protected					0.99		0.95	1.00			1.00	
Satd. Flow (prot)					3297		1608	1765			1746	
Flt Permitted					0.99		0.58	1.00			1.00	
Satd. Flow (perm)					3297		980	1765			1746	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	95	387	15	25	86	0	0	204	11
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	0	0	0	494	0	25	86	0	0	213	0
Confl. Peds. (#/hr)	15		46	46		15	35		34	34		35
Confl. Bikes (#/hr)						60						
Turn Type				Split	NA		Perm	NA			NA	
Protected Phases				8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)					41.0		37.0	37.0			37.0	
Effective Green, g (s)					41.0		37.0	37.0			37.0	
Actuated g/C Ratio					0.48		0.43	0.43			0.43	
Clearance Time (s)					4.0		4.0	4.0			4.0	
Lane Grp Cap (vph)					1571		421	759			751	
v/s Ratio Prot					c0.15			0.05			c0.12	
v/s Ratio Perm							0.03					
v/c Ratio					0.31		0.06	0.11			0.28	
Uniform Delay, d1					13.9		14.3	14.7			15.9	
Progression Factor					0.38		1.00	1.00			1.00	
Incremental Delay, d2					0.5		0.3	0.3			0.9	
Delay (s)					5.8		14.6	15.0			16.8	
Level of Service					A		B	B			B	
Approach Delay (s)		0.0			5.8			14.9			16.8	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	46.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBT	NBT	SBT
Lane Group Flow (vph)	451	62	42
v/c Ratio	0.23	0.12	0.08
Control Delay	1.7	21.9	19.8
Queue Delay	0.2	0.0	0.0
Total Delay	1.9	21.9	19.8
Queue Length 50th (ft)	7	24	14
Queue Length 95th (ft)	11	52	37
Internal Link Dist (ft)	199	104	1901
Turn Bay Length (ft)			
Base Capacity (vph)	1945	512	547
Starvation Cap Reductn	787	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.39	0.12	0.08

Intersection Summary



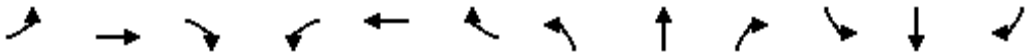
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	62	359	30	19	43	0	0	38	4
Future Volume (vph)	0	0	0	62	359	30	19	43	0	0	38	4
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.0			4.0			4.0	
Lane Util. Factor					0.95			1.00			1.00	
Frpb, ped/bikes					0.99			1.00			1.00	
Flpb, ped/bikes					1.00			0.99			1.00	
Frt					0.99			1.00			0.99	
Flt Protected					0.99			0.98			1.00	
Satd. Flow (prot)					3271			1723			1735	
Flt Permitted					0.99			0.93			1.00	
Satd. Flow (perm)					3271			1634			1735	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	62	359	30	19	43	0	0	38	4
RTOR Reduction (vph)	0	0	0	0	6	0	0	0	0	0	3	0
Lane Group Flow (vph)	0	0	0	0	445	0	0	62	0	0	39	0
Confl. Peds. (#/hr)	26		30	30		26	18		66	66		18
Confl. Bikes (#/hr)						60						
Turn Type				Split	NA		Perm	NA			NA	
Protected Phases				8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)					51.0			27.0			27.0	
Effective Green, g (s)					51.0			27.0			27.0	
Actuated g/C Ratio					0.59			0.31			0.31	
Clearance Time (s)					4.0			4.0			4.0	
Lane Grp Cap (vph)					1939			513			544	
v/s Ratio Prot					c0.14						0.02	
v/s Ratio Perm								c0.04				
v/c Ratio					0.23			0.12			0.07	
Uniform Delay, d1					8.2			21.0			20.7	
Progression Factor					0.17			1.00			1.00	
Incremental Delay, d2					0.3			0.5			0.3	
Delay (s)					1.7			21.5			21.0	
Level of Service					A			C			C	
Approach Delay (s)		0.0			1.7			21.5			21.0	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	5.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.19		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	36.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBT	NBT	SBT
Lane Group Flow (vph)	496	46	40
v/c Ratio	0.24	0.10	0.08
Control Delay	1.9	23.1	18.1
Queue Delay	0.3	0.0	0.0
Total Delay	2.3	23.1	18.1
Queue Length 50th (ft)	21	18	11
Queue Length 95th (ft)	26	43	34
Internal Link Dist (ft)	202	103	244
Turn Bay Length (ft)			
Base Capacity (vph)	2036	465	497
Starvation Cap Reductn	951	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.46	0.10	0.08

Intersection Summary



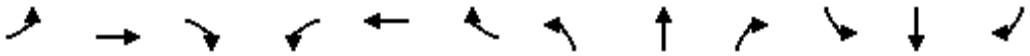
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	36	433	27	19	27	0	0	29	11
Future Volume (vph)	0	0	0	36	433	27	19	27	0	0	29	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.0			4.0			4.0	
Lane Util. Factor					0.95			1.00			1.00	
Frpb, ped/bikes					0.99			1.00			0.99	
Flpb, ped/bikes					1.00			0.99			1.00	
Frt					0.99			1.00			0.96	
Flt Protected					1.00			0.98			1.00	
Satd. Flow (prot)					3297			1717			1686	
Flt Permitted					1.00			0.91			1.00	
Satd. Flow (perm)					3297			1601			1686	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	36	433	27	19	27	0	0	29	11
RTOR Reduction (vph)	0	0	0	0	5	0	0	0	0	0	8	0
Lane Group Flow (vph)	0	0	0	0	491	0	0	46	0	0	32	0
Confl. Peds. (#/hr)	17		15	15		17	10		19	19		10
Confl. Bikes (#/hr)						60						
Turn Type				Split	NA		Perm	NA			NA	
Protected Phases				8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)					53.0			25.0			25.0	
Effective Green, g (s)					53.0			25.0			25.0	
Actuated g/C Ratio					0.62			0.29			0.29	
Clearance Time (s)					4.0			4.0			4.0	
Lane Grp Cap (vph)					2031			465			490	
v/s Ratio Prot					c0.15						0.02	
v/s Ratio Perm								c0.03				
v/c Ratio					0.24			0.10			0.07	
Uniform Delay, d1					7.4			22.3			22.1	
Progression Factor					0.23			1.00			1.00	
Incremental Delay, d2					0.3			0.4			0.3	
Delay (s)					2.0			22.7			22.3	
Level of Service					A			C			C	
Approach Delay (s)		0.0			2.0			22.7			22.3	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	5.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.20		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	37.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBT	NBT	SBT
Lane Group Flow (vph)	510	57	66
v/c Ratio	0.26	0.11	0.12
Control Delay	3.0	21.0	16.5
Queue Delay	0.0	0.0	0.0
Total Delay	3.0	21.0	16.5
Queue Length 50th (ft)	20	21	18
Queue Length 95th (ft)	25	48	46
Internal Link Dist (ft)	315	175	240
Turn Bay Length (ft)			
Base Capacity (vph)	1934	541	559
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.26	0.11	0.12

Intersection Summary



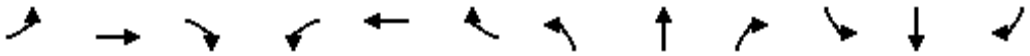
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	28	470	12	14	43	0	0	48	18
Future Volume (vph)	0	0	0	28	470	12	14	43	0	0	48	18
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.0			4.0			4.0	
Lane Util. Factor					0.95			1.00			1.00	
Frpb, ped/bikes					1.00			1.00			0.99	
Flpb, ped/bikes					1.00			0.99			1.00	
Frt					1.00			1.00			0.96	
Flt Protected					1.00			0.99			1.00	
Satd. Flow (prot)					3326			1733			1682	
Flt Permitted					1.00			0.95			1.00	
Satd. Flow (perm)					3326			1664			1682	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	28	470	12	14	43	0	0	48	18
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	12	0
Lane Group Flow (vph)	0	0	0	0	508	0	0	57	0	0	54	0
Confl. Peds. (#/hr)	10		24	24		10	15		12	12		15
Confl. Bikes (#/hr)						60						
Turn Type				Split	NA		Perm	NA			NA	
Protected Phases				8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)					50.0			28.0			28.0	
Effective Green, g (s)					50.0			28.0			28.0	
Actuated g/C Ratio					0.58			0.33			0.33	
Clearance Time (s)					4.0			4.0			4.0	
Lane Grp Cap (vph)					1933			541			547	
v/s Ratio Prot					c0.15						0.03	
v/s Ratio Perm								c0.03				
v/c Ratio					0.26			0.11			0.10	
Uniform Delay, d1					8.9			20.3			20.2	
Progression Factor					0.30			1.00			1.00	
Incremental Delay, d2					0.3			0.4			0.4	
Delay (s)					3.0			20.6			20.6	
Level of Service					A			C			C	
Approach Delay (s)		0.0			3.0			20.6			20.6	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	6.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.21		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	37.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBT	NBT	SBT
Lane Group Flow (vph)	630	64	80
v/c Ratio	0.32	0.13	0.15
Control Delay	3.6	22.1	17.2
Queue Delay	0.3	0.0	0.0
Total Delay	3.9	22.1	17.2
Queue Length 50th (ft)	26	25	23
Queue Length 95th (ft)	37	54	55
Internal Link Dist (ft)	188	104	107
Turn Bay Length (ft)			
Base Capacity (vph)	1949	492	542
Starvation Cap Reductn	656	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.49	0.13	0.15

Intersection Summary



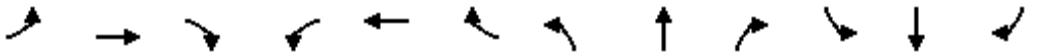
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	37	547	46	25	39	0	0	59	21
Future Volume (vph)	0	0	0	37	547	46	25	39	0	0	59	21
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.0			4.0			4.0	
Lane Util. Factor					0.95			1.00			1.00	
Frpb, ped/bikes					0.99			1.00			0.99	
Flpb, ped/bikes					1.00			0.99			1.00	
Frt					0.99			1.00			0.96	
Flt Protected					1.00			0.98			1.00	
Satd. Flow (prot)					3277			1710			1681	
Flt Permitted					1.00			0.90			1.00	
Satd. Flow (perm)					3277			1570			1681	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	37	547	46	25	39	0	0	59	21
RTOR Reduction (vph)	0	0	0	0	7	0	0	0	0	0	14	0
Lane Group Flow (vph)	0	0	0	0	623	0	0	64	0	0	66	0
Confl. Peds. (#/hr)	36		25	25		36	26		32	32		26
Confl. Bikes (#/hr)						60						
Turn Type				Split	NA		Perm	NA			NA	
Protected Phases				8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)					51.0			27.0			27.0	
Effective Green, g (s)					51.0			27.0			27.0	
Actuated g/C Ratio					0.59			0.31			0.31	
Clearance Time (s)					4.0			4.0			4.0	
Lane Grp Cap (vph)					1943			492			527	
v/s Ratio Prot					c0.19						0.04	
v/s Ratio Perm								c0.04				
v/c Ratio					0.32			0.13			0.12	
Uniform Delay, d1					8.8			21.1			21.1	
Progression Factor					0.37			1.00			1.00	
Incremental Delay, d2					0.4			0.5			0.5	
Delay (s)					3.7			21.6			21.5	
Level of Service					A			C			C	
Approach Delay (s)		0.0			3.7			21.6			21.5	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	7.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.25		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	44.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBT	SBT	SBR
Lane Group Flow (vph)	575	1049	99
v/c Ratio	0.52	0.55	0.12
Control Delay	14.6	5.3	0.4
Queue Delay	0.0	0.1	0.0
Total Delay	14.6	5.4	0.4
Queue Length 50th (ft)	76	50	1
Queue Length 95th (ft)	106	63	1
Internal Link Dist (ft)	467	296	
Turn Bay Length (ft)			
Base Capacity (vph)	1115	1910	845
Starvation Cap Reductn	0	166	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.52	0.60	0.12

Intersection Summary



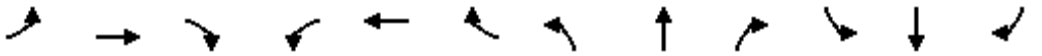
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	153	421	1	0	0	0	0	1049	99
Future Volume (vph)	0	0	0	153	421	1	0	0	0	0	1049	99
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.0						4.0	4.0
Lane Util. Factor					0.95						0.95	1.00
Frpb, ped/bikes					1.00						1.00	0.94
Flpb, ped/bikes					1.00						1.00	1.00
Frt					1.00						1.00	0.85
Flt Protected					0.99						1.00	1.00
Satd. Flow (prot)					3307						3353	1410
Flt Permitted					0.99						1.00	1.00
Satd. Flow (perm)					3307						3353	1410
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	153	421	1	0	0	0	0	1049	99
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	43
Lane Group Flow (vph)	0	0	0	0	575	0	0	0	0	0	1049	56
Confl. Peds. (#/hr)	12		16	16		12	17		16	16		17
Confl. Bikes (#/hr)						60						60
Turn Type				Split	NA						NA	Perm
Protected Phases				8	8						6	
Permitted Phases												6
Actuated Green, G (s)					29.0						49.0	49.0
Effective Green, g (s)					29.0						49.0	49.0
Actuated g/C Ratio					0.34						0.57	0.57
Clearance Time (s)					4.0						4.0	4.0
Lane Grp Cap (vph)					1115						1910	803
v/s Ratio Prot					c0.17						c0.31	
v/s Ratio Perm												0.04
v/c Ratio					0.52						0.55	0.07
Uniform Delay, d1					22.9						11.6	8.3
Progression Factor					0.57						0.36	0.06
Incremental Delay, d2					1.3						1.0	0.1
Delay (s)					14.4						5.2	0.7
Level of Service					B						A	A
Approach Delay (s)		0.0			14.4			0.0			4.8	
Approach LOS		A			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBT	NBT
Lane Group Flow (vph)	451	1563
v/c Ratio	0.62	0.68
Control Delay	31.3	6.1
Queue Delay	0.0	0.1
Total Delay	31.3	6.2
Queue Length 50th (ft)	104	112
Queue Length 95th (ft)	154	181
Internal Link Dist (ft)	230	290
Turn Bay Length (ft)		
Base Capacity (vph)	732	2283
Starvation Cap Reductn	0	9
Spillback Cap Reductn	0	85
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.62	0.71

Intersection Summary

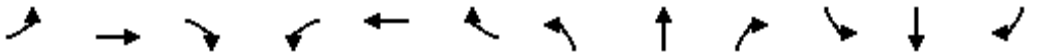


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	344	107	223	1340	0	0	0	0
Future Volume (vph)	0	0	0	0	344	107	223	1340	0	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.0			4.0				
Lane Util. Factor					0.95			0.95				
Frpb, ped/bikes					0.98			1.00				
Flpb, ped/bikes					1.00			1.00				
Frt					0.96			1.00				
Flt Protected					1.00			0.99				
Satd. Flow (prot)					3163			3329				
Flt Permitted					1.00			0.99				
Satd. Flow (perm)					3163			3329				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	0	344	107	223	1340	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	34	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	417	0	0	1563	0	0	0	0
Confl. Peds. (#/hr)	10		10	10		12	10		15	10		10
Confl. Bikes (#/hr)						60			60			
Turn Type					NA		Split	NA				
Protected Phases					8		2	2				
Permitted Phases												
Actuated Green, G (s)					19.0			59.0				
Effective Green, g (s)					19.0			59.0				
Actuated g/C Ratio					0.22			0.69				
Clearance Time (s)					4.0			4.0				
Lane Grp Cap (vph)					698			2283				
v/s Ratio Prot					c0.13			c0.47				
v/s Ratio Perm												
v/c Ratio					0.60			0.68				
Uniform Delay, d1					30.1			8.0				
Progression Factor					1.00			0.58				
Incremental Delay, d2					3.7			1.3				
Delay (s)					33.8			6.0				
Level of Service					C			A				
Approach Delay (s)		0.0			33.8			6.0			0.0	
Approach LOS		A			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	12.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	SBT
Lane Group Flow (vph)	643	1237
v/c Ratio	0.62	0.64
Control Delay	27.2	6.5
Queue Delay	0.0	0.0
Total Delay	27.2	6.5
Queue Length 50th (ft)	147	76
Queue Length 95th (ft)	205	83
Internal Link Dist (ft)	289	290
Turn Bay Length (ft)		
Base Capacity (vph)	1030	1932
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.62	0.64

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	534	109	0	0	0	0	0	0	122	1115	0
Future Volume (vph)	0	534	109	0	0	0	0	0	0	122	1115	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0									4.0	
Lane Util. Factor		0.95									0.95	
Frpb, ped/bikes		0.98									1.00	
Flpb, ped/bikes		1.00									0.98	
Frt		0.97									1.00	
Flt Protected		1.00									1.00	
Satd. Flow (prot)		3217									3259	
Flt Permitted		1.00									1.00	
Satd. Flow (perm)		3217									3259	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	534	109	0	0	0	0	0	0	122	1115	0
RTOR Reduction (vph)	0	20	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	623	0	0	0	0	0	0	0	0	1237	0
Confl. Peds. (#/hr)	33		38	38		33	38		109	109		38
Confl. Bikes (#/hr)												60
Turn Type		NA								Perm	NA	
Protected Phases		4									6	
Permitted Phases										6		
Actuated Green, G (s)		27.0									51.0	
Effective Green, g (s)		27.0									51.0	
Actuated g/C Ratio		0.31									0.59	
Clearance Time (s)		4.0									4.0	
Lane Grp Cap (vph)		1009									1932	
v/s Ratio Prot		c0.19										
v/s Ratio Perm											0.38	
v/c Ratio		0.62									0.64	
Uniform Delay, d1		25.1									11.5	
Progression Factor		1.00									0.43	
Incremental Delay, d2		2.8									1.4	
Delay (s)		27.9									6.4	
Level of Service		C									A	
Approach Delay (s)		27.9			0.0			0.0			6.4	
Approach LOS		C			A			A			A	

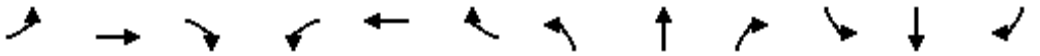
Intersection Summary			
HCM 2000 Control Delay	13.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	NBT	NBR
Lane Group Flow (vph)	145	305	1385	90
v/c Ratio	0.36	0.36	0.66	0.10
Control Delay	10.7	9.7	5.0	0.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	10.7	9.7	5.0	0.4
Queue Length 50th (ft)	19	21	80	0
Queue Length 95th (ft)	m35	31	76	m0
Internal Link Dist (ft)		417	764	
Turn Bay Length (ft)				100
Base Capacity (vph)	408	852	2105	880
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.36	0.36	0.66	0.10

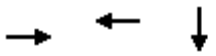
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



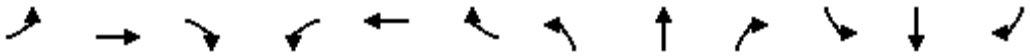
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	194	256	0	0	0	0	0	1385	90	0	0	0
Future Volume (vph)	194	256	0	0	0	0	0	1385	90	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0						5.0	5.0			
Lane Util. Factor	0.91	0.91						0.95	1.00			
Frpb, ped/bikes	1.00	1.00						1.00	0.91			
Flpb, ped/bikes	1.00	1.00						1.00	1.00			
Frt	1.00	1.00						1.00	0.85			
Flt Protected	0.95	0.99						1.00	1.00			
Satd. Flow (prot)	1526	3186						3353	1362			
Flt Permitted	0.95	0.99						1.00	1.00			
Satd. Flow (perm)	1526	3186						3353	1362			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	194	256	0	0	0	0	0	1385	90	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	26	0	0	0
Lane Group Flow (vph)	145	305	0	0	0	0	0	1385	64	0	0	0
Confl. Peds. (#/hr)	10		11	10		25	10		36	10		10
Confl. Bikes (#/hr)									60			
Turn Type	Split	NA						NA	Perm			
Protected Phases	4	4						2				
Permitted Phases									2			
Actuated Green, G (s)	23.0	23.0						54.0	54.0			
Effective Green, g (s)	23.0	23.0						54.0	54.0			
Actuated g/C Ratio	0.27	0.27						0.63	0.63			
Clearance Time (s)	4.0	4.0						5.0	5.0			
Lane Grp Cap (vph)	408	852						2105	855			
v/s Ratio Prot	0.10	c0.10						c0.41				
v/s Ratio Perm									0.05			
v/c Ratio	0.36	0.36						0.66	0.08			
Uniform Delay, d1	25.5	25.5						10.1	6.2			
Progression Factor	0.34	0.34						0.35	0.10			
Incremental Delay, d2	1.9	0.9						1.4	0.1			
Delay (s)	10.5	9.6						4.9	0.8			
Level of Service	B	A						A	A			
Approach Delay (s)		9.9			0.0			4.7			0.0	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	5.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	114.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



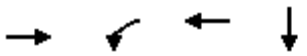
Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	42	37	1228
v/c Ratio	0.14	0.14	0.51
Control Delay	20.9	30.9	1.8
Queue Delay	0.0	0.0	0.1
Total Delay	20.9	30.9	1.9
Queue Length 50th (ft)	11	17	29
Queue Length 95th (ft)	38	44	32
Internal Link Dist (ft)	69	99	279
Turn Bay Length (ft)			
Base Capacity (vph)	310	264	2389
Starvation Cap Reductn	0	0	223
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.14	0.14	0.57

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	24	18	23	14	0	0	0	0	46	1150	32
Future Volume (vph)	0	24	18	23	14	0	0	0	0	46	1150	32
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						0.95	
Frpb, ped/bikes		0.96			1.00						0.99	
Flpb, ped/bikes		1.00			0.95						1.00	
Frt		0.94			1.00						1.00	
Flt Protected		1.00			0.97						1.00	
Satd. Flow (prot)		1592			1623						3312	
Flt Permitted		1.00			0.85						1.00	
Satd. Flow (perm)		1592			1424						3312	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	24	18	23	14	0	0	0	0	46	1150	32
RTOR Reduction (vph)	0	15	0	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	27	0	0	37	0	0	0	0	0	1226	0
Confl. Peds. (#/hr)	80		41	41		80	59		101	101		59
Confl. Bikes (#/hr)												60
Turn Type		NA		Perm	NA					Split	NA	
Protected Phases		4			8					6	6	
Permitted Phases				8								
Actuated Green, G (s)		16.0			16.0						62.0	
Effective Green, g (s)		16.0			16.0						62.0	
Actuated g/C Ratio		0.19			0.19						0.72	
Clearance Time (s)		4.0			4.0						4.0	
Lane Grp Cap (vph)		296			264						2387	
v/s Ratio Prot		0.02									c0.37	
v/s Ratio Perm					c0.03							
v/c Ratio		0.09			0.14						0.51	
Uniform Delay, d1		29.0			29.3						5.3	
Progression Factor		1.00			1.00						0.22	
Incremental Delay, d2		0.6			1.1						0.6	
Delay (s)		29.6			30.4						1.8	
Level of Service		C			C						A	
Approach Delay (s)		29.6			30.4			0.0			1.8	
Approach LOS		C			C			A			A	

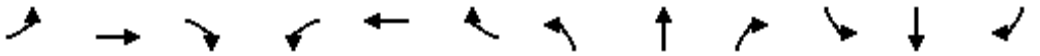
Intersection Summary			
HCM 2000 Control Delay	3.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBL	WBT	SBT
Lane Group Flow (vph)	373	69	289	1185
v/c Ratio	0.58	0.29	0.44	0.67
Control Delay	24.5	17.9	17.9	7.3
Queue Delay	0.0	0.0	0.0	0.1
Total Delay	24.5	17.9	17.9	7.4
Queue Length 50th (ft)	148	20	87	56
Queue Length 95th (ft)	238	m37	129	80
Internal Link Dist (ft)	174		323	277
Turn Bay Length (ft)				
Base Capacity (vph)	643	240	656	1758
Starvation Cap Reductn	0	0	0	47
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.58	0.29	0.44	0.69

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	275	98	69	289	0	0	0	0	155	952	78
Future Volume (vph)	0	275	98	69	289	0	0	0	0	155	952	78
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0		4.0	4.0						4.0	
Lane Util. Factor		1.00		1.00	1.00						0.95	
Frpb, ped/bikes		0.99		1.00	1.00						0.99	
Flpb, ped/bikes		1.00		0.99	1.00						1.00	
Frt		0.96		1.00	1.00						0.99	
Flt Protected		1.00		0.95	1.00						0.99	
Satd. Flow (prot)		1689		1665	1765						3275	
Flt Permitted		1.00		0.37	1.00						0.99	
Satd. Flow (perm)		1689		647	1765						3275	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	275	98	69	289	0	0	0	0	155	952	78
RTOR Reduction (vph)	0	15	0	0	0	0	0	0	0	0	6	0
Lane Group Flow (vph)	0	358	0	69	289	0	0	0	0	0	1179	0
Confl. Peds. (#/hr)	10		10	10		27	10		10	10		21
Confl. Bikes (#/hr)												60
Turn Type		NA		Perm	NA					Split	NA	
Protected Phases		4			8					6	6	
Permitted Phases				8								
Actuated Green, G (s)		32.0		32.0	32.0						46.0	
Effective Green, g (s)		32.0		32.0	32.0						46.0	
Actuated g/C Ratio		0.37		0.37	0.37						0.53	
Clearance Time (s)		4.0		4.0	4.0						4.0	
Lane Grp Cap (vph)		628		240	656						1751	
v/s Ratio Prot		c0.21			0.16						c0.36	
v/s Ratio Perm				0.11								
v/c Ratio		0.57		0.29	0.44						0.67	
Uniform Delay, d1		21.5		19.0	20.3						14.5	
Progression Factor		1.00		0.76	0.77						0.37	
Incremental Delay, d2		3.7		2.6	1.9						1.8	
Delay (s)		25.2		17.0	17.5						7.3	
Level of Service		C		B	B						A	
Approach Delay (s)		25.2			17.4			0.0			7.3	
Approach LOS		C			B			A			A	

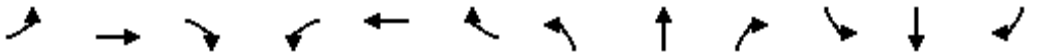
Intersection Summary			
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	77.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Group Flow (vph)	135	234	161	122	1285	75
v/c Ratio	0.72	0.45	0.66	0.40	0.63	0.09
Control Delay	43.3	18.6	47.8	10.5	8.5	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.3	18.6	47.8	10.5	8.5	1.1
Queue Length 50th (ft)	49	63	83	0	78	1
Queue Length 95th (ft)	m99	m102	141	45	278	m4
Internal Link Dist (ft)		323	183		528	
Turn Bay Length (ft)						100
Base Capacity (vph)	253	656	307	355	2030	882
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.36	0.52	0.34	0.63	0.09

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	135	234	0	0	161	122	153	1132	75	0	0	0
Future Volume (vph)	135	234	0	0	161	122	153	1132	75	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Lane Util. Factor	1.00	1.00			1.00	1.00		0.95	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	0.97		1.00	0.94			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.99	1.00			
Satd. Flow (prot)	1676	1765			1765	1460		3333	1415			
Flt Permitted	0.95	1.00			1.00	1.00		0.99	1.00			
Satd. Flow (perm)	1676	1765			1765	1460		3333	1415			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	135	234	0	0	161	122	153	1132	75	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	105	0	0	25	0	0	0
Lane Group Flow (vph)	135	234	0	0	161	17	0	1285	50	0	0	0
Confl. Peds. (#/hr)	8					8	5					5
Confl. Bikes (#/hr)									60			
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	7	4			8		2	2				
Permitted Phases						8			2			
Actuated Green, G (s)	10.7	25.6			11.9	11.9		52.4	52.4			
Effective Green, g (s)	9.7	25.6			11.9	11.9		52.4	52.4			
Actuated g/C Ratio	0.11	0.30			0.14	0.14		0.61	0.61			
Clearance Time (s)	3.0	4.0			4.0	4.0		4.0	4.0			
Vehicle Extension (s)	2.0	2.5			2.5	2.5		0.2	0.2			
Lane Grp Cap (vph)	189	525			244	202		2030	862			
v/s Ratio Prot	c0.08	0.13			c0.09			c0.39				
v/s Ratio Perm						0.01			0.04			
v/c Ratio	0.71	0.45			0.66	0.08		0.63	0.06			
Uniform Delay, d1	36.8	24.5			35.1	32.3		10.7	6.8			
Progression Factor	0.72	0.70			1.00	1.00		0.60	0.29			
Incremental Delay, d2	8.1	0.3			5.7	0.1		1.3	0.1			
Delay (s)	34.8	17.6			40.8	32.4		7.7	2.1			
Level of Service	C	B			D	C		A	A			
Approach Delay (s)		23.9			37.2			7.4			0.0	
Approach LOS		C			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	77.1%	ICU Level of Service	D
Analysis Period (min)	15		

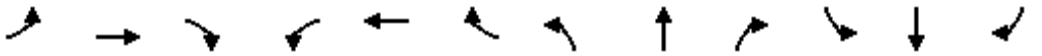
c Critical Lane Group



Lane Group	EBT	WBT	NBT	NBR
Lane Group Flow (vph)	51	98	1327	63
v/c Ratio	0.19	0.28	0.56	0.06
Control Delay	31.0	29.4	7.4	1.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	31.0	29.4	7.4	1.3
Queue Length 50th (ft)	23	42	158	0
Queue Length 95th (ft)	55	85	206	m10
Internal Link Dist (ft)	93	517	2424	
Turn Bay Length (ft)				100
Base Capacity (vph)	268	347	2376	1082
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.19	0.28	0.56	0.06

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



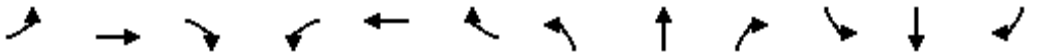
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	14	0	0	85	13	21	1306	63	0	0	0
Future Volume (vph)	37	14	0	0	85	13	21	1306	63	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0			4.0	4.0			
Lane Util. Factor		1.00			1.00			0.95	1.00			
Frpb, ped/bikes		1.00			0.99			1.00	1.00			
Flpb, ped/bikes		0.98			1.00			1.00	1.00			
Frt		1.00			0.98			1.00	0.85			
Flt Protected		0.96			1.00			1.00	1.00			
Satd. Flow (prot)		1673			1724			3350	1500			
Flt Permitted		0.78			1.00			1.00	1.00			
Satd. Flow (perm)		1358			1724			3350	1500			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	37	14	0	0	85	13	21	1306	63	0	0	0
RTOR Reduction (vph)	0	0	0	0	6	0	0	0	18	0	0	0
Lane Group Flow (vph)	0	51	0	0	92	0	0	1327	45	0	0	0
Confl. Peds. (#/hr)	15		12	12		15	10		19	19		10
Confl. Bikes (#/hr)									60			
Turn Type	custom	NA			NA		Split	NA	Prot			
Protected Phases					8		2	2	2			
Permitted Phases	4	4										
Actuated Green, G (s)		17.0			17.0			61.0	61.0			
Effective Green, g (s)		17.0			17.0			61.0	61.0			
Actuated g/C Ratio		0.20			0.20			0.71	0.71			
Clearance Time (s)		4.0			4.0			4.0	4.0			
Lane Grp Cap (vph)		268			340			2376	1063			
v/s Ratio Prot					c0.05			c0.40	0.03			
v/s Ratio Perm		0.04										
v/c Ratio		0.19			0.27			0.56	0.04			
Uniform Delay, d1		28.8			29.2			6.0	3.7			
Progression Factor		1.00			1.00			1.04	1.09			
Incremental Delay, d2		1.6			1.9			1.0	0.1			
Delay (s)		30.3			31.2			7.2	4.2			
Level of Service		C			C			A	A			
Approach Delay (s)		30.3			31.2			7.1			0.0	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	60.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	106	203	173	208	424	65	847	362	875
v/c Ratio	0.69	0.44	0.84	0.76	0.69	0.17	0.61	0.55	0.66
Control Delay	81.8	34.5	88.4	69.9	20.6	47.1	33.4	50.4	34.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.8	34.5	88.4	69.9	20.6	47.1	33.4	50.4	34.9
Queue Length 50th (ft)	87	49	144	169	151	45	288	138	301
Queue Length 95th (ft)	167	96	244	270	231	101	455	219	459
Internal Link Dist (ft)		595		272			1059		378
Turn Bay Length (ft)	175		300			135			
Base Capacity (vph)	227	693	334	465	828	374	1399	805	1821
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.29	0.52	0.45	0.51	0.17	0.61	0.45	0.48

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	106	122	81	173	208	424	65	771	76	362	813	62
Future Volume (vph)	106	122	81	173	208	424	65	771	76	362	813	62
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95		0.97	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1676	3152		1676	1765	1500	1676	3295		3252	3300	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1676	3152		1676	1765	1500	1676	3295		3252	3300	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	106	122	81	173	208	424	65	771	76	362	813	62
RTOR Reduction (vph)	0	71	0	0	0	81	0	5	0	0	4	0
Lane Group Flow (vph)	106	132	0	173	208	343	65	842	0	362	871	0
Confl. Bikes (#/hr)									60			60
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8	1 8	5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	11.7	15.9		16.7	19.9	45.6	28.5	53.9		25.7	51.1	
Effective Green, g (s)	11.7	15.9		15.7	19.9	45.6	28.5	53.9		25.7	51.1	
Actuated g/C Ratio	0.09	0.12		0.12	0.16	0.36	0.22	0.42		0.20	0.40	
Clearance Time (s)	4.0	4.0		3.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	1.5	1.5		1.0	1.5		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	154	394		206	276	537	375	1396		657	1325	
v/s Ratio Prot	0.06	0.04		c0.10	c0.12	0.23	0.04	c0.26		0.11	c0.26	
v/s Ratio Perm												
v/c Ratio	0.69	0.34		0.84	0.75	0.64	0.17	0.60		0.55	0.66	
Uniform Delay, d1	56.0	50.8		54.5	51.3	33.9	39.8	28.4		45.6	30.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.8	0.2		23.9	9.9	2.5	1.0	1.9		1.0	1.2	
Delay (s)	65.7	51.0		78.4	61.2	36.4	40.8	30.3		46.6	32.1	
Level of Service	E	D		E	E	D	D	C		D	C	
Approach Delay (s)		56.1			51.8			31.1			36.3	
Approach LOS		E			D			C			D	

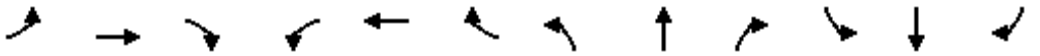
Intersection Summary			
HCM 2000 Control Delay	40.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	127.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	229	602	77	445	412	677	50	156	1008
v/c Ratio	0.94	0.61	0.65	0.67	0.95	0.50	0.06	0.81	0.79
Control Delay	94.7	33.5	77.9	48.0	84.6	29.8	3.2	80.4	38.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	94.7	33.5	77.9	48.0	84.6	29.8	3.2	80.4	38.2
Queue Length 50th (ft)	177	180	59	164	165	204	0	119	353
Queue Length 95th (ft)	#328	234	108	207	#264	301	17	189	#518
Internal Link Dist (ft)		1448		174		1573			1059
Turn Bay Length (ft)	250		250		275		300	150	
Base Capacity (vph)	251	1026	167	831	433	1364	839	251	1270
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.59	0.46	0.54	0.95	0.50	0.06	0.62	0.79

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	229	378	224	77	387	58	412	677	50	156	821	187
Future Volume (vph)	229	378	224	77	387	58	412	677	50	156	821	187
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.94		1.00	0.98		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	3166		1676	3287		3252	3353	1500	1676	3231	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1676	3166		1676	3287		3252	3353	1500	1676	3231	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	229	378	224	77	387	58	412	677	50	156	821	187
RTOR Reduction (vph)	0	73	0	0	10	0	0	0	25	0	15	0
Lane Group Flow (vph)	229	529	0	77	435	0	412	677	25	156	993	0
Confl. Bikes (#/hr)									60			60
Turn Type	Prot	NA		Prot	NA		Prot	NA	pt+ov	Prot	NA	
Protected Phases	7	4		3	8		5	2	2 3	1	6	
Permitted Phases												
Actuated Green, G (s)	18.5	34.4		8.5	24.4		17.0	48.2	60.7	14.9	46.1	
Effective Green, g (s)	17.5	34.4		7.5	24.4		16.0	48.2	60.7	13.9	46.1	
Actuated g/C Ratio	0.15	0.29		0.06	0.20		0.13	0.40	0.51	0.12	0.38	
Clearance Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.5	3.0		2.0	4.0		2.0	3.5		2.0	3.5	
Lane Grp Cap (vph)	244	907		104	668		433	1346	758	194	1241	
v/s Ratio Prot	c0.14	0.17		0.05	c0.13		c0.13	0.20	0.02	0.09	c0.31	
v/s Ratio Perm												
v/c Ratio	0.94	0.58		0.74	0.65		0.95	0.50	0.03	0.80	0.80	
Uniform Delay, d1	50.7	36.7		55.3	43.9		51.6	26.9	14.9	51.7	32.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	40.6	1.0		21.7	2.5		30.8	1.3	0.0	19.9	5.5	
Delay (s)	91.3	37.6		76.9	46.4		82.4	28.3	14.9	71.6	38.3	
Level of Service	F	D		E	D		F	C	B	E	D	
Approach Delay (s)		52.4			50.9			47.3			42.8	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	47.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	82.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Arterial Level of Service: SB Central Avenue

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Central Avenue	III	30	22.0	0.0	22.0	0.16	26.8	B
Jackson Street	III	30	45.4	13.2	58.6	0.36	21.9	C
E 4th Street	III	30	22.6	12.1	34.7	0.18	18.4	C
6th Street	III	30	18.1	2.2	20.3	0.14	24.0	C
Main Street	III	30	11.0	5.3	16.3	0.07	15.7	D
8th Street	III	30	10.9	6.5	17.4	0.07	14.5	D
9th Street	III	30	10.5	1.8	12.3	0.07	19.9	C
10th	III	30	10.5	7.3	17.8	0.07	13.7	E
Total	III		151.0	48.4	199.4	1.11	20.1	C

Arterial Level of Service: SB Court Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Ohio Street	III	30	21.9	8.3	30.2	0.16	19.4	C
E McAndrews Road	III	30	16.0	36.1	52.1	0.11	7.9	F
Central Avenue	III	30	50.4	11.6	62.0	0.40	23.0	C
Total	III		88.3	56.0	144.3	0.67	16.8	D

Arterial Level of Service: WB Main Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Riverside Avenue	IV	30	20.4	31.3	51.7	0.11	7.9	E
Central Avenue	IV	30	18.6	14.6	33.2	0.10	11.2	D
Front Street	IV	30	11.5	3.6	15.1	0.05	12.1	D
Fir Street	IV	30	17.0	3.0	20.0	0.07	13.5	C
Grape Street	IV	30	12.1	1.9	14.0	0.05	13.7	C
Holly Street	IV	30	12.0	1.7	13.7	0.05	13.9	C
Oakdale Avenue	IV	30	19.1	5.8	24.9	0.11	15.3	C
Total	IV		110.7	61.9	172.6	0.55	11.6	D

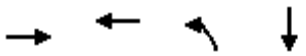
Arterial Level of Service: NB Riverside Avenue

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Barnett Road	III	30	27.4	33.4	60.8	0.22	12.8	E
12th Street	III	30	67.3	7.4	74.7	0.56	27.0	B
10th Street	III	30	16.2	8.5	24.7	0.12	16.8	D
8th Street	III	30	21.4	5.0	26.4	0.16	21.8	C
Main Street	III	30	10.9	6.1	17.0	0.07	14.8	D
	III	30	10.8	7.4	18.2	0.07	13.7	E
4th Street	III	30	18.8	17.8	36.6	0.14	13.8	E
Jackson Street	III	30	10.5	8.2	18.7	0.07	13.0	E
Manzanita Street	III	30	63.4	3.9	67.3	0.50	26.7	B
McAndrews Road	III	30	30.6	40.5	71.1	0.24	12.2	E
Mall Access	III	30	17.6	8.9	26.5	0.12	17.0	D
Total	III		294.9	147.1	442.0	2.26	18.4	C

Arterial Level of Service: SB Riverside Avenue

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Barnett Road	III	30	67.3	34.9	102.2	0.56	19.8	C
Stewart Avenue	III	30	27.4	38.2	65.6	0.22	11.8	E
Total	III		94.7	73.1	167.8	0.78	16.7	D

2024 Alternative B
Protected Phasing

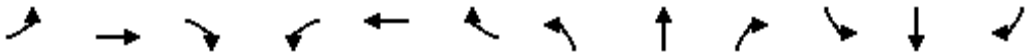


Lane Group	EBT	WBT	NBL	SBT
Lane Group Flow (vph)	276	220	1	1131
v/c Ratio	0.80	1.27	0.01	0.35
Control Delay	53.5	189.8	45.0	8.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	53.5	189.8	45.0	8.7
Queue Length 50th (ft)	168	~163	1	89
Queue Length 95th (ft)	234	#285	6	205
Internal Link Dist (ft)	1754	380		781
Turn Bay Length (ft)				
Base Capacity (vph)	591	296	100	3202
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.47	0.74	0.01	0.35

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	110	166	83	137	0	1	0	0	65	985	81
Future Volume (vph)	0	110	166	83	137	0	1	0	0	65	985	81
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0		6.0				4.0	
Lane Util. Factor		1.00			1.00		1.00				0.91	
Frpb, ped/bikes		0.99			1.00		1.00				0.99	
Flpb, ped/bikes		1.00			1.00		1.00				1.00	
Frt		0.92			1.00		1.00				0.99	
Flt Protected		1.00			0.98		0.95				1.00	
Satd. Flow (prot)		1598			1728		1676				4719	
Flt Permitted		1.00			0.46		0.95				1.00	
Satd. Flow (perm)		1598			801		1676				4719	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	110	166	83	137	0	1	0	0	65	985	81
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	276	0	0	220	0	1	0	0	0	1131	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)												60
Turn Type		NA		Perm	NA		Prot			Perm	NA	
Protected Phases		4			8		5				6	
Permitted Phases				8						6		
Actuated Green, G (s)		22.1			22.1		1.2				63.2	
Effective Green, g (s)		21.6			21.6		1.2				63.2	
Actuated g/C Ratio		0.22			0.22		0.01				0.63	
Clearance Time (s)		3.5			3.5		6.0				4.0	
Vehicle Extension (s)		2.0			2.0		3.0				4.0	
Lane Grp Cap (vph)		345			173		20				2982	
v/s Ratio Prot		0.17					c0.00					
v/s Ratio Perm					c0.27						0.24	
v/c Ratio		0.80			1.27		0.05				0.38	
Uniform Delay, d1		37.2			39.2		48.8				8.9	
Progression Factor		1.00			0.87		1.00				1.00	
Incremental Delay, d2		11.8			158.4		1.0				0.4	
Delay (s)		49.0			192.5		49.9				9.3	
Level of Service		D			F		D				A	
Approach Delay (s)		49.0			192.5			49.9			9.3	
Approach LOS		D			F			D			A	

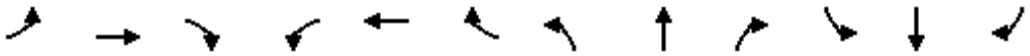
Intersection Summary			
HCM 2000 Control Delay	40.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBT	WBT	WBR	NBT	SBL
Lane Group Flow (vph)	224	95	83	1698	1
v/c Ratio	0.81	0.27	0.23	0.53	0.01
Control Delay	44.3	27.3	7.9	10.9	45.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	44.3	27.3	7.9	10.9	45.0
Queue Length 50th (ft)	77	44	0	166	1
Queue Length 95th (ft)	127	82	35	350	6
Internal Link Dist (ft)	380	1230		579	
Turn Bay Length (ft)					
Base Capacity (vph)	398	502	482	3188	90
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.56	0.19	0.17	0.53	0.01

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	142	82	0	0	74	104	107	1501	90	1	0	0
Future Volume (vph)	142	82	0	0	74	104	107	1501	90	1	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.5			4.5	4.5		5.0		6.0		
Lane Util. Factor		1.00			0.95	0.95		0.91		1.00		
Frpb, ped/bikes		1.00			0.99	0.98		1.00		1.00		
Flpb, ped/bikes		0.99			1.00	1.00		1.00		1.00		
Frt		1.00			0.97	0.85		0.99		1.00		
Flt Protected		0.97			1.00	1.00		1.00		0.95		
Satd. Flow (prot)		1700			1613	1392		4755		1676		
Flt Permitted		0.74			1.00	1.00		1.00		0.95		
Satd. Flow (perm)		1305			1613	1392		4755		1676		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	142	82	0	0	74	104	107	1501	90	1	0	0
RTOR Reduction (vph)	0	0	0	0	12	65	0	5	0	0	0	0
Lane Group Flow (vph)	0	224	0	0	83	18	0	1693	0	1	0	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)												60
Turn Type	Perm	NA			NA	Perm	Split	NA		Prot		
Protected Phases		4			8		2	2		1		
Permitted Phases	4					8						
Actuated Green, G (s)		21.9			21.9	21.9		62.6		1.0		
Effective Green, g (s)		21.4			21.4	21.4		62.1		1.0		
Actuated g/C Ratio		0.21			0.21	0.21		0.62		0.01		
Clearance Time (s)		4.0			4.0	4.0		4.5		6.0		
Vehicle Extension (s)		2.5			2.5	2.5		2.0		3.0		
Lane Grp Cap (vph)		279			345	297		2952		16		
v/s Ratio Prot					0.05			c0.36		c0.00		
v/s Ratio Perm		c0.17				0.01						
v/c Ratio		0.80			0.24	0.06		0.57		0.06		
Uniform Delay, d1		37.3			32.6	31.3		11.2		49.0		
Progression Factor		0.65			1.00	1.00		1.00		1.00		
Incremental Delay, d2		14.3			0.3	0.1		0.8		1.6		
Delay (s)		38.5			32.8	31.4		12.0		50.7		
Level of Service		D			C	C		B		D		
Approach Delay (s)		38.5			32.1			12.0			50.7	
Approach LOS		D			C			B			D	

Intersection Summary			
HCM 2000 Control Delay	16.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		

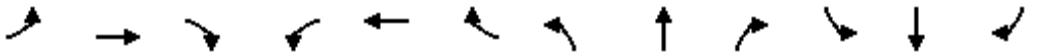
c Critical Lane Group



Lane Group	EBT	WBL	WBT	NBL	SBL	SBT	SBR
Lane Group Flow (vph)	533	195	767	1	380	706	58
v/c Ratio	0.45	0.58	0.39	0.02	0.70	0.65	0.13
Control Delay	32.7	36.0	3.4	57.0	42.4	37.3	27.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.7	36.0	3.4	57.0	42.4	37.3	27.4
Queue Length 50th (ft)	165	150	40	1	248	237	31
Queue Length 95th (ft)	250	m232	53	7	356	300	62
Internal Link Dist (ft)	1762		672			521	
Turn Bay Length (ft)		110			175		175
Base Capacity (vph)	1185	335	1986	55	598	1198	507
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.58	0.39	0.02	0.64	0.59	0.11

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	485	48	195	767	0	1	0	0	380	706	58
Future Volume (vph)	0	485	48	195	767	0	1	0	0	380	706	58
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0		4.0	4.0		6.0			4.0	4.0	4.0
Lane Util. Factor		0.95		1.00	0.95		1.00			1.00	0.95	1.00
Frpb, ped/bikes		1.00		1.00	1.00		1.00			1.00	1.00	0.94
Flpb, ped/bikes		1.00		1.00	1.00		1.00			1.00	1.00	1.00
Frt		0.99		1.00	1.00		1.00			1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00		0.95			0.95	1.00	1.00
Satd. Flow (prot)		3303		1676	3353		1675			1676	3353	1416
Flt Permitted		1.00		0.95	1.00		0.95			0.95	1.00	1.00
Satd. Flow (perm)		3303		1676	3353		1675			1676	3353	1416
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	485	48	195	767	0	1	0	0	380	706	58
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	533	0	195	767	0	1	0	0	380	706	58
Confl. Peds. (#/hr)	2		2	2		2	2		1	1		2
Confl. Bikes (#/hr)												60
Turn Type		NA		Prot	NA		Prot			Split	NA	Perm
Protected Phases		4		3	8		5			6	6	
Permitted Phases												6
Actuated Green, G (s)		38.3		25.0	66.3		0.8			38.9	38.9	38.9
Effective Green, g (s)		38.3		24.0	66.3		0.8			38.9	38.9	38.9
Actuated g/C Ratio		0.32		0.20	0.55		0.01			0.32	0.32	0.32
Clearance Time (s)		4.0		3.0	4.0		6.0			4.0	4.0	4.0
Vehicle Extension (s)		4.0		2.0	4.0		3.0			5.0	5.0	5.0
Lane Grp Cap (vph)		1054		335	1852		11			543	1086	459
v/s Ratio Prot		c0.16		c0.12	0.23		c0.00			c0.23	0.21	
v/s Ratio Perm												0.04
v/c Ratio		0.51		0.58	0.41		0.09			0.70	0.65	0.13
Uniform Delay, d1		33.2		43.5	15.6		59.2			35.4	34.7	28.6
Progression Factor		1.00		0.68	0.21		1.00			1.00	1.00	1.00
Incremental Delay, d2		1.7		1.3	0.5		3.6			5.0	1.9	0.3
Delay (s)		34.9		31.1	3.8		62.8			40.4	36.6	28.8
Level of Service		C		C	A		E			D	D	C
Approach Delay (s)		34.9			9.3			62.8			37.5	
Approach LOS		C			A			E			D	

Intersection Summary			
HCM 2000 Control Delay	26.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	58.1%	ICU Level of Service	B
Analysis Period (min)	15		

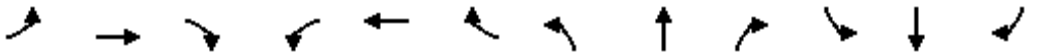
c Critical Lane Group



Lane Group	EBL	EBT	WBT	WBR	NBT	NBR	SBL
Lane Group Flow (vph)	95	750	899	518	1253	263	1
v/c Ratio	0.62	0.39	0.60	0.70	0.71	0.41	0.02
Control Delay	55.9	5.6	27.3	25.3	35.6	11.7	57.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.9	5.6	27.3	25.3	35.6	11.7	57.0
Queue Length 50th (ft)	76	128	278	239	284	43	1
Queue Length 95th (ft)	m#136	60	347	383	388	126	7
Internal Link Dist (ft)		672	692		1193		
Turn Bay Length (ft)	130					150	
Base Capacity (vph)	153	1900	1509	735	1755	647	55
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.39	0.60	0.70	0.71	0.41	0.02

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	95	750	0	0	899	518	139	1114	263	1	0	0
Future Volume (vph)	95	750	0	0	899	518	139	1114	263	1	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	3.0			3.0	3.0		3.0	3.0	6.0		
Lane Util. Factor	1.00	0.95			0.95	1.00		0.91	1.00	1.00		
Frpb, ped/bikes	1.00	1.00			1.00	0.97		1.00	0.97	1.00		
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00	1.00		
Frt	1.00	1.00			1.00	0.85		1.00	0.85	1.00		
Flt Protected	0.95	1.00			1.00	1.00		0.99	1.00	0.95		
Satd. Flow (prot)	1676	3353			3353	1456		4791	1461	1672		
Flt Permitted	0.95	1.00			1.00	1.00		0.99	1.00	0.95		
Satd. Flow (perm)	1676	3353			3353	1456		4791	1461	1672		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	95	750	0	0	899	518	139	1114	263	1	0	0
RTOR Reduction (vph)	0	0	0	0	0	86	0	0	111	0	0	0
Lane Group Flow (vph)	95	750	0	0	899	432	0	1253	152	1	0	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)												60
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm	Prot		
Protected Phases	7	4			8		2	2		1		
Permitted Phases						8			2			
Actuated Green, G (s)	11.0	62.2			48.2	48.2		43.0	43.0	0.8		
Effective Green, g (s)	11.0	63.2			49.2	49.2		44.0	44.0	0.8		
Actuated g/C Ratio	0.09	0.53			0.41	0.41		0.37	0.37	0.01		
Clearance Time (s)	3.0	4.0			4.0	4.0		4.0	4.0	6.0		
Vehicle Extension (s)	2.0	4.0			4.0	4.0		4.0	4.0	3.0		
Lane Grp Cap (vph)	153	1765			1374	596		1756	535	11		
v/s Ratio Prot	c0.06	0.22			0.27			c0.26		c0.00		
v/s Ratio Perm						c0.30			0.10			
v/c Ratio	0.62	0.42			0.65	0.72		0.71	0.28	0.09		
Uniform Delay, d1	52.5	17.3			28.5	29.7		32.6	26.9	59.2		
Progression Factor	0.76	0.34			1.00	1.00		1.00	1.00	1.00		
Incremental Delay, d2	4.8	0.6			2.4	7.5		1.5	0.4	3.6		
Delay (s)	44.6	6.5			31.0	37.2		34.1	27.3	62.8		
Level of Service	D	A			C	D		C	C	E		
Approach Delay (s)		10.8			33.3			32.9			62.8	
Approach LOS		B			C			C			E	

Intersection Summary			
HCM 2000 Control Delay	28.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	76.1%	ICU Level of Service	D
Analysis Period (min)	15		

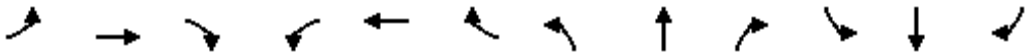
c Critical Lane Group



Lane Group	EBT	WBT	NBT	SBL
Lane Group Flow (vph)	87	19	1535	1
v/c Ratio	0.51	0.08	0.80	0.01
Control Delay	45.5	23.6	6.7	40.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	45.5	23.6	6.7	40.0
Queue Length 50th (ft)	44	5	99	1
Queue Length 95th (ft)	91	24	m112	6
Internal Link Dist (ft)	550	165	918	
Turn Bay Length (ft)				
Base Capacity (vph)	169	228	1923	70
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.51	0.08	0.80	0.01

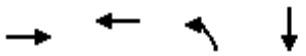
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	83	4	0	0	10	9	44	1474	17	1	0	0
Future Volume (vph)	83	4	0	0	10	9	44	1474	17	1	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0			4.0		6.0		
Lane Util. Factor		1.00			1.00			0.95		1.00		
Frpb, ped/bikes		1.00			0.99			1.00		1.00		
Flpb, ped/bikes		0.98			1.00			1.00		1.00		
Frt		1.00			0.94			1.00		1.00		
Flt Protected		0.95			1.00			1.00		0.95		
Satd. Flow (prot)		1483			1465			3007		1509		
Flt Permitted		0.72			1.00			1.00		0.95		
Satd. Flow (perm)		1122			1465			3007		1509		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	83	4	0	0	10	9	44	1474	17	1	0	0
RTOR Reduction (vph)	0	0	0	0	8	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	87	0	0	11	0	0	1534	0	1	0	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)												60
Turn Type	Perm	NA			NA		Split	NA		Prot		
Protected Phases		4			8		2	2		1		
Permitted Phases	4											
Actuated Green, G (s)		13.0			13.0			55.0		4.0		
Effective Green, g (s)		13.0			13.0			55.0		4.0		
Actuated g/C Ratio		0.15			0.15			0.64		0.05		
Clearance Time (s)		4.0			4.0			4.0		6.0		
Lane Grp Cap (vph)		169			221			1923		70		
v/s Ratio Prot					0.01			c0.51		c0.00		
v/s Ratio Perm		c0.08										
v/c Ratio		0.51			0.05			0.80		0.01		
Uniform Delay, d1		33.6			31.2			11.4		39.1		
Progression Factor		1.00			1.00			0.36		1.00		
Incremental Delay, d2		10.8			0.4			2.4		0.4		
Delay (s)		44.4			31.7			6.5		39.5		
Level of Service		D			C			A		D		
Approach Delay (s)		44.4			31.7			6.5			39.5	
Approach LOS		D			C			A			D	

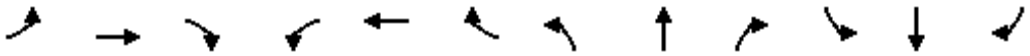
Intersection Summary			
HCM 2000 Control Delay	8.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	68.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBT	NBL	SBT
Lane Group Flow (vph)	207	88	1	991
v/c Ratio	1.00	0.44	0.01	0.57
Control Delay	102.3	30.7	39.0	17.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	102.3	30.7	39.0	17.2
Queue Length 50th (ft)	113	45	1	153
Queue Length 95th (ft)	#251	m51	6	#423
Internal Link Dist (ft)	7	1528		2014
Turn Bay Length (ft)				
Base Capacity (vph)	207	414	92	1728
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.00	0.21	0.01	0.57

Intersection Summary

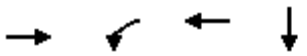
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	35	172	45	43	0	1	0	0	61	907	23
Future Volume (vph)	0	35	172	45	43	0	1	0	0	61	907	23
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0		6.0				4.0	
Lane Util. Factor		1.00			1.00		1.00				0.95	
Frpb, ped/bikes		0.97			1.00		1.00				1.00	
Flpb, ped/bikes		1.00			1.00		0.99				1.00	
Frt		0.89			1.00		1.00				1.00	
Flt Protected		1.00			0.98		0.95				1.00	
Satd. Flow (prot)		1373			1549		1501				2992	
Flt Permitted		1.00			0.98		0.95				1.00	
Satd. Flow (perm)		1373			1549		1501				2992	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	35	172	45	43	0	1	0	0	61	907	23
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	207	0	0	88	0	1	0	0	0	991	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)												60
Turn Type		NA		Split	NA		Prot			Split	NA	
Protected Phases		7		8	8		5			6	6	
Permitted Phases												
Actuated Green, G (s)		13.0			10.1		0.8				44.1	
Effective Green, g (s)		13.0			10.1		0.8				44.1	
Actuated g/C Ratio		0.15			0.12		0.01				0.51	
Clearance Time (s)		4.0			4.0		6.0				4.0	
Vehicle Extension (s)		2.0			2.0		3.0				4.0	
Lane Grp Cap (vph)		207			181		13				1534	
v/s Ratio Prot		c0.15			c0.06		c0.00				c0.33	
v/s Ratio Perm												
v/c Ratio		1.00			0.49		0.08				0.65	
Uniform Delay, d1		36.5			35.5		42.2				15.3	
Progression Factor		1.00			0.79		1.00				1.00	
Incremental Delay, d2		62.6			0.6		2.5				2.1	
Delay (s)		99.1			28.6		44.8				17.4	
Level of Service		F			C		D				B	
Approach Delay (s)		99.1			28.6			44.8			17.4	
Approach LOS		F			C			D			B	

Intersection Summary			
HCM 2000 Control Delay	31.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	67.2%	ICU Level of Service	C
Analysis Period (min)	15		

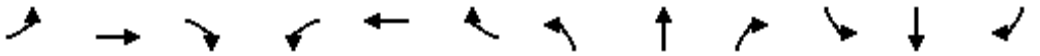
c Critical Lane Group



Lane Group	EBT	WBL	WBT	SBT
Lane Group Flow (vph)	349	57	287	1172
v/c Ratio	0.63	0.26	0.50	0.73
Control Delay	28.8	10.5	11.2	16.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	28.8	10.5	11.2	16.7
Queue Length 50th (ft)	154	12	62	281
Queue Length 95th (ft)	246	m14	m73	m23
Internal Link Dist (ft)	1450		992	1806
Turn Bay Length (ft)		250		
Base Capacity (vph)	556	220	572	1599
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.63	0.26	0.50	0.73

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



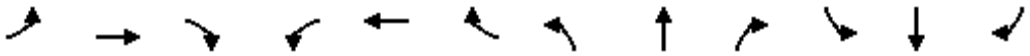
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	288	61	57	287	0	0	0	0	165	890	117
Future Volume (vph)	0	288	61	57	287	0	0	0	0	165	890	117
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0		4.0	4.0						4.0	
Lane Util. Factor		1.00		1.00	1.00						0.95	
Frpb, ped/bikes		1.00		1.00	1.00						0.99	
Flpb, ped/bikes		1.00		1.00	1.00						1.00	
Frt		0.98		1.00	1.00						0.99	
Flt Protected		1.00		0.95	1.00						0.99	
Satd. Flow (prot)		1545		1502	1588						2927	
Flt Permitted		1.00		0.39	1.00						0.99	
Satd. Flow (perm)		1545		612	1588						2927	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	288	61	57	287	0	0	0	0	165	890	117
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	349	0	57	287	0	0	0	0	0	1172	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		15
Confl. Bikes (#/hr)												60
Turn Type		NA		Perm	NA					Split	NA	
Protected Phases		4			8					6	6	
Permitted Phases				8								
Actuated Green, G (s)		31.0		31.0	31.0						47.0	
Effective Green, g (s)		31.0		31.0	31.0						47.0	
Actuated g/C Ratio		0.36		0.36	0.36						0.55	
Clearance Time (s)		4.0		4.0	4.0						4.0	
Lane Grp Cap (vph)		556		220	572						1599	
v/s Ratio Prot		c0.23			0.18						c0.40	
v/s Ratio Perm				0.09								
v/c Ratio		0.63		0.26	0.50						0.73	
Uniform Delay, d1		22.7		19.4	21.5						14.8	
Progression Factor		1.00		0.43	0.43						0.94	
Incremental Delay, d2		5.3		1.6	1.7						2.4	
Delay (s)		28.0		9.9	11.0						16.3	
Level of Service		C		A	B						B	
Approach Delay (s)		28.0			10.8			0.0			16.3	
Approach LOS		C			B			A			B	

Intersection Summary			
HCM 2000 Control Delay	17.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	85.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	NBT	SBL
Lane Group Flow (vph)	110	361	369	1366	1
v/c Ratio	0.84	0.78	0.81	0.91	0.01
Control Delay	72.9	42.6	41.5	17.3	40.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	72.9	42.6	41.5	17.3	40.0
Queue Length 50th (ft)	60	194	167	226	1
Queue Length 95th (ft)	m#118	m#314	#315	m#476	6
Internal Link Dist (ft)		992	302	277	
Turn Bay Length (ft)	200				
Base Capacity (vph)	131	461	455	1495	70
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.84	0.78	0.81	0.91	0.01

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	361	0	0	228	141	105	1221	40	1	0	0
Future Volume (vph)	110	361	0	0	228	141	105	1221	40	1	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0			4.0			4.0		6.0		
Lane Util. Factor	1.00	1.00			1.00			0.95		1.00		
Frpb, ped/bikes	1.00	1.00			0.98			1.00		1.00		
Flpb, ped/bikes	0.99	1.00			1.00			1.00		1.00		
Frt	1.00	1.00			0.95			1.00		1.00		
Flt Protected	0.95	1.00			1.00			1.00		0.95		
Satd. Flow (prot)	1491	1588			1481			2985		1509		
Flt Permitted	0.29	1.00			1.00			1.00		0.95		
Satd. Flow (perm)	451	1588			1481			2985		1509		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	110	361	0	0	228	141	105	1221	40	1	0	0
RTOR Reduction (vph)	0	0	0	0	26	0	0	3	0	0	0	0
Lane Group Flow (vph)	110	361	0	0	343	0	0	1364	0	1	0	0
Confl. Peds. (#/hr)	18		12	12		18	37		32	32		37
Confl. Bikes (#/hr)												60
Turn Type	Perm	NA			NA		Split	NA		Prot		
Protected Phases		4			8		2	2		1		
Permitted Phases	4											
Actuated Green, G (s)	25.0	25.0			25.0			43.0		4.0		
Effective Green, g (s)	25.0	25.0			25.0			43.0		4.0		
Actuated g/C Ratio	0.29	0.29			0.29			0.50		0.05		
Clearance Time (s)	4.0	4.0			4.0			4.0		6.0		
Lane Grp Cap (vph)	131	461			430			1492		70		
v/s Ratio Prot		0.23			0.23			c0.46		c0.00		
v/s Ratio Perm	c0.24											
v/c Ratio	0.84	0.78			0.80			0.91		0.01		
Uniform Delay, d1	28.6	28.0			28.2			19.8		39.1		
Progression Factor	1.12	1.12			1.00			0.43		1.00		
Incremental Delay, d2	36.6	9.8			14.3			7.5		0.4		
Delay (s)	68.5	41.2			42.5			16.1		39.5		
Level of Service	E	D			D			B		D		
Approach Delay (s)		47.6			42.5			16.1			39.5	
Approach LOS		D			D			B			D	

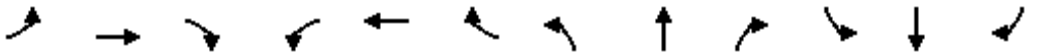
Intersection Summary			
HCM 2000 Control Delay	27.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	91.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBL	WBT	SBT	SBR
Lane Group Flow (vph)	309	239	287	830	179
v/c Ratio	0.67	0.55	0.35	0.70	0.28
Control Delay	34.9	10.6	9.9	11.9	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	34.9	10.6	9.9	11.9	1.1
Queue Length 50th (ft)	144	76	105	116	0
Queue Length 95th (ft)	235	m84	m115	143	m0
Internal Link Dist (ft)	282		688	858	
Turn Bay Length (ft)		250			
Base Capacity (vph)	458	434	812	1191	641
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.67	0.55	0.35	0.70	0.28

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	279	30	239	287	0	0	0	0	21	809	179
Future Volume (vph)	0	279	30	239	287	0	0	0	0	21	809	179
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0		4.0	4.0						4.0	4.0
Lane Util. Factor		1.00		1.00	1.00						0.95	1.00
Frpb, ped/bikes		1.00		1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00						1.00	1.00
Frt		0.99		1.00	1.00						1.00	0.85
Flt Protected		1.00		0.95	1.00						1.00	1.00
Satd. Flow (prot)		1563		1506	1588						3014	1350
Flt Permitted		1.00		0.32	1.00						1.00	1.00
Satd. Flow (perm)		1563		512	1588						3014	1350
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	279	30	239	287	0	0	0	0	21	809	179
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	0	0	0	108
Lane Group Flow (vph)	0	305	0	239	287	0	0	0	0	0	830	71
Confl. Peds. (#/hr)	6		11	11		6			2	2		
Confl. Bikes (#/hr)												60
Turn Type		NA		pm+pt	NA					Split	NA	Prot
Protected Phases		4		3	8					6	6	6
Permitted Phases				8	8							
Actuated Green, G (s)		25.0		44.0	44.0						34.0	34.0
Effective Green, g (s)		25.0		44.0	44.0						34.0	34.0
Actuated g/C Ratio		0.29		0.51	0.51						0.40	0.40
Clearance Time (s)		4.0		4.0	4.0						4.0	4.0
Lane Grp Cap (vph)		454		435	812						1191	533
v/s Ratio Prot		c0.20		c0.10	0.18						c0.28	0.05
v/s Ratio Perm				0.19								
v/c Ratio		0.67		0.55	0.35						0.70	0.13
Uniform Delay, d1		26.9		13.5	12.5						21.7	16.6
Progression Factor		1.00		0.73	0.74						0.43	0.10
Incremental Delay, d2		7.7		1.5	0.4						2.4	0.4
Delay (s)		34.6		11.2	9.7						11.7	2.1
Level of Service		C		B	A						B	A
Approach Delay (s)		34.6			10.4			0.0			10.0	
Approach LOS		C			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	14.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	75.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



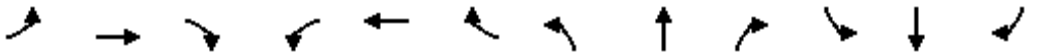
Lane Group	EBL	EBT	WBT	NBT	NBR	SBL
Lane Group Flow (vph)	125	252	474	1143	467	1
v/c Ratio	0.86	0.41	1.03	0.76	0.52	0.01
Control Delay	58.0	13.8	81.7	9.8	1.4	40.0
Queue Delay	0.0	0.0	0.0	0.5	0.0	0.0
Total Delay	58.0	13.8	81.7	10.3	1.4	40.0
Queue Length 50th (ft)	42	124	~277	55	0	1
Queue Length 95th (ft)	m#96	m195	#465	m#410	m10	6
Internal Link Dist (ft)		688	289	661		
Turn Bay Length (ft)	250				250	
Base Capacity (vph)	146	609	461	1506	897	70
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	90	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.41	1.03	0.81	0.52	0.01

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

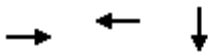
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	252	0	0	460	14	46	1097	467	1	0	0
Future Volume (vph)	125	252	0	0	460	14	46	1097	467	1	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0			4.0			4.0	4.0	6.0		
Lane Util. Factor	1.00	1.00			1.00			0.95	1.00	1.00		
Frpb, ped/bikes	1.00	1.00			1.00			1.00	0.98	1.00		
Flpb, ped/bikes	1.00	1.00			1.00			1.00	1.00	1.00		
Frt	1.00	1.00			1.00			1.00	0.85	1.00		
Flt Protected	0.95	1.00			1.00			1.00	1.00	0.95		
Satd. Flow (prot)	1509	1588			1581			3012	1327	1507		
Flt Permitted	0.14	1.00			1.00			1.00	1.00	0.95		
Satd. Flow (perm)	227	1588			1581			3012	1327	1507		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	125	252	0	0	460	14	46	1097	467	1	0	0
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	260	0	0	0
Lane Group Flow (vph)	125	252	0	0	473	0	0	1143	207	1	0	0
Confl. Peds. (#/hr)	4		5	5		4	5		4	4		5
Confl. Bikes (#/hr)												60
Turn Type	pm+pt	NA			NA		Split	NA	Perm	Prot		
Protected Phases	7	4			8		2	2		1		
Permitted Phases	4								2			
Actuated Green, G (s)	33.0	33.0			25.0			38.2	38.2	0.8		
Effective Green, g (s)	32.0	33.0			25.0			38.2	38.2	0.8		
Actuated g/C Ratio	0.37	0.38			0.29			0.44	0.44	0.01		
Clearance Time (s)	3.0	4.0			4.0			4.0	4.0	6.0		
Vehicle Extension (s)	2.0	0.2			0.2			0.2	0.2	3.0		
Lane Grp Cap (vph)	144	609			459			1337	589	14		
v/s Ratio Prot	c0.04	0.16			c0.30			c0.38		c0.00		
v/s Ratio Perm	0.28								0.16			
v/c Ratio	0.87	0.41			1.03			0.85	0.35	0.07		
Uniform Delay, d1	24.5	19.4			30.5			21.4	15.7	42.2		
Progression Factor	0.63	0.61			1.00			0.34	0.19	1.00		
Incremental Delay, d2	33.5	0.1			49.8			3.8	0.8	2.2		
Delay (s)	49.0	11.9			80.3			11.2	3.8	44.4		
Level of Service	D	B			F			B	A	D		
Approach Delay (s)		24.2			80.3			9.0			44.4	
Approach LOS		C			F			A			D	

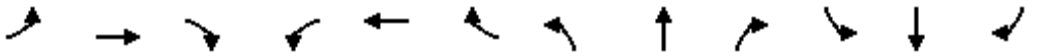
Intersection Summary			
HCM 2000 Control Delay	25.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	84.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	148	89	1168
v/c Ratio	0.37	0.27	0.52
Control Delay	26.9	29.7	2.0
Queue Delay	0.0	0.0	0.0
Total Delay	26.9	29.7	2.0
Queue Length 50th (ft)	58	40	21
Queue Length 95th (ft)	111	81	41
Internal Link Dist (ft)	137	79	634
Turn Bay Length (ft)			
Base Capacity (vph)	404	330	2243
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.37	0.27	0.52

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	108	40	43	46	0	0	0	0	42	1103	23
Future Volume (vph)	0	108	40	43	46	0	0	0	0	42	1103	23
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						0.95	
Frpb, ped/bikes		0.98			1.00						1.00	
Flpb, ped/bikes		1.00			0.98						1.00	
Frt		0.96			1.00						1.00	
Flt Protected		1.00			0.98						1.00	
Satd. Flow (prot)		1672			1691						3325	
Flt Permitted		1.00			0.82						1.00	
Satd. Flow (perm)		1672			1424						3325	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	108	40	43	46	0	0	0	0	42	1103	23
RTOR Reduction (vph)	0	15	0	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	133	0	0	89	0	0	0	0	0	1166	0
Confl. Peds. (#/hr)	22		24	24		22	14		20	20		14
Confl. Bikes (#/hr)												60
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		20.0			20.0						58.0	
Effective Green, g (s)		20.0			20.0						58.0	
Actuated g/C Ratio		0.23			0.23						0.67	
Clearance Time (s)		4.0			4.0						4.0	
Lane Grp Cap (vph)		388			331						2242	
v/s Ratio Prot		c0.08										
v/s Ratio Perm					0.06						0.35	
v/c Ratio		0.34			0.27						0.52	
Uniform Delay, d1		27.5			27.0						7.0	
Progression Factor		1.00			1.00						0.19	
Incremental Delay, d2		2.4			2.0						0.7	
Delay (s)		29.9			29.0						2.0	
Level of Service		C			C						A	
Approach Delay (s)		29.9			29.0			0.0			2.0	
Approach LOS		C			C			A			A	

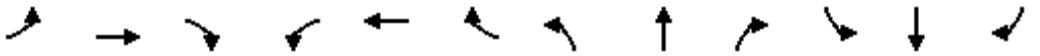
Intersection Summary			
HCM 2000 Control Delay	6.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	67.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBT	WBR	NBT	SBL
Lane Group Flow (vph)	230	16	22	1561	1
v/c Ratio	0.71	0.04	0.05	0.87	0.01
Control Delay	43.4	24.4	0.2	7.0	40.0
Queue Delay	0.0	0.0	0.0	1.4	0.0
Total Delay	43.4	24.4	0.2	8.4	40.0
Queue Length 50th (ft)	113	7	0	48	1
Queue Length 95th (ft)	#217	22	0	m55	6
Internal Link Dist (ft)	175	153		287	
Turn Bay Length (ft)					
Base Capacity (vph)	322	451	449	1785	77
Starvation Cap Reductn	0	0	0	91	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.71	0.04	0.05	0.92	0.01

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



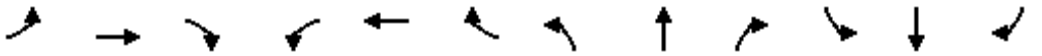
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	220	10	0	0	16	22	56	1489	16	1	0	0
Future Volume (vph)	220	10	0	0	16	22	56	1489	16	1	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0	4.0		4.0		6.0		
Lane Util. Factor		1.00			1.00	1.00		0.95		1.00		
Frpb, ped/bikes		1.00			1.00	1.00		1.00		1.00		
Flpb, ped/bikes		0.99			1.00	1.00		1.00		1.00		
Frt		1.00			1.00	0.85		1.00		1.00		
Flt Protected		0.95			1.00	1.00		1.00		0.95		
Satd. Flow (prot)		1663			1765	1500		3339		1676		
Flt Permitted		0.72			1.00	1.00		1.00		0.95		
Satd. Flow (perm)		1261			1765	1500		3339		1676		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	220	10	0	0	16	22	56	1489	16	1	0	0
RTOR Reduction (vph)	0	0	0	0	0	16	0	1	0	0	0	0
Lane Group Flow (vph)	0	230	0	0	16	6	0	1560	0	1	0	0
Confl. Peds. (#/hr)	10		10				10					10
Confl. Bikes (#/hr)												60
Turn Type	Perm	NA			NA	Perm	Perm	NA		Prot		
Protected Phases		4			8			2		1		
Permitted Phases	4					8	2					
Actuated Green, G (s)		22.0			22.0	22.0		46.0		4.0		
Effective Green, g (s)		22.0			22.0	22.0		46.0		4.0		
Actuated g/C Ratio		0.26			0.26	0.26		0.53		0.05		
Clearance Time (s)		4.0			4.0	4.0		4.0		6.0		
Lane Grp Cap (vph)		322			451	383		1785		77		
v/s Ratio Prot					0.01					c0.00		
v/s Ratio Perm		c0.18				0.00		0.47				
v/c Ratio		0.71			0.04	0.01		0.87		0.01		
Uniform Delay, d1		29.1			24.0	23.9		17.5		39.1		
Progression Factor		1.00			1.00	1.00		0.16		1.00		
Incremental Delay, d2		12.7			0.1	0.1		3.4		0.3		
Delay (s)		41.9			24.2	24.0		6.2		39.4		
Level of Service		D			C	C		A		D		
Approach Delay (s)		41.9			24.1			6.2			39.4	
Approach LOS		D			C			A			D	

Intersection Summary			
HCM 2000 Control Delay	11.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	83.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



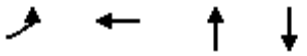
Lane Group	EBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	1	497	25	86	215
v/c Ratio	0.01	0.38	0.08	0.14	0.35
Control Delay	36.0	8.3	19.7	20.0	22.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	36.0	8.3	19.7	20.0	22.9
Queue Length 50th (ft)	1	34	9	31	85
Queue Length 95th (ft)	6	45	26	64	143
Internal Link Dist (ft)		479		105	1243
Turn Bay Length (ft)					
Base Capacity (vph)	155	1307	324	615	609
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.01	0.38	0.08	0.14	0.35

Intersection Summary



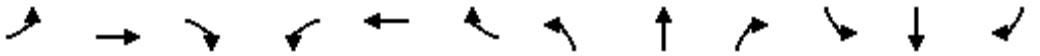
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	0	95	387	15	25	86	0	0	204	11
Future Volume (vph)	1	0	0	95	387	15	25	86	0	0	204	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0				4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00				0.95		1.00	1.00			1.00	
Frpb, ped/bikes	1.00				1.00		1.00	1.00			1.00	
Flpb, ped/bikes	1.00				1.00		0.96	1.00			1.00	
Frt	1.00				1.00		1.00	1.00			0.99	
Flt Protected	0.95				0.99		0.95	1.00			1.00	
Satd. Flow (prot)	1676				3301		1611	1765			1746	
Flt Permitted	0.95				0.99		0.55	1.00			1.00	
Satd. Flow (perm)	1676				3301		930	1765			1746	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	0	0	95	387	15	25	86	0	0	204	11
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	0	0
Lane Group Flow (vph)	1	0	0	0	495	0	25	86	0	0	215	0
Confl. Peds. (#/hr)	15		46	46		15	35		34	34		35
Confl. Bikes (#/hr)			60									
Turn Type	Prot			Split	NA		Perm	NA			NA	
Protected Phases	7			8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)	8.0				34.0		30.0	30.0			30.0	
Effective Green, g (s)	8.0				34.0		30.0	30.0			30.0	
Actuated g/C Ratio	0.09				0.40		0.35	0.35			0.35	
Clearance Time (s)	6.0				4.0		4.0	4.0			4.0	
Lane Grp Cap (vph)	155				1305		324	615			609	
v/s Ratio Prot	c0.00				c0.15			0.05			c0.12	
v/s Ratio Perm							0.03					
v/c Ratio	0.01				0.38		0.08	0.14			0.35	
Uniform Delay, d1	35.4				18.5		18.7	19.2			20.8	
Progression Factor	1.00				0.40		1.00	1.00			1.00	
Incremental Delay, d2	0.1				0.8		0.5	0.5			1.6	
Delay (s)	35.5				8.3		19.2	19.6			22.4	
Level of Service	D				A		B	B			C	
Approach Delay (s)		35.5			8.3			19.5			22.4	
Approach LOS		D			A			B			C	

Intersection Summary			
HCM 2000 Control Delay	13.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



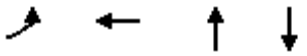
Lane Group	EBL	WBT	NBT	SBT
Lane Group Flow (vph)	1	451	62	42
v/c Ratio	0.01	0.30	0.14	0.09
Control Delay	34.0	1.9	25.1	24.4
Queue Delay	0.0	0.2	0.0	0.0
Total Delay	34.0	2.1	25.1	24.4
Queue Length 50th (ft)	1	8	26	17
Queue Length 95th (ft)	5	11	56	42
Internal Link Dist (ft)		199	104	1901
Turn Bay Length (ft)				
Base Capacity (vph)	194	1492	435	464
Starvation Cap Reductn	0	414	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.01	0.42	0.14	0.09

Intersection Summary



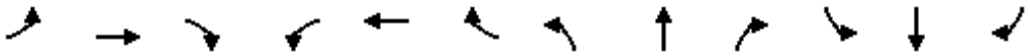
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	0	62	359	30	19	43	0	0	38	4
Future Volume (vph)	1	0	0	62	359	30	19	43	0	0	38	4
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0				4.0			4.0			4.0	
Lane Util. Factor	1.00				0.95			1.00			1.00	
Frpb, ped/bikes	1.00				0.99			1.00			1.00	
Flpb, ped/bikes	1.00				1.00			0.99			1.00	
Frt	1.00				0.99			1.00			0.99	
Flt Protected	0.95				0.99			0.98			1.00	
Satd. Flow (prot)	1676				3279			1723			1735	
Flt Permitted	0.95				0.99			0.93			1.00	
Satd. Flow (perm)	1676				3279			1628			1735	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	0	0	62	359	30	19	43	0	0	38	4
RTOR Reduction (vph)	0	0	0	0	6	0	0	0	0	0	0	0
Lane Group Flow (vph)	1	0	0	0	445	0	0	62	0	0	42	0
Confl. Peds. (#/hr)	26		30	30		26	18		66	66		18
Confl. Bikes (#/hr)			60									
Turn Type	Prot			Split	NA		Perm	NA			NA	
Protected Phases	7			8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)	10.0				39.0			23.0			23.0	
Effective Green, g (s)	10.0				39.0			23.0			23.0	
Actuated g/C Ratio	0.12				0.45			0.27			0.27	
Clearance Time (s)	6.0				4.0			4.0			4.0	
Lane Grp Cap (vph)	194				1486			435			464	
v/s Ratio Prot	c0.00				c0.14						0.02	
v/s Ratio Perm								c0.04				
v/c Ratio	0.01				0.30			0.14			0.09	
Uniform Delay, d1	33.6				14.9			24.0			23.6	
Progression Factor	1.00				0.09			1.00			1.00	
Incremental Delay, d2	0.0				0.5			0.7			0.4	
Delay (s)	33.6				1.9			24.7			24.0	
Level of Service	C				A			C			C	
Approach Delay (s)		33.6			1.9			24.7			24.0	
Approach LOS		C			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	6.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.21		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	34.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



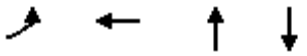
Lane Group	EBL	WBT	NBT	SBT
Lane Group Flow (vph)	1	496	46	40
v/c Ratio	0.01	0.31	0.12	0.10
Control Delay	34.0	3.1	26.4	26.1
Queue Delay	0.0	0.2	0.0	0.0
Total Delay	34.0	3.3	26.4	26.1
Queue Length 50th (ft)	1	8	19	17
Queue Length 95th (ft)	5	12	47	42
Internal Link Dist (ft)		202	103	244
Turn Bay Length (ft)				
Base Capacity (vph)	194	1578	388	411
Starvation Cap Reductn	0	442	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.01	0.44	0.12	0.10

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	0	36	433	27	19	27	0	0	29	11
Future Volume (vph)	1	0	0	36	433	27	19	27	0	0	29	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0				4.0			4.0			4.0	
Lane Util. Factor	1.00				0.95			1.00			1.00	
Frpb, ped/bikes	1.00				1.00			1.00			0.99	
Flpb, ped/bikes	1.00				1.00			0.99			1.00	
Frt	1.00				0.99			1.00			0.96	
Flt Protected	0.95				1.00			0.98			1.00	
Satd. Flow (prot)	1676				3303			1717			1686	
Flt Permitted	0.95				1.00			0.91			1.00	
Satd. Flow (perm)	1676				3303			1593			1686	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	0	0	36	433	27	19	27	0	0	29	11
RTOR Reduction (vph)	0	0	0	0	5	0	0	0	0	0	0	0
Lane Group Flow (vph)	1	0	0	0	491	0	0	46	0	0	40	0
Confl. Peds. (#/hr)	17		15	15		17	10		19	19		10
Confl. Bikes (#/hr)			60									
Turn Type	Prot			Split	NA		Perm	NA			NA	
Protected Phases	7			8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)	10.0				41.0			21.0			21.0	
Effective Green, g (s)	10.0				41.0			21.0			21.0	
Actuated g/C Ratio	0.12				0.48			0.24			0.24	
Clearance Time (s)	6.0				4.0			4.0			4.0	
Lane Grp Cap (vph)	194				1574			388			411	
v/s Ratio Prot	c0.00				c0.15						0.02	
v/s Ratio Perm								c0.03				
v/c Ratio	0.01				0.31			0.12			0.10	
Uniform Delay, d1	33.6				13.8			25.3			25.2	
Progression Factor	1.00				0.19			1.00			1.00	
Incremental Delay, d2	0.0				0.5			0.6			0.5	
Delay (s)	33.6				3.1			25.9			25.6	
Level of Service	C				A			C			C	
Approach Delay (s)		33.6			3.1			25.9			25.6	
Approach LOS		C			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	6.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.21		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	34.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

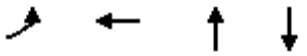


Lane Group	EBL	WBT	NBT	SBT
Lane Group Flow (vph)	1	510	57	66
v/c Ratio	0.01	0.31	0.12	0.14
Control Delay	35.0	2.3	24.1	24.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	35.0	2.3	24.1	24.3
Queue Length 50th (ft)	1	13	23	27
Queue Length 95th (ft)	6	17	52	58
Internal Link Dist (ft)		315	175	240
Turn Bay Length (ft)				
Base Capacity (vph)	165	1626	463	469
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.01	0.31	0.12	0.14

Intersection Summary

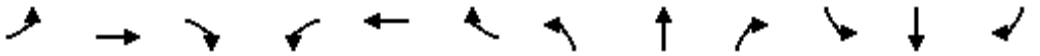
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	0	28	470	12	14	43	0	0	48	18
Future Volume (vph)	1	0	0	28	470	12	14	43	0	0	48	18
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.5				4.0			4.0			4.0	
Lane Util. Factor	1.00				0.95			1.00			1.00	
Frpb, ped/bikes	1.00				1.00			1.00			0.99	
Flpb, ped/bikes	1.00				1.00			0.99			1.00	
Frt	1.00				1.00			1.00			0.96	
Flt Protected	0.95				1.00			0.99			1.00	
Satd. Flow (prot)	1676				3329			1733			1682	
Flt Permitted	0.95				1.00			0.95			1.00	
Satd. Flow (perm)	1676				3329			1660			1682	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	0	0	28	470	12	14	43	0	0	48	18
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	0	0
Lane Group Flow (vph)	1	0	0	0	508	0	0	57	0	0	66	0
Confl. Peds. (#/hr)	10		24	24		10	15		12	12		15
Confl. Bikes (#/hr)			60									
Turn Type	Prot			Split	NA		Perm	NA			NA	
Protected Phases	7			8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)	8.5				42.0			24.0			24.0	
Effective Green, g (s)	8.5				42.0			24.0			24.0	
Actuated g/C Ratio	0.10				0.49			0.28			0.28	
Clearance Time (s)	3.5				4.0			4.0			4.0	
Lane Grp Cap (vph)	165				1625			463			469	
v/s Ratio Prot	c0.00				c0.15						c0.04	
v/s Ratio Perm								0.03				
v/c Ratio	0.01				0.31			0.12			0.14	
Uniform Delay, d1	34.9				13.3			23.1			23.3	
Progression Factor	1.00				0.14			1.00			1.00	
Incremental Delay, d2	0.1				0.5			0.5			0.6	
Delay (s)	35.0				2.3			23.7			23.9	
Level of Service	D				A			C			C	
Approach Delay (s)		35.0			2.3			23.7			23.9	
Approach LOS		D			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	6.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.22		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	11.5
Intersection Capacity Utilization	34.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



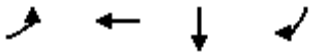
Lane Group	EBL	WBT	NBT	SBT
Lane Group Flow (vph)	1	630	64	80
v/c Ratio	0.01	0.40	0.15	0.18
Control Delay	36.0	6.0	25.3	25.6
Queue Delay	0.0	0.3	0.0	0.0
Total Delay	36.0	6.3	25.3	25.6
Queue Length 50th (ft)	1	37	26	33
Queue Length 95th (ft)	6	51	58	69
Internal Link Dist (ft)		188	104	107
Turn Bay Length (ft)				
Base Capacity (vph)	155	1572	417	449
Starvation Cap Reductn	0	405	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.01	0.54	0.15	0.18

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	0	37	547	46	25	39	0	0	59	21
Future Volume (vph)	1	0	0	37	547	46	25	39	0	0	59	21
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0				4.0			4.0			4.0	
Lane Util. Factor	1.00				0.95			1.00			1.00	
Frpb, ped/bikes	1.00				0.99			1.00			0.99	
Flpb, ped/bikes	1.00				1.00			0.99			1.00	
Frt	1.00				0.99			1.00			0.96	
Flt Protected	0.95				1.00			0.98			1.00	
Satd. Flow (prot)	1676				3285			1710			1681	
Flt Permitted	0.95				1.00			0.90			1.00	
Satd. Flow (perm)	1676				3285			1562			1681	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	0	0	37	547	46	25	39	0	0	59	21
RTOR Reduction (vph)	0	0	0	0	7	0	0	0	0	0	0	0
Lane Group Flow (vph)	1	0	0	0	623	0	0	64	0	0	80	0
Confl. Peds. (#/hr)	36		25	25		36	26		32	32		26
Confl. Bikes (#/hr)			60									
Turn Type	Prot			Split	NA		Perm	NA			NA	
Protected Phases	7			8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)	8.0				41.0			23.0			23.0	
Effective Green, g (s)	8.0				41.0			23.0			23.0	
Actuated g/C Ratio	0.09				0.48			0.27			0.27	
Clearance Time (s)	6.0				4.0			4.0			4.0	
Lane Grp Cap (vph)	155				1566			417			449	
v/s Ratio Prot	c0.00				c0.19						c0.05	
v/s Ratio Perm								0.04				
v/c Ratio	0.01				0.40			0.15			0.18	
Uniform Delay, d1	35.4				14.5			24.1			24.2	
Progression Factor	1.00				0.37			1.00			1.00	
Incremental Delay, d2	0.1				0.7			0.8			0.9	
Delay (s)	35.5				6.1			24.8			25.1	
Level of Service	D				A			C			C	
Approach Delay (s)		35.5			6.1			24.8			25.1	
Approach LOS		D			A			C			C	

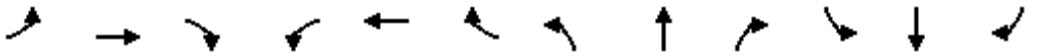
Intersection Summary			
HCM 2000 Control Delay	9.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	41.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	WBT	SBT	SBR
Lane Group Flow (vph)	1	575	1049	99
v/c Ratio	0.01	0.60	0.63	0.14
Control Delay	40.0	15.5	10.0	7.7
Queue Delay	0.0	0.0	0.2	0.0
Total Delay	40.0	15.5	10.2	7.7
Queue Length 50th (ft)	1	80	87	15
Queue Length 95th (ft)	6	m102	91	25
Internal Link Dist (ft)		467	296	
Turn Bay Length (ft)				
Base Capacity (vph)	77	961	1676	703
Starvation Cap Reductn	0	0	126	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.01	0.60	0.68	0.14

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	0	153	421	1	0	0	0	0	1049	99
Future Volume (vph)	1	0	0	153	421	1	0	0	0	0	1049	99
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0				4.0						4.0	4.0
Lane Util. Factor	1.00				0.95						0.95	1.00
Frpb, ped/bikes	1.00				1.00						1.00	0.94
Flpb, ped/bikes	1.00				1.00						1.00	1.00
Frt	1.00				1.00						1.00	0.85
Flt Protected	0.95				0.99						1.00	1.00
Satd. Flow (prot)	1676				3308						3353	1406
Flt Permitted	0.95				0.99						1.00	1.00
Satd. Flow (perm)	1676				3308						3353	1406
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	0	0	153	421	1	0	0	0	0	1049	99
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	1	0	0	0	575	0	0	0	0	0	1049	99
Confl. Peds. (#/hr)	12		16	16		12	17		16	16		17
Confl. Bikes (#/hr)			60									60
Turn Type	Prot			Split	NA						NA	Perm
Protected Phases	7			8	8						6	
Permitted Phases												6
Actuated Green, G (s)	4.0				25.0						43.0	43.0
Effective Green, g (s)	4.0				25.0						43.0	43.0
Actuated g/C Ratio	0.05				0.29						0.50	0.50
Clearance Time (s)	6.0				4.0						4.0	4.0
Lane Grp Cap (vph)	77				961						1676	703
v/s Ratio Prot	c0.00				c0.17						c0.31	
v/s Ratio Perm												0.07
v/c Ratio	0.01				0.60						0.63	0.14
Uniform Delay, d1	39.1				26.2						15.6	11.6
Progression Factor	1.00				0.53						0.53	0.62
Incremental Delay, d2	0.3				1.4						1.6	0.4
Delay (s)	39.4				15.3						9.8	7.5
Level of Service	D				B						A	A
Approach Delay (s)		39.4			15.3			0.0			9.6	
Approach LOS		D			B			A			A	

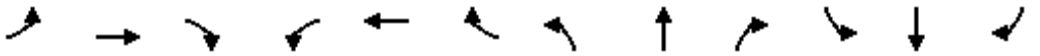
Intersection Summary			
HCM 2000 Control Delay	11.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	54.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	WBT	NBT	SBL
Lane Group Flow (vph)	1	451	1563	1
v/c Ratio	0.01	0.81	0.92	0.01
Control Delay	40.0	44.6	15.5	40.0
Queue Delay	0.0	0.0	1.0	0.0
Total Delay	40.0	44.6	16.4	40.0
Queue Length 50th (ft)	1	114	111	1
Queue Length 95th (ft)	6	#188	#548	6
Internal Link Dist (ft)		230	290	
Turn Bay Length (ft)				
Base Capacity (vph)	77	556	1703	77
Starvation Cap Reductn	0	0	4	0
Spillback Cap Reductn	0	0	36	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.01	0.81	0.94	0.01

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



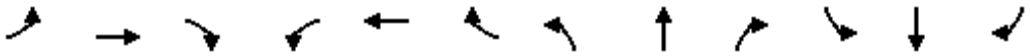
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	0	0	344	107	223	1340	0	1	0	0
Future Volume (vph)	1	0	0	0	344	107	223	1340	0	1	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0				4.0			4.0		6.0		
Lane Util. Factor	1.00				0.95			0.95		1.00		
Frpb, ped/bikes	1.00				0.99			1.00		1.00		
Flpb, ped/bikes	1.00				1.00			1.00		1.00		
Frt	1.00				0.96			1.00		1.00		
Flt Protected	0.95				1.00			0.99		0.95		
Satd. Flow (prot)	1676				3208			3329		1676		
Flt Permitted	0.95				1.00			0.99		0.95		
Satd. Flow (perm)	1676				3208			3329		1676		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	0	0	0	344	107	223	1340	0	1	0	0
RTOR Reduction (vph)	0	0	0	0	34	0	0	0	0	0	0	0
Lane Group Flow (vph)	1	0	0	0	417	0	0	1563	0	1	0	0
Confl. Peds. (#/hr)	10		10	10		12	10		15	10		10
Confl. Bikes (#/hr)			60									60
Turn Type	Prot				NA		Split	NA		Prot		
Protected Phases	7				8		2	2		1		
Permitted Phases												
Actuated Green, G (s)	4.0				14.0			44.0		4.0		
Effective Green, g (s)	4.0				14.0			44.0		4.0		
Actuated g/C Ratio	0.05				0.16			0.51		0.05		
Clearance Time (s)	6.0				4.0			4.0		6.0		
Lane Grp Cap (vph)	77				522			1703		77		
v/s Ratio Prot	c0.00				c0.13			c0.47		c0.00		
v/s Ratio Perm												
v/c Ratio	0.01				0.80			0.92		0.01		
Uniform Delay, d1	39.1				34.6			19.3		39.1		
Progression Factor	1.00				1.00			0.39		1.00		
Incremental Delay, d2	0.3				12.0			6.7		0.3		
Delay (s)	39.4				46.7			14.2		39.4		
Level of Service	D				D			B		D		
Approach Delay (s)		39.4			46.7			14.2			39.4	
Approach LOS		D			D			B			D	

Intersection Summary			
HCM 2000 Control Delay	21.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	SBT
Lane Group Flow (vph)	643	1237
v/c Ratio	0.62	0.64
Control Delay	27.2	3.5
Queue Delay	0.0	0.0
Total Delay	27.2	3.5
Queue Length 50th (ft)	147	37
Queue Length 95th (ft)	205	53
Internal Link Dist (ft)	289	290
Turn Bay Length (ft)		
Base Capacity (vph)	1030	1932
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.62	0.64

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	534	109	0	0	0	0	0	0	122	1115	0
Future Volume (vph)	0	534	109	0	0	0	0	0	0	122	1115	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0									4.0	
Lane Util. Factor		0.95									0.95	
Frpb, ped/bikes		0.98									1.00	
Flpb, ped/bikes		1.00									0.98	
Frt		0.97									1.00	
Flt Protected		1.00									1.00	
Satd. Flow (prot)		3217									3259	
Flt Permitted		1.00									1.00	
Satd. Flow (perm)		3217									3259	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	534	109	0	0	0	0	0	0	122	1115	0
RTOR Reduction (vph)	0	20	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	623	0	0	0	0	0	0	0	0	1237	0
Confl. Peds. (#/hr)	33		38	38		33	38		109	109		38
Confl. Bikes (#/hr)												60
Turn Type		NA								Perm	NA	
Protected Phases		4									6	
Permitted Phases										6		
Actuated Green, G (s)		27.0									51.0	
Effective Green, g (s)		27.0									51.0	
Actuated g/C Ratio		0.31									0.59	
Clearance Time (s)		4.0									4.0	
Lane Grp Cap (vph)		1009									1932	
v/s Ratio Prot		c0.19										
v/s Ratio Perm											0.38	
v/c Ratio		0.62									0.64	
Uniform Delay, d1		25.1									11.5	
Progression Factor		1.00									0.19	
Incremental Delay, d2		2.8									1.3	
Delay (s)		27.9									3.5	
Level of Service		C									A	
Approach Delay (s)		27.9			0.0			0.0			3.5	
Approach LOS		C			A			A			A	

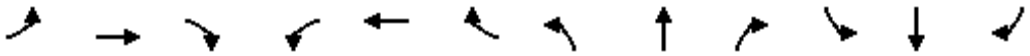
Intersection Summary			
HCM 2000 Control Delay	11.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	NBT	NBR	SBL
Lane Group Flow (vph)	145	305	1385	90	1
v/c Ratio	0.39	0.39	0.77	0.11	0.01
Control Delay	13.0	11.8	11.3	0.6	40.0
Queue Delay	0.0	0.0	0.3	0.0	0.0
Total Delay	13.0	11.8	11.5	0.6	40.0
Queue Length 50th (ft)	25	26	321	0	1
Queue Length 95th (ft)	m39	38	88	m1	6
Internal Link Dist (ft)		417	764		
Turn Bay Length (ft)				100	
Base Capacity (vph)	372	777	1793	785	77
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	74	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.39	0.39	0.81	0.11	0.01

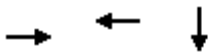
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



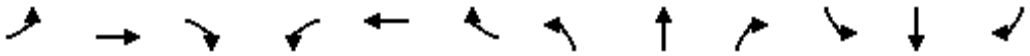
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	194	256	0	0	0	0	0	1385	90	1	0	0
Future Volume (vph)	194	256	0	0	0	0	0	1385	90	1	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0						5.0	5.0	6.0		
Lane Util. Factor	0.91	0.91						0.95	1.00	1.00		
Frpb, ped/bikes	1.00	1.00						1.00	0.93	1.00		
Flpb, ped/bikes	1.00	1.00						1.00	1.00	1.00		
Frt	1.00	1.00						1.00	0.85	1.00		
Flt Protected	0.95	0.99						1.00	1.00	0.95		
Satd. Flow (prot)	1526	3186						3353	1391	1676		
Flt Permitted	0.95	0.99						1.00	1.00	0.95		
Satd. Flow (perm)	1526	3186						3353	1391	1676		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	194	256	0	0	0	0	0	1385	90	1	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	41	0	0	0
Lane Group Flow (vph)	145	305	0	0	0	0	0	1385	49	1	0	0
Confl. Peds. (#/hr)	10		11	10		25	10		36	10		10
Confl. Bikes (#/hr)												60
Turn Type	Split	NA						NA	Perm	Prot		
Protected Phases	4	4						2		1		
Permitted Phases									2			
Actuated Green, G (s)	21.0	21.0						46.0	46.0	4.0		
Effective Green, g (s)	21.0	21.0						46.0	46.0	4.0		
Actuated g/C Ratio	0.24	0.24						0.53	0.53	0.05		
Clearance Time (s)	4.0	4.0						5.0	5.0	6.0		
Lane Grp Cap (vph)	372	777						1793	744	77		
v/s Ratio Prot	0.10	c0.10						c0.41		c0.00		
v/s Ratio Perm									0.03			
v/c Ratio	0.39	0.39						0.77	0.07	0.01		
Uniform Delay, d1	27.1	27.2						15.9	9.6	39.1		
Progression Factor	0.38	0.39						0.53	0.14	1.00		
Incremental Delay, d2	2.4	1.2						2.7	0.1	0.3		
Delay (s)	12.8	11.7						11.0	1.5	39.4		
Level of Service	B	B						B	A	D		
Approach Delay (s)		12.0			0.0			10.4			39.4	
Approach LOS		B			A			B			D	

Intersection Summary			
HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



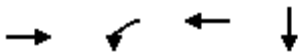
Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	42	37	1228
v/c Ratio	0.14	0.14	0.51
Control Delay	20.9	30.9	1.6
Queue Delay	0.0	0.0	0.2
Total Delay	20.9	30.9	1.9
Queue Length 50th (ft)	11	17	20
Queue Length 95th (ft)	38	44	28
Internal Link Dist (ft)	69	99	279
Turn Bay Length (ft)			
Base Capacity (vph)	310	264	2389
Starvation Cap Reductn	0	0	460
Spillback Cap Reductn	0	0	6
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.14	0.14	0.64

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	24	18	23	14	0	0	0	0	46	1150	32
Future Volume (vph)	0	24	18	23	14	0	0	0	0	46	1150	32
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						0.95	
Frpb, ped/bikes		0.96			1.00						0.99	
Flpb, ped/bikes		1.00			0.95						1.00	
Frt		0.94			1.00						1.00	
Flt Protected		1.00			0.97						1.00	
Satd. Flow (prot)		1592			1623						3312	
Flt Permitted		1.00			0.85						1.00	
Satd. Flow (perm)		1592			1424						3312	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	24	18	23	14	0	0	0	0	46	1150	32
RTOR Reduction (vph)	0	15	0	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	27	0	0	37	0	0	0	0	0	1226	0
Confl. Peds. (#/hr)	80		41	41		80	59		101	101		59
Confl. Bikes (#/hr)												60
Turn Type		NA		Perm	NA					Split	NA	
Protected Phases		4			8					6	6	
Permitted Phases				8								
Actuated Green, G (s)		16.0			16.0						62.0	
Effective Green, g (s)		16.0			16.0						62.0	
Actuated g/C Ratio		0.19			0.19						0.72	
Clearance Time (s)		4.0			4.0						4.0	
Lane Grp Cap (vph)		296			264						2387	
v/s Ratio Prot		0.02									c0.37	
v/s Ratio Perm					c0.03							
v/c Ratio		0.09			0.14						0.51	
Uniform Delay, d1		29.0			29.3						5.3	
Progression Factor		1.00			1.00						0.19	
Incremental Delay, d2		0.6			1.1						0.6	
Delay (s)		29.6			30.4						1.6	
Level of Service		C			C						A	
Approach Delay (s)		29.6			30.4			0.0			1.6	
Approach LOS		C			C			A			A	

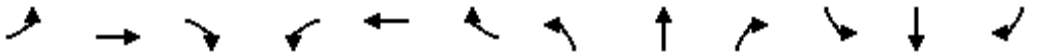
Intersection Summary			
HCM 2000 Control Delay	3.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBL	WBT	SBT
Lane Group Flow (vph)	373	69	289	1185
v/c Ratio	0.58	0.29	0.44	0.67
Control Delay	24.5	17.2	17.4	5.3
Queue Delay	0.0	0.0	0.0	0.1
Total Delay	24.5	17.2	17.4	5.4
Queue Length 50th (ft)	148	26	112	100
Queue Length 95th (ft)	238	m34	198	119
Internal Link Dist (ft)	174		323	277
Turn Bay Length (ft)				
Base Capacity (vph)	643	240	656	1758
Starvation Cap Reductn	0	0	0	47
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.58	0.29	0.44	0.69

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	275	98	69	289	0	0	0	0	155	952	78
Future Volume (vph)	0	275	98	69	289	0	0	0	0	155	952	78
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0		4.0	4.0						4.0	
Lane Util. Factor		1.00		1.00	1.00						0.95	
Frpb, ped/bikes		0.99		1.00	1.00						0.99	
Flpb, ped/bikes		1.00		0.99	1.00						1.00	
Frt		0.96		1.00	1.00						0.99	
Flt Protected		1.00		0.95	1.00						0.99	
Satd. Flow (prot)		1689		1665	1765						3275	
Flt Permitted		1.00		0.37	1.00						0.99	
Satd. Flow (perm)		1689		647	1765						3275	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	275	98	69	289	0	0	0	0	155	952	78
RTOR Reduction (vph)	0	15	0	0	0	0	0	0	0	0	6	0
Lane Group Flow (vph)	0	358	0	69	289	0	0	0	0	0	1179	0
Confl. Peds. (#/hr)	10		10	10		27	10		10	10		21
Confl. Bikes (#/hr)												60
Turn Type		NA		Perm	NA					Split	NA	
Protected Phases		4			8					6	6	
Permitted Phases				8								
Actuated Green, G (s)		32.0		32.0	32.0						46.0	
Effective Green, g (s)		32.0		32.0	32.0						46.0	
Actuated g/C Ratio		0.37		0.37	0.37						0.53	
Clearance Time (s)		4.0		4.0	4.0						4.0	
Lane Grp Cap (vph)		628		240	656						1751	
v/s Ratio Prot		c0.21			0.16						c0.36	
v/s Ratio Perm				0.11								
v/c Ratio		0.57		0.29	0.44						0.67	
Uniform Delay, d1		21.5		19.0	20.3						14.5	
Progression Factor		1.00		0.73	0.75						0.24	
Incremental Delay, d2		3.7		2.6	1.8						1.8	
Delay (s)		25.2		16.4	17.0						5.3	
Level of Service		C		B	B						A	
Approach Delay (s)		25.2			16.9			0.0			5.3	
Approach LOS		C			B			A			A	

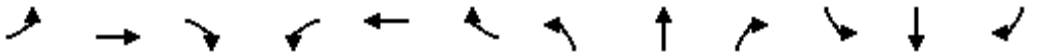
Intersection Summary			
HCM 2000 Control Delay	11.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	80.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	WBR	NBT	NBR	SBL
Lane Group Flow (vph)	135	234	161	122	1285	75	1
v/c Ratio	0.74	0.45	0.67	0.40	0.65	0.08	0.01
Control Delay	55.9	29.5	48.9	10.0	7.2	0.3	40.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.9	29.5	48.9	10.0	7.2	0.3	40.0
Queue Length 50th (ft)	71	107	83	0	43	0	1
Queue Length 95th (ft)	m#143	m183	144	44	400	m1	6
Internal Link Dist (ft)		323	183		528		
Turn Bay Length (ft)						100	
Base Capacity (vph)	205	586	289	345	1970	938	77
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.40	0.56	0.35	0.65	0.08	0.01

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	135	234	0	0	161	122	153	1132	75	1	0	0
Future Volume (vph)	135	234	0	0	161	122	153	1132	75	1	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0	4.0	6.0		
Lane Util. Factor	1.00	1.00			1.00	1.00		0.95	1.00	1.00		
Frpb, ped/bikes	1.00	1.00			1.00	0.97		1.00	1.00	1.00		
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00	1.00		
Frt	1.00	1.00			1.00	0.85		1.00	0.85	1.00		
Flt Protected	0.95	1.00			1.00	1.00		0.99	1.00	0.95		
Satd. Flow (prot)	1676	1765			1765	1460		3333	1500	1676		
Flt Permitted	0.95	1.00			1.00	1.00		0.99	1.00	0.95		
Satd. Flow (perm)	1676	1765			1765	1460		3333	1500	1676		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	135	234	0	0	161	122	153	1132	75	1	0	0
RTOR Reduction (vph)	0	0	0	0	0	105	0	0	35	0	0	0
Lane Group Flow (vph)	135	234	0	0	161	17	0	1285	40	1	0	0
Confl. Peds. (#/hr)	8					8	5					5
Confl. Bikes (#/hr)												60
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm	Prot		
Protected Phases	7	4			8		2	2		1		
Permitted Phases						8			2			
Actuated Green, G (s)	10.4	25.2			11.8	11.8		46.0	46.0	0.8		
Effective Green, g (s)	9.4	25.2			11.8	11.8		46.0	46.0	0.8		
Actuated g/C Ratio	0.11	0.29			0.14	0.14		0.53	0.53	0.01		
Clearance Time (s)	3.0	4.0			4.0	4.0		4.0	4.0	6.0		
Vehicle Extension (s)	2.0	2.5			2.5	2.5		0.2	0.2	3.0		
Lane Grp Cap (vph)	183	517			242	200		1782	802	15		
v/s Ratio Prot	c0.08	0.13			c0.09			c0.39		c0.00		
v/s Ratio Perm						0.01			0.03			
v/c Ratio	0.74	0.45			0.67	0.08		0.72	0.05	0.07		
Uniform Delay, d1	37.1	24.8			35.2	32.4		15.1	9.6	42.2		
Progression Factor	0.98	1.13			1.00	1.00		0.41	0.25	1.00		
Incremental Delay, d2	10.1	0.4			6.1	0.1		2.0	0.1	1.9		
Delay (s)	46.4	28.4			41.3	32.5		8.2	2.4	44.1		
Level of Service	D	C			D	C		A	A	D		
Approach Delay (s)		35.0			37.5			7.9			44.1	
Approach LOS		C			D			A			D	

Intersection Summary			
HCM 2000 Control Delay	17.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		

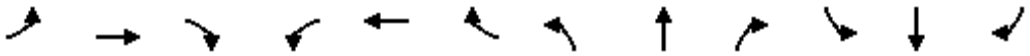
c Critical Lane Group



Lane Group	EBT	WBT	NBT	NBR	SBL
Lane Group Flow (vph)	51	98	1327	63	1
v/c Ratio	0.24	0.34	0.63	0.06	0.01
Control Delay	34.6	33.1	11.2	0.9	40.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	34.6	33.1	11.2	0.9	40.0
Queue Length 50th (ft)	24	44	201	0	1
Queue Length 95th (ft)	57	89	263	m7	6
Internal Link Dist (ft)	93	517	2424		
Turn Bay Length (ft)				100	
Base Capacity (vph)	217	287	2103	974	77
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.24	0.34	0.63	0.06	0.01

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



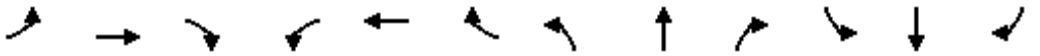
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	14	0	0	85	13	21	1306	63	1	0	0
Future Volume (vph)	37	14	0	0	85	13	21	1306	63	1	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0			4.0	4.0	6.0		
Lane Util. Factor		1.00			1.00			0.95	1.00	1.00		
Frpb, ped/bikes		1.00			0.99			1.00	1.00	1.00		
Flpb, ped/bikes		0.98			1.00			1.00	1.00	1.00		
Frt		1.00			0.98			1.00	0.85	1.00		
Flt Protected		0.96			1.00			1.00	1.00	0.95		
Satd. Flow (prot)		1673			1724			3350	1500	1676		
Flt Permitted		0.77			1.00			1.00	1.00	0.95		
Satd. Flow (perm)		1334			1724			3350	1500	1676		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	37	14	0	0	85	13	21	1306	63	1	0	0
RTOR Reduction (vph)	0	0	0	0	7	0	0	0	23	0	0	0
Lane Group Flow (vph)	0	51	0	0	91	0	0	1327	40	1	0	0
Confl. Peds. (#/hr)	15		12	12		15	10		19	19		10
Confl. Bikes (#/hr)												60
Turn Type	custom	NA			NA		Split	NA	Prot	Prot		
Protected Phases					8		2	2	2	1		
Permitted Phases	4	4										
Actuated Green, G (s)		14.0			14.0			54.0	54.0	4.0		
Effective Green, g (s)		14.0			14.0			54.0	54.0	4.0		
Actuated g/C Ratio		0.16			0.16			0.63	0.63	0.05		
Clearance Time (s)		4.0			4.0			4.0	4.0	6.0		
Lane Grp Cap (vph)		217			280			2103	941	77		
v/s Ratio Prot					c0.05			c0.40	0.03	c0.00		
v/s Ratio Perm		0.04										
v/c Ratio		0.24			0.33			0.63	0.04	0.01		
Uniform Delay, d1		31.3			31.8			9.9	6.1	39.1		
Progression Factor		1.00			1.00			0.97	0.91	1.00		
Incremental Delay, d2		2.5			3.1			1.5	0.1	0.3		
Delay (s)		33.9			34.9			11.0	5.7	39.4		
Level of Service		C			C			B	A	D		
Approach Delay (s)		33.9			34.9			10.7			39.4	
Approach LOS		C			C			B			D	

Intersection Summary			
HCM 2000 Control Delay	13.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	57.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	106	203	173	208	424	65	847	362	875
v/c Ratio	0.69	0.44	0.84	0.76	0.69	0.17	0.61	0.55	0.66
Control Delay	81.8	34.5	88.4	69.9	20.6	47.1	33.4	50.4	34.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.8	34.5	88.4	69.9	20.6	47.1	33.4	50.4	34.9
Queue Length 50th (ft)	87	49	144	169	151	45	288	138	301
Queue Length 95th (ft)	167	96	244	270	231	101	455	219	459
Internal Link Dist (ft)		595		272			1059		378
Turn Bay Length (ft)	175		300			135			
Base Capacity (vph)	227	693	334	465	828	374	1399	805	1821
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.29	0.52	0.45	0.51	0.17	0.61	0.45	0.48

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	106	122	81	173	208	424	65	771	76	362	813	62
Future Volume (vph)	106	122	81	173	208	424	65	771	76	362	813	62
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95		0.97	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1676	3152		1676	1765	1500	1676	3295		3252	3300	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1676	3152		1676	1765	1500	1676	3295		3252	3300	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	106	122	81	173	208	424	65	771	76	362	813	62
RTOR Reduction (vph)	0	71	0	0	0	81	0	5	0	0	4	0
Lane Group Flow (vph)	106	132	0	173	208	343	65	842	0	362	871	0
Confl. Bikes (#/hr)									60			60
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8	1 8	5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	11.7	15.9		16.7	19.9	45.6	28.5	53.9		25.7	51.1	
Effective Green, g (s)	11.7	15.9		15.7	19.9	45.6	28.5	53.9		25.7	51.1	
Actuated g/C Ratio	0.09	0.12		0.12	0.16	0.36	0.22	0.42		0.20	0.40	
Clearance Time (s)	4.0	4.0		3.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	1.5	1.5		1.0	1.5		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	154	394		206	276	537	375	1396		657	1325	
v/s Ratio Prot	0.06	0.04		c0.10	c0.12	0.23	0.04	c0.26		0.11	c0.26	
v/s Ratio Perm												
v/c Ratio	0.69	0.34		0.84	0.75	0.64	0.17	0.60		0.55	0.66	
Uniform Delay, d1	56.0	50.8		54.5	51.3	33.9	39.8	28.4		45.6	30.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.8	0.2		23.9	9.9	2.5	1.0	1.9		1.0	1.2	
Delay (s)	65.7	51.0		78.4	61.2	36.4	40.8	30.3		46.6	32.1	
Level of Service	E	D		E	E	D	D	C		D	C	
Approach Delay (s)		56.1			51.8			31.1			36.3	
Approach LOS		E			D			C			D	

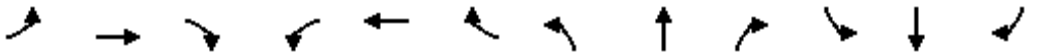
Intersection Summary			
HCM 2000 Control Delay	40.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	127.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	229	602	77	445	412	677	50	156	1008
v/c Ratio	0.97	0.68	0.58	0.67	0.95	0.50	0.07	0.80	0.80
Control Delay	102.1	43.4	69.9	48.9	84.6	29.9	10.3	78.5	39.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	102.1	43.4	69.9	48.9	84.6	29.9	10.3	78.5	39.4
Queue Length 50th (ft)	179	225	58	169	165	202	12	119	358
Queue Length 95th (ft)	#339	279	108	212	#264	301	28	187	#520
Internal Link Dist (ft)		1448		174		1573			1059
Turn Bay Length (ft)	250		250		275		300	150	
Base Capacity (vph)	237	943	167	821	433	1358	758	265	1256
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.64	0.46	0.54	0.95	0.50	0.07	0.59	0.80

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	229	378	224	77	387	58	412	677	50	156	821	187
Future Volume (vph)	229	378	224	77	387	58	412	677	50	156	821	187
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.94		1.00	0.98		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	3166		1676	3287		3252	3353	1500	1676	3231	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1676	3166		1676	3287		3252	3353	1500	1676	3231	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	229	378	224	77	387	58	412	677	50	156	821	187
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	229	602	0	77	445	0	412	677	50	156	1008	0
Confl. Bikes (#/hr)									60			60
Turn Type	Prot	NA		Prot	NA		Prot	NA	pt+ov	Prot	NA	
Protected Phases	7	4		3	8		5	2	2 3	1	6	
Permitted Phases												
Actuated Green, G (s)	18.0	33.4		9.5	24.9		17.0	48.0	57.5	15.1	46.1	
Effective Green, g (s)	17.0	33.4		8.5	24.9		16.0	48.0	57.5	14.1	46.1	
Actuated g/C Ratio	0.14	0.28		0.07	0.21		0.13	0.40	0.48	0.12	0.38	
Clearance Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.5	3.0		2.0	4.0		2.0	3.5		2.0	3.5	
Lane Grp Cap (vph)	237	881		118	682		433	1341	718	196	1241	
v/s Ratio Prot	c0.14	c0.19		0.05	c0.14		c0.13	0.20	0.03	0.09	c0.31	
v/s Ratio Perm												
v/c Ratio	0.97	0.68		0.65	0.65		0.95	0.50	0.07	0.80	0.81	
Uniform Delay, d1	51.2	38.6		54.3	43.6		51.6	27.1	16.8	51.5	33.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	48.5	2.2		9.5	2.5		30.8	1.4	0.0	18.5	5.9	
Delay (s)	99.7	40.8		63.8	46.1		82.4	28.4	16.9	70.0	38.9	
Level of Service	F	D		E	D		F	C	B	E	D	
Approach Delay (s)		57.0			48.7			47.4			43.1	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	48.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	82.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Arterial Level of Service: NB Central Avenue

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Edwards Street	III	30	45.4	39.0	84.4	0.36	15.2	D
Total	III		45.4	39.0	84.4	0.36	15.2	D

Arterial Level of Service: SB Central Avenue

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Central Avenue	III	30	22.0	0.0	22.0	0.16	26.8	B
Jackson Street	III	30	45.4	16.7	62.1	0.36	20.7	C
E 4th Street	III	30	22.6	11.9	34.5	0.18	18.5	C
6th Street	III	30	18.1	2.0	20.1	0.14	24.2	B
Main Street	III	30	11.0	10.0	21.0	0.07	12.2	E
8th Street	III	30	10.9	3.5	14.4	0.07	17.5	D
9th Street	III	30	10.5	1.6	12.1	0.07	20.2	C
10th	III	30	10.5	5.3	15.8	0.07	15.4	D
Total	III		151.0	51.0	202.0	1.11	19.8	C

Arterial Level of Service: NB Court Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
McAndrews Road	III	30	50.4	57.0	107.4	0.40	13.3	E
Ohio Street	III	30	16.0	45.0	61.0	0.11	6.7	F
Total	III		66.4	102.0	168.4	0.51	10.9	E

Arterial Level of Service: SB Court Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Ohio Street	III	30	21.9	8.7	30.6	0.16	19.2	C
E McAndrews Road	III	30	16.0	37.3	53.3	0.11	7.7	F
Central Avenue	III	30	50.4	17.2	67.6	0.40	21.1	C
Total	III		88.3	63.2	151.5	0.67	16.0	D

Arterial Level of Service: EB Main Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Oakdale Avenue	IV	30	17.4	36.0	53.4	0.10	6.5	F
Holly Street	IV	30	19.1	34.0	53.1	0.11	7.2	E
Grape Street	IV	30	12.0	34.0	46.0	0.05	4.1	F
Fir Street	IV	30	12.1	35.0	47.1	0.05	4.1	F
Front Street	IV	30	17.0	36.0	53.0	0.07	5.1	F
Central Avenue	IV	30	11.5	40.0	51.5	0.05	3.5	F
Riverside Avenue	IV	30	18.6	40.0	58.6	0.10	6.4	F
Total	IV		107.7	255.0	362.7	0.54	5.3	F

Arterial Level of Service: WB Main Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Riverside Avenue	IV	30	20.4	44.6	65.0	0.11	6.3	F
Central Avenue	IV	30	18.6	15.5	34.1	0.10	10.9	D
Front Street	IV	30	11.5	6.0	17.5	0.05	10.4	D
Fir Street	IV	30	17.0	2.3	19.3	0.07	14.0	C
Grape Street	IV	30	12.1	3.1	15.2	0.05	12.6	D
Holly Street	IV	30	12.0	1.9	13.9	0.05	13.7	C
Oakdale Avenue	IV	30	19.1	8.3	27.4	0.11	13.9	C
Total	IV		110.7	81.7	192.4	0.55	10.4	D

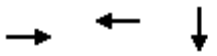
Arterial Level of Service: NB Riverside Avenue

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Barnett Road	III	30	27.4	33.4	60.8	0.22	12.8	E
12th Street	III	30	67.3	11.2	78.5	0.56	25.7	B
10th Street	III	30	16.2	7.2	23.4	0.12	17.7	D
8th Street	III	30	21.4	11.3	32.7	0.16	17.6	D
Main Street	III	30	10.9	15.5	26.4	0.07	9.6	F
	III	30	10.8	7.0	17.8	0.07	14.1	D
4th Street	III	30	18.8	9.8	28.6	0.14	17.7	D
Jackson Street	III	30	10.5	17.3	27.8	0.07	8.8	F
Manzanita Street	III	30	63.4	6.7	70.1	0.50	25.6	B
McAndrews Road	III	30	30.6	35.6	66.2	0.24	13.1	E
Mall Access	III	30	17.6	10.9	28.5	0.12	15.8	D
Total	III		294.9	165.9	460.8	2.26	17.7	D

Arterial Level of Service: SB Riverside Avenue

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Ohio Street	III	30	23.0	45.0	68.0	0.18	9.6	F
McAndrews Road	III	30	17.6	57.0	74.6	0.12	6.0	F
Manzanita Street	III	30	30.6	40.0	70.6	0.24	12.3	E
Jackson Street	III	30	63.4	40.0	103.4	0.50	17.4	D
4th Street	III	30	10.5	40.0	50.5	0.07	4.8	F
6th Street	III	30	18.8	40.0	58.8	0.14	8.6	F
Main Street	III	30	10.8	40.0	50.8	0.07	4.9	F
8th Street	III	30	10.9	40.0	50.9	0.07	5.0	F
10th Street	III	30	21.4	40.0	61.4	0.16	9.4	F
12th Street	III	30	16.2	40.0	56.2	0.12	7.4	F
Barnett Road	III	30	67.3	34.9	102.2	0.56	19.8	C
Stewart Avenue	III	30	27.4	39.4	66.8	0.22	11.6	E
Total	III		317.9	496.3	814.2	2.45	10.8	E

2024 Alternative B
Permissive Phasing

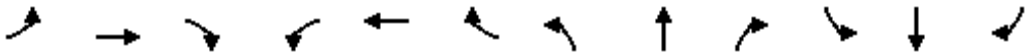


Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	276	220	1131
v/c Ratio	0.72	1.50	0.33
Control Delay	36.8	285.5	6.1
Queue Delay	0.0	0.0	0.0
Total Delay	36.8	285.5	6.1
Queue Length 50th (ft)	120	~180	83
Queue Length 95th (ft)	190	#309	140
Internal Link Dist (ft)	1754	380	781
Turn Bay Length (ft)			
Base Capacity (vph)	715	304	3386
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.39	0.72	0.33

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	110	166	83	137	0	0	0	0	65	985	81
Future Volume (vph)	0	110	166	83	137	0	0	0	0	65	985	81
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						0.91	
Frpb, ped/bikes		0.99			1.00						0.99	
Flpb, ped/bikes		1.00			1.00						1.00	
Frt		0.92			1.00						0.99	
Flt Protected		1.00			0.98						1.00	
Satd. Flow (prot)		1598			1728						4720	
Flt Permitted		1.00			0.41						1.00	
Satd. Flow (perm)		1598			725						4720	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	110	166	83	137	0	0	0	0	65	985	81
RTOR Reduction (vph)	0	60	0	0	0	0	0	0	0	0	5	0
Lane Group Flow (vph)	0	216	0	0	220	0	0	0	0	0	1126	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)												60
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		20.8			20.8						71.7	
Effective Green, g (s)		20.3			20.3						71.7	
Actuated g/C Ratio		0.20			0.20						0.72	
Clearance Time (s)		3.5			3.5						4.0	
Vehicle Extension (s)		2.0			2.0						4.0	
Lane Grp Cap (vph)		324			147						3384	
v/s Ratio Prot		0.14										
v/s Ratio Perm					c0.30						0.24	
v/c Ratio		0.67			1.50						0.33	
Uniform Delay, d1		36.7			39.9						5.3	
Progression Factor		1.00			0.90						1.00	
Incremental Delay, d2		4.0			254.8						0.3	
Delay (s)		40.7			290.7						5.5	
Level of Service		D			F						A	
Approach Delay (s)		40.7			290.7			0.0			5.5	
Approach LOS		D			F			A			A	

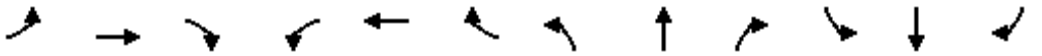
Intersection Summary			
HCM 2000 Control Delay	50.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	68.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBT	WBT	WBR	NBT
Lane Group Flow (vph)	224	95	83	1698
v/c Ratio	0.80	0.26	0.26	0.52
Control Delay	48.2	26.7	22.5	8.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	48.2	26.7	22.5	8.9
Queue Length 50th (ft)	93	44	30	167
Queue Length 95th (ft)	149	81	66	266
Internal Link Dist (ft)	380	1230		579
Turn Bay Length (ft)				
Base Capacity (vph)	450	566	498	3284
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.50	0.17	0.17	0.52

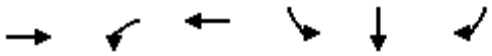
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	142	82	0	0	74	104	107	1501	90	0	0	0
Future Volume (vph)	142	82	0	0	74	104	107	1501	90	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.5			4.5	4.5		5.0				
Lane Util. Factor		1.00			0.95	0.95		0.91				
Frpb, ped/bikes		1.00			0.99	0.98		1.00				
Flpb, ped/bikes		0.99			1.00	1.00		1.00				
Frt		1.00			0.97	0.85		0.99				
Flt Protected		0.97			1.00	1.00		1.00				
Satd. Flow (prot)		1700			1613	1392		4755				
Flt Permitted		0.74			1.00	1.00		1.00				
Satd. Flow (perm)		1306			1613	1392		4755				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	142	82	0	0	74	104	107	1501	90	0	0	0
RTOR Reduction (vph)	0	0	0	0	13	22	0	4	0	0	0	0
Lane Group Flow (vph)	0	224	0	0	82	61	0	1694	0	0	0	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)												60
Turn Type	Perm	NA			NA	Perm	Split	NA				
Protected Phases		4			8		2	2				
Permitted Phases	4					8						
Actuated Green, G (s)		22.0			22.0	22.0		69.5				
Effective Green, g (s)		21.5			21.5	21.5		69.0				
Actuated g/C Ratio		0.22			0.22	0.22		0.69				
Clearance Time (s)		4.0			4.0	4.0		4.5				
Vehicle Extension (s)		2.5			2.5	2.5		2.0				
Lane Grp Cap (vph)		280			346	299		3280				
v/s Ratio Prot					0.05			c0.36				
v/s Ratio Perm		c0.17				0.04						
v/c Ratio		0.80			0.24	0.20		0.52				
Uniform Delay, d1		37.2			32.5	32.2		7.5				
Progression Factor		0.77			1.00	1.00		1.00				
Incremental Delay, d2		14.3			0.3	0.2		0.6				
Delay (s)		43.0			32.7	32.5		8.0				
Level of Service		D			C	C		A				
Approach Delay (s)		43.0			32.6			8.0			0.0	
Approach LOS		D			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	13.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.5
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		

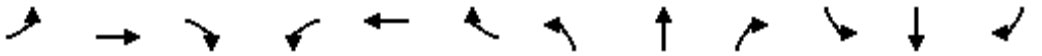
c Critical Lane Group



Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	533	195	767	380	706	58
v/c Ratio	0.48	0.50	0.38	0.68	0.64	0.11
Control Delay	34.1	31.2	4.7	40.8	36.1	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.1	31.2	4.7	40.8	36.1	6.6
Queue Length 50th (ft)	172	137	45	247	236	0
Queue Length 95th (ft)	241	m209	54	337	283	28
Internal Link Dist (ft)	1762		672		521	
Turn Bay Length (ft)		110		175		175
Base Capacity (vph)	1112	391	2018	642	1285	582
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.50	0.38	0.59	0.55	0.10

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	485	48	195	767	0	0	0	0	380	706	58
Future Volume (vph)	0	485	48	195	767	0	0	0	0	380	706	58
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0		4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.95		1.00	0.95					1.00	0.95	1.00
Frpb, ped/bikes		1.00		1.00	1.00					1.00	1.00	0.95
Flpb, ped/bikes		1.00		1.00	1.00					1.00	1.00	1.00
Frt		0.99		1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		3303		1676	3353					1676	3353	1418
Flt Permitted		1.00		0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		3303		1676	3353					1676	3353	1418
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	485	48	195	767	0	0	0	0	380	706	58
RTOR Reduction (vph)	0	6	0	0	0	0	0	0	0	0	0	39
Lane Group Flow (vph)	0	527	0	195	767	0	0	0	0	380	706	19
Confl. Peds. (#/hr)	2		2	2		2	2		1	1		2
Confl. Bikes (#/hr)												60
Turn Type		NA		Prot	NA					Split	NA	Perm
Protected Phases		4		3	8					6	6	
Permitted Phases												6
Actuated Green, G (s)		40.2		29.0	72.2					39.8	39.8	39.8
Effective Green, g (s)		40.2		28.0	72.2					39.8	39.8	39.8
Actuated g/C Ratio		0.34		0.23	0.60					0.33	0.33	0.33
Clearance Time (s)		4.0		3.0	4.0					4.0	4.0	4.0
Vehicle Extension (s)		4.0		2.0	4.0					5.0	5.0	5.0
Lane Grp Cap (vph)		1106		391	2017					555	1112	470
v/s Ratio Prot		c0.16		c0.12	0.23					c0.23	0.21	
v/s Ratio Perm												0.01
v/c Ratio		0.48		0.50	0.38					0.68	0.63	0.04
Uniform Delay, d1		31.6		39.9	12.3					34.7	33.9	27.2
Progression Factor		1.00		0.68	0.31					1.00	1.00	1.00
Incremental Delay, d2		1.5		0.3	0.5					4.5	1.7	0.1
Delay (s)		33.0		27.3	4.3					39.2	35.6	27.2
Level of Service		C		C	A					D	D	C
Approach Delay (s)		33.0			9.0			0.0			36.4	
Approach LOS		C			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	25.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	76.1%	ICU Level of Service	D
Analysis Period (min)	15		

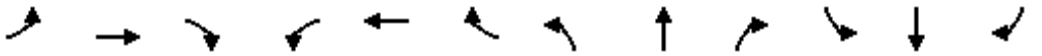
c Critical Lane Group



Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Group Flow (vph)	95	750	899	518	1253	263
v/c Ratio	0.65	0.36	0.53	0.66	0.79	0.43
Control Delay	75.0	1.9	22.0	23.2	40.5	12.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.0	1.9	22.0	23.2	40.5	12.5
Queue Length 50th (ft)	64	25	243	241	319	45
Queue Length 95th (ft)	m123	22	314	384	378	119
Internal Link Dist (ft)		672	692		1193	
Turn Bay Length (ft)	130					150
Base Capacity (vph)	181	2069	1690	781	1596	607
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.36	0.53	0.66	0.79	0.43

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	95	750	0	0	899	518	139	1114	263	0	0	0
Future Volume (vph)	95	750	0	0	899	518	139	1114	263	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	3.0			3.0	3.0		3.0	3.0			
Lane Util. Factor	1.00	0.95			0.95	1.00		0.91	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	0.97		1.00	0.97			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.99	1.00			
Satd. Flow (prot)	1676	3353			3353	1456		4791	1461			
Flt Permitted	0.95	1.00			1.00	1.00		0.99	1.00			
Satd. Flow (perm)	1676	3353			3353	1456		4791	1461			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	95	750	0	0	899	518	139	1114	263	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	47	0	0	120	0	0	0
Lane Group Flow (vph)	95	750	0	0	899	471	0	1253	143	0	0	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)												60
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	7	4			8		2	2				
Permitted Phases						8			2			
Actuated Green, G (s)	10.5	73.1			59.6	59.6		38.9	38.9			
Effective Green, g (s)	10.5	74.1			60.6	60.6		39.9	39.9			
Actuated g/C Ratio	0.09	0.62			0.51	0.51		0.33	0.33			
Clearance Time (s)	3.0	4.0			4.0	4.0		4.0	4.0			
Vehicle Extension (s)	2.0	4.0			4.0	4.0		4.0	4.0			
Lane Grp Cap (vph)	146	2070			1693	735		1593	485			
v/s Ratio Prot	c0.06	0.22			0.27			c0.26				
v/s Ratio Perm						c0.32			0.10			
v/c Ratio	0.65	0.36			0.53	0.64		0.79	0.29			
Uniform Delay, d1	53.0	11.3			20.1	21.7		36.2	29.6			
Progression Factor	1.10	0.13			1.00	1.00		1.00	1.00			
Incremental Delay, d2	6.6	0.4			1.2	4.3		2.8	0.5			
Delay (s)	64.7	1.9			21.3	26.0		39.0	30.1			
Level of Service	E	A			C	C		D	C			
Approach Delay (s)		9.0			23.0			37.5			0.0	
Approach LOS		A			C			D			A	

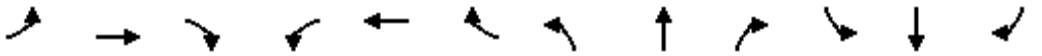
Intersection Summary			
HCM 2000 Control Delay	25.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	76.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



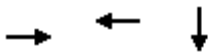
Lane Group	EBT	WBT	NBT
Lane Group Flow (vph)	87	19	1535
v/c Ratio	0.45	0.07	0.70
Control Delay	40.0	22.3	3.9
Queue Delay	0.0	0.0	0.0
Total Delay	40.0	22.3	3.9
Queue Length 50th (ft)	43	5	84
Queue Length 95th (ft)	89	23	80
Internal Link Dist (ft)	550	165	918
Turn Bay Length (ft)			
Base Capacity (vph)	195	263	2203
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.45	0.07	0.70

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	83	4	0	0	10	9	44	1474	17	0	0	0
Future Volume (vph)	83	4	0	0	10	9	44	1474	17	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0			4.0				
Lane Util. Factor		1.00			1.00			0.95				
Frpb, ped/bikes		1.00			0.99			1.00				
Flpb, ped/bikes		0.98			1.00			1.00				
Frt		1.00			0.94			1.00				
Flt Protected		0.95			1.00			1.00				
Satd. Flow (prot)		1483			1466			3007				
Flt Permitted		0.72			1.00			1.00				
Satd. Flow (perm)		1122			1466			3007				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	83	4	0	0	10	9	44	1474	17	0	0	0
RTOR Reduction (vph)	0	0	0	0	7	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	87	0	0	12	0	0	1534	0	0	0	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)												60
Turn Type	Perm	NA			NA		Split	NA				
Protected Phases		4			8		2	2				
Permitted Phases	4											
Actuated Green, G (s)		15.0			15.0			63.0				
Effective Green, g (s)		15.0			15.0			63.0				
Actuated g/C Ratio		0.17			0.17			0.73				
Clearance Time (s)		4.0			4.0			4.0				
Lane Grp Cap (vph)		195			255			2202				
v/s Ratio Prot					0.01			c0.51				
v/s Ratio Perm		c0.08										
v/c Ratio		0.45			0.05			0.70				
Uniform Delay, d1		31.8			29.5			6.3				
Progression Factor		1.00			1.00			0.39				
Incremental Delay, d2		7.2			0.3			1.4				
Delay (s)		39.0			29.9			3.8				
Level of Service		D			C			A				
Approach Delay (s)		39.0			29.9			3.8			0.0	
Approach LOS		D			C			A			A	

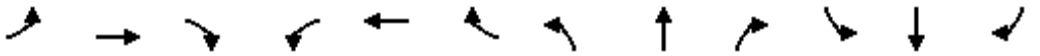
Intersection Summary			
HCM 2000 Control Delay	6.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	207	88	991
v/c Ratio	0.72	0.44	0.50
Control Delay	23.9	37.4	11.6
Queue Delay	0.0	0.0	0.0
Total Delay	23.9	37.4	11.6
Queue Length 50th (ft)	18	49	119
Queue Length 95th (ft)	82	m64	311
Internal Link Dist (ft)	7	1528	2014
Turn Bay Length (ft)			
Base Capacity (vph)	367	414	1965
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.56	0.21	0.50

Intersection Summary

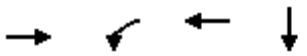
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	35	172	45	43	0	0	0	0	61	907	23
Future Volume (vph)	0	35	172	45	43	0	0	0	0	61	907	23
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						0.95	
Frpb, ped/bikes		0.96			1.00						1.00	
Flpb, ped/bikes		1.00			1.00						1.00	
Frt		0.89			1.00						1.00	
Flt Protected		1.00			0.98						1.00	
Satd. Flow (prot)		1360			1549						2993	
Flt Permitted		1.00			0.98						1.00	
Satd. Flow (perm)		1360			1549						2993	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	35	172	45	43	0	0	0	0	61	907	23
RTOR Reduction (vph)	0	156	0	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	51	0	0	88	0	0	0	0	0	990	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)												60
Turn Type		NA		Split	NA					Split	NA	
Protected Phases		7		8	8					6	6	
Permitted Phases												
Actuated Green, G (s)		8.2			10.1						55.7	
Effective Green, g (s)		8.2			10.1						55.7	
Actuated g/C Ratio		0.10			0.12						0.65	
Clearance Time (s)		4.0			4.0						4.0	
Vehicle Extension (s)		2.0			2.0						4.0	
Lane Grp Cap (vph)		129			181						1938	
v/s Ratio Prot		c0.04			c0.06						c0.33	
v/s Ratio Perm												
v/c Ratio		0.40			0.49						0.51	
Uniform Delay, d1		36.6			35.5						8.0	
Progression Factor		1.00			0.98						1.00	
Incremental Delay, d2		0.7			0.6						1.0	
Delay (s)		37.3			35.4						8.9	
Level of Service		D			D						A	
Approach Delay (s)		37.3			35.4			0.0			8.9	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	15.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.6%	ICU Level of Service	C
Analysis Period (min)	15		

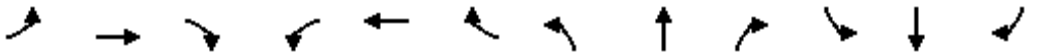
c Critical Lane Group



Lane Group	EBT	WBL	WBT	SBT
Lane Group Flow (vph)	349	57	287	1172
v/c Ratio	0.64	0.27	0.52	0.71
Control Delay	28.8	15.2	16.0	13.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	28.8	15.2	16.0	13.2
Queue Length 50th (ft)	150	13	69	258
Queue Length 95th (ft)	244	m21	m104	63
Internal Link Dist (ft)	1450		992	1806
Turn Bay Length (ft)		250		
Base Capacity (vph)	547	208	553	1643
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.64	0.27	0.52	0.71

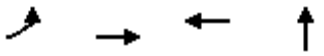
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	288	61	57	287	0	0	0	0	165	890	117
Future Volume (vph)	0	288	61	57	287	0	0	0	0	165	890	117
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0		4.0	4.0						4.0	
Lane Util. Factor		1.00		1.00	1.00						0.95	
Frpb, ped/bikes		1.00		1.00	1.00						0.99	
Flpb, ped/bikes		1.00		1.00	1.00						1.00	
Frt		0.98		1.00	1.00						0.99	
Flt Protected		1.00		0.95	1.00						0.99	
Satd. Flow (prot)		1545		1502	1588						2928	
Flt Permitted		1.00		0.38	1.00						0.99	
Satd. Flow (perm)		1545		597	1588						2928	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	288	61	57	287	0	0	0	0	165	890	117
RTOR Reduction (vph)	0	9	0	0	0	0	0	0	0	0	10	0
Lane Group Flow (vph)	0	340	0	57	287	0	0	0	0	0	1162	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		15
Confl. Bikes (#/hr)												60
Turn Type		NA		Perm	NA					Split	NA	
Protected Phases		4			8					6	6	
Permitted Phases				8								
Actuated Green, G (s)		30.0		30.0	30.0						48.0	
Effective Green, g (s)		30.0		30.0	30.0						48.0	
Actuated g/C Ratio		0.35		0.35	0.35						0.56	
Clearance Time (s)		4.0		4.0	4.0						4.0	
Lane Grp Cap (vph)		538		208	553						1634	
v/s Ratio Prot		c0.22			0.18						c0.40	
v/s Ratio Perm				0.10								
v/c Ratio		0.63		0.27	0.52						0.71	
Uniform Delay, d1		23.4		20.2	22.3						13.9	
Progression Factor		1.00		0.60	0.59						0.77	
Incremental Delay, d2		5.6		2.3	2.4						2.4	
Delay (s)		28.9		14.4	15.6						13.1	
Level of Service		C		B	B						B	
Approach Delay (s)		28.9			15.4			0.0			13.1	
Approach LOS		C			B			A			B	

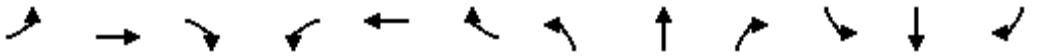
Intersection Summary			
HCM 2000 Control Delay	16.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	91.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	NBT
Lane Group Flow (vph)	110	361	369	1366
v/c Ratio	0.57	0.65	0.68	0.82
Control Delay	37.8	33.0	28.7	8.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	37.8	33.0	28.7	8.1
Queue Length 50th (ft)	54	184	150	59
Queue Length 95th (ft)	m89	m273	251	74
Internal Link Dist (ft)		992	302	277
Turn Bay Length (ft)	200			
Base Capacity (vph)	193	553	542	1668
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.57	0.65	0.68	0.82

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	361	0	0	228	141	105	1221	40	0	0	0
Future Volume (vph)	110	361	0	0	228	141	105	1221	40	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0			4.0			4.0				
Lane Util. Factor	1.00	1.00			1.00			0.95				
Frpb, ped/bikes	1.00	1.00			0.98			1.00				
Flpb, ped/bikes	0.99	1.00			1.00			1.00				
Frt	1.00	1.00			0.95			1.00				
Flt Protected	0.95	1.00			1.00			1.00				
Satd. Flow (prot)	1490	1588			1481			2985				
Flt Permitted	0.35	1.00			1.00			1.00				
Satd. Flow (perm)	554	1588			1481			2985				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	110	361	0	0	228	141	105	1221	40	0	0	0
RTOR Reduction (vph)	0	0	0	0	26	0	0	3	0	0	0	0
Lane Group Flow (vph)	110	361	0	0	343	0	0	1363	0	0	0	0
Confl. Peds. (#/hr)	18		12	12		18	37		32	32		37
Confl. Bikes (#/hr)												60
Turn Type	Perm	NA			NA		Split	NA				
Protected Phases		4			8		2	2				
Permitted Phases	4											
Actuated Green, G (s)	30.0	30.0			30.0			48.0				
Effective Green, g (s)	30.0	30.0			30.0			48.0				
Actuated g/C Ratio	0.35	0.35			0.35			0.56				
Clearance Time (s)	4.0	4.0			4.0			4.0				
Lane Grp Cap (vph)	193	553			516			1666				
v/s Ratio Prot		0.23			c0.23			c0.46				
v/s Ratio Perm	0.20											
v/c Ratio	0.57	0.65			0.66			0.82				
Uniform Delay, d1	22.8	23.6			23.7			15.5				
Progression Factor	1.15	1.16			1.00			0.31				
Incremental Delay, d2	9.0	4.6			6.6			3.2				
Delay (s)	35.3	32.0			30.4			7.9				
Level of Service	D	C			C			A				
Approach Delay (s)		32.8			30.4			7.9			0.0	
Approach LOS		C			C			A			A	

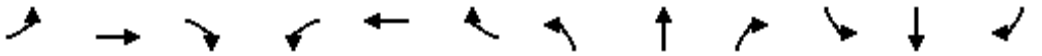
Intersection Summary			
HCM 2000 Control Delay	17.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	91.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBL	WBT	SBT	SBR
Lane Group Flow (vph)	309	239	287	830	179
v/c Ratio	0.67	0.55	0.35	0.70	0.28
Control Delay	34.9	9.9	8.3	12.1	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	34.9	9.9	8.3	12.1	1.0
Queue Length 50th (ft)	144	64	86	90	0
Queue Length 95th (ft)	235	m70	m96	142	m0
Internal Link Dist (ft)	282		688	858	
Turn Bay Length (ft)		250			
Base Capacity (vph)	458	434	812	1191	641
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.67	0.55	0.35	0.70	0.28

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	279	30	239	287	0	0	0	0	21	809	179
Future Volume (vph)	0	279	30	239	287	0	0	0	0	21	809	179
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0		4.0	4.0						4.0	4.0
Lane Util. Factor		1.00		1.00	1.00						0.95	1.00
Frpb, ped/bikes		1.00		1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00						1.00	1.00
Frt		0.99		1.00	1.00						1.00	0.85
Flt Protected		1.00		0.95	1.00						1.00	1.00
Satd. Flow (prot)		1563		1506	1588						3014	1350
Flt Permitted		1.00		0.32	1.00						1.00	1.00
Satd. Flow (perm)		1563		512	1588						3014	1350
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	279	30	239	287	0	0	0	0	21	809	179
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	0	0	0	108
Lane Group Flow (vph)	0	305	0	239	287	0	0	0	0	0	830	71
Confl. Peds. (#/hr)	6		11	11		6			2	2		
Confl. Bikes (#/hr)												60
Turn Type		NA		pm+pt	NA					Split	NA	Prot
Protected Phases		4		3	8					6	6	6
Permitted Phases				8	8							
Actuated Green, G (s)		25.0		44.0	44.0						34.0	34.0
Effective Green, g (s)		25.0		44.0	44.0						34.0	34.0
Actuated g/C Ratio		0.29		0.51	0.51						0.40	0.40
Clearance Time (s)		4.0		4.0	4.0						4.0	4.0
Lane Grp Cap (vph)		454		435	812						1191	533
v/s Ratio Prot		c0.20		c0.10	0.18						c0.28	0.05
v/s Ratio Perm				0.19								
v/c Ratio		0.67		0.55	0.35						0.70	0.13
Uniform Delay, d1		26.9		13.5	12.5						21.7	16.6
Progression Factor		1.00		0.58	0.59						0.44	0.08
Incremental Delay, d2		7.7		2.7	0.7						2.5	0.4
Delay (s)		34.6		10.4	8.1						11.9	1.7
Level of Service		C		B	A						B	A
Approach Delay (s)		34.6			9.2			0.0			10.1	
Approach LOS		C			A			A			B	

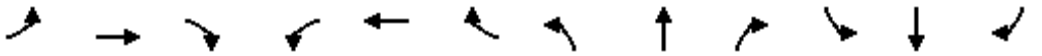
Intersection Summary			
HCM 2000 Control Delay	13.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	84.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	NBT	NBR
Lane Group Flow (vph)	125	252	474	1143	467
v/c Ratio	0.65	0.37	0.94	0.80	0.53
Control Delay	24.6	11.2	56.3	17.8	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	24.6	11.2	56.3	17.8	2.5
Queue Length 50th (ft)	34	118	234	169	2
Queue Length 95th (ft)	m44	m158	#410	#320	m27
Internal Link Dist (ft)		688	289	661	
Turn Bay Length (ft)	250				250
Base Capacity (vph)	194	738	552	1427	875
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.64	0.34	0.86	0.80	0.53

Intersection Summary

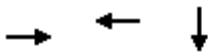
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	252	0	0	460	14	46	1097	467	0	0	0
Future Volume (vph)	125	252	0	0	460	14	46	1097	467	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0			4.0			4.0	4.0			
Lane Util. Factor	1.00	1.00			1.00			0.95	1.00			
Frpb, ped/bikes	1.00	1.00			1.00			1.00	0.98			
Flpb, ped/bikes	1.00	1.00			1.00			1.00	1.00			
Frt	1.00	1.00			1.00			1.00	0.85			
Flt Protected	0.95	1.00			1.00			1.00	1.00			
Satd. Flow (prot)	1509	1588			1581			3012	1327			
Flt Permitted	0.15	1.00			1.00			1.00	1.00			
Satd. Flow (perm)	246	1588			1581			3012	1327			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	125	252	0	0	460	14	46	1097	467	0	0	0
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	246	0	0	0
Lane Group Flow (vph)	125	252	0	0	473	0	0	1143	221	0	0	0
Confl. Peds. (#/hr)	4		5	5		4	5		4	4		5
Confl. Bikes (#/hr)												60
Turn Type	pm+pt	NA			NA		Split	NA	Perm			
Protected Phases	7	4			8		2	2				
Permitted Phases	4								2			
Actuated Green, G (s)	37.3	37.3			27.5			40.7	40.7			
Effective Green, g (s)	36.3	37.3			27.5			40.7	40.7			
Actuated g/C Ratio	0.42	0.43			0.32			0.47	0.47			
Clearance Time (s)	3.0	4.0			4.0			4.0	4.0			
Vehicle Extension (s)	2.0	0.2			0.2			0.2	0.2			
Lane Grp Cap (vph)	189	688			505			1425	628			
v/s Ratio Prot	c0.04	0.16			c0.30			c0.38				
v/s Ratio Perm	0.23								0.17			
v/c Ratio	0.66	0.37			0.94			0.80	0.35			
Uniform Delay, d1	18.7	16.4			28.4			19.2	14.3			
Progression Factor	0.63	0.62			1.00			0.69	0.56			
Incremental Delay, d2	5.6	0.1			24.6			3.2	1.0			
Delay (s)	17.3	10.3			53.0			16.4	9.0			
Level of Service	B	B			D			B	A			
Approach Delay (s)		12.6			53.0			14.3			0.0	
Approach LOS		B			D			B			A	

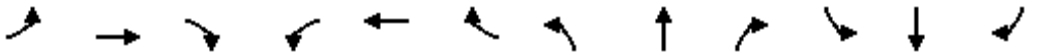
Intersection Summary			
HCM 2000 Control Delay	21.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	84.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	148	89	1168
v/c Ratio	0.37	0.27	0.52
Control Delay	26.9	29.7	2.2
Queue Delay	0.0	0.0	0.0
Total Delay	26.9	29.7	2.2
Queue Length 50th (ft)	58	40	21
Queue Length 95th (ft)	111	81	40
Internal Link Dist (ft)	137	79	634
Turn Bay Length (ft)			
Base Capacity (vph)	404	330	2243
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.37	0.27	0.52

Intersection Summary



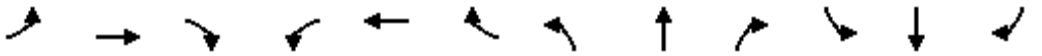
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	108	40	43	46	0	0	0	0	42	1103	23
Future Volume (vph)	0	108	40	43	46	0	0	0	0	42	1103	23
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						0.95	
Frpb, ped/bikes		0.98			1.00						1.00	
Flpb, ped/bikes		1.00			0.98						1.00	
Frt		0.96			1.00						1.00	
Flt Protected		1.00			0.98						1.00	
Satd. Flow (prot)		1672			1691						3325	
Flt Permitted		1.00			0.82						1.00	
Satd. Flow (perm)		1672			1424						3325	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	108	40	43	46	0	0	0	0	42	1103	23
RTOR Reduction (vph)	0	15	0	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	133	0	0	89	0	0	0	0	0	1166	0
Confl. Peds. (#/hr)	22		24	24		22	14		20	20		14
Confl. Bikes (#/hr)												60
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		20.0			20.0						58.0	
Effective Green, g (s)		20.0			20.0						58.0	
Actuated g/C Ratio		0.23			0.23						0.67	
Clearance Time (s)		4.0			4.0						4.0	
Lane Grp Cap (vph)		388			331						2242	
v/s Ratio Prot		c0.08										
v/s Ratio Perm					0.06						0.35	
v/c Ratio		0.34			0.27						0.52	
Uniform Delay, d1		27.5			27.0						7.0	
Progression Factor		1.00			1.00						0.21	
Incremental Delay, d2		2.4			2.0						0.7	
Delay (s)		29.9			29.0						2.2	
Level of Service		C			C						A	
Approach Delay (s)		29.9			29.0			0.0			2.2	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	6.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	67.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBT	WBR	NBT
Lane Group Flow (vph)	230	16	22	1561
v/c Ratio	0.60	0.03	0.05	0.77
Control Delay	33.5	21.5	9.5	7.4
Queue Delay	0.0	0.0	0.0	0.4
Total Delay	33.5	21.5	9.5	7.7
Queue Length 50th (ft)	106	6	0	151
Queue Length 95th (ft)	183	21	17	238
Internal Link Dist (ft)	175	153		287
Turn Bay Length (ft)				
Base Capacity (vph)	381	533	468	2018
Starvation Cap Reductn	0	0	0	115
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.60	0.03	0.05	0.82

Intersection Summary



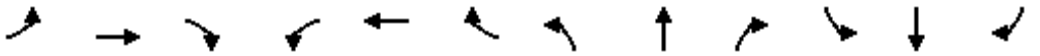
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	220	10	0	0	16	22	56	1489	16	0	0	0
Future Volume (vph)	220	10	0	0	16	22	56	1489	16	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0	4.0		4.0				
Lane Util. Factor		1.00			1.00	1.00		0.95				
Frpb, ped/bikes		1.00			1.00	1.00		1.00				
Flpb, ped/bikes		0.99			1.00	1.00		1.00				
Frt		1.00			1.00	0.85		1.00				
Flt Protected		0.95			1.00	1.00		1.00				
Satd. Flow (prot)		1663			1765	1500		3339				
Flt Permitted		0.72			1.00	1.00		1.00				
Satd. Flow (perm)		1261			1765	1500		3339				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	220	10	0	0	16	22	56	1489	16	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	15	0	1	0	0	0	0
Lane Group Flow (vph)	0	230	0	0	16	7	0	1560	0	0	0	0
Confl. Peds. (#/hr)	10		10				10					10
Confl. Bikes (#/hr)												60
Turn Type	Perm	NA			NA	Perm	Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4					8	2					
Actuated Green, G (s)		26.0			26.0	26.0		52.0				
Effective Green, g (s)		26.0			26.0	26.0		52.0				
Actuated g/C Ratio		0.30			0.30	0.30		0.60				
Clearance Time (s)		4.0			4.0	4.0		4.0				
Lane Grp Cap (vph)		381			533	453		2018				
v/s Ratio Prot					0.01							
v/s Ratio Perm		c0.18				0.00		0.47				
v/c Ratio		0.60			0.03	0.01		0.77				
Uniform Delay, d1		25.6			21.1	21.0		12.6				
Progression Factor		1.00			1.00	1.00		0.39				
Incremental Delay, d2		6.9			0.1	0.1		2.3				
Delay (s)		32.5			21.2	21.1		7.2				
Level of Service		C			C	C		A				
Approach Delay (s)		32.5			21.1			7.2			0.0	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	10.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	83.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	497	25	86	215
v/c Ratio	0.32	0.06	0.11	0.29
Control Delay	5.9	15.0	15.3	16.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	5.9	15.0	15.3	16.9
Queue Length 50th (ft)	28	8	27	72
Queue Length 95th (ft)	40	22	55	122
Internal Link Dist (ft)	479		105	1243
Turn Bay Length (ft)				
Base Capacity (vph)	1576	421	759	753
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.32	0.06	0.11	0.29

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	95	387	15	25	86	0	0	204	11
Future Volume (vph)	0	0	0	95	387	15	25	86	0	0	204	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.0		4.0	4.0			4.0	
Lane Util. Factor					0.95		1.00	1.00			1.00	
Frpb, ped/bikes					1.00		1.00	1.00			1.00	
Flpb, ped/bikes					1.00		0.96	1.00			1.00	
Frt					1.00		1.00	1.00			0.99	
Flt Protected					0.99		0.95	1.00			1.00	
Satd. Flow (prot)					3301		1608	1765			1746	
Flt Permitted					0.99		0.58	1.00			1.00	
Satd. Flow (perm)					3301		980	1765			1746	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	95	387	15	25	86	0	0	204	11
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	0	0	0	494	0	25	86	0	0	213	0
Confl. Peds. (#/hr)	15		46	46		15	35		34	34		35
Confl. Bikes (#/hr)			60									
Turn Type				Split	NA		Perm	NA			NA	
Protected Phases				8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)					41.0		37.0	37.0			37.0	
Effective Green, g (s)					41.0		37.0	37.0			37.0	
Actuated g/C Ratio					0.48		0.43	0.43			0.43	
Clearance Time (s)					4.0		4.0	4.0			4.0	
Lane Grp Cap (vph)					1573		421	759			751	
v/s Ratio Prot					c0.15			0.05			c0.12	
v/s Ratio Perm							0.03					
v/c Ratio					0.31		0.06	0.11			0.28	
Uniform Delay, d1					13.8		14.3	14.7			15.9	
Progression Factor					0.39		1.00	1.00			1.00	
Incremental Delay, d2					0.5		0.3	0.3			0.9	
Delay (s)					5.9		14.6	15.0			16.8	
Level of Service					A		B	B			B	
Approach Delay (s)		0.0			5.9			14.9			16.8	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	10.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	46.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBT	NBT	SBT
Lane Group Flow (vph)	451	62	42
v/c Ratio	0.23	0.12	0.08
Control Delay	1.7	21.9	19.8
Queue Delay	0.2	0.0	0.0
Total Delay	1.9	21.9	19.8
Queue Length 50th (ft)	7	24	14
Queue Length 95th (ft)	11	52	37
Internal Link Dist (ft)	199	104	1901
Turn Bay Length (ft)			
Base Capacity (vph)	1950	512	547
Starvation Cap Reductn	790	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.39	0.12	0.08

Intersection Summary

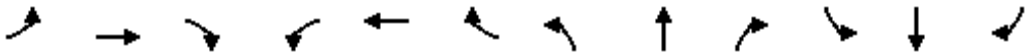
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	62	359	30	19	43	0	0	38	4
Future Volume (vph)	0	0	0	62	359	30	19	43	0	0	38	4
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.0			4.0			4.0	
Lane Util. Factor					0.95			1.00			1.00	
Frpb, ped/bikes					0.99			1.00			1.00	
Flpb, ped/bikes					1.00			0.99			1.00	
Frt					0.99			1.00			0.99	
Flt Protected					0.99			0.98			1.00	
Satd. Flow (prot)					3279			1723			1735	
Flt Permitted					0.99			0.93			1.00	
Satd. Flow (perm)					3279			1634			1735	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	62	359	30	19	43	0	0	38	4
RTOR Reduction (vph)	0	0	0	0	6	0	0	0	0	0	3	0
Lane Group Flow (vph)	0	0	0	0	445	0	0	62	0	0	39	0
Confl. Peds. (#/hr)	26		30	30		26	18		66	66		18
Confl. Bikes (#/hr)			60									
Turn Type				Split	NA		Perm	NA			NA	
Protected Phases				8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)					51.0			27.0			27.0	
Effective Green, g (s)					51.0			27.0			27.0	
Actuated g/C Ratio					0.59			0.31			0.31	
Clearance Time (s)					4.0			4.0			4.0	
Lane Grp Cap (vph)					1944			513			544	
v/s Ratio Prot					c0.14						0.02	
v/s Ratio Perm								c0.04				
v/c Ratio					0.23			0.12			0.07	
Uniform Delay, d1					8.2			21.0			20.7	
Progression Factor					0.17			1.00			1.00	
Incremental Delay, d2					0.3			0.5			0.3	
Delay (s)					1.7			21.5			21.0	
Level of Service					A			C			C	
Approach Delay (s)		0.0			1.7			21.5			21.0	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	5.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.19		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	36.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBT	NBT	SBT
Lane Group Flow (vph)	496	46	40
v/c Ratio	0.24	0.10	0.08
Control Delay	2.8	23.1	18.1
Queue Delay	0.3	0.0	0.0
Total Delay	3.2	23.1	18.1
Queue Length 50th (ft)	33	18	11
Queue Length 95th (ft)	48	43	34
Internal Link Dist (ft)	202	103	244
Turn Bay Length (ft)			
Base Capacity (vph)	2039	465	497
Starvation Cap Reductn	938	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.45	0.10	0.08

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	36	433	27	19	27	0	0	29	11
Future Volume (vph)	0	0	0	36	433	27	19	27	0	0	29	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.0			4.0			4.0	
Lane Util. Factor					0.95			1.00			1.00	
Frpb, ped/bikes					1.00			1.00			0.99	
Flpb, ped/bikes					1.00			0.99			1.00	
Frt					0.99			1.00			0.96	
Flt Protected					1.00			0.98			1.00	
Satd. Flow (prot)					3303			1717			1686	
Flt Permitted					1.00			0.91			1.00	
Satd. Flow (perm)					3303			1601			1686	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	36	433	27	19	27	0	0	29	11
RTOR Reduction (vph)	0	0	0	0	5	0	0	0	0	0	8	0
Lane Group Flow (vph)	0	0	0	0	491	0	0	46	0	0	32	0
Confl. Peds. (#/hr)	17		15	15		17	10		19	19		10
Confl. Bikes (#/hr)			60									
Turn Type				Split	NA		Perm	NA			NA	
Protected Phases				8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)					53.0			25.0			25.0	
Effective Green, g (s)					53.0			25.0			25.0	
Actuated g/C Ratio					0.62			0.29			0.29	
Clearance Time (s)					4.0			4.0			4.0	
Lane Grp Cap (vph)					2035			465			490	
v/s Ratio Prot					c0.15						0.02	
v/s Ratio Perm								c0.03				
v/c Ratio					0.24			0.10			0.07	
Uniform Delay, d1					7.4			22.3			22.1	
Progression Factor					0.35			1.00			1.00	
Incremental Delay, d2					0.3			0.4			0.3	
Delay (s)					2.9			22.7			22.3	
Level of Service					A			C			C	
Approach Delay (s)		0.0			2.9			22.7			22.3	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	5.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.20		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	37.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBT	NBT	SBT
Lane Group Flow (vph)	510	57	66
v/c Ratio	0.26	0.11	0.12
Control Delay	2.7	21.0	16.5
Queue Delay	0.0	0.0	0.0
Total Delay	2.7	21.0	16.5
Queue Length 50th (ft)	32	21	18
Queue Length 95th (ft)	46	48	46
Internal Link Dist (ft)	315	175	240
Turn Bay Length (ft)			
Base Capacity (vph)	1935	541	559
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.26	0.11	0.12

Intersection Summary

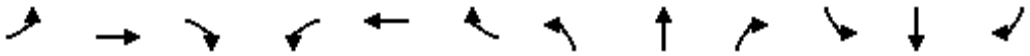
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	28	470	12	14	43	0	0	48	18
Future Volume (vph)	0	0	0	28	470	12	14	43	0	0	48	18
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.0			4.0			4.0	
Lane Util. Factor					0.95			1.00			1.00	
Frpb, ped/bikes					1.00			1.00			0.99	
Flpb, ped/bikes					1.00			0.99			1.00	
Frt					1.00			1.00			0.96	
Flt Protected					1.00			0.99			1.00	
Satd. Flow (prot)					3329			1733			1682	
Flt Permitted					1.00			0.95			1.00	
Satd. Flow (perm)					3329			1664			1682	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	28	470	12	14	43	0	0	48	18
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	12	0
Lane Group Flow (vph)	0	0	0	0	508	0	0	57	0	0	54	0
Confl. Peds. (#/hr)	10		24	24		10	15		12	12		15
Confl. Bikes (#/hr)			60									
Turn Type				Split	NA		Perm	NA			NA	
Protected Phases				8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)					50.0			28.0			28.0	
Effective Green, g (s)					50.0			28.0			28.0	
Actuated g/C Ratio					0.58			0.33			0.33	
Clearance Time (s)					4.0			4.0			4.0	
Lane Grp Cap (vph)					1935			541			547	
v/s Ratio Prot					c0.15						0.03	
v/s Ratio Perm								c0.03				
v/c Ratio					0.26			0.11			0.10	
Uniform Delay, d1					8.9			20.3			20.2	
Progression Factor					0.27			1.00			1.00	
Incremental Delay, d2					0.3			0.4			0.4	
Delay (s)					2.7			20.6			20.6	
Level of Service					A			C			C	
Approach Delay (s)		0.0			2.7			20.6			20.6	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	6.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.21		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	37.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBT	NBT	SBT
Lane Group Flow (vph)	630	64	80
v/c Ratio	0.32	0.13	0.15
Control Delay	3.4	22.1	17.2
Queue Delay	0.1	0.0	0.0
Total Delay	3.5	22.1	17.2
Queue Length 50th (ft)	32	25	23
Queue Length 95th (ft)	39	54	55
Internal Link Dist (ft)	188	104	107
Turn Bay Length (ft)			
Base Capacity (vph)	1955	492	542
Starvation Cap Reductn	484	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.43	0.13	0.15

Intersection Summary



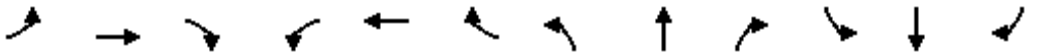
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	37	547	46	25	39	0	0	59	21
Future Volume (vph)	0	0	0	37	547	46	25	39	0	0	59	21
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.0			4.0			4.0	
Lane Util. Factor					0.95			1.00			1.00	
Frpb, ped/bikes					0.99			1.00			0.99	
Flpb, ped/bikes					1.00			0.99			1.00	
Frt					0.99			1.00			0.96	
Flt Protected					1.00			0.98			1.00	
Satd. Flow (prot)					3285			1710			1681	
Flt Permitted					1.00			0.90			1.00	
Satd. Flow (perm)					3285			1570			1681	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	37	547	46	25	39	0	0	59	21
RTOR Reduction (vph)	0	0	0	0	7	0	0	0	0	0	14	0
Lane Group Flow (vph)	0	0	0	0	623	0	0	64	0	0	66	0
Confl. Peds. (#/hr)	36		25	25		36	26		32	32		26
Confl. Bikes (#/hr)			60									
Turn Type				Split	NA		Perm	NA			NA	
Protected Phases				8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)					51.0			27.0			27.0	
Effective Green, g (s)					51.0			27.0			27.0	
Actuated g/C Ratio					0.59			0.31			0.31	
Clearance Time (s)					4.0			4.0			4.0	
Lane Grp Cap (vph)					1948			492			527	
v/s Ratio Prot					c0.19						0.04	
v/s Ratio Perm								c0.04				
v/c Ratio					0.32			0.13			0.12	
Uniform Delay, d1					8.8			21.1			21.1	
Progression Factor					0.34			1.00			1.00	
Incremental Delay, d2					0.4			0.5			0.5	
Delay (s)					3.4			21.6			21.5	
Level of Service					A			C			C	
Approach Delay (s)		0.0			3.4			21.6			21.5	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	6.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.25		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	44.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBT	SBT	SBR
Lane Group Flow (vph)	575	1049	99
v/c Ratio	0.52	0.55	0.12
Control Delay	14.9	5.5	0.4
Queue Delay	0.0	0.1	0.0
Total Delay	14.9	5.6	0.4
Queue Length 50th (ft)	76	55	0
Queue Length 95th (ft)	112	67	1
Internal Link Dist (ft)	467	296	
Turn Bay Length (ft)			
Base Capacity (vph)	1115	1910	845
Starvation Cap Reductn	0	166	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.52	0.60	0.12

Intersection Summary



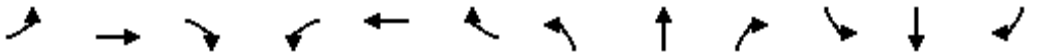
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	153	421	1	0	0	0	0	1049	99
Future Volume (vph)	0	0	0	153	421	1	0	0	0	0	1049	99
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.0						4.0	4.0
Lane Util. Factor					0.95						0.95	1.00
Frpb, ped/bikes					1.00						1.00	0.94
Flpb, ped/bikes					1.00						1.00	1.00
Frt					1.00						1.00	0.85
Flt Protected					0.99						1.00	1.00
Satd. Flow (prot)					3308						3353	1410
Flt Permitted					0.99						1.00	1.00
Satd. Flow (perm)					3308						3353	1410
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	153	421	1	0	0	0	0	1049	99
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	43
Lane Group Flow (vph)	0	0	0	0	575	0	0	0	0	0	1049	56
Confl. Peds. (#/hr)	12		16	16		12	17		16	16		17
Confl. Bikes (#/hr)			60									60
Turn Type				Split	NA						NA	Perm
Protected Phases				8	8						6	
Permitted Phases												6
Actuated Green, G (s)					29.0						49.0	49.0
Effective Green, g (s)					29.0						49.0	49.0
Actuated g/C Ratio					0.34						0.57	0.57
Clearance Time (s)					4.0						4.0	4.0
Lane Grp Cap (vph)					1115						1910	803
v/s Ratio Prot					c0.17						c0.31	
v/s Ratio Perm												0.04
v/c Ratio					0.52						0.55	0.07
Uniform Delay, d1					22.9						11.6	8.3
Progression Factor					0.59						0.38	0.08
Incremental Delay, d2					1.3						1.0	0.1
Delay (s)					14.7						5.4	0.8
Level of Service					B						A	A
Approach Delay (s)		0.0			14.7			0.0			5.0	
Approach LOS		A			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBT	NBT
Lane Group Flow (vph)	451	1563
v/c Ratio	0.61	0.68
Control Delay	31.1	6.1
Queue Delay	0.0	0.1
Total Delay	31.1	6.2
Queue Length 50th (ft)	104	112
Queue Length 95th (ft)	154	181
Internal Link Dist (ft)	230	290
Turn Bay Length (ft)		
Base Capacity (vph)	742	2283
Starvation Cap Reductn	0	9
Spillback Cap Reductn	0	85
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.61	0.71

Intersection Summary

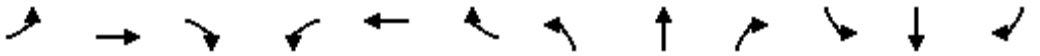


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	344	107	223	1340	0	0	0	0
Future Volume (vph)	0	0	0	0	344	107	223	1340	0	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.0			4.0				
Lane Util. Factor					0.95			0.95				
Frpb, ped/bikes					0.99			1.00				
Flpb, ped/bikes					1.00			1.00				
Frt					0.96			1.00				
Flt Protected					1.00			0.99				
Satd. Flow (prot)					3208			3329				
Flt Permitted					1.00			0.99				
Satd. Flow (perm)					3208			3329				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	0	344	107	223	1340	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	34	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	417	0	0	1563	0	0	0	0
Confl. Peds. (#/hr)	10		10	10		12	10		15	10		10
Confl. Bikes (#/hr)			60									60
Turn Type					NA		Split	NA				
Protected Phases					8		2	2				
Permitted Phases												
Actuated Green, G (s)					19.0			59.0				
Effective Green, g (s)					19.0			59.0				
Actuated g/C Ratio					0.22			0.69				
Clearance Time (s)					4.0			4.0				
Lane Grp Cap (vph)					708			2283				
v/s Ratio Prot					c0.13			c0.47				
v/s Ratio Perm												
v/c Ratio					0.59			0.68				
Uniform Delay, d1					30.0			8.0				
Progression Factor					1.00			0.58				
Incremental Delay, d2					3.6			1.3				
Delay (s)					33.6			6.0				
Level of Service					C			A				
Approach Delay (s)		0.0			33.6			6.0			0.0	
Approach LOS		A			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	12.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	SBT
Lane Group Flow (vph)	643	1237
v/c Ratio	0.62	0.64
Control Delay	27.2	6.3
Queue Delay	0.0	0.0
Total Delay	27.2	6.3
Queue Length 50th (ft)	147	70
Queue Length 95th (ft)	205	81
Internal Link Dist (ft)	289	290
Turn Bay Length (ft)		
Base Capacity (vph)	1030	1932
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.62	0.64

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	534	109	0	0	0	0	0	0	122	1115	0
Future Volume (vph)	0	534	109	0	0	0	0	0	0	122	1115	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0									4.0	
Lane Util. Factor		0.95									0.95	
Frpb, ped/bikes		0.98									1.00	
Flpb, ped/bikes		1.00									0.98	
Frt		0.97									1.00	
Flt Protected		1.00									1.00	
Satd. Flow (prot)		3217									3259	
Flt Permitted		1.00									1.00	
Satd. Flow (perm)		3217									3259	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	534	109	0	0	0	0	0	0	122	1115	0
RTOR Reduction (vph)	0	20	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	623	0	0	0	0	0	0	0	0	1237	0
Confl. Peds. (#/hr)	33		38	38		33	38		109	109		38
Confl. Bikes (#/hr)												60
Turn Type		NA								Perm	NA	
Protected Phases		4									6	
Permitted Phases										6		
Actuated Green, G (s)		27.0									51.0	
Effective Green, g (s)		27.0									51.0	
Actuated g/C Ratio		0.31									0.59	
Clearance Time (s)		4.0									4.0	
Lane Grp Cap (vph)		1009									1932	
v/s Ratio Prot		c0.19										
v/s Ratio Perm											0.38	
v/c Ratio		0.62									0.64	
Uniform Delay, d1		25.1									11.5	
Progression Factor		1.00									0.41	
Incremental Delay, d2		2.8									1.4	
Delay (s)		27.9									6.2	
Level of Service		C									A	
Approach Delay (s)		27.9			0.0			0.0			6.2	
Approach LOS		C			A			A			A	

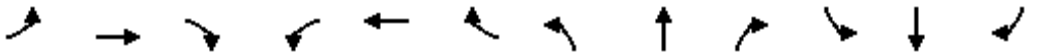
Intersection Summary			
HCM 2000 Control Delay	13.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	NBT	NBR
Lane Group Flow (vph)	145	305	1385	90
v/c Ratio	0.36	0.36	0.66	0.10
Control Delay	10.8	9.8	5.0	0.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	10.8	9.8	5.0	0.4
Queue Length 50th (ft)	19	21	80	0
Queue Length 95th (ft)	m35	31	76	m0
Internal Link Dist (ft)		417	764	
Turn Bay Length (ft)				100
Base Capacity (vph)	408	852	2105	899
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.36	0.36	0.66	0.10

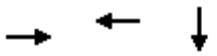
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



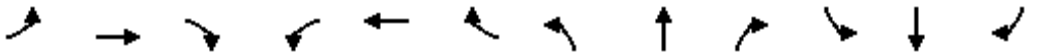
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	194	256	0	0	0	0	0	1385	90	0	0	0
Future Volume (vph)	194	256	0	0	0	0	0	1385	90	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0						5.0	5.0			
Lane Util. Factor	0.91	0.91						0.95	1.00			
Frpb, ped/bikes	1.00	1.00						1.00	0.93			
Flpb, ped/bikes	1.00	1.00						1.00	1.00			
Frt	1.00	1.00						1.00	0.85			
Flt Protected	0.95	0.99						1.00	1.00			
Satd. Flow (prot)	1526	3186						3353	1391			
Flt Permitted	0.95	0.99						1.00	1.00			
Satd. Flow (perm)	1526	3186						3353	1391			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	194	256	0	0	0	0	0	1385	90	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	26	0	0	0
Lane Group Flow (vph)	145	305	0	0	0	0	0	1385	64	0	0	0
Confl. Peds. (#/hr)	10		11	10		25	10		36	10		10
Confl. Bikes (#/hr)												60
Turn Type	Split	NA						NA	Perm			
Protected Phases	4	4						2				
Permitted Phases									2			
Actuated Green, G (s)	23.0	23.0						54.0	54.0			
Effective Green, g (s)	23.0	23.0						54.0	54.0			
Actuated g/C Ratio	0.27	0.27						0.63	0.63			
Clearance Time (s)	4.0	4.0						5.0	5.0			
Lane Grp Cap (vph)	408	852						2105	873			
v/s Ratio Prot	0.10	c0.10						c0.41				
v/s Ratio Perm									0.05			
v/c Ratio	0.36	0.36						0.66	0.07			
Uniform Delay, d1	25.5	25.5						10.1	6.2			
Progression Factor	0.34	0.34						0.35	0.10			
Incremental Delay, d2	1.9	0.9						1.4	0.1			
Delay (s)	10.6	9.7						4.9	0.8			
Level of Service	B	A						A	A			
Approach Delay (s)		9.9			0.0			4.7			0.0	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	5.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	114.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



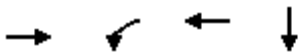
Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	42	37	1228
v/c Ratio	0.14	0.14	0.51
Control Delay	20.9	30.9	1.9
Queue Delay	0.0	0.0	0.1
Total Delay	20.9	30.9	2.0
Queue Length 50th (ft)	11	17	30
Queue Length 95th (ft)	38	44	34
Internal Link Dist (ft)	69	99	279
Turn Bay Length (ft)			
Base Capacity (vph)	310	264	2389
Starvation Cap Reductn	0	0	257
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.14	0.14	0.58

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	24	18	23	14	0	0	0	0	46	1150	32
Future Volume (vph)	0	24	18	23	14	0	0	0	0	46	1150	32
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						0.95	
Frpb, ped/bikes		0.96			1.00						0.99	
Flpb, ped/bikes		1.00			0.95						1.00	
Frt		0.94			1.00						1.00	
Flt Protected		1.00			0.97						1.00	
Satd. Flow (prot)		1592			1623						3312	
Flt Permitted		1.00			0.85						1.00	
Satd. Flow (perm)		1592			1424						3312	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	24	18	23	14	0	0	0	0	46	1150	32
RTOR Reduction (vph)	0	15	0	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	27	0	0	37	0	0	0	0	0	1226	0
Confl. Peds. (#/hr)	80		41	41		80	59		101	101		59
Confl. Bikes (#/hr)												60
Turn Type		NA		Perm	NA					Split	NA	
Protected Phases		4			8					6	6	
Permitted Phases				8								
Actuated Green, G (s)		16.0			16.0						62.0	
Effective Green, g (s)		16.0			16.0						62.0	
Actuated g/C Ratio		0.19			0.19						0.72	
Clearance Time (s)		4.0			4.0						4.0	
Lane Grp Cap (vph)		296			264						2387	
v/s Ratio Prot		0.02									c0.37	
v/s Ratio Perm					c0.03							
v/c Ratio		0.09			0.14						0.51	
Uniform Delay, d1		29.0			29.3						5.3	
Progression Factor		1.00			1.00						0.23	
Incremental Delay, d2		0.6			1.1						0.6	
Delay (s)		29.6			30.4						1.8	
Level of Service		C			C						A	
Approach Delay (s)		29.6			30.4			0.0			1.8	
Approach LOS		C			C			A			A	

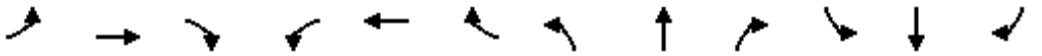
Intersection Summary			
HCM 2000 Control Delay	3.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBL	WBT	SBT
Lane Group Flow (vph)	373	69	289	1185
v/c Ratio	0.58	0.29	0.44	0.67
Control Delay	24.5	17.9	17.9	7.0
Queue Delay	0.0	0.0	0.0	0.1
Total Delay	24.5	17.9	17.9	7.1
Queue Length 50th (ft)	148	20	87	49
Queue Length 95th (ft)	238	m37	129	74
Internal Link Dist (ft)	174		323	277
Turn Bay Length (ft)				
Base Capacity (vph)	643	240	656	1758
Starvation Cap Reductn	0	0	0	47
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.58	0.29	0.44	0.69

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	275	98	69	289	0	0	0	0	155	952	78
Future Volume (vph)	0	275	98	69	289	0	0	0	0	155	952	78
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0		4.0	4.0						4.0	
Lane Util. Factor		1.00		1.00	1.00						0.95	
Frpb, ped/bikes		0.99		1.00	1.00						0.99	
Flpb, ped/bikes		1.00		0.99	1.00						1.00	
Frt		0.96		1.00	1.00						0.99	
Flt Protected		1.00		0.95	1.00						0.99	
Satd. Flow (prot)		1689		1665	1765						3275	
Flt Permitted		1.00		0.37	1.00						0.99	
Satd. Flow (perm)		1689		647	1765						3275	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	275	98	69	289	0	0	0	0	155	952	78
RTOR Reduction (vph)	0	15	0	0	0	0	0	0	0	0	6	0
Lane Group Flow (vph)	0	358	0	69	289	0	0	0	0	0	1179	0
Confl. Peds. (#/hr)	10		10	10		27	10		10	10		21
Confl. Bikes (#/hr)												60
Turn Type		NA		Perm	NA					Split	NA	
Protected Phases		4			8					6	6	
Permitted Phases				8								
Actuated Green, G (s)		32.0		32.0	32.0						46.0	
Effective Green, g (s)		32.0		32.0	32.0						46.0	
Actuated g/C Ratio		0.37		0.37	0.37						0.53	
Clearance Time (s)		4.0		4.0	4.0						4.0	
Lane Grp Cap (vph)		628		240	656						1751	
v/s Ratio Prot		c0.21			0.16						c0.36	
v/s Ratio Perm				0.11								
v/c Ratio		0.57		0.29	0.44						0.67	
Uniform Delay, d1		21.5		19.0	20.3						14.5	
Progression Factor		1.00		0.76	0.77						0.35	
Incremental Delay, d2		3.7		2.6	1.9						1.8	
Delay (s)		25.2		17.0	17.5						7.0	
Level of Service		C		B	B						A	
Approach Delay (s)		25.2			17.4			0.0			7.0	
Approach LOS		C			B			A			A	

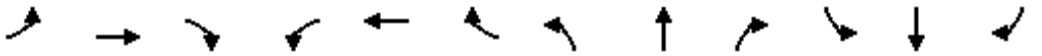
Intersection Summary			
HCM 2000 Control Delay	12.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	77.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Group Flow (vph)	135	234	161	122	1285	75
v/c Ratio	0.72	0.45	0.66	0.40	0.63	0.08
Control Delay	43.3	18.6	47.8	10.5	8.5	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.3	18.6	47.8	10.5	8.5	1.1
Queue Length 50th (ft)	49	64	83	0	78	1
Queue Length 95th (ft)	m99	m102	141	45	278	m4
Internal Link Dist (ft)		323	183		528	
Turn Bay Length (ft)						100
Base Capacity (vph)	253	656	307	355	2030	938
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.36	0.52	0.34	0.63	0.08

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	135	234	0	0	161	122	153	1132	75	0	0	0
Future Volume (vph)	135	234	0	0	161	122	153	1132	75	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Lane Util. Factor	1.00	1.00			1.00	1.00		0.95	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	0.97		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.99	1.00			
Satd. Flow (prot)	1676	1765			1765	1460		3333	1500			
Flt Permitted	0.95	1.00			1.00	1.00		0.99	1.00			
Satd. Flow (perm)	1676	1765			1765	1460		3333	1500			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	135	234	0	0	161	122	153	1132	75	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	105	0	0	25	0	0	0
Lane Group Flow (vph)	135	234	0	0	161	17	0	1285	50	0	0	0
Confl. Peds. (#/hr)	8					8	5					5
Confl. Bikes (#/hr)												60
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	7	4			8		2	2				
Permitted Phases						8			2			
Actuated Green, G (s)	10.7	25.6			11.9	11.9		52.4	52.4			
Effective Green, g (s)	9.7	25.6			11.9	11.9		52.4	52.4			
Actuated g/C Ratio	0.11	0.30			0.14	0.14		0.61	0.61			
Clearance Time (s)	3.0	4.0			4.0	4.0		4.0	4.0			
Vehicle Extension (s)	2.0	2.5			2.5	2.5		0.2	0.2			
Lane Grp Cap (vph)	189	525			244	202		2030	913			
v/s Ratio Prot	c0.08	0.13			c0.09			c0.39				
v/s Ratio Perm						0.01			0.03			
v/c Ratio	0.71	0.45			0.66	0.08		0.63	0.06			
Uniform Delay, d1	36.8	24.5			35.1	32.3		10.7	6.8			
Progression Factor	0.73	0.71			1.00	1.00		0.60	0.29			
Incremental Delay, d2	8.1	0.3			5.7	0.1		1.3	0.1			
Delay (s)	34.8	17.6			40.8	32.4		7.7	2.1			
Level of Service	C	B			D	C		A	A			
Approach Delay (s)		23.9			37.2			7.4			0.0	
Approach LOS		C			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	77.1%	ICU Level of Service	D
Analysis Period (min)	15		

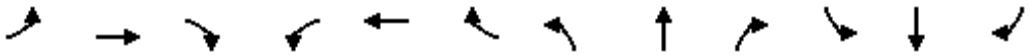
c Critical Lane Group



Lane Group	EBT	WBT	NBT	NBR
Lane Group Flow (vph)	51	98	1327	63
v/c Ratio	0.19	0.28	0.56	0.06
Control Delay	31.0	29.4	7.4	1.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	31.0	29.4	7.4	1.3
Queue Length 50th (ft)	23	42	158	0
Queue Length 95th (ft)	55	85	206	m10
Internal Link Dist (ft)	93	517	2424	
Turn Bay Length (ft)				100
Base Capacity (vph)	268	347	2376	1082
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.19	0.28	0.56	0.06

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



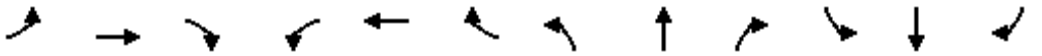
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	14	0	0	85	13	21	1306	63	0	0	0
Future Volume (vph)	37	14	0	0	85	13	21	1306	63	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0			4.0	4.0			
Lane Util. Factor		1.00			1.00			0.95	1.00			
Frpb, ped/bikes		1.00			0.99			1.00	1.00			
Flpb, ped/bikes		0.98			1.00			1.00	1.00			
Frt		1.00			0.98			1.00	0.85			
Flt Protected		0.96			1.00			1.00	1.00			
Satd. Flow (prot)		1673			1724			3350	1500			
Flt Permitted		0.78			1.00			1.00	1.00			
Satd. Flow (perm)		1358			1724			3350	1500			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	37	14	0	0	85	13	21	1306	63	0	0	0
RTOR Reduction (vph)	0	0	0	0	6	0	0	0	18	0	0	0
Lane Group Flow (vph)	0	51	0	0	92	0	0	1327	45	0	0	0
Confl. Peds. (#/hr)	15		12	12		15	10		19	19		10
Confl. Bikes (#/hr)												60
Turn Type	custom	NA			NA		Split	NA	Prot			
Protected Phases					8		2	2	2			
Permitted Phases	4	4										
Actuated Green, G (s)		17.0			17.0			61.0	61.0			
Effective Green, g (s)		17.0			17.0			61.0	61.0			
Actuated g/C Ratio		0.20			0.20			0.71	0.71			
Clearance Time (s)		4.0			4.0			4.0	4.0			
Lane Grp Cap (vph)		268			340			2376	1063			
v/s Ratio Prot					c0.05			c0.40	0.03			
v/s Ratio Perm		0.04										
v/c Ratio		0.19			0.27			0.56	0.04			
Uniform Delay, d1		28.8			29.2			6.0	3.7			
Progression Factor		1.00			1.00			1.04	1.09			
Incremental Delay, d2		1.6			1.9			1.0	0.1			
Delay (s)		30.3			31.2			7.2	4.2			
Level of Service		C			C			A	A			
Approach Delay (s)		30.3			31.2			7.1			0.0	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	60.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	106	203	173	208	424	65	847	362	875
v/c Ratio	0.69	0.44	0.84	0.76	0.69	0.17	0.61	0.55	0.66
Control Delay	81.8	34.5	88.4	69.9	20.6	47.1	33.4	50.4	34.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.8	34.5	88.4	69.9	20.6	47.1	33.4	50.4	34.9
Queue Length 50th (ft)	87	49	144	169	151	45	288	138	301
Queue Length 95th (ft)	167	96	244	270	231	101	455	219	459
Internal Link Dist (ft)		595		272			1059		378
Turn Bay Length (ft)	175		300			135			
Base Capacity (vph)	227	693	334	465	828	374	1399	805	1821
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.29	0.52	0.45	0.51	0.17	0.61	0.45	0.48

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	106	122	81	173	208	424	65	771	76	362	813	62
Future Volume (vph)	106	122	81	173	208	424	65	771	76	362	813	62
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95		0.97	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1676	3152		1676	1765	1500	1676	3295		3252	3300	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1676	3152		1676	1765	1500	1676	3295		3252	3300	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	106	122	81	173	208	424	65	771	76	362	813	62
RTOR Reduction (vph)	0	71	0	0	0	81	0	5	0	0	4	0
Lane Group Flow (vph)	106	132	0	173	208	343	65	842	0	362	871	0
Confl. Bikes (#/hr)									60			60
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8	1 8	5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	11.7	15.9		16.7	19.9	45.6	28.5	53.9		25.7	51.1	
Effective Green, g (s)	11.7	15.9		15.7	19.9	45.6	28.5	53.9		25.7	51.1	
Actuated g/C Ratio	0.09	0.12		0.12	0.16	0.36	0.22	0.42		0.20	0.40	
Clearance Time (s)	4.0	4.0		3.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	1.5	1.5		1.0	1.5		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	154	394		206	276	537	375	1396		657	1325	
v/s Ratio Prot	0.06	0.04		c0.10	c0.12	0.23	0.04	c0.26		0.11	c0.26	
v/s Ratio Perm												
v/c Ratio	0.69	0.34		0.84	0.75	0.64	0.17	0.60		0.55	0.66	
Uniform Delay, d1	56.0	50.8		54.5	51.3	33.9	39.8	28.4		45.6	30.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.8	0.2		23.9	9.9	2.5	1.0	1.9		1.0	1.2	
Delay (s)	65.7	51.0		78.4	61.2	36.4	40.8	30.3		46.6	32.1	
Level of Service	E	D		E	E	D	D	C		D	C	
Approach Delay (s)		56.1			51.8			31.1			36.3	
Approach LOS		E			D			C			D	

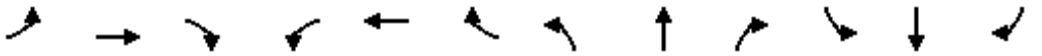
Intersection Summary			
HCM 2000 Control Delay	40.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	127.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	229	602	77	445	412	677	50	156	1008
v/c Ratio	0.94	0.61	0.65	0.67	0.95	0.50	0.06	0.81	0.79
Control Delay	94.7	33.5	77.9	48.0	84.6	29.8	3.2	80.4	38.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	94.7	33.5	77.9	48.0	84.6	29.8	3.2	80.4	38.2
Queue Length 50th (ft)	177	180	59	164	165	204	0	119	353
Queue Length 95th (ft)	#328	234	108	207	#264	301	17	189	#518
Internal Link Dist (ft)		1448		174		1573			1059
Turn Bay Length (ft)	250		250		275		300	150	
Base Capacity (vph)	251	1026	167	831	433	1364	839	251	1270
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.59	0.46	0.54	0.95	0.50	0.06	0.62	0.79

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	229	378	224	77	387	58	412	677	50	156	821	187
Future Volume (vph)	229	378	224	77	387	58	412	677	50	156	821	187
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.94		1.00	0.98		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	3166		1676	3287		3252	3353	1500	1676	3231	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1676	3166		1676	3287		3252	3353	1500	1676	3231	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	229	378	224	77	387	58	412	677	50	156	821	187
RTOR Reduction (vph)	0	73	0	0	10	0	0	0	25	0	15	0
Lane Group Flow (vph)	229	529	0	77	435	0	412	677	25	156	993	0
Confl. Bikes (#/hr)									60			60
Turn Type	Prot	NA		Prot	NA		Prot	NA	pt+ov	Prot	NA	
Protected Phases	7	4		3	8		5	2	2 3	1	6	
Permitted Phases												
Actuated Green, G (s)	18.5	34.4		8.5	24.4		17.0	48.2	60.7	14.9	46.1	
Effective Green, g (s)	17.5	34.4		7.5	24.4		16.0	48.2	60.7	13.9	46.1	
Actuated g/C Ratio	0.15	0.29		0.06	0.20		0.13	0.40	0.51	0.12	0.38	
Clearance Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.5	3.0		2.0	4.0		2.0	3.5		2.0	3.5	
Lane Grp Cap (vph)	244	907		104	668		433	1346	758	194	1241	
v/s Ratio Prot	c0.14	0.17		0.05	c0.13		c0.13	0.20	0.02	0.09	c0.31	
v/s Ratio Perm												
v/c Ratio	0.94	0.58		0.74	0.65		0.95	0.50	0.03	0.80	0.80	
Uniform Delay, d1	50.7	36.7		55.3	43.9		51.6	26.9	14.9	51.7	32.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	40.6	1.0		21.7	2.5		30.8	1.3	0.0	19.9	5.5	
Delay (s)	91.3	37.6		76.9	46.4		82.4	28.3	14.9	71.6	38.3	
Level of Service	F	D		E	D		F	C	B	E	D	
Approach Delay (s)		52.4			50.9			47.3			42.8	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	47.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	82.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Arterial Level of Service: SB Central Avenue

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Central Avenue	III	30	22.0	0.0	22.0	0.16	26.8	B
Jackson Street	III	30	45.4	13.2	58.6	0.36	21.9	C
E 4th Street	III	30	22.6	12.1	34.7	0.18	18.4	C
6th Street	III	30	18.1	2.2	20.3	0.14	24.0	C
Main Street	III	30	11.0	5.5	16.5	0.07	15.5	D
8th Street	III	30	10.9	6.3	17.2	0.07	14.7	D
9th Street	III	30	10.5	1.9	12.4	0.07	19.7	C
10th	III	30	10.5	7.0	17.5	0.07	13.9	E
Total	III		151.0	48.2	199.2	1.11	20.1	C

Arterial Level of Service: SB Court Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Ohio Street	III	30	21.9	6.1	28.0	0.16	21.0	C
E McAndrews Road	III	30	16.0	36.1	52.1	0.11	7.9	F
Central Avenue	III	30	50.4	11.6	62.0	0.40	23.0	C
Total	III		88.3	53.8	142.1	0.67	17.1	D

Arterial Level of Service: WB Main Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Riverside Avenue	IV	30	20.4	31.1	51.5	0.11	7.9	E
Central Avenue	IV	30	18.6	14.9	33.5	0.10	11.1	D
Front Street	IV	30	11.5	3.4	14.9	0.05	12.3	D
Fir Street	IV	30	17.0	2.7	19.7	0.07	13.7	C
Grape Street	IV	30	12.1	2.8	14.9	0.05	12.9	D
Holly Street	IV	30	12.0	1.7	13.7	0.05	13.9	C
Oakdale Avenue	IV	30	19.1	5.9	25.0	0.11	15.2	C
Total	IV		110.7	62.5	173.2	0.55	11.5	D

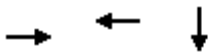
Arterial Level of Service: NB Riverside Avenue

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Barnett Road	III	30	27.4	33.4	60.8	0.22	12.8	E
12th Street	III	30	67.3	7.4	74.7	0.56	27.0	B
10th Street	III	30	16.2	8.5	24.7	0.12	16.8	D
8th Street	III	30	21.4	5.0	26.4	0.16	21.8	C
Main Street	III	30	10.9	6.1	17.0	0.07	14.8	D
	III	30	10.8	7.4	18.2	0.07	13.7	E
4th Street	III	30	18.8	17.8	36.6	0.14	13.8	E
Jackson Street	III	30	10.5	8.1	18.6	0.07	13.1	E
Manzanita Street	III	30	63.4	3.9	67.3	0.50	26.7	B
McAndrews Road	III	30	30.6	40.5	71.1	0.24	12.2	E
Mall Access	III	30	17.6	8.9	26.5	0.12	17.0	D
Total	III		294.9	147.0	441.9	2.26	18.4	C

Arterial Level of Service: SB Riverside Avenue

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Barnett Road	III	30	67.3	34.9	102.2	0.56	19.8	C
Stewart Avenue	III	30	27.4	38.2	65.6	0.22	11.8	E
Total	III		94.7	73.1	167.8	0.78	16.7	D

2038 No-Build

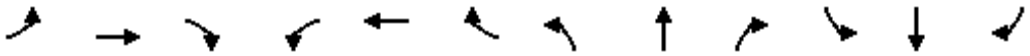


Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	242	181	1144
v/c Ratio	0.72	1.36	0.32
Control Delay	38.5	233.2	4.8
Queue Delay	0.0	0.0	0.0
Total Delay	38.5	233.2	4.8
Queue Length 50th (ft)	103	~138	69
Queue Length 95th (ft)	171	#255	122
Internal Link Dist (ft)	872	380	781
Turn Bay Length (ft)			
Base Capacity (vph)	673	304	3539
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.36	0.60	0.32

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



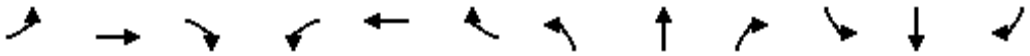
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	107	135	64	117	0	0	0	0	77	977	90
Future Volume (vph)	0	107	135	64	117	0	0	0	0	77	977	90
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						0.91	
Frpb, ped/bikes		0.99			1.00						1.00	
Flpb, ped/bikes		1.00			1.00						1.00	
Frt		0.92			1.00						0.99	
Flt Protected		1.00			0.98						1.00	
Satd. Flow (prot)		1610			1730						4720	
Flt Permitted		1.00			0.44						1.00	
Satd. Flow (perm)		1610			780						4720	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	107	135	64	117	0	0	0	0	77	977	90
RTOR Reduction (vph)	0	61	0	0	0	0	0	0	0	0	5	0
Lane Group Flow (vph)	0	181	0	0	181	0	0	0	0	0	1139	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		17.6			17.6						74.9	
Effective Green, g (s)		17.1			17.1						74.9	
Actuated g/C Ratio		0.17			0.17						0.75	
Clearance Time (s)		3.5			3.5						4.0	
Vehicle Extension (s)		2.0			2.0						4.0	
Lane Grp Cap (vph)		275			133						3535	
v/s Ratio Prot		0.11										
v/s Ratio Perm					c0.23						0.24	
v/c Ratio		0.66			1.36						0.32	
Uniform Delay, d1		38.7			41.5						4.2	
Progression Factor		1.00			0.90						1.00	
Incremental Delay, d2		4.3			202.4						0.2	
Delay (s)		43.0			239.7						4.4	
Level of Service		D			F						A	
Approach Delay (s)		43.0			239.7			0.0			4.4	
Approach LOS		D			F			A			A	

Intersection Summary			
HCM 2000 Control Delay	37.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



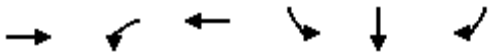
Lane Group	EBT	WBT	WBR	NBT
Lane Group Flow (vph)	223	86	76	1822
v/c Ratio	0.79	0.24	0.24	0.44
Control Delay	47.7	26.3	25.6	8.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	47.7	26.3	25.6	8.1
Queue Length 50th (ft)	96	40	32	132
Queue Length 95th (ft)	132	74	67	205
Internal Link Dist (ft)	380	321		579
Turn Bay Length (ft)				
Base Capacity (vph)	501	619	545	4132
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.45	0.14	0.14	0.44

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	150	73	0	0	59	103	93	1647	82	0	0	0
Future Volume (vph)	150	73	0	0	59	103	93	1647	82	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.5			4.5	4.5		5.0				
Lane Util. Factor		1.00			0.95	0.95		0.86				
Frpb, ped/bikes		1.00			0.99	0.98		1.00				
Flpb, ped/bikes		0.99			1.00	1.00		1.00				
Frt		1.00			0.95	0.85		0.99				
Flt Protected		0.97			1.00	1.00		1.00				
Satd. Flow (prot)		1696			1586	1392		6004				
Flt Permitted		0.74			1.00	1.00		1.00				
Satd. Flow (perm)		1302			1586	1392		6004				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	150	73	0	0	59	103	93	1647	82	0	0	0
RTOR Reduction (vph)	0	0	0	0	11	13	0	4	0	0	0	0
Lane Group Flow (vph)	0	223	0	0	75	63	0	1818	0	0	0	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Turn Type	Perm	NA			NA	Perm	Split	NA				
Protected Phases		4			8		2	2				
Permitted Phases	4					8						
Actuated Green, G (s)		22.2			22.2	22.2		69.3				
Effective Green, g (s)		21.7			21.7	21.7		68.8				
Actuated g/C Ratio		0.22			0.22	0.22		0.69				
Clearance Time (s)		4.0			4.0	4.0		4.5				
Vehicle Extension (s)		2.5			2.5	2.5		2.0				
Lane Grp Cap (vph)		282			344	302		4130				
v/s Ratio Prot					0.05			c0.30				
v/s Ratio Perm		c0.17				0.05						
v/c Ratio		0.79			0.22	0.21		0.44				
Uniform Delay, d1		37.0			32.2	32.1		7.0				
Progression Factor		0.79			1.00	1.00		1.00				
Incremental Delay, d2		13.3			0.2	0.3		0.3				
Delay (s)		42.4			32.4	32.4		7.3				
Level of Service		D			C	C		A				
Approach Delay (s)		42.4			32.4			7.3			0.0	
Approach LOS		D			C			A			A	

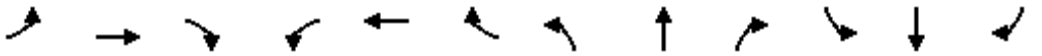
Intersection Summary			
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.5
Intersection Capacity Utilization	67.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	669	161	832	456	599	65
v/c Ratio	0.56	0.55	0.44	0.75	0.34	0.11
Control Delay	33.9	38.7	4.0	41.0	27.6	5.6
Queue Delay	0.0	0.0	0.0	0.4	0.0	0.0
Total Delay	33.9	38.7	4.0	41.4	27.6	5.6
Queue Length 50th (ft)	221	119	45	296	118	0
Queue Length 95th (ft)	300	m187	54	397	141	27
Internal Link Dist (ft)	690		672		521	
Turn Bay Length (ft)		110		175		175
Base Capacity (vph)	1202	293	1910	698	2007	653
Starvation Cap Reductn	0	0	0	40	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.55	0.44	0.69	0.30	0.10

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	625	44	161	832	0	0	0	0	456	599	65
Future Volume (vph)	0	625	44	161	832	0	0	0	0	456	599	65
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0		4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.95		1.00	0.95					1.00	0.91	1.00
Frpb, ped/bikes		1.00		1.00	1.00					1.00	1.00	0.99
Flpb, ped/bikes		1.00		1.00	1.00					1.00	1.00	1.00
Frt		0.99		1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		3316		1676	3353					1676	4818	1478
Flt Permitted		1.00		0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		3316		1676	3353					1676	4818	1478
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	625	44	161	832	0	0	0	0	456	599	65
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	0	0	0	41
Lane Group Flow (vph)	0	665	0	161	832	0	0	0	0	456	599	24
Confl. Peds. (#/hr)	2		2	2		2	2		1	1		2
Turn Type		NA		Prot	NA					Split	NA	Perm
Protected Phases		4		3	8					6	6	
Permitted Phases												6
Actuated Green, G (s)		43.4		22.0	68.4					43.6	43.6	43.6
Effective Green, g (s)		43.4		21.0	68.4					43.6	43.6	43.6
Actuated g/C Ratio		0.36		0.18	0.57					0.36	0.36	0.36
Clearance Time (s)		4.0		3.0	4.0					4.0	4.0	4.0
Vehicle Extension (s)		4.0		2.0	4.0					5.0	5.0	5.0
Lane Grp Cap (vph)		1199		293	1911					608	1750	537
v/s Ratio Prot		c0.20		c0.10	0.25					c0.27	0.12	
v/s Ratio Perm												0.02
v/c Ratio		0.55		0.55	0.44					0.75	0.34	0.04
Uniform Delay, d1		30.6		45.2	14.8					33.4	27.8	24.7
Progression Factor		1.00		0.71	0.21					1.00	1.00	1.00
Incremental Delay, d2		1.9		1.0	0.6					6.1	0.2	0.1
Delay (s)		32.4		33.0	3.7					39.6	28.0	24.8
Level of Service		C		C	A					D	C	C
Approach Delay (s)		32.4			8.5			0.0			32.5	
Approach LOS		C			A			A			C	

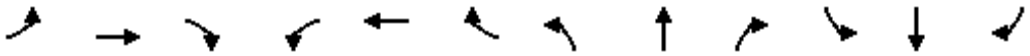
Intersection Summary			
HCM 2000 Control Delay	23.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	81.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Group Flow (vph)	103	946	863	583	1279	319
v/c Ratio	0.62	0.45	0.51	0.75	0.84	0.57
Control Delay	56.3	4.9	20.8	28.0	44.4	22.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.3	4.9	20.8	28.0	44.4	22.4
Queue Length 50th (ft)	84	134	225	310	337	109
Queue Length 95th (ft)	m139	107	282	469	398	206
Internal Link Dist (ft)		672	539		1193	
Turn Bay Length (ft)	130					150
Base Capacity (vph)	167	2123	1704	774	1518	562
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.45	0.51	0.75	0.84	0.57

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



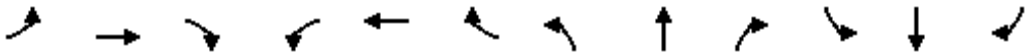
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	946	0	0	863	583	123	1156	319	0	0	0
Future Volume (vph)	103	946	0	0	863	583	123	1156	319	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	3.0			3.0	3.0		3.0	3.0			
Lane Util. Factor	1.00	0.95			0.95	1.00		0.91	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	0.97		1.00	0.97			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		1.00	1.00			
Satd. Flow (prot)	1676	3353			3353	1456		4795	1461			
Flt Permitted	0.95	1.00			1.00	1.00		1.00	1.00			
Satd. Flow (perm)	1676	3353			3353	1456		4795	1461			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	103	946	0	0	863	583	123	1156	319	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	34	0	0	100	0	0	0
Lane Group Flow (vph)	103	946	0	0	863	549	0	1279	219	0	0	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	7	4			8		2	2				
Permitted Phases						8			2			
Actuated Green, G (s)	12.0	75.0			60.0	60.0		37.0	37.0			
Effective Green, g (s)	12.0	76.0			61.0	61.0		38.0	38.0			
Actuated g/C Ratio	0.10	0.63			0.51	0.51		0.32	0.32			
Clearance Time (s)	3.0	4.0			4.0	4.0		4.0	4.0			
Vehicle Extension (s)	2.0	4.0			4.0	4.0		4.0	4.0			
Lane Grp Cap (vph)	167	2123			1704	740		1518	462			
v/s Ratio Prot	c0.06	0.28			0.26			c0.27				
v/s Ratio Perm						c0.38			0.15			
v/c Ratio	0.62	0.45			0.51	0.74		0.84	0.47			
Uniform Delay, d1	51.8	11.2			19.5	23.3		38.2	33.0			
Progression Factor	0.82	0.39			1.00	1.00		1.00	1.00			
Incremental Delay, d2	3.8	0.5			1.1	6.6		4.6	1.1			
Delay (s)	46.4	4.9			20.6	29.9		42.8	34.0			
Level of Service	D	A			C	C		D	C			
Approach Delay (s)		9.0			24.3			41.1			0.0	
Approach LOS		A			C			D			A	

Intersection Summary			
HCM 2000 Control Delay	26.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	81.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBT	NBT
Lane Group Flow (vph)	79	18	1566
v/c Ratio	0.31	0.05	0.53
Control Delay	32.0	19.3	2.3
Queue Delay	0.0	0.0	0.0
Total Delay	32.0	19.3	2.3
Queue Length 50th (ft)	36	4	29
Queue Length 95th (ft)	77	21	43
Internal Link Dist (ft)	550	165	918
Turn Bay Length (ft)			
Base Capacity (vph)	256	330	2969
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.31	0.05	0.53

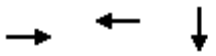
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	4	0	0	9	9	40	1511	15	0	0	0
Future Volume (vph)	75	4	0	0	9	9	40	1511	15	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0			4.0				
Lane Util. Factor		1.00			1.00			0.91				
Frpb, ped/bikes		1.00			0.99			1.00				
Flpb, ped/bikes		0.98			1.00			1.00				
Frt		1.00			0.93			1.00				
Flt Protected		0.95			1.00			1.00				
Satd. Flow (prot)		1483			1462			4322				
Flt Permitted		0.75			1.00			1.00				
Satd. Flow (perm)		1158			1462			4322				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	75	4	0	0	9	9	40	1511	15	0	0	0
RTOR Reduction (vph)	0	0	0	0	7	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	79	0	0	11	0	0	1565	0	0	0	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Turn Type	Perm	NA			NA		Split	NA				
Protected Phases		4			8		2	2				
Permitted Phases	4											
Actuated Green, G (s)		19.0			19.0			59.0				
Effective Green, g (s)		19.0			19.0			59.0				
Actuated g/C Ratio		0.22			0.22			0.69				
Clearance Time (s)		4.0			4.0			4.0				
Lane Grp Cap (vph)		255			323			2965				
v/s Ratio Prot					0.01			c0.36				
v/s Ratio Perm		c0.07										
v/c Ratio		0.31			0.03			0.53				
Uniform Delay, d1		28.0			26.3			6.6				
Progression Factor		1.00			1.00			0.26				
Incremental Delay, d2		3.1			0.2			0.5				
Delay (s)		31.2			26.5			2.3				
Level of Service		C			C			A				
Approach Delay (s)		31.2			26.5			2.3			0.0	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	3.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.3%	ICU Level of Service	B
Analysis Period (min)	15		

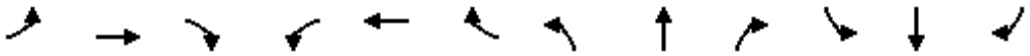
c Critical Lane Group



Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	424	152	888
v/c Ratio	0.85	0.62	0.37
Control Delay	22.6	43.2	13.7
Queue Delay	0.0	0.0	0.0
Total Delay	22.6	43.2	13.7
Queue Length 50th (ft)	33	81	80
Queue Length 95th (ft)	121	m124	194
Internal Link Dist (ft)	7	1528	2014
Turn Bay Length (ft)			
Base Capacity (vph)	666	415	2423
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.64	0.37	0.37

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	54	370	65	87	0	0	0	0	40	818	30
Future Volume (vph)	0	54	370	65	87	0	0	0	0	40	818	30
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						0.91	
Frpb, ped/bikes		0.97			1.00						1.00	
Flpb, ped/bikes		1.00			1.00						1.00	
Frt		0.88			1.00						0.99	
Flt Protected		1.00			0.98						1.00	
Satd. Flow (prot)		1360			1555						4298	
Flt Permitted		1.00			0.98						1.00	
Satd. Flow (perm)		1360			1555						4298	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	54	370	65	87	0	0	0	0	40	818	30
RTOR Reduction (vph)	0	310	0	0	0	0	0	0	0	0	3	0
Lane Group Flow (vph)	0	114	0	0	152	0	0	0	0	0	885	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Turn Type		NA		Split	NA					Split	NA	
Protected Phases		7		8	8					6	6	
Permitted Phases												
Actuated Green, G (s)		11.9			13.6						48.5	
Effective Green, g (s)		11.9			13.6						48.5	
Actuated g/C Ratio		0.14			0.16						0.56	
Clearance Time (s)		4.0			4.0						4.0	
Vehicle Extension (s)		2.0			2.0						4.0	
Lane Grp Cap (vph)		188			245						2423	
v/s Ratio Prot		c0.08			c0.10						c0.21	
v/s Ratio Perm												
v/c Ratio		0.61			0.62						0.37	
Uniform Delay, d1		34.8			33.8						10.3	
Progression Factor		1.00			1.00						1.00	
Incremental Delay, d2		3.7			3.4						0.4	
Delay (s)		38.6			37.3						10.7	
Level of Service		D			D						B	
Approach Delay (s)		38.6			37.3			0.0			10.7	
Approach LOS		D			D			A			B	

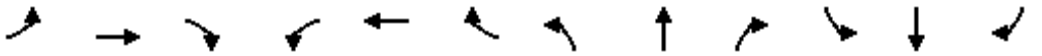
Intersection Summary			
HCM 2000 Control Delay	21.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	75.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBL	WBT	SBT	SBR
Lane Group Flow (vph)	351	59	277	1171	119
v/c Ratio	0.64	0.29	0.50	0.70	0.15
Control Delay	29.0	16.5	17.2	15.4	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	29.0	16.5	17.2	15.4	1.5
Queue Length 50th (ft)	151	15	70	268	7
Queue Length 95th (ft)	245	m24	m109	95	m1
Internal Link Dist (ft)	1450		992	1806	
Turn Bay Length (ft)		250			
Base Capacity (vph)	547	206	553	1671	774
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.64	0.29	0.50	0.70	0.15

Intersection Summary

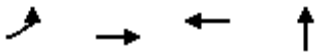
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	291	60	59	277	0	0	0	0	188	983	119
Future Volume (vph)	0	291	60	59	277	0	0	0	0	188	983	119
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0		4.0	4.0						4.0	4.0
Lane Util. Factor		1.00		1.00	1.00						0.95	1.00
Frpb, ped/bikes		1.00		1.00	1.00						1.00	0.96
Flpb, ped/bikes		1.00		1.00	1.00						1.00	1.00
Frt		0.98		1.00	1.00						1.00	0.85
Flt Protected		1.00		0.95	1.00						0.99	1.00
Satd. Flow (prot)		1546		1502	1588						2994	1293
Flt Permitted		1.00		0.38	1.00						0.99	1.00
Satd. Flow (perm)		1546		593	1588						2994	1293
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	291	60	59	277	0	0	0	0	188	983	119
RTOR Reduction (vph)	0	8	0	0	0	0	0	0	0	0	0	53
Lane Group Flow (vph)	0	343	0	59	277	0	0	0	0	0	1171	66
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		15
Turn Type		NA		Perm	NA					Split	NA	Perm
Protected Phases		4			8					6	6	
Permitted Phases				8								6
Actuated Green, G (s)		30.0		30.0	30.0						48.0	48.0
Effective Green, g (s)		30.0		30.0	30.0						48.0	48.0
Actuated g/C Ratio		0.35		0.35	0.35						0.56	0.56
Clearance Time (s)		4.0		4.0	4.0						4.0	4.0
Lane Grp Cap (vph)		539		206	553						1671	721
v/s Ratio Prot		c0.22			0.17						c0.39	
v/s Ratio Perm				0.10								0.05
v/c Ratio		0.64		0.29	0.50						0.70	0.09
Uniform Delay, d1		23.4		20.3	22.1						13.8	8.9
Progression Factor		1.00		0.64	0.64						0.92	0.58
Incremental Delay, d2		5.6		2.8	2.6						2.3	0.2
Delay (s)		29.1		15.7	16.8						15.0	5.4
Level of Service		C		B	B						B	A
Approach Delay (s)		29.1			16.6			0.0			14.1	
Approach LOS		C			B			A			B	

Intersection Summary			
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	81.6%	ICU Level of Service	D
Analysis Period (min)	15		

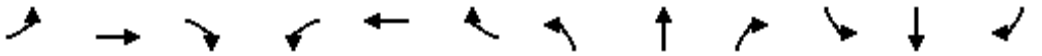
c Critical Lane Group



Lane Group	EBL	EBT	WBT	NBT
Lane Group Flow (vph)	66	346	357	1544
v/c Ratio	0.26	0.55	0.60	0.70
Control Delay	23.5	27.1	24.1	7.3
Queue Delay	0.0	0.0	0.0	0.4
Total Delay	23.5	27.1	24.1	7.7
Queue Length 50th (ft)	27	165	139	109
Queue Length 95th (ft)	m43	244	230	m71
Internal Link Dist (ft)		992	302	277
Turn Bay Length (ft)	200			
Base Capacity (vph)	250	627	597	2192
Starvation Cap Reductn	0	0	0	231
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.26	0.55	0.60	0.79

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	346	0	0	211	146	106	1366	72	0	0	0
Future Volume (vph)	66	346	0	0	211	146	106	1366	72	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0			4.0			4.0				
Lane Util. Factor	1.00	1.00			1.00			0.91				
Frpb, ped/bikes	1.00	1.00			0.98			1.00				
Flpb, ped/bikes	0.99	1.00			1.00			1.00				
Frt	1.00	1.00			0.94			0.99				
Flt Protected	0.95	1.00			1.00			1.00				
Satd. Flow (prot)	1488	1588			1473			4272				
Flt Permitted	0.40	1.00			1.00			1.00				
Satd. Flow (perm)	634	1588			1473			4272				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	66	346	0	0	211	146	106	1366	72	0	0	0
RTOR Reduction (vph)	0	0	0	0	15	0	0	6	0	0	0	0
Lane Group Flow (vph)	66	346	0	0	342	0	0	1538	0	0	0	0
Confl. Peds. (#/hr)	18		12	12		18	37		32	32		37
Turn Type	Perm	NA			NA		Split	NA				
Protected Phases		4			8		2	2				
Permitted Phases	4											
Actuated Green, G (s)	34.0	34.0			34.0			44.0				
Effective Green, g (s)	34.0	34.0			34.0			44.0				
Actuated g/C Ratio	0.40	0.40			0.40			0.51				
Clearance Time (s)	4.0	4.0			4.0			4.0				
Lane Grp Cap (vph)	250	627			582			2185				
v/s Ratio Prot		0.22			c0.23			c0.36				
v/s Ratio Perm	0.10											
v/c Ratio	0.26	0.55			0.59			0.70				
Uniform Delay, d1	17.6	20.1			20.5			16.0				
Progression Factor	1.16	1.18			1.00			0.36				
Incremental Delay, d2	1.9	2.6			4.3			1.4				
Delay (s)	22.3	26.3			24.8			7.2				
Level of Service	C	C			C			A				
Approach Delay (s)		25.7			24.8			7.2			0.0	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	81.6%	ICU Level of Service	D
Analysis Period (min)	15		

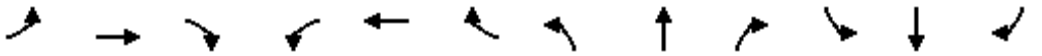
c Critical Lane Group



Lane Group	EBT	WBL	WBT	SBT	SBR
Lane Group Flow (vph)	308	272	289	1053	153
v/c Ratio	0.76	0.70	0.39	0.79	0.22
Control Delay	43.1	23.8	16.5	12.4	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	43.1	23.8	16.5	12.4	0.9
Queue Length 50th (ft)	151	150	159	73	0
Queue Length 95th (ft)	#276	m192	m207	148	m0
Internal Link Dist (ft)	282		688	858	
Turn Bay Length (ft)		250			
Base Capacity (vph)	404	391	738	1332	681
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.76	0.70	0.39	0.79	0.22

Intersection Summary

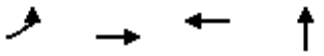
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	273	35	272	289	0	0	0	0	15	1038	153
Future Volume (vph)	0	273	35	272	289	0	0	0	0	15	1038	153
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0		3.5	4.0						4.0	4.0
Lane Util. Factor		1.00		1.00	1.00						0.95	1.00
Frpb, ped/bikes		1.00		1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00						1.00	1.00
Frt		0.98		1.00	1.00						1.00	0.85
Flt Protected		1.00		0.95	1.00						1.00	1.00
Satd. Flow (prot)		1558		1506	1588						3015	1350
Flt Permitted		1.00		0.29	1.00						1.00	1.00
Satd. Flow (perm)		1558		455	1588						3015	1350
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	273	35	272	289	0	0	0	0	15	1038	153
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	0	0	0	85
Lane Group Flow (vph)	0	303	0	272	289	0	0	0	0	0	1053	68
Confl. Peds. (#/hr)	6		11	11		6			2	2		
Turn Type		NA		pm+pt	NA					Split	NA	Prot
Protected Phases		4		3	8					6	6	6
Permitted Phases				8	8							
Actuated Green, G (s)		22.0		40.0	40.0						38.0	38.0
Effective Green, g (s)		22.0		40.0	40.0						38.0	38.0
Actuated g/C Ratio		0.26		0.47	0.47						0.44	0.44
Clearance Time (s)		4.0		3.5	4.0						4.0	4.0
Lane Grp Cap (vph)		398		388	738						1332	596
v/s Ratio Prot		0.19		c0.12	0.18						c0.35	0.05
v/s Ratio Perm				c0.21								
v/c Ratio		0.76		0.70	0.39						0.79	0.11
Uniform Delay, d1		29.6		16.4	15.0						20.6	14.1
Progression Factor		1.00		1.06	1.00						0.41	0.10
Incremental Delay, d2		12.8		7.2	1.1						3.9	0.3
Delay (s)		42.4		24.6	16.1						12.2	1.7
Level of Service		D		C	B						B	A
Approach Delay (s)		42.4			20.2			0.0			10.9	
Approach LOS		D			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	18.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	11.5
Intersection Capacity Utilization	98.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



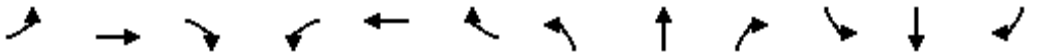
Lane Group	EBL	EBT	WBT	NBT
Lane Group Flow (vph)	137	274	506	1753
v/c Ratio	1.22	0.48	0.88	0.76
Control Delay	176.9	16.3	42.5	11.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	176.9	16.3	42.5	11.1
Queue Length 50th (ft)	~85	141	248	70
Queue Length 95th (ft)	m#127	m197	339	148
Internal Link Dist (ft)		688	289	661
Turn Bay Length (ft)	250			
Base Capacity (vph)	137	701	699	2316
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.00	0.39	0.72	0.76

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

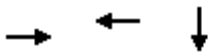
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



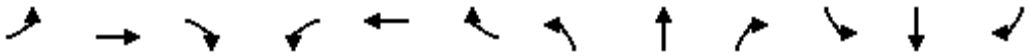
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	137	274	0	0	491	15	50	1194	509	0	0	0
Future Volume (vph)	137	274	0	0	491	15	50	1194	509	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	5.0	4.0			4.0			4.0				
Lane Util. Factor	1.00	1.00			1.00			0.91				
Frpb, ped/bikes	1.00	1.00			1.00			0.99				
Flpb, ped/bikes	1.00	1.00			1.00			1.00				
Frt	1.00	1.00			1.00			0.96				
Flt Protected	0.95	1.00			1.00			1.00				
Satd. Flow (prot)	1509	1588			1581			4120				
Flt Permitted	0.20	1.00			1.00			1.00				
Satd. Flow (perm)	321	1588			1581			4120				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	137	274	0	0	491	15	50	1194	509	0	0	0
RTOR Reduction (vph)	0	0	0	0	1	0	0	73	0	0	0	0
Lane Group Flow (vph)	137	274	0	0	505	0	0	1680	0	0	0	0
Confl. Peds. (#/hr)	4		5	5		4	5		4	4		5
Turn Type	Perm	NA			NA		Split	NA				
Protected Phases		4			8		2	2				
Permitted Phases	4											
Actuated Green, G (s)	31.2	31.2			31.2			46.8				
Effective Green, g (s)	30.2	31.2			31.2			46.8				
Actuated g/C Ratio	0.35	0.36			0.36			0.54				
Clearance Time (s)	4.0	4.0			4.0			4.0				
Vehicle Extension (s)	0.2	0.2			0.2			0.2				
Lane Grp Cap (vph)	112	576			573			2242				
v/s Ratio Prot		0.17			0.32			c0.41				
v/s Ratio Perm	c0.43											
v/c Ratio	1.22	0.48			0.88			0.75				
Uniform Delay, d1	27.9	21.1			25.7			15.1				
Progression Factor	0.80	0.69			1.00			0.57				
Incremental Delay, d2	150.6	0.2			14.4			1.9				
Delay (s)	172.9	14.8			40.0			10.5				
Level of Service	F	B			D			B				
Approach Delay (s)		67.5			40.0			10.5			0.0	
Approach LOS		E			D			B			A	

Intersection Summary			
HCM 2000 Control Delay	24.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	98.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	131	85	1312
v/c Ratio	0.38	0.31	0.56
Control Delay	28.5	33.1	1.6
Queue Delay	0.0	0.0	0.0
Total Delay	28.5	33.1	1.6
Queue Length 50th (ft)	51	40	12
Queue Length 95th (ft)	104	82	36
Internal Link Dist (ft)	137	79	634
Turn Bay Length (ft)			
Base Capacity (vph)	346	276	2361
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.38	0.31	0.56

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	92	39	44	41	0	0	0	0	41	1248	23
Future Volume (vph)	0	92	39	44	41	0	0	0	0	41	1248	23
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						0.95	
Frpb, ped/bikes		0.98			1.00						1.00	
Flpb, ped/bikes		1.00			0.98						1.00	
Frt		0.96			1.00						1.00	
Flt Protected		1.00			0.97						1.00	
Satd. Flow (prot)		1662			1684						3330	
Flt Permitted		1.00			0.81						1.00	
Satd. Flow (perm)		1662			1399						3330	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	92	39	44	41	0	0	0	0	41	1248	23
RTOR Reduction (vph)	0	18	0	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	113	0	0	85	0	0	0	0	0	1311	0
Confl. Peds. (#/hr)	22		24	24		22	14		20	20		14
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		17.0			17.0						61.0	
Effective Green, g (s)		17.0			17.0						61.0	
Actuated g/C Ratio		0.20			0.20						0.71	
Clearance Time (s)		4.0			4.0						4.0	
Lane Grp Cap (vph)		328			276						2361	
v/s Ratio Prot		c0.07										
v/s Ratio Perm					0.06						0.39	
v/c Ratio		0.35			0.31						0.56	
Uniform Delay, d1		29.7			29.5						6.0	
Progression Factor		1.00			1.00						0.16	
Incremental Delay, d2		2.9			2.9						0.6	
Delay (s)		32.6			32.4						1.5	
Level of Service		C			C						A	
Approach Delay (s)		32.6			32.4			0.0			1.5	
Approach LOS		C			C			A			A	

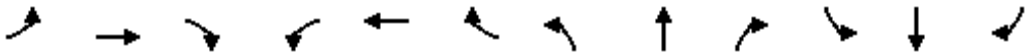
Intersection Summary			
HCM 2000 Control Delay	5.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	71.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBT	WBT	WBR	NBT
Lane Group Flow (vph)	189	13	20	1613
v/c Ratio	0.43	0.02	0.04	0.60
Control Delay	25.2	18.6	8.4	5.2
Queue Delay	0.0	0.0	0.0	0.1
Total Delay	25.2	18.6	8.4	5.2
Queue Length 50th (ft)	77	5	0	85
Queue Length 95th (ft)	138	16	15	91
Internal Link Dist (ft)	175	153		287
Turn Bay Length (ft)				
Base Capacity (vph)	441	615	536	2679
Starvation Cap Reductn	0	0	0	167
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.43	0.02	0.04	0.64

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	181	8	0	0	13	20	50	1548	15	0	0	0
Future Volume (vph)	181	8	0	0	13	20	50	1548	15	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0	4.0		4.0				
Lane Util. Factor		1.00			1.00	1.00		0.91				
Frpb, ped/bikes		1.00			1.00	1.00		1.00				
Flpb, ped/bikes		0.99			1.00	1.00		1.00				
Frt		1.00			1.00	0.85		1.00				
Flt Protected		0.95			1.00	1.00		1.00				
Satd. Flow (prot)		1663			1765	1500		4800				
Flt Permitted		0.73			1.00	1.00		1.00				
Satd. Flow (perm)		1265			1765	1500		4800				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	181	8	0	0	13	20	50	1548	15	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	13	0	1	0	0	0	0
Lane Group Flow (vph)	0	189	0	0	13	7	0	1612	0	0	0	0
Confl. Peds. (#/hr)	10		10				10					10
Turn Type	Perm	NA			NA	Perm	Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4					8	2					
Actuated Green, G (s)		30.0			30.0	30.0		48.0				
Effective Green, g (s)		30.0			30.0	30.0		48.0				
Actuated g/C Ratio		0.35			0.35	0.35		0.56				
Clearance Time (s)		4.0			4.0	4.0		4.0				
Lane Grp Cap (vph)		441			615	523		2679				
v/s Ratio Prot					0.01							
v/s Ratio Perm		c0.15				0.00		0.34				
v/c Ratio		0.43			0.02	0.01		0.60				
Uniform Delay, d1		21.4			18.4	18.3		12.6				
Progression Factor		1.00			1.00	1.00		0.33				
Incremental Delay, d2		3.0			0.1	0.0		0.9				
Delay (s)		24.5			18.4	18.4		5.1				
Level of Service		C			B	B		A				
Approach Delay (s)		24.5			18.4			5.1			0.0	
Approach LOS		C			B			A			A	

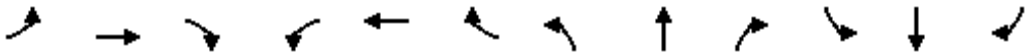
Intersection Summary			
HCM 2000 Control Delay	7.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	70.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	103	424	25	83	214
v/c Ratio	0.13	0.27	0.06	0.11	0.28
Control Delay	6.1	6.0	14.3	14.6	16.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	6.1	6.0	14.3	14.6	16.2
Queue Length 50th (ft)	12	25	8	25	70
Queue Length 95th (ft)	23	35	22	52	118
Internal Link Dist (ft)		479		105	1243
Turn Bay Length (ft)					
Base Capacity (vph)	779	1550	436	779	773
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.13	0.27	0.06	0.11	0.28

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	103	408	16	25	83	0	0	203	11
Future Volume (vph)	0	0	0	103	408	16	25	83	0	0	203	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)				4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor				1.00	0.95		1.00	1.00			1.00	
Frpb, ped/bikes				1.00	1.00		1.00	1.00			1.00	
Flpb, ped/bikes				1.00	1.00		0.96	1.00			1.00	
Frt				1.00	0.99		1.00	1.00			0.99	
Flt Protected				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)				1676	3327		1608	1765			1746	
Flt Permitted				0.95	1.00		0.58	1.00			1.00	
Satd. Flow (perm)				1676	3327		987	1765			1746	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	103	408	16	25	83	0	0	203	11
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	0	0	103	421	0	25	83	0	0	212	0
Confl. Peds. (#/hr)	15		46	46		15	35		34	34		35
Turn Type				Split	NA		Perm	NA			NA	
Protected Phases				8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)				40.0	40.0		38.0	38.0			38.0	
Effective Green, g (s)				40.0	40.0		38.0	38.0			38.0	
Actuated g/C Ratio				0.47	0.47		0.44	0.44			0.44	
Clearance Time (s)				4.0	4.0		4.0	4.0			4.0	
Lane Grp Cap (vph)				779	1547		436	779			771	
v/s Ratio Prot				0.06	c0.13			0.05			c0.12	
v/s Ratio Perm							0.03					
v/c Ratio				0.13	0.27		0.06	0.11			0.27	
Uniform Delay, d1				13.1	14.1		13.7	14.1			15.2	
Progression Factor				0.43	0.40		1.00	1.00			1.00	
Incremental Delay, d2				0.4	0.4		0.3	0.3			0.9	
Delay (s)				6.0	6.0		14.0	14.3			16.1	
Level of Service				A	A		B	B			B	
Approach Delay (s)		0.0			6.0			14.3			16.1	
Approach LOS		A			A			B			B	

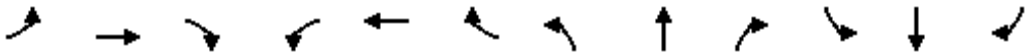
Intersection Summary			
HCM 2000 Control Delay	9.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	WBT	NBT	SBT
Lane Group Flow (vph)	479	73	43
v/c Ratio	0.19	0.12	0.06
Control Delay	1.8	17.8	16.0
Queue Delay	0.0	0.0	0.0
Total Delay	1.8	17.8	16.0
Queue Length 50th (ft)	13	25	13
Queue Length 95th (ft)	15	53	34
Internal Link Dist (ft)	199	104	1901
Turn Bay Length (ft)			
Base Capacity (vph)	2479	618	668
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.19	0.12	0.06

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	71	381	27	25	48	0	0	39	4
Future Volume (vph)	0	0	0	71	381	27	25	48	0	0	39	4
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.0			4.0			4.0	
Lane Util. Factor					0.91			1.00			1.00	
Frpb, ped/bikes					1.00			1.00			1.00	
Flpb, ped/bikes					1.00			0.99			1.00	
Frt					0.99			1.00			0.99	
Flt Protected					0.99			0.98			1.00	
Satd. Flow (prot)					4720			1718			1736	
Flt Permitted					0.99			0.92			1.00	
Satd. Flow (perm)					4720			1613			1736	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	71	381	27	25	48	0	0	39	4
RTOR Reduction (vph)	0	0	0	0	8	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	0	0	0	471	0	0	73	0	0	41	0
Confl. Peds. (#/hr)	26		30	30		26	18		66	66		18
Turn Type				Split	NA		Perm	NA			NA	
Protected Phases				8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)					45.0			33.0			33.0	
Effective Green, g (s)					45.0			33.0			33.0	
Actuated g/C Ratio					0.52			0.38			0.38	
Clearance Time (s)					4.0			4.0			4.0	
Lane Grp Cap (vph)					2469			618			666	
v/s Ratio Prot					c0.10						0.02	
v/s Ratio Perm								c0.05				
v/c Ratio					0.19			0.12			0.06	
Uniform Delay, d1					10.9			17.1			16.7	
Progression Factor					0.16			1.00			1.00	
Incremental Delay, d2					0.2			0.4			0.2	
Delay (s)					1.9			17.5			16.9	
Level of Service					A			B			B	
Approach Delay (s)		0.0			1.9			17.5			16.9	
Approach LOS		A			A			B			B	

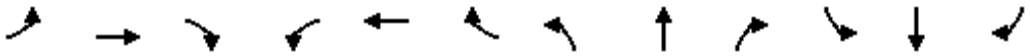
Intersection Summary			
HCM 2000 Control Delay	4.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.16		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	34.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	WBT	NBT	SBT
Lane Group Flow (vph)	509	40	40
v/c Ratio	0.19	0.08	0.07
Control Delay	3.0	20.0	15.8
Queue Delay	0.0	0.0	0.0
Total Delay	3.0	20.0	15.8
Queue Length 50th (ft)	13	15	11
Queue Length 95th (ft)	15	36	32
Internal Link Dist (ft)	202	103	244
Turn Bay Length (ft)			
Base Capacity (vph)	2718	524	575
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.19	0.08	0.07

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	37	456	16	22	18	0	0	29	11
Future Volume (vph)	0	0	0	37	456	16	22	18	0	0	29	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.0			4.0			4.0	
Lane Util. Factor					0.91			1.00			1.00	
Frpb, ped/bikes					1.00			1.00			0.99	
Flpb, ped/bikes					1.00			0.99			1.00	
Frt					1.00			1.00			0.96	
Flt Protected					1.00			0.97			1.00	
Satd. Flow (prot)					4769			1702			1686	
Flt Permitted					1.00			0.89			1.00	
Satd. Flow (perm)					4769			1555			1686	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	37	456	16	22	18	0	0	29	11
RTOR Reduction (vph)	0	0	0	0	4	0	0	0	0	0	7	0
Lane Group Flow (vph)	0	0	0	0	505	0	0	40	0	0	33	0
Confl. Peds. (#/hr)	17		15	15		17	10		19	19		10
Turn Type				Split	NA		Perm	NA			NA	
Protected Phases				8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)					49.0			29.0			29.0	
Effective Green, g (s)					49.0			29.0			29.0	
Actuated g/C Ratio					0.57			0.34			0.34	
Clearance Time (s)					4.0			4.0			4.0	
Lane Grp Cap (vph)					2717			524			568	
v/s Ratio Prot					c0.11						0.02	
v/s Ratio Perm								c0.03				
v/c Ratio					0.19			0.08			0.06	
Uniform Delay, d1					8.9			19.4			19.3	
Progression Factor					0.32			1.00			1.00	
Incremental Delay, d2					0.1			0.3			0.2	
Delay (s)					3.0			19.7			19.5	
Level of Service					A			B			B	
Approach Delay (s)		0.0			3.0			19.7			19.5	
Approach LOS		A			A			B			B	

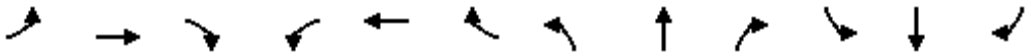
Intersection Summary			
HCM 2000 Control Delay	5.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.15		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	34.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	WBT	NBT	SBT
Lane Group Flow (vph)	536	55	64
v/c Ratio	0.20	0.10	0.11
Control Delay	2.7	19.5	15.2
Queue Delay	0.0	0.0	0.0
Total Delay	2.7	19.5	15.2
Queue Length 50th (ft)	8	20	16
Queue Length 95th (ft)	15	45	43
Internal Link Dist (ft)	315	175	240
Turn Bay Length (ft)			
Base Capacity (vph)	2673	576	597
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.20	0.10	0.11

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	29	496	11	15	40	0	0	46	18
Future Volume (vph)	0	0	0	29	496	11	15	40	0	0	46	18
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.0			4.0			4.0	
Lane Util. Factor					0.91			1.00			1.00	
Frpb, ped/bikes					1.00			1.00			0.99	
Flpb, ped/bikes					1.00			0.99			1.00	
Frt					1.00			1.00			0.96	
Flt Protected					1.00			0.99			1.00	
Satd. Flow (prot)					4786			1730			1680	
Flt Permitted					1.00			0.94			1.00	
Satd. Flow (perm)					4786			1654			1680	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	29	496	11	15	40	0	0	46	18
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	0	0	12	0
Lane Group Flow (vph)	0	0	0	0	533	0	0	55	0	0	52	0
Confl. Peds. (#/hr)	10		24	24		10	15		12	12		15
Turn Type				Split	NA		Perm	NA			NA	
Protected Phases				8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)					48.0			30.0			30.0	
Effective Green, g (s)					48.0			30.0			30.0	
Actuated g/C Ratio					0.56			0.35			0.35	
Clearance Time (s)					4.0			4.0			4.0	
Lane Grp Cap (vph)					2671			576			586	
v/s Ratio Prot					c0.11						0.03	
v/s Ratio Perm								c0.03				
v/c Ratio					0.20			0.10			0.09	
Uniform Delay, d1					9.4			18.9			18.8	
Progression Factor					0.27			1.00			1.00	
Incremental Delay, d2					0.2			0.3			0.3	
Delay (s)					2.7			19.2			19.1	
Level of Service					A			B			B	
Approach Delay (s)		0.0			2.7			19.2			19.1	
Approach LOS		A			A			B			B	

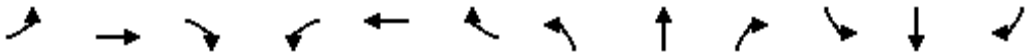
Intersection Summary			
HCM 2000 Control Delay	5.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.16		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	34.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	WBT	NBT	SBT
Lane Group Flow (vph)	592	94	101
v/c Ratio	0.25	0.16	0.15
Control Delay	5.8	17.1	11.8
Queue Delay	0.2	0.0	0.0
Total Delay	6.1	17.1	11.8
Queue Length 50th (ft)	28	31	22
Queue Length 95th (ft)	38	63	53
Internal Link Dist (ft)	188	104	107
Turn Bay Length (ft)			
Base Capacity (vph)	2383	592	695
Starvation Cap Reductn	1049	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.44	0.16	0.15

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	27	539	26	50	44	0	0	68	33
Future Volume (vph)	0	0	0	27	539	26	50	44	0	0	68	33
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.0			4.0			4.0	
Lane Util. Factor					0.91			1.00			1.00	
Frpb, ped/bikes					1.00			1.00			0.98	
Flpb, ped/bikes					1.00			0.98			1.00	
Frt					0.99			1.00			0.96	
Flt Protected					1.00			0.97			1.00	
Satd. Flow (prot)					4756			1691			1661	
Flt Permitted					1.00			0.84			1.00	
Satd. Flow (perm)					4756			1456			1661	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	27	539	26	50	44	0	0	68	33
RTOR Reduction (vph)	0	0	0	0	6	0	0	0	0	0	20	0
Lane Group Flow (vph)	0	0	0	0	587	0	0	94	0	0	81	0
Confl. Peds. (#/hr)	36		25	25		36	26		32	32		26
Turn Type				Split	NA		Perm	NA			NA	
Protected Phases				8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)					43.0			35.0			35.0	
Effective Green, g (s)					43.0			35.0			35.0	
Actuated g/C Ratio					0.50			0.41			0.41	
Clearance Time (s)					4.0			4.0			4.0	
Lane Grp Cap (vph)					2378			592			675	
v/s Ratio Prot					c0.12						0.05	
v/s Ratio Perm								c0.06				
v/c Ratio					0.25			0.16			0.12	
Uniform Delay, d1					12.3			16.2			15.9	
Progression Factor					0.46			1.00			1.00	
Incremental Delay, d2					0.2			0.6			0.4	
Delay (s)					5.9			16.7			16.3	
Level of Service					A			B			B	
Approach Delay (s)		0.0			5.9			16.7			16.3	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	8.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.21		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	40.8%	ICU Level of Service	A
Analysis Period (min)	15		

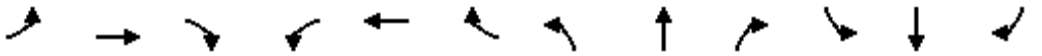
c Critical Lane Group



Lane Group	WBT	SBT	SBR
Lane Group Flow (vph)	520	1156	61
v/c Ratio	0.47	0.51	0.06
Control Delay	18.9	2.1	0.1
Queue Delay	0.0	0.1	0.0
Total Delay	18.9	2.2	0.1
Queue Length 50th (ft)	60	23	0
Queue Length 95th (ft)	75	30	m0
Internal Link Dist (ft)	467	296	
Turn Bay Length (ft)			
Base Capacity (vph)	1099	2261	993
Starvation Cap Reductn	0	236	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.47	0.57	0.06

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	204	316	0	0	0	0	0	1156	61
Future Volume (vph)	0	0	0	204	316	0	0	0	0	0	1156	61
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.0						4.0	4.0
Lane Util. Factor					0.91						0.95	1.00
Frpb, ped/bikes					1.00						1.00	0.96
Flpb, ped/bikes					1.00						1.00	1.00
Frt					1.00						1.00	0.85
Flt Protected					0.98						1.00	1.00
Satd. Flow (prot)					4725						3353	1444
Flt Permitted					0.98						1.00	1.00
Satd. Flow (perm)					4725						3353	1444
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	204	316	0	0	0	0	0	1156	61
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	20
Lane Group Flow (vph)	0	0	0	0	520	0	0	0	0	0	1156	41
Confl. Peds. (#/hr)	12		16	16		12	17		16	16		17
Turn Type				Split	NA						NA	Perm
Protected Phases				8	8						6	
Permitted Phases												6
Actuated Green, G (s)					20.0						58.0	58.0
Effective Green, g (s)					20.0						58.0	58.0
Actuated g/C Ratio					0.23						0.67	0.67
Clearance Time (s)					4.0						4.0	4.0
Lane Grp Cap (vph)					1098						2261	973
v/s Ratio Prot					c0.11						c0.34	
v/s Ratio Perm												0.03
v/c Ratio					0.47						0.51	0.04
Uniform Delay, d1					28.5						7.0	4.7
Progression Factor					0.61						0.20	0.00
Incremental Delay, d2					1.3						0.7	0.1
Delay (s)					18.7						2.1	0.1
Level of Service					B						A	A
Approach Delay (s)		0.0			18.7			0.0			2.0	
Approach LOS		A			B			A			A	

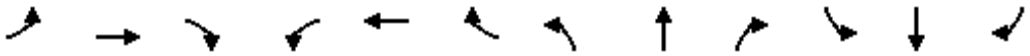
Intersection Summary			
HCM 2000 Control Delay	7.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	59.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	WBT	NBT
Lane Group Flow (vph)	418	1686
v/c Ratio	0.39	0.51
Control Delay	25.3	2.7
Queue Delay	0.0	0.0
Total Delay	25.3	2.7
Queue Length 50th (ft)	59	45
Queue Length 95th (ft)	89	39
Internal Link Dist (ft)	230	290
Turn Bay Length (ft)		
Base Capacity (vph)	1069	3282
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.39	0.51

Intersection Summary



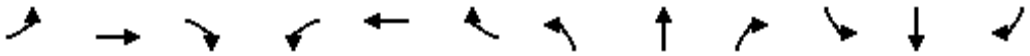
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	322	96	250	1436	0	0	0	0
Future Volume (vph)	0	0	0	0	322	96	250	1436	0	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.0			4.0				
Lane Util. Factor					0.91			0.91				
Frpb, ped/bikes					0.99			1.00				
Flpb, ped/bikes					1.00			1.00				
Frt					0.97			1.00				
Flt Protected					1.00			0.99				
Satd. Flow (prot)					4616			4782				
Flt Permitted					1.00			0.99				
Satd. Flow (perm)					4616			4782				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	0	322	96	250	1436	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	49	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	369	0	0	1686	0	0	0	0
Confl. Peds. (#/hr)	10		10	10		12	10		15	10		10
Turn Type					NA		Split	NA				
Protected Phases					8		2	2				
Permitted Phases												
Actuated Green, G (s)					19.0			59.0				
Effective Green, g (s)					19.0			59.0				
Actuated g/C Ratio					0.22			0.69				
Clearance Time (s)					4.0			4.0				
Lane Grp Cap (vph)					1019			3280				
v/s Ratio Prot					c0.08			c0.35				
v/s Ratio Perm												
v/c Ratio					0.36			0.51				
Uniform Delay, d1					28.4			6.5				
Progression Factor					1.00			0.32				
Incremental Delay, d2					1.0			0.5				
Delay (s)					29.4			2.6				
Level of Service					C			A				
Approach Delay (s)		0.0			29.4			2.6			0.0	
Approach LOS		A			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	55.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	SBT
Lane Group Flow (vph)	756	1239
v/c Ratio	0.69	0.66
Control Delay	26.8	7.7
Queue Delay	0.0	0.1
Total Delay	26.8	7.8
Queue Length 50th (ft)	172	118
Queue Length 95th (ft)	236	115
Internal Link Dist (ft)	289	290
Turn Bay Length (ft)		
Base Capacity (vph)	1101	1871
Starvation Cap Reductn	0	68
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.69	0.69

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	585	171	0	0	0	0	0	0	88	1151	0
Future Volume (vph)	0	585	171	0	0	0	0	0	0	88	1151	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0									4.0	
Lane Util. Factor		0.95									0.95	
Frpb, ped/bikes		0.98									1.00	
Flpb, ped/bikes		1.00									0.98	
Frt		0.97									1.00	
Flt Protected		1.00									1.00	
Satd. Flow (prot)		3172									3285	
Flt Permitted		1.00									1.00	
Satd. Flow (perm)		3172									3285	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	585	171	0	0	0	0	0	0	88	1151	0
RTOR Reduction (vph)	0	32	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	724	0	0	0	0	0	0	0	0	1239	0
Confl. Peds. (#/hr)	33		38	38		33	38		109	109		38
Turn Type		NA								Perm	NA	
Protected Phases		4									6	
Permitted Phases										6		
Actuated Green, G (s)		29.0									49.0	
Effective Green, g (s)		29.0									49.0	
Actuated g/C Ratio		0.34									0.57	
Clearance Time (s)		4.0									4.0	
Lane Grp Cap (vph)		1069									1871	
v/s Ratio Prot		c0.23										
v/s Ratio Perm											0.38	
v/c Ratio		0.68									0.66	
Uniform Delay, d1		24.5									12.8	
Progression Factor		1.00									0.47	
Incremental Delay, d2		3.5									1.6	
Delay (s)		27.9									7.6	
Level of Service		C									A	
Approach Delay (s)		27.9			0.0			0.0			7.6	
Approach LOS		C			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	15.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		

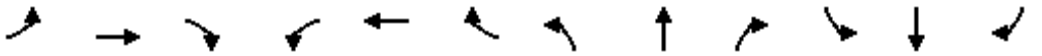
c Critical Lane Group



Lane Group	EBL	EBT	NBT	NBR
Lane Group Flow (vph)	173	364	1428	102
v/c Ratio	0.34	0.34	0.53	0.12
Control Delay	7.7	7.0	5.4	0.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	7.7	7.0	5.4	0.4
Queue Length 50th (ft)	20	21	53	0
Queue Length 95th (ft)	m29	29	49	m0
Internal Link Dist (ft)		417	764	
Turn Bay Length (ft)				100
Base Capacity (vph)	514	1076	2689	817
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.34	0.34	0.53	0.12

Intersection Summary

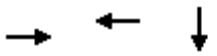
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	219	318	0	0	0	0	0	1428	102	0	0	0
Future Volume (vph)	219	318	0	0	0	0	0	1428	102	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0						5.0	5.0			
Lane Util. Factor	0.91	0.91						0.91	1.00			
Frpb, ped/bikes	1.00	1.00						1.00	0.93			
Flpb, ped/bikes	1.00	1.00						1.00	1.00			
Frt	1.00	1.00						1.00	0.85			
Flt Protected	0.95	0.99						1.00	1.00			
Satd. Flow (prot)	1526	3192						4818	1391			
Flt Permitted	0.95	0.99						1.00	1.00			
Satd. Flow (perm)	1526	3192						4818	1391			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	219	318	0	0	0	0	0	1428	102	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	41	0	0	0
Lane Group Flow (vph)	173	364	0	0	0	0	0	1428	61	0	0	0
Confl. Peds. (#/hr)	10		11	10		25	10		36	10		10
Turn Type	Split	NA						NA	Perm			
Protected Phases	4	4						2				
Permitted Phases									2			
Actuated Green, G (s)	29.0	29.0						48.0	48.0			
Effective Green, g (s)	29.0	29.0						48.0	48.0			
Actuated g/C Ratio	0.34	0.34						0.56	0.56			
Clearance Time (s)	4.0	4.0						5.0	5.0			
Lane Grp Cap (vph)	514	1076						2689	776			
v/s Ratio Prot	0.11	c0.11						c0.30				
v/s Ratio Perm									0.04			
v/c Ratio	0.34	0.34						0.53	0.08			
Uniform Delay, d1	21.3	21.3						11.9	8.8			
Progression Factor	0.29	0.30						0.40	0.07			
Incremental Delay, d2	1.3	0.6						0.6	0.2			
Delay (s)	7.5	7.0						5.4	0.8			
Level of Service	A	A						A	A			
Approach Delay (s)		7.1			0.0			5.1			0.0	
Approach LOS		A			A			A			A	

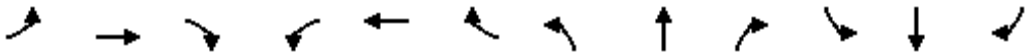
Intersection Summary			
HCM 2000 Control Delay	5.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	106.6%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	40	35	1338
v/c Ratio	0.15	0.15	0.54
Control Delay	21.8	32.9	1.9
Queue Delay	0.0	0.0	0.3
Total Delay	21.8	32.9	2.1
Queue Length 50th (ft)	10	16	32
Queue Length 95th (ft)	38	43	43
Internal Link Dist (ft)	69	99	279
Turn Bay Length (ft)			
Base Capacity (vph)	272	227	2472
Starvation Cap Reductn	0	0	443
Spillback Cap Reductn	0	0	23
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.15	0.15	0.66

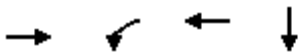
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	22	18	23	12	0	0	0	0	45	1262	31
Future Volume (vph)	0	22	18	23	12	0	0	0	0	45	1262	31
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						0.95	
Frpb, ped/bikes		0.96			1.00						0.99	
Flpb, ped/bikes		1.00			0.95						1.00	
Frt		0.94			1.00						1.00	
Flt Protected		1.00			0.97						1.00	
Satd. Flow (prot)		1584			1615						3318	
Flt Permitted		1.00			0.84						1.00	
Satd. Flow (perm)		1584			1397						3318	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	22	18	23	12	0	0	0	0	45	1262	31
RTOR Reduction (vph)	0	15	0	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	25	0	0	35	0	0	0	0	0	1336	0
Confl. Peds. (#/hr)	80		41	41		80	59		101	101		59
Turn Type		NA		Perm	NA					Split	NA	
Protected Phases		4			8					6	6	
Permitted Phases				8								
Actuated Green, G (s)		14.0			14.0						64.0	
Effective Green, g (s)		14.0			14.0						64.0	
Actuated g/C Ratio		0.16			0.16						0.74	
Clearance Time (s)		4.0			4.0						4.0	
Lane Grp Cap (vph)		257			227						2469	
v/s Ratio Prot		0.02									c0.40	
v/s Ratio Perm					c0.03							
v/c Ratio		0.10			0.15						0.54	
Uniform Delay, d1		30.6			30.9						4.7	
Progression Factor		1.00			1.00						0.26	
Incremental Delay, d2		0.8			1.4						0.6	
Delay (s)		31.4			32.4						1.9	
Level of Service		C			C						A	
Approach Delay (s)		31.4			32.4			0.0			1.9	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	3.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		

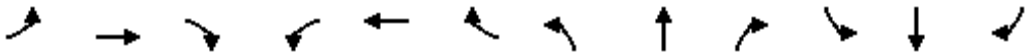
c Critical Lane Group



Lane Group	EBT	WBL	WBT	SBT
Lane Group Flow (vph)	383	53	315	1377
v/c Ratio	0.64	0.26	0.51	0.75
Control Delay	27.1	13.6	15.2	7.2
Queue Delay	0.0	0.0	0.7	0.0
Total Delay	27.1	13.6	15.9	7.3
Queue Length 50th (ft)	157	7	44	64
Queue Length 95th (ft)	253	m16	82	71
Internal Link Dist (ft)	174		323	277
Turn Bay Length (ft)				
Base Capacity (vph)	603	205	615	1833
Starvation Cap Reductn	0	0	97	16
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.64	0.26	0.61	0.76

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	259	124	53	315	0	0	0	0	135	1113	129
Future Volume (vph)	0	259	124	53	315	0	0	0	0	135	1113	129
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0		4.0	4.0						4.0	
Lane Util. Factor		1.00		1.00	1.00						0.95	
Frpb, ped/bikes		0.99		1.00	1.00						0.99	
Flpb, ped/bikes		1.00		0.99	1.00						1.00	
Frt		0.96		1.00	1.00						0.99	
Flt Protected		1.00		0.95	1.00						1.00	
Satd. Flow (prot)		1672		1666	1765						3269	
Flt Permitted		1.00		0.34	1.00						1.00	
Satd. Flow (perm)		1672		590	1765						3269	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	259	124	53	315	0	0	0	0	135	1113	129
RTOR Reduction (vph)	0	20	0	0	0	0	0	0	0	0	9	0
Lane Group Flow (vph)	0	363	0	53	315	0	0	0	0	0	1368	0
Confl. Peds. (#/hr)	10		10	10		27	10		10	10		21
Turn Type		NA		Perm	NA					Split	NA	
Protected Phases		4			8					6	6	
Permitted Phases				8								
Actuated Green, G (s)		30.0		30.0	30.0						48.0	
Effective Green, g (s)		30.0		30.0	30.0						48.0	
Actuated g/C Ratio		0.35		0.35	0.35						0.56	
Clearance Time (s)		4.0		4.0	4.0						4.0	
Lane Grp Cap (vph)		583		205	615						1824	
v/s Ratio Prot		c0.22			0.18						c0.42	
v/s Ratio Perm				0.09								
v/c Ratio		0.62		0.26	0.51						0.75	
Uniform Delay, d1		23.3		20.0	22.2						14.4	
Progression Factor		1.00		0.52	0.56						0.32	
Incremental Delay, d2		4.9		2.6	2.6						2.5	
Delay (s)		28.2		13.0	14.9						7.2	
Level of Service		C		B	B						A	
Approach Delay (s)		28.2			14.6			0.0			7.2	
Approach LOS		C			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	83.8%	ICU Level of Service	E
Analysis Period (min)	15		

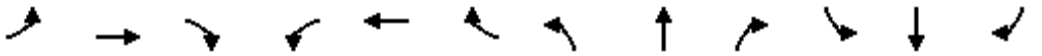
c Critical Lane Group



Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Group Flow (vph)	213	118	236	130	1653	65
v/c Ratio	0.81	0.17	0.75	0.38	0.66	0.08
Control Delay	53.7	25.0	48.0	12.5	13.2	3.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.7	25.0	48.0	12.5	13.2	3.3
Queue Length 50th (ft)	116	55	121	12	235	1
Queue Length 95th (ft)	m174	m68	192	57	338	10
Internal Link Dist (ft)		323	183		528	
Turn Bay Length (ft)						100
Base Capacity (vph)	350	841	389	402	2514	809
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.14	0.61	0.32	0.66	0.08

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	213	118	0	0	236	130	90	1563	65	0	0	0
Future Volume (vph)	213	118	0	0	236	130	90	1563	65	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Lane Util. Factor	1.00	1.00			1.00	1.00		0.91	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	0.97		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		1.00	1.00			
Satd. Flow (prot)	1676	1765			1765	1460		4805	1500			
Flt Permitted	0.95	1.00			1.00	1.00		1.00	1.00			
Satd. Flow (perm)	1676	1765			1765	1460		4805	1500			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	213	118	0	0	236	130	90	1563	65	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	85	0	0	24	0	0	0
Lane Group Flow (vph)	213	118	0	0	236	45	0	1653	41	0	0	0
Confl. Peds. (#/hr)	8					8	5					5
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	7	4			8		2	2				
Permitted Phases						8			2			
Actuated Green, G (s)	14.6	33.0			15.4	15.4		45.0	45.0			
Effective Green, g (s)	13.6	33.0			15.4	15.4		45.0	45.0			
Actuated g/C Ratio	0.16	0.38			0.18	0.18		0.52	0.52			
Clearance Time (s)	3.0	4.0			4.0	4.0		4.0	4.0			
Vehicle Extension (s)	2.0	2.5			2.5	2.5		0.2	0.2			
Lane Grp Cap (vph)	265	677			316	261		2514	784			
v/s Ratio Prot	c0.13	0.07			c0.13			c0.34				
v/s Ratio Perm						0.03			0.03			
v/c Ratio	0.80	0.17			0.75	0.17		0.66	0.05			
Uniform Delay, d1	34.9	17.5			33.5	29.9		14.9	10.0			
Progression Factor	1.06	1.57			1.00	1.00		0.72	0.55			
Incremental Delay, d2	11.5	0.1			8.8	0.2		1.3	0.1			
Delay (s)	48.4	27.6			42.3	30.1		12.0	5.6			
Level of Service	D	C			D	C		B	A			
Approach Delay (s)		41.0			38.0			11.7			0.0	
Approach LOS		D			D			B			A	

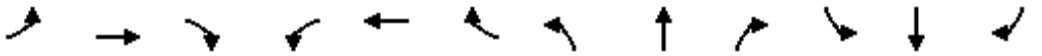
Intersection Summary			
HCM 2000 Control Delay	19.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	83.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBT	NBT	NBR
Lane Group Flow (vph)	47	90	1459	100
v/c Ratio	0.14	0.22	0.45	0.10
Control Delay	27.6	25.7	7.1	1.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	27.6	25.7	7.1	1.3
Queue Length 50th (ft)	20	35	119	0
Queue Length 95th (ft)	49	75	145	m13
Internal Link Dist (ft)	93	517	2424	
Turn Bay Length (ft)				100
Base Capacity (vph)	334	406	3245	1044
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.14	0.22	0.45	0.10

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	17	0	0	77	13	21	1438	100	0	0	0
Future Volume (vph)	30	17	0	0	77	13	21	1438	100	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0			4.0	4.0			
Lane Util. Factor		1.00			1.00			0.91	1.00			
Frpb, ped/bikes		1.00			0.99			1.00	1.00			
Flpb, ped/bikes		0.98			1.00			1.00	1.00			
Frt		1.00			0.98			1.00	0.85			
Flt Protected		0.97			1.00			1.00	1.00			
Satd. Flow (prot)		1683			1721			4814	1500			
Flt Permitted		0.83			1.00			1.00	1.00			
Satd. Flow (perm)		1436			1721			4814	1500			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	30	17	0	0	77	13	21	1438	100	0	0	0
RTOR Reduction (vph)	0	0	0	0	7	0	0	0	33	0	0	0
Lane Group Flow (vph)	0	47	0	0	83	0	0	1459	67	0	0	0
Confl. Peds. (#/hr)	15		12	12		15	10		19	19		10
Turn Type	custom	NA			NA		Split	NA	Prot			
Protected Phases					8		2	2	2			
Permitted Phases	4	4										
Actuated Green, G (s)		20.0			20.0			58.0	58.0			
Effective Green, g (s)		20.0			20.0			58.0	58.0			
Actuated g/C Ratio		0.23			0.23			0.67	0.67			
Clearance Time (s)		4.0			4.0			4.0	4.0			
Lane Grp Cap (vph)		333			400			3246	1011			
v/s Ratio Prot					c0.05			c0.30	0.04			
v/s Ratio Perm		0.03										
v/c Ratio		0.14			0.21			0.45	0.07			
Uniform Delay, d1		26.2			26.6			6.5	4.8			
Progression Factor		1.00			1.00			1.00	0.98			
Incremental Delay, d2		0.9			1.2			0.5	0.1			
Delay (s)		27.1			27.8			7.0	4.8			
Level of Service		C			C			A	A			
Approach Delay (s)		27.1			27.8			6.9			0.0	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	50.3%	ICU Level of Service	A
Analysis Period (min)	15		

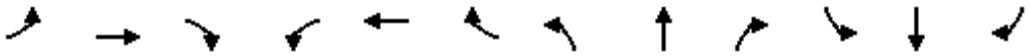
c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	155	290	190	245	440	95	1000	425	1110
v/c Ratio	0.84	0.56	0.91	0.84	0.69	0.28	0.79	0.58	0.82
Control Delay	98.9	52.0	106.3	82.8	22.5	55.4	46.3	52.5	43.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	98.9	52.0	106.3	82.8	22.5	55.4	46.3	52.5	43.8
Queue Length 50th (ft)	140	108	174	220	187	75	429	182	482
Queue Length 95th (ft)	#283	180	#302	351	269	151	#664	254	625
Internal Link Dist (ft)		595		272			1059		378
Turn Bay Length (ft)	175		300			135			
Base Capacity (vph)	229	623	302	395	755	339	1273	814	1633
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.47	0.63	0.62	0.58	0.28	0.79	0.52	0.68

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	155	195	95	190	245	440	95	925	75	425	1030	80
Future Volume (vph)	155	195	95	190	245	440	95	925	75	425	1030	80
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95		0.97	0.95	
Frt	1.00	0.95		1.00	1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1676	3188		1676	1765	1500	1676	3315		3252	3317	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1676	3188		1676	1765	1500	1676	3315		3252	3317	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	155	195	95	190	245	440	95	925	75	425	1030	80
RTOR Reduction (vph)	0	40	0	0	0	51	0	4	0	0	4	0
Lane Group Flow (vph)	155	250	0	190	245	389	95	996	0	425	1106	0
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8	1 8	5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	15.5	21.3		18.6	23.4	55.2	28.5	54.0		31.8	57.3	
Effective Green, g (s)	15.5	21.3		17.6	23.4	55.2	28.5	54.0		31.8	57.3	
Actuated g/C Ratio	0.11	0.15		0.13	0.17	0.39	0.20	0.38		0.23	0.41	
Clearance Time (s)	4.0	4.0		3.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	1.5	1.5		1.0	1.5		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	184	482		209	293	588	339	1272		734	1350	
v/s Ratio Prot	0.09	0.08		c0.11	c0.14	0.26	0.06	c0.30		0.13	c0.33	
v/s Ratio Perm												
v/c Ratio	0.84	0.52		0.91	0.84	0.66	0.28	0.78		0.58	0.82	
Uniform Delay, d1	61.4	55.0		60.8	56.8	35.1	47.4	38.2		48.5	37.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	27.0	0.4		37.1	17.6	2.8	2.1	4.9		1.1	4.0	
Delay (s)	88.4	55.4		97.8	74.4	37.9	49.5	43.1		49.6	41.1	
Level of Service	F	E		F	E	D	D	D		D	D	
Approach Delay (s)		66.9			61.1			43.6			43.5	
Approach LOS		E			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	50.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	140.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	78.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

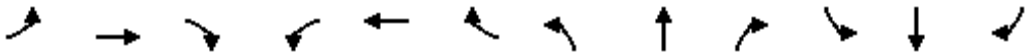


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	380	825	80	525	505	1395	45	295	1190
v/c Ratio	1.60	0.82	0.73	0.69	1.27	1.09	0.06	1.51	0.95
Control Delay	324.5	44.3	89.8	46.4	181.5	90.4	1.1	292.0	53.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	324.5	44.3	89.8	46.4	181.5	90.4	1.1	292.0	53.2
Queue Length 50th (ft)	~421	291	61	187	~284	~673	0	~318	464
Queue Length 95th (ft)	#615	371	#132	247	#393	#813	6	#495	#615
Internal Link Dist (ft)		1448		174		1573			1059
Turn Bay Length (ft)	250		250		275		300	150	
Base Capacity (vph)	237	1049	125	831	399	1277	723	195	1248
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.60	0.79	0.64	0.63	1.27	1.09	0.06	1.51	0.95

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	380	615	210	80	460	65	505	1395	45	295	1095	95
Future Volume (vph)	380	615	210	80	460	65	505	1395	45	295	1095	95
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95	1.00	1.00	0.95	
Frt	1.00	0.96		1.00	0.98		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	3225		1676	3291		3252	3353	1500	1676	3313	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1676	3225		1676	3291		3252	3353	1500	1676	3313	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	380	615	210	80	460	65	505	1395	45	295	1095	95
RTOR Reduction (vph)	0	29	0	0	9	0	0	0	25	0	6	0
Lane Group Flow (vph)	380	796	0	80	516	0	505	1395	20	295	1184	0
Turn Type	Prot	NA		Prot	NA		Prot	NA	pt+ov	Prot	NA	
Protected Phases	7	4		3	8		5	2	2 3	1	6	
Permitted Phases												
Actuated Green, G (s)	18.0	36.4		8.9	27.3		15.7	45.7	54.6	15.0	45.0	
Effective Green, g (s)	17.0	36.4		7.9	27.3		14.7	45.7	54.6	14.0	45.0	
Actuated g/C Ratio	0.14	0.30		0.07	0.23		0.12	0.38	0.46	0.12	0.38	
Clearance Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.5	3.0		2.0	4.0		2.0	3.5		2.0	3.5	
Lane Grp Cap (vph)	237	978		110	748		398	1276	682	195	1242	
v/s Ratio Prot	c0.23	c0.25		0.05	0.16		c0.16	c0.42	0.01	c0.18	0.36	
v/s Ratio Perm												
v/c Ratio	1.60	0.81		0.73	0.69		1.27	1.09	0.03	1.51	0.95	
Uniform Delay, d1	51.5	38.7		55.0	42.5		52.6	37.1	18.1	53.0	36.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	290.4	5.3		18.2	2.9		139.5	54.7	0.0	255.4	16.6	
Delay (s)	341.9	44.0		73.2	45.4		192.1	91.8	18.1	308.4	53.1	
Level of Service	F	D		E	D		F	F	B	F	D	
Approach Delay (s)		137.9			49.0			116.2			103.8	
Approach LOS		F			D			F			F	

Intersection Summary			
HCM 2000 Control Delay	109.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	109.1%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Arterial Level of Service: SB Central Avenue

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Central Avenue	III	30	22.0	0.0	22.0	0.16	26.8	B
Jackson Street	III	30	45.4	15.4	60.8	0.36	21.1	C
E 4th Street	III	30	22.6	12.4	35.0	0.18	18.3	C
6th Street	III	30	18.1	1.6	19.7	0.14	24.7	B
Main Street	III	30	11.0	2.1	13.1	0.07	19.6	C
8th Street	III	30	10.9	7.7	18.6	0.07	13.6	E
9th Street	III	30	10.5	1.9	12.4	0.07	19.7	C
10th	III	30	10.5	7.2	17.7	0.07	13.8	E
Total	III		151.0	48.3	199.3	1.11	20.1	C

Arterial Level of Service: SB Court Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Ohio Street	III	30	21.9	4.8	26.7	0.16	22.0	C
E McAndrews Road	III	30	16.0	27.6	43.6	0.11	9.4	F
Central Avenue	III	30	50.4	13.7	64.1	0.40	22.3	C
Total	III		88.3	46.1	134.4	0.67	18.0	C

Arterial Level of Service: WB Main Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Riverside Avenue	IV	30	20.4	25.3	45.7	0.11	8.9	E
Central Avenue	IV	30	18.6	18.9	37.5	0.10	9.9	D
Front Street	IV	30	11.5	5.8	17.3	0.05	10.6	D
Fir Street	IV	30	17.0	2.7	19.7	0.07	13.7	C
Grape Street	IV	30	12.1	3.0	15.1	0.05	12.7	D
Holly Street	IV	30	12.0	1.8	13.8	0.05	13.8	C
Oakdale Avenue	IV	30	19.1	6.0	25.1	0.11	15.2	C
Total	IV		110.7	63.5	174.2	0.55	11.5	D

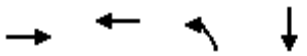
Arterial Level of Service: NB Riverside Avenue

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Barnett Road	III	30	27.4	46.3	73.7	0.22	10.5	E
12th Street	III	30	67.3	7.1	74.4	0.56	27.1	B
10th Street	III	30	16.2	13.2	29.4	0.12	14.1	D
8th Street	III	30	21.4	5.4	26.8	0.16	21.5	C
Main Street	III	30	10.9	2.7	13.6	0.07	18.5	C
	III	30	10.8	5.2	16.0	0.07	15.6	D
4th Street	III	30	18.8	11.1	29.9	0.14	16.9	D
Jackson Street	III	30	10.5	7.3	17.8	0.07	13.7	E
Manzanita Street	III	30	63.4	2.3	65.7	0.50	27.3	B
McAndrews Road	III	30	30.6	44.4	75.0	0.24	11.6	E
Mall Access	III	30	17.6	8.1	25.7	0.12	17.5	D
Total	III		294.9	153.1	448.0	2.26	18.2	C

Arterial Level of Service: SB Riverside Avenue

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Barnett Road	III	30	67.3	43.8	111.1	0.56	18.2	C
Stewart Avenue	III	30	27.4	53.2	80.6	0.22	9.6	F
Total	III		94.7	97.0	191.7	0.78	14.6	D

2038 Alternative A
Protected Phasing

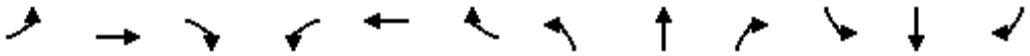


Lane Group	EBT	WBT	NBL	SBT
Lane Group Flow (vph)	242	181	1	1144
v/c Ratio	0.79	1.06	0.01	0.49
Control Delay	56.8	118.3	45.0	9.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	56.8	118.3	45.0	9.2
Queue Length 50th (ft)	148	~96	1	134
Queue Length 95th (ft)	215	#223	6	329
Internal Link Dist (ft)	1754	380		781
Turn Bay Length (ft)				
Base Capacity (vph)	467	262	94	2314
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.52	0.69	0.01	0.49

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	107	135	64	117	0	1	0	0	77	977	90
Future Volume (vph)	0	107	135	64	117	0	1	0	0	77	977	90
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0		6.0				4.0	
Lane Util. Factor		1.00			1.00		1.00				0.95	
Frpb, ped/bikes		0.99			1.00		1.00				0.99	
Flpb, ped/bikes		1.00			1.00		1.00				1.00	
Frt		0.92			1.00		1.00				0.99	
Flt Protected		1.00			0.98		0.95				1.00	
Satd. Flow (prot)		1610			1730		1676				3277	
Flt Permitted		1.00			0.51		0.95				1.00	
Satd. Flow (perm)		1610			906		1676				3277	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	107	135	64	117	0	1	0	0	77	977	90
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	242	0	0	181	0	1	0	0	0	1144	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)												60
Turn Type		NA		Perm	NA		Prot			Perm	NA	
Protected Phases		4			8		5				6	
Permitted Phases				8						6		
Actuated Green, G (s)		19.4			19.4		1.2				65.9	
Effective Green, g (s)		18.9			18.9		1.2				65.9	
Actuated g/C Ratio		0.19			0.19		0.01				0.66	
Clearance Time (s)		3.5			3.5		6.0				4.0	
Vehicle Extension (s)		2.0			2.0		3.0				4.0	
Lane Grp Cap (vph)		304			171		20				2159	
v/s Ratio Prot		0.15					c0.00					
v/s Ratio Perm					c0.20						0.35	
v/c Ratio		0.80			1.06		0.05				0.53	
Uniform Delay, d1		38.7			40.5		48.8				8.9	
Progression Factor		1.00			0.89		1.00				1.00	
Incremental Delay, d2		12.6			83.5		1.0				0.9	
Delay (s)		51.3			119.4		49.9				9.9	
Level of Service		D			F		D				A	
Approach Delay (s)		51.3			119.4			49.9			9.9	
Approach LOS		D			F			D			A	

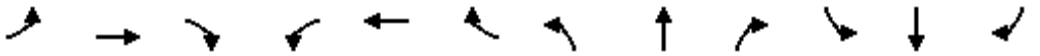
Intersection Summary			
HCM 2000 Control Delay	28.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBT	WBT	WBR	NBT	SBL
Lane Group Flow (vph)	223	86	76	1822	1
v/c Ratio	0.81	0.26	0.26	0.57	0.01
Control Delay	44.9	32.8	33.0	11.1	46.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	44.9	32.8	33.0	11.1	46.0
Queue Length 50th (ft)	79	48	43	187	1
Queue Length 95th (ft)	117	85	77	375	6
Internal Link Dist (ft)	380	1230		579	
Turn Bay Length (ft)					
Base Capacity (vph)	371	452	396	3203	88
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.60	0.19	0.19	0.57	0.01

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	150	73	0	0	59	103	93	1647	82	1	0	0
Future Volume (vph)	150	73	0	0	59	103	93	1647	82	1	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.5			4.5	4.5		5.0		6.0		
Lane Util. Factor		1.00			0.95	0.95		0.91		1.00		
Frpb, ped/bikes		1.00			0.99	0.98		1.00		1.00		
Flpb, ped/bikes		0.99			1.00	1.00		1.00		1.00		
Frt		1.00			0.95	0.85		0.99		1.00		
Flt Protected		0.97			1.00	1.00		1.00		0.95		
Satd. Flow (prot)		1696			1586	1392		4757		1674		
Flt Permitted		0.74			1.00	1.00		1.00		0.95		
Satd. Flow (perm)		1302			1586	1392		4757		1674		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	150	73	0	0	59	103	93	1647	82	1	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	223	0	0	86	76	0	1822	0	1	0	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)									60			
Turn Type	Perm	NA			NA	Perm	Split	NA		Prot		
Protected Phases		4			8		2	2		1		
Permitted Phases	4					8						
Actuated Green, G (s)		21.6			21.6	21.6		63.1		0.8		
Effective Green, g (s)		21.1			21.1	21.1		62.6		0.8		
Actuated g/C Ratio		0.21			0.21	0.21		0.63		0.01		
Clearance Time (s)		4.0			4.0	4.0		4.5		6.0		
Vehicle Extension (s)		2.5			2.5	2.5		2.0		3.0		
Lane Grp Cap (vph)		274			334	293		2977		13		
v/s Ratio Prot					0.05			c0.38		c0.00		
v/s Ratio Perm		c0.17				0.05						
v/c Ratio		0.81			0.26	0.26		0.61		0.08		
Uniform Delay, d1		37.6			32.9	32.9		11.3		49.2		
Progression Factor		0.65			1.00	1.00		1.00		1.00		
Incremental Delay, d2		15.2			0.3	0.3		0.9		2.5		
Delay (s)		39.7			33.2	33.3		12.3		51.8		
Level of Service		D			C	C		B		D		
Approach Delay (s)		39.7			33.2			12.3			51.8	
Approach LOS		D			C			B			D	

Intersection Summary			
HCM 2000 Control Delay	16.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	76.4%	ICU Level of Service	D
Analysis Period (min)	15		

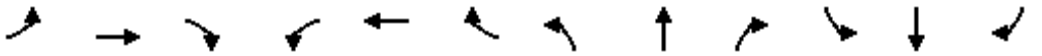
c Critical Lane Group



Lane Group	EBT	WBL	WBT	NBL	SBL	SBT	SBR
Lane Group Flow (vph)	669	161	832	1	456	599	65
v/c Ratio	0.55	0.61	0.44	0.02	0.77	0.50	0.13
Control Delay	33.9	39.1	3.8	57.0	42.9	31.3	24.9
Queue Delay	0.0	0.0	0.0	0.0	0.3	0.0	0.0
Total Delay	33.9	39.1	3.8	57.0	43.2	31.3	24.9
Queue Length 50th (ft)	215	121	42	1	298	183	32
Queue Length 95th (ft)	318	m193	55	7	422	235	64
Internal Link Dist (ft)	1762		672			521	
Turn Bay Length (ft)		110			175		175
Base Capacity (vph)	1223	265	1879	55	655	1311	557
Starvation Cap Reductn	0	0	0	0	24	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.61	0.44	0.02	0.72	0.46	0.12

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	625	44	161	832	0	1	0	0	456	599	65
Future Volume (vph)	0	625	44	161	832	0	1	0	0	456	599	65
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0		4.0	4.0		6.0			4.0	4.0	4.0
Lane Util. Factor		0.95		1.00	0.95		1.00			1.00	0.95	1.00
Frpb, ped/bikes		1.00		1.00	1.00		1.00			1.00	1.00	0.95
Flpb, ped/bikes		1.00		1.00	1.00		1.00			1.00	1.00	1.00
Frt		0.99		1.00	1.00		1.00			1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00		0.95			0.95	1.00	1.00
Satd. Flow (prot)		3316		1676	3353		1674			1676	3353	1422
Flt Permitted		1.00		0.95	1.00		0.95			0.95	1.00	1.00
Satd. Flow (perm)		3316		1676	3353		1674			1676	3353	1422
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	625	44	161	832	0	1	0	0	456	599	65
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	669	0	161	832	0	1	0	0	456	599	65
Confl. Peds. (#/hr)	2		2	2		2	2		1	1		2
Confl. Bikes (#/hr)												60
Turn Type		NA		Prot	NA		Prot			Split	NA	Perm
Protected Phases		4		3	8		5			6	6	
Permitted Phases												6
Actuated Green, G (s)		39.5		20.0	62.5		0.8			42.7	42.7	42.7
Effective Green, g (s)		39.5		19.0	62.5		0.8			42.7	42.7	42.7
Actuated g/C Ratio		0.33		0.16	0.52		0.01			0.36	0.36	0.36
Clearance Time (s)		4.0		3.0	4.0		6.0			4.0	4.0	4.0
Vehicle Extension (s)		4.0		2.0	4.0		3.0			5.0	5.0	5.0
Lane Grp Cap (vph)		1091		265	1746		11			596	1193	505
v/s Ratio Prot		c0.20		c0.10	0.25		c0.00			c0.27	0.18	
v/s Ratio Perm												0.05
v/c Ratio		0.61		0.61	0.48		0.09			0.77	0.50	0.13
Uniform Delay, d1		33.8		47.0	18.3		59.2			34.2	30.3	26.1
Progression Factor		1.00		0.64	0.19		1.00			1.00	1.00	1.00
Incremental Delay, d2		2.6		2.2	0.8		3.6			6.8	0.7	0.2
Delay (s)		36.4		32.5	4.2		62.8			41.0	31.0	26.3
Level of Service		D		C	A		E			D	C	C
Approach Delay (s)		36.4			8.8			62.8			34.8	
Approach LOS		D			A			E			C	

Intersection Summary			
HCM 2000 Control Delay	25.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	64.1%	ICU Level of Service	C
Analysis Period (min)	15		

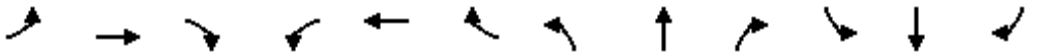
c Critical Lane Group



Lane Group	EBL	EBT	WBT	WBR	NBT	NBR	SBL
Lane Group Flow (vph)	103	946	863	583	1279	319	1
v/c Ratio	0.74	0.49	0.55	0.86	0.74	0.64	0.02
Control Delay	66.0	6.2	24.9	43.3	37.3	39.6	57.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.0	6.2	24.9	43.3	37.3	39.6	57.0
Queue Length 50th (ft)	83	156	250	399	301	195	1
Queue Length 95th (ft)	m#153	75	314	#624	#409	#359	7
Internal Link Dist (ft)		672	692		1193		
Turn Bay Length (ft)	130					150	
Base Capacity (vph)	139	1927	1563	679	1718	500	55
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.49	0.55	0.86	0.74	0.64	0.02

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	946	0	0	863	583	123	1156	319	1	0	0
Future Volume (vph)	103	946	0	0	863	583	123	1156	319	1	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	3.0			3.0	3.0		3.0	3.0	6.0		
Lane Util. Factor	1.00	0.95			0.95	1.00		0.91	1.00	1.00		
Frpb, ped/bikes	1.00	1.00			1.00	0.97		1.00	0.94	1.00		
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00	1.00		
Frt	1.00	1.00			1.00	0.85		1.00	0.85	1.00		
Flt Protected	0.95	1.00			1.00	1.00		1.00	1.00	0.95		
Satd. Flow (prot)	1676	3353			3353	1456		4795	1406	1673		
Flt Permitted	0.95	1.00			1.00	1.00		1.00	1.00	0.95		
Satd. Flow (perm)	1676	3353			3353	1456		4795	1406	1673		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	103	946	0	0	863	583	123	1156	319	1	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	103	946	0	0	863	583	0	1279	319	1	0	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)									60			
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm	Prot		
Protected Phases	7	4			8		2	2		1		
Permitted Phases						8			2			
Actuated Green, G (s)	10.0	63.2			50.2	50.2		42.0	42.0	0.8		
Effective Green, g (s)	10.0	64.2			51.2	51.2		43.0	43.0	0.8		
Actuated g/C Ratio	0.08	0.54			0.43	0.43		0.36	0.36	0.01		
Clearance Time (s)	3.0	4.0			4.0	4.0		4.0	4.0	6.0		
Vehicle Extension (s)	2.0	4.0			4.0	4.0		4.0	4.0	3.0		
Lane Grp Cap (vph)	139	1793			1430	621		1718	503	11		
v/s Ratio Prot	c0.06	0.28			0.26			c0.27		c0.00		
v/s Ratio Perm						c0.40			0.23			
v/c Ratio	0.74	0.53			0.60	0.94		0.74	0.63	0.09		
Uniform Delay, d1	53.7	18.1			26.6	32.9		33.7	32.0	59.2		
Progression Factor	0.75	0.36			1.00	1.00		1.00	1.00	1.00		
Incremental Delay, d2	13.7	0.9			1.9	23.8		1.9	2.9	3.6		
Delay (s)	53.9	7.3			28.5	56.7		35.6	34.9	62.8		
Level of Service	D	A			C	E		D	C	E		
Approach Delay (s)		11.9			39.9			35.5			62.8	
Approach LOS		B			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	31.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	81.4%	ICU Level of Service	D
Analysis Period (min)	15		

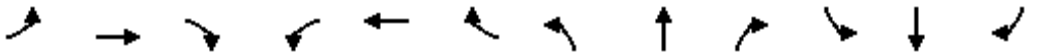
c Critical Lane Group



Lane Group	EBT	WBT	NBT	SBL
Lane Group Flow (vph)	79	18	1566	1
v/c Ratio	0.55	0.10	0.78	0.01
Control Delay	51.2	34.6	4.6	40.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	51.2	34.6	4.6	40.0
Queue Length 50th (ft)	41	9	78	1
Queue Length 95th (ft)	#97	28	m82	6
Internal Link Dist (ft)	550	165	918	
Turn Bay Length (ft)				
Base Capacity (vph)	143	185	1995	70
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.55	0.10	0.78	0.01

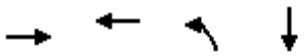
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	4	0	0	9	9	40	1511	15	1	0	0
Future Volume (vph)	75	4	0	0	9	9	40	1511	15	1	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0			4.0		6.0		
Lane Util. Factor		1.00			1.00			0.95		1.00		
Frpb, ped/bikes		1.00			0.98			1.00		1.00		
Flpb, ped/bikes		0.98			1.00			1.00		1.00		
Frt		1.00			0.93			1.00		1.00		
Flt Protected		0.95			1.00			1.00		0.95		
Satd. Flow (prot)		1483			1455			3007		1509		
Flt Permitted		0.72			1.00			1.00		0.95		
Satd. Flow (perm)		1125			1455			3007		1509		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	75	4	0	0	9	9	40	1511	15	1	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	79	0	0	18	0	0	1566	0	1	0	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)									60			
Turn Type	Perm	NA			NA		Split	NA		Prot		
Protected Phases		4			8		2	2		1		
Permitted Phases	4											
Actuated Green, G (s)		11.0			11.0			57.0		4.0		
Effective Green, g (s)		11.0			11.0			57.0		4.0		
Actuated g/C Ratio		0.13			0.13			0.66		0.05		
Clearance Time (s)		4.0			4.0			4.0		6.0		
Lane Grp Cap (vph)		143			186			1993		70		
v/s Ratio Prot					0.01			c0.52		c0.00		
v/s Ratio Perm		c0.07										
v/c Ratio		0.55			0.10			0.79		0.01		
Uniform Delay, d1		35.2			33.1			10.2		39.1		
Progression Factor		1.00			1.00			0.28		1.00		
Incremental Delay, d2		14.5			1.0			1.6		0.4		
Delay (s)		49.7			34.1			4.5		39.5		
Level of Service		D			C			A		D		
Approach Delay (s)		49.7			34.1			4.5			39.5	
Approach LOS		D			C			A			D	

Intersection Summary			
HCM 2000 Control Delay	7.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	69.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



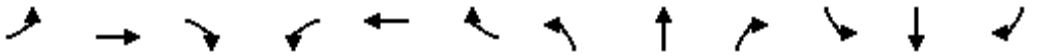
Lane Group	EBT	WBT	NBL	SBT
Lane Group Flow (vph)	424	152	1	888
v/c Ratio	1.48	0.62	0.01	0.63
Control Delay	263.8	39.3	39.0	23.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	263.8	39.3	39.0	23.1
Queue Length 50th (ft)	~320	80	1	169
Queue Length 95th (ft)	#497	m102	6	#411
Internal Link Dist (ft)	7	1528		2014
Turn Bay Length (ft)				
Base Capacity (vph)	286	415	92	1400
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.48	0.37	0.01	0.63

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

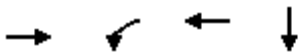
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	54	370	65	87	0	1	0	0	40	818	30
Future Volume (vph)	0	54	370	65	87	0	1	0	0	40	818	30
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0		6.0				4.0	
Lane Util. Factor		1.00			1.00		1.00				0.95	
Frpb, ped/bikes		0.98			1.00		1.00				1.00	
Flpb, ped/bikes		1.00			1.00		0.99				1.00	
Frt		0.88			1.00		1.00				0.99	
Flt Protected		1.00			0.98		0.95				1.00	
Satd. Flow (prot)		1369			1555		1500				2986	
Flt Permitted		1.00			0.98		0.95				1.00	
Satd. Flow (perm)		1369			1555		1500				2986	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	54	370	65	87	0	1	0	0	40	818	30
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	424	0	0	152	0	1	0	0	0	888	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)												60
Turn Type		NA		Split	NA		Prot			Split	NA	
Protected Phases		7		8	8		5			6	6	
Permitted Phases												
Actuated Green, G (s)		18.0			13.6		0.8				35.6	
Effective Green, g (s)		18.0			13.6		0.8				35.6	
Actuated g/C Ratio		0.21			0.16		0.01				0.41	
Clearance Time (s)		4.0			4.0		6.0				4.0	
Vehicle Extension (s)		2.0			2.0		3.0				4.0	
Lane Grp Cap (vph)		286			245		13				1236	
v/s Ratio Prot		c0.31			c0.10		c0.00				c0.30	
v/s Ratio Perm												
v/c Ratio		1.48			0.62		0.08				0.72	
Uniform Delay, d1		34.0			33.8		42.2				21.0	
Progression Factor		1.00			0.90		1.00				1.00	
Incremental Delay, d2		235.0			3.2		2.5				3.6	
Delay (s)		269.0			33.6		44.8				24.6	
Level of Service		F			C		D				C	
Approach Delay (s)		269.0			33.6			44.8			24.6	
Approach LOS		F			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	96.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	82.4%	ICU Level of Service	E
Analysis Period (min)	15		

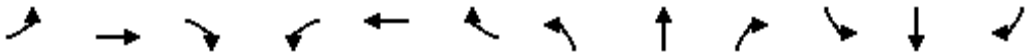
c Critical Lane Group



Lane Group	EBT	WBL	WBT	SBT
Lane Group Flow (vph)	351	59	277	1290
v/c Ratio	0.65	0.29	0.50	0.79
Control Delay	30.4	10.2	10.4	12.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	30.4	10.2	10.4	12.5
Queue Length 50th (ft)	158	11	56	263
Queue Length 95th (ft)	253	m13	m60	m25
Internal Link Dist (ft)	1450		992	1806
Turn Bay Length (ft)		250		
Base Capacity (vph)	539	206	553	1636
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.65	0.29	0.50	0.79

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	291	60	59	277	0	0	0	0	188	983	119
Future Volume (vph)	0	291	60	59	277	0	0	0	0	188	983	119
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0		4.0	4.0						4.0	
Lane Util. Factor		1.00		1.00	1.00						0.95	
Frpb, ped/bikes		1.00		1.00	1.00						0.99	
Flpb, ped/bikes		1.00		1.00	1.00						1.00	
Frt		0.98		1.00	1.00						0.99	
Flt Protected		1.00		0.95	1.00						0.99	
Satd. Flow (prot)		1546		1502	1588						2932	
Flt Permitted		1.00		0.38	1.00						0.99	
Satd. Flow (perm)		1546		593	1588						2932	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	291	60	59	277	0	0	0	0	188	983	119
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	351	0	59	277	0	0	0	0	0	1290	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		15
Confl. Bikes (#/hr)												60
Turn Type		NA		Perm	NA					Split	NA	
Protected Phases		4			8					6	6	
Permitted Phases				8								
Actuated Green, G (s)		30.0		30.0	30.0						48.0	
Effective Green, g (s)		30.0		30.0	30.0						48.0	
Actuated g/C Ratio		0.35		0.35	0.35						0.56	
Clearance Time (s)		4.0		4.0	4.0						4.0	
Lane Grp Cap (vph)		539		206	553						1636	
v/s Ratio Prot		c0.23			0.17						c0.44	
v/s Ratio Perm				0.10								
v/c Ratio		0.65		0.29	0.50						0.79	
Uniform Delay, d1		23.6		20.3	22.1						15.0	
Progression Factor		1.00		0.41	0.40						0.68	
Incremental Delay, d2		6.0		1.4	1.3						2.0	
Delay (s)		29.6		9.7	10.2						12.2	
Level of Service		C		A	B						B	
Approach Delay (s)		29.6			10.1			0.0			12.2	
Approach LOS		C			B			A			B	

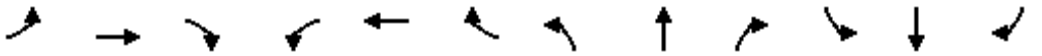
Intersection Summary			
HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	89.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	NBT	SBL
Lane Group Flow (vph)	66	346	357	1544	1
v/c Ratio	0.65	0.85	0.95	0.97	0.01
Control Delay	56.2	49.6	68.5	29.6	40.0
Queue Delay	0.0	0.0	0.0	0.3	0.0
Total Delay	56.2	49.6	68.5	29.9	40.0
Queue Length 50th (ft)	35	191	190	196	1
Queue Length 95th (ft)	m53	m#310	#357	m#547	6
Internal Link Dist (ft)		992	302	277	
Turn Bay Length (ft)	200				
Base Capacity (vph)	101	406	377	1588	70
Starvation Cap Reductn	0	0	0	4	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.65	0.85	0.95	0.97	0.01

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	346	0	0	211	146	106	1366	72	1	0	0
Future Volume (vph)	66	346	0	0	211	146	106	1366	72	1	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0			4.0			4.0		6.0		
Lane Util. Factor	1.00	1.00			1.00			0.95		1.00		
Frpb, ped/bikes	1.00	1.00			0.98			0.99		1.00		
Flpb, ped/bikes	0.99	1.00			1.00			1.00		1.00		
Frt	1.00	1.00			0.94			0.99		1.00		
Flt Protected	0.95	1.00			1.00			1.00		0.95		
Satd. Flow (prot)	1491	1588			1473			2968		1509		
Flt Permitted	0.25	1.00			1.00			1.00		0.95		
Satd. Flow (perm)	397	1588			1473			2968		1509		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	66	346	0	0	211	146	106	1366	72	1	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	66	346	0	0	357	0	0	1544	0	1	0	0
Confl. Peds. (#/hr)	18		12	12		18	37		32	32		37
Confl. Bikes (#/hr)									60			
Turn Type	Perm	NA			NA		Split	NA		Prot		
Protected Phases		4			8		2	2		1		
Permitted Phases	4											
Actuated Green, G (s)	22.0	22.0			22.0			46.0		4.0		
Effective Green, g (s)	22.0	22.0			22.0			46.0		4.0		
Actuated g/C Ratio	0.26	0.26			0.26			0.53		0.05		
Clearance Time (s)	4.0	4.0			4.0			4.0		6.0		
Lane Grp Cap (vph)	101	406			376			1587		70		
v/s Ratio Prot		0.22			c0.24			c0.52		c0.00		
v/s Ratio Perm	0.17											
v/c Ratio	0.65	0.85			0.95			0.97		0.01		
Uniform Delay, d1	28.6	30.5			31.5			19.4		39.1		
Progression Factor	1.09	1.10			1.00			0.77		1.00		
Incremental Delay, d2	20.6	14.6			35.3			13.1		0.4		
Delay (s)	51.8	48.0			66.7			28.0		39.5		
Level of Service	D	D			E			C		D		
Approach Delay (s)		48.6			66.7			28.0			39.5	
Approach LOS		D			E			C			D	

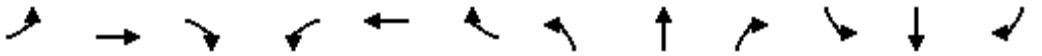
Intersection Summary			
HCM 2000 Control Delay	37.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	96.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBL	WBT	SBT	SBR
Lane Group Flow (vph)	308	272	289	1053	153
v/c Ratio	0.76	0.70	0.39	0.79	0.22
Control Delay	43.1	17.3	11.1	14.1	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	43.1	17.3	11.1	14.1	1.1
Queue Length 50th (ft)	151	108	116	229	4
Queue Length 95th (ft)	#276	m124	m133	245	m5
Internal Link Dist (ft)	282		688	858	
Turn Bay Length (ft)		250			
Base Capacity (vph)	404	391	738	1332	681
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.76	0.70	0.39	0.79	0.22

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	273	35	272	289	0	0	0	0	15	1038	153
Future Volume (vph)	0	273	35	272	289	0	0	0	0	15	1038	153
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0		3.5	4.0						4.0	4.0
Lane Util. Factor		1.00		1.00	1.00						0.95	1.00
Frpb, ped/bikes		1.00		1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00						1.00	1.00
Frt		0.98		1.00	1.00						1.00	0.85
Flt Protected		1.00		0.95	1.00						1.00	1.00
Satd. Flow (prot)		1558		1506	1588						3015	1350
Flt Permitted		1.00		0.29	1.00						1.00	1.00
Satd. Flow (perm)		1558		455	1588						3015	1350
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	273	35	272	289	0	0	0	0	15	1038	153
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	0	0	0	85
Lane Group Flow (vph)	0	303	0	272	289	0	0	0	0	0	1053	68
Confl. Peds. (#/hr)	6		11	11		6			2	2		
Confl. Bikes (#/hr)												60
Turn Type		NA		pm+pt	NA					Split	NA	Prot
Protected Phases		4		3	8					6	6	6
Permitted Phases				8	8							
Actuated Green, G (s)		22.0		40.0	40.0						38.0	38.0
Effective Green, g (s)		22.0		40.0	40.0						38.0	38.0
Actuated g/C Ratio		0.26		0.47	0.47						0.44	0.44
Clearance Time (s)		4.0		3.5	4.0						4.0	4.0
Lane Grp Cap (vph)		398		388	738						1332	596
v/s Ratio Prot		0.19		c0.12	0.18						c0.35	0.05
v/s Ratio Perm				c0.21								
v/c Ratio		0.76		0.70	0.39						0.79	0.11
Uniform Delay, d1		29.6		16.4	15.0						20.6	14.1
Progression Factor		1.00		0.72	0.66						0.50	0.21
Incremental Delay, d2		12.8		5.9	0.9						3.5	0.3
Delay (s)		42.4		17.6	10.8						13.9	3.2
Level of Service		D		B	B						B	A
Approach Delay (s)		42.4			14.1			0.0			12.5	
Approach LOS		D			B			A			B	

Intersection Summary			
HCM 2000 Control Delay	17.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	11.5
Intersection Capacity Utilization	84.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



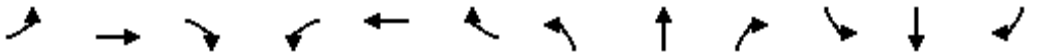
Lane Group	EBL	EBT	WBT	NBT	NBR	SBL
Lane Group Flow (vph)	137	274	506	1244	509	1
v/c Ratio	1.02	0.45	0.83	0.83	0.79	0.01
Control Delay	108.8	20.2	38.3	11.6	15.1	40.0
Queue Delay	25.9	0.0	0.0	0.3	0.0	0.0
Total Delay	134.7	20.2	38.3	11.9	15.1	40.0
Queue Length 50th (ft)	~82	143	243	78	61	1
Queue Length 95th (ft)	m#143	m202	#419	#498	m#391	6
Internal Link Dist (ft)		688	289	661		
Turn Bay Length (ft)	250				250	
Base Capacity (vph)	134	609	606	1506	641	70
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	11	0	0	39	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.11	0.45	0.83	0.85	0.79	0.01

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

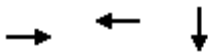
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	137	274	0	0	491	15	50	1194	509	1	0	0
Future Volume (vph)	137	274	0	0	491	15	50	1194	509	1	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	5.0	4.0			4.0			4.0	4.0	6.0		
Lane Util. Factor	1.00	1.00			1.00			0.95	1.00	1.00		
Frpb, ped/bikes	1.00	1.00			1.00			1.00	0.95	1.00		
Flpb, ped/bikes	1.00	1.00			1.00			1.00	1.00	1.00		
Frt	1.00	1.00			1.00			1.00	0.85	1.00		
Flt Protected	0.95	1.00			1.00			1.00	1.00	0.95		
Satd. Flow (prot)	1507	1588			1581			3012	1286	1507		
Flt Permitted	0.23	1.00			1.00			1.00	1.00	0.95		
Satd. Flow (perm)	361	1588			1581			3012	1286	1507		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	137	274	0	0	491	15	50	1194	509	1	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	137	274	0	0	506	0	0	1244	509	1	0	0
Confl. Peds. (#/hr)	4		5	5		4	5		4	4		5
Confl. Bikes (#/hr)									60			
Turn Type	Perm	NA			NA		Split	NA	Perm	Prot		
Protected Phases		4			8		2	2		1		
Permitted Phases	4								2			
Actuated Green, G (s)	33.0	33.0			33.0			38.2	38.2	0.8		
Effective Green, g (s)	32.0	33.0			33.0			38.2	38.2	0.8		
Actuated g/C Ratio	0.37	0.38			0.38			0.44	0.44	0.01		
Clearance Time (s)	4.0	4.0			4.0			4.0	4.0	6.0		
Vehicle Extension (s)	0.2	0.2			0.2			0.2	0.2	3.0		
Lane Grp Cap (vph)	134	609			606			1337	571	14		
v/s Ratio Prot		0.17			0.32			c0.41		c0.00		
v/s Ratio Perm	c0.38								0.40			
v/c Ratio	1.02	0.45			0.83			0.93	0.89	0.07		
Uniform Delay, d1	27.0	19.7			24.0			22.6	22.0	42.2		
Progression Factor	0.94	0.89			1.00			0.32	0.33	1.00		
Incremental Delay, d2	77.9	0.2			9.3			7.8	11.4	2.2		
Delay (s)	103.1	17.8			33.3			15.1	18.6	44.4		
Level of Service	F	B			C			B	B	D		
Approach Delay (s)		46.2			33.3			16.1			44.4	
Approach LOS		D			C			B			D	

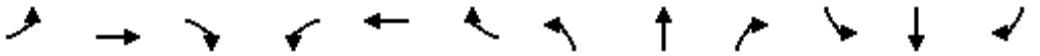
Intersection Summary			
HCM 2000 Control Delay	24.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	96.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	131	85	1312
v/c Ratio	0.38	0.31	0.56
Control Delay	28.5	33.1	1.7
Queue Delay	0.0	0.0	0.0
Total Delay	28.5	33.1	1.7
Queue Length 50th (ft)	51	40	12
Queue Length 95th (ft)	104	82	34
Internal Link Dist (ft)	137	79	634
Turn Bay Length (ft)			
Base Capacity (vph)	346	276	2360
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.38	0.31	0.56

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	92	39	44	41	0	0	0	0	41	1248	23
Future Volume (vph)	0	92	39	44	41	0	0	0	0	41	1248	23
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						0.95	
Frpb, ped/bikes		0.98			1.00						1.00	
Flpb, ped/bikes		1.00			0.98						1.00	
Frt		0.96			1.00						1.00	
Flt Protected		1.00			0.97						1.00	
Satd. Flow (prot)		1662			1684						3328	
Flt Permitted		1.00			0.81						1.00	
Satd. Flow (perm)		1662			1399						3328	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	92	39	44	41	0	0	0	0	41	1248	23
RTOR Reduction (vph)	0	18	0	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	113	0	0	85	0	0	0	0	0	1311	0
Confl. Peds. (#/hr)	22		24	24		22	14		20	20		14
Confl. Bikes (#/hr)												60
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		17.0			17.0						61.0	
Effective Green, g (s)		17.0			17.0						61.0	
Actuated g/C Ratio		0.20			0.20						0.71	
Clearance Time (s)		4.0			4.0						4.0	
Lane Grp Cap (vph)		328			276						2360	
v/s Ratio Prot		c0.07										
v/s Ratio Perm					0.06						0.39	
v/c Ratio		0.35			0.31						0.56	
Uniform Delay, d1		29.7			29.5						6.0	
Progression Factor		1.00			1.00						0.19	
Incremental Delay, d2		2.9			2.9						0.6	
Delay (s)		32.6			32.4						1.7	
Level of Service		C			C						A	
Approach Delay (s)		32.6			32.4			0.0			1.7	
Approach LOS		C			C			A			A	

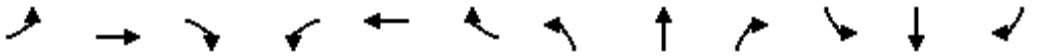
Intersection Summary			
HCM 2000 Control Delay	6.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	71.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBT	WBR	NBT	SBL
Lane Group Flow (vph)	189	13	20	1613	1
v/c Ratio	0.68	0.03	0.06	0.85	0.01
Control Delay	44.6	26.7	27.2	4.7	40.0
Queue Delay	0.0	0.0	0.0	1.2	0.0
Total Delay	44.6	26.7	27.2	6.0	40.0
Queue Length 50th (ft)	94	6	9	41	1
Queue Length 95th (ft)	#185	20	27	m44	6
Internal Link Dist (ft)	175	153		287	
Turn Bay Length (ft)					
Base Capacity (vph)	279	389	331	1902	77
Starvation Cap Reductn	0	0	0	122	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.68	0.03	0.06	0.91	0.01

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



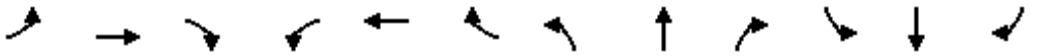
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	181	8	0	0	13	20	50	1548	15	1	0	0
Future Volume (vph)	181	8	0	0	13	20	50	1548	15	1	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0	4.0		4.0		6.0		
Lane Util. Factor		1.00			1.00	1.00		0.95		1.00		
Frpb, ped/bikes		1.00			1.00	1.00		1.00		1.00		
Flpb, ped/bikes		0.99			1.00	1.00		1.00		1.00		
Frt		1.00			1.00	0.85		1.00		1.00		
Flt Protected		0.95			1.00	1.00		1.00		0.95		
Satd. Flow (prot)		1663			1765	1500		3339		1676		
Flt Permitted		0.73			1.00	1.00		1.00		0.95		
Satd. Flow (perm)		1265			1765	1500		3339		1676		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	181	8	0	0	13	20	50	1548	15	1	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	189	0	0	13	20	0	1613	0	1	0	0
Confl. Peds. (#/hr)	10		10				10					10
Confl. Bikes (#/hr)									60			
Turn Type	Perm	NA			NA	Perm	Perm	NA		Prot		
Protected Phases		4			8			2		1		
Permitted Phases	4					8	2					
Actuated Green, G (s)		19.0			19.0	19.0		49.0		4.0		
Effective Green, g (s)		19.0			19.0	19.0		49.0		4.0		
Actuated g/C Ratio		0.22			0.22	0.22		0.57		0.05		
Clearance Time (s)		4.0			4.0	4.0		4.0		6.0		
Lane Grp Cap (vph)		279			389	331		1902		77		
v/s Ratio Prot					0.01					c0.00		
v/s Ratio Perm		c0.15				0.01		0.48				
v/c Ratio		0.68			0.03	0.06		0.85		0.01		
Uniform Delay, d1		30.7			26.3	26.5		15.4		39.1		
Progression Factor		1.00			1.00	1.00		0.16		1.00		
Incremental Delay, d2		12.5			0.2	0.3		1.9		0.3		
Delay (s)		43.2			26.5	26.8		4.4		39.4		
Level of Service		D			C	C		A		D		
Approach Delay (s)		43.2			26.7			4.4			39.4	
Approach LOS		D			C			A			D	

Intersection Summary			
HCM 2000 Control Delay	8.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	84.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



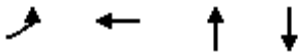
Lane Group	EBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	1	527	25	83	214
v/c Ratio	0.01	0.39	0.08	0.14	0.36
Control Delay	36.0	7.6	20.4	20.7	23.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	36.0	7.6	20.4	20.7	23.8
Queue Length 50th (ft)	1	35	9	31	86
Queue Length 95th (ft)	6	46	27	63	146
Internal Link Dist (ft)		479		105	1243
Turn Bay Length (ft)					
Base Capacity (vph)	155	1339	311	595	588
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.01	0.39	0.08	0.14	0.36

Intersection Summary



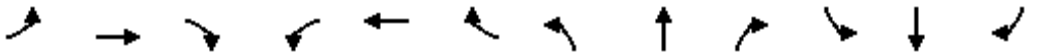
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	0	103	408	16	25	83	0	0	203	11
Future Volume (vph)	1	0	0	103	408	16	25	83	0	0	203	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0				4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00				0.95		1.00	1.00			1.00	
Frpb, ped/bikes	1.00				1.00		1.00	1.00			1.00	
Flpb, ped/bikes	1.00				1.00		0.96	1.00			1.00	
Frt	1.00				1.00		1.00	1.00			0.99	
Flt Protected	0.95				0.99		0.95	1.00			1.00	
Satd. Flow (prot)	1676				3295		1611	1765			1746	
Flt Permitted	0.95				0.99		0.54	1.00			1.00	
Satd. Flow (perm)	1676				3295		924	1765			1746	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	0	0	103	408	16	25	83	0	0	203	11
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	1	0	0	0	527	0	25	83	0	0	214	0
Confl. Peds. (#/hr)	15		46	46		15	35		34	34		35
Confl. Bikes (#/hr)						60						
Turn Type	Prot			Split	NA		Perm	NA			NA	
Protected Phases	7			8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)	8.0				35.0		29.0	29.0			29.0	
Effective Green, g (s)	8.0				35.0		29.0	29.0			29.0	
Actuated g/C Ratio	0.09				0.41		0.34	0.34			0.34	
Clearance Time (s)	6.0				4.0		4.0	4.0			4.0	
Lane Grp Cap (vph)	155				1340		311	595			588	
v/s Ratio Prot	c0.00				c0.16			0.05			c0.12	
v/s Ratio Perm							0.03					
v/c Ratio	0.01				0.39		0.08	0.14			0.36	
Uniform Delay, d1	35.4				18.0		19.4	19.8			21.5	
Progression Factor	1.00				0.37		1.00	1.00			1.00	
Incremental Delay, d2	0.1				0.9		0.5	0.5			1.7	
Delay (s)	35.5				7.5		19.9	20.3			23.3	
Level of Service	D				A		B	C			C	
Approach Delay (s)		35.5			7.5			20.2			23.3	
Approach LOS		D			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	13.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



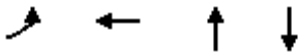
Lane Group	EBL	WBT	NBT	SBT
Lane Group Flow (vph)	1	479	73	43
v/c Ratio	0.01	0.33	0.16	0.09
Control Delay	34.0	3.1	24.7	23.7
Queue Delay	0.0	0.2	0.0	0.0
Total Delay	34.0	3.3	24.7	23.7
Queue Length 50th (ft)	1	13	30	17
Queue Length 95th (ft)	5	17	64	42
Internal Link Dist (ft)		199	104	1901
Turn Bay Length (ft)				
Base Capacity (vph)	194	1448	447	484
Starvation Cap Reductn	0	367	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.01	0.44	0.16	0.09

Intersection Summary



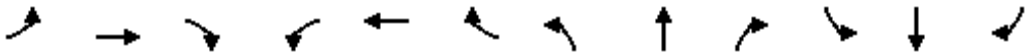
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	0	71	381	27	25	48	0	0	39	4
Future Volume (vph)	1	0	0	71	381	27	25	48	0	0	39	4
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0				4.0			4.0			4.0	
Lane Util. Factor	1.00				0.95			1.00			1.00	
Frpb, ped/bikes	1.00				0.99			1.00			1.00	
Flpb, ped/bikes	1.00				1.00			0.99			1.00	
Frt	1.00				0.99			1.00			0.99	
Flt Protected	0.95				0.99			0.98			1.00	
Satd. Flow (prot)	1676				3276			1718			1736	
Flt Permitted	0.95				0.99			0.92			1.00	
Satd. Flow (perm)	1676				3276			1603			1736	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	0	0	71	381	27	25	48	0	0	39	4
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	1	0	0	0	479	0	0	73	0	0	43	0
Confl. Peds. (#/hr)	26		30	30		26	18		66	66		18
Confl. Bikes (#/hr)						60						
Turn Type	Prot			Split	NA		Perm	NA			NA	
Protected Phases	7			8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)	10.0				38.0			24.0			24.0	
Effective Green, g (s)	10.0				38.0			24.0			24.0	
Actuated g/C Ratio	0.12				0.44			0.28			0.28	
Clearance Time (s)	6.0				4.0			4.0			4.0	
Lane Grp Cap (vph)	194				1447			447			484	
v/s Ratio Prot	c0.00				c0.15						0.02	
v/s Ratio Perm								c0.05				
v/c Ratio	0.01				0.33			0.16			0.09	
Uniform Delay, d1	33.6				15.7			23.4			22.9	
Progression Factor	1.00				0.16			1.00			1.00	
Incremental Delay, d2	0.0				0.6			0.8			0.4	
Delay (s)	33.6				3.1			24.2			23.3	
Level of Service	C				A			C			C	
Approach Delay (s)		33.6			3.1			24.2			23.3	
Approach LOS		C			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	7.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	34.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



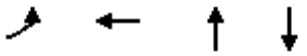
Lane Group	EBL	WBT	NBT	SBT
Lane Group Flow (vph)	1	509	40	40
v/c Ratio	0.01	0.32	0.11	0.10
Control Delay	34.0	1.9	26.2	26.1
Queue Delay	0.0	0.2	0.0	0.0
Total Delay	34.0	2.1	26.2	26.1
Queue Length 50th (ft)	1	10	17	17
Queue Length 95th (ft)	5	13	42	42
Internal Link Dist (ft)		202	103	244
Turn Bay Length (ft)				
Base Capacity (vph)	194	1578	375	411
Starvation Cap Reductn	0	383	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.01	0.43	0.11	0.10

Intersection Summary



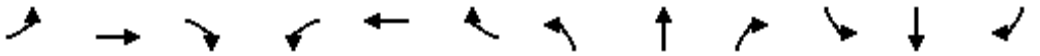
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	0	37	456	16	22	18	0	0	29	11
Future Volume (vph)	1	0	0	37	456	16	22	18	0	0	29	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0				4.0			4.0			4.0	
Lane Util. Factor	1.00				0.95			1.00			1.00	
Frpb, ped/bikes	1.00				1.00			1.00			0.99	
Flpb, ped/bikes	1.00				1.00			0.99			1.00	
Frt	1.00				1.00			1.00			0.96	
Flt Protected	0.95				1.00			0.97			1.00	
Satd. Flow (prot)	1676				3314			1702			1686	
Flt Permitted	0.95				1.00			0.88			1.00	
Satd. Flow (perm)	1676				3314			1537			1686	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	0	0	37	456	16	22	18	0	0	29	11
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	1	0	0	0	509	0	0	40	0	0	40	0
Confl. Peds. (#/hr)	17		15	15		17	10		19	19		10
Confl. Bikes (#/hr)						60						
Turn Type	Prot			Split	NA		Perm	NA			NA	
Protected Phases	7			8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)	10.0				41.0			21.0			21.0	
Effective Green, g (s)	10.0				41.0			21.0			21.0	
Actuated g/C Ratio	0.12				0.48			0.24			0.24	
Clearance Time (s)	6.0				4.0			4.0			4.0	
Lane Grp Cap (vph)	194				1579			375			411	
v/s Ratio Prot	c0.00				c0.15						0.02	
v/s Ratio Perm								c0.03				
v/c Ratio	0.01				0.32			0.11			0.10	
Uniform Delay, d1	33.6				13.9			25.2			25.2	
Progression Factor	1.00				0.10			1.00			1.00	
Incremental Delay, d2	0.0				0.5			0.6			0.5	
Delay (s)	33.6				1.9			25.8			25.6	
Level of Service	C				A			C			C	
Approach Delay (s)		33.6			1.9			25.8			25.6	
Approach LOS		C			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	5.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.22		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	34.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



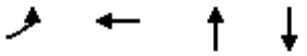
Lane Group	EBL	WBT	NBT	SBT
Lane Group Flow (vph)	1	536	55	64
v/c Ratio	0.01	0.32	0.12	0.14
Control Delay	35.0	3.9	24.9	25.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	35.0	3.9	24.9	25.1
Queue Length 50th (ft)	1	22	23	26
Queue Length 95th (ft)	6	29	52	58
Internal Link Dist (ft)		315	175	240
Turn Bay Length (ft)				
Base Capacity (vph)	165	1663	440	449
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.01	0.32	0.13	0.14

Intersection Summary



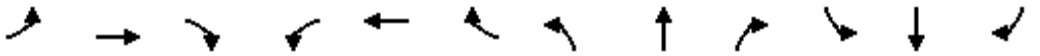
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	0	29	496	11	15	40	0	0	46	18
Future Volume (vph)	1	0	0	29	496	11	15	40	0	0	46	18
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.5				4.0			4.0			4.0	
Lane Util. Factor	1.00				0.95			1.00			1.00	
Frpb, ped/bikes	1.00				1.00			1.00			0.99	
Flpb, ped/bikes	1.00				1.00			0.99			1.00	
Frt	1.00				1.00			1.00			0.96	
Flt Protected	0.95				1.00			0.99			1.00	
Satd. Flow (prot)	1676				3328			1730			1680	
Flt Permitted	0.95				1.00			0.94			1.00	
Satd. Flow (perm)	1676				3328			1646			1680	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	0	0	29	496	11	15	40	0	0	46	18
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	1	0	0	0	536	0	0	55	0	0	64	0
Confl. Peds. (#/hr)	10		24	24		10	15		12	12		15
Confl. Bikes (#/hr)						60						
Turn Type	Prot			Split	NA		Perm	NA			NA	
Protected Phases	7			8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)	8.5				43.0			23.0			23.0	
Effective Green, g (s)	8.5				43.0			23.0			23.0	
Actuated g/C Ratio	0.10				0.50			0.27			0.27	
Clearance Time (s)	3.5				4.0			4.0			4.0	
Lane Grp Cap (vph)	165				1664			440			449	
v/s Ratio Prot	c0.00				c0.16						c0.04	
v/s Ratio Perm								0.03				
v/c Ratio	0.01				0.32			0.12			0.14	
Uniform Delay, d1	34.9				12.8			23.9			24.0	
Progression Factor	1.00				0.26			1.00			1.00	
Incremental Delay, d2	0.1				0.5			0.6			0.7	
Delay (s)	35.0				3.8			24.5			24.7	
Level of Service	D				A			C			C	
Approach Delay (s)		35.0			3.8			24.5			24.7	
Approach LOS		D			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	7.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	11.5
Intersection Capacity Utilization	34.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



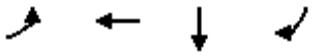
Lane Group	EBL	WBT	NBT	SBT
Lane Group Flow (vph)	1	592	94	101
v/c Ratio	0.01	0.41	0.22	0.20
Control Delay	36.0	8.3	24.1	23.7
Queue Delay	0.0	0.5	0.0	0.0
Total Delay	36.0	8.7	24.1	23.7
Queue Length 50th (ft)	1	52	38	40
Queue Length 95th (ft)	6	68	76	79
Internal Link Dist (ft)		188	104	107
Turn Bay Length (ft)				
Base Capacity (vph)	155	1459	435	502
Starvation Cap Reductn	0	436	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.01	0.58	0.22	0.20

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	0	27	539	26	50	44	0	0	68	33
Future Volume (vph)	1	0	0	27	539	26	50	44	0	0	68	33
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0				4.0			4.0			4.0	
Lane Util. Factor	1.00				0.95			1.00			1.00	
Frpb, ped/bikes	1.00				0.99			1.00			0.98	
Flpb, ped/bikes	1.00				1.00			0.98			1.00	
Frt	1.00				0.99			1.00			0.96	
Flt Protected	0.95				1.00			0.97			1.00	
Satd. Flow (prot)	1676				3303			1691			1661	
Flt Permitted	0.95				1.00			0.83			1.00	
Satd. Flow (perm)	1676				3303			1441			1661	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	0	0	27	539	26	50	44	0	0	68	33
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	1	0	0	0	592	0	0	94	0	0	101	0
Confl. Peds. (#/hr)	36		25	25		36	26		32	32		26
Confl. Bikes (#/hr)						60						
Turn Type	Prot			Split	NA		Perm	NA			NA	
Protected Phases	7			8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)	8.0				38.0			26.0			26.0	
Effective Green, g (s)	8.0				38.0			26.0			26.0	
Actuated g/C Ratio	0.09				0.44			0.30			0.30	
Clearance Time (s)	6.0				4.0			4.0			4.0	
Lane Grp Cap (vph)	155				1459			435			502	
v/s Ratio Prot	c0.00				c0.18						0.06	
v/s Ratio Perm								c0.07				
v/c Ratio	0.01				0.41			0.22			0.20	
Uniform Delay, d1	35.4				16.3			22.4			22.3	
Progression Factor	1.00				0.45			1.00			1.00	
Incremental Delay, d2	0.1				0.8			1.1			0.9	
Delay (s)	35.5				8.2			23.5			23.2	
Level of Service	D				A			C			C	
Approach Delay (s)		35.5			8.2			23.5			23.2	
Approach LOS		D			A			C			C	

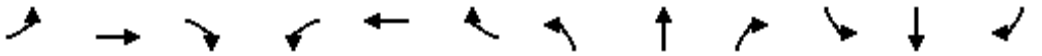
Intersection Summary			
HCM 2000 Control Delay	12.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	40.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	WBT	SBT	SBR
Lane Group Flow (vph)	1	520	1156	61
v/c Ratio	0.01	0.62	0.64	0.08
Control Delay	40.0	11.3	7.7	5.4
Queue Delay	0.0	0.0	0.2	0.0
Total Delay	40.0	11.3	8.0	5.4
Queue Length 50th (ft)	1	65	87	8
Queue Length 95th (ft)	6	m75	84	m12
Internal Link Dist (ft)		467	296	
Turn Bay Length (ft)				
Base Capacity (vph)	77	841	1793	753
Starvation Cap Reductn	0	0	154	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.01	0.62	0.71	0.08

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	0	204	316	0	0	0	0	0	1156	61
Future Volume (vph)	1	0	0	204	316	0	0	0	0	0	1156	61
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0				4.0						4.0	4.0
Lane Util. Factor	1.00				0.95						0.95	1.00
Frpb, ped/bikes	1.00				1.00						1.00	0.94
Flpb, ped/bikes	1.00				1.00						1.00	1.00
Frt	1.00				1.00						1.00	0.85
Flt Protected	0.95				0.98						1.00	1.00
Satd. Flow (prot)	1676				3288						3353	1408
Flt Permitted	0.95				0.98						1.00	1.00
Satd. Flow (perm)	1676				3288						3353	1408
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	0	0	204	316	0	0	0	0	0	1156	61
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	1	0	0	0	520	0	0	0	0	0	1156	61
Confl. Peds. (#/hr)	12		16	16		12	17		16	16		17
Confl. Bikes (#/hr)						60						60
Turn Type	Prot			Split	NA						NA	Perm
Protected Phases	7			8	8						6	
Permitted Phases												6
Actuated Green, G (s)	4.0				22.0						46.0	46.0
Effective Green, g (s)	4.0				22.0						46.0	46.0
Actuated g/C Ratio	0.05				0.26						0.53	0.53
Clearance Time (s)	6.0				4.0						4.0	4.0
Lane Grp Cap (vph)	77				841						1793	753
v/s Ratio Prot	c0.00				c0.16						c0.34	
v/s Ratio Perm												0.04
v/c Ratio	0.01				0.62						0.64	0.08
Uniform Delay, d1	39.1				28.3						14.2	9.7
Progression Factor	1.00				0.34						0.43	0.52
Incremental Delay, d2	0.3				1.5						1.5	0.2
Delay (s)	39.4				11.1						7.6	5.2
Level of Service	D				B						A	A
Approach Delay (s)		39.4			11.1			0.0			7.5	
Approach LOS		D			B			A			A	

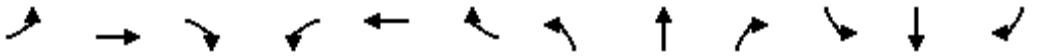
Intersection Summary			
HCM 2000 Control Delay	8.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	WBT	NBT	SBL
Lane Group Flow (vph)	1	418	1686	1
v/c Ratio	0.01	0.81	0.99	0.01
Control Delay	40.0	49.1	26.4	40.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	40.0	49.1	26.4	40.0
Queue Length 50th (ft)	1	116	122	1
Queue Length 95th (ft)	6	#188	#621	6
Internal Link Dist (ft)		230	290	
Turn Bay Length (ft)				
Base Capacity (vph)	77	513	1703	77
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.01	0.81	0.99	0.01

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

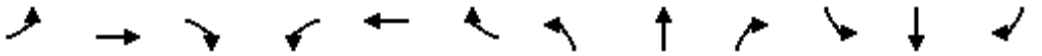


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	0	0	322	96	250	1436	0	1	0	0
Future Volume (vph)	1	0	0	0	322	96	250	1436	0	1	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0				4.0			4.0		6.0		
Lane Util. Factor	1.00				0.95			0.95		1.00		
Frpb, ped/bikes	1.00				0.97			1.00		1.00		
Flpb, ped/bikes	1.00				1.00			1.00		1.00		
Frt	1.00				0.97			1.00		1.00		
Flt Protected	0.95				1.00			0.99		0.95		
Satd. Flow (prot)	1676				3154			3328		1676		
Flt Permitted	0.95				1.00			0.99		0.95		
Satd. Flow (perm)	1676				3154			3328		1676		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	0	0	0	322	96	250	1436	0	1	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	1	0	0	0	418	0	0	1686	0	1	0	0
Confl. Peds. (#/hr)	10		10	10		12	10		15	10		10
Confl. Bikes (#/hr)						60			60			
Turn Type	Prot				NA		Split	NA		Prot		
Protected Phases	7				8		2	2		1		
Permitted Phases												
Actuated Green, G (s)	4.0				14.0			44.0		4.0		
Effective Green, g (s)	4.0				14.0			44.0		4.0		
Actuated g/C Ratio	0.05				0.16			0.51		0.05		
Clearance Time (s)	6.0				4.0			4.0		6.0		
Lane Grp Cap (vph)	77				513			1702		77		
v/s Ratio Prot	c0.00				c0.13			c0.51		c0.00		
v/s Ratio Perm												
v/c Ratio	0.01				0.81			0.99		0.01		
Uniform Delay, d1	39.1				34.7			20.8		39.1		
Progression Factor	1.00				1.00			0.41		1.00		
Incremental Delay, d2	0.3				13.3			15.6		0.3		
Delay (s)	39.4				48.1			24.2		39.4		
Level of Service	D				D			C		D		
Approach Delay (s)		39.4			48.1			24.2			39.4	
Approach LOS		D			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	28.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	SBT
Lane Group Flow (vph)	756	1239
v/c Ratio	0.69	0.66
Control Delay	26.8	4.6
Queue Delay	0.0	0.1
Total Delay	26.8	4.7
Queue Length 50th (ft)	172	65
Queue Length 95th (ft)	236	88
Internal Link Dist (ft)	289	290
Turn Bay Length (ft)		
Base Capacity (vph)	1101	1871
Starvation Cap Reductn	0	68
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.69	0.69

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	585	171	0	0	0	0	0	0	88	1151	0
Future Volume (vph)	0	585	171	0	0	0	0	0	0	88	1151	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0									4.0	
Lane Util. Factor		0.95									0.95	
Frpb, ped/bikes		0.98									1.00	
Flpb, ped/bikes		1.00									0.98	
Frt		0.97									1.00	
Flt Protected		1.00									1.00	
Satd. Flow (prot)		3172									3285	
Flt Permitted		1.00									1.00	
Satd. Flow (perm)		3172									3285	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	585	171	0	0	0	0	0	0	88	1151	0
RTOR Reduction (vph)	0	32	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	724	0	0	0	0	0	0	0	0	1239	0
Confl. Peds. (#/hr)	33		38	38		33	38		109	109		38
Confl. Bikes (#/hr)												60
Turn Type		NA								Perm	NA	
Protected Phases		4									6	
Permitted Phases										6		
Actuated Green, G (s)		29.0									49.0	
Effective Green, g (s)		29.0									49.0	
Actuated g/C Ratio		0.34									0.57	
Clearance Time (s)		4.0									4.0	
Lane Grp Cap (vph)		1069									1871	
v/s Ratio Prot		c0.23										
v/s Ratio Perm											0.38	
v/c Ratio		0.68									0.66	
Uniform Delay, d1		24.5									12.8	
Progression Factor		1.00									0.24	
Incremental Delay, d2		3.5									1.4	
Delay (s)		27.9									4.5	
Level of Service		C									A	
Approach Delay (s)		27.9			0.0			0.0			4.5	
Approach LOS		C			A			A			A	

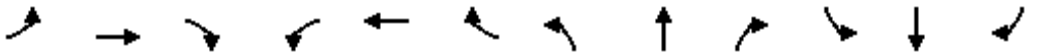
Intersection Summary			
HCM 2000 Control Delay	13.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	NBT	NBR	SBL
Lane Group Flow (vph)	173	364	1428	102	1
v/c Ratio	0.47	0.47	0.80	0.14	0.01
Control Delay	13.1	11.5	10.9	5.4	40.0
Queue Delay	0.0	0.0	0.6	0.0	0.0
Total Delay	13.1	11.5	11.4	5.4	40.0
Queue Length 50th (ft)	24	25	241	11	1
Queue Length 95th (ft)	m40	39	m90	m13	6
Internal Link Dist (ft)		417	764		
Turn Bay Length (ft)				100	
Base Capacity (vph)	372	779	1793	725	77
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	106	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.47	0.47	0.85	0.14	0.01

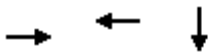
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



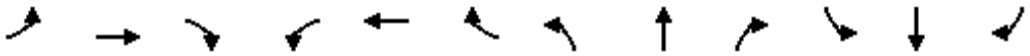
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	219	318	0	0	0	0	0	1428	102	1	0	0
Future Volume (vph)	219	318	0	0	0	0	0	1428	102	1	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0						5.0	5.0	6.0		
Lane Util. Factor	0.91	0.91						0.95	1.00	1.00		
Frpb, ped/bikes	1.00	1.00						1.00	0.90	1.00		
Flpb, ped/bikes	1.00	1.00						1.00	1.00	1.00		
Frt	1.00	1.00						1.00	0.85	1.00		
Flt Protected	0.95	0.99						1.00	1.00	0.95		
Satd. Flow (prot)	1526	3192						3353	1357	1676		
Flt Permitted	0.95	0.99						1.00	1.00	0.95		
Satd. Flow (perm)	1526	3192						3353	1357	1676		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	219	318	0	0	0	0	0	1428	102	1	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	173	364	0	0	0	0	0	1428	102	1	0	0
Confl. Peds. (#/hr)	10		11	10		25	10		36	10		10
Confl. Bikes (#/hr)									60			
Turn Type	Split	NA						NA	Perm	Prot		
Protected Phases	4	4						2		1		
Permitted Phases									2			
Actuated Green, G (s)	21.0	21.0						46.0	46.0	4.0		
Effective Green, g (s)	21.0	21.0						46.0	46.0	4.0		
Actuated g/C Ratio	0.24	0.24						0.53	0.53	0.05		
Clearance Time (s)	4.0	4.0						5.0	5.0	6.0		
Lane Grp Cap (vph)	372	779						1793	725	77		
v/s Ratio Prot	0.11	c0.11						c0.43		c0.00		
v/s Ratio Perm									0.08			
v/c Ratio	0.47	0.47						0.80	0.14	0.01		
Uniform Delay, d1	27.7	27.7						16.2	10.1	39.1		
Progression Factor	0.35	0.36						0.55	0.51	1.00		
Incremental Delay, d2	3.0	1.5						1.7	0.2	0.3		
Delay (s)	12.8	11.3						10.6	5.3	39.4		
Level of Service	B	B						B	A	D		
Approach Delay (s)		11.8			0.0			10.3			39.4	
Approach LOS		B			A			B			D	

Intersection Summary			
HCM 2000 Control Delay	10.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



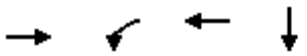
Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	40	35	1338
v/c Ratio	0.15	0.15	0.54
Control Delay	21.8	32.9	2.0
Queue Delay	0.0	0.0	0.2
Total Delay	21.8	32.9	2.2
Queue Length 50th (ft)	10	16	34
Queue Length 95th (ft)	38	43	45
Internal Link Dist (ft)	69	99	279
Turn Bay Length (ft)			
Base Capacity (vph)	272	227	2470
Starvation Cap Reductn	0	0	414
Spillback Cap Reductn	0	0	23
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.15	0.15	0.65

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	22	18	23	12	0	0	0	0	45	1262	31
Future Volume (vph)	0	22	18	23	12	0	0	0	0	45	1262	31
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						0.95	
Frpb, ped/bikes		0.96			1.00						0.99	
Flpb, ped/bikes		1.00			0.95						1.00	
Frt		0.94			1.00						1.00	
Flt Protected		1.00			0.97						1.00	
Satd. Flow (prot)		1584			1615						3316	
Flt Permitted		1.00			0.84						1.00	
Satd. Flow (perm)		1584			1397						3316	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	22	18	23	12	0	0	0	0	45	1262	31
RTOR Reduction (vph)	0	15	0	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	25	0	0	35	0	0	0	0	0	1336	0
Confl. Peds. (#/hr)	80		41	41		80	59		101	101		59
Confl. Bikes (#/hr)												60
Turn Type		NA		Perm	NA					Split	NA	
Protected Phases		4			8					6	6	
Permitted Phases				8								
Actuated Green, G (s)		14.0			14.0						64.0	
Effective Green, g (s)		14.0			14.0						64.0	
Actuated g/C Ratio		0.16			0.16						0.74	
Clearance Time (s)		4.0			4.0						4.0	
Lane Grp Cap (vph)		257			227						2467	
v/s Ratio Prot		0.02									c0.40	
v/s Ratio Perm					c0.03							
v/c Ratio		0.10			0.15						0.54	
Uniform Delay, d1		30.6			30.9						4.7	
Progression Factor		1.00			1.00						0.27	
Incremental Delay, d2		0.8			1.4						0.6	
Delay (s)		31.4			32.4						1.9	
Level of Service		C			C						A	
Approach Delay (s)		31.4			32.4			0.0			1.9	
Approach LOS		C			C			A			A	

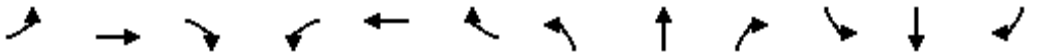
Intersection Summary			
HCM 2000 Control Delay	3.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBL	WBT	SBT
Lane Group Flow (vph)	383	53	315	1377
v/c Ratio	0.64	0.26	0.51	0.75
Control Delay	27.1	13.7	15.1	7.2
Queue Delay	0.0	0.0	0.7	0.0
Total Delay	27.1	13.7	15.9	7.2
Queue Length 50th (ft)	157	8	46	61
Queue Length 95th (ft)	253	m12	m120	68
Internal Link Dist (ft)	174		323	277
Turn Bay Length (ft)				
Base Capacity (vph)	603	205	615	1827
Starvation Cap Reductn	0	0	101	13
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.64	0.26	0.61	0.76

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	259	124	53	315	0	0	0	0	135	1113	129
Future Volume (vph)	0	259	124	53	315	0	0	0	0	135	1113	129
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0		4.0	4.0						4.0	
Lane Util. Factor		1.00		1.00	1.00						0.95	
Frpb, ped/bikes		0.99		1.00	1.00						0.99	
Flpb, ped/bikes		1.00		0.99	1.00						1.00	
Frt		0.96		1.00	1.00						0.99	
Flt Protected		1.00		0.95	1.00						1.00	
Satd. Flow (prot)		1672		1666	1765						3257	
Flt Permitted		1.00		0.34	1.00						1.00	
Satd. Flow (perm)		1672		590	1765						3257	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	259	124	53	315	0	0	0	0	135	1113	129
RTOR Reduction (vph)	0	20	0	0	0	0	0	0	0	0	9	0
Lane Group Flow (vph)	0	363	0	53	315	0	0	0	0	0	1368	0
Confl. Peds. (#/hr)	10		10	10		27	10		10	10		21
Confl. Bikes (#/hr)												60
Turn Type		NA		Perm	NA					Split	NA	
Protected Phases		4			8					6	6	
Permitted Phases				8								
Actuated Green, G (s)		30.0		30.0	30.0						48.0	
Effective Green, g (s)		30.0		30.0	30.0						48.0	
Actuated g/C Ratio		0.35		0.35	0.35						0.56	
Clearance Time (s)		4.0		4.0	4.0						4.0	
Lane Grp Cap (vph)		583		205	615						1817	
v/s Ratio Prot		c0.22			0.18						c0.42	
v/s Ratio Perm				0.09								
v/c Ratio		0.62		0.26	0.51						0.75	
Uniform Delay, d1		23.3		20.0	22.2						14.5	
Progression Factor		1.00		0.55	0.58						0.32	
Incremental Delay, d2		4.9		2.0	2.0						2.6	
Delay (s)		28.2		13.0	14.8						7.2	
Level of Service		C		B	B						A	
Approach Delay (s)		28.2			14.5			0.0			7.2	
Approach LOS		C			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	12.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	87.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



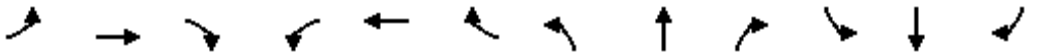
Lane Group	EBL	EBT	WBT	WBR	NBT	NBR	SBL
Lane Group Flow (vph)	213	118	236	130	1653	65	1
v/c Ratio	1.10	0.21	0.86	0.57	0.88	0.08	0.01
Control Delay	123.7	31.2	64.3	44.1	15.0	4.1	40.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	123.7	31.2	64.3	44.1	15.0	4.1	40.0
Queue Length 50th (ft)	~134	57	125	65	64	4	1
Queue Length 95th (ft)	m#254	m85	#247	123	#665	m13	6
Internal Link Dist (ft)		323	183		528		
Turn Bay Length (ft)						100	
Base Capacity (vph)	194	574	287	237	1887	789	83
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.10	0.21	0.82	0.55	0.88	0.08	0.01

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	213	118	0	0	236	130	90	1563	65	1	0	0
Future Volume (vph)	213	118	0	0	236	130	90	1563	65	1	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0	4.0	6.0		
Lane Util. Factor	1.00	1.00			1.00	1.00		0.95	1.00	1.00		
Frpb, ped/bikes	1.00	1.00			1.00	0.97		1.00	0.94	1.00		
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00	1.00		
Frt	1.00	1.00			1.00	0.85		1.00	0.85	1.00		
Flt Protected	0.95	1.00			1.00	1.00		1.00	1.00	0.95		
Satd. Flow (prot)	1676	1765			1765	1460		3344	1405	1676		
Flt Permitted	0.95	1.00			1.00	1.00		1.00	1.00	0.95		
Satd. Flow (perm)	1676	1765			1765	1460		3344	1405	1676		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	213	118	0	0	236	130	90	1563	65	1	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	213	118	0	0	236	130	0	1653	65	1	0	0
Confl. Peds. (#/hr)	8					8	5					5
Confl. Bikes (#/hr)									60			
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm	Prot		
Protected Phases	7	4			8		2	2		1		
Permitted Phases						8			2			
Actuated Green, G (s)	11.0	27.4			13.4	13.4		43.8	43.8	0.8		
Effective Green, g (s)	10.0	27.4			13.4	13.4		43.8	43.8	0.8		
Actuated g/C Ratio	0.12	0.32			0.16	0.16		0.51	0.51	0.01		
Clearance Time (s)	3.0	4.0			4.0	4.0		4.0	4.0	6.0		
Vehicle Extension (s)	2.0	2.5			2.5	2.5		0.2	0.2	3.0		
Lane Grp Cap (vph)	194	562			275	227		1703	715	15		
v/s Ratio Prot	c0.13	0.07			c0.13			c0.49		c0.00		
v/s Ratio Perm						0.09			0.05			
v/c Ratio	1.10	0.21			0.86	0.57		0.97	0.09	0.07		
Uniform Delay, d1	38.0	21.4			35.4	33.6		20.5	10.9	42.2		
Progression Factor	1.05	1.43			1.00	1.00		0.45	0.39	1.00		
Incremental Delay, d2	83.9	0.1			22.1	2.8		13.9	0.2	1.9		
Delay (s)	123.6	30.6			57.4	36.5		23.1	4.4	44.1		
Level of Service	F	C			E	D		C	A	D		
Approach Delay (s)		90.5			50.0			22.4			44.1	
Approach LOS		F			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	35.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	83.9%	ICU Level of Service	E
Analysis Period (min)	15		

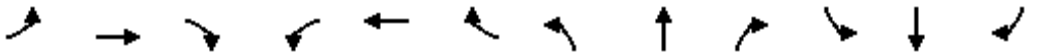
c Critical Lane Group



Lane Group	EBT	WBT	NBT	NBR	SBL
Lane Group Flow (vph)	47	90	1459	100	1
v/c Ratio	0.21	0.32	0.69	0.11	0.01
Control Delay	33.9	35.5	12.5	6.6	40.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	33.9	35.5	12.5	6.6	40.0
Queue Length 50th (ft)	22	44	243	19	1
Queue Length 95th (ft)	54	88	317	m37	6
Internal Link Dist (ft)	93	517	2424		
Turn Bay Length (ft)				100	
Base Capacity (vph)	227	280	2103	941	77
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.21	0.32	0.69	0.11	0.01

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	17	0	0	77	13	21	1438	100	1	0	0
Future Volume (vph)	30	17	0	0	77	13	21	1438	100	1	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0			4.0	4.0	6.0		
Lane Util. Factor		1.00			1.00			0.95	1.00	1.00		
Frpb, ped/bikes		1.00			0.99			1.00	1.00	1.00		
Flpb, ped/bikes		0.98			1.00			1.00	1.00	1.00		
Frt		1.00			0.98			1.00	0.85	1.00		
Flt Protected		0.97			1.00			1.00	1.00	0.95		
Satd. Flow (prot)		1683			1721			3351	1500	1676		
Flt Permitted		0.81			1.00			1.00	1.00	0.95		
Satd. Flow (perm)		1399			1721			3351	1500	1676		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	30	17	0	0	77	13	21	1438	100	1	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	47	0	0	90	0	0	1459	100	1	0	0
Confl. Peds. (#/hr)	15		12	12		15	10		19	19		10
Confl. Bikes (#/hr)									60			
Turn Type	custom	NA			NA		Split	NA	Prot	Prot		
Protected Phases					8		2	2	2	1		
Permitted Phases	4	4										
Actuated Green, G (s)		14.0			14.0			54.0	54.0	4.0		
Effective Green, g (s)		14.0			14.0			54.0	54.0	4.0		
Actuated g/C Ratio		0.16			0.16			0.63	0.63	0.05		
Clearance Time (s)		4.0			4.0			4.0	4.0	6.0		
Lane Grp Cap (vph)		227			280			2104	941	77		
v/s Ratio Prot					c0.05			c0.44	0.07	c0.00		
v/s Ratio Perm		0.03										
v/c Ratio		0.21			0.32			0.69	0.11	0.01		
Uniform Delay, d1		31.2			31.8			10.5	6.4	39.1		
Progression Factor		1.00			1.00			0.98	0.98	1.00		
Incremental Delay, d2		2.1			3.0			1.9	0.2	0.3		
Delay (s)		33.2			34.8			12.2	6.5	39.4		
Level of Service		C			C			B	A	D		
Approach Delay (s)		33.2			34.8			11.9			39.4	
Approach LOS		C			C			B			D	

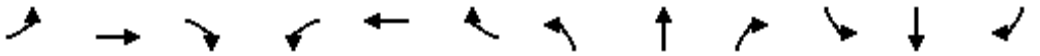
Intersection Summary			
HCM 2000 Control Delay	13.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	60.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	155	290	190	245	440	95	1000	425	1110
v/c Ratio	0.84	0.56	0.91	0.84	0.69	0.28	0.79	0.58	0.82
Control Delay	99.0	52.0	106.2	82.9	22.5	55.4	46.5	52.4	44.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	99.0	52.0	106.2	82.9	22.5	55.4	46.5	52.4	44.1
Queue Length 50th (ft)	140	108	174	220	187	75	430	182	483
Queue Length 95th (ft)	#283	180	#302	351	269	151	#666	254	628
Internal Link Dist (ft)		595		272			1059		378
Turn Bay Length (ft)	175		300			135			
Base Capacity (vph)	229	622	302	395	756	338	1268	815	1624
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.47	0.63	0.62	0.58	0.28	0.79	0.52	0.68

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	155	195	95	190	245	440	95	925	75	425	1030	80
Future Volume (vph)	155	195	95	190	245	440	95	925	75	425	1030	80
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95		0.97	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1676	3188		1676	1765	1500	1676	3304		3252	3299	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1676	3188		1676	1765	1500	1676	3304		3252	3299	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	155	195	95	190	245	440	95	925	75	425	1030	80
RTOR Reduction (vph)	0	40	0	0	0	51	0	4	0	0	4	0
Lane Group Flow (vph)	155	250	0	190	245	389	95	996	0	425	1106	0
Confl. Bikes (#/hr)									60			60
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8	1 8	5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	15.5	21.3		18.6	23.4	55.3	28.5	54.0		31.9	57.4	
Effective Green, g (s)	15.5	21.3		17.6	23.4	55.3	28.5	54.0		31.9	57.4	
Actuated g/C Ratio	0.11	0.15		0.12	0.17	0.39	0.20	0.38		0.23	0.41	
Clearance Time (s)	4.0	4.0		3.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	1.5	1.5		1.0	1.5		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	184	482		209	293	589	339	1267		736	1344	
v/s Ratio Prot	0.09	0.08		c0.11	c0.14	0.26	0.06	c0.30		0.13	c0.34	
v/s Ratio Perm												
v/c Ratio	0.84	0.52		0.91	0.84	0.66	0.28	0.79		0.58	0.82	
Uniform Delay, d1	61.5	55.0		60.8	56.8	35.1	47.5	38.3		48.5	37.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	27.0	0.4		37.1	17.6	2.8	2.1	5.0		1.1	4.2	
Delay (s)	88.4	55.4		97.9	74.4	37.8	49.5	43.3		49.6	41.4	
Level of Service	F	E		F	E	D	D	D		D	D	
Approach Delay (s)		66.9			61.1			43.8			43.6	
Approach LOS		E			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	50.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	140.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	78.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

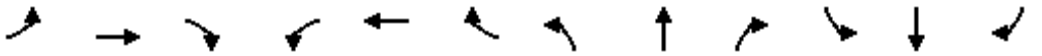


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	380	825	80	525	505	1395	45	295	1190
v/c Ratio	1.60	0.82	0.73	0.69	1.27	1.09	0.06	1.51	0.96
Control Delay	324.5	44.3	89.8	46.4	181.5	90.4	1.1	292.0	53.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	324.5	44.3	89.8	46.4	181.5	90.4	1.1	292.0	53.8
Queue Length 50th (ft)	~421	291	61	187	~284	~673	0	~318	465
Queue Length 95th (ft)	#615	371	#132	247	#393	#813	6	#495	#617
Internal Link Dist (ft)		1448		174		1573			1059
Turn Bay Length (ft)	250		250		275		300	150	
Base Capacity (vph)	237	1049	125	831	399	1277	723	195	1243
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.60	0.79	0.64	0.63	1.27	1.09	0.06	1.51	0.96

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	380	615	210	80	460	65	505	1395	45	295	1095	95
Future Volume (vph)	380	615	210	80	460	65	505	1395	45	295	1095	95
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	0.98		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	3225		1676	3291		3252	3353	1500	1676	3300	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1676	3225		1676	3291		3252	3353	1500	1676	3300	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	380	615	210	80	460	65	505	1395	45	295	1095	95
RTOR Reduction (vph)	0	29	0	0	9	0	0	0	25	0	6	0
Lane Group Flow (vph)	380	796	0	80	516	0	505	1395	20	295	1184	0
Confl. Bikes (#/hr)									60			60
Turn Type	Prot	NA		Prot	NA		Prot	NA	pt+ov	Prot	NA	
Protected Phases	7	4		3	8		5	2	2 3	1	6	
Permitted Phases												
Actuated Green, G (s)	18.0	36.4		8.9	27.3		15.7	45.7	54.6	15.0	45.0	
Effective Green, g (s)	17.0	36.4		7.9	27.3		14.7	45.7	54.6	14.0	45.0	
Actuated g/C Ratio	0.14	0.30		0.07	0.23		0.12	0.38	0.46	0.12	0.38	
Clearance Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.5	3.0		2.0	4.0		2.0	3.5		2.0	3.5	
Lane Grp Cap (vph)	237	978		110	748		398	1276	682	195	1237	
v/s Ratio Prot	c0.23	c0.25		0.05	0.16		c0.16	c0.42	0.01	c0.18	0.36	
v/s Ratio Perm												
v/c Ratio	1.60	0.81		0.73	0.69		1.27	1.09	0.03	1.51	0.96	
Uniform Delay, d1	51.5	38.7		55.0	42.5		52.6	37.1	18.1	53.0	36.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	290.4	5.3		18.2	2.9		139.5	54.7	0.0	255.4	17.2	
Delay (s)	341.9	44.0		73.2	45.4		192.1	91.8	18.1	308.4	53.8	
Level of Service	F	D		E	D		F	F	B	F	D	
Approach Delay (s)		137.9			49.0			116.2			104.4	
Approach LOS		F			D			F			F	

Intersection Summary			
HCM 2000 Control Delay	110.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	109.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Arterial Level of Service: NB Central Avenue

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Edwards Street	III	30	45.4	39.0	84.4	0.36	15.2	D
Total	III		45.4	39.0	84.4	0.36	15.2	D

Arterial Level of Service: SB Central Avenue

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Central Avenue	III	30	22.0	0.0	22.0	0.16	26.8	B
Jackson Street	III	30	45.4	12.5	57.9	0.36	22.2	C
E 4th Street	III	30	22.6	14.1	36.7	0.18	17.4	D
6th Street	III	30	18.1	1.7	19.8	0.14	24.6	B
Main Street	III	30	11.0	7.7	18.7	0.07	13.7	E
8th Street	III	30	10.9	4.6	15.5	0.07	16.3	D
9th Street	III	30	10.5	2.0	12.5	0.07	19.6	C
10th	III	30	10.5	7.2	17.7	0.07	13.8	E
Total	III		151.0	49.8	200.8	1.11	19.9	C

Arterial Level of Service: NB Court Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
McAndrews Road	III	30	50.4	57.0	107.4	0.40	13.3	E
Ohio Street	III	30	16.0	45.0	61.0	0.11	6.7	F
Total	III		66.4	102.0	168.4	0.51	10.9	E

Arterial Level of Service: SB Court Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Ohio Street	III	30	21.9	9.2	31.1	0.16	18.9	C
E McAndrews Road	III	30	16.0	31.3	47.3	0.11	8.7	F
Central Avenue	III	30	50.4	23.1	73.5	0.40	19.4	C
Total	III		88.3	63.6	151.9	0.67	16.0	D

Arterial Level of Service: EB Main Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Oakdale Avenue	IV	30	17.4	36.0	53.4	0.10	6.5	F
Holly Street	IV	30	19.1	34.0	53.1	0.11	7.2	E
Grape Street	IV	30	12.0	34.0	46.0	0.05	4.1	F
Fir Street	IV	30	12.1	35.0	47.1	0.05	4.1	F
Front Street	IV	30	17.0	36.0	53.0	0.07	5.1	F
Central Avenue	IV	30	11.5	40.0	51.5	0.05	3.5	F
Riverside Avenue	IV	30	18.6	40.0	58.6	0.10	6.4	F
Total	IV		107.7	255.0	362.7	0.54	5.3	F

Arterial Level of Service: WB Main Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Riverside Avenue	IV	30	20.4	49.1	69.5	0.11	5.9	F
Central Avenue	IV	30	18.6	11.3	29.9	0.10	12.5	D
Front Street	IV	30	11.5	8.3	19.8	0.05	9.2	D
Fir Street	IV	30	17.0	3.9	20.9	0.07	12.9	D
Grape Street	IV	30	12.1	1.9	14.0	0.05	13.7	C
Holly Street	IV	30	12.0	3.1	15.1	0.05	12.6	D
Oakdale Avenue	IV	30	19.1	7.6	26.7	0.11	14.3	C
Total	IV		110.7	85.2	195.9	0.55	10.2	D

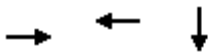
Arterial Level of Service: NB Riverside Avenue

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Barnett Road	III	30	27.4	46.5	73.9	0.22	10.5	E
12th Street	III	30	67.3	12.5	79.8	0.56	25.3	B
10th Street	III	30	16.2	15.0	31.2	0.12	13.3	E
8th Street	III	30	21.4	10.9	32.3	0.16	17.8	D
Main Street	III	30	10.9	26.4	37.3	0.07	6.8	F
	III	30	10.8	4.7	15.5	0.07	16.1	D
4th Street	III	30	18.8	11.6	30.4	0.14	16.6	D
Jackson Street	III	30	10.5	29.6	40.1	0.07	6.1	F
Manzanita Street	III	30	63.4	4.6	68.0	0.50	26.4	B
McAndrews Road	III	30	30.6	37.3	67.9	0.24	12.8	E
Mall Access	III	30	17.6	11.1	28.7	0.12	15.7	D
Total	III		294.9	210.2	505.1	2.26	16.1	D

Arterial Level of Service: SB Riverside Avenue

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Ohio Street	III	30	23.0	46.0	69.0	0.18	9.4	F
McAndrews Road	III	30	17.6	57.0	74.6	0.12	6.0	F
Manzanita Street	III	30	30.6	40.0	70.6	0.24	12.3	E
Jackson Street	III	30	63.4	40.0	103.4	0.50	17.4	D
4th Street	III	30	10.5	40.0	50.5	0.07	4.8	F
6th Street	III	30	18.8	40.0	58.8	0.14	8.6	F
Main Street	III	30	10.8	40.0	50.8	0.07	4.9	F
8th Street	III	30	10.9	40.0	50.9	0.07	5.0	F
10th Street	III	30	21.4	40.0	61.4	0.16	9.4	F
12th Street	III	30	16.2	40.0	56.2	0.12	7.4	F
Barnett Road	III	30	67.3	44.1	111.4	0.56	18.1	C
Stewart Avenue	III	30	27.4	53.8	81.2	0.22	9.6	F
Total	III		317.9	520.9	838.8	2.45	10.5	E

2038 Alternative A
Permissive Phasing

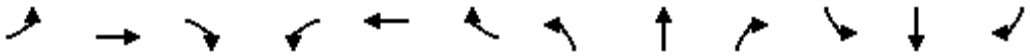


Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	242	181	1144
v/c Ratio	0.72	1.30	0.47
Control Delay	39.9	209.4	6.2
Queue Delay	0.0	0.0	0.0
Total Delay	39.9	209.4	6.2
Queue Length 50th (ft)	107	~131	120
Queue Length 95th (ft)	175	#252	214
Internal Link Dist (ft)	1754	380	781
Turn Bay Length (ft)			
Base Capacity (vph)	561	256	2448
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.43	0.71	0.47

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	107	135	64	117	0	0	0	0	77	977	90
Future Volume (vph)	0	107	135	64	117	0	0	0	0	77	977	90
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						0.95	
Frpb, ped/bikes		0.99			1.00						0.99	
Flpb, ped/bikes		1.00			1.00						1.00	
Frt		0.92			1.00						0.99	
Flt Protected		1.00			0.98						1.00	
Satd. Flow (prot)		1610			1730						3278	
Flt Permitted		1.00			0.46						1.00	
Satd. Flow (perm)		1610			803						3278	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	107	135	64	117	0	0	0	0	77	977	90
RTOR Reduction (vph)	0	55	0	0	0	0	0	0	0	0	4	0
Lane Group Flow (vph)	0	187	0	0	181	0	0	0	0	0	1140	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)												60
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		17.9			17.9						74.6	
Effective Green, g (s)		17.4			17.4						74.6	
Actuated g/C Ratio		0.17			0.17						0.75	
Clearance Time (s)		3.5			3.5						4.0	
Vehicle Extension (s)		2.0			2.0						4.0	
Lane Grp Cap (vph)		280			139						2445	
v/s Ratio Prot		0.12										
v/s Ratio Perm					c0.23						0.35	
v/c Ratio		0.67			1.30						0.47	
Uniform Delay, d1		38.6			41.3						4.9	
Progression Factor		1.00			0.90						1.00	
Incremental Delay, d2		4.6			177.0						0.6	
Delay (s)		43.2			214.1						5.6	
Level of Service		D			F						A	
Approach Delay (s)		43.2			214.1			0.0			5.6	
Approach LOS		D			F			A			A	

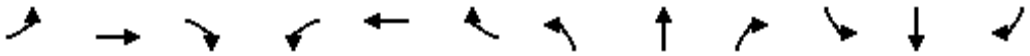
Intersection Summary			
HCM 2000 Control Delay	35.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	77.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBT	WBT	WBR	NBT
Lane Group Flow (vph)	223	86	76	1822
v/c Ratio	0.80	0.24	0.24	0.56
Control Delay	47.5	24.0	23.6	9.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	47.5	24.0	23.6	9.4
Queue Length 50th (ft)	95	35	29	187
Queue Length 95th (ft)	135	70	63	297
Internal Link Dist (ft)	380	1230		579
Turn Bay Length (ft)				
Base Capacity (vph)	423	530	467	3282
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.53	0.16	0.16	0.56

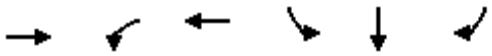
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	150	73	0	0	59	103	93	1647	82	0	0	0
Future Volume (vph)	150	73	0	0	59	103	93	1647	82	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.5			4.5	4.5		5.0				
Lane Util. Factor		1.00			0.95	0.95		0.91				
Frpb, ped/bikes		1.00			0.99	0.98		1.00				
Flpb, ped/bikes		0.99			1.00	1.00		1.00				
Frt		1.00			0.95	0.85		0.99				
Flt Protected		0.97			1.00	1.00		1.00				
Satd. Flow (prot)		1696			1586	1392		4758				
Flt Permitted		0.74			1.00	1.00		1.00				
Satd. Flow (perm)		1302			1586	1392		4758				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	150	73	0	0	59	103	93	1647	82	0	0	0
RTOR Reduction (vph)	0	0	0	0	17	17	0	4	0	0	0	0
Lane Group Flow (vph)	0	223	0	0	69	59	0	1818	0	0	0	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)									60			
Turn Type	Perm	NA			NA	Perm	Split	NA				
Protected Phases		4			8		2	2				
Permitted Phases	4					8						
Actuated Green, G (s)		22.0			22.0	22.0		69.5				
Effective Green, g (s)		21.5			21.5	21.5		69.0				
Actuated g/C Ratio		0.22			0.22	0.22		0.69				
Clearance Time (s)		4.0			4.0	4.0		4.5				
Vehicle Extension (s)		2.5			2.5	2.5		2.0				
Lane Grp Cap (vph)		279			340	299		3283				
v/s Ratio Prot					0.04			c0.38				
v/s Ratio Perm		c0.17				0.04						
v/c Ratio		0.80			0.20	0.20		0.55				
Uniform Delay, d1		37.2			32.2	32.2		7.8				
Progression Factor		0.77			1.00	1.00		1.00				
Incremental Delay, d2		13.6			0.2	0.2		0.7				
Delay (s)		42.3			32.4	32.4		8.5				
Level of Service		D			C	C		A				
Approach Delay (s)		42.3			32.4			8.5			0.0	
Approach LOS		D			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	13.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.5
Intersection Capacity Utilization	76.4%	ICU Level of Service	D
Analysis Period (min)	15		

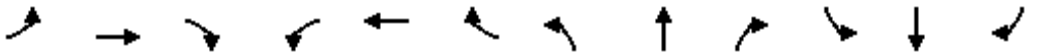
c Critical Lane Group



Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	669	161	832	456	599	65
v/c Ratio	0.56	0.55	0.44	0.75	0.49	0.12
Control Delay	33.9	38.7	4.0	41.0	30.3	5.6
Queue Delay	0.0	0.0	0.0	0.4	0.0	0.0
Total Delay	33.9	38.7	4.0	41.4	30.3	5.6
Queue Length 50th (ft)	221	119	45	296	181	0
Queue Length 95th (ft)	300	m187	54	397	221	27
Internal Link Dist (ft)	1762		672		521	
Turn Bay Length (ft)		110		175		175
Base Capacity (vph)	1202	293	1910	698	1397	633
Starvation Cap Reductn	0	0	0	40	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.55	0.44	0.69	0.43	0.10

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	625	44	161	832	0	0	0	0	456	599	65
Future Volume (vph)	0	625	44	161	832	0	0	0	0	456	599	65
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0		4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.95		1.00	0.95					1.00	0.95	1.00
Frpb, ped/bikes		1.00		1.00	1.00					1.00	1.00	0.95
Flpb, ped/bikes		1.00		1.00	1.00					1.00	1.00	1.00
Frt		0.99		1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		3316		1676	3353					1676	3353	1423
Flt Permitted		1.00		0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		3316		1676	3353					1676	3353	1423
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	625	44	161	832	0	0	0	0	456	599	65
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	0	0	0	41
Lane Group Flow (vph)	0	665	0	161	832	0	0	0	0	456	599	24
Confl. Peds. (#/hr)	2		2	2		2	2		1	1		2
Confl. Bikes (#/hr)												60
Turn Type		NA		Prot	NA					Split	NA	Perm
Protected Phases		4		3	8					6	6	
Permitted Phases												6
Actuated Green, G (s)		43.4		22.0	68.4					43.6	43.6	43.6
Effective Green, g (s)		43.4		21.0	68.4					43.6	43.6	43.6
Actuated g/C Ratio		0.36		0.18	0.57					0.36	0.36	0.36
Clearance Time (s)		4.0		3.0	4.0					4.0	4.0	4.0
Vehicle Extension (s)		4.0		2.0	4.0					5.0	5.0	5.0
Lane Grp Cap (vph)		1199		293	1911					608	1218	517
v/s Ratio Prot		c0.20		c0.10	0.25					c0.27	0.18	
v/s Ratio Perm												0.02
v/c Ratio		0.55		0.55	0.44					0.75	0.49	0.05
Uniform Delay, d1		30.6		45.2	14.8					33.4	29.6	24.7
Progression Factor		1.00		0.71	0.21					1.00	1.00	1.00
Incremental Delay, d2		1.9		1.0	0.6					6.1	0.7	0.1
Delay (s)		32.4		33.0	3.7					39.6	30.3	24.8
Level of Service		C		C	A					D	C	C
Approach Delay (s)		32.4			8.5			0.0			33.7	
Approach LOS		C			A			A			C	

Intersection Summary			
HCM 2000 Control Delay	24.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	81.4%	ICU Level of Service	D
Analysis Period (min)	15		

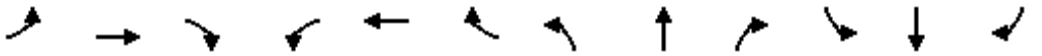
c Critical Lane Group



Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Group Flow (vph)	103	946	863	583	1279	319
v/c Ratio	0.62	0.45	0.51	0.75	0.84	0.59
Control Delay	56.3	4.9	20.8	28.0	44.4	23.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.3	4.9	20.8	28.0	44.4	23.1
Queue Length 50th (ft)	84	134	225	310	337	111
Queue Length 95th (ft)	m139	107	282	469	398	210
Internal Link Dist (ft)		672	692		1193	
Turn Bay Length (ft)	130					150
Base Capacity (vph)	167	2123	1704	774	1518	542
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.45	0.51	0.75	0.84	0.59

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	946	0	0	863	583	123	1156	319	0	0	0
Future Volume (vph)	103	946	0	0	863	583	123	1156	319	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	3.0			3.0	3.0		3.0	3.0			
Lane Util. Factor	1.00	0.95			0.95	1.00		0.91	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	0.97		1.00	0.93			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		1.00	1.00			
Satd. Flow (prot)	1676	3353			3353	1456		4795	1399			
Flt Permitted	0.95	1.00			1.00	1.00		1.00	1.00			
Satd. Flow (perm)	1676	3353			3353	1456		4795	1399			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	103	946	0	0	863	583	123	1156	319	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	34	0	0	100	0	0	0
Lane Group Flow (vph)	103	946	0	0	863	549	0	1279	219	0	0	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)									60			
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	7	4			8		2	2				
Permitted Phases						8			2			
Actuated Green, G (s)	12.0	75.0			60.0	60.0		37.0	37.0			
Effective Green, g (s)	12.0	76.0			61.0	61.0		38.0	38.0			
Actuated g/C Ratio	0.10	0.63			0.51	0.51		0.32	0.32			
Clearance Time (s)	3.0	4.0			4.0	4.0		4.0	4.0			
Vehicle Extension (s)	2.0	4.0			4.0	4.0		4.0	4.0			
Lane Grp Cap (vph)	167	2123			1704	740		1518	443			
v/s Ratio Prot	c0.06	0.28			0.26			c0.27				
v/s Ratio Perm						c0.38			0.16			
v/c Ratio	0.62	0.45			0.51	0.74		0.84	0.49			
Uniform Delay, d1	51.8	11.2			19.5	23.3		38.2	33.2			
Progression Factor	0.82	0.39			1.00	1.00		1.00	1.00			
Incremental Delay, d2	3.8	0.5			1.1	6.6		4.6	1.2			
Delay (s)	46.4	4.9			20.6	29.9		42.8	34.4			
Level of Service	D	A			C	C		D	C			
Approach Delay (s)		9.0			24.3			41.2			0.0	
Approach LOS		A			C			D			A	

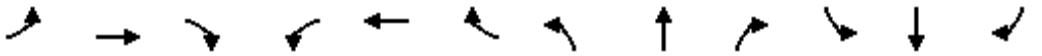
Intersection Summary			
HCM 2000 Control Delay	27.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	81.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



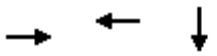
Lane Group	EBT	WBT	NBT
Lane Group Flow (vph)	79	18	1566
v/c Ratio	0.43	0.07	0.70
Control Delay	40.7	22.5	3.0
Queue Delay	0.0	0.0	0.0
Total Delay	40.7	22.5	3.0
Queue Length 50th (ft)	39	4	65
Queue Length 95th (ft)	84	23	63
Internal Link Dist (ft)	550	165	918
Turn Bay Length (ft)			
Base Capacity (vph)	183	244	2240
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.43	0.07	0.70

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	4	0	0	9	9	40	1511	15	0	0	0
Future Volume (vph)	75	4	0	0	9	9	40	1511	15	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0			4.0				
Lane Util. Factor		1.00			1.00			0.95				
Frpb, ped/bikes		1.00			0.98			1.00				
Flpb, ped/bikes		0.98			1.00			1.00				
Frt		1.00			0.93			1.00				
Flt Protected		0.95			1.00			1.00				
Satd. Flow (prot)		1483			1459			3007				
Flt Permitted		0.72			1.00			1.00				
Satd. Flow (perm)		1126			1459			3007				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	75	4	0	0	9	9	40	1511	15	0	0	0
RTOR Reduction (vph)	0	0	0	0	8	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	79	0	0	10	0	0	1565	0	0	0	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)									60			
Turn Type	Perm	NA			NA		Split	NA				
Protected Phases		4			8		2	2				
Permitted Phases	4											
Actuated Green, G (s)		14.0			14.0			64.0				
Effective Green, g (s)		14.0			14.0			64.0				
Actuated g/C Ratio		0.16			0.16			0.74				
Clearance Time (s)		4.0			4.0			4.0				
Lane Grp Cap (vph)		183			237			2237				
v/s Ratio Prot					0.01			c0.52				
v/s Ratio Perm		c0.07										
v/c Ratio		0.43			0.04			0.70				
Uniform Delay, d1		32.4			30.4			5.9				
Progression Factor		1.00			1.00			0.28				
Incremental Delay, d2		7.3			0.4			1.2				
Delay (s)		39.7			30.7			2.9				
Level of Service		D			C			A				
Approach Delay (s)		39.7			30.7			2.9			0.0	
Approach LOS		D			C			A			A	

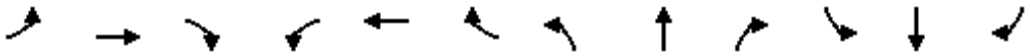
Intersection Summary			
HCM 2000 Control Delay	4.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	72.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	424	152	888
v/c Ratio	0.88	0.62	0.53
Control Delay	27.4	44.3	16.6
Queue Delay	0.0	0.0	0.0
Total Delay	27.4	44.3	16.6
Queue Length 50th (ft)	43	81	138
Queue Length 95th (ft)	146	m111	#337
Internal Link Dist (ft)	7	1528	2014
Turn Bay Length (ft)			
Base Capacity (vph)	591	415	1678
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.72	0.37	0.53

Intersection Summary

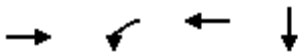
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	54	370	65	87	0	0	0	0	40	818	30
Future Volume (vph)	0	54	370	65	87	0	0	0	0	40	818	30
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						0.95	
Frpb, ped/bikes		0.97			1.00						1.00	
Flpb, ped/bikes		1.00			1.00						1.00	
Frt		0.88			1.00						0.99	
Flt Protected		1.00			0.98						1.00	
Satd. Flow (prot)		1361			1555						2988	
Flt Permitted		1.00			0.98						1.00	
Satd. Flow (perm)		1361			1555						2988	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	54	370	65	87	0	0	0	0	40	818	30
RTOR Reduction (vph)	0	292	0	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	132	0	0	152	0	0	0	0	0	886	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)												60
Turn Type		NA		Split	NA					Split	NA	
Protected Phases		7		8	8					6	6	
Permitted Phases												
Actuated Green, G (s)		12.1			13.6						48.3	
Effective Green, g (s)		12.1			13.6						48.3	
Actuated g/C Ratio		0.14			0.16						0.56	
Clearance Time (s)		4.0			4.0						4.0	
Vehicle Extension (s)		2.0			2.0						4.0	
Lane Grp Cap (vph)		191			245						1678	
v/s Ratio Prot		c0.10			c0.10						c0.30	
v/s Ratio Perm												
v/c Ratio		0.69			0.62						0.53	
Uniform Delay, d1		35.2			33.8						11.7	
Progression Factor		1.00			1.05						1.00	
Incremental Delay, d2		8.4			3.3						1.2	
Delay (s)		43.5			38.7						12.9	
Level of Service		D			D						B	
Approach Delay (s)		43.5			38.7			0.0			12.9	
Approach LOS		D			D			A			B	

Intersection Summary			
HCM 2000 Control Delay	24.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	85.7%	ICU Level of Service	E
Analysis Period (min)	15		

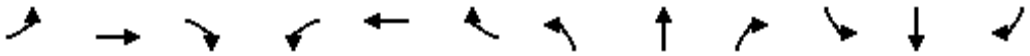
c Critical Lane Group



Lane Group	EBT	WBL	WBT	SBT
Lane Group Flow (vph)	351	59	277	1290
v/c Ratio	0.64	0.29	0.50	0.78
Control Delay	29.0	14.2	14.9	14.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	29.0	14.2	14.9	14.8
Queue Length 50th (ft)	151	14	67	308
Queue Length 95th (ft)	245	m18	m85	121
Internal Link Dist (ft)	1450		992	1806
Turn Bay Length (ft)		250		
Base Capacity (vph)	547	206	553	1645
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.64	0.29	0.50	0.78

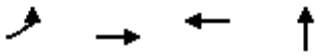
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	291	60	59	277	0	0	0	0	188	983	119
Future Volume (vph)	0	291	60	59	277	0	0	0	0	188	983	119
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0		4.0	4.0						4.0	
Lane Util. Factor		1.00		1.00	1.00						0.95	
Frpb, ped/bikes		1.00		1.00	1.00						0.99	
Flpb, ped/bikes		1.00		1.00	1.00						1.00	
Frt		0.98		1.00	1.00						0.99	
Flt Protected		1.00		0.95	1.00						0.99	
Satd. Flow (prot)		1546		1502	1588						2932	
Flt Permitted		1.00		0.38	1.00						0.99	
Satd. Flow (perm)		1546		593	1588						2932	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	291	60	59	277	0	0	0	0	188	983	119
RTOR Reduction (vph)	0	8	0	0	0	0	0	0	0	0	9	0
Lane Group Flow (vph)	0	343	0	59	277	0	0	0	0	0	1281	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		15
Confl. Bikes (#/hr)												60
Turn Type		NA		Perm	NA					Split	NA	
Protected Phases		4			8					6	6	
Permitted Phases				8								
Actuated Green, G (s)		30.0		30.0	30.0						48.0	
Effective Green, g (s)		30.0		30.0	30.0						48.0	
Actuated g/C Ratio		0.35		0.35	0.35						0.56	
Clearance Time (s)		4.0		4.0	4.0						4.0	
Lane Grp Cap (vph)		539		206	553						1636	
v/s Ratio Prot		c0.22			0.17						c0.44	
v/s Ratio Perm				0.10								
v/c Ratio		0.64		0.29	0.50						0.78	
Uniform Delay, d1		23.4		20.3	22.1						14.9	
Progression Factor		1.00		0.55	0.56						0.76	
Incremental Delay, d2		5.6		2.3	2.1						3.2	
Delay (s)		29.1		13.5	14.5						14.6	
Level of Service		C		B	B						B	
Approach Delay (s)		29.1			14.3			0.0			14.6	
Approach LOS		C			B			A			B	

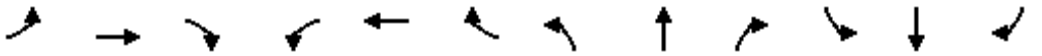
Intersection Summary			
HCM 2000 Control Delay	17.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	96.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	NBT
Lane Group Flow (vph)	66	346	357	1544
v/c Ratio	0.44	0.72	0.75	0.86
Control Delay	34.9	36.5	35.6	8.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	34.9	36.5	35.6	8.9
Queue Length 50th (ft)	30	172	154	65
Queue Length 95th (ft)	m49	m261	#285	m90
Internal Link Dist (ft)		992	302	277
Turn Bay Length (ft)	200			
Base Capacity (vph)	151	480	474	1799
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.44	0.72	0.75	0.86

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	346	0	0	211	146	106	1366	72	0	0	0
Future Volume (vph)	66	346	0	0	211	146	106	1366	72	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0			4.0			4.0				
Lane Util. Factor	1.00	1.00			1.00			0.95				
Frpb, ped/bikes	1.00	1.00			0.98			0.99				
Flpb, ped/bikes	0.99	1.00			1.00			1.00				
Frt	1.00	1.00			0.94			0.99				
Flt Protected	0.95	1.00			1.00			1.00				
Satd. Flow (prot)	1490	1588			1473			2968				
Flt Permitted	0.32	1.00			1.00			1.00				
Satd. Flow (perm)	501	1588			1473			2968				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	66	346	0	0	211	146	106	1366	72	0	0	0
RTOR Reduction (vph)	0	0	0	0	29	0	0	4	0	0	0	0
Lane Group Flow (vph)	66	346	0	0	328	0	0	1540	0	0	0	0
Confl. Peds. (#/hr)	18		12	12		18	37		32	32		37
Confl. Bikes (#/hr)									60			
Turn Type	Perm	NA			NA		Split	NA				
Protected Phases		4			8		2	2				
Permitted Phases	4											
Actuated Green, G (s)	26.0	26.0			26.0			52.0				
Effective Green, g (s)	26.0	26.0			26.0			52.0				
Actuated g/C Ratio	0.30	0.30			0.30			0.60				
Clearance Time (s)	4.0	4.0			4.0			4.0				
Lane Grp Cap (vph)	151	480			445			1794				
v/s Ratio Prot		0.22			c0.22			c0.52				
v/s Ratio Perm	0.13											
v/c Ratio	0.44	0.72			0.74			0.86				
Uniform Delay, d1	24.1	26.8			26.9			14.0				
Progression Factor	1.09	1.08			1.00			0.30				
Incremental Delay, d2	6.4	6.5			10.4			4.2				
Delay (s)	32.6	35.4			37.3			8.3				
Level of Service	C	D			D			A				
Approach Delay (s)		35.0			37.3			8.3			0.0	
Approach LOS		C			D			A			A	

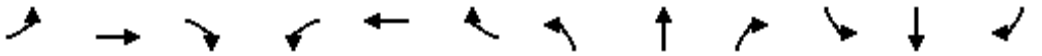
Intersection Summary			
HCM 2000 Control Delay	17.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	96.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBL	WBT	SBT	SBR
Lane Group Flow (vph)	308	272	289	1053	153
v/c Ratio	0.76	0.70	0.39	0.79	0.22
Control Delay	43.1	23.4	16.3	13.6	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	43.1	23.4	16.3	13.6	1.2
Queue Length 50th (ft)	151	144	154	77	0
Queue Length 95th (ft)	#276	m188	m202	220	m3
Internal Link Dist (ft)	282		688	858	
Turn Bay Length (ft)		250			
Base Capacity (vph)	404	391	738	1332	681
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.76	0.70	0.39	0.79	0.22

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	273	35	272	289	0	0	0	0	15	1038	153
Future Volume (vph)	0	273	35	272	289	0	0	0	0	15	1038	153
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0		3.5	4.0						4.0	4.0
Lane Util. Factor		1.00		1.00	1.00						0.95	1.00
Frpb, ped/bikes		1.00		1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00						1.00	1.00
Frt		0.98		1.00	1.00						1.00	0.85
Flt Protected		1.00		0.95	1.00						1.00	1.00
Satd. Flow (prot)		1558		1506	1588						3015	1350
Flt Permitted		1.00		0.29	1.00						1.00	1.00
Satd. Flow (perm)		1558		455	1588						3015	1350
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	273	35	272	289	0	0	0	0	15	1038	153
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	0	0	0	85
Lane Group Flow (vph)	0	303	0	272	289	0	0	0	0	0	1053	68
Confl. Peds. (#/hr)	6		11	11		6			2	2		
Confl. Bikes (#/hr)												60
Turn Type		NA		pm+pt	NA					Split	NA	Prot
Protected Phases		4		3	8					6	6	6
Permitted Phases				8	8							
Actuated Green, G (s)		22.0		40.0	40.0						38.0	38.0
Effective Green, g (s)		22.0		40.0	40.0						38.0	38.0
Actuated g/C Ratio		0.26		0.47	0.47						0.44	0.44
Clearance Time (s)		4.0		3.5	4.0						4.0	4.0
Lane Grp Cap (vph)		398		388	738						1332	596
v/s Ratio Prot		0.19		c0.12	0.18						c0.35	0.05
v/s Ratio Perm				c0.21								
v/c Ratio		0.76		0.70	0.39						0.79	0.11
Uniform Delay, d1		29.6		16.4	15.0						20.6	14.1
Progression Factor		1.00		1.05	0.99						0.48	0.25
Incremental Delay, d2		12.8		7.0	1.1						3.5	0.3
Delay (s)		42.4		24.2	15.9						13.4	3.7
Level of Service		D		C	B						B	A
Approach Delay (s)		42.4			19.9			0.0			12.2	
Approach LOS		D			B			A			B	

Intersection Summary			
HCM 2000 Control Delay	18.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	11.5
Intersection Capacity Utilization	96.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



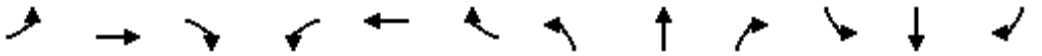
Lane Group	EBL	EBT	WBT	NBT	NBR
Lane Group Flow (vph)	137	274	506	1244	509
v/c Ratio	1.23	0.48	0.88	0.76	0.56
Control Delay	177.8	16.3	42.7	15.2	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	177.8	16.3	42.7	15.2	2.5
Queue Length 50th (ft)	~82	139	240	135	13
Queue Length 95th (ft)	m#129	m198	347	#322	25
Internal Link Dist (ft)		688	289	661	
Turn Bay Length (ft)	250				
Base Capacity (vph)	133	683	681	1640	914
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.03	0.40	0.74	0.76	0.56

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

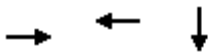
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	137	274	0	0	491	15	50	1194	509	0	0	0
Future Volume (vph)	137	274	0	0	491	15	50	1194	509	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	5.0	4.0			4.0			4.0	4.0			
Lane Util. Factor	1.00	1.00			1.00			0.95	1.00			
Frpb, ped/bikes	1.00	1.00			1.00			1.00	0.96			
Flpb, ped/bikes	1.00	1.00			1.00			1.00	1.00			
Frt	1.00	1.00			1.00			1.00	0.85			
Flt Protected	0.95	1.00			1.00			1.00	1.00			
Satd. Flow (prot)	1509	1588			1581			3012	1294			
Flt Permitted	0.20	1.00			1.00			1.00	1.00			
Satd. Flow (perm)	321	1588			1581			3012	1294			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	137	274	0	0	491	15	50	1194	509	0	0	0
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	212	0	0	0
Lane Group Flow (vph)	137	274	0	0	505	0	0	1244	297	0	0	0
Confl. Peds. (#/hr)	4		5	5		4	5		4	4		5
Confl. Bikes (#/hr)									60			
Turn Type	Perm	NA			NA		Split	NA	Perm			
Protected Phases		4			8		2	2				
Permitted Phases	4								2			
Actuated Green, G (s)	31.2	31.2			31.2			46.8	46.8			
Effective Green, g (s)	30.2	31.2			31.2			46.8	46.8			
Actuated g/C Ratio	0.35	0.36			0.36			0.54	0.54			
Clearance Time (s)	4.0	4.0			4.0			4.0	4.0			
Vehicle Extension (s)	0.2	0.2			0.2			0.2	0.2			
Lane Grp Cap (vph)	112	576			573			1639	704			
v/s Ratio Prot		0.17			0.32			c0.41				
v/s Ratio Perm	c0.43								0.23			
v/c Ratio	1.22	0.48			0.88			0.76	0.42			
Uniform Delay, d1	27.9	21.1			25.7			15.2	11.6			
Progression Factor	0.79	0.69			1.00			0.72	0.37			
Incremental Delay, d2	150.6	0.2			14.4			2.3	1.2			
Delay (s)	172.7	14.8			40.0			13.3	5.5			
Level of Service	F	B			D			B	A			
Approach Delay (s)		67.4			40.0			11.1			0.0	
Approach LOS		E			D			B			A	

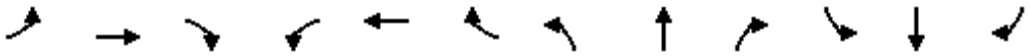
Intersection Summary			
HCM 2000 Control Delay	25.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	96.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	131	85	1312
v/c Ratio	0.38	0.31	0.56
Control Delay	28.5	33.1	1.7
Queue Delay	0.0	0.0	0.0
Total Delay	28.5	33.1	1.7
Queue Length 50th (ft)	51	40	13
Queue Length 95th (ft)	104	82	34
Internal Link Dist (ft)	137	79	634
Turn Bay Length (ft)			
Base Capacity (vph)	346	276	2360
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.38	0.31	0.56

Intersection Summary



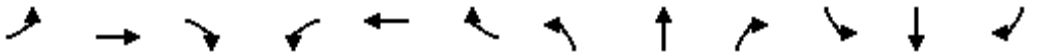
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	92	39	44	41	0	0	0	0	41	1248	23
Future Volume (vph)	0	92	39	44	41	0	0	0	0	41	1248	23
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						0.95	
Frpb, ped/bikes		0.98			1.00						1.00	
Flpb, ped/bikes		1.00			0.98						1.00	
Frt		0.96			1.00						1.00	
Flt Protected		1.00			0.97						1.00	
Satd. Flow (prot)		1662			1684						3328	
Flt Permitted		1.00			0.81						1.00	
Satd. Flow (perm)		1662			1399						3328	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	92	39	44	41	0	0	0	0	41	1248	23
RTOR Reduction (vph)	0	18	0	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	113	0	0	85	0	0	0	0	0	1311	0
Confl. Peds. (#/hr)	22		24	24		22	14		20	20		14
Confl. Bikes (#/hr)												60
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		17.0			17.0						61.0	
Effective Green, g (s)		17.0			17.0						61.0	
Actuated g/C Ratio		0.20			0.20						0.71	
Clearance Time (s)		4.0			4.0						4.0	
Lane Grp Cap (vph)		328			276						2360	
v/s Ratio Prot		c0.07										
v/s Ratio Perm					0.06						0.39	
v/c Ratio		0.35			0.31						0.56	
Uniform Delay, d1		29.7			29.5						6.0	
Progression Factor		1.00			1.00						0.19	
Incremental Delay, d2		2.9			2.9						0.6	
Delay (s)		32.6			32.4						1.7	
Level of Service		C			C						A	
Approach Delay (s)		32.6			32.4			0.0			1.7	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	6.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	71.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBT	WBR	NBT
Lane Group Flow (vph)	189	13	20	1613
v/c Ratio	0.56	0.03	0.05	0.76
Control Delay	34.6	23.6	10.7	6.2
Queue Delay	0.0	0.0	0.0	0.4
Total Delay	34.6	23.6	10.7	6.6
Queue Length 50th (ft)	88	5	0	177
Queue Length 95th (ft)	157	19	17	217
Internal Link Dist (ft)	175	153		287
Turn Bay Length (ft)				
Base Capacity (vph)	338	472	415	2136
Starvation Cap Reductn	0	0	0	147
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.56	0.03	0.05	0.81

Intersection Summary



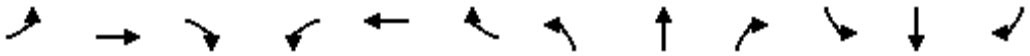
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	181	8	0	0	13	20	50	1548	15	0	0	0
Future Volume (vph)	181	8	0	0	13	20	50	1548	15	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0	4.0		4.0				
Lane Util. Factor		1.00			1.00	1.00		0.95				
Frpb, ped/bikes		1.00			1.00	1.00		1.00				
Flpb, ped/bikes		0.99			1.00	1.00		1.00				
Frt		1.00			1.00	0.85		1.00				
Flt Protected		0.95			1.00	1.00		1.00				
Satd. Flow (prot)		1663			1765	1500		3339				
Flt Permitted		0.73			1.00	1.00		1.00				
Satd. Flow (perm)		1265			1765	1500		3339				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	181	8	0	0	13	20	50	1548	15	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	15	0	1	0	0	0	0
Lane Group Flow (vph)	0	189	0	0	13	5	0	1612	0	0	0	0
Confl. Peds. (#/hr)	10		10				10					10
Confl. Bikes (#/hr)									60			
Turn Type	Perm	NA			NA	Perm	Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4					8	2					
Actuated Green, G (s)		23.0			23.0	23.0		55.0				
Effective Green, g (s)		23.0			23.0	23.0		55.0				
Actuated g/C Ratio		0.27			0.27	0.27		0.64				
Clearance Time (s)		4.0			4.0	4.0		4.0				
Lane Grp Cap (vph)		338			472	401		2135				
v/s Ratio Prot					0.01							
v/s Ratio Perm		c0.15				0.00		0.48				
v/c Ratio		0.56			0.03	0.01		0.76				
Uniform Delay, d1		27.1			23.2	23.2		10.8				
Progression Factor		1.00			1.00	1.00		0.39				
Incremental Delay, d2		6.5			0.1	0.1		1.9				
Delay (s)		33.7			23.4	23.2		6.1				
Level of Service		C			C	C		A				
Approach Delay (s)		33.7			23.3			6.1			0.0	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	84.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	527	25	83	214
v/c Ratio	0.33	0.06	0.11	0.29
Control Delay	5.7	15.6	15.9	17.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	5.7	15.6	15.9	17.6
Queue Length 50th (ft)	31	8	27	73
Queue Length 95th (ft)	42	23	55	124
Internal Link Dist (ft)	479		105	1243
Turn Bay Length (ft)				
Base Capacity (vph)	1610	408	738	733
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.33	0.06	0.11	0.29

Intersection Summary



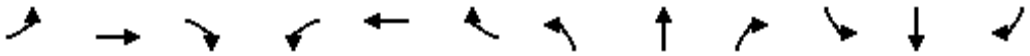
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	103	408	16	25	83	0	0	203	11
Future Volume (vph)	0	0	0	103	408	16	25	83	0	0	203	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.0		4.0	4.0			4.0	
Lane Util. Factor					0.95		1.00	1.00			1.00	
Frpb, ped/bikes					1.00		1.00	1.00			1.00	
Flpb, ped/bikes					1.00		0.96	1.00			1.00	
Frt					1.00		1.00	1.00			0.99	
Flt Protected					0.99		0.95	1.00			1.00	
Satd. Flow (prot)					3296		1608	1765			1746	
Flt Permitted					0.99		0.58	1.00			1.00	
Satd. Flow (perm)					3296		976	1765			1746	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	103	408	16	25	83	0	0	203	11
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	0	0	0	524	0	25	83	0	0	212	0
Confl. Peds. (#/hr)	15		46	46		15	35		34	34		35
Confl. Bikes (#/hr)						60						
Turn Type				Split	NA		Perm	NA			NA	
Protected Phases				8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)					42.0		36.0	36.0			36.0	
Effective Green, g (s)					42.0		36.0	36.0			36.0	
Actuated g/C Ratio					0.49		0.42	0.42			0.42	
Clearance Time (s)					4.0		4.0	4.0			4.0	
Lane Grp Cap (vph)					1609		408	738			730	
v/s Ratio Prot					c0.16			0.05			c0.12	
v/s Ratio Perm							0.03					
v/c Ratio					0.33		0.06	0.11			0.29	
Uniform Delay, d1					13.4		14.9	15.3			16.5	
Progression Factor					0.38		1.00	1.00			1.00	
Incremental Delay, d2					0.5		0.3	0.3			1.0	
Delay (s)					5.7		15.2	15.6			17.5	
Level of Service					A		B	B			B	
Approach Delay (s)		0.0			5.7			15.5			17.5	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	47.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBT	NBT	SBT
Lane Group Flow (vph)	479	73	43
v/c Ratio	0.26	0.13	0.07
Control Delay	1.9	20.7	18.5
Queue Delay	0.2	0.0	0.0
Total Delay	2.1	20.7	18.5
Queue Length 50th (ft)	8	27	14
Queue Length 95th (ft)	12	58	37
Internal Link Dist (ft)	199	104	1901
Turn Bay Length (ft)			
Base Capacity (vph)	1874	542	587
Starvation Cap Reductn	715	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.41	0.13	0.07

Intersection Summary



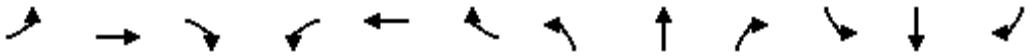
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	71	381	27	25	48	0	0	39	4
Future Volume (vph)	0	0	0	71	381	27	25	48	0	0	39	4
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.0			4.0			4.0	
Lane Util. Factor					0.95			1.00			1.00	
Frpb, ped/bikes					0.99			1.00			1.00	
Flpb, ped/bikes					1.00			0.99			1.00	
Frt					0.99			1.00			0.99	
Flt Protected					0.99			0.98			1.00	
Satd. Flow (prot)					3278			1718			1736	
Flt Permitted					0.99			0.92			1.00	
Satd. Flow (perm)					3278			1610			1736	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	71	381	27	25	48	0	0	39	4
RTOR Reduction (vph)	0	0	0	0	5	0	0	0	0	0	3	0
Lane Group Flow (vph)	0	0	0	0	474	0	0	73	0	0	40	0
Confl. Peds. (#/hr)	26		30	30		26	18		66	66		18
Confl. Bikes (#/hr)						60						
Turn Type				Split	NA		Perm	NA			NA	
Protected Phases				8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)					49.0			29.0			29.0	
Effective Green, g (s)					49.0			29.0			29.0	
Actuated g/C Ratio					0.57			0.34			0.34	
Clearance Time (s)					4.0			4.0			4.0	
Lane Grp Cap (vph)					1867			542			585	
v/s Ratio Prot					c0.14						0.02	
v/s Ratio Perm								c0.05				
v/c Ratio					0.25			0.13			0.07	
Uniform Delay, d1					9.3			19.8			19.3	
Progression Factor					0.17			1.00			1.00	
Incremental Delay, d2					0.3			0.5			0.2	
Delay (s)					1.9			20.3			19.6	
Level of Service					A			C			B	
Approach Delay (s)		0.0			1.9			20.3			19.6	
Approach LOS		A			A			C			B	

Intersection Summary			
HCM 2000 Control Delay	5.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.21		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	36.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBT	NBT	SBT
Lane Group Flow (vph)	509	40	40
v/c Ratio	0.25	0.09	0.08
Control Delay	4.4	23.0	18.1
Queue Delay	0.3	0.0	0.0
Total Delay	4.8	23.0	18.1
Queue Length 50th (ft)	46	16	11
Queue Length 95th (ft)	68	39	34
Internal Link Dist (ft)	202	103	244
Turn Bay Length (ft)			
Base Capacity (vph)	2044	450	497
Starvation Cap Reductn	953	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.47	0.09	0.08

Intersection Summary



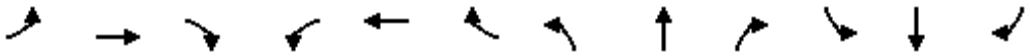
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	37	456	16	22	18	0	0	29	11
Future Volume (vph)	0	0	0	37	456	16	22	18	0	0	29	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.0			4.0			4.0	
Lane Util. Factor					0.95			1.00			1.00	
Frpb, ped/bikes					1.00			1.00			0.99	
Flpb, ped/bikes					1.00			0.99			1.00	
Frt					1.00			1.00			0.96	
Flt Protected					1.00			0.97			1.00	
Satd. Flow (prot)					3315			1702			1686	
Flt Permitted					1.00			0.88			1.00	
Satd. Flow (perm)					3315			1547			1686	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	37	456	16	22	18	0	0	29	11
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	0	0	8	0
Lane Group Flow (vph)	0	0	0	0	506	0	0	40	0	0	32	0
Confl. Peds. (#/hr)	17		15	15		17	10		19	19		10
Confl. Bikes (#/hr)						60						
Turn Type				Split	NA		Perm	NA			NA	
Protected Phases				8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)					53.0			25.0			25.0	
Effective Green, g (s)					53.0			25.0			25.0	
Actuated g/C Ratio					0.62			0.29			0.29	
Clearance Time (s)					4.0			4.0			4.0	
Lane Grp Cap (vph)					2042			449			490	
v/s Ratio Prot					c0.15						0.02	
v/s Ratio Perm								c0.03				
v/c Ratio					0.25			0.09			0.07	
Uniform Delay, d1					7.5			22.2			22.1	
Progression Factor					0.56			1.00			1.00	
Incremental Delay, d2					0.3			0.4			0.3	
Delay (s)					4.4			22.6			22.3	
Level of Service					A			C			C	
Approach Delay (s)		0.0			4.4			22.6			22.3	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	6.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.20		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	37.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBT	NBT	SBT
Lane Group Flow (vph)	536	55	64
v/c Ratio	0.26	0.11	0.13
Control Delay	2.1	23.3	18.2
Queue Delay	0.0	0.0	0.0
Total Delay	2.1	23.3	18.2
Queue Length 50th (ft)	7	22	18
Queue Length 95th (ft)	13	50	48
Internal Link Dist (ft)	315	175	240
Turn Bay Length (ft)			
Base Capacity (vph)	2051	479	501
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.26	0.11	0.13

Intersection Summary



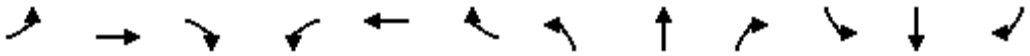
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	29	496	11	15	40	0	0	46	18
Future Volume (vph)	0	0	0	29	496	11	15	40	0	0	46	18
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.0			4.0			4.0	
Lane Util. Factor					0.95			1.00			1.00	
Frpb, ped/bikes					1.00			1.00			0.99	
Flpb, ped/bikes					1.00			0.99			1.00	
Frt					1.00			1.00			0.96	
Flt Protected					1.00			0.99			1.00	
Satd. Flow (prot)					3328			1730			1680	
Flt Permitted					1.00			0.94			1.00	
Satd. Flow (perm)					3328			1649			1680	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	29	496	11	15	40	0	0	46	18
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	13	0
Lane Group Flow (vph)	0	0	0	0	534	0	0	55	0	0	51	0
Confl. Peds. (#/hr)	10		24	24		10	15		12	12		15
Confl. Bikes (#/hr)						60						
Turn Type				Split	NA		Perm	NA			NA	
Protected Phases				8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)					53.0			25.0			25.0	
Effective Green, g (s)					53.0			25.0			25.0	
Actuated g/C Ratio					0.62			0.29			0.29	
Clearance Time (s)					4.0			4.0			4.0	
Lane Grp Cap (vph)					2050			479			488	
v/s Ratio Prot					c0.16						0.03	
v/s Ratio Perm								c0.03				
v/c Ratio					0.26			0.11			0.10	
Uniform Delay, d1					7.5			22.4			22.3	
Progression Factor					0.24			1.00			1.00	
Incremental Delay, d2					0.3			0.5			0.4	
Delay (s)					2.1			22.9			22.7	
Level of Service					A			C			C	
Approach Delay (s)		0.0			2.1			22.9			22.7	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	5.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.21		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	38.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBT	NBT	SBT
Lane Group Flow (vph)	592	94	101
v/c Ratio	0.33	0.18	0.16
Control Delay	5.2	20.0	14.0
Queue Delay	0.2	0.0	0.0
Total Delay	5.4	20.0	14.0
Queue Length 50th (ft)	39	34	25
Queue Length 95th (ft)	53	69	58
Internal Link Dist (ft)	188	104	107
Turn Bay Length (ft)			
Base Capacity (vph)	1809	522	619
Starvation Cap Reductn	525	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.46	0.18	0.16

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	27	539	26	50	44	0	0	68	33
Future Volume (vph)	0	0	0	27	539	26	50	44	0	0	68	33
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.0			4.0			4.0	
Lane Util. Factor					0.95			1.00			1.00	
Frpb, ped/bikes					0.99			1.00			0.98	
Flpb, ped/bikes					1.00			0.98			1.00	
Frt					0.99			1.00			0.96	
Flt Protected					1.00			0.97			1.00	
Satd. Flow (prot)					3305			1691			1661	
Flt Permitted					1.00			0.84			1.00	
Satd. Flow (perm)					3305			1450			1661	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	27	539	26	50	44	0	0	68	33
RTOR Reduction (vph)	0	0	0	0	4	0	0	0	0	0	20	0
Lane Group Flow (vph)	0	0	0	0	588	0	0	94	0	0	81	0
Confl. Peds. (#/hr)	36		25	25		36	26		32	32		26
Confl. Bikes (#/hr)						60						
Turn Type				Split	NA		Perm	NA			NA	
Protected Phases				8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)					47.0			31.0			31.0	
Effective Green, g (s)					47.0			31.0			31.0	
Actuated g/C Ratio					0.55			0.36			0.36	
Clearance Time (s)					4.0			4.0			4.0	
Lane Grp Cap (vph)					1806			522			598	
v/s Ratio Prot					c0.18						0.05	
v/s Ratio Perm								c0.06				
v/c Ratio					0.33			0.18			0.13	
Uniform Delay, d1					10.8			18.8			18.5	
Progression Factor					0.44			1.00			1.00	
Incremental Delay, d2					0.5			0.8			0.5	
Delay (s)					5.2			19.6			19.0	
Level of Service					A			B			B	
Approach Delay (s)		0.0			5.2			19.6			19.0	
Approach LOS		A			A			B			B	

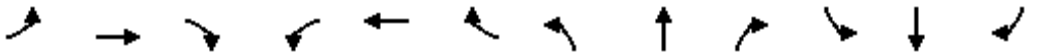
Intersection Summary			
HCM 2000 Control Delay	8.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	43.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBT	SBT	SBR
Lane Group Flow (vph)	520	1156	61
v/c Ratio	0.52	0.57	0.07
Control Delay	19.2	4.7	0.2
Queue Delay	0.0	0.1	0.0
Total Delay	19.2	4.8	0.2
Queue Length 50th (ft)	69	58	0
Queue Length 95th (ft)	130	61	m0
Internal Link Dist (ft)	467	296	
Turn Bay Length (ft)			
Base Capacity (vph)	994	2027	877
Starvation Cap Reductn	0	195	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.52	0.63	0.07

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



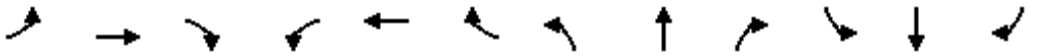
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	204	316	0	0	0	0	0	1156	61
Future Volume (vph)	0	0	0	204	316	0	0	0	0	0	1156	61
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.0						4.0	4.0
Lane Util. Factor					0.95						0.95	1.00
Frpb, ped/bikes					1.00						1.00	0.94
Flpb, ped/bikes					1.00						1.00	1.00
Frt					1.00						1.00	0.85
Flt Protected					0.98						1.00	1.00
Satd. Flow (prot)					3288						3353	1412
Flt Permitted					0.98						1.00	1.00
Satd. Flow (perm)					3288						3353	1412
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	204	316	0	0	0	0	0	1156	61
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	24
Lane Group Flow (vph)	0	0	0	0	520	0	0	0	0	0	1156	37
Confl. Peds. (#/hr)	12		16	16		12	17		16	16		17
Confl. Bikes (#/hr)						60						60
Turn Type				Split	NA						NA	Perm
Protected Phases				8	8						6	
Permitted Phases												6
Actuated Green, G (s)					26.0						52.0	52.0
Effective Green, g (s)					26.0						52.0	52.0
Actuated g/C Ratio					0.30						0.60	0.60
Clearance Time (s)					4.0						4.0	4.0
Lane Grp Cap (vph)					994						2027	853
v/s Ratio Prot					c0.16						c0.34	
v/s Ratio Perm												0.03
v/c Ratio					0.52						0.57	0.04
Uniform Delay, d1					24.9						10.3	6.9
Progression Factor					0.70						0.35	0.05
Incremental Delay, d2					1.4						1.0	0.1
Delay (s)					18.9						4.6	0.5
Level of Service					B						A	A
Approach Delay (s)		0.0			18.9			0.0			4.4	
Approach LOS		A			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	59.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBT	NBT
Lane Group Flow (vph)	418	1686
v/c Ratio	0.64	0.71
Control Delay	33.5	6.8
Queue Delay	0.0	0.1
Total Delay	33.5	6.8
Queue Length 50th (ft)	99	150
Queue Length 95th (ft)	148	178
Internal Link Dist (ft)	230	290
Turn Bay Length (ft)		
Base Capacity (vph)	657	2361
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	60
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.64	0.73

Intersection Summary

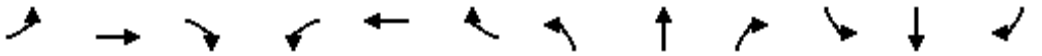


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	322	96	250	1436	0	0	0	0
Future Volume (vph)	0	0	0	0	322	96	250	1436	0	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.0			4.0				
Lane Util. Factor					0.95			0.95				
Frpb, ped/bikes					0.98			1.00				
Flpb, ped/bikes					1.00			1.00				
Frt					0.97			1.00				
Flt Protected					1.00			0.99				
Satd. Flow (prot)					3164			3328				
Flt Permitted					1.00			0.99				
Satd. Flow (perm)					3164			3328				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	0	322	96	250	1436	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	32	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	386	0	0	1686	0	0	0	0
Confl. Peds. (#/hr)	10		10	10		12	10		15	10		10
Confl. Bikes (#/hr)						60			60			
Turn Type					NA		Split	NA				
Protected Phases					8		2	2				
Permitted Phases												
Actuated Green, G (s)					17.0			61.0				
Effective Green, g (s)					17.0			61.0				
Actuated g/C Ratio					0.20			0.71				
Clearance Time (s)					4.0			4.0				
Lane Grp Cap (vph)					625			2360				
v/s Ratio Prot					c0.12			c0.51				
v/s Ratio Perm												
v/c Ratio					0.62			0.71				
Uniform Delay, d1					31.5			7.4				
Progression Factor					1.00			0.69				
Incremental Delay, d2					4.5			1.5				
Delay (s)					36.1			6.6				
Level of Service					D			A				
Approach Delay (s)		0.0			36.1			6.6			0.0	
Approach LOS		A			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	12.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	72.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	SBT
Lane Group Flow (vph)	756	1239
v/c Ratio	0.69	0.66
Control Delay	26.8	6.5
Queue Delay	0.0	0.1
Total Delay	26.8	6.6
Queue Length 50th (ft)	172	73
Queue Length 95th (ft)	236	94
Internal Link Dist (ft)	289	290
Turn Bay Length (ft)		
Base Capacity (vph)	1101	1871
Starvation Cap Reductn	0	68
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.69	0.69

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	585	171	0	0	0	0	0	0	88	1151	0
Future Volume (vph)	0	585	171	0	0	0	0	0	0	88	1151	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0									4.0	
Lane Util. Factor		0.95									0.95	
Frpb, ped/bikes		0.98									1.00	
Flpb, ped/bikes		1.00									0.98	
Frt		0.97									1.00	
Flt Protected		1.00									1.00	
Satd. Flow (prot)		3172									3285	
Flt Permitted		1.00									1.00	
Satd. Flow (perm)		3172									3285	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	585	171	0	0	0	0	0	0	88	1151	0
RTOR Reduction (vph)	0	32	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	724	0	0	0	0	0	0	0	0	1239	0
Confl. Peds. (#/hr)	33		38	38		33	38		109	109		38
Confl. Bikes (#/hr)												60
Turn Type		NA								Perm	NA	
Protected Phases		4									6	
Permitted Phases										6		
Actuated Green, G (s)		29.0									49.0	
Effective Green, g (s)		29.0									49.0	
Actuated g/C Ratio		0.34									0.57	
Clearance Time (s)		4.0									4.0	
Lane Grp Cap (vph)		1069									1871	
v/s Ratio Prot		c0.23										
v/s Ratio Perm											0.38	
v/c Ratio		0.68									0.66	
Uniform Delay, d1		24.5									12.8	
Progression Factor		1.00									0.38	
Incremental Delay, d2		3.5									1.6	
Delay (s)		27.9									6.4	
Level of Service		C									A	
Approach Delay (s)		27.9			0.0			0.0			6.4	
Approach LOS		C			A			A			A	

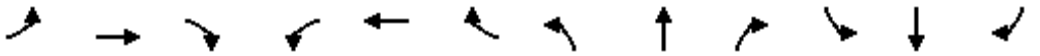
Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	NBT	NBR
Lane Group Flow (vph)	173	364	1428	102
v/c Ratio	0.42	0.43	0.68	0.12
Control Delay	11.3	10.1	3.9	0.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	11.3	10.1	3.9	0.4
Queue Length 50th (ft)	24	24	61	1
Queue Length 95th (ft)	m34	34	m95	m1
Internal Link Dist (ft)		417	764	
Turn Bay Length (ft)				100
Base Capacity (vph)	408	853	2105	883
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.42	0.43	0.68	0.12

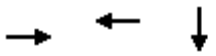
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



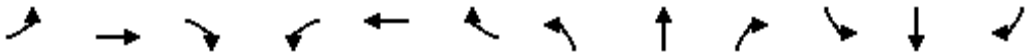
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	219	318	0	0	0	0	0	1428	102	0	0	0
Future Volume (vph)	219	318	0	0	0	0	0	1428	102	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0						5.0	5.0			
Lane Util. Factor	0.91	0.91						0.95	1.00			
Frpb, ped/bikes	1.00	1.00						1.00	0.91			
Flpb, ped/bikes	1.00	1.00						1.00	1.00			
Frt	1.00	1.00						1.00	0.85			
Flt Protected	0.95	0.99						1.00	1.00			
Satd. Flow (prot)	1526	3192						3353	1362			
Flt Permitted	0.95	0.99						1.00	1.00			
Satd. Flow (perm)	1526	3192						3353	1362			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	219	318	0	0	0	0	0	1428	102	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	28	0	0	0
Lane Group Flow (vph)	173	364	0	0	0	0	0	1428	74	0	0	0
Confl. Peds. (#/hr)	10		11	10		25	10		36	10		10
Confl. Bikes (#/hr)									60			
Turn Type	Split	NA						NA	Perm			
Protected Phases	4	4						2				
Permitted Phases									2			
Actuated Green, G (s)	23.0	23.0						54.0	54.0			
Effective Green, g (s)	23.0	23.0						54.0	54.0			
Actuated g/C Ratio	0.27	0.27						0.63	0.63			
Clearance Time (s)	4.0	4.0						5.0	5.0			
Lane Grp Cap (vph)	408	853						2105	855			
v/s Ratio Prot	0.11	c0.11						c0.43				
v/s Ratio Perm									0.05			
v/c Ratio	0.42	0.43						0.68	0.09			
Uniform Delay, d1	26.0	26.0						10.4	6.3			
Progression Factor	0.34	0.34						0.29	0.12			
Incremental Delay, d2	2.3	1.1						0.9	0.1			
Delay (s)	11.1	10.0						3.9	0.8			
Level of Service	B	A						A	A			
Approach Delay (s)		10.3			0.0			3.7			0.0	
Approach LOS		B			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	5.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	119.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



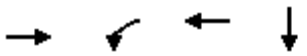
Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	40	35	1338
v/c Ratio	0.15	0.15	0.54
Control Delay	21.8	32.9	2.2
Queue Delay	0.0	0.0	0.2
Total Delay	21.8	32.9	2.3
Queue Length 50th (ft)	10	16	40
Queue Length 95th (ft)	38	43	47
Internal Link Dist (ft)	69	99	279
Turn Bay Length (ft)			
Base Capacity (vph)	272	227	2470
Starvation Cap Reductn	0	0	332
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.15	0.15	0.63

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	22	18	23	12	0	0	0	0	45	1262	31
Future Volume (vph)	0	22	18	23	12	0	0	0	0	45	1262	31
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						0.95	
Frpb, ped/bikes		0.96			1.00						0.99	
Flpb, ped/bikes		1.00			0.95						1.00	
Frt		0.94			1.00						1.00	
Flt Protected		1.00			0.97						1.00	
Satd. Flow (prot)		1584			1615						3316	
Flt Permitted		1.00			0.84						1.00	
Satd. Flow (perm)		1584			1397						3316	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	22	18	23	12	0	0	0	0	45	1262	31
RTOR Reduction (vph)	0	15	0	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	25	0	0	35	0	0	0	0	0	1336	0
Confl. Peds. (#/hr)	80		41	41		80	59		101	101		59
Confl. Bikes (#/hr)												60
Turn Type		NA		Perm	NA					Split	NA	
Protected Phases		4			8					6	6	
Permitted Phases				8								
Actuated Green, G (s)		14.0			14.0						64.0	
Effective Green, g (s)		14.0			14.0						64.0	
Actuated g/C Ratio		0.16			0.16						0.74	
Clearance Time (s)		4.0			4.0						4.0	
Lane Grp Cap (vph)		257			227						2467	
v/s Ratio Prot		0.02									c0.40	
v/s Ratio Perm					c0.03							
v/c Ratio		0.10			0.15						0.54	
Uniform Delay, d1		30.6			30.9						4.7	
Progression Factor		1.00			1.00						0.31	
Incremental Delay, d2		0.8			1.4						0.6	
Delay (s)		31.4			32.4						2.1	
Level of Service		C			C						A	
Approach Delay (s)		31.4			32.4			0.0			2.1	
Approach LOS		C			C			A			A	

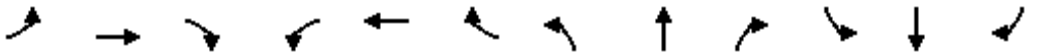
Intersection Summary			
HCM 2000 Control Delay	3.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBL	WBT	SBT
Lane Group Flow (vph)	383	53	315	1377
v/c Ratio	0.64	0.26	0.51	0.75
Control Delay	27.1	11.1	12.7	7.8
Queue Delay	0.0	0.0	0.8	0.0
Total Delay	27.1	11.1	13.5	7.8
Queue Length 50th (ft)	157	10	60	73
Queue Length 95th (ft)	253	m13	m74	92
Internal Link Dist (ft)	174		323	277
Turn Bay Length (ft)				
Base Capacity (vph)	603	205	615	1827
Starvation Cap Reductn	0	0	109	13
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.64	0.26	0.62	0.76

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	259	124	53	315	0	0	0	0	135	1113	129
Future Volume (vph)	0	259	124	53	315	0	0	0	0	135	1113	129
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0		4.0	4.0						4.0	
Lane Util. Factor		1.00		1.00	1.00						0.95	
Frpb, ped/bikes		0.99		1.00	1.00						0.99	
Flpb, ped/bikes		1.00		0.99	1.00						1.00	
Frt		0.96		1.00	1.00						0.99	
Flt Protected		1.00		0.95	1.00						1.00	
Satd. Flow (prot)		1672		1666	1765						3257	
Flt Permitted		1.00		0.34	1.00						1.00	
Satd. Flow (perm)		1672		590	1765						3257	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	259	124	53	315	0	0	0	0	135	1113	129
RTOR Reduction (vph)	0	20	0	0	0	0	0	0	0	0	9	0
Lane Group Flow (vph)	0	363	0	53	315	0	0	0	0	0	1368	0
Confl. Peds. (#/hr)	10		10	10		27	10		10	10		21
Confl. Bikes (#/hr)												60
Turn Type		NA		Perm	NA					Split	NA	
Protected Phases		4			8					6	6	
Permitted Phases				8								
Actuated Green, G (s)		30.0		30.0	30.0						48.0	
Effective Green, g (s)		30.0		30.0	30.0						48.0	
Actuated g/C Ratio		0.35		0.35	0.35						0.56	
Clearance Time (s)		4.0		4.0	4.0						4.0	
Lane Grp Cap (vph)		583		205	615						1817	
v/s Ratio Prot		c0.22			0.18						c0.42	
v/s Ratio Perm				0.09								
v/c Ratio		0.62		0.26	0.51						0.75	
Uniform Delay, d1		23.3		20.0	22.2						14.5	
Progression Factor		1.00		0.43	0.47						0.35	
Incremental Delay, d2		4.9		2.0	2.0						2.6	
Delay (s)		28.2		10.6	12.4						7.7	
Level of Service		C		B	B						A	
Approach Delay (s)		28.2			12.1			0.0			7.7	
Approach LOS		C			B			A			A	

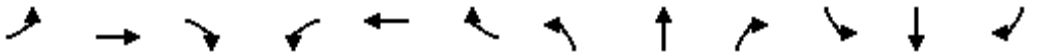
Intersection Summary			
HCM 2000 Control Delay	12.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	83.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Group Flow (vph)	213	118	236	130	1653	65
v/c Ratio	0.89	0.19	0.86	0.46	0.88	0.08
Control Delay	58.3	16.3	64.3	23.8	18.9	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.3	16.3	64.3	23.8	18.9	2.7
Queue Length 50th (ft)	76	27	125	32	225	0
Queue Length 95th (ft)	m#207	m56	#247	85	#275	m9
Internal Link Dist (ft)		323	183		528	
Turn Bay Length (ft)						100
Base Capacity (vph)	253	636	287	290	1876	818
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.19	0.82	0.45	0.88	0.08

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	213	118	0	0	236	130	90	1563	65	0	0	0
Future Volume (vph)	213	118	0	0	236	130	90	1563	65	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Lane Util. Factor	1.00	1.00			1.00	1.00		0.95	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	0.97		1.00	0.94			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		1.00	1.00			
Satd. Flow (prot)	1676	1765			1765	1460		3344	1411			
Flt Permitted	0.95	1.00			1.00	1.00		1.00	1.00			
Satd. Flow (perm)	1676	1765			1765	1460		3344	1411			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	213	118	0	0	236	130	90	1563	65	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	53	0	0	28	0	0	0
Lane Group Flow (vph)	213	118	0	0	236	77	0	1653	37	0	0	0
Confl. Peds. (#/hr)	8					8	5					5
Confl. Bikes (#/hr)									60			
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	7	4			8		2	2				
Permitted Phases						8			2			
Actuated Green, G (s)	13.3	29.7			13.4	13.4		48.3	48.3			
Effective Green, g (s)	12.3	29.7			13.4	13.4		48.3	48.3			
Actuated g/C Ratio	0.14	0.35			0.16	0.16		0.56	0.56			
Clearance Time (s)	3.0	4.0			4.0	4.0		4.0	4.0			
Vehicle Extension (s)	2.0	2.5			2.5	2.5		0.2	0.2			
Lane Grp Cap (vph)	239	609			275	227		1878	792			
v/s Ratio Prot	c0.13	0.07			c0.13			c0.49				
v/s Ratio Perm						0.05			0.03			
v/c Ratio	0.89	0.19			0.86	0.34		0.88	0.05			
Uniform Delay, d1	36.2	19.7			35.4	32.3		16.3	8.5			
Progression Factor	0.75	0.81			1.00	1.00		0.73	0.89			
Incremental Delay, d2	24.1	0.1			22.1	0.6		5.6	0.1			
Delay (s)	51.4	16.1			57.4	33.0		17.6	7.6			
Level of Service	D	B			E	C		B	A			
Approach Delay (s)		38.8			48.8			17.2			0.0	
Approach LOS		D			D			B			A	

Intersection Summary			
HCM 2000 Control Delay	25.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	83.9%	ICU Level of Service	E
Analysis Period (min)	15		

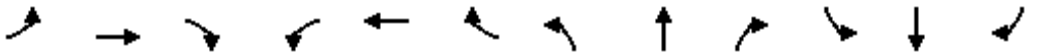
c Critical Lane Group



Lane Group	EBT	WBT	NBT	NBR
Lane Group Flow (vph)	47	90	1459	100
v/c Ratio	0.18	0.28	0.60	0.09
Control Delay	31.6	29.6	7.4	1.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	31.6	29.6	7.5	1.1
Queue Length 50th (ft)	22	38	175	1
Queue Length 95th (ft)	52	80	227	m12
Internal Link Dist (ft)	93	517	2424	
Turn Bay Length (ft)				100
Base Capacity (vph)	263	327	2415	1108
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	58	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.18	0.28	0.62	0.09

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	17	0	0	77	13	21	1438	100	0	0	0
Future Volume (vph)	30	17	0	0	77	13	21	1438	100	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0			4.0	4.0			
Lane Util. Factor		1.00			1.00			0.95	1.00			
Frpb, ped/bikes		1.00			0.99			1.00	1.00			
Flpb, ped/bikes		0.98			1.00			1.00	1.00			
Frt		1.00			0.98			1.00	0.85			
Flt Protected		0.97			1.00			1.00	1.00			
Satd. Flow (prot)		1683			1721			3351	1500			
Flt Permitted		0.81			1.00			1.00	1.00			
Satd. Flow (perm)		1415			1721			3351	1500			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	30	17	0	0	77	13	21	1438	100	0	0	0
RTOR Reduction (vph)	0	0	0	0	7	0	0	0	27	0	0	0
Lane Group Flow (vph)	0	47	0	0	83	0	0	1459	73	0	0	0
Confl. Peds. (#/hr)	15		12	12		15	10		19	19		10
Confl. Bikes (#/hr)									60			
Turn Type	custom	NA			NA		Split	NA	Prot			
Protected Phases					8		2	2	2			
Permitted Phases	4	4										
Actuated Green, G (s)		16.0			16.0			62.0	62.0			
Effective Green, g (s)		16.0			16.0			62.0	62.0			
Actuated g/C Ratio		0.19			0.19			0.72	0.72			
Clearance Time (s)		4.0			4.0			4.0	4.0			
Lane Grp Cap (vph)		263			320			2415	1081			
v/s Ratio Prot					c0.05			c0.44	0.05			
v/s Ratio Perm		0.03										
v/c Ratio		0.18			0.26			0.60	0.07			
Uniform Delay, d1		29.5			29.9			5.9	3.5			
Progression Factor		1.00			1.00			1.03	1.09			
Incremental Delay, d2		1.5			1.9			1.1	0.1			
Delay (s)		31.0			31.9			7.3	4.0			
Level of Service		C			C			A	A			
Approach Delay (s)		31.0			31.9			7.1			0.0	
Approach LOS		C			C			A			A	

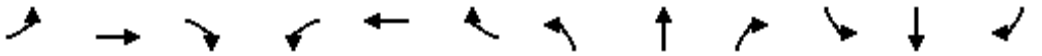
Intersection Summary			
HCM 2000 Control Delay	9.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	64.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	155	290	190	245	440	95	1000	425	1110
v/c Ratio	0.84	0.56	0.91	0.84	0.69	0.28	0.79	0.58	0.82
Control Delay	99.0	52.0	106.2	82.9	22.5	55.4	46.5	52.4	44.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	99.0	52.0	106.2	82.9	22.5	55.4	46.5	52.4	44.1
Queue Length 50th (ft)	140	108	174	220	187	75	430	182	483
Queue Length 95th (ft)	#283	180	#302	351	269	151	#666	254	628
Internal Link Dist (ft)		595		272			1059		378
Turn Bay Length (ft)	175		300			135			
Base Capacity (vph)	229	622	302	395	756	338	1268	815	1624
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.47	0.63	0.62	0.58	0.28	0.79	0.52	0.68

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	155	195	95	190	245	440	95	925	75	425	1030	80
Future Volume (vph)	155	195	95	190	245	440	95	925	75	425	1030	80
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95		0.97	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1676	3188		1676	1765	1500	1676	3304		3252	3299	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1676	3188		1676	1765	1500	1676	3304		3252	3299	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	155	195	95	190	245	440	95	925	75	425	1030	80
RTOR Reduction (vph)	0	40	0	0	0	51	0	4	0	0	4	0
Lane Group Flow (vph)	155	250	0	190	245	389	95	996	0	425	1106	0
Confl. Bikes (#/hr)									60			60
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8	1 8	5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	15.5	21.3		18.6	23.4	55.3	28.5	54.0		31.9	57.4	
Effective Green, g (s)	15.5	21.3		17.6	23.4	55.3	28.5	54.0		31.9	57.4	
Actuated g/C Ratio	0.11	0.15		0.12	0.17	0.39	0.20	0.38		0.23	0.41	
Clearance Time (s)	4.0	4.0		3.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	1.5	1.5		1.0	1.5		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	184	482		209	293	589	339	1267		736	1344	
v/s Ratio Prot	0.09	0.08		c0.11	c0.14	0.26	0.06	c0.30		0.13	c0.34	
v/s Ratio Perm												
v/c Ratio	0.84	0.52		0.91	0.84	0.66	0.28	0.79		0.58	0.82	
Uniform Delay, d1	61.5	55.0		60.8	56.8	35.1	47.5	38.3		48.5	37.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	27.0	0.4		37.1	17.6	2.8	2.1	5.0		1.1	4.2	
Delay (s)	88.4	55.4		97.9	74.4	37.8	49.5	43.3		49.6	41.4	
Level of Service	F	E		F	E	D	D	D		D	D	
Approach Delay (s)		66.9			61.1			43.8			43.6	
Approach LOS		E			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	50.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	140.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	78.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

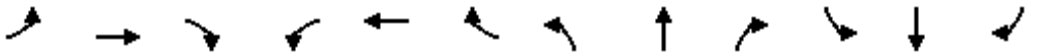


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	380	825	80	525	505	1395	45	295	1190
v/c Ratio	1.60	0.82	0.73	0.69	1.27	1.09	0.06	1.51	0.96
Control Delay	324.5	44.3	89.8	46.4	181.5	90.4	1.1	292.0	53.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	324.5	44.3	89.8	46.4	181.5	90.4	1.1	292.0	53.8
Queue Length 50th (ft)	~421	291	61	187	~284	~673	0	~318	465
Queue Length 95th (ft)	#615	371	#132	247	#393	#813	6	#495	#617
Internal Link Dist (ft)		1448		174		1573			1059
Turn Bay Length (ft)	250		250		275		300	150	
Base Capacity (vph)	237	1049	125	831	399	1277	723	195	1243
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.60	0.79	0.64	0.63	1.27	1.09	0.06	1.51	0.96

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	380	615	210	80	460	65	505	1395	45	295	1095	95
Future Volume (vph)	380	615	210	80	460	65	505	1395	45	295	1095	95
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	0.98		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	3225		1676	3291		3252	3353	1500	1676	3300	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1676	3225		1676	3291		3252	3353	1500	1676	3300	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	380	615	210	80	460	65	505	1395	45	295	1095	95
RTOR Reduction (vph)	0	29	0	0	9	0	0	0	25	0	6	0
Lane Group Flow (vph)	380	796	0	80	516	0	505	1395	20	295	1184	0
Confl. Bikes (#/hr)									60			60
Turn Type	Prot	NA		Prot	NA		Prot	NA	pt+ov	Prot	NA	
Protected Phases	7	4		3	8		5	2	2 3	1	6	
Permitted Phases												
Actuated Green, G (s)	18.0	36.4		8.9	27.3		15.7	45.7	54.6	15.0	45.0	
Effective Green, g (s)	17.0	36.4		7.9	27.3		14.7	45.7	54.6	14.0	45.0	
Actuated g/C Ratio	0.14	0.30		0.07	0.23		0.12	0.38	0.46	0.12	0.38	
Clearance Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.5	3.0		2.0	4.0		2.0	3.5		2.0	3.5	
Lane Grp Cap (vph)	237	978		110	748		398	1276	682	195	1237	
v/s Ratio Prot	c0.23	c0.25		0.05	0.16		c0.16	c0.42	0.01	c0.18	0.36	
v/s Ratio Perm												
v/c Ratio	1.60	0.81		0.73	0.69		1.27	1.09	0.03	1.51	0.96	
Uniform Delay, d1	51.5	38.7		55.0	42.5		52.6	37.1	18.1	53.0	36.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	290.4	5.3		18.2	2.9		139.5	54.7	0.0	255.4	17.2	
Delay (s)	341.9	44.0		73.2	45.4		192.1	91.8	18.1	308.4	53.8	
Level of Service	F	D		E	D		F	F	B	F	D	
Approach Delay (s)		137.9			49.0			116.2			104.4	
Approach LOS		F			D			F			F	

Intersection Summary			
HCM 2000 Control Delay	110.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	109.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Arterial Level of Service: SB Central Avenue

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Central Avenue	III	30	22.0	0.0	22.0	0.16	26.8	B
Jackson Street	III	30	45.4	14.8	60.2	0.36	21.4	C
E 4th Street	III	30	22.6	13.6	36.2	0.18	17.7	D
6th Street	III	30	18.1	1.7	19.8	0.14	24.6	B
Main Street	III	30	11.0	4.7	15.7	0.07	16.3	D
8th Street	III	30	10.9	6.5	17.4	0.07	14.5	D
9th Street	III	30	10.5	2.2	12.7	0.07	19.3	C
10th	III	30	10.5	7.8	18.3	0.07	13.3	E
Total	III		151.0	51.3	202.3	1.11	19.8	C

Arterial Level of Service: SB Court Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Ohio Street	III	30	21.9	6.2	28.1	0.16	20.9	C
E McAndrews Road	III	30	16.0	30.3	46.3	0.11	8.9	F
Central Avenue	III	30	50.4	16.6	67.0	0.40	21.3	C
Total	III		88.3	53.1	141.4	0.67	17.1	D

Arterial Level of Service: WB Main Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Riverside Avenue	IV	30	20.4	33.5	53.9	0.11	7.6	E
Central Avenue	IV	30	18.6	19.2	37.8	0.10	9.9	D
Front Street	IV	30	11.5	5.2	16.7	0.05	10.9	D
Fir Street	IV	30	17.0	2.1	19.1	0.07	14.1	C
Grape Street	IV	30	12.1	4.4	16.5	0.05	11.7	D
Holly Street	IV	30	12.0	1.9	13.9	0.05	13.7	C
Oakdale Avenue	IV	30	19.1	5.7	24.8	0.11	15.4	C
Total	IV		110.7	72.0	182.7	0.55	10.9	D

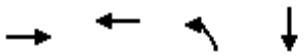
Arterial Level of Service: NB Riverside Avenue

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Barnett Road	III	30	27.4	46.5	73.9	0.22	10.5	E
12th Street	III	30	67.3	7.4	74.7	0.56	27.0	B
10th Street	III	30	16.2	18.9	35.1	0.12	11.8	E
8th Street	III	30	21.4	3.9	25.3	0.16	22.7	C
Main Street	III	30	10.9	6.8	17.7	0.07	14.3	D
	III	30	10.8	6.2	17.0	0.07	14.7	D
4th Street	III	30	18.8	15.2	34.0	0.14	14.9	D
Jackson Street	III	30	10.5	8.9	19.4	0.07	12.5	E
Manzanita Street	III	30	63.4	3.0	66.4	0.50	27.1	B
McAndrews Road	III	30	30.6	44.4	75.0	0.24	11.6	E
Mall Access	III	30	17.6	9.4	27.0	0.12	16.6	D
Total	III		294.9	170.6	465.5	2.26	17.5	D

Arterial Level of Service: SB Riverside Avenue

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Barnett Road	III	30	67.3	44.1	111.4	0.56	18.1	C
Stewart Avenue	III	30	27.4	53.8	81.2	0.22	9.6	F
Total	III		94.7	97.9	192.6	0.78	14.5	D

2038 Alternative B
Protected Phasing

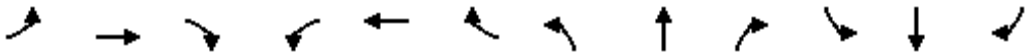


Lane Group	EBT	WBT	NBL	SBT
Lane Group Flow (vph)	242	181	1	1144
v/c Ratio	0.79	1.03	0.01	0.34
Control Delay	56.0	110.7	45.0	7.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	56.0	110.7	45.0	7.4
Queue Length 50th (ft)	148	~101	1	81
Queue Length 95th (ft)	214	#221	6	190
Internal Link Dist (ft)	1754	380		781
Turn Bay Length (ft)				
Base Capacity (vph)	563	321	100	3316
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.43	0.56	0.01	0.34

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	107	135	64	117	0	1	0	0	77	977	90
Future Volume (vph)	0	107	135	64	117	0	1	0	0	77	977	90
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0		6.0				4.0	
Lane Util. Factor		1.00			1.00		1.00				0.91	
Frpb, ped/bikes		0.99			1.00		1.00				0.99	
Flpb, ped/bikes		1.00			1.00		1.00				1.00	
Frt		0.92			1.00		1.00				0.99	
Flt Protected		1.00			0.98		0.95				1.00	
Satd. Flow (prot)		1610			1730		1676				4708	
Flt Permitted		1.00			0.52		0.95				1.00	
Satd. Flow (perm)		1610			919		1676				4708	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	107	135	64	117	0	1	0	0	77	977	90
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	242	0	0	181	0	1	0	0	0	1144	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)												60
Turn Type		NA		Perm	NA		Prot			Perm	NA	
Protected Phases		4			8		5				6	
Permitted Phases				8						6		
Actuated Green, G (s)		19.6			19.6		1.2				65.7	
Effective Green, g (s)		19.1			19.1		1.2				65.7	
Actuated g/C Ratio		0.19			0.19		0.01				0.66	
Clearance Time (s)		3.5			3.5		6.0				4.0	
Vehicle Extension (s)		2.0			2.0		3.0				4.0	
Lane Grp Cap (vph)		307			175		20				3093	
v/s Ratio Prot		0.15					c0.00					
v/s Ratio Perm					c0.20						0.24	
v/c Ratio		0.79			1.03		0.05				0.37	
Uniform Delay, d1		38.5			40.5		48.8				7.8	
Progression Factor		1.00			0.86		1.00				1.00	
Incremental Delay, d2		11.7			75.7		1.0				0.3	
Delay (s)		50.2			110.6		49.9				8.1	
Level of Service		D			F		D				A	
Approach Delay (s)		50.2			110.6			49.9			8.1	
Approach LOS		D			F			D			A	

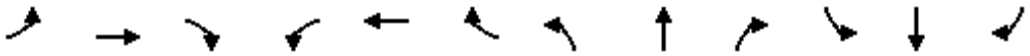
Intersection Summary			
HCM 2000 Control Delay	26.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	63.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBT	WBT	WBR	NBT	SBL
Lane Group Flow (vph)	223	86	76	1822	1
v/c Ratio	0.81	0.24	0.21	0.57	0.01
Control Delay	45.6	24.2	7.2	11.0	46.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	45.6	24.2	7.2	11.0	46.0
Queue Length 50th (ft)	78	34	0	186	1
Queue Length 95th (ft)	126	71	32	372	6
Internal Link Dist (ft)	380	1230		579	
Turn Bay Length (ft)					
Base Capacity (vph)	371	468	455	3213	88
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.60	0.18	0.17	0.57	0.01

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	150	73	0	0	59	103	93	1647	82	1	0	0
Future Volume (vph)	150	73	0	0	59	103	93	1647	82	1	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.5			4.5	4.5		5.0		6.0		
Lane Util. Factor		1.00			0.95	0.95		0.91		1.00		
Frpb, ped/bikes		1.00			0.99	0.98		1.00		1.00		
Flpb, ped/bikes		0.99			1.00	1.00		1.00		1.00		
Frt		1.00			0.95	0.85		0.99		1.00		
Flt Protected		0.97			1.00	1.00		1.00		0.95		
Satd. Flow (prot)		1696			1586	1392		4765		1674		
Flt Permitted		0.74			1.00	1.00		1.00		0.95		
Satd. Flow (perm)		1302			1586	1392		4765		1674		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	150	73	0	0	59	103	93	1647	82	1	0	0
RTOR Reduction (vph)	0	0	0	0	18	60	0	4	0	0	0	0
Lane Group Flow (vph)	0	223	0	0	68	16	0	1818	0	1	0	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)												60
Turn Type	Perm	NA			NA	Perm	Split	NA		Prot		
Protected Phases		4			8		2	2		1		
Permitted Phases	4					8						
Actuated Green, G (s)		21.6			21.6	21.6		63.1		0.8		
Effective Green, g (s)		21.1			21.1	21.1		62.6		0.8		
Actuated g/C Ratio		0.21			0.21	0.21		0.63		0.01		
Clearance Time (s)		4.0			4.0	4.0		4.5		6.0		
Vehicle Extension (s)		2.5			2.5	2.5		2.0		3.0		
Lane Grp Cap (vph)		274			334	293		2982		13		
v/s Ratio Prot					0.04			c0.38		c0.00		
v/s Ratio Perm		c0.17				0.01						
v/c Ratio		0.81			0.20	0.05		0.61		0.08		
Uniform Delay, d1		37.6			32.5	31.5		11.3		49.2		
Progression Factor		0.65			1.00	1.00		1.00		1.00		
Incremental Delay, d2		15.8			0.2	0.1		0.9		2.5		
Delay (s)		40.2			32.7	31.5		12.2		51.8		
Level of Service		D			C	C		B		D		
Approach Delay (s)		40.2			32.2			12.2			51.8	
Approach LOS		D			C			B			D	

Intersection Summary			
HCM 2000 Control Delay	16.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	76.4%	ICU Level of Service	D
Analysis Period (min)	15		

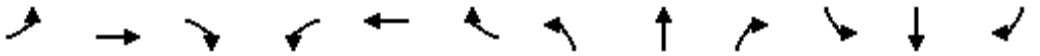
c Critical Lane Group



Lane Group	EBT	WBL	WBT	NBL	SBL	SBT	SBR
Lane Group Flow (vph)	669	161	832	1	456	599	65
v/c Ratio	0.55	0.61	0.44	0.02	0.77	0.50	0.13
Control Delay	33.9	39.1	3.8	57.0	42.9	31.3	24.9
Queue Delay	0.0	0.0	0.0	0.0	0.3	0.0	0.0
Total Delay	33.9	39.1	3.8	57.0	43.2	31.3	24.9
Queue Length 50th (ft)	215	121	42	1	298	183	32
Queue Length 95th (ft)	318	m193	55	7	422	235	64
Internal Link Dist (ft)	1762		672			521	
Turn Bay Length (ft)		110			175		175
Base Capacity (vph)	1223	265	1879	55	655	1311	557
Starvation Cap Reductn	0	0	0	0	24	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.61	0.44	0.02	0.72	0.46	0.12

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	625	44	161	832	0	1	0	0	456	599	65
Future Volume (vph)	0	625	44	161	832	0	1	0	0	456	599	65
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0		4.0	4.0		6.0			4.0	4.0	4.0
Lane Util. Factor		0.95		1.00	0.95		1.00			1.00	0.95	1.00
Frpb, ped/bikes		1.00		1.00	1.00		1.00			1.00	1.00	0.95
Flpb, ped/bikes		1.00		1.00	1.00		1.00			1.00	1.00	1.00
Frt		0.99		1.00	1.00		1.00			1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00		0.95			0.95	1.00	1.00
Satd. Flow (prot)		3316		1676	3353		1674			1676	3353	1422
Flt Permitted		1.00		0.95	1.00		0.95			0.95	1.00	1.00
Satd. Flow (perm)		3316		1676	3353		1674			1676	3353	1422
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	625	44	161	832	0	1	0	0	456	599	65
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	669	0	161	832	0	1	0	0	456	599	65
Confl. Peds. (#/hr)	2		2	2		2	2		1	1		2
Confl. Bikes (#/hr)												60
Turn Type		NA		Prot	NA		Prot			Split	NA	Perm
Protected Phases		4		3	8		5			6	6	
Permitted Phases												6
Actuated Green, G (s)		39.5		20.0	62.5		0.8			42.7	42.7	42.7
Effective Green, g (s)		39.5		19.0	62.5		0.8			42.7	42.7	42.7
Actuated g/C Ratio		0.33		0.16	0.52		0.01			0.36	0.36	0.36
Clearance Time (s)		4.0		3.0	4.0		6.0			4.0	4.0	4.0
Vehicle Extension (s)		4.0		2.0	4.0		3.0			5.0	5.0	5.0
Lane Grp Cap (vph)		1091		265	1746		11			596	1193	505
v/s Ratio Prot		c0.20		c0.10	0.25		c0.00			c0.27	0.18	
v/s Ratio Perm												0.05
v/c Ratio		0.61		0.61	0.48		0.09			0.77	0.50	0.13
Uniform Delay, d1		33.8		47.0	18.3		59.2			34.2	30.3	26.1
Progression Factor		1.00		0.64	0.19		1.00			1.00	1.00	1.00
Incremental Delay, d2		2.6		2.2	0.8		3.6			6.8	0.7	0.2
Delay (s)		36.4		32.5	4.2		62.8			41.0	31.0	26.3
Level of Service		D		C	A		E			D	C	C
Approach Delay (s)		36.4			8.8			62.8			34.8	
Approach LOS		D			A			E			C	

Intersection Summary			
HCM 2000 Control Delay	25.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	64.1%	ICU Level of Service	C
Analysis Period (min)	15		

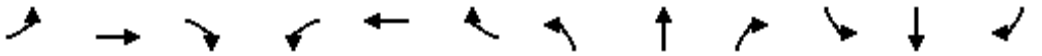
c Critical Lane Group



Lane Group	EBL	EBT	WBT	WBR	NBT	NBR	SBL
Lane Group Flow (vph)	103	946	863	583	1279	319	1
v/c Ratio	0.74	0.49	0.55	0.78	0.74	0.50	0.02
Control Delay	66.0	6.2	24.9	29.0	37.3	17.0	57.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.0	6.2	24.9	29.0	37.3	17.0	57.0
Queue Length 50th (ft)	83	156	250	297	301	81	1
Queue Length 95th (ft)	m#153	75	314	465	#409	191	7
Internal Link Dist (ft)		672	692		1193		
Turn Bay Length (ft)	130					150	
Base Capacity (vph)	139	1927	1563	751	1718	632	55
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.49	0.55	0.78	0.74	0.50	0.02

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	946	0	0	863	583	123	1156	319	1	0	0
Future Volume (vph)	103	946	0	0	863	583	123	1156	319	1	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	3.0			3.0	3.0		3.0	3.0	6.0		
Lane Util. Factor	1.00	0.95			0.95	1.00		0.91	1.00	1.00		
Frpb, ped/bikes	1.00	1.00			1.00	0.97		1.00	0.97	1.00		
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00	1.00		
Frt	1.00	1.00			1.00	0.85		1.00	0.85	1.00		
Flt Protected	0.95	1.00			1.00	1.00		1.00	1.00	0.95		
Satd. Flow (prot)	1676	3353			3353	1456		4795	1461	1673		
Flt Permitted	0.95	1.00			1.00	1.00		1.00	1.00	0.95		
Satd. Flow (perm)	1676	3353			3353	1456		4795	1461	1673		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	103	946	0	0	863	583	123	1156	319	1	0	0
RTOR Reduction (vph)	0	0	0	0	0	77	0	0	109	0	0	0
Lane Group Flow (vph)	103	946	0	0	863	506	0	1279	210	1	0	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)												60
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm	Prot		
Protected Phases	7	4			8		2	2		1		
Permitted Phases						8			2			
Actuated Green, G (s)	10.0	63.2			50.2	50.2		42.0	42.0	0.8		
Effective Green, g (s)	10.0	64.2			51.2	51.2		43.0	43.0	0.8		
Actuated g/C Ratio	0.08	0.54			0.43	0.43		0.36	0.36	0.01		
Clearance Time (s)	3.0	4.0			4.0	4.0		4.0	4.0	6.0		
Vehicle Extension (s)	2.0	4.0			4.0	4.0		4.0	4.0	3.0		
Lane Grp Cap (vph)	139	1793			1430	621		1718	523	11		
v/s Ratio Prot	c0.06	0.28			0.26			c0.27		c0.00		
v/s Ratio Perm						c0.35			0.14			
v/c Ratio	0.74	0.53			0.60	0.81		0.74	0.40	0.09		
Uniform Delay, d1	53.7	18.1			26.6	30.2		33.7	28.9	59.2		
Progression Factor	0.75	0.36			1.00	1.00		1.00	1.00	1.00		
Incremental Delay, d2	13.7	0.9			1.9	11.2		1.9	0.7	3.6		
Delay (s)	53.9	7.3			28.5	41.4		35.6	29.5	62.8		
Level of Service	D	A			C	D		D	C	E		
Approach Delay (s)		11.9			33.7			34.4			62.8	
Approach LOS		B			C			C			E	

Intersection Summary			
HCM 2000 Control Delay	28.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	81.4%	ICU Level of Service	D
Analysis Period (min)	15		

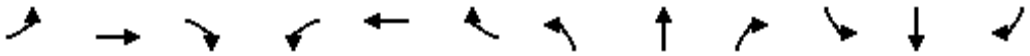
c Critical Lane Group



Lane Group	EBT	WBT	NBT	SBL
Lane Group Flow (vph)	79	18	1566	1
v/c Ratio	0.51	0.09	0.80	0.01
Control Delay	46.6	23.9	5.0	40.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	46.6	23.9	5.0	40.0
Queue Length 50th (ft)	40	4	77	1
Queue Length 95th (ft)	#86	24	m83	6
Internal Link Dist (ft)	550	165	918	
Turn Bay Length (ft)				
Base Capacity (vph)	156	210	1960	70
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.51	0.09	0.80	0.01

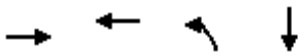
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	4	0	0	9	9	40	1511	15	1	0	0
Future Volume (vph)	75	4	0	0	9	9	40	1511	15	1	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0			4.0		6.0		
Lane Util. Factor		1.00			1.00			0.95		1.00		
Frpb, ped/bikes		1.00			0.98			1.00		1.00		
Flpb, ped/bikes		0.98			1.00			1.00		1.00		
Frt		1.00			0.93			1.00		1.00		
Flt Protected		0.95			1.00			1.00		0.95		
Satd. Flow (prot)		1483			1457			3008		1509		
Flt Permitted		0.72			1.00			1.00		0.95		
Satd. Flow (perm)		1125			1457			3008		1509		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	75	4	0	0	9	9	40	1511	15	1	0	0
RTOR Reduction (vph)	0	0	0	0	8	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	79	0	0	10	0	0	1565	0	1	0	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)												60
Turn Type	Perm	NA			NA		Split	NA		Prot		
Protected Phases		4			8		2	2		1		
Permitted Phases	4											
Actuated Green, G (s)		12.0			12.0			56.0		4.0		
Effective Green, g (s)		12.0			12.0			56.0		4.0		
Actuated g/C Ratio		0.14			0.14			0.65		0.05		
Clearance Time (s)		4.0			4.0			4.0		6.0		
Lane Grp Cap (vph)		156			203			1958		70		
v/s Ratio Prot					0.01			c0.52		c0.00		
v/s Ratio Perm		c0.07										
v/c Ratio		0.51			0.05			0.80		0.01		
Uniform Delay, d1		34.3			32.1			10.9		39.1		
Progression Factor		1.00			1.00			0.27		1.00		
Incremental Delay, d2		11.3			0.5			1.9		0.4		
Delay (s)		45.5			32.5			4.8		39.5		
Level of Service		D			C			A		D		
Approach Delay (s)		45.5			32.5			4.8			39.5	
Approach LOS		D			C			A			D	

Intersection Summary			
HCM 2000 Control Delay	7.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	69.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



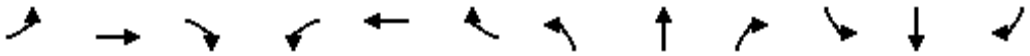
Lane Group	EBT	WBT	NBL	SBT
Lane Group Flow (vph)	424	152	1	888
v/c Ratio	1.48	0.62	0.01	0.63
Control Delay	263.8	38.0	39.0	23.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	263.8	38.0	39.0	23.1
Queue Length 50th (ft)	~320	76	1	169
Queue Length 95th (ft)	#497	m97	6	#411
Internal Link Dist (ft)	7	1528		2014
Turn Bay Length (ft)				
Base Capacity (vph)	286	415	92	1400
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.48	0.37	0.01	0.63

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

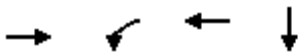
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	54	370	65	87	0	1	0	0	40	818	30
Future Volume (vph)	0	54	370	65	87	0	1	0	0	40	818	30
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0		6.0				4.0	
Lane Util. Factor		1.00			1.00		1.00				0.95	
Frpb, ped/bikes		0.98			1.00		1.00				1.00	
Flpb, ped/bikes		1.00			1.00		0.99				1.00	
Frt		0.88			1.00		1.00				0.99	
Flt Protected		1.00			0.98		0.95				1.00	
Satd. Flow (prot)		1369			1555		1500				2986	
Flt Permitted		1.00			0.98		0.95				1.00	
Satd. Flow (perm)		1369			1555		1500				2986	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	54	370	65	87	0	1	0	0	40	818	30
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	424	0	0	152	0	1	0	0	0	888	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)												60
Turn Type		NA		Split	NA		Prot			Split	NA	
Protected Phases		7		8	8		5			6	6	
Permitted Phases												
Actuated Green, G (s)		18.0			13.6		0.8				35.6	
Effective Green, g (s)		18.0			13.6		0.8				35.6	
Actuated g/C Ratio		0.21			0.16		0.01				0.41	
Clearance Time (s)		4.0			4.0		6.0				4.0	
Vehicle Extension (s)		2.0			2.0		3.0				4.0	
Lane Grp Cap (vph)		286			245		13				1236	
v/s Ratio Prot		c0.31			c0.10		c0.00				c0.30	
v/s Ratio Perm												
v/c Ratio		1.48			0.62		0.08				0.72	
Uniform Delay, d1		34.0			33.8		42.2				21.0	
Progression Factor		1.00			0.86		1.00				1.00	
Incremental Delay, d2		235.0			3.2		2.5				3.6	
Delay (s)		269.0			32.2		44.8				24.6	
Level of Service		F			C		D				C	
Approach Delay (s)		269.0			32.2			44.8			24.6	
Approach LOS		F			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	96.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	82.4%	ICU Level of Service	E
Analysis Period (min)	15		

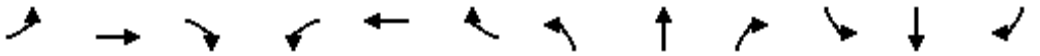
c Critical Lane Group



Lane Group	EBT	WBL	WBT	SBT
Lane Group Flow (vph)	351	59	277	1290
v/c Ratio	0.65	0.29	0.50	0.79
Control Delay	30.4	14.4	14.3	12.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	30.4	14.4	14.3	12.5
Queue Length 50th (ft)	158	13	66	263
Queue Length 95th (ft)	253	m17	m80	m25
Internal Link Dist (ft)	1450		992	1806
Turn Bay Length (ft)		250		
Base Capacity (vph)	539	206	553	1636
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.65	0.29	0.50	0.79

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	291	60	59	277	0	0	0	0	188	983	119
Future Volume (vph)	0	291	60	59	277	0	0	0	0	188	983	119
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0		4.0	4.0						4.0	
Lane Util. Factor		1.00		1.00	1.00						0.95	
Frpb, ped/bikes		1.00		1.00	1.00						0.99	
Flpb, ped/bikes		1.00		1.00	1.00						1.00	
Frt		0.98		1.00	1.00						0.99	
Flt Protected		1.00		0.95	1.00						0.99	
Satd. Flow (prot)		1546		1502	1588						2932	
Flt Permitted		1.00		0.38	1.00						0.99	
Satd. Flow (perm)		1546		593	1588						2932	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	291	60	59	277	0	0	0	0	188	983	119
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	351	0	59	277	0	0	0	0	0	1290	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		15
Confl. Bikes (#/hr)												60
Turn Type		NA		Perm	NA					Split	NA	
Protected Phases		4			8					6	6	
Permitted Phases				8								
Actuated Green, G (s)		30.0		30.0	30.0						48.0	
Effective Green, g (s)		30.0		30.0	30.0						48.0	
Actuated g/C Ratio		0.35		0.35	0.35						0.56	
Clearance Time (s)		4.0		4.0	4.0						4.0	
Lane Grp Cap (vph)		539		206	553						1636	
v/s Ratio Prot		c0.23			0.17						c0.44	
v/s Ratio Perm				0.10								
v/c Ratio		0.65		0.29	0.50						0.79	
Uniform Delay, d1		23.6		20.3	22.1						15.0	
Progression Factor		1.00		0.59	0.56						0.68	
Incremental Delay, d2		6.0		1.6	1.5						2.0	
Delay (s)		29.6		13.6	14.0						12.2	
Level of Service		C		B	B						B	
Approach Delay (s)		29.6			13.9			0.0			12.2	
Approach LOS		C			B			A			B	

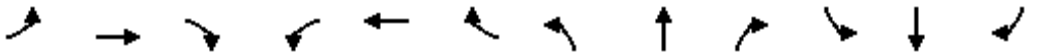
Intersection Summary			
HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	89.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	NBT	SBL
Lane Group Flow (vph)	66	346	357	1544	1
v/c Ratio	0.74	0.89	0.92	0.95	0.01
Control Delay	71.6	57.9	59.9	18.5	40.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	71.6	57.9	59.9	18.5	40.0
Queue Length 50th (ft)	37	198	170	73	1
Queue Length 95th (ft)	m#59	m#321	#337	m#201	6
Internal Link Dist (ft)		992	302	277	
Turn Bay Length (ft)	200				
Base Capacity (vph)	89	387	388	1629	70
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.74	0.89	0.92	0.95	0.01

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	346	0	0	211	146	106	1366	72	1	0	0
Future Volume (vph)	66	346	0	0	211	146	106	1366	72	1	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0			4.0			4.0		6.0		
Lane Util. Factor	1.00	1.00			1.00			0.95		1.00		
Frpb, ped/bikes	1.00	1.00			0.98			1.00		1.00		
Flpb, ped/bikes	0.99	1.00			1.00			1.00		1.00		
Frt	1.00	1.00			0.94			0.99		1.00		
Flt Protected	0.95	1.00			1.00			1.00		0.95		
Satd. Flow (prot)	1491	1588			1473			2973		1509		
Flt Permitted	0.23	1.00			1.00			1.00		0.95		
Satd. Flow (perm)	365	1588			1473			2973		1509		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	66	346	0	0	211	146	106	1366	72	1	0	0
RTOR Reduction (vph)	0	0	0	0	29	0	0	4	0	0	0	0
Lane Group Flow (vph)	66	346	0	0	328	0	0	1540	0	1	0	0
Confl. Peds. (#/hr)	18		12	12		18	37		32	32		37
Confl. Bikes (#/hr)												60
Turn Type	Perm	NA			NA		Split	NA		Prot		
Protected Phases		4			8		2	2		1		
Permitted Phases	4											
Actuated Green, G (s)	21.0	21.0			21.0			47.0		4.0		
Effective Green, g (s)	21.0	21.0			21.0			47.0		4.0		
Actuated g/C Ratio	0.24	0.24			0.24			0.55		0.05		
Clearance Time (s)	4.0	4.0			4.0			4.0		6.0		
Lane Grp Cap (vph)	89	387			359			1624		70		
v/s Ratio Prot		0.22			c0.22			c0.52		c0.00		
v/s Ratio Perm	0.18											
v/c Ratio	0.74	0.89			0.91			0.95		0.01		
Uniform Delay, d1	30.0	31.4			31.6			18.4		39.1		
Progression Factor	1.17	1.18			1.00			0.39		1.00		
Incremental Delay, d2	31.7	19.4			30.1			9.6		0.4		
Delay (s)	66.8	56.3			61.7			16.7		39.5		
Level of Service	E	E			E			B		D		
Approach Delay (s)		58.0			61.7			16.7			39.5	
Approach LOS		E			E			B			D	

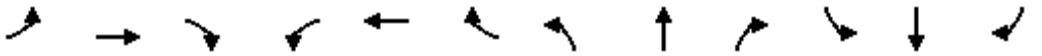
Intersection Summary			
HCM 2000 Control Delay	31.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	96.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBL	WBT	SBT	SBR
Lane Group Flow (vph)	308	272	289	1053	153
v/c Ratio	0.76	0.69	0.38	0.81	0.23
Control Delay	43.1	16.7	10.9	17.9	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	43.1	16.7	10.9	17.9	1.2
Queue Length 50th (ft)	151	109	116	177	1
Queue Length 95th (ft)	#276	m124	m133	242	m4
Internal Link Dist (ft)	282		688	858	
Turn Bay Length (ft)		250			
Base Capacity (vph)	404	397	757	1297	667
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.76	0.69	0.38	0.81	0.23

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	273	35	272	289	0	0	0	0	15	1038	153
Future Volume (vph)	0	273	35	272	289	0	0	0	0	15	1038	153
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0		4.0	4.0						4.0	4.0
Lane Util. Factor		1.00		1.00	1.00						0.95	1.00
Frpb, ped/bikes		1.00		1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00						1.00	1.00
Frt		0.98		1.00	1.00						1.00	0.85
Flt Protected		1.00		0.95	1.00						1.00	1.00
Satd. Flow (prot)		1558		1506	1588						3015	1350
Flt Permitted		1.00		0.28	1.00						1.00	1.00
Satd. Flow (perm)		1558		447	1588						3015	1350
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	273	35	272	289	0	0	0	0	15	1038	153
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	0	0	0	87
Lane Group Flow (vph)	0	303	0	272	289	0	0	0	0	0	1053	66
Confl. Peds. (#/hr)	6		11	11		6			2	2		
Confl. Bikes (#/hr)												60
Turn Type		NA		pm+pt	NA					Split	NA	Prot
Protected Phases		4		3	8					6	6	6
Permitted Phases				8	8							
Actuated Green, G (s)		22.0		41.0	41.0						37.0	37.0
Effective Green, g (s)		22.0		41.0	41.0						37.0	37.0
Actuated g/C Ratio		0.26		0.48	0.48						0.43	0.43
Clearance Time (s)		4.0		4.0	4.0						4.0	4.0
Lane Grp Cap (vph)		398		397	757						1297	580
v/s Ratio Prot		0.19		c0.12	0.18						c0.35	0.05
v/s Ratio Perm				c0.21								
v/c Ratio		0.76		0.69	0.38						0.81	0.11
Uniform Delay, d1		29.6		15.8	14.4						21.5	14.7
Progression Factor		1.00		0.73	0.68						0.62	0.23
Incremental Delay, d2		12.8		5.4	0.8						4.1	0.3
Delay (s)		42.4		17.0	10.6						17.4	3.7
Level of Service		D		B	B						B	A
Approach Delay (s)		42.4			13.7			0.0			15.6	
Approach LOS		D			B			A			B	

Intersection Summary			
HCM 2000 Control Delay	19.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	84.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



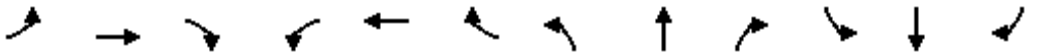
Lane Group	EBL	EBT	WBT	NBT	NBR	SBL
Lane Group Flow (vph)	137	274	506	1244	509	1
v/c Ratio	1.02	0.45	0.83	0.83	0.56	0.01
Control Delay	108.3	19.6	38.1	11.3	2.3	40.0
Queue Delay	0.0	0.0	0.0	1.2	0.0	0.0
Total Delay	108.3	19.6	38.1	12.5	2.3	40.0
Queue Length 50th (ft)	~82	143	242	75	0	1
Queue Length 95th (ft)	m#141	m201	#419	#497	m25	6
Internal Link Dist (ft)		688	289	661		
Turn Bay Length (ft)	250				250	
Base Capacity (vph)	134	609	607	1506	908	70
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	102	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.02	0.45	0.83	0.89	0.56	0.01

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

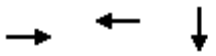
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	137	274	0	0	491	15	50	1194	509	1	0	0
Future Volume (vph)	137	274	0	0	491	15	50	1194	509	1	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	5.0	4.0			4.0			4.0	4.0	6.0		
Lane Util. Factor	1.00	1.00			1.00			0.95	1.00	1.00		
Frpb, ped/bikes	1.00	1.00			1.00			1.00	0.98	1.00		
Flpb, ped/bikes	1.00	1.00			1.00			1.00	1.00	1.00		
Frt	1.00	1.00			1.00			1.00	0.85	1.00		
Flt Protected	0.95	1.00			1.00			1.00	1.00	0.95		
Satd. Flow (prot)	1507	1588			1581			3012	1327	1507		
Flt Permitted	0.23	1.00			1.00			1.00	1.00	0.95		
Satd. Flow (perm)	361	1588			1581			3012	1327	1507		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	137	274	0	0	491	15	50	1194	509	1	0	0
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	272	0	0	0
Lane Group Flow (vph)	137	274	0	0	505	0	0	1244	237	1	0	0
Confl. Peds. (#/hr)	4		5	5		4	5		4	4		5
Confl. Bikes (#/hr)												60
Turn Type	Perm	NA			NA		Split	NA	Perm	Prot		
Protected Phases		4			8		2	2		1		
Permitted Phases	4								2			
Actuated Green, G (s)	33.0	33.0			33.0			38.2	38.2	0.8		
Effective Green, g (s)	32.0	33.0			33.0			38.2	38.2	0.8		
Actuated g/C Ratio	0.37	0.38			0.38			0.44	0.44	0.01		
Clearance Time (s)	4.0	4.0			4.0			4.0	4.0	6.0		
Vehicle Extension (s)	0.2	0.2			0.2			0.2	0.2	3.0		
Lane Grp Cap (vph)	134	609			606			1337	589	14		
v/s Ratio Prot		0.17			0.32			c0.41		c0.00		
v/s Ratio Perm	c0.38								0.18			
v/c Ratio	1.02	0.45			0.83			0.93	0.40	0.07		
Uniform Delay, d1	27.0	19.7			24.0			22.6	16.2	42.2		
Progression Factor	0.91	0.86			1.00			0.31	0.42	1.00		
Incremental Delay, d2	77.9	0.2			9.2			7.9	1.1	2.2		
Delay (s)	102.4	17.2			33.2			14.8	7.9	44.4		
Level of Service	F	B			C			B	A	D		
Approach Delay (s)		45.6			33.2			12.8			44.4	
Approach LOS		D			C			B			D	

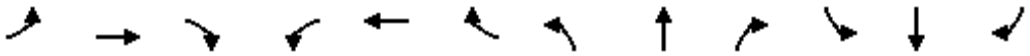
Intersection Summary			
HCM 2000 Control Delay	21.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	96.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	131	85	1312
v/c Ratio	0.38	0.31	0.56
Control Delay	28.5	33.1	1.5
Queue Delay	0.0	0.0	0.0
Total Delay	28.5	33.1	1.5
Queue Length 50th (ft)	51	40	13
Queue Length 95th (ft)	104	82	34
Internal Link Dist (ft)	137	79	634
Turn Bay Length (ft)			
Base Capacity (vph)	346	276	2360
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.38	0.31	0.56

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	92	39	44	41	0	0	0	0	41	1248	23
Future Volume (vph)	0	92	39	44	41	0	0	0	0	41	1248	23
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						0.95	
Frpb, ped/bikes		0.98			1.00						1.00	
Flpb, ped/bikes		1.00			0.98						1.00	
Frt		0.96			1.00						1.00	
Flt Protected		1.00			0.97						1.00	
Satd. Flow (prot)		1662			1684						3328	
Flt Permitted		1.00			0.81						1.00	
Satd. Flow (perm)		1662			1399						3328	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	92	39	44	41	0	0	0	0	41	1248	23
RTOR Reduction (vph)	0	18	0	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	113	0	0	85	0	0	0	0	0	1311	0
Confl. Peds. (#/hr)	22		24	24		22	14		20	20		14
Confl. Bikes (#/hr)												60
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		17.0			17.0						61.0	
Effective Green, g (s)		17.0			17.0						61.0	
Actuated g/C Ratio		0.20			0.20						0.71	
Clearance Time (s)		4.0			4.0						4.0	
Lane Grp Cap (vph)		328			276						2360	
v/s Ratio Prot		c0.07										
v/s Ratio Perm					0.06						0.39	
v/c Ratio		0.35			0.31						0.56	
Uniform Delay, d1		29.7			29.5						6.0	
Progression Factor		1.00			1.00						0.16	
Incremental Delay, d2		2.9			2.9						0.6	
Delay (s)		32.6			32.4						1.5	
Level of Service		C			C						A	
Approach Delay (s)		32.6			32.4			0.0			1.5	
Approach LOS		C			C			A			A	

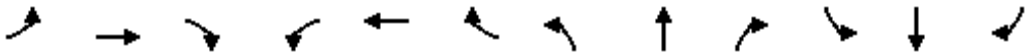
Intersection Summary			
HCM 2000 Control Delay	5.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	71.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBT	WBR	NBT	SBL
Lane Group Flow (vph)	189	13	20	1613	1
v/c Ratio	0.68	0.03	0.05	0.85	0.01
Control Delay	44.6	26.7	0.2	4.7	40.0
Queue Delay	0.0	0.0	0.0	1.1	0.0
Total Delay	44.6	26.7	0.2	5.8	40.0
Queue Length 50th (ft)	94	6	0	39	1
Queue Length 95th (ft)	#185	20	0	m42	6
Internal Link Dist (ft)	175	153		287	
Turn Bay Length (ft)					
Base Capacity (vph)	279	389	400	1904	77
Starvation Cap Reductn	0	0	0	119	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.68	0.03	0.05	0.90	0.01

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



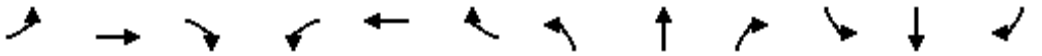
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	181	8	0	0	13	20	50	1548	15	1	0	0
Future Volume (vph)	181	8	0	0	13	20	50	1548	15	1	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0	4.0		4.0		6.0		
Lane Util. Factor		1.00			1.00	1.00		0.95		1.00		
Frpb, ped/bikes		1.00			1.00	1.00		1.00		1.00		
Flpb, ped/bikes		0.99			1.00	1.00		1.00		1.00		
Frt		1.00			1.00	0.85		1.00		1.00		
Flt Protected		0.95			1.00	1.00		1.00		0.95		
Satd. Flow (prot)		1663			1765	1500		3341		1676		
Flt Permitted		0.73			1.00	1.00		1.00		0.95		
Satd. Flow (perm)		1265			1765	1500		3341		1676		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	181	8	0	0	13	20	50	1548	15	1	0	0
RTOR Reduction (vph)	0	0	0	0	0	16	0	1	0	0	0	0
Lane Group Flow (vph)	0	189	0	0	13	4	0	1612	0	1	0	0
Confl. Peds. (#/hr)	10		10				10					10
Confl. Bikes (#/hr)												60
Turn Type	Perm	NA			NA	Perm	Perm	NA		Prot		
Protected Phases		4			8			2		1		
Permitted Phases	4					8	2					
Actuated Green, G (s)		19.0			19.0	19.0		49.0		4.0		
Effective Green, g (s)		19.0			19.0	19.0		49.0		4.0		
Actuated g/C Ratio		0.22			0.22	0.22		0.57		0.05		
Clearance Time (s)		4.0			4.0	4.0		4.0		6.0		
Lane Grp Cap (vph)		279			389	331		1903		77		
v/s Ratio Prot					0.01					c0.00		
v/s Ratio Perm		c0.15				0.00		0.48				
v/c Ratio		0.68			0.03	0.01		0.85		0.01		
Uniform Delay, d1		30.7			26.3	26.2		15.4		39.1		
Progression Factor		1.00			1.00	1.00		0.16		1.00		
Incremental Delay, d2		12.5			0.2	0.1		1.9		0.3		
Delay (s)		43.2			26.5	26.2		4.3		39.4		
Level of Service		D			C	C		A		D		
Approach Delay (s)		43.2			26.3			4.3			39.4	
Approach LOS		D			C			A			D	

Intersection Summary			
HCM 2000 Control Delay	8.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	84.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



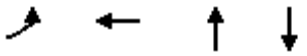
Lane Group	EBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	1	527	25	83	214
v/c Ratio	0.01	0.40	0.08	0.13	0.35
Control Delay	36.0	8.2	19.7	20.0	22.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	36.0	8.2	19.7	20.0	22.9
Queue Length 50th (ft)	1	36	9	30	85
Queue Length 95th (ft)	6	48	26	62	143
Internal Link Dist (ft)		479		105	1243
Turn Bay Length (ft)					
Base Capacity (vph)	155	1306	325	615	609
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.01	0.40	0.08	0.13	0.35

Intersection Summary



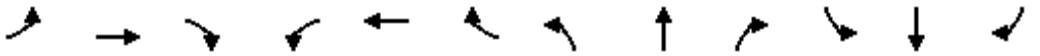
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	0	103	408	16	25	83	0	0	203	11
Future Volume (vph)	1	0	0	103	408	16	25	83	0	0	203	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0				4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00				0.95		1.00	1.00			1.00	
Frpb, ped/bikes	1.00				1.00		1.00	1.00			1.00	
Flpb, ped/bikes	1.00				1.00		0.96	1.00			1.00	
Frt	1.00				1.00		1.00	1.00			0.99	
Flt Protected	0.95				0.99		0.95	1.00			1.00	
Satd. Flow (prot)	1676				3300		1610	1765			1746	
Flt Permitted	0.95				0.99		0.55	1.00			1.00	
Satd. Flow (perm)	1676				3300		933	1765			1746	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	0	0	103	408	16	25	83	0	0	203	11
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	0	0
Lane Group Flow (vph)	1	0	0	0	525	0	25	83	0	0	214	0
Confl. Peds. (#/hr)	15		46	46		15	35		34	34		35
Confl. Bikes (#/hr)			60									
Turn Type	Prot			Split	NA		Perm	NA			NA	
Protected Phases	7			8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)	8.0				34.0		30.0	30.0			30.0	
Effective Green, g (s)	8.0				34.0		30.0	30.0			30.0	
Actuated g/C Ratio	0.09				0.40		0.35	0.35			0.35	
Clearance Time (s)	6.0				4.0		4.0	4.0			4.0	
Lane Grp Cap (vph)	155				1304		325	615			609	
v/s Ratio Prot	c0.00				c0.16			0.05			c0.12	
v/s Ratio Perm							0.03					
v/c Ratio	0.01				0.40		0.08	0.13			0.35	
Uniform Delay, d1	35.4				18.7		18.7	19.1			20.8	
Progression Factor	1.00				0.39		1.00	1.00			1.00	
Incremental Delay, d2	0.1				0.9		0.5	0.5			1.6	
Delay (s)	35.5				8.2		19.2	19.6			22.4	
Level of Service	D				A		B	B			C	
Approach Delay (s)		35.5			8.2			19.5			22.4	
Approach LOS		D			A			B			C	

Intersection Summary			
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



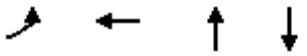
Lane Group	EBL	WBT	NBT	SBT
Lane Group Flow (vph)	1	479	73	43
v/c Ratio	0.01	0.33	0.16	0.09
Control Delay	34.0	2.3	24.7	23.7
Queue Delay	0.0	0.2	0.0	0.0
Total Delay	34.0	2.5	24.7	23.7
Queue Length 50th (ft)	1	9	30	17
Queue Length 95th (ft)	5	14	64	42
Internal Link Dist (ft)		199	104	1901
Turn Bay Length (ft)				
Base Capacity (vph)	194	1457	447	484
Starvation Cap Reductn	0	373	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.01	0.44	0.16	0.09

Intersection Summary



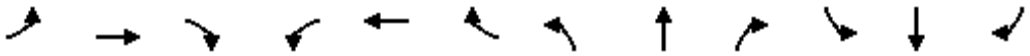
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	0	71	381	27	25	48	0	0	39	4
Future Volume (vph)	1	0	0	71	381	27	25	48	0	0	39	4
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0				4.0			4.0			4.0	
Lane Util. Factor	1.00				0.95			1.00			1.00	
Frpb, ped/bikes	1.00				1.00			1.00			1.00	
Flpb, ped/bikes	1.00				1.00			0.99			1.00	
Frt	1.00				0.99			1.00			0.99	
Flt Protected	0.95				0.99			0.98			1.00	
Satd. Flow (prot)	1676				3285			1718			1736	
Flt Permitted	0.95				0.99			0.92			1.00	
Satd. Flow (perm)	1676				3285			1603			1736	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	0	0	71	381	27	25	48	0	0	39	4
RTOR Reduction (vph)	0	0	0	0	5	0	0	0	0	0	0	0
Lane Group Flow (vph)	1	0	0	0	474	0	0	73	0	0	43	0
Confl. Peds. (#/hr)	26		30	30		26	18		66	66		18
Confl. Bikes (#/hr)			60									
Turn Type	Prot			Split	NA		Perm	NA			NA	
Protected Phases	7			8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)	10.0				38.0			24.0			24.0	
Effective Green, g (s)	10.0				38.0			24.0			24.0	
Actuated g/C Ratio	0.12				0.44			0.28			0.28	
Clearance Time (s)	6.0				4.0			4.0			4.0	
Lane Grp Cap (vph)	194				1451			447			484	
v/s Ratio Prot	c0.00				c0.14						0.02	
v/s Ratio Perm								c0.05				
v/c Ratio	0.01				0.33			0.16			0.09	
Uniform Delay, d1	33.6				15.7			23.4			22.9	
Progression Factor	1.00				0.11			1.00			1.00	
Incremental Delay, d2	0.0				0.6			0.8			0.4	
Delay (s)	33.6				2.3			24.2			23.3	
Level of Service	C				A			C			C	
Approach Delay (s)		33.6			2.3			24.2			23.3	
Approach LOS		C			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	6.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	34.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



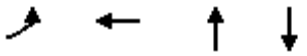
Lane Group	EBL	WBT	NBT	SBT
Lane Group Flow (vph)	1	509	40	40
v/c Ratio	0.01	0.32	0.11	0.10
Control Delay	34.0	1.9	26.2	26.1
Queue Delay	0.0	0.2	0.0	0.0
Total Delay	34.0	2.1	26.2	26.1
Queue Length 50th (ft)	1	9	17	17
Queue Length 95th (ft)	5	12	42	42
Internal Link Dist (ft)		202	103	244
Turn Bay Length (ft)				
Base Capacity (vph)	194	1583	375	411
Starvation Cap Reductn	0	385	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.01	0.42	0.11	0.10

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	0	37	456	16	22	18	0	0	29	11
Future Volume (vph)	1	0	0	37	456	16	22	18	0	0	29	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0				4.0			4.0			4.0	
Lane Util. Factor	1.00				0.95			1.00			1.00	
Frpb, ped/bikes	1.00				1.00			1.00			0.99	
Flpb, ped/bikes	1.00				1.00			0.99			1.00	
Frt	1.00				1.00			1.00			0.96	
Flt Protected	0.95				1.00			0.97			1.00	
Satd. Flow (prot)	1676				3319			1702			1686	
Flt Permitted	0.95				1.00			0.88			1.00	
Satd. Flow (perm)	1676				3319			1537			1686	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	0	0	37	456	16	22	18	0	0	29	11
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	0	0	0	0
Lane Group Flow (vph)	1	0	0	0	506	0	0	40	0	0	40	0
Confl. Peds. (#/hr)	17		15	15		17	10		19	19		10
Confl. Bikes (#/hr)			60									
Turn Type	Prot			Split	NA		Perm	NA			NA	
Protected Phases	7			8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)	10.0				41.0			21.0			21.0	
Effective Green, g (s)	10.0				41.0			21.0			21.0	
Actuated g/C Ratio	0.12				0.48			0.24			0.24	
Clearance Time (s)	6.0				4.0			4.0			4.0	
Lane Grp Cap (vph)	194				1582			375			411	
v/s Ratio Prot	c0.00				c0.15						0.02	
v/s Ratio Perm								c0.03				
v/c Ratio	0.01				0.32			0.11			0.10	
Uniform Delay, d1	33.6				13.9			25.2			25.2	
Progression Factor	1.00				0.10			1.00			1.00	
Incremental Delay, d2	0.0				0.5			0.6			0.5	
Delay (s)	33.6				1.9			25.8			25.6	
Level of Service	C				A			C			C	
Approach Delay (s)		33.6			1.9			25.8			25.6	
Approach LOS		C			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	5.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.21		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	34.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

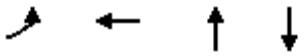


Lane Group	EBL	WBT	NBT	SBT
Lane Group Flow (vph)	1	536	55	64
v/c Ratio	0.01	0.32	0.12	0.14
Control Delay	35.0	4.3	24.9	25.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	35.0	4.3	24.9	25.1
Queue Length 50th (ft)	1	23	23	26
Queue Length 95th (ft)	6	30	52	58
Internal Link Dist (ft)		315	175	240
Turn Bay Length (ft)				
Base Capacity (vph)	165	1666	440	449
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.01	0.32	0.13	0.14

Intersection Summary

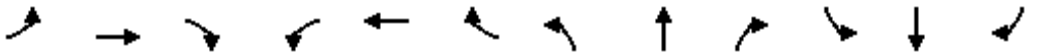
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	0	29	496	11	15	40	0	0	46	18
Future Volume (vph)	1	0	0	29	496	11	15	40	0	0	46	18
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.5				4.0			4.0			4.0	
Lane Util. Factor	1.00				0.95			1.00			1.00	
Frpb, ped/bikes	1.00				1.00			1.00			0.99	
Flpb, ped/bikes	1.00				1.00			0.99			1.00	
Frt	1.00				1.00			1.00			0.96	
Flt Protected	0.95				1.00			0.99			1.00	
Satd. Flow (prot)	1676				3331			1730			1680	
Flt Permitted	0.95				1.00			0.94			1.00	
Satd. Flow (perm)	1676				3331			1646			1680	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	0	0	29	496	11	15	40	0	0	46	18
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	0	0
Lane Group Flow (vph)	1	0	0	0	535	0	0	55	0	0	64	0
Confl. Peds. (#/hr)	10		24	24		10	15		12	12		15
Confl. Bikes (#/hr)			60									
Turn Type	Prot			Split	NA		Perm	NA			NA	
Protected Phases	7			8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)	8.5				43.0			23.0			23.0	
Effective Green, g (s)	8.5				43.0			23.0			23.0	
Actuated g/C Ratio	0.10				0.50			0.27			0.27	
Clearance Time (s)	3.5				4.0			4.0			4.0	
Lane Grp Cap (vph)	165				1665			440			449	
v/s Ratio Prot	c0.00				c0.16						c0.04	
v/s Ratio Perm								0.03				
v/c Ratio	0.01				0.32			0.12			0.14	
Uniform Delay, d1	34.9				12.8			23.9			24.0	
Progression Factor	1.00				0.30			1.00			1.00	
Incremental Delay, d2	0.1				0.5			0.6			0.7	
Delay (s)	35.0				4.3			24.5			24.7	
Level of Service	D				A			C			C	
Approach Delay (s)		35.0			4.3			24.5			24.7	
Approach LOS		D			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	8.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	11.5
Intersection Capacity Utilization	34.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



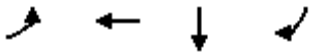
Lane Group	EBL	WBT	NBT	SBT
Lane Group Flow (vph)	1	592	94	101
v/c Ratio	0.01	0.40	0.22	0.20
Control Delay	36.0	8.1	24.1	23.7
Queue Delay	0.0	0.5	0.0	0.0
Total Delay	36.0	8.5	24.1	23.7
Queue Length 50th (ft)	1	50	38	40
Queue Length 95th (ft)	6	67	76	79
Internal Link Dist (ft)		188	104	107
Turn Bay Length (ft)				
Base Capacity (vph)	155	1466	435	502
Starvation Cap Reductn	0	439	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.01	0.58	0.22	0.20

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	0	27	539	26	50	44	0	0	68	33
Future Volume (vph)	1	0	0	27	539	26	50	44	0	0	68	33
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0				4.0			4.0			4.0	
Lane Util. Factor	1.00				0.95			1.00			1.00	
Frpb, ped/bikes	1.00				1.00			1.00			0.98	
Flpb, ped/bikes	1.00				1.00			0.98			1.00	
Frt	1.00				0.99			1.00			0.96	
Flt Protected	0.95				1.00			0.97			1.00	
Satd. Flow (prot)	1676				3310			1691			1661	
Flt Permitted	0.95				1.00			0.83			1.00	
Satd. Flow (perm)	1676				3310			1441			1661	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	0	0	27	539	26	50	44	0	0	68	33
RTOR Reduction (vph)	0	0	0	0	4	0	0	0	0	0	0	0
Lane Group Flow (vph)	1	0	0	0	588	0	0	94	0	0	101	0
Confl. Peds. (#/hr)	36		25	25		36	26		32	32		26
Confl. Bikes (#/hr)			60									
Turn Type	Prot			Split	NA		Perm	NA			NA	
Protected Phases	7			8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)	8.0				38.0			26.0			26.0	
Effective Green, g (s)	8.0				38.0			26.0			26.0	
Actuated g/C Ratio	0.09				0.44			0.30			0.30	
Clearance Time (s)	6.0				4.0			4.0			4.0	
Lane Grp Cap (vph)	155				1462			435			502	
v/s Ratio Prot	c0.00				c0.18						0.06	
v/s Ratio Perm								c0.07				
v/c Ratio	0.01				0.40			0.22			0.20	
Uniform Delay, d1	35.4				16.3			22.4			22.3	
Progression Factor	1.00				0.45			1.00			1.00	
Incremental Delay, d2	0.1				0.8			1.1			0.9	
Delay (s)	35.5				8.1			23.5			23.2	
Level of Service	D				A			C			C	
Approach Delay (s)		35.5			8.1			23.5			23.2	
Approach LOS		D			A			C			C	

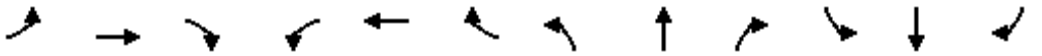
Intersection Summary			
HCM 2000 Control Delay	11.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	40.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	WBT	SBT	SBR
Lane Group Flow (vph)	1	520	1156	61
v/c Ratio	0.01	0.62	0.64	0.08
Control Delay	40.0	13.1	7.7	5.4
Queue Delay	0.0	0.0	0.2	0.0
Total Delay	40.0	13.1	8.0	5.4
Queue Length 50th (ft)	1	73	86	8
Queue Length 95th (ft)	6	m86	83	m12
Internal Link Dist (ft)		467	296	
Turn Bay Length (ft)				
Base Capacity (vph)	77	841	1793	753
Starvation Cap Reductn	0	0	154	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.01	0.62	0.71	0.08

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	0	204	316	0	0	0	0	0	1156	61
Future Volume (vph)	1	0	0	204	316	0	0	0	0	0	1156	61
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0				4.0						4.0	4.0
Lane Util. Factor	1.00				0.95						0.95	1.00
Frpb, ped/bikes	1.00				1.00						1.00	0.94
Flpb, ped/bikes	1.00				1.00						1.00	1.00
Frt	1.00				1.00						1.00	0.85
Flt Protected	0.95				0.98						1.00	1.00
Satd. Flow (prot)	1676				3288						3353	1408
Flt Permitted	0.95				0.98						1.00	1.00
Satd. Flow (perm)	1676				3288						3353	1408
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	0	0	204	316	0	0	0	0	0	1156	61
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	1	0	0	0	520	0	0	0	0	0	1156	61
Confl. Peds. (#/hr)	12		16	16		12	17		16	16		17
Confl. Bikes (#/hr)			60									60
Turn Type	Prot			Split	NA						NA	Perm
Protected Phases	7			8	8						6	
Permitted Phases												6
Actuated Green, G (s)	4.0				22.0						46.0	46.0
Effective Green, g (s)	4.0				22.0						46.0	46.0
Actuated g/C Ratio	0.05				0.26						0.53	0.53
Clearance Time (s)	6.0				4.0						4.0	4.0
Lane Grp Cap (vph)	77				841						1793	753
v/s Ratio Prot	c0.00				c0.16						c0.34	
v/s Ratio Perm												0.04
v/c Ratio	0.01				0.62						0.64	0.08
Uniform Delay, d1	39.1				28.3						14.2	9.7
Progression Factor	1.00				0.40						0.43	0.52
Incremental Delay, d2	0.3				1.7						1.5	0.2
Delay (s)	39.4				12.9						7.6	5.3
Level of Service	D				B						A	A
Approach Delay (s)		39.4			12.9			0.0			7.5	
Approach LOS		D			B			A			A	

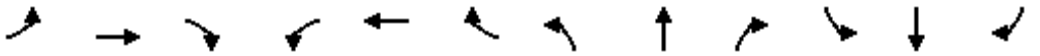
Intersection Summary			
HCM 2000 Control Delay	9.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	WBT	NBT	SBL
Lane Group Flow (vph)	1	418	1686	1
v/c Ratio	0.01	0.75	0.99	0.01
Control Delay	40.0	40.9	26.7	40.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	40.0	40.9	26.7	40.0
Queue Length 50th (ft)	1	104	127	1
Queue Length 95th (ft)	6	#166	#621	6
Internal Link Dist (ft)		230	290	
Turn Bay Length (ft)				
Base Capacity (vph)	77	555	1703	77
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.01	0.75	0.99	0.01

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

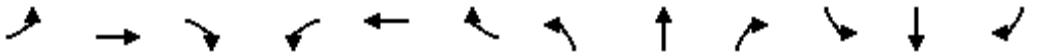


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	0	0	322	96	250	1436	0	1	0	0
Future Volume (vph)	1	0	0	0	322	96	250	1436	0	1	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0				4.0			4.0		6.0		
Lane Util. Factor	1.00				0.95			0.95		1.00		
Frpb, ped/bikes	1.00				0.99			1.00		1.00		
Flpb, ped/bikes	1.00				1.00			1.00		1.00		
Frt	1.00				0.97			1.00		1.00		
Flt Protected	0.95				1.00			0.99		0.95		
Satd. Flow (prot)	1676				3212			3328		1676		
Flt Permitted	0.95				1.00			0.99		0.95		
Satd. Flow (perm)	1676				3212			3328		1676		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	0	0	0	322	96	250	1436	0	1	0	0
RTOR Reduction (vph)	0	0	0	0	33	0	0	0	0	0	0	0
Lane Group Flow (vph)	1	0	0	0	385	0	0	1686	0	1	0	0
Confl. Peds. (#/hr)	10		10	10		12	10		15	10		10
Confl. Bikes (#/hr)			60									60
Turn Type	Prot				NA		Split	NA		Prot		
Protected Phases	7				8		2	2		1		
Permitted Phases												
Actuated Green, G (s)	4.0				14.0			44.0		4.0		
Effective Green, g (s)	4.0				14.0			44.0		4.0		
Actuated g/C Ratio	0.05				0.16			0.51		0.05		
Clearance Time (s)	6.0				4.0			4.0		6.0		
Lane Grp Cap (vph)	77				522			1702		77		
v/s Ratio Prot	c0.00				c0.12			c0.51		c0.00		
v/s Ratio Perm												
v/c Ratio	0.01				0.74			0.99		0.01		
Uniform Delay, d1	39.1				34.3			20.8		39.1		
Progression Factor	1.00				1.00			0.42		1.00		
Incremental Delay, d2	0.3				9.0			15.6		0.3		
Delay (s)	39.4				43.3			24.4		39.4		
Level of Service	D				D			C		D		
Approach Delay (s)		39.4			43.3			24.4			39.4	
Approach LOS		D			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	28.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	SBT
Lane Group Flow (vph)	756	1239
v/c Ratio	0.69	0.66
Control Delay	26.8	4.7
Queue Delay	0.0	0.1
Total Delay	26.8	4.8
Queue Length 50th (ft)	172	65
Queue Length 95th (ft)	236	91
Internal Link Dist (ft)	289	290
Turn Bay Length (ft)		
Base Capacity (vph)	1101	1871
Starvation Cap Reductn	0	68
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.69	0.69

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	585	171	0	0	0	0	0	0	88	1151	0
Future Volume (vph)	0	585	171	0	0	0	0	0	0	88	1151	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0									4.0	
Lane Util. Factor		0.95									0.95	
Frpb, ped/bikes		0.98									1.00	
Flpb, ped/bikes		1.00									0.98	
Frt		0.97									1.00	
Flt Protected		1.00									1.00	
Satd. Flow (prot)		3172									3285	
Flt Permitted		1.00									1.00	
Satd. Flow (perm)		3172									3285	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	585	171	0	0	0	0	0	0	88	1151	0
RTOR Reduction (vph)	0	32	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	724	0	0	0	0	0	0	0	0	1239	0
Confl. Peds. (#/hr)	33		38	38		33	38		109	109		38
Confl. Bikes (#/hr)												60
Turn Type		NA								Perm	NA	
Protected Phases		4									6	
Permitted Phases										6		
Actuated Green, G (s)		29.0									49.0	
Effective Green, g (s)		29.0									49.0	
Actuated g/C Ratio		0.34									0.57	
Clearance Time (s)		4.0									4.0	
Lane Grp Cap (vph)		1069									1871	
v/s Ratio Prot		c0.23										
v/s Ratio Perm											0.38	
v/c Ratio		0.68									0.66	
Uniform Delay, d1		24.5									12.8	
Progression Factor		1.00									0.25	
Incremental Delay, d2		3.5									1.4	
Delay (s)		27.9									4.6	
Level of Service		C									A	
Approach Delay (s)		27.9			0.0			0.0			4.6	
Approach LOS		C			A			A			A	

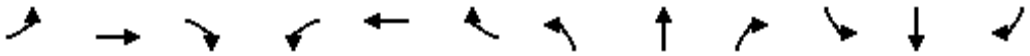
Intersection Summary			
HCM 2000 Control Delay	13.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	NBT	NBR	SBL
Lane Group Flow (vph)	173	364	1428	102	1
v/c Ratio	0.47	0.47	0.80	0.13	0.01
Control Delay	13.1	11.4	9.5	0.7	40.0
Queue Delay	0.0	0.0	0.7	0.0	0.0
Total Delay	13.1	11.4	10.1	0.7	40.0
Queue Length 50th (ft)	24	25	199	0	1
Queue Length 95th (ft)	m40	39	m80	m1	6
Internal Link Dist (ft)		417	764		
Turn Bay Length (ft)				100	
Base Capacity (vph)	372	779	1793	785	77
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	119	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.47	0.47	0.85	0.13	0.01

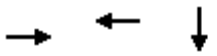
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



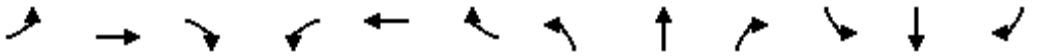
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	219	318	0	0	0	0	0	1428	102	1	0	0
Future Volume (vph)	219	318	0	0	0	0	0	1428	102	1	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0						5.0	5.0	6.0		
Lane Util. Factor	0.91	0.91						0.95	1.00	1.00		
Frpb, ped/bikes	1.00	1.00						1.00	0.93	1.00		
Flpb, ped/bikes	1.00	1.00						1.00	1.00	1.00		
Frt	1.00	1.00						1.00	0.85	1.00		
Flt Protected	0.95	0.99						1.00	1.00	0.95		
Satd. Flow (prot)	1526	3192						3353	1391	1676		
Flt Permitted	0.95	0.99						1.00	1.00	0.95		
Satd. Flow (perm)	1526	3192						3353	1391	1676		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	219	318	0	0	0	0	0	1428	102	1	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	41	0	0	0
Lane Group Flow (vph)	173	364	0	0	0	0	0	1428	61	1	0	0
Confl. Peds. (#/hr)	10		11	10		25	10		36	10		10
Confl. Bikes (#/hr)												60
Turn Type	Split	NA						NA	Perm	Prot		
Protected Phases	4	4						2		1		
Permitted Phases									2			
Actuated Green, G (s)	21.0	21.0						46.0	46.0	4.0		
Effective Green, g (s)	21.0	21.0						46.0	46.0	4.0		
Actuated g/C Ratio	0.24	0.24						0.53	0.53	0.05		
Clearance Time (s)	4.0	4.0						5.0	5.0	6.0		
Lane Grp Cap (vph)	372	779						1793	744	77		
v/s Ratio Prot	0.11	c0.11						c0.43		c0.00		
v/s Ratio Perm									0.04			
v/c Ratio	0.47	0.47						0.80	0.08	0.01		
Uniform Delay, d1	27.7	27.7						16.2	9.7	39.1		
Progression Factor	0.35	0.36						0.46	0.17	1.00		
Incremental Delay, d2	3.0	1.5						1.8	0.1	0.3		
Delay (s)	12.8	11.3						9.3	1.8	39.4		
Level of Service	B	B						A	A	D		
Approach Delay (s)		11.8			0.0			8.8			39.4	
Approach LOS		B			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	9.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



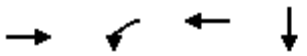
Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	40	35	1338
v/c Ratio	0.15	0.15	0.54
Control Delay	21.8	32.9	2.0
Queue Delay	0.0	0.0	0.2
Total Delay	21.8	32.9	2.2
Queue Length 50th (ft)	10	16	34
Queue Length 95th (ft)	38	43	45
Internal Link Dist (ft)	69	99	279
Turn Bay Length (ft)			
Base Capacity (vph)	272	227	2470
Starvation Cap Reductn	0	0	414
Spillback Cap Reductn	0	0	23
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.15	0.15	0.65

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	22	18	23	12	0	0	0	0	45	1262	31
Future Volume (vph)	0	22	18	23	12	0	0	0	0	45	1262	31
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						0.95	
Frpb, ped/bikes		0.96			1.00						0.99	
Flpb, ped/bikes		1.00			0.95						1.00	
Frt		0.94			1.00						1.00	
Flt Protected		1.00			0.97						1.00	
Satd. Flow (prot)		1584			1615						3316	
Flt Permitted		1.00			0.84						1.00	
Satd. Flow (perm)		1584			1397						3316	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	22	18	23	12	0	0	0	0	45	1262	31
RTOR Reduction (vph)	0	15	0	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	25	0	0	35	0	0	0	0	0	1336	0
Confl. Peds. (#/hr)	80		41	41		80	59		101	101		59
Confl. Bikes (#/hr)												60
Turn Type		NA		Perm	NA					Split	NA	
Protected Phases		4			8					6	6	
Permitted Phases				8								
Actuated Green, G (s)		14.0			14.0						64.0	
Effective Green, g (s)		14.0			14.0						64.0	
Actuated g/C Ratio		0.16			0.16						0.74	
Clearance Time (s)		4.0			4.0						4.0	
Lane Grp Cap (vph)		257			227						2467	
v/s Ratio Prot		0.02									c0.40	
v/s Ratio Perm					c0.03							
v/c Ratio		0.10			0.15						0.54	
Uniform Delay, d1		30.6			30.9						4.7	
Progression Factor		1.00			1.00						0.27	
Incremental Delay, d2		0.8			1.4						0.6	
Delay (s)		31.4			32.4						1.9	
Level of Service		C			C						A	
Approach Delay (s)		31.4			32.4			0.0			1.9	
Approach LOS		C			C			A			A	

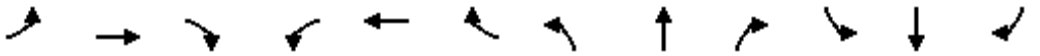
Intersection Summary			
HCM 2000 Control Delay	3.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBL	WBT	SBT
Lane Group Flow (vph)	383	53	315	1377
v/c Ratio	0.64	0.26	0.51	0.75
Control Delay	27.1	13.6	15.4	7.2
Queue Delay	0.0	0.0	0.7	0.0
Total Delay	27.1	13.6	16.1	7.2
Queue Length 50th (ft)	157	8	46	61
Queue Length 95th (ft)	253	m12	m120	68
Internal Link Dist (ft)	174		323	277
Turn Bay Length (ft)				
Base Capacity (vph)	603	205	615	1827
Starvation Cap Reductn	0	0	101	13
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.64	0.26	0.61	0.76

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	259	124	53	315	0	0	0	0	135	1113	129
Future Volume (vph)	0	259	124	53	315	0	0	0	0	135	1113	129
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0		4.0	4.0						4.0	
Lane Util. Factor		1.00		1.00	1.00						0.95	
Frpb, ped/bikes		0.99		1.00	1.00						0.99	
Flpb, ped/bikes		1.00		0.99	1.00						1.00	
Frt		0.96		1.00	1.00						0.99	
Flt Protected		1.00		0.95	1.00						1.00	
Satd. Flow (prot)		1672		1666	1765						3257	
Flt Permitted		1.00		0.34	1.00						1.00	
Satd. Flow (perm)		1672		590	1765						3257	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	259	124	53	315	0	0	0	0	135	1113	129
RTOR Reduction (vph)	0	20	0	0	0	0	0	0	0	0	9	0
Lane Group Flow (vph)	0	363	0	53	315	0	0	0	0	0	1368	0
Confl. Peds. (#/hr)	10		10	10		27	10		10	10		21
Confl. Bikes (#/hr)												60
Turn Type		NA		Perm	NA					Split	NA	
Protected Phases		4			8					6	6	
Permitted Phases				8								
Actuated Green, G (s)		30.0		30.0	30.0						48.0	
Effective Green, g (s)		30.0		30.0	30.0						48.0	
Actuated g/C Ratio		0.35		0.35	0.35						0.56	
Clearance Time (s)		4.0		4.0	4.0						4.0	
Lane Grp Cap (vph)		583		205	615						1817	
v/s Ratio Prot		c0.22			0.18						c0.42	
v/s Ratio Perm				0.09								
v/c Ratio		0.62		0.26	0.51						0.75	
Uniform Delay, d1		23.3		20.0	22.2						14.5	
Progression Factor		1.00		0.55	0.59						0.32	
Incremental Delay, d2		4.9		2.0	2.0						2.6	
Delay (s)		28.2		13.0	15.0						7.1	
Level of Service		C		B	B						A	
Approach Delay (s)		28.2			14.7			0.0			7.1	
Approach LOS		C			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	87.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



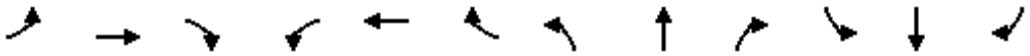
Lane Group	EBL	EBT	WBT	WBR	NBT	NBR	SBL
Lane Group Flow (vph)	213	118	236	130	1653	65	1
v/c Ratio	1.10	0.21	0.86	0.39	0.88	0.07	0.01
Control Delay	123.7	31.2	64.3	10.4	15.1	0.1	40.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	123.7	31.2	64.3	10.4	15.1	0.1	40.0
Queue Length 50th (ft)	~134	57	125	1	106	0	1
Queue Length 95th (ft)	m#254	m85	#247	49	#665	m0	6
Internal Link Dist (ft)		323	183		528		
Turn Bay Length (ft)						100	
Base Capacity (vph)	194	574	287	344	1887	902	83
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.10	0.21	0.82	0.38	0.88	0.07	0.01

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	213	118	0	0	236	130	90	1563	65	1	0	0
Future Volume (vph)	213	118	0	0	236	130	90	1563	65	1	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0	4.0	6.0		
Lane Util. Factor	1.00	1.00			1.00	1.00		0.95	1.00	1.00		
Frpb, ped/bikes	1.00	1.00			1.00	0.97		1.00	1.00	1.00		
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00	1.00		
Frt	1.00	1.00			1.00	0.85		1.00	0.85	1.00		
Flt Protected	0.95	1.00			1.00	1.00		1.00	1.00	0.95		
Satd. Flow (prot)	1676	1765			1765	1460		3344	1500	1676		
Flt Permitted	0.95	1.00			1.00	1.00		1.00	1.00	0.95		
Satd. Flow (perm)	1676	1765			1765	1460		3344	1500	1676		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	213	118	0	0	236	130	90	1563	65	1	0	0
RTOR Reduction (vph)	0	0	0	0	0	107	0	0	32	0	0	0
Lane Group Flow (vph)	213	118	0	0	236	23	0	1653	33	1	0	0
Confl. Peds. (#/hr)	8					8	5					5
Confl. Bikes (#/hr)												60
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm	Prot		
Protected Phases	7	4			8		2	2		1		
Permitted Phases						8			2			
Actuated Green, G (s)	11.0	27.4			13.4	13.4		43.8	43.8	0.8		
Effective Green, g (s)	10.0	27.4			13.4	13.4		43.8	43.8	0.8		
Actuated g/C Ratio	0.12	0.32			0.16	0.16		0.51	0.51	0.01		
Clearance Time (s)	3.0	4.0			4.0	4.0		4.0	4.0	6.0		
Vehicle Extension (s)	2.0	2.5			2.5	2.5		0.2	0.2	3.0		
Lane Grp Cap (vph)	194	562			275	227		1703	763	15		
v/s Ratio Prot	c0.13	0.07			c0.13			c0.49		c0.00		
v/s Ratio Perm						0.02			0.02			
v/c Ratio	1.10	0.21			0.86	0.10		0.97	0.04	0.07		
Uniform Delay, d1	38.0	21.4			35.4	31.1		20.5	10.6	42.2		
Progression Factor	1.05	1.43			1.00	1.00		0.46	0.02	1.00		
Incremental Delay, d2	83.9	0.1			22.1	0.1		13.9	0.1	1.9		
Delay (s)	123.6	30.6			57.4	31.3		23.3	0.3	44.1		
Level of Service	F	C			E	C		C	A	D		
Approach Delay (s)		90.5			48.1			22.4			44.1	
Approach LOS		F			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	35.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	83.9%	ICU Level of Service	E
Analysis Period (min)	15		

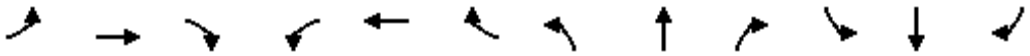
c Critical Lane Group



Lane Group	EBT	WBT	NBT	NBR	SBL
Lane Group Flow (vph)	47	90	1459	100	1
v/c Ratio	0.21	0.31	0.69	0.10	0.01
Control Delay	33.9	32.3	12.7	2.0	40.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	33.9	32.3	12.7	2.0	40.0
Queue Length 50th (ft)	22	40	247	2	1
Queue Length 95th (ft)	54	83	322	m18	6
Internal Link Dist (ft)	93	517	2424		
Turn Bay Length (ft)				100	
Base Capacity (vph)	227	286	2103	974	77
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.21	0.31	0.69	0.10	0.01

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	17	0	0	77	13	21	1438	100	1	0	0
Future Volume (vph)	30	17	0	0	77	13	21	1438	100	1	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0			4.0	4.0	6.0		
Lane Util. Factor		1.00			1.00			0.95	1.00	1.00		
Frpb, ped/bikes		1.00			0.99			1.00	1.00	1.00		
Flpb, ped/bikes		0.98			1.00			1.00	1.00	1.00		
Frt		1.00			0.98			1.00	0.85	1.00		
Flt Protected		0.97			1.00			1.00	1.00	0.95		
Satd. Flow (prot)		1683			1721			3351	1500	1676		
Flt Permitted		0.81			1.00			1.00	1.00	0.95		
Satd. Flow (perm)		1399			1721			3351	1500	1676		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	30	17	0	0	77	13	21	1438	100	1	0	0
RTOR Reduction (vph)	0	0	0	0	7	0	0	0	33	0	0	0
Lane Group Flow (vph)	0	47	0	0	83	0	0	1459	67	1	0	0
Confl. Peds. (#/hr)	15		12	12		15	10		19	19		10
Confl. Bikes (#/hr)												60
Turn Type	custom	NA			NA		Split	NA	Prot	Prot		
Protected Phases					8		2	2	2	1		
Permitted Phases	4	4										
Actuated Green, G (s)		14.0			14.0			54.0	54.0	4.0		
Effective Green, g (s)		14.0			14.0			54.0	54.0	4.0		
Actuated g/C Ratio		0.16			0.16			0.63	0.63	0.05		
Clearance Time (s)		4.0			4.0			4.0	4.0	6.0		
Lane Grp Cap (vph)		227			280			2104	941	77		
v/s Ratio Prot					c0.05			c0.44	0.04	c0.00		
v/s Ratio Perm		0.03										
v/c Ratio		0.21			0.30			0.69	0.07	0.01		
Uniform Delay, d1		31.2			31.7			10.5	6.2	39.1		
Progression Factor		1.00			1.00			0.99	0.95	1.00		
Incremental Delay, d2		2.1			2.7			1.9	0.1	0.3		
Delay (s)		33.2			34.4			12.4	6.0	39.4		
Level of Service		C			C			B	A	D		
Approach Delay (s)		33.2			34.4			12.0			39.4	
Approach LOS		C			C			B			D	

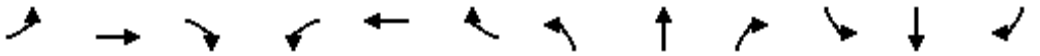
Intersection Summary			
HCM 2000 Control Delay	13.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	60.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	155	290	190	245	440	95	1000	425	1110
v/c Ratio	0.84	0.56	0.91	0.84	0.69	0.28	0.79	0.58	0.82
Control Delay	99.0	52.0	106.2	82.9	22.5	55.4	46.5	52.4	44.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	99.0	52.0	106.2	82.9	22.5	55.4	46.5	52.4	44.1
Queue Length 50th (ft)	140	108	174	220	187	75	430	182	483
Queue Length 95th (ft)	#283	180	#302	351	269	151	#666	254	628
Internal Link Dist (ft)		595		272			1059		378
Turn Bay Length (ft)	175		300			135			
Base Capacity (vph)	229	622	302	395	756	338	1268	815	1624
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.47	0.63	0.62	0.58	0.28	0.79	0.52	0.68

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	155	195	95	190	245	440	95	925	75	425	1030	80
Future Volume (vph)	155	195	95	190	245	440	95	925	75	425	1030	80
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95		0.97	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1676	3188		1676	1765	1500	1676	3304		3252	3299	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1676	3188		1676	1765	1500	1676	3304		3252	3299	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	155	195	95	190	245	440	95	925	75	425	1030	80
RTOR Reduction (vph)	0	40	0	0	0	51	0	4	0	0	4	0
Lane Group Flow (vph)	155	250	0	190	245	389	95	996	0	425	1106	0
Confl. Bikes (#/hr)									60			60
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8	1 8	5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	15.5	21.3		18.6	23.4	55.3	28.5	54.0		31.9	57.4	
Effective Green, g (s)	15.5	21.3		17.6	23.4	55.3	28.5	54.0		31.9	57.4	
Actuated g/C Ratio	0.11	0.15		0.12	0.17	0.39	0.20	0.38		0.23	0.41	
Clearance Time (s)	4.0	4.0		3.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	1.5	1.5		1.0	1.5		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	184	482		209	293	589	339	1267		736	1344	
v/s Ratio Prot	0.09	0.08		c0.11	c0.14	0.26	0.06	c0.30		0.13	c0.34	
v/s Ratio Perm												
v/c Ratio	0.84	0.52		0.91	0.84	0.66	0.28	0.79		0.58	0.82	
Uniform Delay, d1	61.5	55.0		60.8	56.8	35.1	47.5	38.3		48.5	37.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	27.0	0.4		37.1	17.6	2.8	2.1	5.0		1.1	4.2	
Delay (s)	88.4	55.4		97.9	74.4	37.8	49.5	43.3		49.6	41.4	
Level of Service	F	E		F	E	D	D	D		D	D	
Approach Delay (s)		66.9			61.1			43.8			43.6	
Approach LOS		E			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	50.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	140.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	78.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

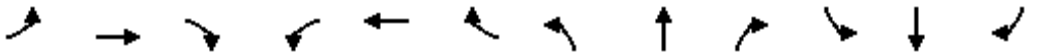


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	380	825	80	525	505	1395	45	295	1190
v/c Ratio	1.60	0.82	0.78	0.69	1.30	1.10	0.07	1.51	0.96
Control Delay	324.5	46.1	99.0	47.3	193.5	93.5	11.8	292.0	55.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	324.5	46.1	99.0	47.3	193.5	93.5	11.8	292.0	55.0
Queue Length 50th (ft)	~421	304	62	191	~284	~673	13	~318	469
Queue Length 95th (ft)	#615	383	#144	252	#393	#813	29	#495	#621
Internal Link Dist (ft)		1448		174		1573			1059
Turn Bay Length (ft)	250		250		275		300	150	
Base Capacity (vph)	237	1048	111	822	389	1268	667	195	1237
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.60	0.79	0.72	0.64	1.30	1.10	0.07	1.51	0.96

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	380	615	210	80	460	65	505	1395	45	295	1095	95
Future Volume (vph)	380	615	210	80	460	65	505	1395	45	295	1095	95
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	0.98		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	3225		1676	3291		3252	3353	1500	1676	3300	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1676	3225		1676	3291		3252	3353	1500	1676	3300	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	380	615	210	80	460	65	505	1395	45	295	1095	95
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	380	825	0	80	525	0	505	1395	45	295	1190	0
Confl. Bikes (#/hr)									60			60
Turn Type	Prot	NA		Prot	NA		Prot	NA	pt+ov	Prot	NA	
Protected Phases	7	4		3	8		5	2	2 3	1	6	
Permitted Phases												
Actuated Green, G (s)	18.0	37.2		8.4	27.6		15.4	45.4	53.8	15.0	45.0	
Effective Green, g (s)	17.0	37.2		7.4	27.6		14.4	45.4	53.8	14.0	45.0	
Actuated g/C Ratio	0.14	0.31		0.06	0.23		0.12	0.38	0.45	0.12	0.38	
Clearance Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.5	3.0		2.0	4.0		2.0	3.5		2.0	3.5	
Lane Grp Cap (vph)	237	999		103	756		390	1268	672	195	1237	
v/s Ratio Prot	c0.23	c0.26		0.05	0.16		c0.16	c0.42	0.03	c0.18	0.36	
v/s Ratio Perm												
v/c Ratio	1.60	0.83		0.78	0.69		1.29	1.10	0.07	1.51	0.96	
Uniform Delay, d1	51.5	38.4		55.5	42.3		52.8	37.3	18.8	53.0	36.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	290.4	5.7		27.6	3.0		150.6	57.3	0.0	255.4	18.0	
Delay (s)	341.9	44.1		83.1	45.3		203.4	94.6	18.8	308.4	54.6	
Level of Service	F	D		F	D		F	F	B	F	D	
Approach Delay (s)		138.0			50.3			121.1			105.0	
Approach LOS		F			D			F			F	

Intersection Summary			
HCM 2000 Control Delay	112.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	109.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Arterial Level of Service: NB Central Avenue

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Edwards Street	III	30	45.4	39.0	84.4	0.36	15.2	D
Total	III		45.4	39.0	84.4	0.36	15.2	D

Arterial Level of Service: SB Central Avenue

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Central Avenue	III	30	22.0	0.0	22.0	0.16	26.8	B
Jackson Street	III	30	45.4	12.5	57.9	0.36	22.2	C
E 4th Street	III	30	22.6	17.9	40.5	0.18	15.8	D
6th Street	III	30	18.1	1.5	19.6	0.14	24.8	B
Main Street	III	30	11.0	7.7	18.7	0.07	13.7	E
8th Street	III	30	10.9	4.7	15.6	0.07	16.2	D
9th Street	III	30	10.5	2.0	12.5	0.07	19.6	C
10th	III	30	10.5	7.2	17.7	0.07	13.8	E
Total	III		151.0	53.5	204.5	1.11	19.6	C

Arterial Level of Service: NB Court Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
McAndrews Road	III	30	50.4	57.0	107.4	0.40	13.3	E
Ohio Street	III	30	16.0	45.0	61.0	0.11	6.7	F
Total	III		66.4	102.0	168.4	0.51	10.9	E

Arterial Level of Service: SB Court Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Ohio Street	III	30	21.9	7.4	29.3	0.16	20.0	C
E McAndrews Road	III	30	16.0	31.3	47.3	0.11	8.7	F
Central Avenue	III	30	50.4	23.1	73.5	0.40	19.4	C
Total	III		88.3	61.8	150.1	0.67	16.2	D

Arterial Level of Service: EB Main Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Oakdale Avenue	IV	30	17.4	36.0	53.4	0.10	6.5	F
Holly Street	IV	30	19.1	34.0	53.1	0.11	7.2	E
Grape Street	IV	30	12.0	34.0	46.0	0.05	4.1	F
Fir Street	IV	30	12.1	35.0	47.1	0.05	4.1	F
Front Street	IV	30	17.0	36.0	53.0	0.07	5.1	F
Central Avenue	IV	30	11.5	40.0	51.5	0.05	3.5	F
Riverside Avenue	IV	30	18.6	40.0	58.6	0.10	6.4	F
Total	IV		107.7	255.0	362.7	0.54	5.3	F

Arterial Level of Service: WB Main Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Riverside Avenue	IV	30	20.4	40.9	61.3	0.11	6.7	F
Central Avenue	IV	30	18.6	13.0	31.6	0.10	11.8	D
Front Street	IV	30	11.5	8.1	19.6	0.05	9.3	D
Fir Street	IV	30	17.0	4.3	21.3	0.07	12.6	D
Grape Street	IV	30	12.1	1.9	14.0	0.05	13.7	C
Holly Street	IV	30	12.0	2.3	14.3	0.05	13.3	C
Oakdale Avenue	IV	30	19.1	8.2	27.3	0.11	14.0	C
Total	IV		110.7	78.7	189.4	0.55	10.5	D

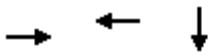
Arterial Level of Service: NB Riverside Avenue

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Barnett Road	III	30	27.4	46.5	73.9	0.22	10.5	E
12th Street	III	30	67.3	12.7	80.0	0.56	25.2	B
10th Street	III	30	16.2	15.1	31.3	0.12	13.2	E
8th Street	III	30	21.4	9.5	30.9	0.16	18.6	C
Main Street	III	30	10.9	26.7	37.6	0.07	6.7	F
	III	30	10.8	4.7	15.5	0.07	16.1	D
4th Street	III	30	18.8	11.3	30.1	0.14	16.8	D
Jackson Street	III	30	10.5	18.5	29.0	0.07	8.4	F
Manzanita Street	III	30	63.4	5.0	68.4	0.50	26.3	B
McAndrews Road	III	30	30.6	37.3	67.9	0.24	12.8	E
Mall Access	III	30	17.6	11.0	28.6	0.12	15.7	D
Total	III		294.9	198.3	493.2	2.26	16.5	D

Arterial Level of Service: SB Riverside Avenue

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Ohio Street	III	30	23.0	46.0	69.0	0.18	9.4	F
McAndrews Road	III	30	17.6	57.0	74.6	0.12	6.0	F
Manzanita Street	III	30	30.6	40.0	70.6	0.24	12.3	E
Jackson Street	III	30	63.4	40.0	103.4	0.50	17.4	D
4th Street	III	30	10.5	40.0	50.5	0.07	4.8	F
6th Street	III	30	18.8	40.0	58.8	0.14	8.6	F
Main Street	III	30	10.8	40.0	50.8	0.07	4.9	F
8th Street	III	30	10.9	40.0	50.9	0.07	5.0	F
10th Street	III	30	21.4	40.0	61.4	0.16	9.4	F
12th Street	III	30	16.2	40.0	56.2	0.12	7.4	F
Barnett Road	III	30	67.3	44.1	111.4	0.56	18.1	C
Stewart Avenue	III	30	27.4	55.0	82.4	0.22	9.4	F
Total	III		317.9	522.1	840.0	2.45	10.5	E

2038 Alternative B
Permissive Phasing

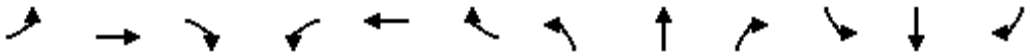


Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	276	220	1131
v/c Ratio	0.72	1.50	0.33
Control Delay	36.8	285.5	6.1
Queue Delay	0.0	0.0	0.0
Total Delay	36.8	285.5	6.1
Queue Length 50th (ft)	120	~180	83
Queue Length 95th (ft)	190	#309	140
Internal Link Dist (ft)	1754	380	781
Turn Bay Length (ft)			
Base Capacity (vph)	715	304	3386
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.39	0.72	0.33

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	110	166	83	137	0	0	0	0	65	985	81
Future Volume (vph)	0	110	166	83	137	0	0	0	0	65	985	81
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						0.91	
Frpb, ped/bikes		0.99			1.00						0.99	
Flpb, ped/bikes		1.00			1.00						1.00	
Frt		0.92			1.00						0.99	
Flt Protected		1.00			0.98						1.00	
Satd. Flow (prot)		1598			1728						4720	
Flt Permitted		1.00			0.41						1.00	
Satd. Flow (perm)		1598			725						4720	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	110	166	83	137	0	0	0	0	65	985	81
RTOR Reduction (vph)	0	60	0	0	0	0	0	0	0	0	5	0
Lane Group Flow (vph)	0	216	0	0	220	0	0	0	0	0	1126	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)												60
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		20.8			20.8						71.7	
Effective Green, g (s)		20.3			20.3						71.7	
Actuated g/C Ratio		0.20			0.20						0.72	
Clearance Time (s)		3.5			3.5						4.0	
Vehicle Extension (s)		2.0			2.0						4.0	
Lane Grp Cap (vph)		324			147						3384	
v/s Ratio Prot		0.14										
v/s Ratio Perm					c0.30						0.24	
v/c Ratio		0.67			1.50						0.33	
Uniform Delay, d1		36.7			39.9						5.3	
Progression Factor		1.00			0.90						1.00	
Incremental Delay, d2		4.0			254.8						0.3	
Delay (s)		40.7			290.7						5.5	
Level of Service		D			F						A	
Approach Delay (s)		40.7			290.7			0.0			5.5	
Approach LOS		D			F			A			A	

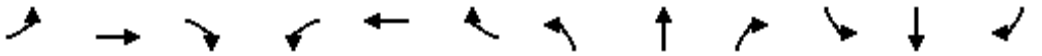
Intersection Summary			
HCM 2000 Control Delay	50.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	68.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBT	WBT	WBR	NBT
Lane Group Flow (vph)	224	95	83	1698
v/c Ratio	0.80	0.26	0.26	0.52
Control Delay	48.2	26.7	22.5	8.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	48.2	26.7	22.5	8.9
Queue Length 50th (ft)	93	44	30	167
Queue Length 95th (ft)	149	81	66	266
Internal Link Dist (ft)	380	1230		579
Turn Bay Length (ft)				
Base Capacity (vph)	450	566	498	3284
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.50	0.17	0.17	0.52

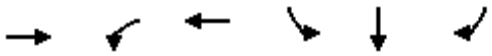
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	142	82	0	0	74	104	107	1501	90	0	0	0
Future Volume (vph)	142	82	0	0	74	104	107	1501	90	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.5			4.5	4.5		5.0				
Lane Util. Factor		1.00			0.95	0.95		0.91				
Frpb, ped/bikes		1.00			0.99	0.98		1.00				
Flpb, ped/bikes		0.99			1.00	1.00		1.00				
Frt		1.00			0.97	0.85		0.99				
Flt Protected		0.97			1.00	1.00		1.00				
Satd. Flow (prot)		1700			1613	1392		4755				
Flt Permitted		0.74			1.00	1.00		1.00				
Satd. Flow (perm)		1306			1613	1392		4755				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	142	82	0	0	74	104	107	1501	90	0	0	0
RTOR Reduction (vph)	0	0	0	0	13	22	0	4	0	0	0	0
Lane Group Flow (vph)	0	224	0	0	82	61	0	1694	0	0	0	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)												60
Turn Type	Perm	NA			NA	Perm	Split	NA				
Protected Phases		4			8		2	2				
Permitted Phases	4					8						
Actuated Green, G (s)		22.0			22.0	22.0		69.5				
Effective Green, g (s)		21.5			21.5	21.5		69.0				
Actuated g/C Ratio		0.22			0.22	0.22		0.69				
Clearance Time (s)		4.0			4.0	4.0		4.5				
Vehicle Extension (s)		2.5			2.5	2.5		2.0				
Lane Grp Cap (vph)		280			346	299		3280				
v/s Ratio Prot					0.05			c0.36				
v/s Ratio Perm		c0.17				0.04						
v/c Ratio		0.80			0.24	0.20		0.52				
Uniform Delay, d1		37.2			32.5	32.2		7.5				
Progression Factor		0.77			1.00	1.00		1.00				
Incremental Delay, d2		14.3			0.3	0.2		0.6				
Delay (s)		43.0			32.7	32.5		8.0				
Level of Service		D			C	C		A				
Approach Delay (s)		43.0			32.6			8.0			0.0	
Approach LOS		D			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	13.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.5
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		

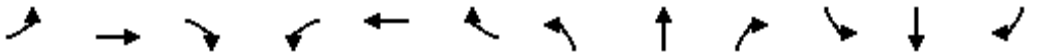
c Critical Lane Group



Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	533	195	767	380	706	58
v/c Ratio	0.48	0.50	0.38	0.68	0.64	0.11
Control Delay	34.1	31.2	4.7	40.8	36.1	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.1	31.2	4.7	40.8	36.1	6.6
Queue Length 50th (ft)	172	137	45	247	236	0
Queue Length 95th (ft)	241	m209	54	337	283	28
Internal Link Dist (ft)	1762		672		521	
Turn Bay Length (ft)		110		175		175
Base Capacity (vph)	1112	391	2018	642	1285	582
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.50	0.38	0.59	0.55	0.10

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	485	48	195	767	0	0	0	0	380	706	58
Future Volume (vph)	0	485	48	195	767	0	0	0	0	380	706	58
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0		4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.95		1.00	0.95					1.00	0.95	1.00
Frpb, ped/bikes		1.00		1.00	1.00					1.00	1.00	0.95
Flpb, ped/bikes		1.00		1.00	1.00					1.00	1.00	1.00
Frt		0.99		1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		3303		1676	3353					1676	3353	1418
Flt Permitted		1.00		0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		3303		1676	3353					1676	3353	1418
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	485	48	195	767	0	0	0	0	380	706	58
RTOR Reduction (vph)	0	6	0	0	0	0	0	0	0	0	0	39
Lane Group Flow (vph)	0	527	0	195	767	0	0	0	0	380	706	19
Confl. Peds. (#/hr)	2		2	2		2	2		1	1		2
Confl. Bikes (#/hr)												60
Turn Type		NA		Prot	NA					Split	NA	Perm
Protected Phases		4		3	8					6	6	
Permitted Phases												6
Actuated Green, G (s)		40.2		29.0	72.2					39.8	39.8	39.8
Effective Green, g (s)		40.2		28.0	72.2					39.8	39.8	39.8
Actuated g/C Ratio		0.34		0.23	0.60					0.33	0.33	0.33
Clearance Time (s)		4.0		3.0	4.0					4.0	4.0	4.0
Vehicle Extension (s)		4.0		2.0	4.0					5.0	5.0	5.0
Lane Grp Cap (vph)		1106		391	2017					555	1112	470
v/s Ratio Prot		c0.16		c0.12	0.23					c0.23	0.21	
v/s Ratio Perm												0.01
v/c Ratio		0.48		0.50	0.38					0.68	0.63	0.04
Uniform Delay, d1		31.6		39.9	12.3					34.7	33.9	27.2
Progression Factor		1.00		0.68	0.31					1.00	1.00	1.00
Incremental Delay, d2		1.5		0.3	0.5					4.5	1.7	0.1
Delay (s)		33.0		27.3	4.3					39.2	35.6	27.2
Level of Service		C		C	A					D	D	C
Approach Delay (s)		33.0			9.0			0.0			36.4	
Approach LOS		C			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	25.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	76.1%	ICU Level of Service	D
Analysis Period (min)	15		

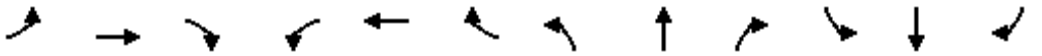
c Critical Lane Group



Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Group Flow (vph)	95	750	899	518	1253	263
v/c Ratio	0.65	0.36	0.53	0.66	0.79	0.43
Control Delay	75.0	1.9	22.0	23.2	40.5	12.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.0	1.9	22.0	23.2	40.5	12.5
Queue Length 50th (ft)	64	25	243	241	319	45
Queue Length 95th (ft)	m123	22	314	384	378	119
Internal Link Dist (ft)		672	692		1193	
Turn Bay Length (ft)	130					150
Base Capacity (vph)	181	2069	1690	781	1596	607
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.36	0.53	0.66	0.79	0.43

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	95	750	0	0	899	518	139	1114	263	0	0	0
Future Volume (vph)	95	750	0	0	899	518	139	1114	263	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	3.0			3.0	3.0		3.0	3.0			
Lane Util. Factor	1.00	0.95			0.95	1.00		0.91	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	0.97		1.00	0.97			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.99	1.00			
Satd. Flow (prot)	1676	3353			3353	1456		4791	1461			
Flt Permitted	0.95	1.00			1.00	1.00		0.99	1.00			
Satd. Flow (perm)	1676	3353			3353	1456		4791	1461			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	95	750	0	0	899	518	139	1114	263	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	47	0	0	120	0	0	0
Lane Group Flow (vph)	95	750	0	0	899	471	0	1253	143	0	0	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)												60
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	7	4			8		2	2				
Permitted Phases						8			2			
Actuated Green, G (s)	10.5	73.1			59.6	59.6		38.9	38.9			
Effective Green, g (s)	10.5	74.1			60.6	60.6		39.9	39.9			
Actuated g/C Ratio	0.09	0.62			0.51	0.51		0.33	0.33			
Clearance Time (s)	3.0	4.0			4.0	4.0		4.0	4.0			
Vehicle Extension (s)	2.0	4.0			4.0	4.0		4.0	4.0			
Lane Grp Cap (vph)	146	2070			1693	735		1593	485			
v/s Ratio Prot	c0.06	0.22			0.27			c0.26				
v/s Ratio Perm						c0.32			0.10			
v/c Ratio	0.65	0.36			0.53	0.64		0.79	0.29			
Uniform Delay, d1	53.0	11.3			20.1	21.7		36.2	29.6			
Progression Factor	1.10	0.13			1.00	1.00		1.00	1.00			
Incremental Delay, d2	6.6	0.4			1.2	4.3		2.8	0.5			
Delay (s)	64.7	1.9			21.3	26.0		39.0	30.1			
Level of Service	E	A			C	C		D	C			
Approach Delay (s)		9.0			23.0			37.5			0.0	
Approach LOS		A			C			D			A	

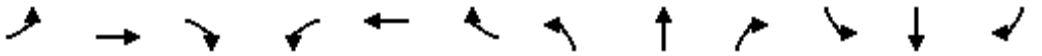
Intersection Summary			
HCM 2000 Control Delay	25.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	76.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



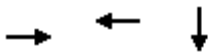
Lane Group	EBT	WBT	NBT
Lane Group Flow (vph)	87	19	1535
v/c Ratio	0.45	0.07	0.70
Control Delay	40.0	22.3	3.9
Queue Delay	0.0	0.0	0.0
Total Delay	40.0	22.3	3.9
Queue Length 50th (ft)	43	5	84
Queue Length 95th (ft)	89	23	80
Internal Link Dist (ft)	550	165	918
Turn Bay Length (ft)			
Base Capacity (vph)	195	263	2203
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.45	0.07	0.70

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	83	4	0	0	10	9	44	1474	17	0	0	0
Future Volume (vph)	83	4	0	0	10	9	44	1474	17	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0			4.0				
Lane Util. Factor		1.00			1.00			0.95				
Frpb, ped/bikes		1.00			0.99			1.00				
Flpb, ped/bikes		0.98			1.00			1.00				
Frt		1.00			0.94			1.00				
Flt Protected		0.95			1.00			1.00				
Satd. Flow (prot)		1483			1466			3007				
Flt Permitted		0.72			1.00			1.00				
Satd. Flow (perm)		1122			1466			3007				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	83	4	0	0	10	9	44	1474	17	0	0	0
RTOR Reduction (vph)	0	0	0	0	7	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	87	0	0	12	0	0	1534	0	0	0	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)												60
Turn Type	Perm	NA			NA		Split	NA				
Protected Phases		4			8		2	2				
Permitted Phases	4											
Actuated Green, G (s)		15.0			15.0			63.0				
Effective Green, g (s)		15.0			15.0			63.0				
Actuated g/C Ratio		0.17			0.17			0.73				
Clearance Time (s)		4.0			4.0			4.0				
Lane Grp Cap (vph)		195			255			2202				
v/s Ratio Prot					0.01			c0.51				
v/s Ratio Perm		c0.08										
v/c Ratio		0.45			0.05			0.70				
Uniform Delay, d1		31.8			29.5			6.3				
Progression Factor		1.00			1.00			0.39				
Incremental Delay, d2		7.2			0.3			1.4				
Delay (s)		39.0			29.9			3.8				
Level of Service		D			C			A				
Approach Delay (s)		39.0			29.9			3.8			0.0	
Approach LOS		D			C			A			A	

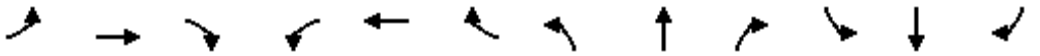
Intersection Summary			
HCM 2000 Control Delay	6.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	207	88	991
v/c Ratio	0.72	0.44	0.50
Control Delay	23.9	37.4	11.6
Queue Delay	0.0	0.0	0.0
Total Delay	23.9	37.4	11.6
Queue Length 50th (ft)	18	49	119
Queue Length 95th (ft)	82	m64	311
Internal Link Dist (ft)	7	1528	2014
Turn Bay Length (ft)			
Base Capacity (vph)	367	414	1965
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.56	0.21	0.50

Intersection Summary

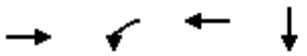
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	35	172	45	43	0	0	0	0	61	907	23
Future Volume (vph)	0	35	172	45	43	0	0	0	0	61	907	23
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						0.95	
Frpb, ped/bikes		0.96			1.00						1.00	
Flpb, ped/bikes		1.00			1.00						1.00	
Frt		0.89			1.00						1.00	
Flt Protected		1.00			0.98						1.00	
Satd. Flow (prot)		1360			1549						2993	
Flt Permitted		1.00			0.98						1.00	
Satd. Flow (perm)		1360			1549						2993	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	35	172	45	43	0	0	0	0	61	907	23
RTOR Reduction (vph)	0	156	0	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	51	0	0	88	0	0	0	0	0	990	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)												60
Turn Type		NA		Split	NA					Split	NA	
Protected Phases		7		8	8					6	6	
Permitted Phases												
Actuated Green, G (s)		8.2			10.1						55.7	
Effective Green, g (s)		8.2			10.1						55.7	
Actuated g/C Ratio		0.10			0.12						0.65	
Clearance Time (s)		4.0			4.0						4.0	
Vehicle Extension (s)		2.0			2.0						4.0	
Lane Grp Cap (vph)		129			181						1938	
v/s Ratio Prot		c0.04			c0.06						c0.33	
v/s Ratio Perm												
v/c Ratio		0.40			0.49						0.51	
Uniform Delay, d1		36.6			35.5						8.0	
Progression Factor		1.00			0.98						1.00	
Incremental Delay, d2		0.7			0.6						1.0	
Delay (s)		37.3			35.4						8.9	
Level of Service		D			D						A	
Approach Delay (s)		37.3			35.4			0.0			8.9	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	15.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.6%	ICU Level of Service	C
Analysis Period (min)	15		

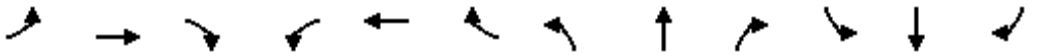
c Critical Lane Group



Lane Group	EBT	WBL	WBT	SBT
Lane Group Flow (vph)	349	57	287	1172
v/c Ratio	0.64	0.27	0.52	0.71
Control Delay	28.8	15.2	16.0	13.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	28.8	15.2	16.0	13.2
Queue Length 50th (ft)	150	13	69	258
Queue Length 95th (ft)	244	m21	m104	63
Internal Link Dist (ft)	1450		992	1806
Turn Bay Length (ft)		250		
Base Capacity (vph)	547	208	553	1643
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.64	0.27	0.52	0.71

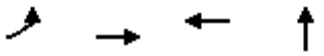
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	288	61	57	287	0	0	0	0	165	890	117
Future Volume (vph)	0	288	61	57	287	0	0	0	0	165	890	117
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0		4.0	4.0						4.0	
Lane Util. Factor		1.00		1.00	1.00						0.95	
Frpb, ped/bikes		1.00		1.00	1.00						0.99	
Flpb, ped/bikes		1.00		1.00	1.00						1.00	
Frt		0.98		1.00	1.00						0.99	
Flt Protected		1.00		0.95	1.00						0.99	
Satd. Flow (prot)		1545		1502	1588						2928	
Flt Permitted		1.00		0.38	1.00						0.99	
Satd. Flow (perm)		1545		597	1588						2928	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	288	61	57	287	0	0	0	0	165	890	117
RTOR Reduction (vph)	0	9	0	0	0	0	0	0	0	0	10	0
Lane Group Flow (vph)	0	340	0	57	287	0	0	0	0	0	1162	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		15
Confl. Bikes (#/hr)												60
Turn Type		NA		Perm	NA					Split	NA	
Protected Phases		4			8					6	6	
Permitted Phases				8								
Actuated Green, G (s)		30.0		30.0	30.0						48.0	
Effective Green, g (s)		30.0		30.0	30.0						48.0	
Actuated g/C Ratio		0.35		0.35	0.35						0.56	
Clearance Time (s)		4.0		4.0	4.0						4.0	
Lane Grp Cap (vph)		538		208	553						1634	
v/s Ratio Prot		c0.22			0.18						c0.40	
v/s Ratio Perm				0.10								
v/c Ratio		0.63		0.27	0.52						0.71	
Uniform Delay, d1		23.4		20.2	22.3						13.9	
Progression Factor		1.00		0.60	0.59						0.77	
Incremental Delay, d2		5.6		2.3	2.4						2.4	
Delay (s)		28.9		14.4	15.6						13.1	
Level of Service		C		B	B						B	
Approach Delay (s)		28.9			15.4			0.0			13.1	
Approach LOS		C			B			A			B	

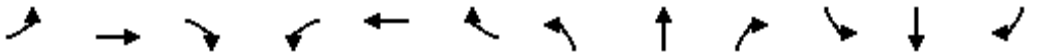
Intersection Summary			
HCM 2000 Control Delay	16.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	91.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	NBT
Lane Group Flow (vph)	110	361	369	1366
v/c Ratio	0.57	0.65	0.68	0.82
Control Delay	37.8	33.0	28.7	8.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	37.8	33.0	28.7	8.1
Queue Length 50th (ft)	54	184	150	59
Queue Length 95th (ft)	m89	m273	251	74
Internal Link Dist (ft)		992	302	277
Turn Bay Length (ft)	200			
Base Capacity (vph)	193	553	542	1668
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.57	0.65	0.68	0.82

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	361	0	0	228	141	105	1221	40	0	0	0
Future Volume (vph)	110	361	0	0	228	141	105	1221	40	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0			4.0			4.0				
Lane Util. Factor	1.00	1.00			1.00			0.95				
Frpb, ped/bikes	1.00	1.00			0.98			1.00				
Flpb, ped/bikes	0.99	1.00			1.00			1.00				
Frt	1.00	1.00			0.95			1.00				
Flt Protected	0.95	1.00			1.00			1.00				
Satd. Flow (prot)	1490	1588			1481			2985				
Flt Permitted	0.35	1.00			1.00			1.00				
Satd. Flow (perm)	554	1588			1481			2985				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	110	361	0	0	228	141	105	1221	40	0	0	0
RTOR Reduction (vph)	0	0	0	0	26	0	0	3	0	0	0	0
Lane Group Flow (vph)	110	361	0	0	343	0	0	1363	0	0	0	0
Confl. Peds. (#/hr)	18		12	12		18	37		32	32		37
Confl. Bikes (#/hr)												60
Turn Type	Perm	NA			NA		Split	NA				
Protected Phases		4			8		2	2				
Permitted Phases	4											
Actuated Green, G (s)	30.0	30.0			30.0			48.0				
Effective Green, g (s)	30.0	30.0			30.0			48.0				
Actuated g/C Ratio	0.35	0.35			0.35			0.56				
Clearance Time (s)	4.0	4.0			4.0			4.0				
Lane Grp Cap (vph)	193	553			516			1666				
v/s Ratio Prot		0.23			c0.23			c0.46				
v/s Ratio Perm	0.20											
v/c Ratio	0.57	0.65			0.66			0.82				
Uniform Delay, d1	22.8	23.6			23.7			15.5				
Progression Factor	1.15	1.16			1.00			0.31				
Incremental Delay, d2	9.0	4.6			6.6			3.2				
Delay (s)	35.3	32.0			30.4			7.9				
Level of Service	D	C			C			A				
Approach Delay (s)		32.8			30.4			7.9			0.0	
Approach LOS		C			C			A			A	

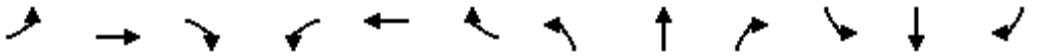
Intersection Summary			
HCM 2000 Control Delay	17.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	91.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBL	WBT	SBT	SBR
Lane Group Flow (vph)	309	239	287	830	179
v/c Ratio	0.67	0.55	0.35	0.70	0.28
Control Delay	34.9	9.9	8.3	12.1	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	34.9	9.9	8.3	12.1	1.0
Queue Length 50th (ft)	144	64	86	90	0
Queue Length 95th (ft)	235	m70	m96	142	m0
Internal Link Dist (ft)	282		688	858	
Turn Bay Length (ft)		250			
Base Capacity (vph)	458	434	812	1191	641
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.67	0.55	0.35	0.70	0.28

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	279	30	239	287	0	0	0	0	21	809	179
Future Volume (vph)	0	279	30	239	287	0	0	0	0	21	809	179
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0		4.0	4.0						4.0	4.0
Lane Util. Factor		1.00		1.00	1.00						0.95	1.00
Frpb, ped/bikes		1.00		1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00						1.00	1.00
Frt		0.99		1.00	1.00						1.00	0.85
Flt Protected		1.00		0.95	1.00						1.00	1.00
Satd. Flow (prot)		1563		1506	1588						3014	1350
Flt Permitted		1.00		0.32	1.00						1.00	1.00
Satd. Flow (perm)		1563		512	1588						3014	1350
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	279	30	239	287	0	0	0	0	21	809	179
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	0	0	0	108
Lane Group Flow (vph)	0	305	0	239	287	0	0	0	0	0	830	71
Confl. Peds. (#/hr)	6		11	11		6			2	2		
Confl. Bikes (#/hr)												60
Turn Type		NA		pm+pt	NA					Split	NA	Prot
Protected Phases		4		3	8					6	6	6
Permitted Phases				8	8							
Actuated Green, G (s)		25.0		44.0	44.0						34.0	34.0
Effective Green, g (s)		25.0		44.0	44.0						34.0	34.0
Actuated g/C Ratio		0.29		0.51	0.51						0.40	0.40
Clearance Time (s)		4.0		4.0	4.0						4.0	4.0
Lane Grp Cap (vph)		454		435	812						1191	533
v/s Ratio Prot		c0.20		c0.10	0.18						c0.28	0.05
v/s Ratio Perm				0.19								
v/c Ratio		0.67		0.55	0.35						0.70	0.13
Uniform Delay, d1		26.9		13.5	12.5						21.7	16.6
Progression Factor		1.00		0.58	0.59						0.44	0.08
Incremental Delay, d2		7.7		2.7	0.7						2.5	0.4
Delay (s)		34.6		10.4	8.1						11.9	1.7
Level of Service		C		B	A						B	A
Approach Delay (s)		34.6			9.2			0.0			10.1	
Approach LOS		C			A			A			B	

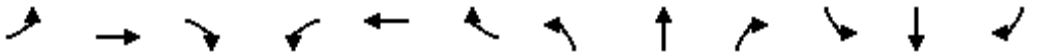
Intersection Summary			
HCM 2000 Control Delay	13.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	84.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	NBT	NBR
Lane Group Flow (vph)	125	252	474	1143	467
v/c Ratio	0.65	0.37	0.94	0.80	0.53
Control Delay	24.6	11.2	56.3	17.8	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	24.6	11.2	56.3	17.8	2.5
Queue Length 50th (ft)	34	118	234	169	2
Queue Length 95th (ft)	m44	m158	#410	#320	m27
Internal Link Dist (ft)		688	289	661	
Turn Bay Length (ft)	250				250
Base Capacity (vph)	194	738	552	1427	875
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.64	0.34	0.86	0.80	0.53

Intersection Summary

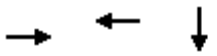
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	252	0	0	460	14	46	1097	467	0	0	0
Future Volume (vph)	125	252	0	0	460	14	46	1097	467	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0			4.0			4.0	4.0			
Lane Util. Factor	1.00	1.00			1.00			0.95	1.00			
Frpb, ped/bikes	1.00	1.00			1.00			1.00	0.98			
Flpb, ped/bikes	1.00	1.00			1.00			1.00	1.00			
Frt	1.00	1.00			1.00			1.00	0.85			
Flt Protected	0.95	1.00			1.00			1.00	1.00			
Satd. Flow (prot)	1509	1588			1581			3012	1327			
Flt Permitted	0.15	1.00			1.00			1.00	1.00			
Satd. Flow (perm)	246	1588			1581			3012	1327			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	125	252	0	0	460	14	46	1097	467	0	0	0
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	246	0	0	0
Lane Group Flow (vph)	125	252	0	0	473	0	0	1143	221	0	0	0
Confl. Peds. (#/hr)	4		5	5		4	5		4	4		5
Confl. Bikes (#/hr)												60
Turn Type	pm+pt	NA			NA		Split	NA	Perm			
Protected Phases	7	4			8		2	2				
Permitted Phases	4								2			
Actuated Green, G (s)	37.3	37.3			27.5			40.7	40.7			
Effective Green, g (s)	36.3	37.3			27.5			40.7	40.7			
Actuated g/C Ratio	0.42	0.43			0.32			0.47	0.47			
Clearance Time (s)	3.0	4.0			4.0			4.0	4.0			
Vehicle Extension (s)	2.0	0.2			0.2			0.2	0.2			
Lane Grp Cap (vph)	189	688			505			1425	628			
v/s Ratio Prot	c0.04	0.16			c0.30			c0.38				
v/s Ratio Perm	0.23								0.17			
v/c Ratio	0.66	0.37			0.94			0.80	0.35			
Uniform Delay, d1	18.7	16.4			28.4			19.2	14.3			
Progression Factor	0.63	0.62			1.00			0.69	0.56			
Incremental Delay, d2	5.6	0.1			24.6			3.2	1.0			
Delay (s)	17.3	10.3			53.0			16.4	9.0			
Level of Service	B	B			D			B	A			
Approach Delay (s)		12.6			53.0			14.3			0.0	
Approach LOS		B			D			B			A	

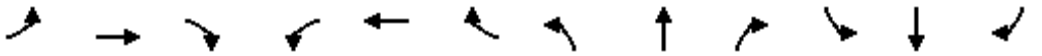
Intersection Summary			
HCM 2000 Control Delay	21.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	84.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	148	89	1168
v/c Ratio	0.37	0.27	0.52
Control Delay	26.9	29.7	2.2
Queue Delay	0.0	0.0	0.0
Total Delay	26.9	29.7	2.2
Queue Length 50th (ft)	58	40	21
Queue Length 95th (ft)	111	81	40
Internal Link Dist (ft)	137	79	634
Turn Bay Length (ft)			
Base Capacity (vph)	404	330	2243
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.37	0.27	0.52

Intersection Summary



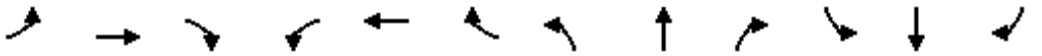
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	108	40	43	46	0	0	0	0	42	1103	23
Future Volume (vph)	0	108	40	43	46	0	0	0	0	42	1103	23
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						0.95	
Frpb, ped/bikes		0.98			1.00						1.00	
Flpb, ped/bikes		1.00			0.98						1.00	
Frt		0.96			1.00						1.00	
Flt Protected		1.00			0.98						1.00	
Satd. Flow (prot)		1672			1691						3325	
Flt Permitted		1.00			0.82						1.00	
Satd. Flow (perm)		1672			1424						3325	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	108	40	43	46	0	0	0	0	42	1103	23
RTOR Reduction (vph)	0	15	0	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	133	0	0	89	0	0	0	0	0	1166	0
Confl. Peds. (#/hr)	22		24	24		22	14		20	20		14
Confl. Bikes (#/hr)												60
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		20.0			20.0						58.0	
Effective Green, g (s)		20.0			20.0						58.0	
Actuated g/C Ratio		0.23			0.23						0.67	
Clearance Time (s)		4.0			4.0						4.0	
Lane Grp Cap (vph)		388			331						2242	
v/s Ratio Prot		c0.08										
v/s Ratio Perm					0.06						0.35	
v/c Ratio		0.34			0.27						0.52	
Uniform Delay, d1		27.5			27.0						7.0	
Progression Factor		1.00			1.00						0.21	
Incremental Delay, d2		2.4			2.0						0.7	
Delay (s)		29.9			29.0						2.2	
Level of Service		C			C						A	
Approach Delay (s)		29.9			29.0			0.0			2.2	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	6.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	67.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBT	WBR	NBT
Lane Group Flow (vph)	230	16	22	1561
v/c Ratio	0.60	0.03	0.05	0.77
Control Delay	33.5	21.5	9.5	7.4
Queue Delay	0.0	0.0	0.0	0.4
Total Delay	33.5	21.5	9.5	7.7
Queue Length 50th (ft)	106	6	0	151
Queue Length 95th (ft)	183	21	17	238
Internal Link Dist (ft)	175	153		287
Turn Bay Length (ft)				
Base Capacity (vph)	381	533	468	2018
Starvation Cap Reductn	0	0	0	115
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.60	0.03	0.05	0.82

Intersection Summary



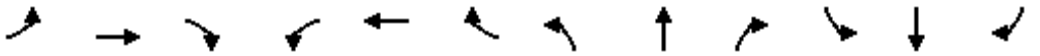
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	220	10	0	0	16	22	56	1489	16	0	0	0
Future Volume (vph)	220	10	0	0	16	22	56	1489	16	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0	4.0		4.0				
Lane Util. Factor		1.00			1.00	1.00		0.95				
Frpb, ped/bikes		1.00			1.00	1.00		1.00				
Flpb, ped/bikes		0.99			1.00	1.00		1.00				
Frt		1.00			1.00	0.85		1.00				
Flt Protected		0.95			1.00	1.00		1.00				
Satd. Flow (prot)		1663			1765	1500		3339				
Flt Permitted		0.72			1.00	1.00		1.00				
Satd. Flow (perm)		1261			1765	1500		3339				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	220	10	0	0	16	22	56	1489	16	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	15	0	1	0	0	0	0
Lane Group Flow (vph)	0	230	0	0	16	7	0	1560	0	0	0	0
Confl. Peds. (#/hr)	10		10				10					10
Confl. Bikes (#/hr)												60
Turn Type	Perm	NA			NA	Perm	Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4					8	2					
Actuated Green, G (s)		26.0			26.0	26.0		52.0				
Effective Green, g (s)		26.0			26.0	26.0		52.0				
Actuated g/C Ratio		0.30			0.30	0.30		0.60				
Clearance Time (s)		4.0			4.0	4.0		4.0				
Lane Grp Cap (vph)		381			533	453		2018				
v/s Ratio Prot					0.01							
v/s Ratio Perm		c0.18				0.00		0.47				
v/c Ratio		0.60			0.03	0.01		0.77				
Uniform Delay, d1		25.6			21.1	21.0		12.6				
Progression Factor		1.00			1.00	1.00		0.39				
Incremental Delay, d2		6.9			0.1	0.1		2.3				
Delay (s)		32.5			21.2	21.1		7.2				
Level of Service		C			C	C		A				
Approach Delay (s)		32.5			21.1			7.2			0.0	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	10.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	83.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	497	25	86	215
v/c Ratio	0.32	0.06	0.11	0.29
Control Delay	5.9	15.0	15.3	16.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	5.9	15.0	15.3	16.9
Queue Length 50th (ft)	28	8	27	72
Queue Length 95th (ft)	40	22	55	122
Internal Link Dist (ft)	479		105	1243
Turn Bay Length (ft)				
Base Capacity (vph)	1576	421	759	753
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.32	0.06	0.11	0.29

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	95	387	15	25	86	0	0	204	11
Future Volume (vph)	0	0	0	95	387	15	25	86	0	0	204	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.0		4.0	4.0			4.0	
Lane Util. Factor					0.95		1.00	1.00			1.00	
Frpb, ped/bikes					1.00		1.00	1.00			1.00	
Flpb, ped/bikes					1.00		0.96	1.00			1.00	
Frt					1.00		1.00	1.00			0.99	
Flt Protected					0.99		0.95	1.00			1.00	
Satd. Flow (prot)					3301		1608	1765			1746	
Flt Permitted					0.99		0.58	1.00			1.00	
Satd. Flow (perm)					3301		980	1765			1746	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	95	387	15	25	86	0	0	204	11
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	0	0	0	494	0	25	86	0	0	213	0
Confl. Peds. (#/hr)	15		46	46		15	35		34	34		35
Confl. Bikes (#/hr)			60									
Turn Type				Split	NA		Perm	NA			NA	
Protected Phases				8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)					41.0		37.0	37.0			37.0	
Effective Green, g (s)					41.0		37.0	37.0			37.0	
Actuated g/C Ratio					0.48		0.43	0.43			0.43	
Clearance Time (s)					4.0		4.0	4.0			4.0	
Lane Grp Cap (vph)					1573		421	759			751	
v/s Ratio Prot					c0.15			0.05			c0.12	
v/s Ratio Perm							0.03					
v/c Ratio					0.31		0.06	0.11			0.28	
Uniform Delay, d1					13.8		14.3	14.7			15.9	
Progression Factor					0.39		1.00	1.00			1.00	
Incremental Delay, d2					0.5		0.3	0.3			0.9	
Delay (s)					5.9		14.6	15.0			16.8	
Level of Service					A		B	B			B	
Approach Delay (s)		0.0			5.9			14.9			16.8	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	10.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	46.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBT	NBT	SBT
Lane Group Flow (vph)	451	62	42
v/c Ratio	0.23	0.12	0.08
Control Delay	1.7	21.9	19.8
Queue Delay	0.2	0.0	0.0
Total Delay	1.9	21.9	19.8
Queue Length 50th (ft)	7	24	14
Queue Length 95th (ft)	11	52	37
Internal Link Dist (ft)	199	104	1901
Turn Bay Length (ft)			
Base Capacity (vph)	1950	512	547
Starvation Cap Reductn	790	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.39	0.12	0.08

Intersection Summary

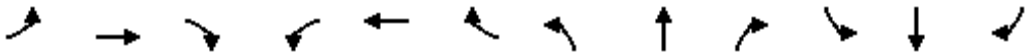
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	62	359	30	19	43	0	0	38	4
Future Volume (vph)	0	0	0	62	359	30	19	43	0	0	38	4
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.0			4.0			4.0	
Lane Util. Factor					0.95			1.00			1.00	
Frpb, ped/bikes					0.99			1.00			1.00	
Flpb, ped/bikes					1.00			0.99			1.00	
Frt					0.99			1.00			0.99	
Flt Protected					0.99			0.98			1.00	
Satd. Flow (prot)					3279			1723			1735	
Flt Permitted					0.99			0.93			1.00	
Satd. Flow (perm)					3279			1634			1735	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	62	359	30	19	43	0	0	38	4
RTOR Reduction (vph)	0	0	0	0	6	0	0	0	0	0	3	0
Lane Group Flow (vph)	0	0	0	0	445	0	0	62	0	0	39	0
Confl. Peds. (#/hr)	26		30	30		26	18		66	66		18
Confl. Bikes (#/hr)			60									
Turn Type				Split	NA		Perm	NA			NA	
Protected Phases				8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)					51.0			27.0			27.0	
Effective Green, g (s)					51.0			27.0			27.0	
Actuated g/C Ratio					0.59			0.31			0.31	
Clearance Time (s)					4.0			4.0			4.0	
Lane Grp Cap (vph)					1944			513			544	
v/s Ratio Prot					c0.14						0.02	
v/s Ratio Perm								c0.04				
v/c Ratio					0.23			0.12			0.07	
Uniform Delay, d1					8.2			21.0			20.7	
Progression Factor					0.17			1.00			1.00	
Incremental Delay, d2					0.3			0.5			0.3	
Delay (s)					1.7			21.5			21.0	
Level of Service					A			C			C	
Approach Delay (s)		0.0			1.7			21.5			21.0	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	5.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.19		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	36.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBT	NBT	SBT
Lane Group Flow (vph)	496	46	40
v/c Ratio	0.24	0.10	0.08
Control Delay	2.8	23.1	18.1
Queue Delay	0.3	0.0	0.0
Total Delay	3.2	23.1	18.1
Queue Length 50th (ft)	33	18	11
Queue Length 95th (ft)	48	43	34
Internal Link Dist (ft)	202	103	244
Turn Bay Length (ft)			
Base Capacity (vph)	2039	465	497
Starvation Cap Reductn	938	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.45	0.10	0.08

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	36	433	27	19	27	0	0	29	11
Future Volume (vph)	0	0	0	36	433	27	19	27	0	0	29	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.0			4.0			4.0	
Lane Util. Factor					0.95			1.00			1.00	
Frpb, ped/bikes					1.00			1.00			0.99	
Flpb, ped/bikes					1.00			0.99			1.00	
Frt					0.99			1.00			0.96	
Flt Protected					1.00			0.98			1.00	
Satd. Flow (prot)					3303			1717			1686	
Flt Permitted					1.00			0.91			1.00	
Satd. Flow (perm)					3303			1601			1686	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	36	433	27	19	27	0	0	29	11
RTOR Reduction (vph)	0	0	0	0	5	0	0	0	0	0	8	0
Lane Group Flow (vph)	0	0	0	0	491	0	0	46	0	0	32	0
Confl. Peds. (#/hr)	17		15	15		17	10		19	19		10
Confl. Bikes (#/hr)			60									
Turn Type				Split	NA		Perm	NA			NA	
Protected Phases				8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)					53.0			25.0			25.0	
Effective Green, g (s)					53.0			25.0			25.0	
Actuated g/C Ratio					0.62			0.29			0.29	
Clearance Time (s)					4.0			4.0			4.0	
Lane Grp Cap (vph)					2035			465			490	
v/s Ratio Prot					c0.15						0.02	
v/s Ratio Perm								c0.03				
v/c Ratio					0.24			0.10			0.07	
Uniform Delay, d1					7.4			22.3			22.1	
Progression Factor					0.35			1.00			1.00	
Incremental Delay, d2					0.3			0.4			0.3	
Delay (s)					2.9			22.7			22.3	
Level of Service					A			C			C	
Approach Delay (s)		0.0			2.9			22.7			22.3	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	5.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.20		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	37.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBT	NBT	SBT
Lane Group Flow (vph)	510	57	66
v/c Ratio	0.26	0.11	0.12
Control Delay	2.7	21.0	16.5
Queue Delay	0.0	0.0	0.0
Total Delay	2.7	21.0	16.5
Queue Length 50th (ft)	32	21	18
Queue Length 95th (ft)	46	48	46
Internal Link Dist (ft)	315	175	240
Turn Bay Length (ft)			
Base Capacity (vph)	1935	541	559
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.26	0.11	0.12

Intersection Summary

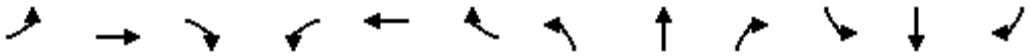
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	28	470	12	14	43	0	0	48	18
Future Volume (vph)	0	0	0	28	470	12	14	43	0	0	48	18
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.0			4.0			4.0	
Lane Util. Factor					0.95			1.00			1.00	
Frpb, ped/bikes					1.00			1.00			0.99	
Flpb, ped/bikes					1.00			0.99			1.00	
Frt					1.00			1.00			0.96	
Flt Protected					1.00			0.99			1.00	
Satd. Flow (prot)					3329			1733			1682	
Flt Permitted					1.00			0.95			1.00	
Satd. Flow (perm)					3329			1664			1682	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	28	470	12	14	43	0	0	48	18
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	12	0
Lane Group Flow (vph)	0	0	0	0	508	0	0	57	0	0	54	0
Confl. Peds. (#/hr)	10		24	24		10	15		12	12		15
Confl. Bikes (#/hr)			60									
Turn Type				Split	NA		Perm	NA			NA	
Protected Phases				8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)					50.0			28.0			28.0	
Effective Green, g (s)					50.0			28.0			28.0	
Actuated g/C Ratio					0.58			0.33			0.33	
Clearance Time (s)					4.0			4.0			4.0	
Lane Grp Cap (vph)					1935			541			547	
v/s Ratio Prot					c0.15						0.03	
v/s Ratio Perm								c0.03				
v/c Ratio					0.26			0.11			0.10	
Uniform Delay, d1					8.9			20.3			20.2	
Progression Factor					0.27			1.00			1.00	
Incremental Delay, d2					0.3			0.4			0.4	
Delay (s)					2.7			20.6			20.6	
Level of Service					A			C			C	
Approach Delay (s)		0.0			2.7			20.6			20.6	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	6.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.21		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	37.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBT	NBT	SBT
Lane Group Flow (vph)	630	64	80
v/c Ratio	0.32	0.13	0.15
Control Delay	3.4	22.1	17.2
Queue Delay	0.1	0.0	0.0
Total Delay	3.5	22.1	17.2
Queue Length 50th (ft)	32	25	23
Queue Length 95th (ft)	39	54	55
Internal Link Dist (ft)	188	104	107
Turn Bay Length (ft)			
Base Capacity (vph)	1955	492	542
Starvation Cap Reductn	484	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.43	0.13	0.15

Intersection Summary



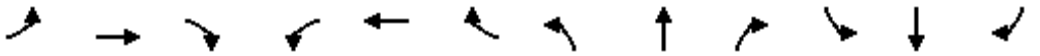
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	37	547	46	25	39	0	0	59	21
Future Volume (vph)	0	0	0	37	547	46	25	39	0	0	59	21
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.0			4.0			4.0	
Lane Util. Factor					0.95			1.00			1.00	
Frpb, ped/bikes					0.99			1.00			0.99	
Flpb, ped/bikes					1.00			0.99			1.00	
Frt					0.99			1.00			0.96	
Flt Protected					1.00			0.98			1.00	
Satd. Flow (prot)					3285			1710			1681	
Flt Permitted					1.00			0.90			1.00	
Satd. Flow (perm)					3285			1570			1681	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	37	547	46	25	39	0	0	59	21
RTOR Reduction (vph)	0	0	0	0	7	0	0	0	0	0	14	0
Lane Group Flow (vph)	0	0	0	0	623	0	0	64	0	0	66	0
Confl. Peds. (#/hr)	36		25	25		36	26		32	32		26
Confl. Bikes (#/hr)			60									
Turn Type				Split	NA		Perm	NA			NA	
Protected Phases				8	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)					51.0			27.0			27.0	
Effective Green, g (s)					51.0			27.0			27.0	
Actuated g/C Ratio					0.59			0.31			0.31	
Clearance Time (s)					4.0			4.0			4.0	
Lane Grp Cap (vph)					1948			492			527	
v/s Ratio Prot					c0.19						0.04	
v/s Ratio Perm								c0.04				
v/c Ratio					0.32			0.13			0.12	
Uniform Delay, d1					8.8			21.1			21.1	
Progression Factor					0.34			1.00			1.00	
Incremental Delay, d2					0.4			0.5			0.5	
Delay (s)					3.4			21.6			21.5	
Level of Service					A			C			C	
Approach Delay (s)		0.0			3.4			21.6			21.5	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	6.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.25		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	44.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBT	SBT	SBR
Lane Group Flow (vph)	575	1049	99
v/c Ratio	0.52	0.55	0.12
Control Delay	14.9	5.5	0.4
Queue Delay	0.0	0.1	0.0
Total Delay	14.9	5.6	0.4
Queue Length 50th (ft)	76	55	0
Queue Length 95th (ft)	112	67	1
Internal Link Dist (ft)	467	296	
Turn Bay Length (ft)			
Base Capacity (vph)	1115	1910	845
Starvation Cap Reductn	0	166	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.52	0.60	0.12

Intersection Summary



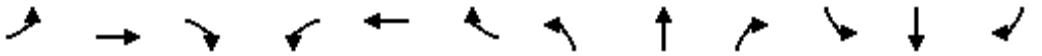
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	153	421	1	0	0	0	0	1049	99
Future Volume (vph)	0	0	0	153	421	1	0	0	0	0	1049	99
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.0						4.0	4.0
Lane Util. Factor					0.95						0.95	1.00
Frpb, ped/bikes					1.00						1.00	0.94
Flpb, ped/bikes					1.00						1.00	1.00
Frt					1.00						1.00	0.85
Flt Protected					0.99						1.00	1.00
Satd. Flow (prot)					3308						3353	1410
Flt Permitted					0.99						1.00	1.00
Satd. Flow (perm)					3308						3353	1410
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	153	421	1	0	0	0	0	1049	99
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	43
Lane Group Flow (vph)	0	0	0	0	575	0	0	0	0	0	1049	56
Confl. Peds. (#/hr)	12		16	16		12	17		16	16		17
Confl. Bikes (#/hr)			60									60
Turn Type				Split	NA						NA	Perm
Protected Phases				8	8						6	
Permitted Phases												6
Actuated Green, G (s)					29.0						49.0	49.0
Effective Green, g (s)					29.0						49.0	49.0
Actuated g/C Ratio					0.34						0.57	0.57
Clearance Time (s)					4.0						4.0	4.0
Lane Grp Cap (vph)					1115						1910	803
v/s Ratio Prot					c0.17						c0.31	
v/s Ratio Perm												0.04
v/c Ratio					0.52						0.55	0.07
Uniform Delay, d1					22.9						11.6	8.3
Progression Factor					0.59						0.38	0.08
Incremental Delay, d2					1.3						1.0	0.1
Delay (s)					14.7						5.4	0.8
Level of Service					B						A	A
Approach Delay (s)		0.0			14.7			0.0			5.0	
Approach LOS		A			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBT	NBT
Lane Group Flow (vph)	451	1563
v/c Ratio	0.61	0.68
Control Delay	31.1	6.1
Queue Delay	0.0	0.1
Total Delay	31.1	6.2
Queue Length 50th (ft)	104	112
Queue Length 95th (ft)	154	181
Internal Link Dist (ft)	230	290
Turn Bay Length (ft)		
Base Capacity (vph)	742	2283
Starvation Cap Reductn	0	9
Spillback Cap Reductn	0	85
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.61	0.71

Intersection Summary

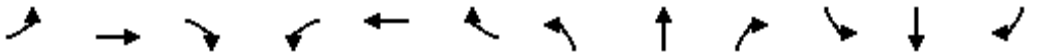


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	344	107	223	1340	0	0	0	0
Future Volume (vph)	0	0	0	0	344	107	223	1340	0	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.0			4.0				
Lane Util. Factor					0.95			0.95				
Frpb, ped/bikes					0.99			1.00				
Flpb, ped/bikes					1.00			1.00				
Frt					0.96			1.00				
Flt Protected					1.00			0.99				
Satd. Flow (prot)					3208			3329				
Flt Permitted					1.00			0.99				
Satd. Flow (perm)					3208			3329				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	0	344	107	223	1340	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	34	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	417	0	0	1563	0	0	0	0
Confl. Peds. (#/hr)	10		10	10		12	10		15	10		10
Confl. Bikes (#/hr)			60									60
Turn Type					NA		Split	NA				
Protected Phases					8		2	2				
Permitted Phases												
Actuated Green, G (s)					19.0			59.0				
Effective Green, g (s)					19.0			59.0				
Actuated g/C Ratio					0.22			0.69				
Clearance Time (s)					4.0			4.0				
Lane Grp Cap (vph)					708			2283				
v/s Ratio Prot					c0.13			c0.47				
v/s Ratio Perm												
v/c Ratio					0.59			0.68				
Uniform Delay, d1					30.0			8.0				
Progression Factor					1.00			0.58				
Incremental Delay, d2					3.6			1.3				
Delay (s)					33.6			6.0				
Level of Service					C			A				
Approach Delay (s)		0.0			33.6			6.0			0.0	
Approach LOS		A			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	12.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	SBT
Lane Group Flow (vph)	643	1237
v/c Ratio	0.62	0.64
Control Delay	27.2	6.3
Queue Delay	0.0	0.0
Total Delay	27.2	6.3
Queue Length 50th (ft)	147	70
Queue Length 95th (ft)	205	81
Internal Link Dist (ft)	289	290
Turn Bay Length (ft)		
Base Capacity (vph)	1030	1932
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.62	0.64

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	534	109	0	0	0	0	0	0	122	1115	0
Future Volume (vph)	0	534	109	0	0	0	0	0	0	122	1115	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0									4.0	
Lane Util. Factor		0.95									0.95	
Frpb, ped/bikes		0.98									1.00	
Flpb, ped/bikes		1.00									0.98	
Frt		0.97									1.00	
Flt Protected		1.00									1.00	
Satd. Flow (prot)		3217									3259	
Flt Permitted		1.00									1.00	
Satd. Flow (perm)		3217									3259	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	534	109	0	0	0	0	0	0	122	1115	0
RTOR Reduction (vph)	0	20	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	623	0	0	0	0	0	0	0	0	1237	0
Confl. Peds. (#/hr)	33		38	38		33	38		109	109		38
Confl. Bikes (#/hr)												60
Turn Type		NA								Perm	NA	
Protected Phases		4									6	
Permitted Phases										6		
Actuated Green, G (s)		27.0									51.0	
Effective Green, g (s)		27.0									51.0	
Actuated g/C Ratio		0.31									0.59	
Clearance Time (s)		4.0									4.0	
Lane Grp Cap (vph)		1009									1932	
v/s Ratio Prot		c0.19										
v/s Ratio Perm											0.38	
v/c Ratio		0.62									0.64	
Uniform Delay, d1		25.1									11.5	
Progression Factor		1.00									0.41	
Incremental Delay, d2		2.8									1.4	
Delay (s)		27.9									6.2	
Level of Service		C									A	
Approach Delay (s)		27.9			0.0			0.0			6.2	
Approach LOS		C			A			A			A	

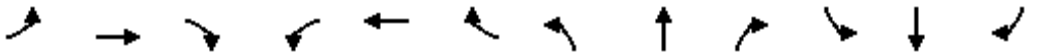
Intersection Summary			
HCM 2000 Control Delay	13.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	NBT	NBR
Lane Group Flow (vph)	145	305	1385	90
v/c Ratio	0.36	0.36	0.66	0.10
Control Delay	10.8	9.8	5.0	0.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	10.8	9.8	5.0	0.4
Queue Length 50th (ft)	19	21	80	0
Queue Length 95th (ft)	m35	31	76	m0
Internal Link Dist (ft)		417	764	
Turn Bay Length (ft)				100
Base Capacity (vph)	408	852	2105	899
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.36	0.36	0.66	0.10

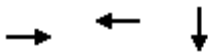
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



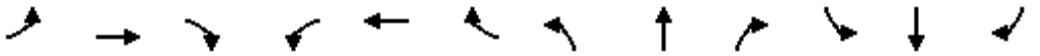
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	194	256	0	0	0	0	0	1385	90	0	0	0
Future Volume (vph)	194	256	0	0	0	0	0	1385	90	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0						5.0	5.0			
Lane Util. Factor	0.91	0.91						0.95	1.00			
Frpb, ped/bikes	1.00	1.00						1.00	0.93			
Flpb, ped/bikes	1.00	1.00						1.00	1.00			
Frt	1.00	1.00						1.00	0.85			
Flt Protected	0.95	0.99						1.00	1.00			
Satd. Flow (prot)	1526	3186						3353	1391			
Flt Permitted	0.95	0.99						1.00	1.00			
Satd. Flow (perm)	1526	3186						3353	1391			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	194	256	0	0	0	0	0	1385	90	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	26	0	0	0
Lane Group Flow (vph)	145	305	0	0	0	0	0	1385	64	0	0	0
Confl. Peds. (#/hr)	10		11	10		25	10		36	10		10
Confl. Bikes (#/hr)												60
Turn Type	Split	NA						NA	Perm			
Protected Phases	4	4						2				
Permitted Phases									2			
Actuated Green, G (s)	23.0	23.0						54.0	54.0			
Effective Green, g (s)	23.0	23.0						54.0	54.0			
Actuated g/C Ratio	0.27	0.27						0.63	0.63			
Clearance Time (s)	4.0	4.0						5.0	5.0			
Lane Grp Cap (vph)	408	852						2105	873			
v/s Ratio Prot	0.10	c0.10						c0.41				
v/s Ratio Perm									0.05			
v/c Ratio	0.36	0.36						0.66	0.07			
Uniform Delay, d1	25.5	25.5						10.1	6.2			
Progression Factor	0.34	0.34						0.35	0.10			
Incremental Delay, d2	1.9	0.9						1.4	0.1			
Delay (s)	10.6	9.7						4.9	0.8			
Level of Service	B	A						A	A			
Approach Delay (s)		9.9			0.0			4.7			0.0	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	5.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	114.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



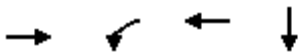
Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	42	37	1228
v/c Ratio	0.14	0.14	0.51
Control Delay	20.9	30.9	1.9
Queue Delay	0.0	0.0	0.1
Total Delay	20.9	30.9	2.0
Queue Length 50th (ft)	11	17	30
Queue Length 95th (ft)	38	44	34
Internal Link Dist (ft)	69	99	279
Turn Bay Length (ft)			
Base Capacity (vph)	310	264	2389
Starvation Cap Reductn	0	0	257
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.14	0.14	0.58

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	24	18	23	14	0	0	0	0	46	1150	32
Future Volume (vph)	0	24	18	23	14	0	0	0	0	46	1150	32
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						0.95	
Frpb, ped/bikes		0.96			1.00						0.99	
Flpb, ped/bikes		1.00			0.95						1.00	
Frt		0.94			1.00						1.00	
Flt Protected		1.00			0.97						1.00	
Satd. Flow (prot)		1592			1623						3312	
Flt Permitted		1.00			0.85						1.00	
Satd. Flow (perm)		1592			1424						3312	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	24	18	23	14	0	0	0	0	46	1150	32
RTOR Reduction (vph)	0	15	0	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	27	0	0	37	0	0	0	0	0	1226	0
Confl. Peds. (#/hr)	80		41	41		80	59		101	101		59
Confl. Bikes (#/hr)												60
Turn Type		NA		Perm	NA					Split	NA	
Protected Phases		4			8					6	6	
Permitted Phases				8								
Actuated Green, G (s)		16.0			16.0						62.0	
Effective Green, g (s)		16.0			16.0						62.0	
Actuated g/C Ratio		0.19			0.19						0.72	
Clearance Time (s)		4.0			4.0						4.0	
Lane Grp Cap (vph)		296			264						2387	
v/s Ratio Prot		0.02									c0.37	
v/s Ratio Perm					c0.03							
v/c Ratio		0.09			0.14						0.51	
Uniform Delay, d1		29.0			29.3						5.3	
Progression Factor		1.00			1.00						0.23	
Incremental Delay, d2		0.6			1.1						0.6	
Delay (s)		29.6			30.4						1.8	
Level of Service		C			C						A	
Approach Delay (s)		29.6			30.4			0.0			1.8	
Approach LOS		C			C			A			A	

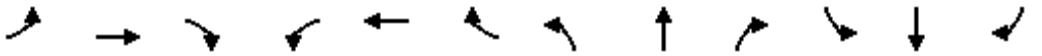
Intersection Summary			
HCM 2000 Control Delay	3.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBL	WBT	SBT
Lane Group Flow (vph)	373	69	289	1185
v/c Ratio	0.58	0.29	0.44	0.67
Control Delay	24.5	17.9	17.9	7.0
Queue Delay	0.0	0.0	0.0	0.1
Total Delay	24.5	17.9	17.9	7.1
Queue Length 50th (ft)	148	20	87	49
Queue Length 95th (ft)	238	m37	129	74
Internal Link Dist (ft)	174		323	277
Turn Bay Length (ft)				
Base Capacity (vph)	643	240	656	1758
Starvation Cap Reductn	0	0	0	47
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.58	0.29	0.44	0.69

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	275	98	69	289	0	0	0	0	155	952	78
Future Volume (vph)	0	275	98	69	289	0	0	0	0	155	952	78
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0		4.0	4.0						4.0	
Lane Util. Factor		1.00		1.00	1.00						0.95	
Frpb, ped/bikes		0.99		1.00	1.00						0.99	
Flpb, ped/bikes		1.00		0.99	1.00						1.00	
Frt		0.96		1.00	1.00						0.99	
Flt Protected		1.00		0.95	1.00						0.99	
Satd. Flow (prot)		1689		1665	1765						3275	
Flt Permitted		1.00		0.37	1.00						0.99	
Satd. Flow (perm)		1689		647	1765						3275	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	275	98	69	289	0	0	0	0	155	952	78
RTOR Reduction (vph)	0	15	0	0	0	0	0	0	0	0	6	0
Lane Group Flow (vph)	0	358	0	69	289	0	0	0	0	0	1179	0
Confl. Peds. (#/hr)	10		10	10		27	10		10	10		21
Confl. Bikes (#/hr)												60
Turn Type		NA		Perm	NA					Split	NA	
Protected Phases		4			8					6	6	
Permitted Phases				8								
Actuated Green, G (s)		32.0		32.0	32.0						46.0	
Effective Green, g (s)		32.0		32.0	32.0						46.0	
Actuated g/C Ratio		0.37		0.37	0.37						0.53	
Clearance Time (s)		4.0		4.0	4.0						4.0	
Lane Grp Cap (vph)		628		240	656						1751	
v/s Ratio Prot		c0.21			0.16						c0.36	
v/s Ratio Perm				0.11								
v/c Ratio		0.57		0.29	0.44						0.67	
Uniform Delay, d1		21.5		19.0	20.3						14.5	
Progression Factor		1.00		0.76	0.77						0.35	
Incremental Delay, d2		3.7		2.6	1.9						1.8	
Delay (s)		25.2		17.0	17.5						7.0	
Level of Service		C		B	B						A	
Approach Delay (s)		25.2			17.4			0.0			7.0	
Approach LOS		C			B			A			A	

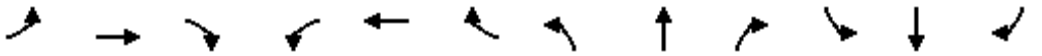
Intersection Summary			
HCM 2000 Control Delay	12.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	77.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Group Flow (vph)	135	234	161	122	1285	75
v/c Ratio	0.72	0.45	0.66	0.40	0.63	0.08
Control Delay	43.3	18.6	47.8	10.5	8.5	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.3	18.6	47.8	10.5	8.5	1.1
Queue Length 50th (ft)	49	64	83	0	78	1
Queue Length 95th (ft)	m99	m102	141	45	278	m4
Internal Link Dist (ft)		323	183		528	
Turn Bay Length (ft)						100
Base Capacity (vph)	253	656	307	355	2030	938
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.36	0.52	0.34	0.63	0.08

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	135	234	0	0	161	122	153	1132	75	0	0	0
Future Volume (vph)	135	234	0	0	161	122	153	1132	75	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Lane Util. Factor	1.00	1.00			1.00	1.00		0.95	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	0.97		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.99	1.00			
Satd. Flow (prot)	1676	1765			1765	1460		3333	1500			
Flt Permitted	0.95	1.00			1.00	1.00		0.99	1.00			
Satd. Flow (perm)	1676	1765			1765	1460		3333	1500			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	135	234	0	0	161	122	153	1132	75	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	105	0	0	25	0	0	0
Lane Group Flow (vph)	135	234	0	0	161	17	0	1285	50	0	0	0
Confl. Peds. (#/hr)	8					8	5					5
Confl. Bikes (#/hr)												60
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	7	4			8		2	2				
Permitted Phases						8			2			
Actuated Green, G (s)	10.7	25.6			11.9	11.9		52.4	52.4			
Effective Green, g (s)	9.7	25.6			11.9	11.9		52.4	52.4			
Actuated g/C Ratio	0.11	0.30			0.14	0.14		0.61	0.61			
Clearance Time (s)	3.0	4.0			4.0	4.0		4.0	4.0			
Vehicle Extension (s)	2.0	2.5			2.5	2.5		0.2	0.2			
Lane Grp Cap (vph)	189	525			244	202		2030	913			
v/s Ratio Prot	c0.08	0.13			c0.09			c0.39				
v/s Ratio Perm						0.01			0.03			
v/c Ratio	0.71	0.45			0.66	0.08		0.63	0.06			
Uniform Delay, d1	36.8	24.5			35.1	32.3		10.7	6.8			
Progression Factor	0.73	0.71			1.00	1.00		0.60	0.29			
Incremental Delay, d2	8.1	0.3			5.7	0.1		1.3	0.1			
Delay (s)	34.8	17.6			40.8	32.4		7.7	2.1			
Level of Service	C	B			D	C		A	A			
Approach Delay (s)		23.9			37.2			7.4			0.0	
Approach LOS		C			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	77.1%	ICU Level of Service	D
Analysis Period (min)	15		

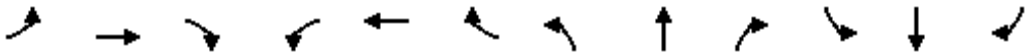
c Critical Lane Group



Lane Group	EBT	WBT	NBT	NBR
Lane Group Flow (vph)	51	98	1327	63
v/c Ratio	0.19	0.28	0.56	0.06
Control Delay	31.0	29.4	7.4	1.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	31.0	29.4	7.4	1.3
Queue Length 50th (ft)	23	42	158	0
Queue Length 95th (ft)	55	85	206	m10
Internal Link Dist (ft)	93	517	2424	
Turn Bay Length (ft)				100
Base Capacity (vph)	268	347	2376	1082
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.19	0.28	0.56	0.06

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



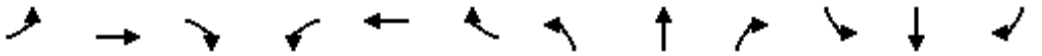
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	14	0	0	85	13	21	1306	63	0	0	0
Future Volume (vph)	37	14	0	0	85	13	21	1306	63	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0			4.0			4.0	4.0			
Lane Util. Factor		1.00			1.00			0.95	1.00			
Frpb, ped/bikes		1.00			0.99			1.00	1.00			
Flpb, ped/bikes		0.98			1.00			1.00	1.00			
Frt		1.00			0.98			1.00	0.85			
Flt Protected		0.96			1.00			1.00	1.00			
Satd. Flow (prot)		1673			1724			3350	1500			
Flt Permitted		0.78			1.00			1.00	1.00			
Satd. Flow (perm)		1358			1724			3350	1500			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	37	14	0	0	85	13	21	1306	63	0	0	0
RTOR Reduction (vph)	0	0	0	0	6	0	0	0	18	0	0	0
Lane Group Flow (vph)	0	51	0	0	92	0	0	1327	45	0	0	0
Confl. Peds. (#/hr)	15		12	12		15	10		19	19		10
Confl. Bikes (#/hr)												60
Turn Type	custom	NA			NA		Split	NA	Prot			
Protected Phases					8		2	2	2			
Permitted Phases	4	4										
Actuated Green, G (s)		17.0			17.0			61.0	61.0			
Effective Green, g (s)		17.0			17.0			61.0	61.0			
Actuated g/C Ratio		0.20			0.20			0.71	0.71			
Clearance Time (s)		4.0			4.0			4.0	4.0			
Lane Grp Cap (vph)		268			340			2376	1063			
v/s Ratio Prot					c0.05			c0.40	0.03			
v/s Ratio Perm		0.04										
v/c Ratio		0.19			0.27			0.56	0.04			
Uniform Delay, d1		28.8			29.2			6.0	3.7			
Progression Factor		1.00			1.00			1.04	1.09			
Incremental Delay, d2		1.6			1.9			1.0	0.1			
Delay (s)		30.3			31.2			7.2	4.2			
Level of Service		C			C			A	A			
Approach Delay (s)		30.3			31.2			7.1			0.0	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	60.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	106	203	173	208	424	65	847	362	875
v/c Ratio	0.69	0.44	0.84	0.76	0.69	0.17	0.61	0.55	0.66
Control Delay	81.8	34.5	88.4	69.9	20.6	47.1	33.4	50.4	34.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.8	34.5	88.4	69.9	20.6	47.1	33.4	50.4	34.9
Queue Length 50th (ft)	87	49	144	169	151	45	288	138	301
Queue Length 95th (ft)	167	96	244	270	231	101	455	219	459
Internal Link Dist (ft)		595		272			1059		378
Turn Bay Length (ft)	175		300			135			
Base Capacity (vph)	227	693	334	465	828	374	1399	805	1821
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.29	0.52	0.45	0.51	0.17	0.61	0.45	0.48

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	106	122	81	173	208	424	65	771	76	362	813	62
Future Volume (vph)	106	122	81	173	208	424	65	771	76	362	813	62
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95		0.97	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1676	3152		1676	1765	1500	1676	3295		3252	3300	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1676	3152		1676	1765	1500	1676	3295		3252	3300	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	106	122	81	173	208	424	65	771	76	362	813	62
RTOR Reduction (vph)	0	71	0	0	0	81	0	5	0	0	4	0
Lane Group Flow (vph)	106	132	0	173	208	343	65	842	0	362	871	0
Confl. Bikes (#/hr)									60			60
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8	1 8	5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	11.7	15.9		16.7	19.9	45.6	28.5	53.9		25.7	51.1	
Effective Green, g (s)	11.7	15.9		15.7	19.9	45.6	28.5	53.9		25.7	51.1	
Actuated g/C Ratio	0.09	0.12		0.12	0.16	0.36	0.22	0.42		0.20	0.40	
Clearance Time (s)	4.0	4.0		3.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	1.5	1.5		1.0	1.5		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	154	394		206	276	537	375	1396		657	1325	
v/s Ratio Prot	0.06	0.04		c0.10	c0.12	0.23	0.04	c0.26		0.11	c0.26	
v/s Ratio Perm												
v/c Ratio	0.69	0.34		0.84	0.75	0.64	0.17	0.60		0.55	0.66	
Uniform Delay, d1	56.0	50.8		54.5	51.3	33.9	39.8	28.4		45.6	30.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.8	0.2		23.9	9.9	2.5	1.0	1.9		1.0	1.2	
Delay (s)	65.7	51.0		78.4	61.2	36.4	40.8	30.3		46.6	32.1	
Level of Service	E	D		E	E	D	D	C		D	C	
Approach Delay (s)		56.1			51.8			31.1			36.3	
Approach LOS		E			D			C			D	

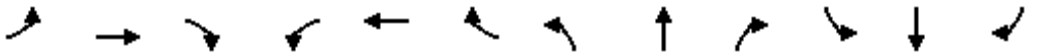
Intersection Summary			
HCM 2000 Control Delay	40.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	127.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	229	602	77	445	412	677	50	156	1008
v/c Ratio	0.94	0.61	0.65	0.67	0.95	0.50	0.06	0.81	0.79
Control Delay	94.7	33.5	77.9	48.0	84.6	29.8	3.2	80.4	38.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	94.7	33.5	77.9	48.0	84.6	29.8	3.2	80.4	38.2
Queue Length 50th (ft)	177	180	59	164	165	204	0	119	353
Queue Length 95th (ft)	#328	234	108	207	#264	301	17	189	#518
Internal Link Dist (ft)		1448		174		1573			1059
Turn Bay Length (ft)	250		250		275		300	150	
Base Capacity (vph)	251	1026	167	831	433	1364	839	251	1270
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.59	0.46	0.54	0.95	0.50	0.06	0.62	0.79

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	229	378	224	77	387	58	412	677	50	156	821	187
Future Volume (vph)	229	378	224	77	387	58	412	677	50	156	821	187
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.94		1.00	0.98		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	3166		1676	3287		3252	3353	1500	1676	3231	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1676	3166		1676	3287		3252	3353	1500	1676	3231	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	229	378	224	77	387	58	412	677	50	156	821	187
RTOR Reduction (vph)	0	73	0	0	10	0	0	0	25	0	15	0
Lane Group Flow (vph)	229	529	0	77	435	0	412	677	25	156	993	0
Confl. Bikes (#/hr)									60			60
Turn Type	Prot	NA		Prot	NA		Prot	NA	pt+ov	Prot	NA	
Protected Phases	7	4		3	8		5	2	2 3	1	6	
Permitted Phases												
Actuated Green, G (s)	18.5	34.4		8.5	24.4		17.0	48.2	60.7	14.9	46.1	
Effective Green, g (s)	17.5	34.4		7.5	24.4		16.0	48.2	60.7	13.9	46.1	
Actuated g/C Ratio	0.15	0.29		0.06	0.20		0.13	0.40	0.51	0.12	0.38	
Clearance Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.5	3.0		2.0	4.0		2.0	3.5		2.0	3.5	
Lane Grp Cap (vph)	244	907		104	668		433	1346	758	194	1241	
v/s Ratio Prot	c0.14	0.17		0.05	c0.13		c0.13	0.20	0.02	0.09	c0.31	
v/s Ratio Perm												
v/c Ratio	0.94	0.58		0.74	0.65		0.95	0.50	0.03	0.80	0.80	
Uniform Delay, d1	50.7	36.7		55.3	43.9		51.6	26.9	14.9	51.7	32.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	40.6	1.0		21.7	2.5		30.8	1.3	0.0	19.9	5.5	
Delay (s)	91.3	37.6		76.9	46.4		82.4	28.3	14.9	71.6	38.3	
Level of Service	F	D		E	D		F	C	B	E	D	
Approach Delay (s)		52.4			50.9			47.3			42.8	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	47.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	82.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Arterial Level of Service: SB Central Avenue

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Central Avenue	III	30	22.0	0.0	22.0	0.16	26.8	B
Jackson Street	III	30	45.4	13.2	58.6	0.36	21.9	C
E 4th Street	III	30	22.6	12.1	34.7	0.18	18.4	C
6th Street	III	30	18.1	2.2	20.3	0.14	24.0	C
Main Street	III	30	11.0	5.5	16.5	0.07	15.5	D
8th Street	III	30	10.9	6.3	17.2	0.07	14.7	D
9th Street	III	30	10.5	1.9	12.4	0.07	19.7	C
10th	III	30	10.5	7.0	17.5	0.07	13.9	E
Total	III		151.0	48.2	199.2	1.11	20.1	C

Arterial Level of Service: SB Court Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Ohio Street	III	30	21.9	6.1	28.0	0.16	21.0	C
E McAndrews Road	III	30	16.0	36.1	52.1	0.11	7.9	F
Central Avenue	III	30	50.4	11.6	62.0	0.40	23.0	C
Total	III		88.3	53.8	142.1	0.67	17.1	D

Arterial Level of Service: WB Main Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Riverside Avenue	IV	30	20.4	31.1	51.5	0.11	7.9	E
Central Avenue	IV	30	18.6	14.9	33.5	0.10	11.1	D
Front Street	IV	30	11.5	3.4	14.9	0.05	12.3	D
Fir Street	IV	30	17.0	2.7	19.7	0.07	13.7	C
Grape Street	IV	30	12.1	2.8	14.9	0.05	12.9	D
Holly Street	IV	30	12.0	1.7	13.7	0.05	13.9	C
Oakdale Avenue	IV	30	19.1	5.9	25.0	0.11	15.2	C
Total	IV		110.7	62.5	173.2	0.55	11.5	D

Arterial Level of Service: NB Riverside Avenue

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Barnett Road	III	30	27.4	33.4	60.8	0.22	12.8	E
12th Street	III	30	67.3	7.4	74.7	0.56	27.0	B
10th Street	III	30	16.2	8.5	24.7	0.12	16.8	D
8th Street	III	30	21.4	5.0	26.4	0.16	21.8	C
Main Street	III	30	10.9	6.1	17.0	0.07	14.8	D
	III	30	10.8	7.4	18.2	0.07	13.7	E
4th Street	III	30	18.8	17.8	36.6	0.14	13.8	E
Jackson Street	III	30	10.5	8.1	18.6	0.07	13.1	E
Manzanita Street	III	30	63.4	3.9	67.3	0.50	26.7	B
McAndrews Road	III	30	30.6	40.5	71.1	0.24	12.2	E
Mall Access	III	30	17.6	8.9	26.5	0.12	17.0	D
Total	III		294.9	147.0	441.9	2.26	18.4	C

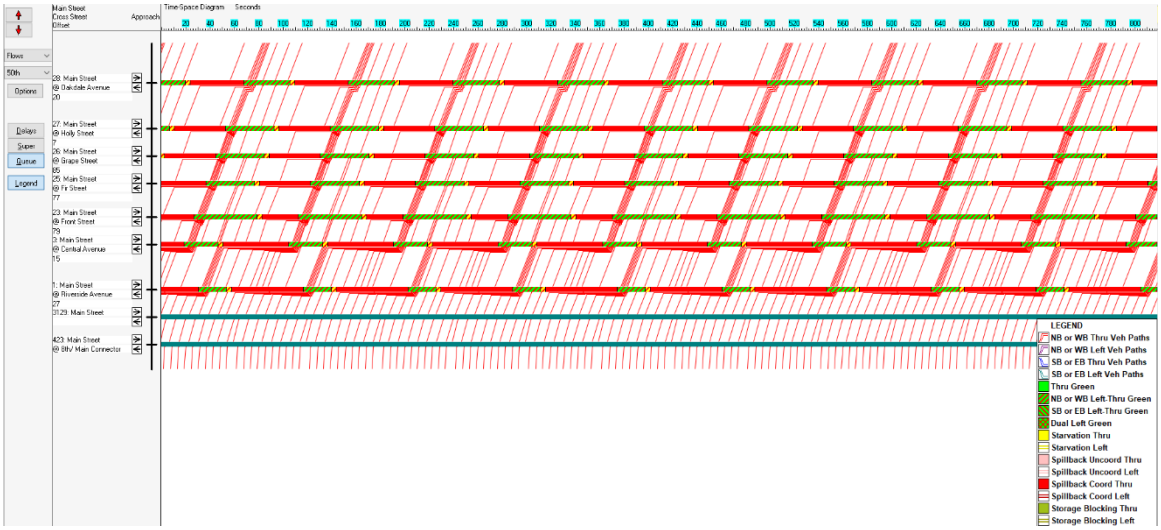
Arterial Level of Service: SB Riverside Avenue

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Barnett Road	III	30	67.3	34.9	102.2	0.56	19.8	C
Stewart Avenue	III	30	27.4	38.2	65.6	0.22	11.8	E
Total	III		94.7	73.1	167.8	0.78	16.7	D

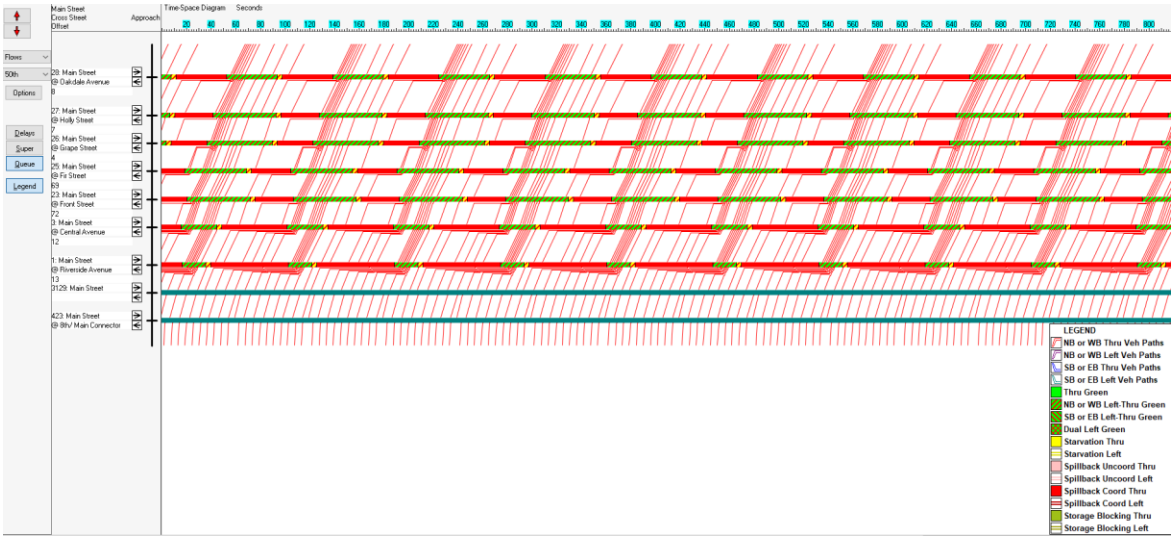
Appendix E
Time Space Diagrams

E MAIN STREET

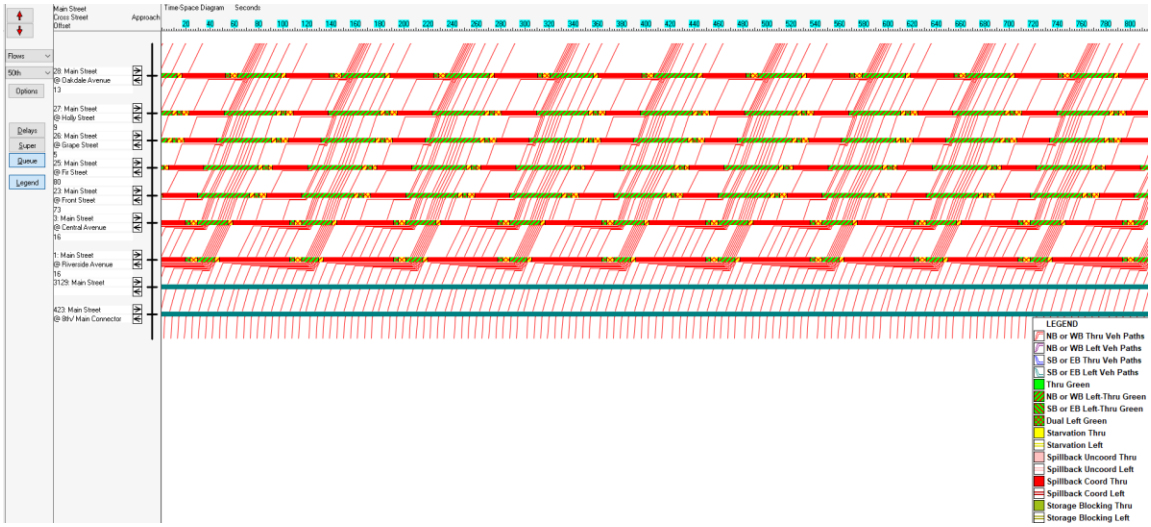
No-Build (2024)



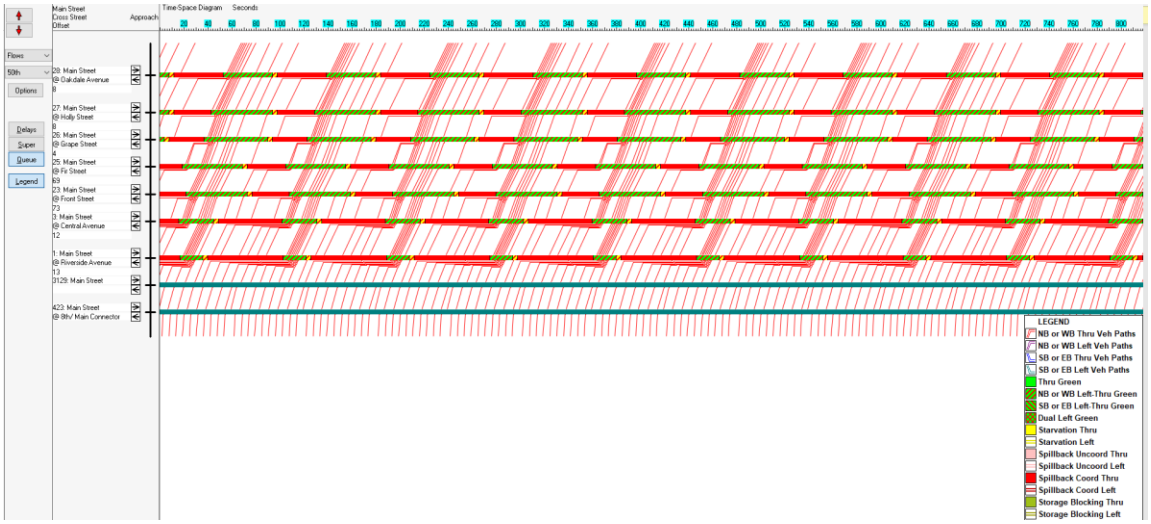
Alternative A – Permitted Phasing (2024)



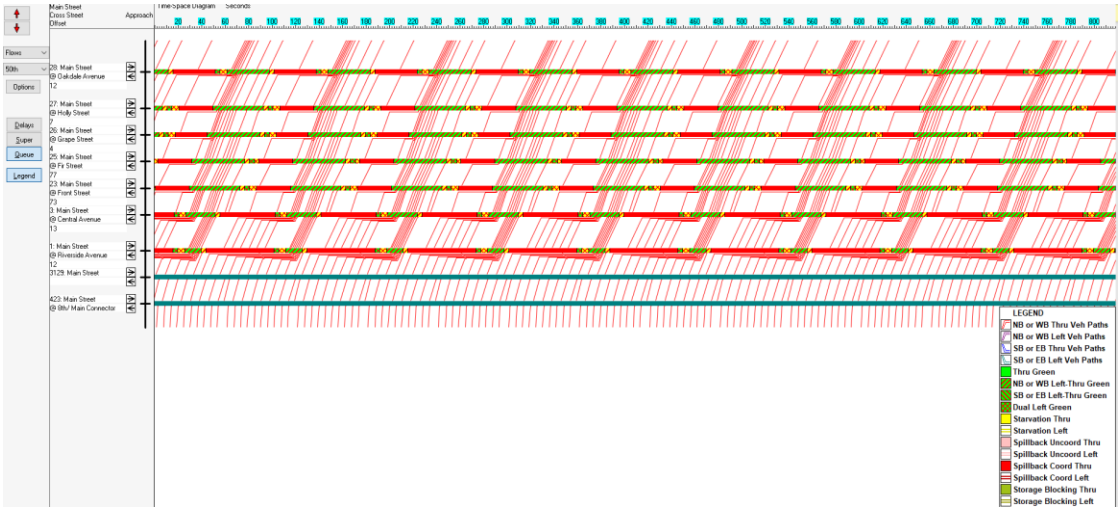
Alternative A – Protected Phasing (2024)



Alternative B – Permitted Phasing (2024)

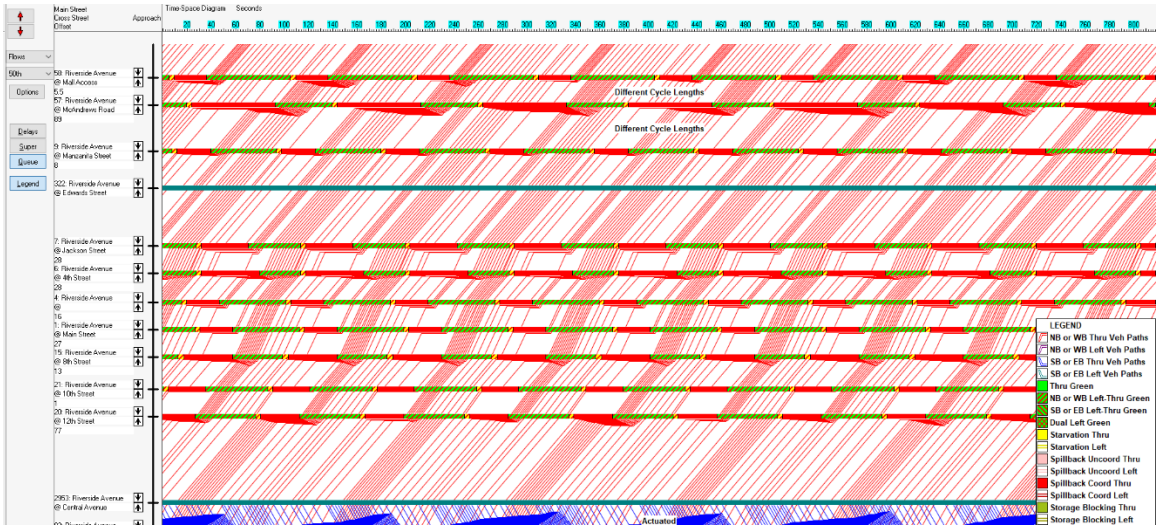


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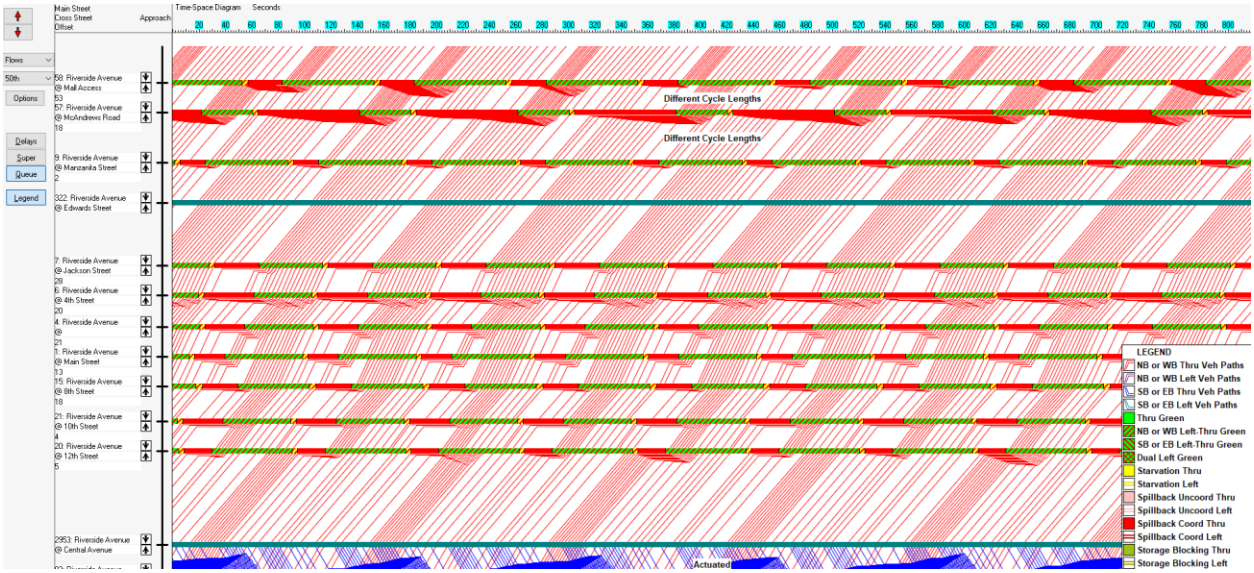


RIVERSIDE AVENUE

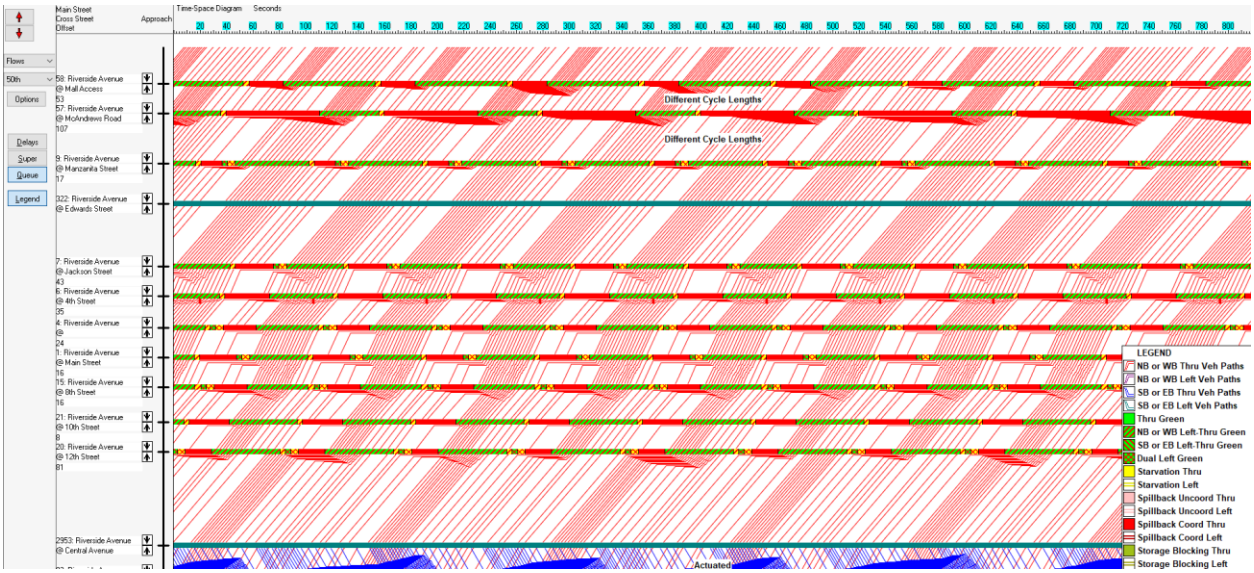
No-Build (2024)



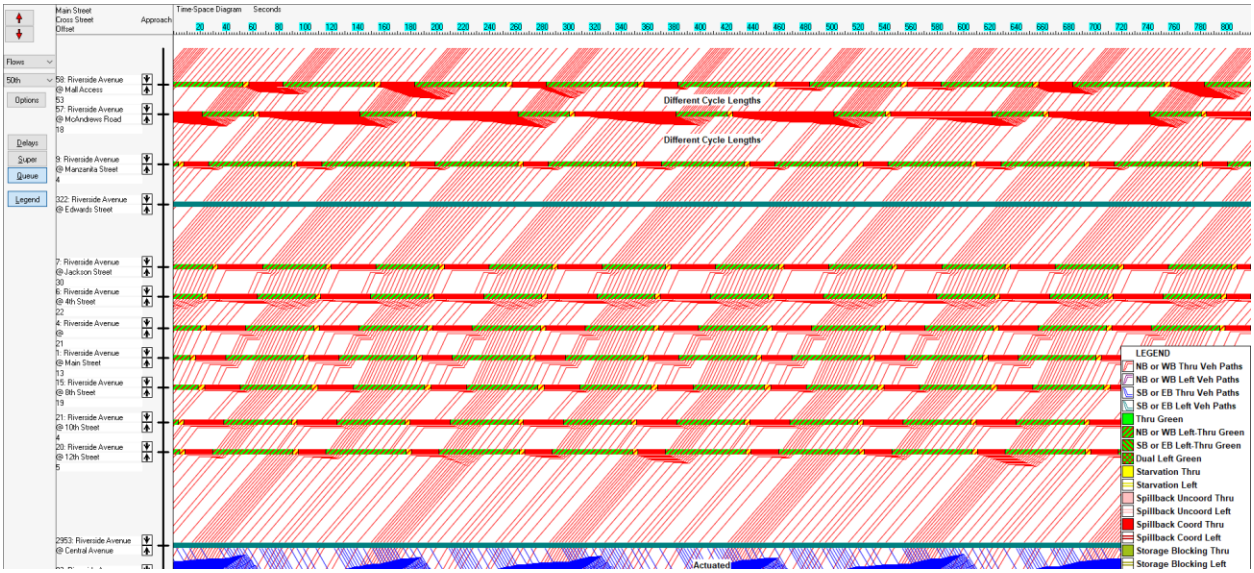
Alternative A – Permitted Phasing (2024)



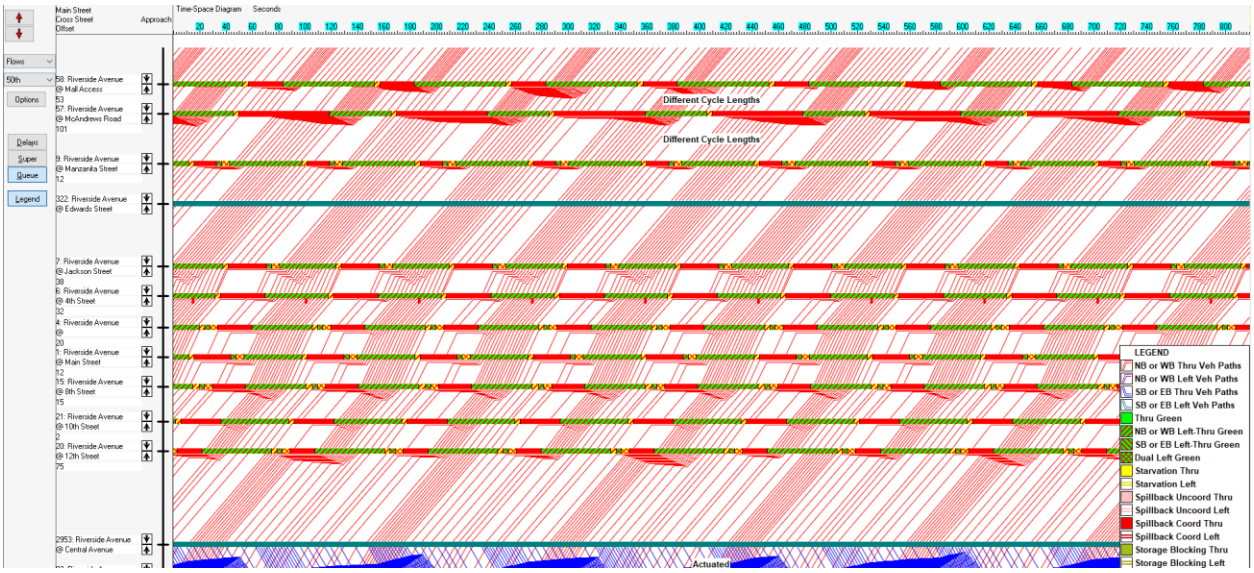
Alternative A – Protected Phasing (2024)



Alternative B – Permitted Phasing (2024)

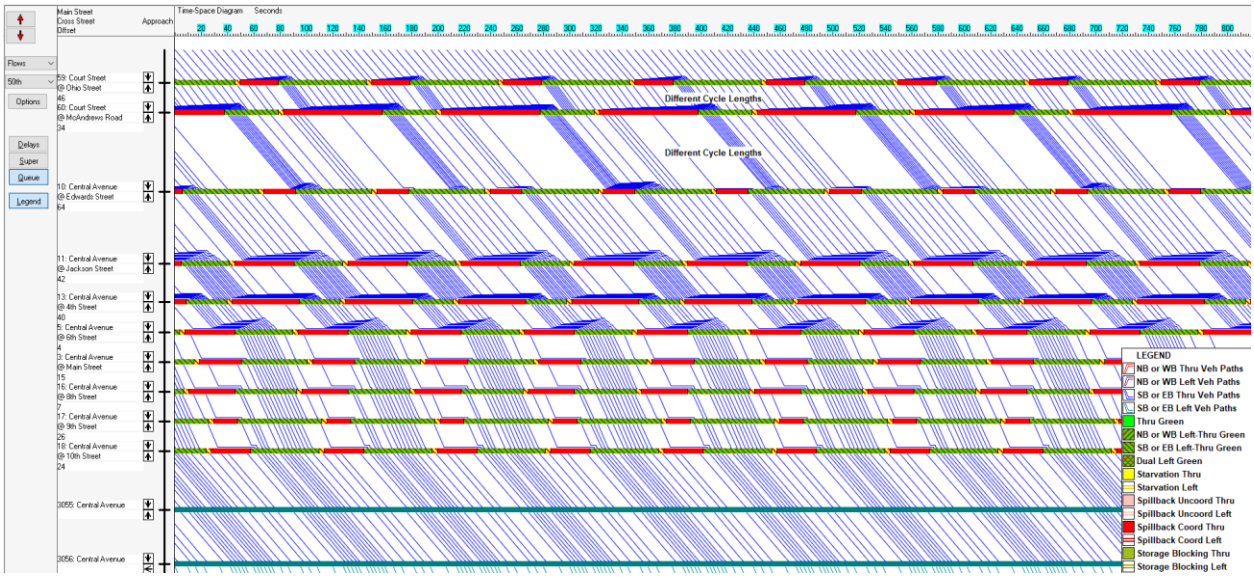


Alternative B – Protected Phasing (2024)

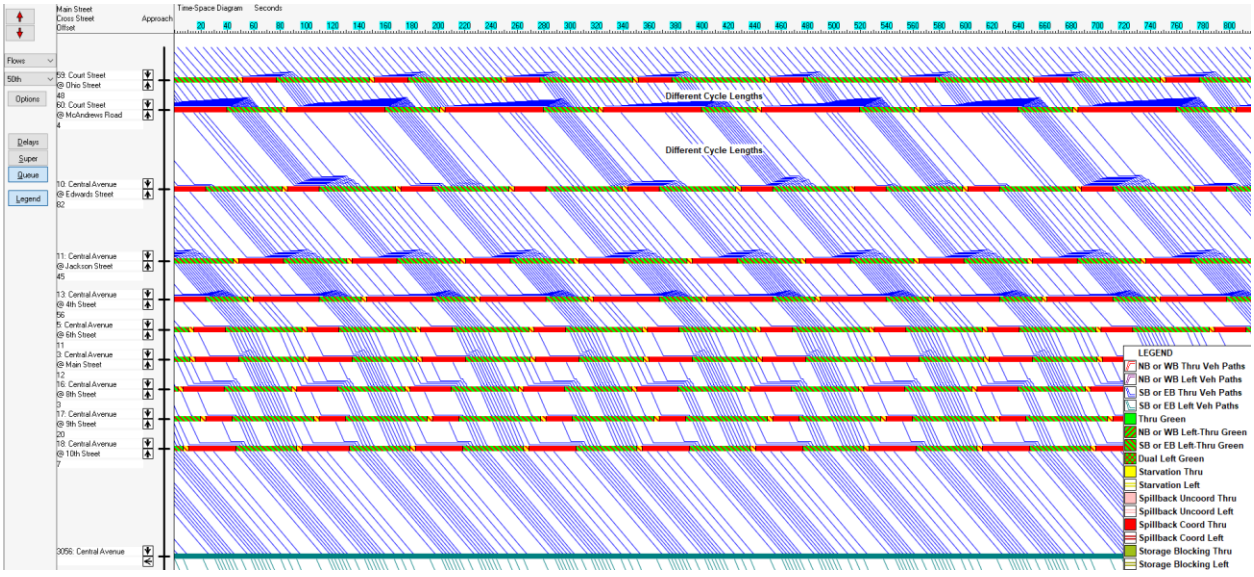


CENTRAL AVENUE/COURT STREET

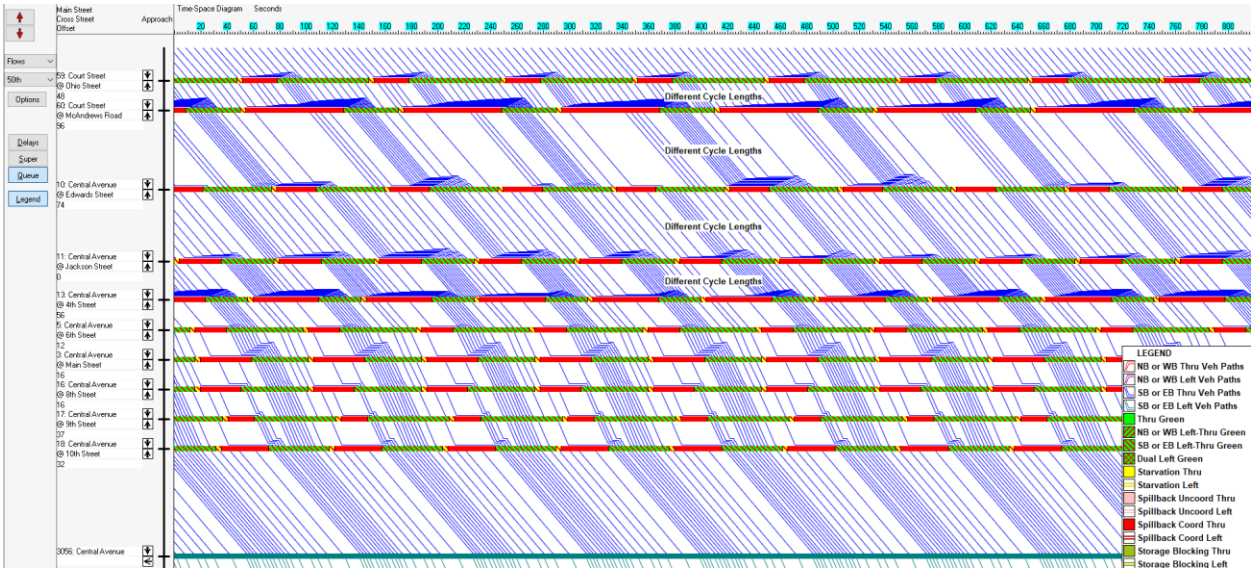
No-Build (2024)



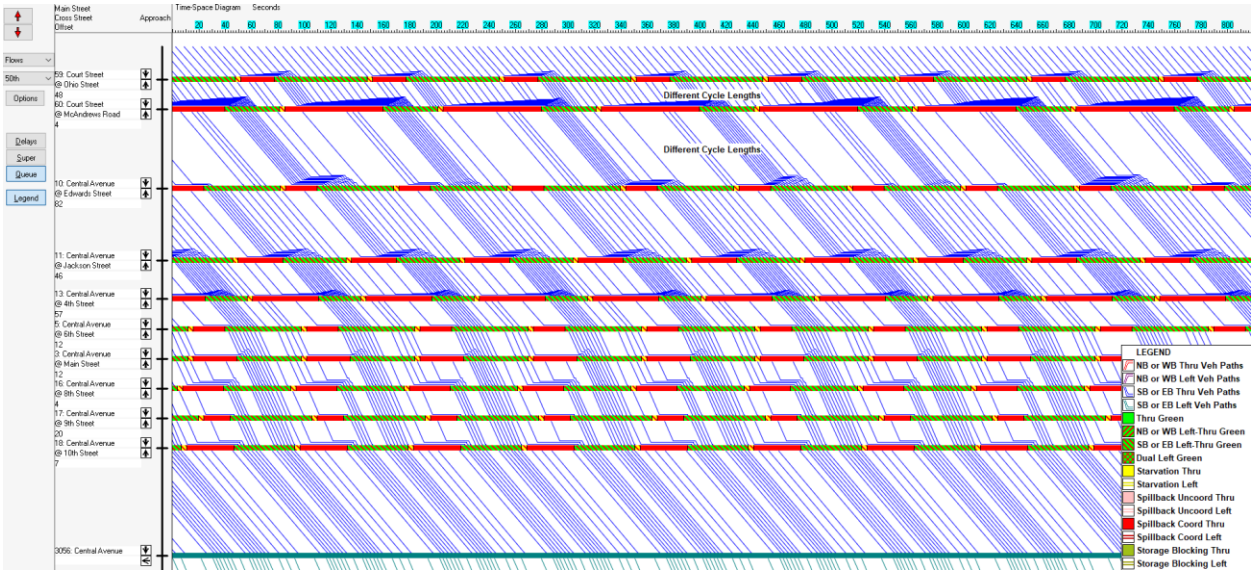
Alternative A – Permitted Phasing (2024)



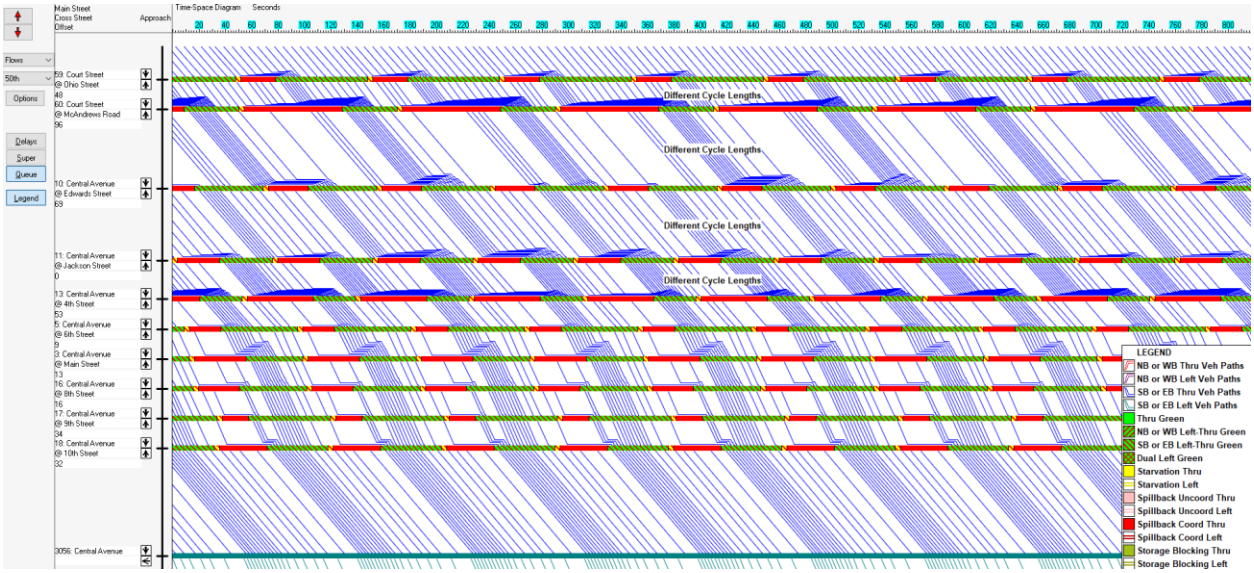
Alternative A – Protected Phasing (2024)



Alternative B – Permitted Phasing (2024)



Alternative B – Protected Phasing (2024)



Public Outreach Event #1 Summary

KITTELSON & ASSOCIATES
851 SW 6th Avenue, Suite 600
Portland, OR 97204
P 503.228.5230

Memorandum

June 7, 2022

Project# 27358

To: Christina Charvat
Karl MacNair
City of Medford

From: Amy Griffiths, Nick Gross, Susan Wright, PE

RE: Riverside, Central, E Main Multimodal Study

PUBLIC OUTREACH EVENT #1 SUMMARY

Kittelson and City of Medford staff hosted an in-person walking tour and public open house for the Riverside, Central, E Main Multimodal Study on June 1, 2022.

- The purpose of the walking tour was for the consultant team to document field observations including roadway characteristics, constraints, changes in roadway context, and user experience described through walking tour participants.
- The purpose of the public open house was to introduce the study to the general public and solicit feedback on study area constraints, study goals as well as the preliminary cross section design alternatives to address the walking and biking needs along the study corridor(s).

The list of concept design alternatives will be refined based on the input received as part of the public open house and used as part of the preliminary evaluation to get to the narrowed down list of concept design alternatives. This memorandum summarizes the feedback received from public outreach event #1.

Study Area Walking Tour

City of Medford staff, as well as representatives from City Council, the Bicycle-Pedestrian Advisory Committee (BPAC), and members of the public attended the Study Area walking tour. A list of key themes and input voiced during the walking tour is described below:

- The wide three-lane cross sections are very loud; people spoke about "drag racing".
- There are few comfortable crossing opportunities south of 10th Street.
- Landscape buffers with mature trees make for the most comfortable pedestrian environment.
- Central Avenue from E Main to 10th was described as ideal, preferred cross section.
- There are more driveway access points along west side of Riverside than along the east side.

In-Person Public Open House

The in-person public open house was held at 6:00pm on June 1 at the Rogue Community College on Riverside Avenue. Over 15 people attended the public open house. The public open house included several stations including study area input, study goal priorities, cross section design preferences, and a survey. A sign-in sheet for public open house participants is included in Attachment "A".

STUDY AREA INPUT

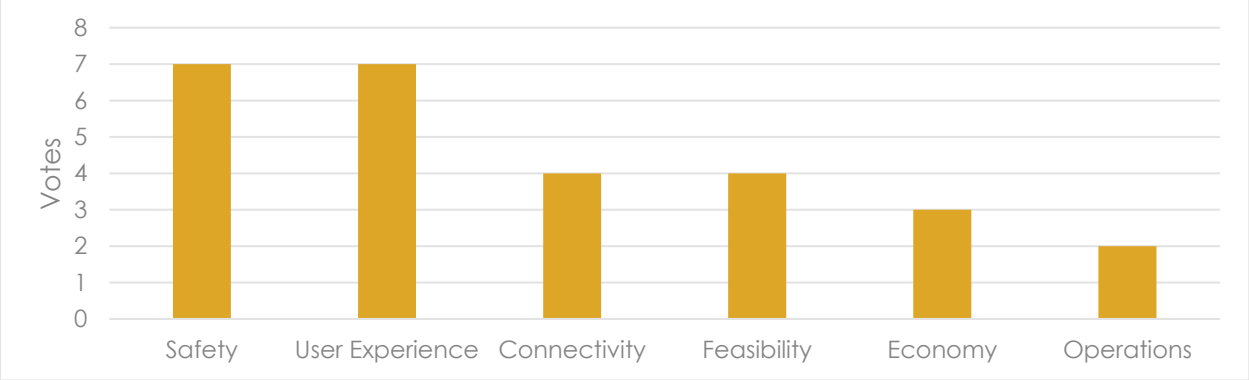
A 36"x 114" roll plot of the study area was laid out in the middle of the public open house to solicit general input on the study area. Members of the public and stakeholders were invited to place sticky notes on the roll plot to provide their perspectives and input on the study area needs. A PDF of the scanned roll plot is included in Attachment "B". Key themes and input voiced as part of this exercise is described below:

- "trees are terrific! Thank you for adding them!"
- "expanded sidewalks require ROW acquisition $$$"
- "reduce lane widths in purple zone to slow traffic. Prepare transition to one-way north"
- "crosswalks" – "yes!"
- "stop parking in the bike lanes" – "yes!"
- "safe + secure parking for bikes + trailers everywhere"
- "level grade of street"
- "add bike lanes please" – "yes!"
- "no speed bumps in the bike lane please. Think "kids in bike trailer" – "agree!" – "yes"
- "please add bike lanes + maybe parking where Central becomes three lanes"
- "P.O. needs parking spots, not the rest though!"
- "curb bump outs"
- "flashing crosswalk is nice"
- "please work towards separated + single lane infrastructure"
- "too much sign pollution speed signs in front of kid unlimited trees in median"
- "parking protected bike lane on 1-way streets"
- "universal flower beds for parking strips H20 sensitive"
- "reduce crown! Riverside"
- "please enforce noise/litter lows"
- "parking protected seems like best idea. 2-birds ya know"
- "connectivity on bike lanes E Jackson (please remove parking)"
- "change Riverside + Central to two-way streets"

STUDY GOAL PRIORITIES

Participants at the Public Open House were asked to vote on their priority goals for the study. The results of the voting exercise are shown in Chart 1. A PDF of the scanned study goal priority voting exercise is included in Attachment "C". The top study goal priorities expressed as part of the Public Open House for the study are safety and user experience.

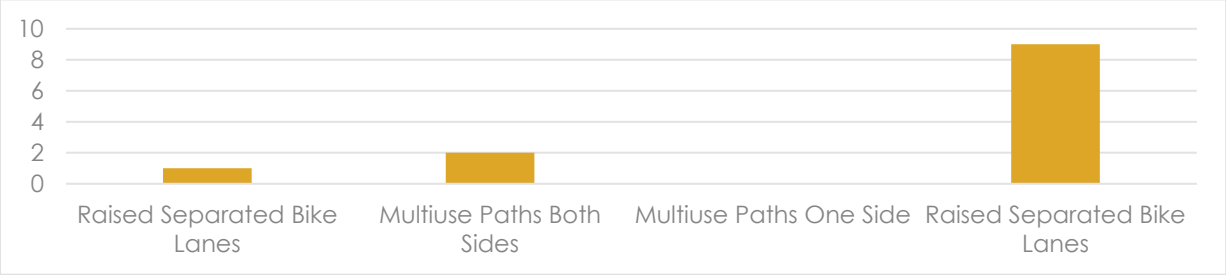
Chart 1. Study Goals Priorities



CROSS SECTION DESIGN PREFERENCES

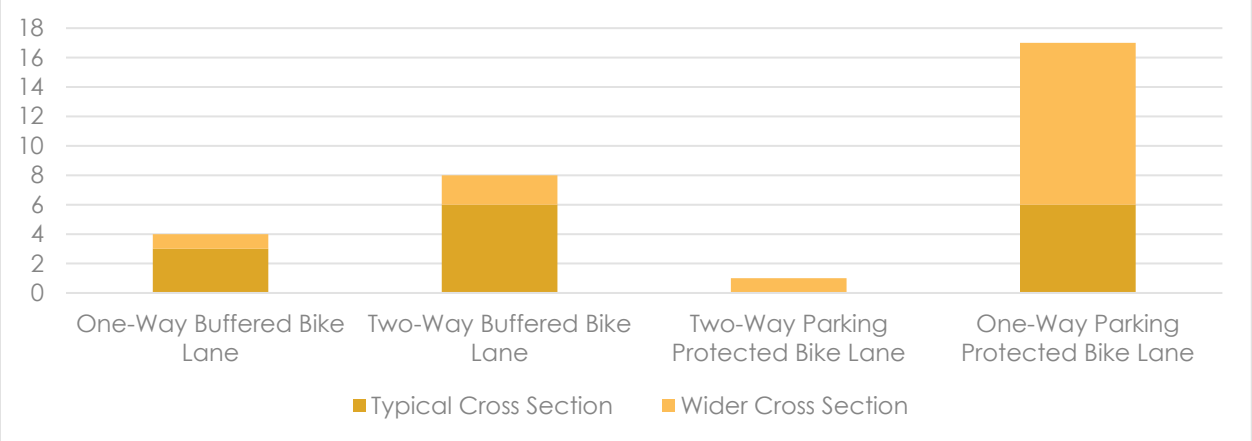
Participants at the Public Open House were asked to vote on their cross-section design alternative preferences for the four (4) unique segments on the corridor including South of the Couplet, Typical Cross Section, Wider Cross Section, and E Main Street. A PDF of the scanned cross section design voting exercise is included in Attachment "D". Voting exercise results are summarized in Chart 2, Chart 3, and Chart 4 below.

Chart 2. Cross Section Design Preferences South of Couplet



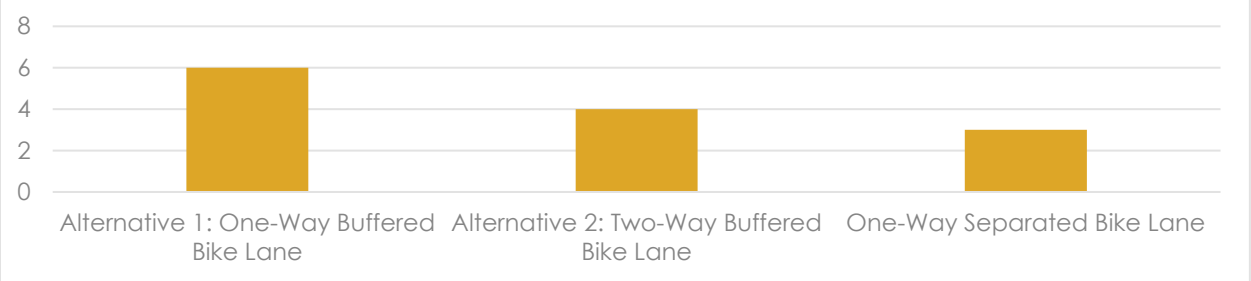
As shown in Chart 2, the preferred facility for the South of the Couplet is raised, separated bike lanes.

Chart 3. Cross Section Design Preferences along Riverside/Central Cross Section (Typical and Wider)



As shown in Chart 3, the preferred facility along Riverside/Central Section is the one-way parking protected bike lane.

Chart 4. Cross Section Design Preferences along E Main Street Cross Section

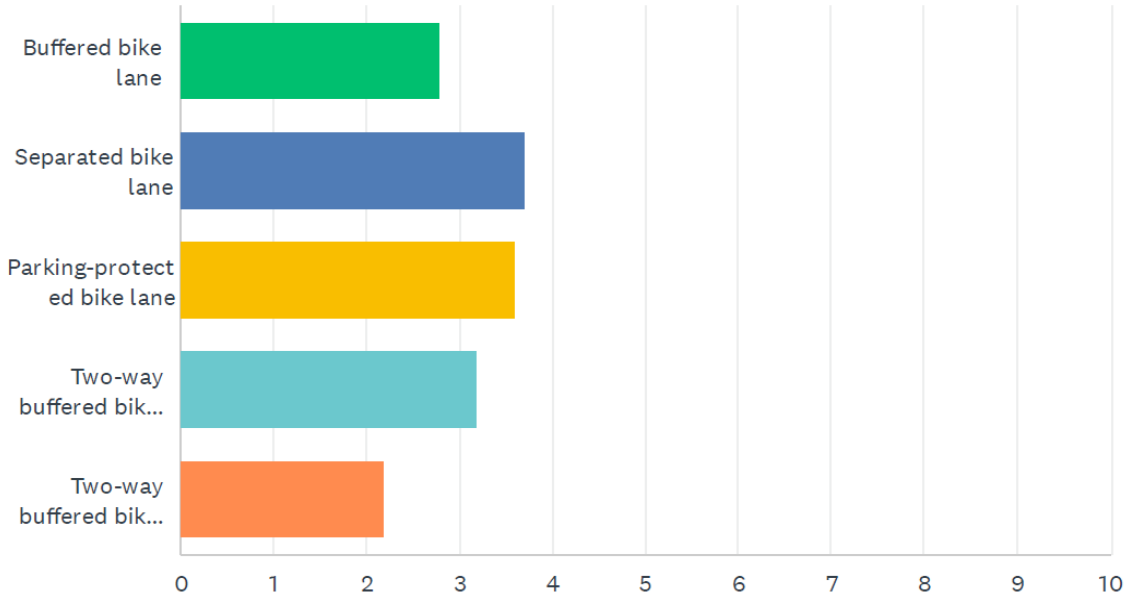


As shown in Chart 4, the preferred facility along E Main Street is the one-way buffered bike lane.

STUDY SURVEY RESPONSES

Survey respondents were asked to rank their preference of the cross-section design concepts. The top response was the separated bike lane option, but there was a range of preferences, as shown in Chart 5.

Chart 5. Preference of the Cross-Section Design Concepts



Respondents ranked their top choices for the following reasons:

- Separated bike lane: it is the safest, most accommodating option, with the most likelihood of usage.
- Parking protected bike lane: it is a good use of space because the buffer has the dual-purpose of being used for parking.
- Two-way buffered bike lane (right or left side): it is simple and provides more space for bicyclists to travel in the direction needed.

Respondents mentioned that focusing on pedestrian and bicycle improvements in this area is an appropriate priority for The City. Other priority routes mentioned include enhancements along Steward, Niantic, Beatty, Manzanita, and a path from Jacksonville to Medford.

Survey respondents emphasized the need for secure bicycle parking and crosswalks in the area.

Conclusions

Kittelson and City of Medford staff hosted an in-person walking tour and public open house for the Riverside, Central, E Main Multimodal Study on June 1, 2022. Conclusions are summarized below:

- The top study goal priorities expressed as part of the Public Open House for the study are safety and user experience.
- Additional separation between bicycle facilities and vehicle traffic is desired: one-way separated bike lanes and parking-protected bike lanes were supported in the survey and cross section design preferences open house stations.
- Participants supported one-way facilities more than two-way facilities.
- Some participants suggested phased implementation: start with a buffer and build to full separation.

These findings will be incorporated into the *Concept Design Alternatives* memorandum to evaluate alternative cross sections developed to address the active transportation needs in the study area to produce a narrowed down list of alternative

Attachment B – Roll Plot Comments


OHIO ST
MCANDREWS RD
COURT ST
N CENTRAL AVE
N RIVERSIDE AVE
JACKSON ST
4TH ST
E MAIN ST
8TH ST
10TH ST
BARNETT RD
STEWART AVE
N
N

Attachment C – Study Goal Priorities Voting Results

Riverside, Central, E Main Multimodal Enhancements Study

Place a dot on the goals you feel are most important, or add a post it with goals not listed

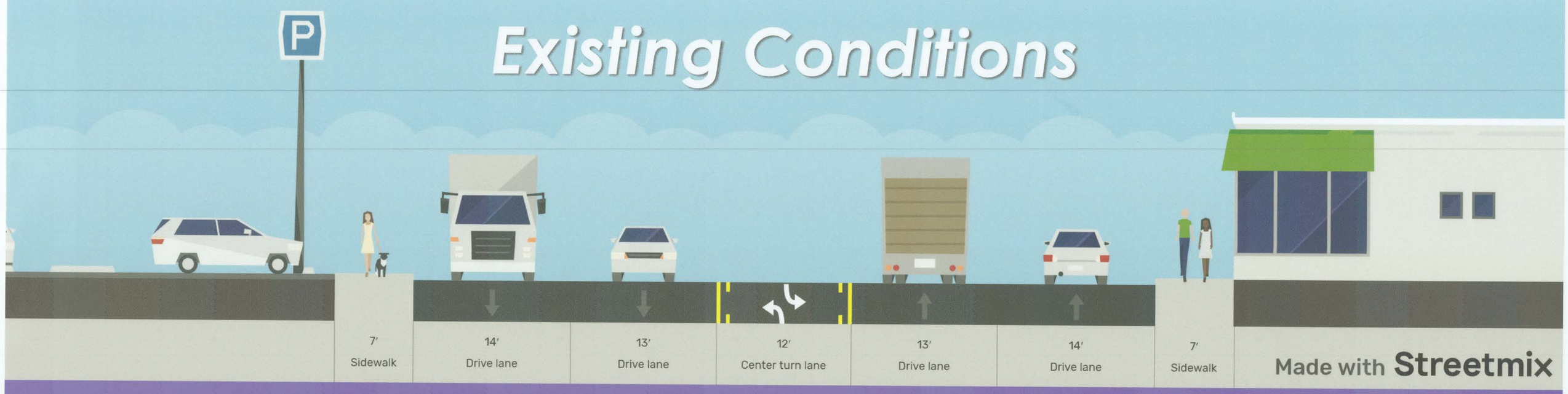
Study Goals	Feedback (Place a dot)
Safety: ***Safety*** *will measure the opportunity to reduce the crashes based on the facility type*	ped + cyclist safety esp. · Kids in a bike trailer
Connectivity: ***Connectivity*** *will measure how well the facility type connects to adjacent and nearby facilities (e.g., Beak Creek Greenway and bike lanes on 10th Street) & transit*	
User Experience: ***User Experience*** *will measure how comfortable it is for people of all ages and abilities to use the facility type*	More trees!
Economy: ***Economy*** *will measure how the facility type supports economic development by increasing on-street parking and the potential to develop surface parking*	
Feasibility: ***Feasibility*** *will measure the cost of the project and identify challenges to design, maintain, or construct the project*	
Operations: ***Operations*** *will measure a facility type's impact on the amount of time it takes to travel along the corridor for people walking, biking, driving, and taking transit*	

Attachment D – Cross Section Design Alternative Voting Results

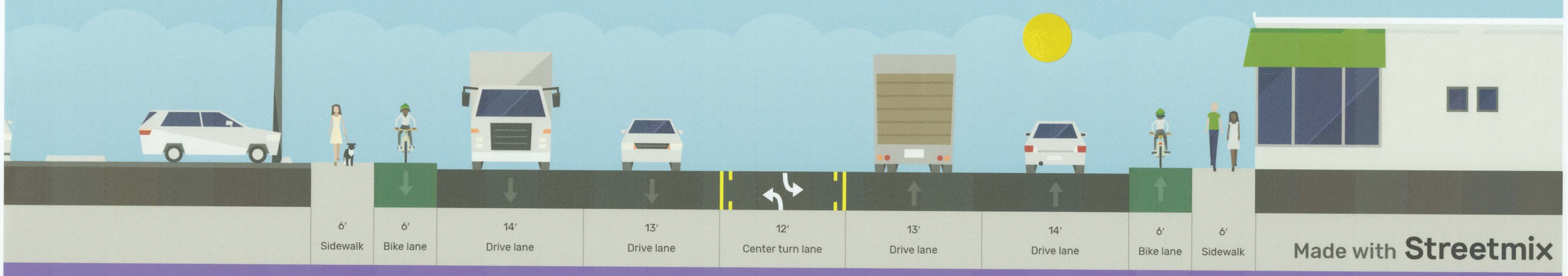
South of Couplet Cross Section Design

Place a dot on your preferred cross section design

Existing Conditions



Alternative 1: Raised Separated Bike Lanes



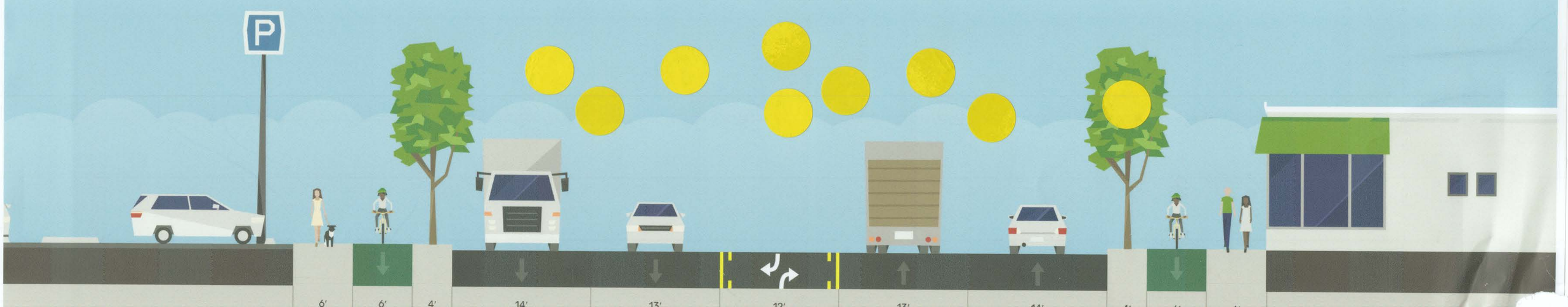
Alternative 2: Multiuse Paths Both Sides



Alternative 3: Multiuse Paths One Side



Alternative 4: Raised Separated Bike Lanes



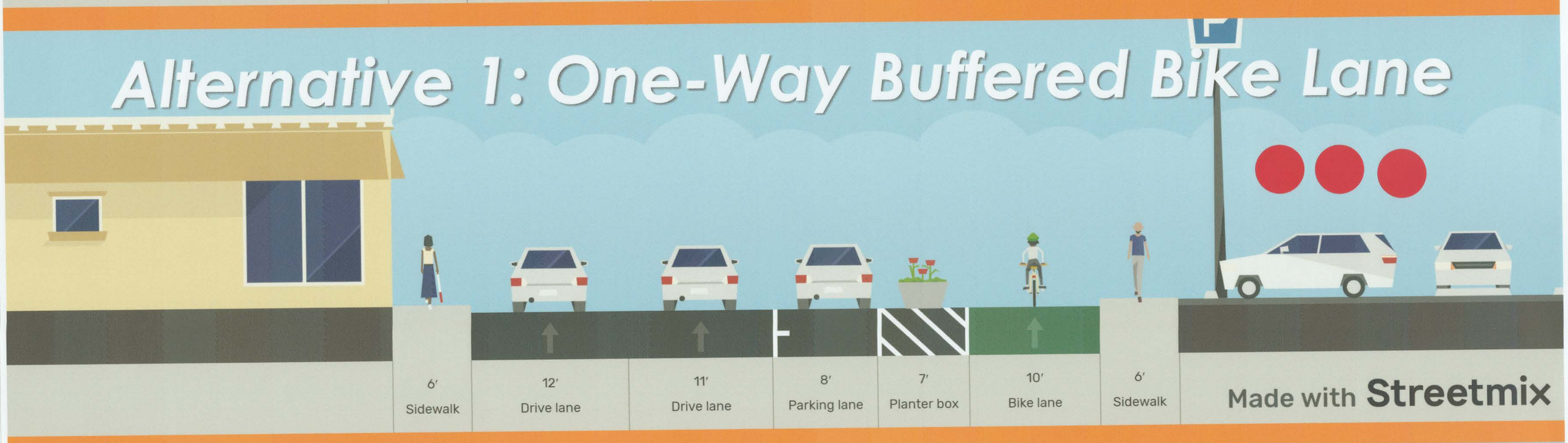
Typical Cross Section Design

Place a dot on your preferred cross section design

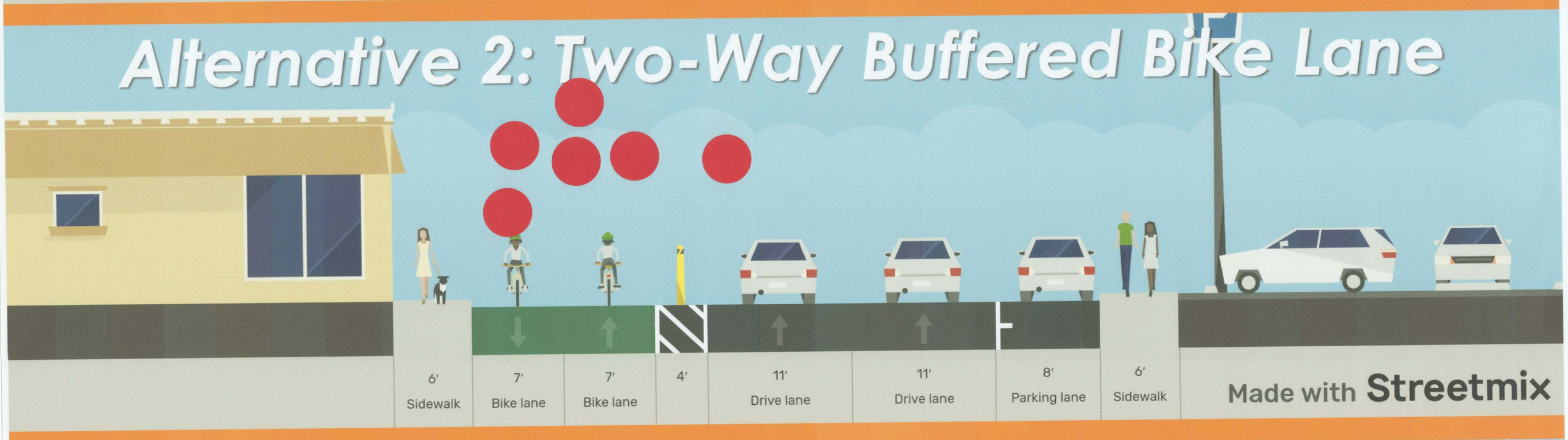
Existing Conditions



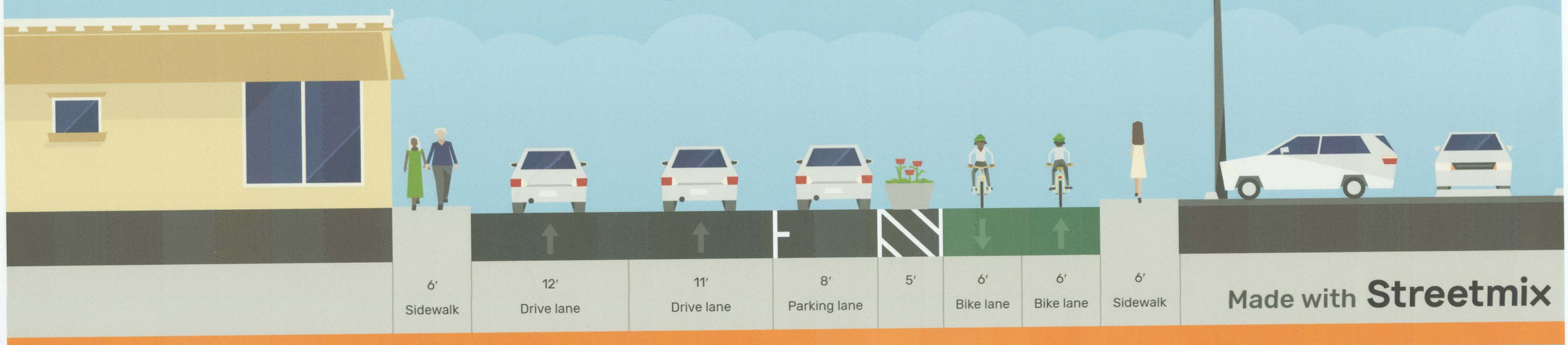
Alternative 1: One-Way Buffered Bike Lane



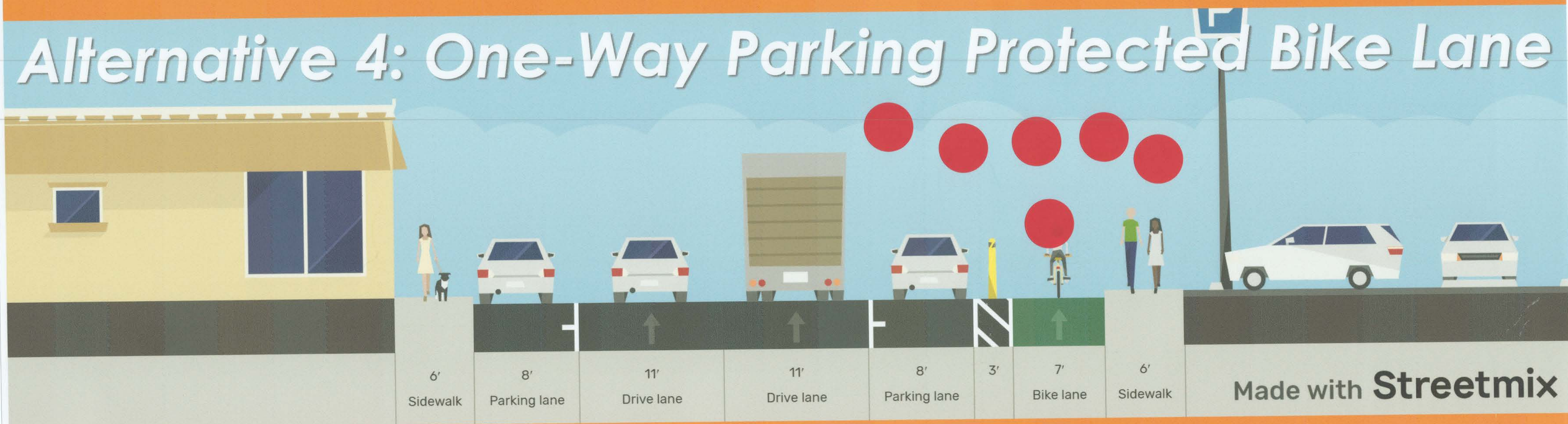
Alternative 2: Two-Way Buffered Bike Lane



Alternative 3: Two-Way Parking Protected Bike Lane



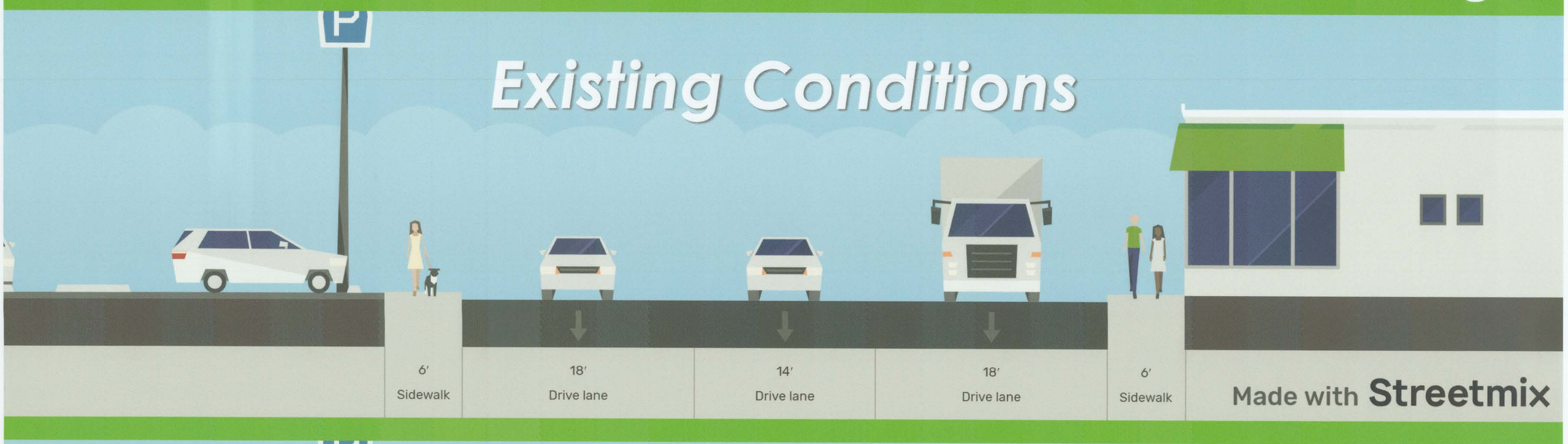
Alternative 4: One-Way Parking Protected Bike Lane



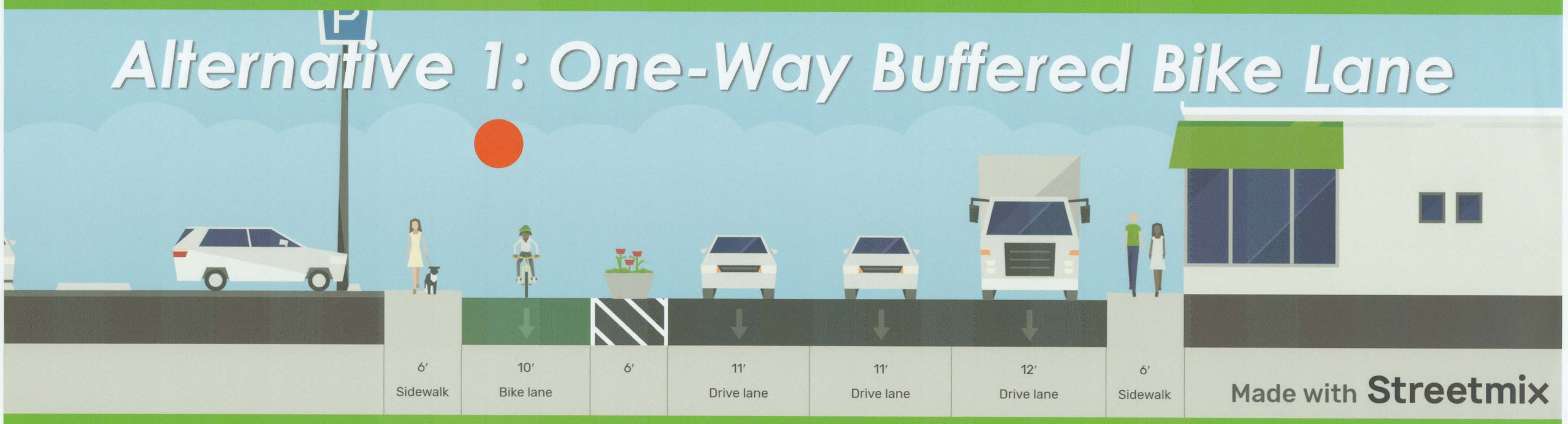
Wider Cross Section Design

Place a dot on your preferred cross section design

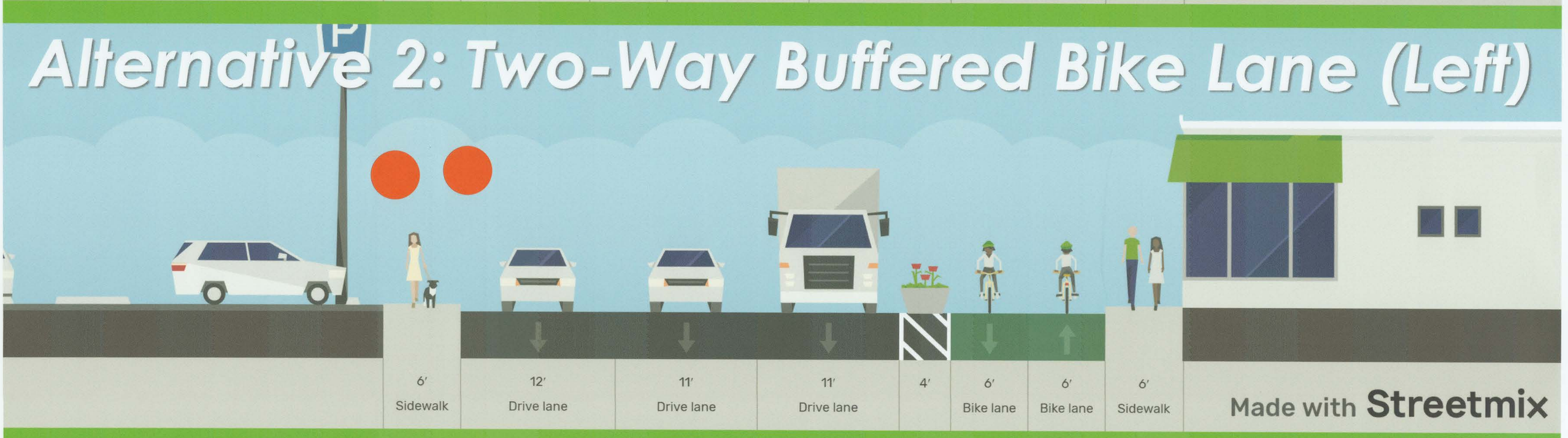
Existing Conditions



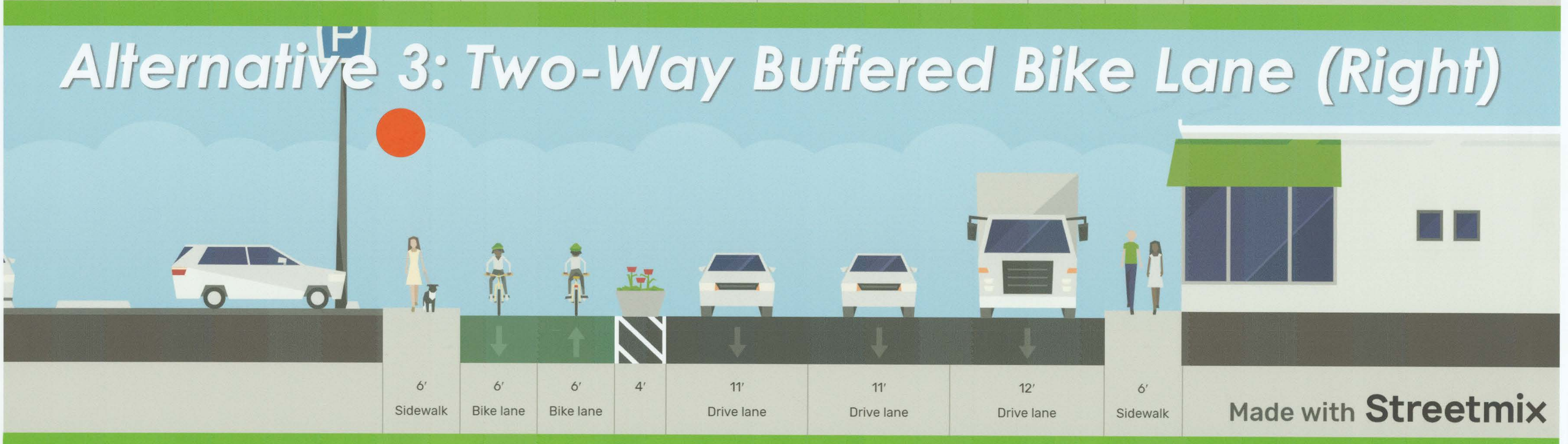
Alternative 1: One-Way Buffered Bike Lane



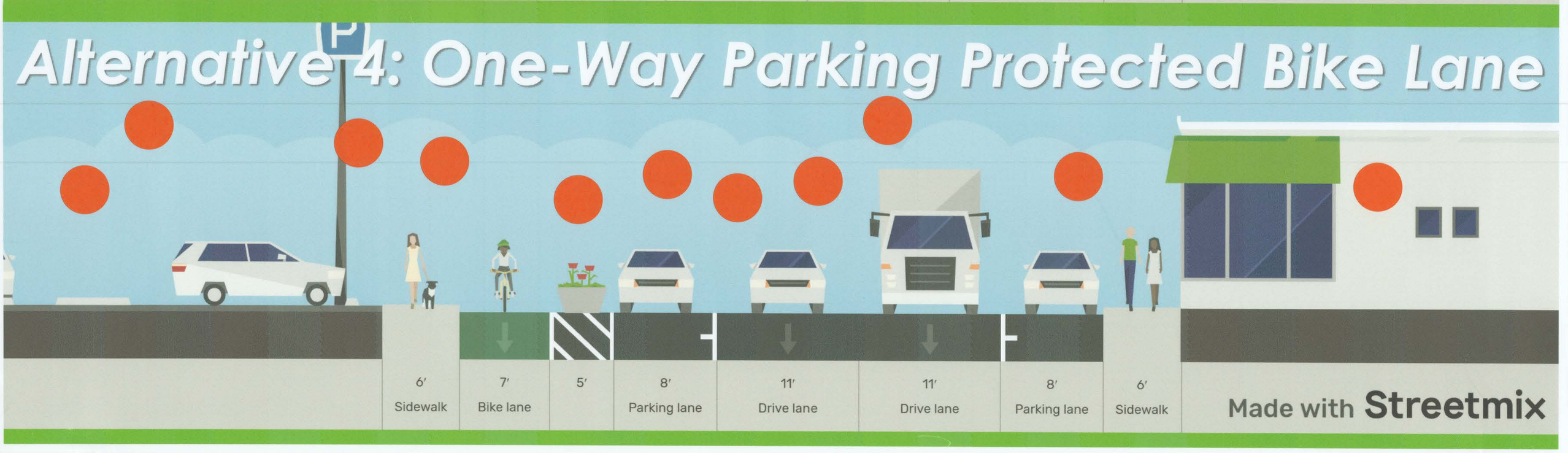
Alternative 2: Two-Way Buffered Bike Lane (Left)



Alternative 3: Two-Way Buffered Bike Lane (Right)



Alternative 4: One-Way Parking Protected Bike Lane



E Main Street Cross Section Designs

Place a dot on your preferred cross section design

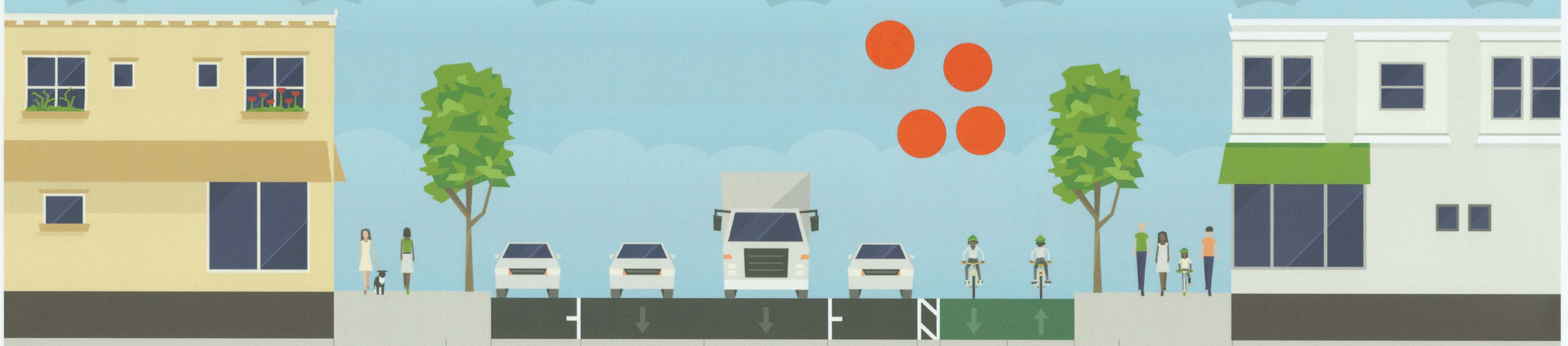
Existing Conditions



10′ Sidewalk	4′	8′ Parking lane	12′ Sharrow	12′ Drive lane	12′ Drive lane	8′ Parking lane	4′	10′ Sidewalk

Made with **Streetmix**

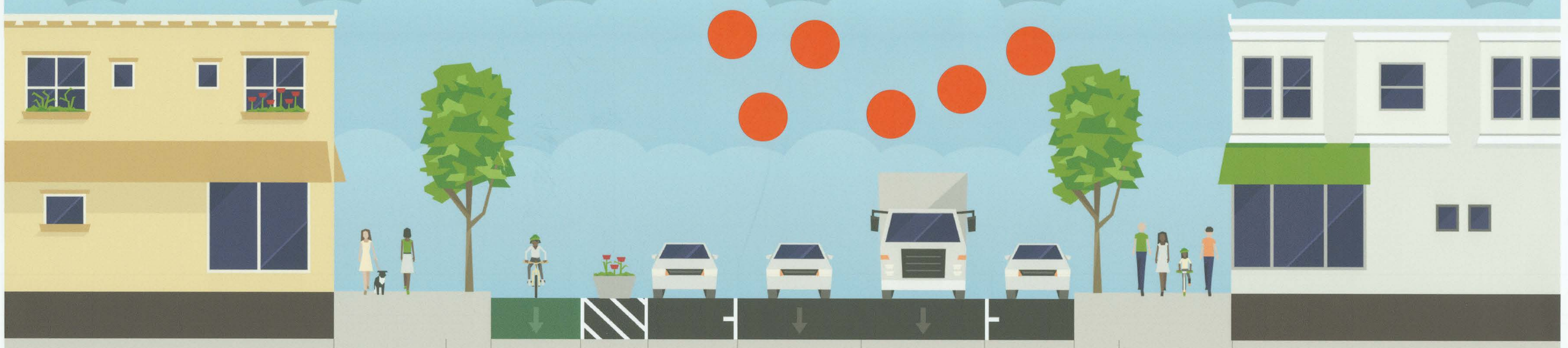
Alternative 1: Two-Way Separated Bike Lane



10′ Sidewalk	4′	8′ Parking lane	11′ Drive lane	11′ Drive lane	8′ Parking lane	2′	6′ Bike lane	6′ Bike lane	4′	10′ Sidewalk

Made with **Streetmix**

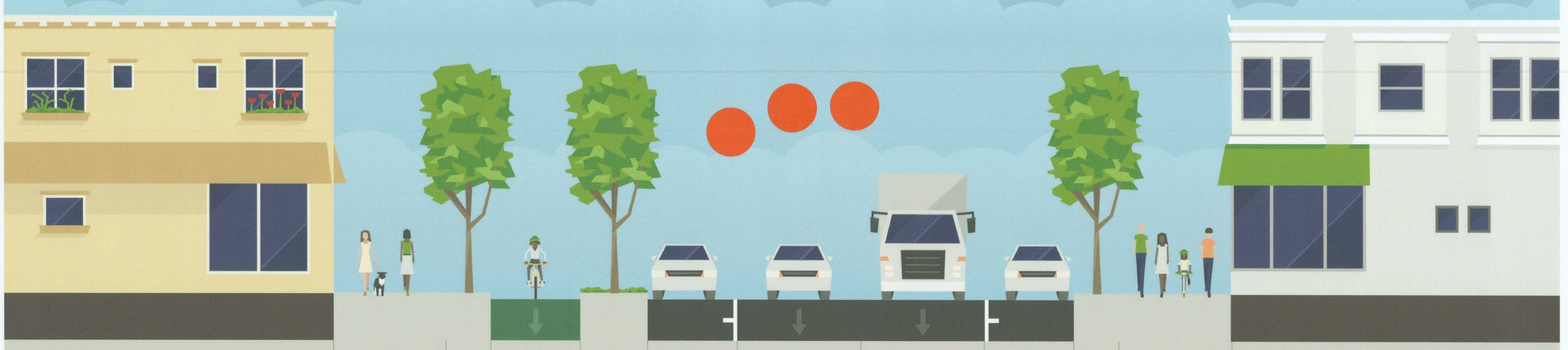
Alternative 2: One-Way Buffered Bike Lane



10′ Sidewalk	4′	8′ Bike lane	6′	8′ Parking lane	11′ Drive lane	11′ Drive lane	8′ Parking lane	4′	10′ Sidewalk

Made with **Streetmix**

Alternative 3: One-Way Separated Bike Lane



10′ Sidewalk	4′	8′ Bike lane	6′	8′ Parking lane	11′ Drive lane	11′ Drive lane	8′ Parking lane	4′	10′ Sidewalk

Made with **Streetmix**

Public Outreach Event #2 Summary

KITTELSON & ASSOCIATES
851 SW 6th Avenue, Suite 600
Portland, OR 97204
P 503.228.5230

Memorandum

September 6, 2022

Project# 27358

To: Christina Charvat, PE
Karl MacNair, PE
City of Medford

From: Amy Griffiths, Nick Gross, Susan Wright, PE

RE: Riverside, Central, E Main Multimodal Study

PUBLIC OUTREACH EVENT #2 SUMMARY

Kittelson and City of Medford staff hosted an online "virtual" public open house for the Riverside, Central, E Main Multimodal Study from August 10 to August 31, 2022.

The purpose of the virtual public open house was to update the public on the study, solicit feedback on bicycle facility design alternatives, and gather information on potential locations for enhanced pedestrian crossings. The public input will be used to inform the selection of a preferred concept design alternative and locations for enhanced pedestrian crossings. This memorandum summarizes the feedback received from public outreach event #2.

Virtual Public Open House

The virtual public open house was open on StoryMaps from August 10 to August 31. 1,800 people viewed the open house site. The public open house included a survey and a mapping exercise. Public input is summarized below. The survey and comment box responses are included in Attachment "A" and the map comments are provided in Attachment "B".

SURVEY

There were 695[1] survey responses: Approximately 70% of respondents expressed preference for the no-build along E Main Street, Riverside Avenue, Court Street, and Central Avenue. Facility preferences for those in support of a bicycle facilities are illustrated in Chart 1, Chart 2, and Chart 3. Survey respondents preferred the following:

- A two-way parking-protected bike lane along E Main Street
- A one-way parking protected bike lane along Riverside Avenue
- A one-way separated bike lane along Central Avenue/Court Street

[1] Note: it appears that identical survey responses expressing opposition to the study from the same IP address were submitted. It is not feasible to distinguish between the same person filling out multiple surveys or different people filling out the survey on the same computer, therefore no responses to the general survey were deleted. This likely causes an over exaggeration of negative responses to the study.

Chart 1. Preferred Design Concept on E Main Street

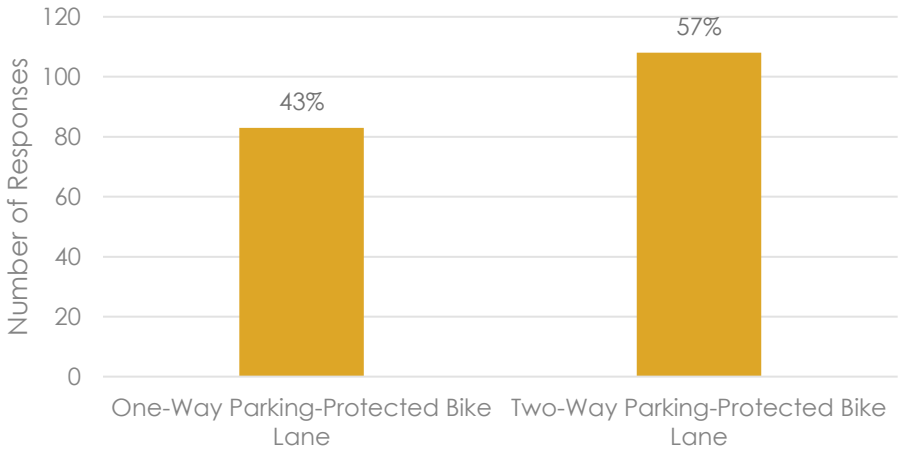


Chart 2. Preferred Design Concept on Riverside Avenue

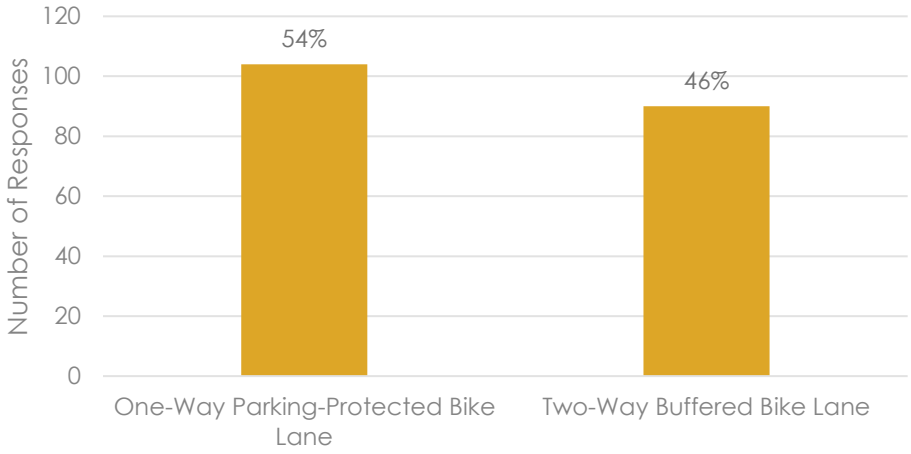
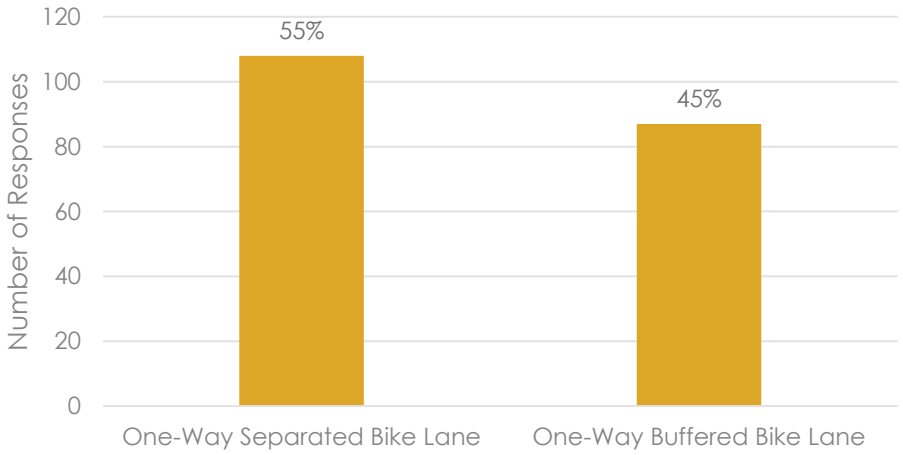


Chart 3. Preferred Design Concept on Central Avenue/Court Street



The survey also asked respondents to share their priorities along the E Main Street, Riverside Avenue, Central Avenue, and Court Street with respect to design tradeoffs.

Chart 4, Chart 5, and Chart 6 summarize the average preference respondents have for three key tradeoffs based on design treatments. In these graphs, "0" means that only the factor on the left side of the chart is important and that the factor on the right is not a priority. A "100" means that only the factor on the right side of the chart is important and that the factor on the left is not a priority. As illustrated in the charts below, respondents generally express the following preferences:

- Low cost of construction and maintenance is more important than high vertical separation
- Increased on-street parking is more important than increased bicycle facility width
- Maintaining vehicle throughput is equally important as improving safety and comfort for people walking, biking, rolling, and taking transit

When filtering results to include only people who support a build alternative there is a moderate preference for vertical separation over low cost of construction and maintenance, for increased bicycle facility width over increased on-street parking, and a high preference for improving safety over maintaining vehicle throughput.

Chart 4. Respondents' Relative Preference for High Vertical Separation vs. Low Cost of Construction and Maintenance

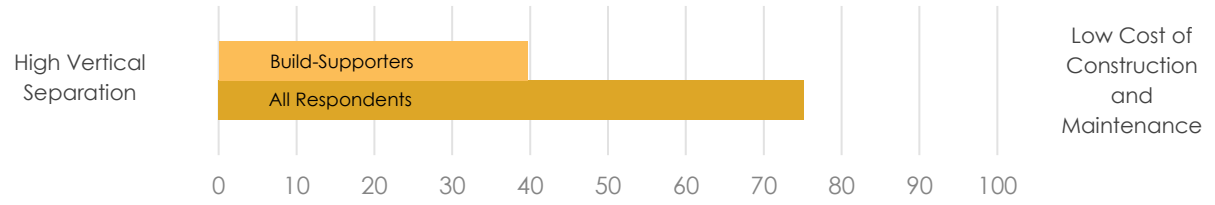


Chart 5. Respondents' Relative Preference for Increased Bicycle Facility Width v. Increased On-Street Parking

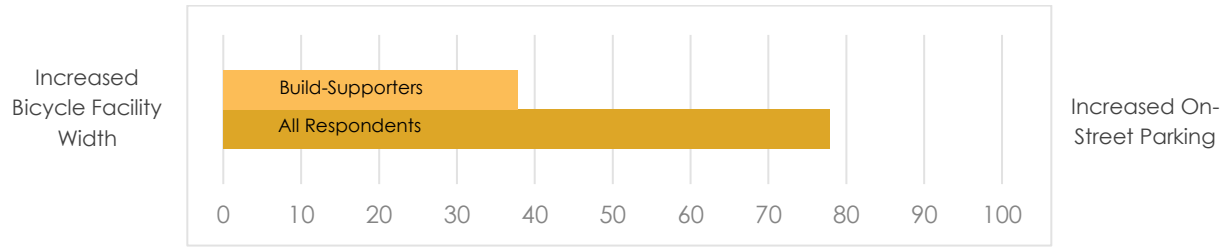
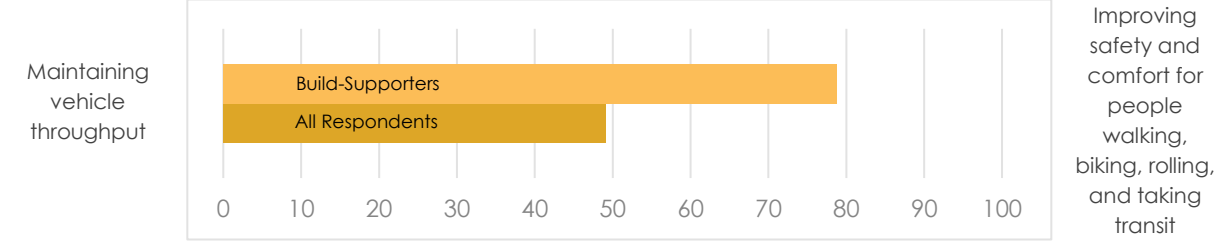


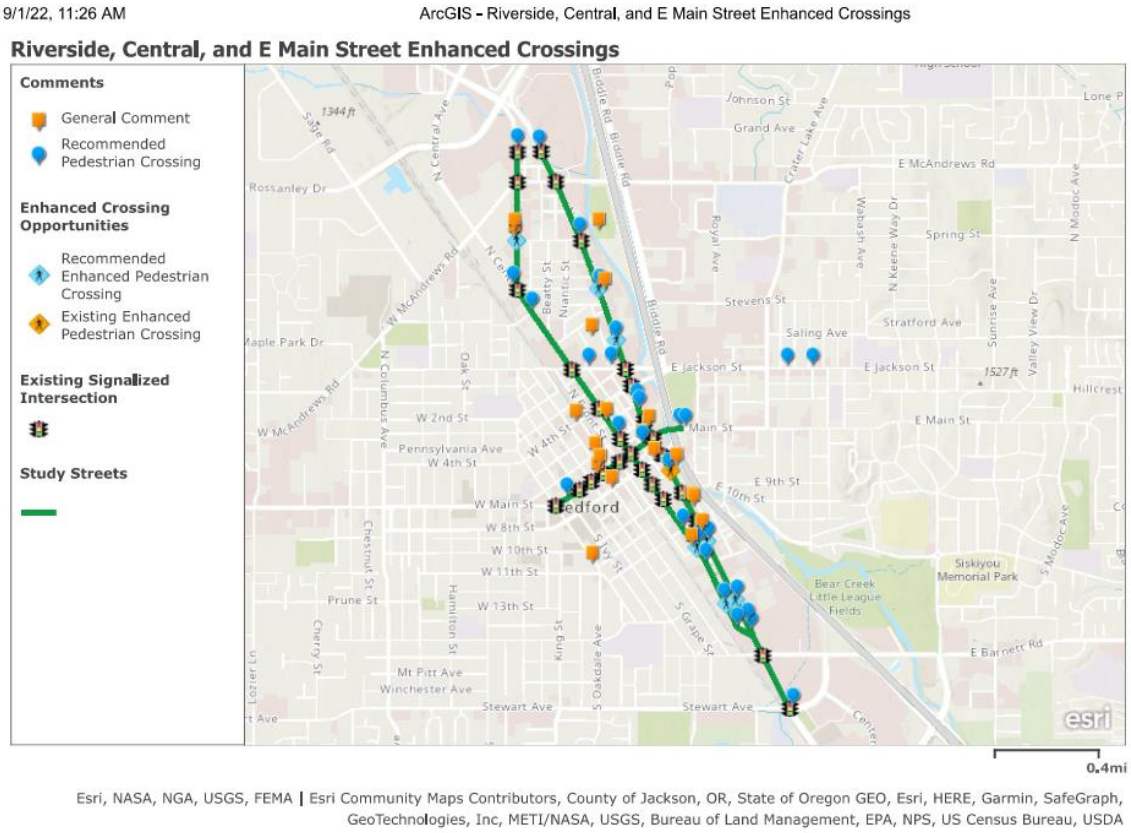
Chart 6. Respondent's Relative Preference for Maintaining Vehicle Throughput vs. Improving Safety and Comfort for People Walking, Biking, Rolling, and Taking Transit



MAPPING EXERCISE

There were 52 comments on the mapping exercise. There were comments supporting all the preliminary recommended enhanced pedestrian crossing locations. Comments are mapped in Figure 1.

Figure 1. Riverside, Central, and E Main Street Comment Map



- Comments suggested crossing improvements at the following signalized intersections:
  - Stewart Avenue/Riverside Avenue
  - 6th Street/Central Avenue
  - Court Street/Central Avenue
  - Manzanita Street/Riverside Avenue
  - Ohio Street/Court Street
  - Ohio Street/Riverside Avenue
- Comments suggested crossing improvement at the following unsignalized intersections (not included in the preliminary recommended enhanced pedestrian crossing list)
  - Clark Street/Central Avenue
  - Bartlett Street/Jackson Street
  - Pine Street/Jackson Street
  - Riverside Avenue/5th Street (at intersection or at midblock)
  - Bartlett Street/Main Street
  - 12th Street/Central Avenue
  - Earhart Street/Central Avenue
  - Boyd Street/Central Avenue
  - Boyd Street/Riverside Avenue
  - Riverside Avenue/Central Avenue
  - Ivy Street/Main Street
  - 8th Street/Main Street
  - McAndrews Street/Jackson Street
  - Madison Place/Jackson Street

- Additional comments recommend the following:
  - Improve connections to the Bear Creek Greenway
  - Increase enforcement at crossings
  - Increase traffic lanes and parking
  - Increase outdoor restaurant seating
  - Consider a one-way bike facility on 4th Avenue to complement a one-way bike facility on Main Street

COMMENT BOXES, VOICEMAILS, AND EMAILS

There were 486[2] unique comment box responses. Emails and voicemails directed to the City were also reviewed as part of this analysis. Of these responses, 64 expressed support for the study, 191 expressed general opposition, and 242 expressed specific concerns. These concerns included (in order of prevalence):

- Congestion / Traffic
- Lack of existing cycling demand/ Does not think that the facility would be used
- Emergency Access/ Access in disaster events
- Negative economic impact downtown
- Safety/Crime
- Prefers bicycle facilities on side streets
- Prioritize other funding use
- Parking
- Impacts to parklets

Those that support the study think that the study will improve safety, create a bicycle and pedestrian friendly environments, facilitate emergency access, and make it easier to cross the street(s). The selection and design of a preferred alternative will consider the concerns above and work towards a solution that alleviates the concerns of those with opposition to the study.

[2] There were initially 509 comments. Duplicate comments from the same IP address were removed. Unique comments from the same IP address were preserved since these reflect different concerns or comments that could be from different people sharing a computer.

Conclusions

Kittelson and City of Medford staff hosted an online public open house for the Riverside, Central, E Main Multimodal Study on in August 2022. Conclusions are summarized below:

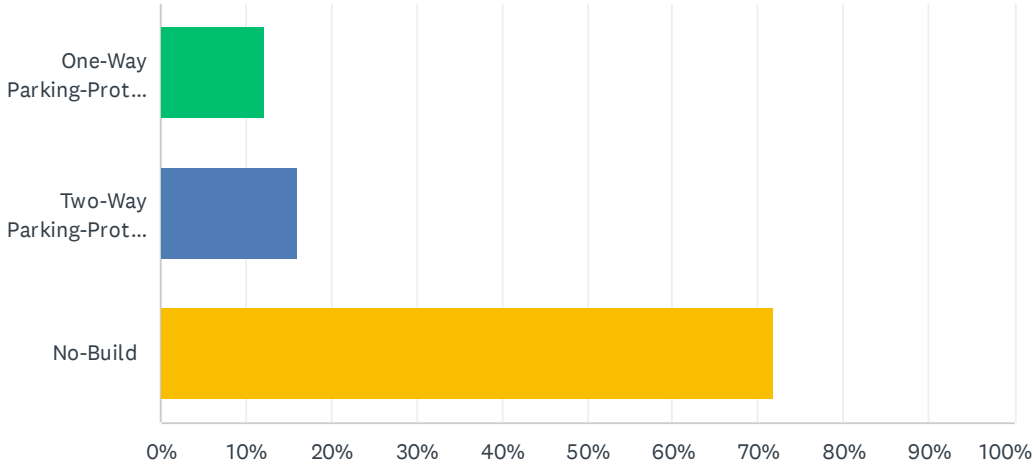
- Survey respondents supporting a build alternative prefer the following:
  - A two-way parking-protected bike lane along E Main Street
  - A one-way parking protected bike lane along Riverside Avenue
  - A one-way separated bike lane along Central Avenue/Court Street
- Comment map respondents support all proposed enhanced crossing locations and recommended crossing improvements at several additional signalized and unsignalized intersections
- Many survey respondents prefer the no-build alternative, citing vehicle congestion, lack of existing cycling demand, emergency access during disaster events, and economic impacts as their main concerns

These findings will be used along with the information presented in the Operations Analysis Memorandum to identify the preferred treatment(s) along the corridor.

Attachment A – Survey Responses

Q1 E Main Street

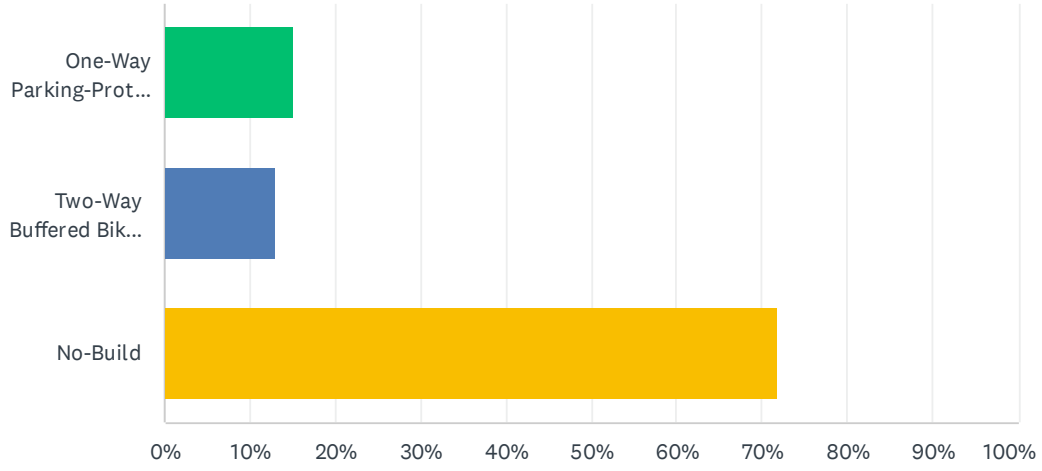
Answered: 678 Skipped: 17



ANSWER CHOICES	RESPONSES	
One-Way Parking-Protected Bike Lane	12.24%	83
Two-Way Parking-Protected Bike Lane	15.93%	108
No-Build	71.83%	487
TOTAL		678

Q2 Riverside Avenue

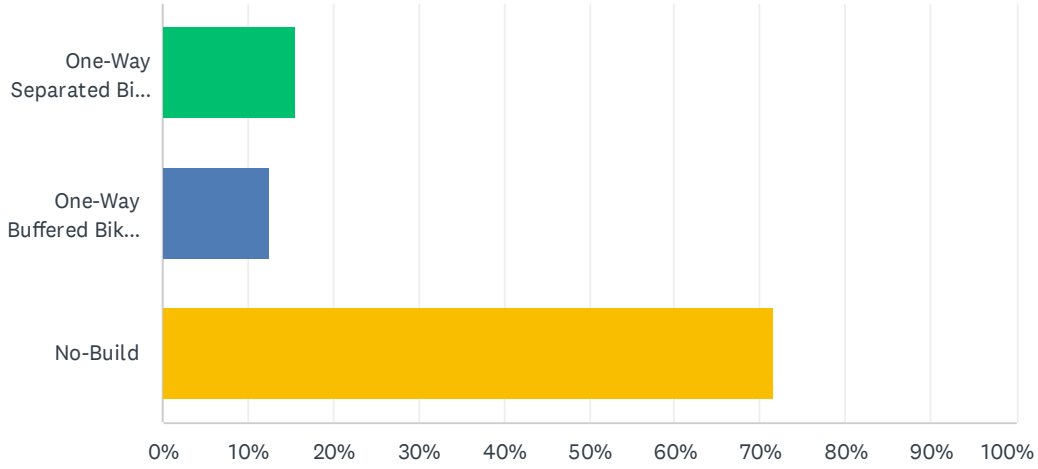
Answered: 689 Skipped: 6



ANSWER CHOICES	RESPONSES	
One-Way Parking-Protected Bike Lane	15.09%	104
Two-Way Buffered Bike Lane	13.06%	90
No-Build	71.84%	495
TOTAL		689

Q3 Central Avenue/Court Street

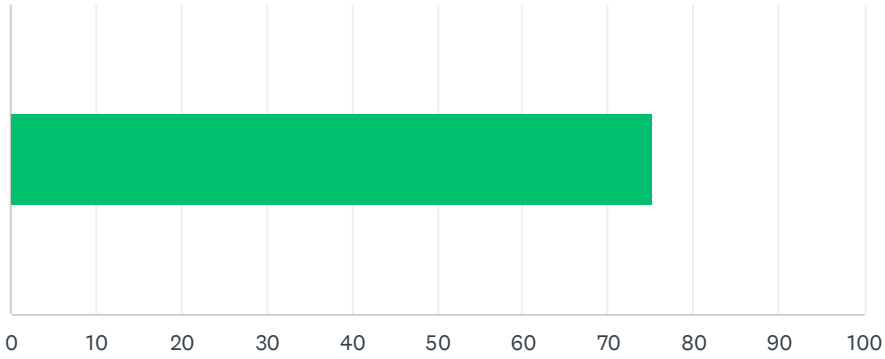
Answered: 690 Skipped: 5



ANSWER CHOICES	RESPONSES	
One-Way Separated Bike Lane	15.65%	108
One-Way Buffered Bike Lane	12.61%	87
No-Build	71.74%	495
TOTAL		690

Q4 Providing substantial vertical separation (e.g. curbs, landscaping) between people biking and vehicles improves safety and comfort but also increases the cost of construction and maintenance. Please move the slider to show the relative importance you feel about these priorities.

Answered: 594 Skipped: 101



ANSWER CHOICES	AVERAGE NUMBER	TOTAL NUMBER	RESPONSES
	75	44,667	594
Total Respondents: 594			

#		DATE
1	100	9/1/2022 7:13 AM
2	46	9/1/2022 6:04 AM
3	50	8/31/2022 11:54 PM
4	100	8/31/2022 11:21 PM
5	100	8/31/2022 11:15 PM
6	0	8/31/2022 11:08 PM
7	100	8/31/2022 10:38 PM
8	100	8/31/2022 9:19 PM
9	99	8/31/2022 8:57 PM
10	100	8/31/2022 8:36 PM
11	100	8/31/2022 7:42 PM
12	92	8/31/2022 7:29 PM
13	100	8/31/2022 7:03 PM
14	0	8/31/2022 6:54 PM
15	100	8/31/2022 6:53 PM
16	100	8/31/2022 6:37 PM
17	54	8/31/2022 6:35 PM

18	0	8/31/2022 6:19 PM
19	100	8/31/2022 6:06 PM
20	98	8/31/2022 6:04 PM
21	30	8/31/2022 5:48 PM
22	86	8/31/2022 5:33 PM
23	57	8/31/2022 5:21 PM
24	98	8/31/2022 5:19 PM
25	100	8/31/2022 5:14 PM
26	100	8/31/2022 5:12 PM
27	0	8/31/2022 5:10 PM
28	2	8/31/2022 5:00 PM
29	100	8/31/2022 4:48 PM
30	29	8/31/2022 4:43 PM
31	100	8/31/2022 4:36 PM
32	100	8/31/2022 3:16 PM
33	100	8/31/2022 3:06 PM
34	30	8/31/2022 3:06 PM
35	100	8/31/2022 2:52 PM
36	72	8/31/2022 2:50 PM
37	100	8/31/2022 2:49 PM
38	31	8/31/2022 2:49 PM
39	96	8/31/2022 2:47 PM
40	51	8/31/2022 2:38 PM
41	0	8/31/2022 2:37 PM
42	98	8/31/2022 2:34 PM
43	100	8/31/2022 2:33 PM
44	100	8/31/2022 2:32 PM
45	0	8/31/2022 2:30 PM
46	100	8/31/2022 2:27 PM
47	100	8/31/2022 2:26 PM
48	100	8/31/2022 2:26 PM
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51	100	8/31/2022 2:20 PM
52	67	8/31/2022 2:18 PM
53	50	8/31/2022 2:16 PM
54	100	8/31/2022 2:15 PM
55	100	8/31/2022 2:14 PM

56	100	8/31/2022 2:11 PM
57	98	8/31/2022 2:04 PM
58	100	8/31/2022 2:03 PM
59	100	8/31/2022 2:02 PM
60	100	8/31/2022 2:01 PM
61	100	8/31/2022 2:01 PM
62	53	8/31/2022 2:01 PM
63	93	8/31/2022 1:58 PM
64	100	8/31/2022 1:56 PM
65	100	8/31/2022 1:56 PM
66	100	8/31/2022 1:52 PM
67	55	8/31/2022 1:46 PM
68	100	8/31/2022 1:46 PM
69	11	8/31/2022 1:44 PM
70	100	8/31/2022 1:40 PM
71	100	8/31/2022 1:36 PM
72	0	8/31/2022 1:32 PM
73	34	8/31/2022 1:27 PM
74	72	8/31/2022 1:23 PM
75	86	8/31/2022 1:09 PM
76	100	8/31/2022 1:04 PM
77	83	8/31/2022 12:53 PM
78	78	8/31/2022 12:36 PM
79	100	8/31/2022 12:19 PM
80	100	8/31/2022 12:17 PM
81	100	8/31/2022 12:07 PM
82	100	8/31/2022 12:01 PM
83	100	8/31/2022 11:56 AM
84	100	8/31/2022 11:23 AM
85	100	8/31/2022 11:22 AM
86	100	8/31/2022 11:21 AM
87	100	8/31/2022 11:12 AM
88	100	8/31/2022 11:04 AM
89	82	8/31/2022 10:40 AM
90	0	8/31/2022 10:28 AM
91	98	8/31/2022 10:19 AM
92	17	8/31/2022 9:39 AM
93	100	8/31/2022 9:36 AM

94	100	8/31/2022 9:28 AM
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96	100	8/31/2022 9:26 AM
97	100	8/31/2022 9:13 AM
98	100	8/31/2022 9:13 AM
99	97	8/31/2022 9:13 AM
100	100	8/31/2022 9:10 AM
101	99	8/31/2022 9:04 AM
102	100	8/31/2022 9:01 AM
103	100	8/31/2022 9:00 AM
104	61	8/31/2022 8:41 AM
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106	100	8/31/2022 8:06 AM
107	65	8/31/2022 7:32 AM
108	100	8/31/2022 7:05 AM
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111	100	8/31/2022 6:39 AM
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129	100	8/30/2022 8:38 PM
130	100	8/30/2022 8:18 PM
131	19	8/30/2022 8:13 PM

132	100	8/30/2022 8:06 PM
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167	100	8/30/2022 11:35 AM
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169	100	8/30/2022 11:04 AM

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279	49	8/29/2022 6:46 PM
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317	77	8/29/2022 8:10 AM
318	47	8/29/2022 8:05 AM
319	6	8/28/2022 4:28 PM
320	84	8/28/2022 4:19 PM
321	34	8/28/2022 1:02 PM

322	97	8/27/2022 7:09 PM
323	100	8/27/2022 4:41 PM
324	100	8/27/2022 1:08 PM
325	61	8/27/2022 11:05 AM
326	66	8/27/2022 8:04 AM
327	52	8/27/2022 6:50 AM
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355	63	8/25/2022 7:08 AM
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361	83	8/24/2022 9:04 PM
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387	100	8/24/2022 1:55 PM
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392	13	8/24/2022 1:16 PM
393	100	8/24/2022 10:02 AM
394	100	8/24/2022 5:32 AM
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399	100	8/23/2022 2:04 PM
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404	100	8/23/2022 10:25 AM
405	0	8/23/2022 10:19 AM
406	100	8/23/2022 9:20 AM
407	100	8/23/2022 9:09 AM
408	99	8/23/2022 9:03 AM
409	98	8/23/2022 8:16 AM
410	100	8/23/2022 8:13 AM
411	100	8/23/2022 8:07 AM
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416	33	8/22/2022 4:45 PM
417	100	8/22/2022 4:10 PM
418	76	8/22/2022 3:49 PM
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420	100	8/22/2022 2:09 PM
421	5	8/22/2022 1:38 PM
422	98	8/22/2022 1:18 PM
423	100	8/22/2022 1:12 PM
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431	100	8/22/2022 9:33 AM
432	100	8/22/2022 9:32 AM
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438	100	8/22/2022 8:20 AM
439	50	8/22/2022 7:54 AM
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441	100	8/22/2022 7:28 AM
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452	100	8/20/2022 10:59 AM
453	22	8/20/2022 9:59 AM
454	98	8/20/2022 9:03 AM
455	22	8/20/2022 8:14 AM
456	64	8/20/2022 7:43 AM
457	100	8/20/2022 7:09 AM
458	0	8/19/2022 7:21 PM
459	99	8/19/2022 6:48 PM
460	0	8/19/2022 6:24 PM
461	99	8/19/2022 5:28 PM
462	18	8/19/2022 9:44 AM
463	100	8/19/2022 9:42 AM
464	100	8/19/2022 9:01 AM
465	44	8/18/2022 2:44 PM
466	18	8/18/2022 12:36 PM
467	17	8/18/2022 11:43 AM
468	48	8/18/2022 10:57 AM
469	100	8/18/2022 8:20 AM
470	38	8/17/2022 12:34 PM
471	79	8/17/2022 9:15 AM
472	47	8/17/2022 7:51 AM
473	0	8/17/2022 6:36 AM

474	100	8/17/2022 5:25 AM
475	100	8/17/2022 3:28 AM
476	100	8/16/2022 9:29 PM
477	100	8/16/2022 9:23 PM
478	100	8/16/2022 7:47 PM
479	52	8/16/2022 4:52 PM
480	42	8/16/2022 4:33 PM
481	0	8/16/2022 4:32 PM
482	0	8/16/2022 4:21 PM
483	0	8/16/2022 4:08 PM
484	17	8/16/2022 3:33 PM
485	0	8/16/2022 3:11 PM
486	100	8/16/2022 2:31 PM
487	2	8/16/2022 2:26 PM
488	74	8/16/2022 2:21 PM
489	100	8/16/2022 1:49 PM
490	0	8/16/2022 1:46 PM
491	100	8/16/2022 1:33 PM
492	24	8/16/2022 1:18 PM
493	73	8/16/2022 12:52 PM
494	100	8/16/2022 12:13 PM
495	0	8/16/2022 11:18 AM
496	71	8/16/2022 11:11 AM
497	100	8/16/2022 10:55 AM
498	13	8/16/2022 10:21 AM
499	100	8/16/2022 9:22 AM
500	17	8/15/2022 8:29 PM
501	100	8/15/2022 8:27 PM
502	5	8/15/2022 6:40 PM
503	24	8/15/2022 2:21 PM
504	71	8/15/2022 12:55 PM
505	78	8/15/2022 12:55 PM
506	2	8/15/2022 12:06 PM
507	100	8/15/2022 11:40 AM
508	0	8/15/2022 10:11 AM
509	11	8/15/2022 9:57 AM
510	49	8/15/2022 8:20 AM
511	52	8/14/2022 9:12 PM

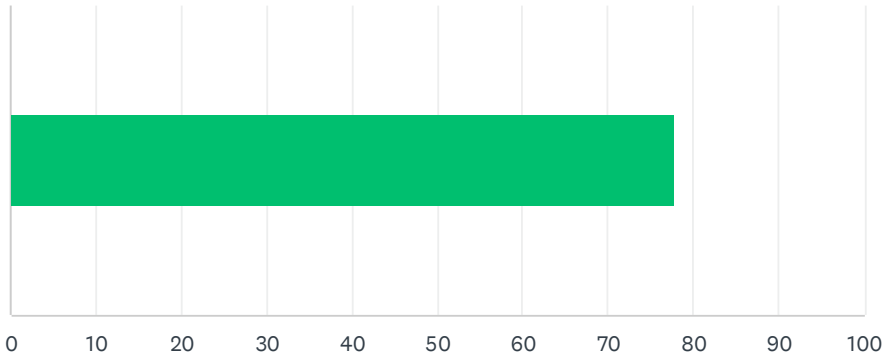
512	82	8/14/2022 5:23 PM
513	85	8/14/2022 4:36 PM
514	28	8/14/2022 4:21 PM
515	26	8/14/2022 9:38 AM
516	100	8/14/2022 8:09 AM
517	51	8/14/2022 1:35 AM
518	100	8/13/2022 10:28 PM
519	71	8/13/2022 10:03 PM
520	42	8/13/2022 9:12 PM
521	42	8/13/2022 9:01 PM
522	29	8/13/2022 3:30 PM
523	0	8/13/2022 3:25 PM
524	100	8/13/2022 12:21 PM
525	0	8/13/2022 8:49 AM
526	0	8/13/2022 8:48 AM
527	1	8/13/2022 8:32 AM
528	100	8/13/2022 7:56 AM
529	100	8/13/2022 7:00 AM
530	100	8/12/2022 11:58 PM
531	7	8/12/2022 6:12 PM
532	46	8/12/2022 3:51 PM
533	100	8/12/2022 12:20 PM
534	84	8/12/2022 10:28 AM
535	48	8/12/2022 8:58 AM
536	100	8/12/2022 8:51 AM
537	100	8/12/2022 8:38 AM
538	99	8/12/2022 8:37 AM
539	24	8/12/2022 7:30 AM
540	100	8/12/2022 7:12 AM
541	100	8/12/2022 6:55 AM
542	100	8/12/2022 6:46 AM
543	14	8/12/2022 2:32 AM
544	100	8/12/2022 12:47 AM
545	100	8/11/2022 11:20 PM
546	98	8/11/2022 10:54 PM
547	100	8/11/2022 10:52 PM
548	100	8/11/2022 10:31 PM
549	100	8/11/2022 9:41 PM

550	100	8/11/2022 9:35 PM
551	100	8/11/2022 9:34 PM
552	100	8/11/2022 9:04 PM
553	100	8/11/2022 8:43 PM
554	100	8/11/2022 8:22 PM
555	100	8/11/2022 8:06 PM
556	0	8/11/2022 8:02 PM
557	100	8/11/2022 8:00 PM
558	100	8/11/2022 7:47 PM
559	61	8/11/2022 7:46 PM
560	100	8/11/2022 7:28 PM
561	100	8/11/2022 7:14 PM
562	100	8/11/2022 7:14 PM
563	100	8/11/2022 7:11 PM
564	100	8/11/2022 7:11 PM
565	100	8/11/2022 7:07 PM
566	93	8/11/2022 7:01 PM
567	100	8/11/2022 6:54 PM
568	100	8/11/2022 6:47 PM
569	47	8/11/2022 6:47 PM
570	100	8/11/2022 6:43 PM
571	30	8/11/2022 5:15 PM
572	100	8/11/2022 3:56 PM
573	54	8/11/2022 1:43 PM
574	64	8/11/2022 12:26 PM
575	0	8/11/2022 11:22 AM
576	2	8/11/2022 11:04 AM
577	15	8/11/2022 8:31 AM
578	20	8/11/2022 8:08 AM
579	96	8/11/2022 8:01 AM
580	40	8/10/2022 1:41 PM
581	0	8/10/2022 1:21 PM
582	100	8/10/2022 12:11 PM
583	90	8/10/2022 11:33 AM
584	51	8/10/2022 11:23 AM
585	100	8/10/2022 11:04 AM
586	100	8/10/2022 10:30 AM
587	100	8/10/2022 10:29 AM

588	100	8/10/2022 7:33 AM
589	100	8/10/2022 5:34 AM
590	75	8/9/2022 4:32 PM
591	97	8/9/2022 3:52 PM
592	100	8/9/2022 3:48 PM
593	18	8/9/2022 3:41 PM
594	100	8/9/2022 3:23 PM

Q5 Providing increased width of bicycle facilities, including the width of potential landscaping and buffers improves safety and comfort but may also reduce the ability to increase the amount of on-street parking available along some portions of the corridor. Please move the slider to show the relative importance you feel about these priorities.

Answered: 583 Skipped: 112



ANSWER CHOICES	AVERAGE NUMBER	TOTAL NUMBER	RESPONSES
	78	45,431	583
Total Respondents: 583			

#		DATE
1	100	9/1/2022 7:13 AM
2	43	9/1/2022 6:04 AM
3	24	8/31/2022 11:54 PM
4	100	8/31/2022 11:21 PM
5	100	8/31/2022 11:15 PM
6	99	8/31/2022 10:38 PM
7	100	8/31/2022 9:19 PM
8	99	8/31/2022 8:57 PM
9	100	8/31/2022 8:36 PM
10	100	8/31/2022 8:26 PM
11	100	8/31/2022 7:42 PM
12	100	8/31/2022 7:29 PM
13	100	8/31/2022 7:03 PM
14	0	8/31/2022 6:54 PM
15	100	8/31/2022 6:53 PM
16	100	8/31/2022 6:37 PM

17	52	8/31/2022 6:35 PM
18	100	8/31/2022 6:06 PM
19	100	8/31/2022 6:04 PM
20	34	8/31/2022 5:48 PM
21	100	8/31/2022 5:33 PM
22	100	8/31/2022 5:21 PM
23	66	8/31/2022 5:19 PM
24	98	8/31/2022 5:14 PM
25	100	8/31/2022 5:12 PM
26	0	8/31/2022 5:10 PM
27	2	8/31/2022 5:00 PM
28	100	8/31/2022 4:48 PM
29	34	8/31/2022 4:43 PM
30	100	8/31/2022 4:36 PM
31	100	8/31/2022 3:16 PM
32	100	8/31/2022 3:06 PM
33	16	8/31/2022 3:06 PM
34	100	8/31/2022 2:52 PM
35	99	8/31/2022 2:50 PM
36	100	8/31/2022 2:49 PM
37	0	8/31/2022 2:49 PM
38	98	8/31/2022 2:47 PM
39	68	8/31/2022 2:38 PM
40	49	8/31/2022 2:34 PM
41	100	8/31/2022 2:33 PM
42	100	8/31/2022 2:33 PM
43	100	8/31/2022 2:30 PM
44	100	8/31/2022 2:27 PM
45	100	8/31/2022 2:26 PM
46	100	8/31/2022 2:26 PM
47	100	8/31/2022 2:25 PM
48	44	8/31/2022 2:25 PM
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51	100	8/31/2022 2:16 PM
52	100	8/31/2022 2:15 PM
53	100	8/31/2022 2:14 PM
54	100	8/31/2022 2:11 PM

55	100	8/31/2022 2:08 PM
56	100	8/31/2022 2:04 PM
57	100	8/31/2022 2:03 PM
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59	100	8/31/2022 2:01 PM
60	100	8/31/2022 2:01 PM
61	100	8/31/2022 2:01 PM
62	100	8/31/2022 1:58 PM
63	49	8/31/2022 1:56 PM
64	100	8/31/2022 1:56 PM
65	100	8/31/2022 1:52 PM
66	0	8/31/2022 1:46 PM
67	50	8/31/2022 1:46 PM
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69	100	8/31/2022 1:40 PM
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71	0	8/31/2022 1:32 PM
72	73	8/31/2022 1:27 PM
73	24	8/31/2022 1:23 PM
74	96	8/31/2022 1:09 PM
75	100	8/31/2022 1:04 PM
76	98	8/31/2022 12:53 PM
77	51	8/31/2022 12:36 PM
78	100	8/31/2022 12:19 PM
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86	100	8/31/2022 11:13 AM
87	70	8/31/2022 11:12 AM
88	0	8/31/2022 11:06 AM
89	100	8/31/2022 11:04 AM
90	84	8/31/2022 10:40 AM
91	100	8/31/2022 10:19 AM
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93	100	8/31/2022 9:36 AM
94	100	8/31/2022 9:28 AM
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96	100	8/31/2022 9:26 AM
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100	100	8/31/2022 9:10 AM
101	99	8/31/2022 9:04 AM
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103	98	8/31/2022 9:00 AM
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109	99	8/31/2022 7:05 AM
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121	100	8/30/2022 10:19 PM
122	0	8/30/2022 9:52 PM
123	41	8/30/2022 9:16 PM
124	0	8/30/2022 8:57 PM
125	43	8/30/2022 8:52 PM
126	24	8/30/2022 8:48 PM
127	98	8/30/2022 8:47 PM
128	11	8/30/2022 8:46 PM
129	0	8/30/2022 8:45 PM
130	100	8/30/2022 8:41 PM

131	100	8/30/2022 8:38 PM
132	100	8/30/2022 8:18 PM
133	20	8/30/2022 8:13 PM
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156	52	8/30/2022 1:38 PM
157	47	8/30/2022 1:11 PM
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160	99	8/30/2022 12:46 PM
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167	100	8/30/2022 11:35 AM
168	0	8/30/2022 11:24 AM

169	100	8/30/2022 11:07 AM
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188	100	8/30/2022 7:18 AM
189	98	8/30/2022 7:17 AM
190	100	8/30/2022 7:14 AM
191	100	8/30/2022 7:11 AM
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193	98	8/30/2022 6:56 AM
194	1	8/30/2022 6:44 AM
195	99	8/30/2022 6:44 AM
196	0	8/30/2022 6:37 AM
197	32	8/30/2022 6:33 AM
198	100	8/30/2022 6:32 AM
199	100	8/30/2022 6:28 AM
200	99	8/30/2022 6:25 AM
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202	100	8/30/2022 6:03 AM
203	100	8/30/2022 5:47 AM
204	100	8/30/2022 5:44 AM
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207	100	8/30/2022 4:58 AM
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209	98	8/30/2022 2:01 AM
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211	99	8/29/2022 11:47 PM
212	100	8/29/2022 11:32 PM
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223	100	8/29/2022 9:49 PM
224	100	8/29/2022 9:46 PM
225	100	8/29/2022 9:38 PM
226	100	8/29/2022 9:33 PM
227	99	8/29/2022 9:21 PM
228	100	8/29/2022 9:20 PM
229	99	8/29/2022 9:16 PM
230	41	8/29/2022 9:11 PM
231	9	8/29/2022 9:11 PM
232	12	8/29/2022 9:08 PM
233	100	8/29/2022 9:05 PM
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235	98	8/29/2022 9:00 PM
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240	89	8/29/2022 8:44 PM
241	100	8/29/2022 8:37 PM
242	60	8/29/2022 8:33 PM
243	93	8/29/2022 8:20 PM
244	100	8/29/2022 8:20 PM

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246	100	8/29/2022 8:03 PM
247	100	8/29/2022 8:02 PM
248	100	8/29/2022 8:01 PM
249	100	8/29/2022 7:55 PM
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273	100	8/29/2022 6:51 PM
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315	100	8/29/2022 8:34 AM
316	100	8/29/2022 8:18 AM
317	78	8/29/2022 8:10 AM
318	100	8/29/2022 8:05 AM
319	6	8/28/2022 4:28 PM
320	6	8/28/2022 4:19 PM

321	93	8/28/2022 1:02 PM
322	100	8/27/2022 7:09 PM
323	51	8/27/2022 4:47 PM
324	100	8/27/2022 4:41 PM
325	48	8/27/2022 1:08 PM
326	59	8/27/2022 11:05 AM
327	37	8/27/2022 8:04 AM
328	40	8/27/2022 6:50 AM
329	26	8/27/2022 5:21 AM
330	100	8/26/2022 8:06 PM
331	23	8/26/2022 6:03 PM
332	30	8/26/2022 4:51 PM
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334	21	8/26/2022 2:25 PM
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337	99	8/26/2022 12:01 AM
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341	43	8/25/2022 6:55 PM
342	56	8/25/2022 4:11 PM
343	25	8/25/2022 4:01 PM
344	87	8/25/2022 3:35 PM
345	79	8/25/2022 3:29 PM
346	31	8/25/2022 2:02 PM
347	100	8/25/2022 1:29 PM
348	0	8/25/2022 12:23 PM
349	99	8/25/2022 10:27 AM
350	100	8/25/2022 10:00 AM
351	53	8/25/2022 9:28 AM
352	28	8/25/2022 9:24 AM
353	19	8/25/2022 9:18 AM
354	78	8/25/2022 8:41 AM
355	66	8/25/2022 8:21 AM
356	48	8/25/2022 7:08 AM
357	100	8/25/2022 1:31 AM
358	100	8/24/2022 10:03 PM

359	100	8/24/2022 10:03 PM
360	100	8/24/2022 9:27 PM
361	2	8/24/2022 9:17 PM
362	83	8/24/2022 9:04 PM
363	100	8/24/2022 8:44 PM
364	77	8/24/2022 7:37 PM
365	100	8/24/2022 7:14 PM
366	100	8/24/2022 7:07 PM
367	76	8/24/2022 6:58 PM
368	100	8/24/2022 6:45 PM
369	100	8/24/2022 5:47 PM
370	48	8/24/2022 5:27 PM
371	78	8/24/2022 5:13 PM
372	100	8/24/2022 4:57 PM
373	100	8/24/2022 4:56 PM
374	100	8/24/2022 4:28 PM
375	100	8/24/2022 4:26 PM
376	52	8/24/2022 4:10 PM
377	28	8/24/2022 3:58 PM
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379	100	8/24/2022 3:51 PM
380	48	8/24/2022 3:49 PM
381	30	8/24/2022 3:40 PM
382	85	8/24/2022 2:48 PM
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384	100	8/24/2022 2:11 PM
385	34	8/24/2022 2:09 PM
386	100	8/24/2022 1:55 PM
387	100	8/24/2022 1:38 PM
388	100	8/24/2022 1:33 PM
389	100	8/24/2022 1:29 PM
390	100	8/24/2022 1:23 PM
391	0	8/24/2022 1:16 PM
392	100	8/24/2022 10:02 AM
393	100	8/24/2022 7:11 AM
394	100	8/24/2022 5:32 AM
395	100	8/24/2022 3:03 AM
396	26	8/23/2022 5:00 PM

397	100	8/23/2022 3:41 PM
398	44	8/23/2022 2:35 PM
399	100	8/23/2022 2:04 PM
400	49	8/23/2022 1:13 PM
401	100	8/23/2022 1:12 PM
402	100	8/23/2022 12:38 PM
403	100	8/23/2022 10:27 AM
404	95	8/23/2022 10:25 AM
405	0	8/23/2022 10:19 AM
406	100	8/23/2022 9:20 AM
407	100	8/23/2022 9:09 AM
408	99	8/23/2022 9:03 AM
409	99	8/23/2022 8:16 AM
410	100	8/23/2022 8:13 AM
411	100	8/23/2022 8:07 AM
412	100	8/23/2022 7:52 AM
413	100	8/23/2022 7:47 AM
414	100	8/22/2022 5:32 PM
415	63	8/22/2022 4:45 PM
416	100	8/22/2022 4:10 PM
417	77	8/22/2022 3:49 PM
418	100	8/22/2022 2:09 PM
419	4	8/22/2022 1:38 PM
420	98	8/22/2022 1:18 PM
421	100	8/22/2022 1:12 PM
422	100	8/22/2022 12:30 PM
423	26	8/22/2022 12:19 PM
424	100	8/22/2022 11:45 AM
425	100	8/22/2022 11:09 AM
426	100	8/22/2022 10:45 AM
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428	50	8/22/2022 9:40 AM
429	100	8/22/2022 9:33 AM
430	44	8/22/2022 9:32 AM
431	86	8/22/2022 9:30 AM
432	100	8/22/2022 8:29 AM
433	9	8/22/2022 8:27 AM
434	100	8/22/2022 8:26 AM

435	100	8/22/2022 8:20 AM
436	98	8/22/2022 8:03 AM
437	51	8/22/2022 7:54 AM
438	100	8/22/2022 7:52 AM
439	100	8/22/2022 7:28 AM
440	100	8/22/2022 7:22 AM
441	98	8/22/2022 7:14 AM
442	100	8/22/2022 7:10 AM
443	100	8/22/2022 6:48 AM
444	100	8/21/2022 5:07 PM
445	11	8/21/2022 1:26 PM
446	22	8/20/2022 8:34 PM
447	100	8/20/2022 4:11 PM
448	28	8/20/2022 2:10 PM
449	100	8/20/2022 10:59 AM
450	50	8/20/2022 9:59 AM
451	100	8/20/2022 9:03 AM
452	33	8/20/2022 7:43 AM
453	100	8/20/2022 7:09 AM
454	100	8/19/2022 6:48 PM
455	0	8/19/2022 6:24 PM
456	98	8/19/2022 5:28 PM
457	48	8/19/2022 9:44 AM
458	100	8/19/2022 9:42 AM
459	100	8/19/2022 9:01 AM
460	16	8/18/2022 2:44 PM
461	97	8/18/2022 12:36 PM
462	89	8/18/2022 11:43 AM
463	28	8/18/2022 10:57 AM
464	100	8/18/2022 8:20 AM
465	38	8/17/2022 12:34 PM
466	74	8/17/2022 9:15 AM
467	100	8/17/2022 7:51 AM
468	51	8/17/2022 5:25 AM
469	100	8/17/2022 3:28 AM
470	100	8/16/2022 9:29 PM
471	100	8/16/2022 9:23 PM
472	100	8/16/2022 7:47 PM

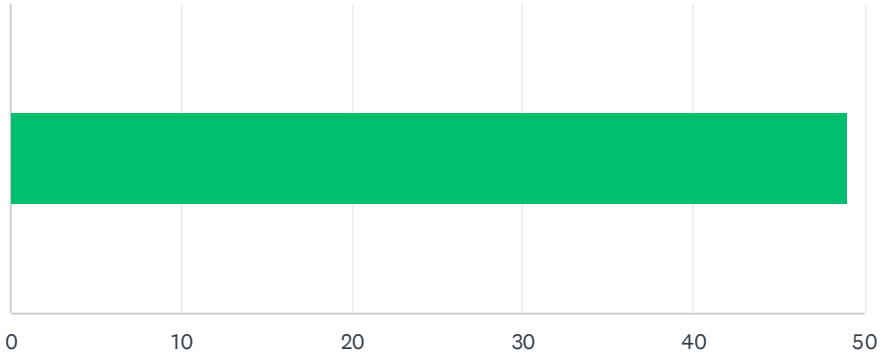
473	49	8/16/2022 4:52 PM
474	37	8/16/2022 4:33 PM
475	0	8/16/2022 4:32 PM
476	0	8/16/2022 4:21 PM
477	0	8/16/2022 4:08 PM
478	30	8/16/2022 3:33 PM
479	0	8/16/2022 3:11 PM
480	100	8/16/2022 2:31 PM
481	54	8/16/2022 2:21 PM
482	100	8/16/2022 1:49 PM
483	100	8/16/2022 1:46 PM
484	100	8/16/2022 1:33 PM
485	2	8/16/2022 1:18 PM
486	100	8/16/2022 12:52 PM
487	100	8/16/2022 12:13 PM
488	0	8/16/2022 11:18 AM
489	74	8/16/2022 11:11 AM
490	100	8/16/2022 10:55 AM
491	100	8/16/2022 9:22 AM
492	46	8/15/2022 8:29 PM
493	100	8/15/2022 8:27 PM
494	7	8/15/2022 6:40 PM
495	27	8/15/2022 2:21 PM
496	54	8/15/2022 12:55 PM
497	77	8/15/2022 12:55 PM
498	1	8/15/2022 12:06 PM
499	53	8/15/2022 11:40 AM
500	49	8/15/2022 10:11 AM
501	11	8/15/2022 9:57 AM
502	79	8/15/2022 8:20 AM
503	38	8/14/2022 9:12 PM
504	100	8/14/2022 5:56 PM
505	82	8/14/2022 5:23 PM
506	51	8/14/2022 4:36 PM
507	0	8/14/2022 4:21 PM
508	19	8/14/2022 9:38 AM
509	100	8/14/2022 8:09 AM
510	100	8/13/2022 10:28 PM

511	54	8/13/2022 10:03 PM
512	51	8/13/2022 9:12 PM
513	100	8/13/2022 9:01 PM
514	49	8/13/2022 3:30 PM
515	100	8/13/2022 12:21 PM
516	100	8/13/2022 8:49 AM
517	0	8/13/2022 8:48 AM
518	0	8/13/2022 8:32 AM
519	100	8/13/2022 7:56 AM
520	100	8/13/2022 7:00 AM
521	100	8/12/2022 11:58 PM
522	100	8/12/2022 6:12 PM
523	31	8/12/2022 3:51 PM
524	100	8/12/2022 12:20 PM
525	52	8/12/2022 10:28 AM
526	100	8/12/2022 8:58 AM
527	53	8/12/2022 8:51 AM
528	100	8/12/2022 8:38 AM
529	100	8/12/2022 8:37 AM
530	100	8/12/2022 7:12 AM
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534	100	8/12/2022 12:47 AM
535	100	8/11/2022 11:20 PM
536	100	8/11/2022 10:54 PM
537	100	8/11/2022 10:52 PM
538	100	8/11/2022 10:31 PM
539	100	8/11/2022 9:41 PM
540	100	8/11/2022 9:35 PM
541	100	8/11/2022 9:34 PM
542	100	8/11/2022 9:04 PM
543	100	8/11/2022 8:43 PM
544	100	8/11/2022 8:22 PM
545	100	8/11/2022 8:06 PM
546	100	8/11/2022 8:00 PM
547	100	8/11/2022 7:47 PM
548	51	8/11/2022 7:46 PM

549	100	8/11/2022 7:28 PM
550	100	8/11/2022 7:14 PM
551	100	8/11/2022 7:14 PM
552	100	8/11/2022 7:11 PM
553	100	8/11/2022 7:11 PM
554	100	8/11/2022 7:07 PM
555	97	8/11/2022 7:01 PM
556	100	8/11/2022 6:54 PM
557	100	8/11/2022 6:47 PM
558	48	8/11/2022 6:47 PM
559	100	8/11/2022 6:43 PM
560	12	8/11/2022 5:15 PM
561	0	8/11/2022 3:56 PM
562	52	8/11/2022 1:43 PM
563	76	8/11/2022 12:26 PM
564	0	8/11/2022 11:22 AM
565	62	8/11/2022 11:04 AM
566	30	8/11/2022 8:31 AM
567	50	8/11/2022 8:08 AM
568	87	8/11/2022 8:01 AM
569	7	8/10/2022 1:41 PM
570	0	8/10/2022 1:21 PM
571	100	8/10/2022 12:11 PM
572	90	8/10/2022 11:33 AM
573	51	8/10/2022 11:23 AM
574	100	8/10/2022 11:04 AM
575	100	8/10/2022 10:30 AM
576	100	8/10/2022 10:29 AM
577	100	8/10/2022 7:33 AM
578	100	8/10/2022 5:34 AM
579	100	8/9/2022 4:32 PM
580	100	8/9/2022 3:52 PM
581	100	8/9/2022 3:48 PM
582	0	8/9/2022 3:41 PM
583	100	8/9/2022 3:23 PM

Q6 Dedicating additional space for people walking, biking, rolling, and taking transit may reduce the space available for people driving. Operations will be evaluated to ensure that the corridor continues to operate according to adopted mobility standards. However, there may still be tradeoffs between vehicle throughput and safety and comfort for people walking, biking, rolling, and taking transit. Please move the slider to show the relative importance you feel about these priorities.

Answered: 339 Skipped: 356



ANSWER CHOICES	AVERAGE NUMBER	TOTAL NUMBER	RESPONSES
	49	16,642	339
Total Respondents: 339			

#		DATE
1	65	9/1/2022 6:04 AM
2	100	8/31/2022 11:54 PM
3	0	8/31/2022 11:21 PM
4	0	8/31/2022 11:15 PM
5	100	8/31/2022 11:08 PM
6	49	8/31/2022 10:38 PM
7	2	8/31/2022 10:19 PM
8	3	8/31/2022 8:36 PM
9	0	8/31/2022 7:50 PM
10	4	8/31/2022 7:29 PM
11	100	8/31/2022 6:54 PM
12	100	8/31/2022 6:35 PM
13	75	8/31/2022 5:48 PM
14	0	8/31/2022 5:33 PM

15	40	8/31/2022 5:19 PM
16	100	8/31/2022 5:10 PM
17	100	8/31/2022 5:00 PM
18	29	8/31/2022 4:48 PM
19	76	8/31/2022 4:43 PM
20	87	8/31/2022 3:06 PM
21	50	8/31/2022 2:49 PM
22	76	8/31/2022 2:49 PM
23	100	8/31/2022 2:47 PM
24	47	8/31/2022 2:38 PM
25	100	8/31/2022 2:37 PM
26	1	8/31/2022 2:33 PM
27	0	8/31/2022 2:25 PM
28	61	8/31/2022 2:25 PM
29	78	8/31/2022 2:18 PM
30	0	8/31/2022 2:08 PM
31	100	8/31/2022 1:46 PM
32	100	8/31/2022 1:46 PM
33	5	8/31/2022 1:44 PM
34	7	8/31/2022 1:36 PM
35	68	8/31/2022 1:23 PM
36	14	8/31/2022 1:09 PM
37	100	8/31/2022 1:04 PM
38	0	8/31/2022 12:53 PM
39	62	8/31/2022 12:36 PM
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41	91	8/31/2022 9:39 AM
42	100	8/31/2022 9:13 AM
43	1	8/31/2022 9:13 AM
44	0	8/31/2022 9:11 AM
45	0	8/31/2022 9:04 AM
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47	99	8/31/2022 9:00 AM
48	74	8/31/2022 8:41 AM
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51	13	8/31/2022 6:56 AM
52	100	8/31/2022 6:39 AM

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55	88	8/30/2022 9:52 PM
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57	99	8/30/2022 8:57 PM
58	92	8/30/2022 8:48 PM
59	0	8/30/2022 8:47 PM
60	83	8/30/2022 8:46 PM
61	95	8/30/2022 8:45 PM
62	0	8/30/2022 8:41 PM
63	69	8/30/2022 8:13 PM
64	4	8/30/2022 8:06 PM
65	74	8/30/2022 8:05 PM
66	96	8/30/2022 7:58 PM
67	8	8/30/2022 7:49 PM
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76	100	8/30/2022 2:45 PM
77	20	8/30/2022 2:44 PM
78	100	8/30/2022 2:41 PM
79	68	8/30/2022 2:14 PM
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81	0	8/30/2022 12:46 PM
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83	100	8/30/2022 12:31 PM
84	100	8/30/2022 12:09 PM
85	0	8/30/2022 12:08 PM
86	70	8/30/2022 12:03 PM
87	71	8/30/2022 11:52 AM
88	92	8/30/2022 11:51 AM
89	0	8/30/2022 11:35 AM
90	3	8/30/2022 11:04 AM

91	11	8/30/2022 10:39 AM
92	77	8/30/2022 10:16 AM
93	0	8/30/2022 9:30 AM
94	4	8/30/2022 9:05 AM
95	0	8/30/2022 8:26 AM
96	0	8/30/2022 7:56 AM
97	100	8/30/2022 7:20 AM
98	0	8/30/2022 7:17 AM
99	0	8/30/2022 7:14 AM
100	1	8/30/2022 7:11 AM
101	1	8/30/2022 6:59 AM
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114	82	8/29/2022 9:08 PM
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117	0	8/29/2022 8:44 PM
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121	11	8/29/2022 8:16 PM
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128	0	8/29/2022 6:50 PM

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175	100	8/25/2022 12:23 PM
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180	99	8/25/2022 9:24 AM
181	100	8/25/2022 9:18 AM
182	38	8/25/2022 8:41 AM
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184	31	8/25/2022 7:08 AM
185	100	8/25/2022 1:31 AM
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204	80	8/24/2022 3:40 PM

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225	50	8/23/2022 7:07 AM
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232	0	8/22/2022 12:19 PM
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237	95	8/22/2022 8:27 AM
238	0	8/22/2022 8:03 AM
239	5	8/22/2022 7:54 AM
240	2	8/22/2022 7:14 AM
241	0	8/21/2022 3:52 PM
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243	88	8/20/2022 8:34 PM
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260	36	8/17/2022 7:51 AM
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267	100	8/16/2022 4:08 PM
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269	100	8/16/2022 3:11 PM
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273	100	8/16/2022 1:18 PM
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277	76	8/16/2022 11:11 AM
278	100	8/16/2022 10:21 AM
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280	100	8/15/2022 6:40 PM

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282	78	8/15/2022 12:55 PM
283	79	8/15/2022 12:55 PM
284	100	8/15/2022 12:06 PM
285	53	8/15/2022 11:40 AM
286	85	8/15/2022 10:11 AM
287	87	8/15/2022 9:57 AM
288	52	8/15/2022 8:20 AM
289	94	8/14/2022 9:12 PM
290	15	8/14/2022 5:23 PM
291	78	8/14/2022 4:36 PM
292	100	8/14/2022 4:21 PM
293	100	8/14/2022 9:38 AM
294	0	8/14/2022 8:09 AM
295	100	8/14/2022 1:35 AM
296	52	8/13/2022 10:03 PM
297	100	8/13/2022 9:12 PM
298	92	8/13/2022 9:01 PM
299	74	8/13/2022 3:30 PM
300	100	8/13/2022 3:25 PM
301	64	8/13/2022 8:49 AM
302	39	8/13/2022 8:48 AM
303	69	8/13/2022 8:32 AM
304	0	8/13/2022 7:00 AM
305	51	8/12/2022 6:12 PM
306	52	8/12/2022 3:51 PM
307	0	8/12/2022 12:20 PM
308	71	8/12/2022 10:28 AM
309	100	8/12/2022 7:30 AM
310	0	8/12/2022 7:12 AM
311	15	8/12/2022 2:32 AM
312	100	8/11/2022 9:34 PM
313	0	8/11/2022 8:43 PM
314	0	8/11/2022 8:06 PM
315	43	8/11/2022 7:46 PM
316	0	8/11/2022 7:28 PM
317	0	8/11/2022 7:11 PM
318	0	8/11/2022 7:07 PM

319	5	8/11/2022 7:01 PM
320	47	8/11/2022 6:47 PM
321	39	8/11/2022 5:15 PM
322	100	8/11/2022 3:56 PM
323	75	8/11/2022 1:43 PM
324	57	8/11/2022 12:26 PM
325	100	8/11/2022 11:22 AM
326	64	8/11/2022 11:04 AM
327	50	8/11/2022 8:31 AM
328	0	8/11/2022 8:01 AM
329	100	8/10/2022 1:41 PM
330	100	8/10/2022 1:21 PM
331	20	8/10/2022 12:11 PM
332	25	8/10/2022 11:33 AM
333	87	8/10/2022 11:23 AM
334	1	8/10/2022 11:04 AM
335	1	8/10/2022 7:33 AM
336	0	8/10/2022 5:34 AM
337	46	8/9/2022 4:32 PM
338	90	8/9/2022 3:52 PM
339	100	8/9/2022 3:41 PM

Q1 Do you have any additional comments or input? Please share them below.

Answered: 509 Skipped: 0

#	RESPONSES	DATE
1	Oregon City tried this and FAILED. Cost them a ton of money to revert it back. Grants Pass Task Force just voted down something real similar. DONT KILL THE DOWNTOWN SHOPPPING. Downtown is vital for every town and city.	9/1/2022 7:57 AM
2	Stop the road diet!!!	9/1/2022 7:52 AM
3	I think having a "Road Diet" though downtown Medford would be a big mistake. You can barely cross the road west to east as it is during rush hour, now you'd wait half an hour for an opening. It worked so well in downtown Phoenix that the changed it back to two lanes already. Let Portland stay up north, we do not need there influence in our community. They are two completely different cities, keep it that way	9/1/2022 7:44 AM
4	No road diet	9/1/2022 7:38 AM
5	Stupid idea! It takes long enough now to drive through town; this will screw things up even more and having me ignore Medford except for medical visits. I'll do my library visits to smaller branches and will drive to Grants Pass for my groceries. :-(	9/1/2022 7:25 AM
6	I believe this will contribute more pollution to the air due to much more vehicle congestion. The volume of bikers compared to vehicles isn't even comparable. If you do go thru with this, how will the bikers contribute financially to the project designed for them?	9/1/2022 6:41 AM
7	The only bicyclists we have have are junkies that are wearing proper gear or following any rules anyway. This doesn't help them or drivers	9/1/2022 6:15 AM
8	I feel that if this road change will hurt the downtown area more than it will help. You saw what happened in Phoenix. You see what's happening in Portland! Why would you want that for our town? Why would you want to hurt the downtown area for something that looks good on paper but in real life won't work for us? It's 100+ degrees out there in the summer. No one is going to be riding bikes. We need more parking if anything. Build a parking garage if you must. But not bike lanes. Thank you, Tamara Grass	9/1/2022 6:04 AM
9	This would make it more difficult to access businesses for paying customers and easier for the criminal element stealing bikes and riding them around to access business and commit further crimes. With the Smokey summers and mask mandates, no one is riding their bikes to WORK.	9/1/2022 5:37 AM
10	No good	9/1/2022 5:23 AM
11	I say it should be voted on by registed tax paying people.	9/1/2022 5:07 AM
12	No road diet!!	9/1/2022 1:05 AM
13	I live in West Medford and I am car-free by choice, so I do EVERYTHING on foot or by bicycle. Thank you for these coming improvements downtown, and for the recent ones on N. Ross (between Rossanley and W Main) and on Columbus! They have made my life so much safer!	9/1/2022 12:00 AM
14	More bike lanes? Do you want the drivers to cut off more bikers and hikers?! We need wider roads and more car lanes. Do you think this will solve congestion? The population went up. Hence more cars. Get a clue!	8/31/2022 11:48 PM
15	Sounds like this is a horrible idea with more traffic and not enough roads space for	8/31/2022 11:32 PM
16	I approve this message. 541-292-7437	8/31/2022 11:27 PM
17	Creating more traffic issues will not make pedestrians and bicyclist safer. It will put them more at risk from more congestion and frustration. Tax bicycles and pedestrians as much as motorist before giving them more. NO NO NO NO!	8/31/2022 11:22 PM

18	Please no road diet.	8/31/2022 11:22 PM
19	If they must make a bike lane do it on a side street leave the main arteries in and out of town for cars. Quit taking away our traffic lanes!	8/31/2022 11:21 PM
20	The "road diet" for the city of medford would cause the citze to lose valuable space in case of evacuations due to natural disasters. The Greenway was constructed for bicyclists and walkers. There is no reason the roads need to be narrowed to accommodate bicyclists when there is already facilities in place for them. The citynof medford needs to use the funds to deal with the Greenway issues instead of pretend like they aren't there.	8/31/2022 11:20 PM
21	The "road diet" for the city of medford would cause the citze to lose valuable space in case of evacuations due to natural disasters. The Greenway was constructed for bicyclists and walkers. There is no reason the roads need to be narrowed to accommodate bicyclists when there is already facilities in place for them. The citynof medford needs to use the funds to deal with the Greenway issues instead of pretend like they aren't there.	8/31/2022 11:20 PM
22	It’s already too crowded to drive through Medford. This will be a disaster if it goes through.	8/31/2022 11:12 PM
23	I do not want to see the roads made for bicycle paths. That's what the Greenway is for. They don't need holding up traffic on the roads. If they want to ride on roads they should have to follow the rules of the road. We don't need our car lanes cut back any more to cause more traffic congestion. Just saying. They can ride the road or green way they don't need a designated lane to ride.	8/31/2022 11:12 PM
24	Do not put in the bike lanes	8/31/2022 11:12 PM
25	Please don't make the road narrower... it's already so hard to get around that side of town. My mother has cancer and we drive to and by providence every few days and it's a very frustrating experience. Sincerely, April Schneider 541-613-0557	8/31/2022 10:58 PM
26	Who's Fucking Wet Dream Was This,"KATE BROWN as in nose".	8/31/2022 10:51 PM
27	Use front street for the bikers. Downtown medford is already bad enough with your 20mph and your speed cameras. If you go ahead with your disgusting plan what are the percentages of accidents you've worked into your equations. Already bad enough for the businesses with your parking meters and does traps. A BIG NO from this family.	8/31/2022 10:38 PM
28	Very BAD idea!!!	8/31/2022 10:38 PM
29	Please dont do it! Its already hard enough, this would make downtown unbearable to drive through!	8/31/2022 10:36 PM
30	Please no more road diets. Change one of the side roads for bikes if you must but leave our main arteries in and out of town alone!	8/31/2022 10:30 PM
31	NO ROAD DIET. These roads are main traffic roads through the middle of town. Also used as detours in the event that the freeway is closed or blocked. Eliminating even one lane from an already busy road would cause way more problems. Local businesses would suffer. People with mobility issues are not likely to come into town to visit businesses they can't easily access.	8/31/2022 10:28 PM
32	NO. Stop diverting attention away from much bigger issues going on.	8/31/2022 10:27 PM
33	The roads are already over congested if you make them have less lanes you will create more accidents	8/31/2022 10:22 PM
34	All this does is increase the chance of more traffic accidents.Most bike riders dont obey the rules of the road anyhow. Many of them run stop signs, red lights etc. All your going to do is make traffic more congested. I vote NO Road Diet!	8/31/2022 10:22 PM
35	NO. I have to drive through Medford traffic several times and operate a business downtown. This is bullshit. It's hard enough to get people to come downtown. Tired of the pandering to special interests that don't even pay for the f****** roads	8/31/2022 10:19 PM
36	NO! NO! NO! NO! NO!	8/31/2022 10:19 PM
37	Please stop messing up the traffic patterns. You're going to create evacuation problems and It will only get worse as Medford continues to grow. Bikes are great, but How about a little common sense here?	8/31/2022 10:18 PM

38	Foolish idea medford has too much traffic flow to do a road diet. Let the bikers use the sidewalk along with the few pedestrian users. WAKE UP	8/31/2022 10:14 PM
39	Please NO bike lanes. Downtown is suffering already. Don't push shoppers away!! Don't do it.	8/31/2022 10:14 PM
40	No road diet …. Stop the stupid bike lanes	8/31/2022 9:54 PM
41	Don’t proceed with making the road smaller for bikes , people can ride the greenway (actually due to safety reasons from homeless population, they can’t ride that pretty trail safely)	8/31/2022 9:52 PM
42	I don’t believe enough people ride bikes on these roads to warrant this action and cause unnecessary travel issues for drivers who are the vast majority of people traveling those roads. I drive this route daily from CP and I work on E McAndrews. The only people I see in this area are on foot. Most are houseless individuals maneuvering baby strollers of what amounts to an unstable sleigh of stuff strapped to the cart. This is what is dangerous to the citizens of Jackson County using the roads. Any bicycle rider I encounter- which is rarely on these roads - has never been an issue in my experience. If this is the direction our county is choosing to go, then I would like to see a mandatory bicycle license and tax. It wouldn’t apply to residential neighborhoods or off-highway mountain bike riding. It should strictly apply to all bicycle riders who elect to use their bicycle as transportation on busy highways and main roads. It can be similar to a dune rider permit sticker, which would prevent theft. I would also like to see bicycle safety equipment enforced for these riders including, a helmet, reflectors, & a headlight. This tax does not seem any different to me than the boat permit I must carry for my inflatable paddle board or the list of safety equipment I must carry on my board. I vote no on the road diet.	8/31/2022 9:51 PM
43	Don’t do it.	8/31/2022 9:49 PM
44	Stop the road diet	8/31/2022 9:44 PM
45	Why would the city of Medford take traffic lanes away from an already congested area to give them to bicycle traffic that I barely see traveling these roads. Stupidity at its best. Medford please rethink this.	8/31/2022 9:36 PM
46	No road diet	8/31/2022 9:34 PM
47	I am grateful that interest is being shown for safer and more practical bicycle travel in Medford.	8/31/2022 9:27 PM
48	Please do not take lanes away from downtown. The traffic is already terrible and it will only hurt local businesses. We have the Greenway for bicycle traffic, we do not need bike lanes. It is completely unnecessary. Thank you for your time.	8/31/2022 9:24 PM
49	Traffic	8/31/2022 9:09 PM
50	I rarely see cyclists in downtown Medford, but I do see many many vehicles. Use your common sense!	8/31/2022 9:07 PM
51	Road diets are a health risk to the public. They inhibit evacuation in the event of a natural disaster. It was hard enough to evacuate in 2020 with the fires and we continue to be at risk of more year after year. These road diets put all of us at risk. I am opposed to reducing main roadway car traffic access.	8/31/2022 9:03 PM
52	We have plenty of bike lanes- most are rarely used. Cars / car owners pay taxes and they fill the roads.	8/31/2022 8:58 PM
53	Need more time on this. Sounds like most folks did not know about this.	8/31/2022 8:56 PM
54	No road diet for Medford, Oregon.	8/31/2022 8:55 PM
55	NO BIKE LANE IN MEDFORD NO TO RAOD DIET WE WANT ALL 3 LANES FOR VEHICLES!	8/31/2022 8:53 PM
56	No road diet in Medford!	8/31/2022 8:52 PM
57	Please no road diet	8/31/2022 8:51 PM
58	This has to stop for security of people escaping during fires not to mention the back ups all ready on Columbus and Lozier lane is stupid for the city to stop the flow of traffic especially with gas prices so high!! Make our city with more streets and safe for all drivers as well as pedestrians because this is crazy what’s happening to Medford!! Hardly anyone rides bikes as	8/31/2022 8:49 PM

	most homeless don't cross at crosswalk as it is!! Start protecting those of us who actually pay taxes and work over those who do whatever they want for the taking!!	
59	This road diet is a terrible idea.	8/31/2022 8:49 PM
60	The road is already congested enough, bikers have plenty of space on the greenway that is what it what it was originally designed for right? Fix the problems on the greenways so they can ride free of cars and homless interference, do not inconvenience motorists travel in an already difficult area...	8/31/2022 8:48 PM
61	The streets are already crowded enough where you're planning it, people on drugs already use the entire street as a bike lane and it won't help traffic in any way, shape or form	8/31/2022 8:47 PM
62	Stop reducing driving lanes. It creates traffic congestion in an increasing populated area and will only get worse over time.	8/31/2022 8:43 PM
63	Stop the road diet project.	8/31/2022 8:41 PM
64	Do not do the road diet	8/31/2022 8:27 PM
65	STOP THE ROAD DIET!	8/31/2022 8:24 PM
66	I have 3 bikes. A mountain, a road and an E bike. I take McAndrews frequently, and would not dream of riding any of my bikes near that traffic. As much as I love to ride my bike, I would NEVER ride my bike there.	8/31/2022 8:18 PM
67	Please stop this is ridiculous we didn't ask for it	8/31/2022 8:17 PM
68	I am NOT in favor of a Road Diet. It will ruin downtown- cause more congestion/delays and bike lanes are a waste of taxpayer's hard earned dollars because not enough people will use them.	8/31/2022 8:15 PM
69	Road diets make all of us less safe. As we saw in the Almeda fire emergency, limiting the use of roads traps people when they need to exit an area and limits the ability of emergency personnel responding to incidents. Stop reducing our roads and putting us all at higher risk of being trapped. Stop using taxpayer dollars on something so unhelpful.	8/31/2022 8:13 PM
70	Don't do it!	8/31/2022 8:09 PM
71	Please stop the road diet. This only makes roads more congested. If you are going to reduce lanes in the middle of town, at least add another freeway exit so we don't have to drive through this town. Reducing lanes is the opposite of innovation and growth for this town. I am an extremely disappointed tax payer, long time resident, and homeowner.	8/31/2022 8:04 PM
72	No to the road diet....	8/31/2022 8:00 PM
73	No Road diet. This will make more congestion. Our area is already growing past the roads available, making less options does not make sense.	8/31/2022 7:56 PM
74	Please no	8/31/2022 7:53 PM
75	Please spend my tax dollars cleaning up the greenway so I can safely ride my through Medford, and leave the 3 lanes as they are. We don't need more congestion downtown. As if you could safely even lock your bike up downtown if you wanted to shop or dine anyway.	8/31/2022 7:52 PM
76	No road diet!! Get the greenway cleaned up, it was meant for bicycles!	8/31/2022 7:44 PM
77	Terrible idea. I've watched Medford get increasingly more congested every year...this will make it worse...I grew up in Talent and watching how ineffective and non sensible this was in Phoenix and Ashland (which have much less traffic) makes me wonder how in the world anyone thought this was a good idea.	8/31/2022 7:43 PM
78	The streets are already congested as it is we don't need more bike lanes.	8/31/2022 7:41 PM
79	I think it's a terrible plan.	8/31/2022 7:33 PM
80	NO ROAD DIET!!!! Clean up the Greenyway! Use the money to hire more police! We want our Greenway back! This city needs to figure out the homeless issue! Like now! Have any of the people who are for the road diet noticed how much traffic we now have? What in the hell are they thinking when they want to cut lanes? Insane! No! We have bigger issues to deal with!	8/31/2022 7:32 PM
81	I do not wish to see a bike lane in downtown. The traffic is bad enough, there are minimal	8/31/2022 7:32 PM

	cyclists in Medford already, If our downtown area was more metropolitan and had housing and such in the area then this proposed idea would make sense. Medford is too sparse to justify a dedicated bike lane, people aren't going to suddenly start cycling on it. Speaking for myself and my wife, we would like to see the money spent addressing the greenway. I would even like to see a multi city initiative, the greenway is a beautiful route through are city. And connects multiple towns, and businesses with a safe path for transporting. Most of this proposed bike lane is already less than a quarter mile from the green way, fixing the greenway would do more good than this proposed bike lane.	
82	Traffic is bad downtown already. Eliminating lanes will make it worse. First we need to figure out how to make cars, bikes, and pedestrians follow the traffic laws	8/31/2022 7:31 PM
83	STOP THE ROAD DIETS!! IT'S VERY DANGEROUS TO CREATE MORE BACKUP ON THE ROADS THAN THERE ALREADY IS. THIS TOWN IS ALREADY TERRIBLE WITH THE ROAD RAGE AND THIS WILL JUST MAKE THINGS WORSE!	8/31/2022 7:28 PM
84	Vote no. Not a good idea	8/31/2022 7:23 PM
85	Let's not enable more homeless drug addicts to take over downtown Medford, but keep the traffic flowing I stead. Let's be reasonable!	8/31/2022 7:20 PM
86	NO ROAD DIET IT IS DANGEROUS HIGH FOR EVACUATIONS 2 LANES FOR THOUSANDS UPON THOUSANDS OF CARS THERES BARLEY ANY ROOM WITH 3 LANES AS IT IS IMAGINE 2 LANES THATS CLOSE PROXIMITY WITH BIKE LANES SOMETIMES TRUCKS GO DOWN RIVERSIDE VERY DANGEROUS FOR BIKERS ASWELL	8/31/2022 7:20 PM
87	It will create more backed up traffic and with the fire that happened in 2020 if you only have one lane that will cause a nightmare of a situation! What about the fire that just happened on central. If that would have been in the day and on a red flag day that could've been far worse. What if you had one lane. Downtown is already busy! We don't need a road diet!	8/31/2022 7:20 PM
88	Bad idea! Remember Phoenix?	8/31/2022 7:17 PM
89	Please DO NOT do this. Roads are already so full with the minimal lanes we have.	8/31/2022 7:12 PM
90	Stoooooop with the road diets! We will never have more bikes than cars. Never. Whoever designed the bike lanes heading west from Hedrick on Jackson should be questioned. Looks as though someone was inebriated when painting the lines, and we're supposed to drive within them?! Every road that has been narrowed has caused more congestion. Please. Stop.	8/31/2022 7:11 PM
91	Why on earth do these idiots want to do a road diet in a city with high vehicle traffic and that Has tons of wild fires every year?!! That puts all the citizens at risk if a evacuation was ordered! Didn't any of you learn anything from the paradise fires and the Almeda fire?! So many life's lost needlessly! Screw the road diet! Take that crappy idea to Ashland	8/31/2022 7:10 PM
92	We need these roads for vehicles. Make alternative routes for bicycles. It isn't safe to ride down Main Street as it is.	8/31/2022 7:08 PM
93	I don't think you should add bike lanes to those main roads. The parking is essential for businesses and if you would clean up the Greenway the way you said you would then there would be plenty of bike access.	8/31/2022 7:08 PM
94	As you prepare to make changes to major arteries in Medford, please ask how the proposed changes will decrease the ability for evacuation during a major fire or other disaster. I have been stuck in traffic twice by fires recently and it is frightening when the fire is coming closer and traffic isn't moving. I thought after the Alameda fire it was determined we needed more ways to evacuate people. Maybe Medford didn't evaluate evacuation procedures since the fire that year wasn't in the city limits.	8/31/2022 7:06 PM
95	This is a terrible idea. Please stop trying to turn Oregon into California.	8/31/2022 7:02 PM
96	No mcAndrews is already so busy we do not need a bike lane please reconsider - we need all the lanes we can have. Not Portland or Eugene	8/31/2022 6:55 PM
97	Boo road diet!! Traffic is sometime already so backed up on our narrow roads with the homeless jumping in and out of traffic this will be a absolute disaster!	8/31/2022 6:54 PM
98	STOP THE ROAD DIET. This is TERRIFYING. As someone who was stuck on Hwy99 in the middle of the Almeda fire, 1 lane is TERRIFYING. Stop, just please, stop. It does not make sense in the case of an emergency. Who is voting for this?!?!	8/31/2022 6:52 PM

99	Extremely poor idea! Extreme fire hazard, extreme congestion, extremely poor use of resources being wasted in extremely few bikes.	8/31/2022 6:52 PM
100	I ditto what Bill Meyer said. So many great points. Cutting down main arterials? What? Who does that? And add bike lanes to the 3rd worst area on your list? Come on! My comment to the city of Medford re the Road Diet bike lane proposal for Riverside, Court, E. Main, Central: Hello, City of Medford. This entire study is designed to "tick the boxes" on a pre-determined outcome/consensus process that we're to get a "Road Diet" good and hard. The answer is NO. Slicing a third of the vehicle capacity of the MAIN ARTERIAL routes is a crime against the people. Bicycle traffic must be accommodated on a lower traffic/lower priority street system. I would add that state law already prohibits this consensus-based process being used when other laws and remedies exist, so why are you using this process? Community health and safety dictates that these main routes retain the highest capacity for vehicular traffic possible. Not only is this needed for daily transportation needs, commercial, commuting, and shopping, but there's the necessity of maximum road capacity for emergency evacuation and disaster purposes. Medford is not Portland. This plan to starve the downtown of vehicle travel capacity so that we'll force 82-year olds to bicycle to their cardiologist is Soviet thinking at its most despicable. Have you checked the demographics of this area? We are aging and have hot summers and cold winters. Not a place that would steal conventional traffic lanes from these key roads to hand over to lightly traveled seasonal transportation options. It's clear that you're under pressure (much of this agenda-based) to comply with the Governor's and state goals to reduce vehicle traffic. However, these are the people's roads and lives you are toying with. The City must push "up the food chain" to the governor and state that the majority of residents aren't interested in the Governor's emission or miles-traveled goals, which is what is REALLY driving this questionable "consensus process" survey and open house. You might consider putting these road diet plans to a vote of the people, with clear, open public debate in hearings, too, rather than this self-selected electronic ONLY input process. I imagine the reason these major life-changing decisions aren't put before a vote of the people is that it's safe to assume they would FAIL MISERABLY at the ballot box. That's the REAL public input you must consider. Stop the insanity, NO BUILD option on all of it.	8/31/2022 6:50 PM
101	So now your gonna do what you did in Phoenix and make it not safe when there is an emergency like the Alameda fire making it harder for people to evacuate in an emergency	8/31/2022 6:50 PM
102	I ride my bike from juanippero to sage rd every day if it's not raining, 5 days a week. I can say I do not want bike lanes. I always obey traffic laws, as I am considered a vehicle. With that said I do not want the bike lanes, nor did I want the ones in front of my house. Now my company can't park by my house . And I don't want them downtown either. I know the traffic well since I have lived here 50 years, and know a bike is a part of traffic. I obey the laws and ride just like if I was a motorcycle, we do not need to choke up our already conjested traffic. Leave things as they are!	8/31/2022 6:49 PM
103	Stop the road diet. We don't want it.	8/31/2022 6:46 PM
104	I am against this reduction of auto lanes on main streets. This could be done on parallel secondary streets	8/31/2022 6:43 PM
105	I drive Central & Riverside daily to/from work. At 5pm Riverside is packed with cars, all 3 lanes. Taking a lane away will only make it worse. I never see bikes in the area anyway so who is going to be riding in the bike lane? The impact on Columbus after the road diet causes backups near Santo center during peak hours as well. Was there a traffic study that said otherwise? If so it was not accurate. NO ROAD DIET! It is dangerous in an emergency if evacuations are needed, less cars can safely move through town. Please, no.	8/31/2022 6:42 PM
106	Don’t do it	8/31/2022 6:39 PM
107	Bad idea	8/31/2022 6:26 PM
108	Stop with the road diet, there is already too much congestion in this area!	8/31/2022 6:26 PM
109	Save lives—no road diet!	8/31/2022 6:25 PM
110	Don’t	8/31/2022 6:18 PM
111	Please don’t do this. If a fire was to happen people would be trapped	8/31/2022 6:17 PM
112	Please STOP with the stupid taxpayer waste of dollars on the road diet. It is unnecessary. I don’t believe I’ve seen more than 4 or 5 bicycles in the bike lanes we already have! What is	8/31/2022 6:17 PM

	your point?	
113	Going to one lane would be a disaster for downtown traffic.	8/31/2022 6:14 PM
114	Going to one lane would be a disaster for downtown traffic.	8/31/2022 6:13 PM
115	Would LOVE a to see this happen!	8/31/2022 6:13 PM
116	Stop the road diets	8/31/2022 6:11 PM
117	It's just simply a terrible idea.	8/31/2022 6:11 PM
118	No road diet - how ridiculous can you ppl be to think that would be a good idea.	8/31/2022 6:09 PM
119	This road diet idea is complete idiotic!!!	8/31/2022 6:09 PM
120	No more bile trails please, money is needed in many other areas for daily household and survival needs.	8/31/2022 6:06 PM
121	No road diet!	8/31/2022 6:04 PM
122	I vote no	8/31/2022 6:02 PM
123	I vote NO!!!	8/31/2022 6:01 PM
124	No road diet. Not enough people ride to cause so many issues for other people. My husband and I now avoid Columbus and its even worse during rush hours. No more road diets!!	8/31/2022 6:00 PM
125	The road diet will not be in the best interest of the majority of the citizens of this area. Please do not proceed with this plan, creating more traffic congestion and less safety for our community.	8/31/2022 5:59 PM
126	Please do not take away lanes on our roads, it causes major traffic jams, and people need places to park their cars	8/31/2022 5:57 PM
127	STOP THE ROAD DIET! It’s not what the people want! If this gets approved we need to reevaluate who we vote for!	8/31/2022 5:56 PM
128	There is already so much traffic congestion in Medford. This would be extremely detrimental and add to more traffic congestion. I oppose this proposal.	8/31/2022 5:54 PM
129	JUST PLAIN NO.	8/31/2022 5:51 PM
130	Quit trying to screw up southern Oregon. Traffic is bad enough already. Without choking down traffic. Our streets aren’t able to handle the fallout from this plan. Also we don’t have enough bicyclists to need this.	8/31/2022 5:49 PM
131	A road diet is insane. Roads are designed to move as Many people as possible especially during an emergency. If you cut the capacity back the potential for many people to die is increased What are you thinking. Obviously not for the benefit of the local population. Your agenda is more important then peoples lives. I am not a conservative. I am a realist. Get real and see what you are doing to the average citizen	8/31/2022 5:48 PM
132	I'm against the road diet. It's one of the few main roads in town. Use the money to clean up the greenway and get the homeless the help they need so people can feel safe on the bike path we already have! Not to mention the greenway has fewer streets for a biker to cross, which is the most dangerous point of riding on a street.	8/31/2022 5:48 PM
133	I disagree with widening the bike bath. Only people that use it is the homeless. Your widening it so they can now safely ride down it with another bike in tow that they just stole. The tax paying True Cyclists do not ride downtown Medford. They take Scienic routes away from traffic. Widening this path will not change their mind. Widening the bike path concerns me because you are creating more space and opening it up for pop up tents to settle there. Please! Don’t turn Medford into Portland. This is a heavy traffic route. The only cyclists I ever see are the homeless and they NEVER fallow the rules anyway so doesn’t matter what changes you make. You should be paying money into making it safe for who uses it the most, vehicles.	8/31/2022 5:46 PM
134	It's a horrible idea	8/31/2022 5:46 PM
135	There is not enough room for a bike lane. This isn't New York here. Just stop.	8/31/2022 5:45 PM

136	Why would you narrow McAndrews Eastbound? It is already too narrow. It is the only evacuation route especially from up Roxy Ann area. It is populated with senior care facilities. What happens when an ambulance is stuck in traffic and arrives too late to a senior facility? I lived at Keene and McAndrews. City did a vehicle count 3.5 years ago. That count was over 6,000 vehicles daily then. It's only gotten worse. Since the city owns 10 feet of the southbound homes, If the city really wants a bike lane why not exercise eminent domain and use that space for bike lanes that will not be used. Staff is supposed to work for and represent rhe citizens. This doesn't. This only represents Portland views which aren't appropriate for Medford. Unpopular moves like this will lead to poor relationships between citizens and staff.	8/31/2022 5:45 PM
137	There is not enough room for a bike lane. This isn't New York here. Just stop.	8/31/2022 5:44 PM
138	Please no this is the worst thing ever NO !!!!!!!	8/31/2022 5:41 PM
139	Don't do it!!!!	8/31/2022 5:40 PM
140	I have worked on E Main St for a decade, and I'm pretty open to restructuring the roadways but I have two concerns: 1) Large commercial vehicles (almost semi-truck size) routinely deliver goods to businesses on Main. Often times they can't physically use the alley way because their trucks are so large. They currently park on the far right line while they are delivering their goods. Making Main only 2 lanes would mean it would only become 1 lane every time they are delivering. 2) We have worked really hard with the city and DMA to have parklet seating on Main St. If there was a dedicated bike lake on the right side of the street, there wouldn't be room for a parklet. Thank you!	8/31/2022 5:40 PM
141	No Road Diet!!! Don’t take away downtown. Not everyone can walk easily. And it will invite the homeless to hang out or even camp.	8/31/2022 5:37 PM
142	Please stop with the unnecessary Road changes it's hard enough with as much traffic that we have going through now	8/31/2022 5:36 PM
143	Please stop with the unnecessary Road changes it's hard enough with as much traffic that we have going through now	8/31/2022 5:36 PM
144	We do NOT need this!	8/31/2022 5:36 PM
145	We do NOT need this!	8/31/2022 5:36 PM
146	No Road diet. Beginning to look like Portland, Salem & Eugene	8/31/2022 5:36 PM
147	Businesses have lost parking due to a bike lane that is hardly used on e.Jackson with no parking on one whole side and a lot of handicap parking that we have not seen been used yet because we have them at businesses parking lots	8/31/2022 5:35 PM
148	The redesigned Columbus avenue is proof that this does not work. Many times it take three light cycles to get past Main Street.	8/31/2022 5:34 PM
149	No road diet. Downtown streets already narrow. Don't need separate bike lanes	8/31/2022 5:33 PM
150	Yes! Stop, this is the stupidest idea ever!	8/31/2022 5:33 PM
151	No road diet. Downtown streets already narrow. Don't need separate bike lanes	8/31/2022 5:32 PM
152	No road diet. Downtown streets already narrow. Don't need separate bike lanes	8/31/2022 5:32 PM
153	The amount of bicycle traffic, or lack there of, does not make sense. The traffic in Medford is already packed and this will make the congestion worse. I absolutely do not think a road diet is necessary or needed.	8/31/2022 5:31 PM
154	No	8/31/2022 5:31 PM
155	Bike lanes though this area will make it much harder for school buses to pick up their students in these area, many hotels in the area we stop to load kids. I don’t believe it will be helpful for the community	8/31/2022 5:29 PM
156	Please do NOT give up more roadway to the road diet. If you plan to widen roads first to do so, ok. Jackson Street has a really dangerous area thanks to the added bike lanes. One lane is especially narrow in front of Donut Country (opposite side of Donut Ciuntry) and the swerve near the school is dangerous. Downtown is already scary enough driving thru, a road diet is mail in the coffin. Wish we took a more utilitarian approach to changes and projects. What yields the most net good. ? NO to the road diet.	8/31/2022 5:29 PM

157	The road diet is NOT a solution. It is NOT a good idea at all. It would cause more accidents and be dangerous for everyone	8/31/2022 5:29 PM
158	Road diet in Medford is a terrible idea. Please a couple bikes and hurt the thousands of cars/trucks that travel thru there daily. Terrible idea.	8/31/2022 5:28 PM
159	Bike lanes are recipe for elected officials to be replaced. We will put people in office that represent the majority.	8/31/2022 5:28 PM
160	Please do not remove lanes. Traffic is bad enough.	8/31/2022 5:27 PM
161	Pretty crazy to make the already highest traffic areas in town worse	8/31/2022 5:27 PM
162	I do not thinks this a good idea and as a tax paying member of this county don’t support road diet	8/31/2022 5:26 PM
163	No road diet	8/31/2022 5:26 PM
164	No road diet	8/31/2022 5:26 PM
165	Please put the health of downtown businesses as the primary focus. Making it more difficult to park and removing sidewalk seating will put strain on already struggling businesses. Downtown will be less attractive for commerce to both businesses and customers with potential to create a ghost town .	8/31/2022 5:26 PM
166	No road diet! It would just increase backed up traffic and has proven not to work in neighboring towns!	8/31/2022 5:25 PM
167	Down town Medford is constant stop n go traffic with very crowded street parking, delivery trucks, vans, students n through automobile traffic. Way too busy for bicycles. To have bike lanes on the three busiest streets makes no sense. Use less traffic streets that parallel the three proposed streets to avoid further congestion. I feel bike lanes as proposed will cause motorists to steer away from the area entirely, causing a negative economic impact for down town businesses entirely. Please, listen to the public n take us seriously, publish the results of this survey n don't push your own agenda.	8/31/2022 5:25 PM
168	Just cut the crap.	8/31/2022 5:24 PM
169	No road diet.	8/31/2022 5:24 PM
170	No road diet! This community is growing! Please don’t encourage bikes on roads where main flows of traffic occur. It is way too dangerous!	8/31/2022 5:24 PM
171	Stupid ides	8/31/2022 5:23 PM
172	I am for a two way parking buffered bike lane on main st. I do not think a bike lane is necessary on riverside nor central because the greenway provides a north to south/south to north bike access. No build on riverside and central.	8/31/2022 5:21 PM
173	Against the "road diet" on Riverside and Central, will not agree to eliminate an entire lane on these roads for bike paths, if u can do it and keep the car lanes as is then I would agree. The fact that it's already highly congested and if u do this it will push people to drive thru residential areas to avoid or perhaps cause more traffic on I-5 during peek times, the roads are already a mess ...plus we have the Greenway if you commitment to make it safe to ride the Greenway people would use it but it's not safe and it's disgusting that it can't be used safely for what it was intended..	8/31/2022 5:20 PM
174	The road diet is an awful idea. And this is coming from a family of cyclists. Please stop this crap	8/31/2022 5:20 PM
175	NO road diet!!!!!	8/31/2022 5:18 PM
176	No to bike lanes in downtown Medford	8/31/2022 5:17 PM
177	This is going to hurt not benefit the downtown area. Start listening to the ones that pay taxes rather then favoring in the ones that don’t participate in helping keep Southern Oregon safe and clean!	8/31/2022 5:17 PM
178	Yes STOP “DO NOT CHANGE THE ROAD” ‼	8/31/2022 5:17 PM
179	Do not agree with the plan	8/31/2022 5:16 PM

180	No don’t do it!!	8/31/2022 5:16 PM
181	No road diet in Medford! One lane downtown would cause issues than it would resolve. What if there was another fire, like the Almeda fire, and people had a hard time getting out?! Phoenix had tried this but went back to 2 lanes because of safety issues after the Almeda fire. The only people riding bikes downtown are people who are homeless and they don't care about bike lanes or safety.	8/31/2022 5:15 PM
182	no single lanes in Downtown Medford!!!!!	8/31/2022 5:14 PM
183	I think it would be a waste of dollars to close off streets that are actually FILLED WITH TRAFFIC to appease a very small portion of the populous. This money should be directed to greenway policing, trash removal, and numerous other Projects….maybe a new mail to end the revolving door of injustice here in town…	8/31/2022 5:14 PM
184	I stumbled on this through a Google selection. I wish you could have advertised this survey more widely for those of us who Want to get involved and involve family members and friends for there input.	8/31/2022 5:13 PM
185	Total waste of money. Not that many bikers would be using it, and it would just can just the downtown area.	8/31/2022 5:12 PM
186	This is an awful idea. As a citizen here for 25 years I couldn’t be more against it.	8/31/2022 5:12 PM
187	Roads are already crowded and unsafe. Move bikes to a side road and leave the main roads to the cars. Reducing the lanes is foolish and has proven to cause problems in other areas. No road diet! It's not good for business or drivers.	8/31/2022 5:11 PM
188	Many of us come to Medford from outlying cities and towns. We can’t ride bikes. Please don’t make it harder to drive through Medford by taking away lanes and narrowing the streets. There are many more cars than bicycles!	8/31/2022 5:11 PM
189	Good idea	8/31/2022 5:10 PM
190	We do not have enough bicycle, skateboarders et cetera, to warrant giving up vital parking. I drive these streets frequently and have fraught my brain to try and remember bicycle encounters. I think maybe 4 or 5 in the last year? there is not enough frequency to warrant the cost of constructin and loss of parking.	8/31/2022 5:10 PM
191	No road diet. Not enough people ride to cause so many issues for other people. Columbus sucks to drive now and its even worse during rush hours. No more road diets!!	8/31/2022 5:10 PM
192	We do not have enough bicycle, skateboarders et cetera, to warrant giving up vital parking. I drive these streets frequently and have fraught my brain to try and remember bicycle encounters. I think maybe 4 or 5 in the last year? there is not enough frequency to warrant the cost of constructin and loss of parking.	8/31/2022 5:09 PM
193	This is a terrible idea. For an area that is constantly growing, to narrow main lines through town will only push people away from these areas and kill the business they are trying to rebuild downtown. The slowing of traffic will push people to use alternative routes. They tried it in Phoenix before realizing it was a terrible idea and put it back; Medford has a much larger population you would be messing with traffic flow. It would be disastrous.	8/31/2022 5:09 PM
194	I don’t think this is going to solve any problems! Look at Ashland	8/31/2022 5:09 PM
195	It didn't work in Phoenix, why spend the money. I live in Talent, it is ridiculous. Columbus and Jackson in Medford is an accident waiting to happen.	8/31/2022 5:07 PM
196	Please do this. I believe it would benefit emergency personnel. It allows a center lane to be open for emergency vehicles to drive.	8/31/2022 5:07 PM
197	Traffic is bad enough. No road diet. Our taxes pay for this. You people come up with ideas and push them on us. They are usually not for the common good.	8/31/2022 5:07 PM
198	No road diet	8/31/2022 5:07 PM
199	Please do this. I believe it would benefit emergency personnel. It allows a center lane to be open for emergency vehicles to drive.	8/31/2022 5:07 PM
200	Stop taking our lanes away to give to Bikes that hardly every use them.	8/31/2022 5:07 PM

201	Stop the road diet!	8/31/2022 5:06 PM
202	No road diet!! They are stupid and cause congestion. Leave thing as they are.	8/31/2022 5:06 PM
203	Na	8/31/2022 5:06 PM
204	Traffic on E McAndrews is already congested. Losing a lane each way will create chaos. We DO NOT need dedicated bike lanes. I totally oppose this change.	8/31/2022 5:05 PM
205	Traffic on E McAndrews is already congested. Losing a lane each way will create chaos. We DO NOT need dedicated bike lanes. I totally oppose this change.	8/31/2022 5:05 PM
206	No road diet. The disaster of Phoenix and Talent during the fires should quash any and all thoughts of restrictions on our current roads. It was nearly impossible to get anywhere during a major emergency. Took my husband 4 hrs to get home from Ashland. If we had to evacuate it would have been impossible	8/31/2022 5:05 PM
207	No road diet	8/31/2022 5:05 PM
208	No road diet	8/31/2022 5:04 PM
209	This is the dumbest idea you've ever come up with.	8/31/2022 5:04 PM
210	As you can see by my totally screwed up comment on the recommended pedestrian crossing at East main and Bear Creek, please call me so I can explain. your site was totally anti friendly Mindy 5418907081	8/31/2022 5:04 PM
211	Please don't do this It will just be a bottleneck for down town.	8/31/2022 5:03 PM
212	i think it will be awesome to have a more bike friendly city	8/31/2022 5:02 PM
213	Are you all joking the traffic in this valley is bad enough without you making it worse	8/31/2022 5:01 PM
214	I live in Talent and the road diet here was absolutely horrible during the evacuation for the Alameda fire. My daughter had to walk 3 mi and Park her car to get home to her baby. Phoenix took the road diet out because it hurt businesses. There's already not enough room and too much traffic in downtown Medford. STOP IT NOW!	8/31/2022 4:57 PM
215	No	8/31/2022 4:57 PM
216	I live in Talent and the road diet here was absolutely horrible during the evacuation for the Alameda fire. My daughter had to walk 3 mi and Park her car to get home to her baby. Phoenix took the road diet out because it hurt businesses. There's already not enough room and too much traffic in downtown Medford. STOP IT NOW!	8/31/2022 4:54 PM
217	I believe that there is much more pressing needs for our community to spend money on than bike lanes.	8/31/2022 4:45 PM
218	This is a much needed project. I have ridden my bike much less than I used to before moving to Medford. Motorists seem hostile to bikes.	8/31/2022 4:45 PM
219	Absolutely terrible proposal even if cost was totally free. This is a complete waste of time and money. Traffic movement in these areas is already a nightmare and this will only make things worse. If this train wreck of an idea involved anywhere but Medford it would be hard to believe anyone with an IQ higher than a rock could possibly seriously consider actually doing this. But, this is about what I would expect from idiots having anything to do with planning involving Medford.	8/31/2022 3:26 PM
220	Improving safety & accessibility for bike, pedestrian, wheelchair, alternate modes of transportation all around the city will be an important factor in moving our city forward and improving quality of life. I don't, unfortunately, have time to elaborate, but I wanted to put my 2 cents in that I think this is a vital project for creating a more connected and accessible community.	8/31/2022 3:16 PM
221	City should not decrease traffic in downtown.	8/31/2022 3:13 PM
222	Are we trying to put lipstick on a pig? Let fix the problems like bums burning down the town and trashing every city owned space. No to any of this!!	8/31/2022 2:47 PM
223	Please please please build these bike lanes it feels so dangerous so be a biker in Medford in general and especially downtown. Motorists often intentionally mess with you and drive too	8/31/2022 2:45 PM

	close or aren't looking. I hope this can become a reality	
224	Although I just heard about this project on the last day, I couldn't be more excited about these improvements. As a BPAC member in the past, we dreamed about these upgrades for Riverside, Central and E. Main--safety is paramount--as much separation from vehicles as possible would be appreciated, especially with the fast speeds on 99 - Thanks much! Betsy Martin	8/31/2022 2:43 PM
225	Need more bike lanes everywhere	8/31/2022 2:38 PM
226	If revitalizing downtown is seriously a goal, then putting in bike lanes is not the answer. We need more parking for motor vehicles, and streets that can handle the traffic. Give residents and potential tourists a reason to visit and spend money. Why don't we work on making people feel safe, and start with cleaning up the greenway! The greenway was designed for pedestrians and cyclists, and unless you want to risk being assaulted, the general public is too afraid to use it. The city planners need to put the needs of the city first, and not the interests or desires of who gives the grant money. But no comments will really matter, because the planners will get their bike lanes no matter what the majority of residents want. And downtown will continue to suffer, slowly on its way to a ghost town.	8/31/2022 2:29 PM
227	I do not support this in any way. This will hurt local businesses especially in downtown on Main street. Let's make decisions that help grow downtown businesses not make it harder for them to stay alive. Esp the ones who rely on outdoor seating that would be impacted by this.	8/31/2022 2:21 PM
228	No. Terrible for downtown commerce.	8/31/2022 2:16 PM
229	No, Way too many funds allocated for a small minority and further requirement for maintenance when the city can barely maintain its roads.	8/31/2022 2:15 PM
230	Talking crosswalks would be great!	8/31/2022 2:10 PM
231	I don't agree with this direction. This is not a necessary expense when we already have bike lanes on every other street. I don't agree with a bike lane in this area on E. Main street.	8/31/2022 2:08 PM
232	I don't want a bike lane in this area. Thank you	8/31/2022 2:07 PM
233	I do not agree to this decision	8/31/2022 2:06 PM
234	There is already a terrible traffic problems in the Medford area due to the growth of this area from Portland Salem and California we do not need to narrow and restrict traffic flows	8/31/2022 2:03 PM
235	I'm a no.	8/31/2022 2:02 PM
236	There is already in Hanst traffic problems in the Medford area due to the growth of this area from Portland Salem and California we do not need to narrow and restrict traffic flows	8/31/2022 2:00 PM
237	No build, more parking, better support for traffic. Don't take away the outdoor seating from local restaurants just to build a bike lane	8/31/2022 1:58 PM
238	No build, more parking and support for better traffic	8/31/2022 1:54 PM
239	Most of it has no common sense	8/31/2022 1:42 PM
240	I've been biking since 1978, and will say this isn't needed. It appears to me certain city staff are fulfilling their own agenda.	8/31/2022 1:36 PM
241	Reducing lanes on Hwy 99 (south), Columbus Avenue, and others around town has created unnecessary congestion (which makes pollution worse also) and a much more frustrating driving experience that requires much more time, especially at peak traffic times. Adding bike lanes doesn't help congestion at all and only serves a very small segment of bicyclists compared to causing a huge problem for the majority of average citizens and other vehicles traversing town.	8/31/2022 12:59 PM
242	I think this is a very bad idea. This area is not comprised of very many bicycles commuters and all you will do is endanger the ones there are. Dumb idea to make already busy streets more congested.	8/31/2022 12:56 PM
243	The city has screwed up downtown with the 20 mph limit. RIDICULOUS! The city has screwed up Columbus 6 tries to get through Main! The city us in the process of screwing up East McAndrews. Whoever is in charge needs to drive these roads continually for 6 months. We live here we drive them we know. You have NO CLUE.	8/31/2022 12:01 PM

244	We need to use taxpayer $ to maintain current roads, deal with homeless problem and be able to use downtown without fecal matter and urine and harassment! Don't make more trouble with limited vehicle access. What about emergency exit like during the Almeda Fire? Did we learn NOTHING? Please. All the money you all designated to "improving" downtown is for not at this point. How about focusing on just cleaning it up so it is actually usable instead of flushing all that money down the proverbial drain! Common Sense.	8/31/2022 10:11 AM
245	Leave it alone. Or extend Biddle road to Barnett so you take the load of vehicles off of central/riverside.	8/31/2022 10:06 AM
246	Stop messing with the major arterials for Medford. When the fire occurred in Phoenix the reduced road capacity increased the danger and potential loss of life. These plans, if implemented, will make Medford untravelable and will reduce access to the numerous businesses located within Medford. I moved my business out of Phoenix when they implemented the road diet there and I am lucky I did, as my business neighbors saw their revenue drop and drop till several had to close their doors. If Medford goes forward with this lunacy I will take my business to Grants Pass. Set aside the fact that this entire faux consensus process is against Oregon law when other laws and remedies exist, which they do. If you think these plans are such a good idea then put these plans to a vote of the people, as you should do with major economic and safety impacts. However I know you would not put this communist wet dream to a vote because you know it would go down in catastrophic defeat. STOP THIS NONSENSE! KEEP MEDFORD NAVIGABLE TO VEHICULAR TRAFFIC!	8/31/2022 9:45 AM
247	Choking down traffic in an era of wildfires and evacuations is irresponsible. My son barely escaped the Alameda fire when it came through Phoenix. It took him an hour to get from Phoenix to Medford, that’s usually a 10 minute trip. He’s lucky that he and his 95 year old grandfather were able to get through, the house was burned to the ground. Phoenix choked down thier Main Street (hwy 99) with bike lanes before Almeda. Choking down Main Street arteries in Medford is a foolish move. I do not support this. It is a public safety concern and a business killing move for local stores. It’s not good for safety or the local economy. Do NOT move forward with this bike lane proposal. NO BUILD!	8/31/2022 9:12 AM
248	Choking down traffic in an era of wildfires and evacuations is irresponsible. My son barely escaped the Alameda fire when it came through Phoenix. It took him an hour to get from Phoenix to Medford, that’s usually a 10 minute trip. He’s lucky that he and his 95 year old grandfather were able to get through, the house was burned to the ground. Phoenix choked down thier Main Street (hwy 99) with bike lanes before Almeda. Choking down Main Street arteries in Medford is a foolish move. I do not support this. It is a public safety concern and a business killing move for local stores. It’s not good for safety or the local economy. Do NOT move forward with this bike lane proposal. NO BUILD!	8/31/2022 9:11 AM
249	This plan is horrible. It is going to back up traffic badly and make evacuating in a fire a total life threatening event. NO ONE WANTS THIS! Save the money and do something better like clean up the greenway so its safe to use. Colubus ave is a disaster. Going to and leaving ashland sucks. Phoenix showed you it is a horrible idea.	8/31/2022 8:44 AM
250	None of the above. This is insanity. Also, surveys are not votes. Citizens should be able to vote in an election on this type of issue. Surveys are sneaky at best.	8/31/2022 8:29 AM
251	Why would the traffic “planners” in Medford want to destroy the free flow of auto traffic within the city? To allow a few bikers, loving referred to as the Spandex Mafia, one of whom I am? Why would the traffic “planners” wipe out parking on some streets, Juanipero, for instance, and replace them with bike lanes? I understand a “letter was sent” to the residents along that street notifying the,m of the re-stripping not asking for their input on the project. Isn't this more bike tyranny rather than government by, “of, by and for the people?” Can we stop the dictator mentality in the city and swerve the needs of the majority instead of a few? Or is that beyond the pale of the hired hands? Perhaps they have been programmed to feel their views are better than those of ordinary citizens. I suggest the attitude of those “traffic planners” change or you look for other employment, possibly in more friendly tyrannical, and anti-citizen, regimes such as Cuber or North Korea. Dennis V. Sinclair	8/31/2022 8:25 AM
252	What gives you the right to follow 2030 agenda and take away methods of travel other than the bicycle. This is very dangerous for the population and is not for everyone's safety. Do nothing and make no changes.	8/31/2022 7:45 AM
253	I only see this will hurt small business. No parking, no customers. There is truly no need for this. I don't see bicycles on 4th street or Columbus. But I do see alot of vehicle backups at	8/31/2022 7:19 AM

	stop lights. There is also more vehicles spending on side streets.....Medford is known as a retirement community. Seniors can't ride bicycles. Especially in extreme heat or cold rainy weather.	
254	My comment to the city of Medford re the Road Diet bike lane proposal for Riverside, Court, E. Main, Central: Hello, City of Medford. This entire study is designed to "tick the boxes" on a pre-determined outcome/consensus process that we're to get a "Road Diet" good and hard. The answer is NO. Slicing a third of the vehicle capacity of the MAIN ARTERIAL routes is a crime against the people. Bicycle traffic must be accommodated on a lower traffic/lower priority street system. I would add that state law already prohibits this consensus-based process being used when other laws and remedies exist, so why are you using this process? Community health and safety dictates that these main routes retain the highest capacity for vehicular traffic possible. Not only is this needed for daily transportation needs, commercial, commuting, and shopping, but there's the necessity of maximum road capacity for emergency evacuation and disaster purposes. Medford is not Portland. This plan to starve the downtown of vehicle travel capacity so that we'll force 82-year olds to bicycle to their cardiologist is Soviet thinking at its most despicable. Have you checked the demographics of this area? We are aging and have hot summers and cold winters. Not a place that would steal conventional traffic lanes from these key roads to hand over to lightly traveled seasonal transportation options. It's clear that you're under pressure (much of this agenda-based) to comply with the Governor's and state goals to reduce vehicle traffic. However, these are the people's roads and lives you are toying with. The City must push "up the food chain" to the governor and state that the majority of residents aren't interested in the Governor's emission or miles-traveled goals, which is what is REALLY driving this questionable "consensus process" survey and open house. You might consider putting these road diet plans to a vote of the people, with clear, open public debate in hearings, too, rather than this self-selected electronic ONLY input process. I imagine the reason these major life-changing decisions aren't put before a vote of the people is that it's safe to assume they would FAIL MISERABLY at the ballot box. That's the REAL public input you must consider. Stop the insanity, NO BUILD option on all of it.	8/31/2022 7:05 AM
255	taking away lanes from cars is only going to increase more problems.	8/31/2022 6:50 AM
256	The traffic and parking is already terrible in Medford. I do NOT think it smart to narrow the main artery streets even more! People go to work, and shop and doctor appointments using those roads. We don't want them narrower. And for fire evacuations, we NEED those roads wider, not narrower. Put a bike lane on a less used residential road. Do NOT build bike lanes on these proposed roads!	8/31/2022 6:42 AM
257	We have a lot of traffic we don't need to make less lanes. How often do I see anyone riding a bike, very rare, except for an occasional homeless person probably on a stolen bike. Your we're chosen to work for the people so why are you not asking or opinion, that is what you should be working toward. We want real, not virtual meetings , this is our decision and your job to make sure you are doing what we want not what your gang green friends want!	8/31/2022 6:42 AM
258	The dumbest idea yet. There are not enough bike riders to justify this stupidity!! Go back to Portland!	8/31/2022 6:40 AM
259	It’s a very bad idea.	8/31/2022 6:36 AM
260	My comment to the city of Medford re the Road Diet bike lane proposal for Riverside, Court, E. Main, Central: Hello, City of Medford. This entire study is designed to "tick the boxes" on a pre-determined outcome/consensus process that we're to get a "Road Diet" good and hard. The answer is NO. Slicing a third of the vehicle capacity of the MAIN ARTERIAL routes is a crime against the people. Bicycle traffic must be accommodated on a lower traffic/lower priority street system. I would add that state law already prohibits this consensus-based process being used when other laws and remedies exist, so why are you using this process? Community health and safety dictates that these main routes retain the highest capacity for vehicular traffic possible. Not only is this needed for daily transportation needs, commercial, commuting, and shopping, but there's the necessity of maximum road capacity for emergency evacuation and disaster purposes. Medford is not Portland. This plan to starve the downtown of vehicle travel capacity so that we'll force 82-year olds to bicycle to their cardiologist is Soviet thinking at its most despicable. Have you checked the demographics of this area? We are aging and have hot summers and cold winters. Not a place that would steal conventional traffic lanes from these key roads to hand over to lightly traveled seasonal transportation options. It's clear that you're under pressure (much of this agenda-based) to comply with the Governor's and state goals to reduce vehicle traffic. However, these are the people's roads and lives you are toying with. The City must push "up the food chain" to the governor and state	8/31/2022 5:39 AM

	that the majority of residents aren't interested in the Governor's emission or miles-traveled goals, which is what is REALLY driving this questionable "consensus process" survey and open house. You might consider putting these road diet plans to a vote of the people, with clear, open public debate in hearings, too, rather than this self-selected electronic ONLY input process. I imagine the reason these major life-changing decisions aren't put before a vote of the people is that it's safe to assume they would FAIL MISERABLY at the ballot box. That's the REAL public input you must consider. Stop the insanity, NO BUILD option on all of it.	
261	We do not want this to happen in Southern Oregon. WE ARE NOT Eugene Salem or Portland! Please DO NOT spend our tax dollars doing this! We DO NOT want this!	8/31/2022 5:33 AM
262	No Build! The spandex warriors do not rule.	8/31/2022 5:20 AM
263	No bicycle lane	8/30/2022 11:58 PM
264	No, it is not reasonable or in the public's best interest to add bicycle lanes by eliminating car lanes, as you are proposing. This does NOT serve the public's best interest. I am vehemently against this for multiple reasons. #1 While it is a nice idea to provide bike lanes, to eliminate car lanes will guarantee traffic jams especially during certain hours of the day. #2. The majority of people who use the roads are in cars. The elderly, people with health conditions, those who live out of town, families with small children, a whole spectrum of people who cannot ride bicycles will suffer from the closure of a lane of traffic. #3 We taxpayers who fund these roads should reject or approve such broad-reaching decisions. NOT a panel of "planners". You must not forget this is OUR city. #4. There is a lot of resistance for what you are trying to do because it's just WRONG for the city of Medford Debra Moreno	8/30/2022 11:41 PM
265	I realize that a lot of people resist this kind of change, frequently saying hardly anyone walks or rides on these streets. But I walk a lot and I avoid these ugly, busy streets. These changes are long overdue	8/30/2022 11:27 PM
266	THIS FORMAT IS VERY DIFFICULT FOR ME TO USE. If you complete this project Medford will become extremely difficult for many people to use. I say NO BUILD to the entire prospected project.	8/30/2022 11:03 PM
267	I vote for Chevron lane painted marking only.	8/30/2022 10:56 PM
268	Yes we have yo much traffic for one to two lanes on any street. We don't have enough bikes for that anyways I hardly ever see bikes on those streets, walkers yes. If there was ever a fire like talent/ashland one we will be screwed if u do that	8/30/2022 10:42 PM
269	Bike lanes will make a few hundred bikers happy and piss off thousands of drivers - if city management thinks that's a good trade off, we have bigger problem than bike lanes. Downtown business will suffer big time	8/30/2022 10:03 PM
270	No more road diet. What a stupid idea. Do not do this. It's already very congested and this will make it much worse. Wake up.	8/30/2022 10:02 PM
271	Please put this on the ballot as required by law, this decision is for the voters, not administrators	8/30/2022 9:19 PM
272	No to ALL OF THIS. It is political maneuvering to control people as much as possible and cause congestion in the the areas discussed to somehow justify other planned miserable living conditions. We HEATEDLY DISAGREE WITH THE EFFORT TO make misery for the majority to help the non tax paying homeless bikers and extremely few exercise bikers that would approve of this. NO TO IT ALL.	8/30/2022 9:19 PM
273	Please don’t make it harder for our retirees to enjoy downtown. The bicyclists already have our sidewalks, they need to use side streets, not zip in and out of traffic with cars.	8/30/2022 9:07 PM
274	Hello, City of Medford. This entire study is designed to "tick the boxes" on a pre-determined outcome/consensus process that we're to get a "Road Diet" good and hard. The answer is NO. Slicing a third of the vehicle capacity of the MAIN ARTERIAL routes is a crime against the people. Bicycle traffic can and must be accommodated on a lower traffic/lower priority street system. I would add that state law already prohibits this consensus-based process being used when other laws and remedies exist, so why are you using this process? Community health and safety dictates that these main routes retain the highest capacity for vehicular traffic possible. Not only is this needed for daily transportation needs, commercial, commuting, and shopping, but there's the necessity of maximum road capacity for emergency evacuation and disaster purposes. Paradise, CA learned this the hard way and Ashland has experienced	8/30/2022 8:54 PM

	issues in their roadways during the Almeda fire. I can't think this is being embraced by businesses on these proposed routes. Medford is not Portland. This plan to starve the downtown of vehicle travel capacity so that we'll force 82-year olds to bicycle to their cardiologist is Soviet thinking at its most despicable. Have you checked the demographics of this area? We are aging and have hot summers and cold winters. Not a place that would steal conventional traffic lanes from these key roads to hand over to lightly traveled seasonal transportation options. It's clear that you're under pressure (much of this agenda-based) to comply with the Governor's and state goals to reduce vehicle traffic. However, these are the people's roads and lives you are toying with. The City must push "up the food chain" to the governor and state that the majority of residents aren't interested in the Governor's emission or miles-traveled goals, which is what is REALLY driving this questionable "consensus process" survey and open house. You might consider putting these road diet plans to a vote of the people, with clear, open public debate in hearings (not zoom), too, rather than this self-selected electronic ONLY input process. I imagine the reason these major life-changing decisions aren't put before a vote of the people is that it's safe to assume they would FAIL MISERABLY at the ballot box. That's the REAL public input you must consider. Stop the insanity, NO BUILD option on all of it.	
275	Bad idea. It will keep me out of the area.	8/30/2022 8:30 PM
276	Bad idea. It will keep me out of the area.	8/30/2022 8:30 PM
277	I do not think there is benefit at this time to reduce vehicle traffic lanes to accommodate bicycle lanes beyond what is currently available in Medford. The greenway was built for a reason.	8/30/2022 8:12 PM
278	No thank you	8/30/2022 8:12 PM
279	This road narrowing under the guise of bike lanes is a lie and should not be allowed to move forward. You've already ruined traffic on Jackson, Columbus and others. This is not looking forward for growth. Don't do it!	8/30/2022 8:07 PM
280	Tax payers dollars. Not being put to the vote of the people. We’re the stakeholders and should have a voice.	8/30/2022 7:46 PM
281	Seriously this is insane. Example of poor planing and lack of foresight. Look at Ashland and Talent. Traffic is backed up and I don’t see hardly anyone on bicycles.	8/30/2022 7:44 PM
282	Seriously this is insane. Example of poor planing and lack of foresight. Look at Ashland and Talent. Traffic is backed up and I don’t see hardly anyone on bicycles.	8/30/2022 7:43 PM
283	I say NO to this plan. It will be detrimental to downtown Medford.	8/30/2022 7:32 PM
284	not only should this not be allowed, but you should make Columbus back to 4 lanes. Columbus is a complete disaster. I drive it 3 times a day. You know how many people I see on bikes on that road? I see one about every 30 days….ONE!! GO BACK TO PORTLAND!	8/30/2022 7:24 PM
285	Please don't build this, downtown Medford is a nightmare to get through. The businesses have already been hit hard these last two years. This is not a viable investment	8/30/2022 5:43 PM
286	Do not change the roads in this way!	8/30/2022 4:55 PM
287	Difficult,at least for me ,to provide valid input ,particularly with the pedestrian crossings.Providing a larger image in a public setting of the areas to be evaluated by someone experienced with multi-modal traffic patterns/bike safety/pedestrian safety and rolling safety would be more helpful ,if practical .	8/30/2022 4:41 PM
288	This is a huge waste of tax dollars	8/30/2022 4:18 PM
289	Thank you for addressing the current bicycling hazards on E and W Main, Rverside and Central. You need to b stree/traffic wise to bicycle any of these multi lane streets. Sharrows make thing more dangerous! Coming N from Burger King I bail onto 10th stree rather than taking more chances on Riverside or biking S on Central i'll turn on 19th. Thanks for considering these improvements By the way the uphill sharrows on Black Oak makes no sense bike maybe go 6 - 10 mph uphill in a 25mph zone = encourages Road Rage. Car drivers do not know what sharows mean. Same with the right lane sharrows on Riverside!	8/30/2022 3:03 PM
290	Any and all efforts to reduce the number of lanes of traffic on Riverside and Central will only serve to benefit residents and local businesses in the corridor, but must be matched with	8/30/2022 2:17 PM

	additional off street parking for motorists.	
291	No build	8/30/2022 1:31 PM
292	Love the idea of sensible designated bike lanes	8/30/2022 1:12 PM
293	Doing anything is always more controversial than doing nothing... I see that there are a lot of negative comments on the map. Maybe there is a way to implement some of the concepts as a pilot PRIOR to the actual overlay work? No matter the configuration, people are most opposed to removing travel lanes so it would help show people that it will work. Be sure to collect data about travel time, delay, etc. and show folks how things changed. Point to vision of city and TSP. Just my 2-cents. :) Thanks for your efforts!	8/30/2022 12:49 PM
294	I heard some radio show and the facilitator told all of his constituents to vote "no build". I don't think the biking progressive community has a blow horn like that, so the survey will probably be biased towards auto centric people. This is a chance to make Medford safe for bikes, but it will probably be squashed by this radio show ;^(	8/30/2022 12:14 PM
295	Hello, City of Medford. This entire study is designed to "tick the boxes" on a pre-determined outcome/consensus process that we're to get a "Road Diet" good and hard. The answer is NO. Slicing a third of the vehicle capacity of the MAIN ARTERIAL routes is a crime against the people. Bicycle traffic must be accommodated on a lower traffic/lower priority street system. I would add that state law already prohibits this consensus-based process being used when other laws and remedies exist, so why are you using this process? Community health and safety dictates that these main routes retain the highest capacity for vehicular traffic possible. Not only is this needed for daily transportation needs, commercial, commuting, and shopping, but there's the necessity of maximum road capacity for emergency evacuation and disaster purposes. Medford is not Portland. This plan to starve the downtown of vehicle travel capacity so that we'll force 82-year olds to bicycle to their cardiologist is Soviet thinking at its most despicable. Have you checked the demographics of this area? We are aging and have hot summers and cold winters. Not a place that would steal conventional traffic lanes from these key roads to hand over to lightly traveled seasonal transportation options. It's clear that you're under pressure (much of this agenda-based) to comply with the Governor's and state goals to reduce vehicle traffic. However, these are the people's roads and lives you are toying with. The City must push "up the food chain" to the governor and state that the majority of residents aren't interested in the Governor's emission or miles-traveled goals, which is what is REALLY driving this questionable "consensus process" survey and open house. You might consider putting these road diet plans to a vote of the people, with clear, open public debate in hearings, too, rather than this self-selected electronic ONLY input process. I imagine the reason these major life-changing decisions aren't put before a vote of the people is that it's safe to assume they would FAIL MISERABLY at the ballot box. That's the REAL public input you must consider. Stop the insanity, NO BUILD option on all of it.	8/30/2022 12:10 PM
296	The new painted crosswalks are great, would be nice to see more of this fun aesthetic incorporated into the multimodal project!	8/30/2022 11:57 AM
297	The is a shit idea!! The towns growing an you want to shrink roads…wtf over!!! Screw the spandex moffia let them ride the “greeenway”	8/30/2022 11:54 AM
298	This is not true public input. You already have an agenda and are trying to funnel public input into it. All you want to do is cause more chaos and strife for the people who live here. Wake up, your future is at stake too. Do you want to live with constant smoke, fires, no water (by dam removal), and now reduced travel by car. Sounds like a communist takeover.	8/30/2022 11:40 AM
299	Please leave the main arterial streets as the roads presently exist. Automobile drivers should not be punished by replacing available driving lanes to bikes that do not pay for the roads. Local businesses will be harmed by a lack of parking spaces near their businesses. Traffic jams will increase during the holidays. Medford should be encouraging local shopping instead of eliminating parking available for local businesses. Road diets also make it difficult and confusing to leave the road through the bike lane to get onto off streets. The City of Phoenix realized the damage of a road diet and restriped the street back to two lanes. At least Phoenix had not built those ugly planters to divide the bike lane from the automobiles. The road diet plan is an ill-conceived plan. It will cost taxpayer money and should be put to the voters for a vote before further plans are made to convert Medford arterials streets to a road diet. Even though I live in Phoenix, I drive to Medford almost daily for shopping, businesses, meetings, and restaurants. Your planned changes to Medford arterial streets will also affect many	8/30/2022 11:23 AM

	citizens of Oregon. Please leave the main arterial streets in Medford as is. Karen Shrader Phoenix OR 97535	
300	Allow bicycles to use sidewalks. This provides them a safety separation from vehicles. And in most places and the sidewalks already exist.	8/30/2022 11:22 AM
301	No build	8/30/2022 11:16 AM
302	No build!	8/30/2022 11:10 AM
303	Please leave things as they are. No changes necessary.	8/30/2022 10:25 AM
304	It seems that the agendas of climate change activists and bicycle fanatics are driving this "conceptual plan." 99% or more of the trips to the Medford central core are made in motor vehicles - that is not going to change regardless of how the City tries to discourage motor vehicle traffic. The City needs to listen to the real stakeholders in this process - motor vehicle drivers who pay for these roads, and who travel to and support the many businesses that will be negatively affected by the traffic constraints which will result from this plan. The roadways in Medford's central core are already constrained by the I-5 viaduct - does it makes any sense whatsoever to restrict them further? Bicycle traffic can be accommodated, but it should be accommodated off of the central roadways, where these types of changes will have minimal impact to businesses and citizens.	8/30/2022 9:57 AM
305	The roads are needed for cars	8/30/2022 9:20 AM
306	Itis a crime to carve a lane from the MAIN ARTERIAL routes in Medford for this agenda-driven nonsense. Have REAL hearings, have advisory votes, get REAL public input...anything but this faked up self-selected electronic survey. Do not build this mess in Medford!	8/30/2022 8:47 AM
307	How interesting that the "No Build" option is not shown as a choice for a bogus, push poll survey. Medford downtown will be further negatively impacted by any of these "choices" except "no build". As a city we are not required to swallow every poison pill laden funding scheme offered. To do so and incorporate these proposed changes creates a harm to residents and business owners in Medford. The road limitations proposed will cause congestion resulting increased pollution, decrease efficiency, make downtown Medford less attractive for residents and demand that drivers once again fund projects that are of no benefit to them and, in fact, create harm to benefit a small minority. Further ,the consolidation of parking makes getting about more difficult for residents who have mobility issues but not to the degree of having the "placard". These often elderly residents may not have the balance or joint integrity that make bike riding feasible. It is smoky and headed for 102 degrees as I write, great for a forced bike ride. This is not PORTLAND or nice flat, Salem- NO BUILD.	8/30/2022 8:38 AM
308	The proposed bike lanes in downtown Medford make no sense. Take them off the main arterial roadways. Why punish the people you are supposed to be serving.	8/30/2022 8:36 AM
309	I just submitted my comments regarding my feelings of implementing a "road diet" for the main arterial roadways of downtown Medford. I just thought of another VERY important consequence of the change. If people have a difficult time driving downtown and if parking is reduced, businesses will suffer. Many did not survive the lock down from the Covid pandemic and are already on shaking ground. This could be the death of them. I realize you get money from the state but with that, there are stings attached that will not be good for our community. I would rather you decline the money and watch do what is best for the people you serve. Pat K.	8/30/2022 8:18 AM
310	No build. We need fire escape routes more.	8/30/2022 8:14 AM
311	It would have been nice if I had been offered more input into this ridiculous change to our downtown roads E. Main, Riverside/Central/ Court and McAndrews. Leave the roads alone. I have nothing against bikes but they should not take away from our main roads. The roads as they are allow for decent flow. However, by reducing the number of lanes we will have more congestion which will of course cause more pollution. There will probably be more accidents because of congestion. Look at Ashland. Reducing the number of automobile lanes has caused a mess, especially during commuting times. You have disenfranchised the public whom you are there to serve. If you continue with this debacle I will work very hard to help change the make up of the council to people who will serve the people, not special interests. Pat	8/30/2022 8:04 AM
312	Don’t do it Bicycles are vehicles we share the road!!!	8/30/2022 7:58 AM
313	Do not build any of this. You work for me; I am a tax paying life long resident of Medford. Don't	8/30/2022 7:56 AM

	attempt to turn my city into Portland or Eugene. That is not who we are, nor who we want to be. This has not been put to a vote by the tax paying public, and is therefore, in effect, theft. You do not have the right to take my tax dollars and use them to make my daily life more difficult. DO NOT BUILD! DO NOT!!!	
314	Riverside, Central, and Main are already crowded. Removing one lane of vehicle traffic will only make this situation worse. Also, putting bikes on the main streets creates a safety hazard, as you would have bikes in close proximity to 35+ mph vehicle traffic. A better solution would be to move the bike traffic to secondary streets, where there is less vehicle traffic and it is moving at a slower (and safer) pace.	8/30/2022 7:45 AM
315	It already takes WAY too long to get through town during peak times, and this plan will devastate downtown. Those of us who cross it multiple times a day will suffer greatly, not to mention emergency services! How will police and fire get where they need to go when no one can get out of the way? We're not a bicycle town, so stop trying to force something that's not needed at the peril of something that desperately is.	8/30/2022 7:32 AM
316	our office is located in downtown Medford and we live too far away to bike roll or walk to work so we drive every day and park in the downtown (middleford garage). our clients also drive to our office, and parking is already hard to deal with. None of the options proposed would improve matters for us or our clients, and all of them except the no build would in fact make things worse be making downtown parking and circulation even more complicated for those of us using trucks and cars for transportation.	8/30/2022 7:32 AM
317	This seems ludicrous to spend $ on an issue that's not a problem. I never see bikes downtown. If you get rid of the homeless/drug addicted from the greenway then people could use that to ride bikes to and from destinations. I just don't see the need for messing with the already clogged car lanes downtown until the greenway is a safe useable space agin.	8/30/2022 7:18 AM
318	I absolutely hate driving in downtown Medford now I can't imagine what it'll be like with these ridiculous changes. Plus taking away parking for the few businesses that are still in Medford is egregious	8/30/2022 7:13 AM
319	I don't think this is a wise idea for the area	8/30/2022 7:02 AM
320	There is no way that this should go through. We are in a time when money is going to be very tight. Don't add more taxes to a struggling economy	8/30/2022 6:58 AM
321	Leave the roads alone. You are leaving no space for emergency vehicles or people to exit the city if there is a catastrophic incident.	8/30/2022 6:57 AM
322	Limiting driving appears to be the goal of planning. I don't think this will help attract people to Medford. The downtown area needs enhancements and free parking to help attract tenants and customers. Overall, there are not that many people riding bicycles. Please listen to the public's input. Don't spend the money if not necessary and don't feel that it funding is available it has to be used. Strings are generally attached. Thanks	8/30/2022 6:38 AM
323	Return McAndrews to two lanes going both directions between Crater Lake avenue and springbrook.	8/30/2022 6:31 AM
324	i have come to Medford to shop monthly... in the last 20 years, Medford ODOT and the city have ruined what used to be a handy market town, now it is unusable... if you do the plan suggested here, i will never come to Medford to shop again.	8/30/2022 6:27 AM
325	The only ones that ride bikes are the ones that have a stolen bike & they won't use a bike lane. Bad idea.	8/30/2022 1:44 AM
326	It won't make a difference to implement these changes except to cause more traffic issues. There aren't enough bike riders to cause for the expense. This is a waste of money.	8/30/2022 1:39 AM
327	My comment about the proposed changes to three of the most busy and important streets in down town Medford is a no build/ change comment. One no public input was asked for or include prior to having builders/ planers (unelected officials) say this is the plan here are your choices. This plan will not only hinder the access into and throughout Medford but also the ability for work truck, delivery trucks all helping local businesses as well as emergency services. The lanes that will be left for vehicles will be big enough for small suv/ cross over types cars and small sedans. Nothing els. No to mention the massive cut back for out of towners to be able to park or just drive around (the main reason so much was spent of the Bird scooters). Unelected officials do not get to dictate what and how things happen in our city. A	8/29/2022 11:55 PM

	small group of people who refuse to drive cars or don't like cars but need services provided by those who use cars do not get to dictate what happens in our town. No to the build, no to the changes.	
328	No to all .	8/29/2022 10:14 PM
329	That map was confusing, so I'll just say it here: no to all changes. I live just off of Jackson where you put in that wide bike lane. I have not seen one bike in that lane. Meanwhile, traffic is backed up at the lights, and it is harder to cross because of the endless stream of cars. This road diet nonsense needs to stop.	8/29/2022 10:10 PM
330	I cannot believe that the city is considering these concepts for the busiest streets in the city. I have almost been hit a few time with oncoming traffic in the left-hand turn lanes with opposite traffic trying to turn left at the same time from the middle lane. And who is going to be cycling through Medford in December, January and February...not very many. Cycling lanes do not have to be on the main thoroughfares in Medford, side streets could more easily be used without all the disruption. It is already difficult to park in downtown Medford for any length of time without risking a ticket if you do not move your car to another street in a couple of hours. If you are trying to further destroy downtown businesses these proposals will further that objective. I empathize with anyone whose livelihood depends on those small businesses.	8/29/2022 10:09 PM
331	It is an ill-conceived notion that repurposing vehicle traffic lanes on busy arterial streets into bike and ped space is going to improve an already problematic situation. The road diet / road share plan is simply not successful in reality. It FEELS good to officials talking to other officials about the projects they forwarded. It SOUNDS good to have this kind of "metro" scale project on a resume. It APPEARS like progress to pursue and gain funds for this type of project. But people don't like the REALITY of congested traffic. People don't like the REALITY of increased pollution from stalled traffic. Medford taxpayers don't like that project funds are used for officials to perpetuate a failed design that fails to find a reasonable solution that lasts the test of time. Medford is a unique City. North/South travel and East/West travel is uniquely constrained due to choices made in 1960's planning phases of the I-5 Viaduct. In part, those decisions have contributed to our current situation. How are these travel limitations to be solved with the proposed design to reduce space for vehicular traffic? This kind of design is infuriating at the worst and frustrating at the least because it simply doesn't provide a working solution for the actual problem. Experience informs us that City-favored designs are pushed through by officials regardless of so called "community input." We taxpaying citizens know getting our input is merely a check in the box for a City process that is already in motion. We recognize this concept is a prepackaged road design fad for streets and arterials already carrying high traffic loads. Please hear: this is not the answer the Public is looking for. It is not the solution that fits the actual problem. I urge the City if Medford to please take a step back and be willing to abandon these projects - even if it means forfeiting the use of available state, federal or local funds. Please recognize the logic that reducing vehicular travel will create more problems just as it did when decisions made in the 60's greatly contributed to the limited inner-city travel options we have today.	8/29/2022 10:07 PM
332	NO BUILD ON ALL OF IT	8/29/2022 9:23 PM
333	Leave it the hell alone!	8/29/2022 9:17 PM
334	Use emment domain and buy half the bussiness down town and then with a medford bicycle tax pay to build a bike way.	8/29/2022 9:06 PM
335	I am opposed to adding bike lanes.	8/29/2022 9:00 PM
336	Please Do Not do this to Medford. This is a horrible prospect to “Choke” our streets and artierials. don’t do this in any part of Medford. Period!	8/29/2022 8:54 PM
337	This is a complete waste on funds. Will someone please tell me where the funds come from? Gas tax maybe we need to be improving traffics not making it worse	8/29/2022 8:44 PM
338	Please don’t change anything. Medford is an aging population. We had NO input into this decision.	8/29/2022 8:43 PM
339	No build!	8/29/2022 8:37 PM
340	No road diet. Never in the history of road diets has a similar plan been successful. Downtown needs vibrant businesses without human poo in the doorways. No one will park a bike around here anyway. It’ll just get stolen.	8/29/2022 8:28 PM

341	I am opposed to Medford making this change. There are not enough bicyclists for this to make sense. There is already enough "down town" traffic as there is, why create more of a problem by lessening the lanes? What will happen during the times i5 is closed down and people have to detour thru this section of Medford? Sorry, but it is a poor use of tax dollars making the suggested changes above all for realistically what, maybe 10 bicyclists? Please address the homeless issue. No one feels safe in down town Medford anymore as it is.	8/29/2022 8:23 PM
342	I am opposed to Medford making this change. There are not enough bicyclists for this to make sense. There is already enough "down town" traffic as there is, why create more of a problem by lessening the lanes? What will happen during the times i5 is closed down and people have to detour thru this section of Medford? Sorry, but it is a poor use of tax dollars making the suggested changes above all for what, maybe 10 bicyclists? Please address the homeless issue. No one feels safe in down town Medford anymore as it is.	8/29/2022 8:21 PM
343	As a home-owning, tax paying, citizen I am completely opposed to these so called" enhancements". Traffic flow is already a problem in this town. The changes to Columbus already prove that these changes are not only not helpful, but they are restrictive, frustrating, and not well thought out. I live off of Columbus and have sat at the same main st stop light 3 to 4 changes and as far back as prune st on the south and as far back as 2nd st. On the north. The same will become a problem downtown. Everyone will be backed up, stuck in traffic, causing road rage incidents and all for bike lanes that will get minimal use by taxpayers. The majority of bike traffic, honestly, is the non tax paying and transient populations. To increase congestion and reduce the current flow is counter productive. Just like Columbus, from McAndrews Ave to Stewart Ave. there will be more problems than solutions if this is done. I and my family are very much in opposition to this study and belive the planners need to use our tax dollars for better solutions such as improving the rather poor design that exists, and maybe consider enhancing the current bike path that runs through town and the one along biddle road. The purpose of the Greenway becomes redundant if most of this goes into place	8/29/2022 8:09 PM
344	I agree with the proposed bike lanes	8/29/2022 7:57 PM
345	No changes. This is what the bike path in intended for.	8/29/2022 7:54 PM
346	Leave the roads as they are	8/29/2022 7:50 PM
347	NO BUILD.	8/29/2022 7:32 PM
348	No build	8/29/2022 7:23 PM
349	No build	8/29/2022 7:23 PM
350	Fix the homeless and drug problems around there first. No one wants to ride a bike or walk or do anything because of that.	8/29/2022 7:20 PM
351	No build!	8/29/2022 7:15 PM
352	No build!	8/29/2022 7:15 PM
353	No build!	8/29/2022 7:14 PM
354	Downtown Medford is already horrible to drive through and park in. The parking garages are not conveniently located or safe to be. If you are attempting to kill off the remaining businesses so you can turn it into a mini-Portland, congratulations, you are going to succeed. It really appears that you are trying to accommodate the marginal citizens that ride their BMX style bikes because they can't get and keep a driver license, vehicle, and insurance. They already don't follow rules, what makes you think they will use the lanes? Bicycle lanes are put in and then they are not maintained. When bicycle lanes are not maintained, i.e. kept clear of garbage, gravel, etc., bicyclists end up in the vehicle lanes anyway. Fix I-5 first so we can just avoid downtown Medford. And what are the citizens supposed to do when a homeless person burns the rest of the town down? How are they going to evacuate when you remove travel lanes? Think, booboo, think.	8/29/2022 7:13 PM
355	No changes from current driving lanes.	8/29/2022 7:04 PM
356	No build. This is a horrible idea	8/29/2022 7:03 PM
357	No bicycle lanes at all!	8/29/2022 7:02 PM
358	No build	8/29/2022 7:02 PM

359	The people who presented this obviously don't understand the needs of the community. We need more vehicle lanes, not fewer lanes. I drive through town 6 plus times a day. It's already congested enough. I'm not riding a bike. And I'm not riding a bus. I value my freedom to go when and where I want.	8/29/2022 6:58 PM
360	With a growing population, the push for higher concentration of housing, more vehicles which equates to more traffic, taking away lanes makes zero sense. Zero.	8/29/2022 6:57 PM
361	We don't need this. Leave our roads alone!!	8/29/2022 6:50 PM
362	This is a horrible idea. Mark my words money will be wasted doing it and then more wasted putting it back or fixing it again....bikes are always welcome on the road if you know the rules of the road. There is no need to redo anything and waste money.	8/29/2022 6:47 PM
363	No build option is preferred	8/29/2022 6:33 PM
364	There's no reason for this! Roads are already too narrow. Rediculous.	8/29/2022 6:30 PM
365	I would go with no build option. Don’t take away traffic lanes.	8/29/2022 6:28 PM
366	You should be fired for doing all these road diets!	8/29/2022 6:24 PM
367	Kyle shouldn’t lie and tell the media you are doing this because of a high volume of accidents. I work for the police department, and that is completely FALSE!	8/29/2022 6:22 PM
368	I want to thank you guys for creating this survey! We so need friendlier access to riding, walking, and biking. Multimodal access to transportation is so important! It can be used for getting to work, school, medical, and leisure. We need this after the pandemic. I feel that this would be beneficial for our mental health and safety. I am all for this! I say go for it because this is not a waste of time or money. These changes are crucial for our community. I hope one day families and individuals in our community feel safer with these changes in place and don't have to fear for their lives about being injured.	8/29/2022 10:56 AM
369	Looking at the parking protected solution, it appears without a curb, drivers can and will park on top of the white painted section meant to outline the parking space. This could create a hazard for two-way parking protected option allowing vehicle doors to open into the path of travel for bikes, scooters and skateboards. Consideration of a physical barrier (cement curb) preventing vehicles from getting so close that their doors open in the bike lane of travel. The flimsy plastic cones aren't a deterrent enough for some drivers and eventually cones will be damaged or missing. Should bicyclist not feel safe knowing doors could potentially open at any time (drivers don't pay attention or expect their door to open into the path of travel) bicyclist will eventually ride in the wrong lane of travel or not use the path at all instead going to the sidewalk or riding on court in the sharrow lane.	8/29/2022 10:43 AM
370	This is a great opportunity for the Cory of Medford to really enhance the safety and visual beautification of downtown. Don’t blow it! We need more separated bike lanes with green scape. More greenery will soften the all the concrete on Main and make it a more enjoyable promenade for pedestrians.	8/29/2022 10:37 AM
371	Riverside is a serious pain for most pedestrians. Traveling down riverside daily from work, I experience first hand the challenges poor street planning have on the community. The sharrows are nice but, bicyclists don't really feel safe in that lane so most travel on the sidewalk at a high rate of speed forcing pedestrians to move into the street, gravel or occasionally be ran over by the bicyclist (I've been ran over at least once by a man simply not paying attention while riding on the sidewalk). Pedestrians must deal with speeding bikes, skateboards and scooters. Add electricity to a bike and now you basically have a motorcycle on the sidewalk. Bicyclists must feel safe and should not be forced to ride the sidewalk creating new challenges for pedestrians. There needs to be curb cuts at the intersection of 12th and riverside as a fair number of pedestrians, including those in mobility devices, use but are forced into gravel or traffic. Compounding the intersection, 12th is used as a shortcut to 10th where they can race home through residential neighborhoods like mine. Riverside is basically 4 lanes wide encouraging people to drive fast through an area basically connecting residential, parks, shopping ,etc with other goods and services. When people get to the downtown area around the RCC buildings, they now can't safety cross the bearcreek and walk the bike path as the bike path and bridge are camps for houseless individuals.	8/29/2022 9:32 AM
372	The survey you provide is not adequate to engage with the public for input. Without open engagement and dialog the public trust is being destroyed. The public can clearly see that an	8/29/2022 8:40 AM

	agenda is being forced on us. This will not stand, please start engaging with the people and not special interests that are impeding the health, safety and livelihood of the people. We are seeking accountability for this sort of non elected, non representative, agenda driven governance.	
373	This whole concept is not legal. Do not go forward with this, no one wants it. You are risking your political life, you can be fired. I am 75 years old and was born in Medford. My taxes have built the roads here and you do not have my permission to go forward with this rotten policy. Who is pushing this? If it is not your idea whose idea is it?	8/29/2022 8:16 AM
374	NO!	8/27/2022 4:45 PM
375	I tried to keep in mind cost and positive outcome for businesses. I don't currently bike into downtown Medford but with these changes I would!	8/26/2022 6:13 PM
376	Protect bike/ped/roll-ers as much as possible! We've got more than enough vehicle throughput and parking.	8/26/2022 4:02 PM
377	Until the homeless are gone from downtown-this will never work. Perhaps dealing with that first.	8/26/2022 8:26 AM
378	This is disastrous if there is a fire. I am so disappointed in Medford for not putting fire evacuation as the TOP priority. PLEASE listen to the community and do not reduce the lanes. Take Phoenix's experience and use it and be a progressive city. Please. I am the admin of a fire watch group of 10,000 people and none of us want you to reduce the lanes. It's hazardous.	8/26/2022 7:58 AM
379	As a daily biker from Dakota street to Northgate Fred Meyer, more just buffered bike lanes like on Columbus is fine. But they need to enforce not parking in out to the point of blocking them. Even the lanes on Jackson are fine, as long as on the eastbound side cars are able to park correctly and not block the lane. Anything done on Riverside/Central needs to be focused on maintaining parking spaces.	8/26/2022 12:08 AM
380	This is a staff driven boondoggle supported by at most a few dozen actual citizens. Where are the traffic counts including bicycles? Where are the car and truck traffic counts? How do they compare? Where do taxes come from, drivers or bikers? Don't squander any more of our tax dollars on this boondoggle!	8/25/2022 8:32 PM
381	This is not a practical use of downtown streets. Looking at similar models of other cities and towns will show that it reduces good parking locations for patrons of businesses with little upside. Weigh the cost (including to store owners) to the benefit of a much smaller segment (bikes, etc.) and it should be an easy decision. I hope you take these concerns to heart before moving forward on a losing plan.	8/25/2022 3:35 PM
382	This is a great idea. Me and many other cyclists and people who just don't like having to be stuck in traffic or don't want to be run over by a giant metal box where someone isn't watching the road would be very appreciative. Thank you.	8/25/2022 2:28 PM
383	I like this project, but I am concerned that it might be too hard to get into downtown by bike for these changes to be used as much as I want them to be, so I'm concerned about connectivity. The Main street project doesn't seem long enough into the suburbs, and the Riverside and Central projects seem like they extend too far upwards, into what's a more industrial and less developed area, but that's just my instinct. I think it might also be much easier to develop adjacent streets with better bike infrastructure, instead of developing bike infrastructure along very heavily trafficked streets. Might be easier to get approved, and I imagine it'd be easier to do more with less. There's less space, though, so motorists might be angry about that. Also, I would look into turning Riverside and Central into two way streets. I don't think that the speed of traffic, especially around the core of downtown, is high enough to justify them being one way streets. I also think that turning them into two way streets along their length would slow traffic at the top and bottom enough to allow walkability to develop, but this is obviously a multifaceted issue that's related to zoning, as well.	8/25/2022 1:17 PM
384	The parking protected bike lane should include a three foot wide buffer not two feet. Car/truck doors extend four-feet from the vehicle. Source: https://usa.streetsblog.org/2014/07/30/study-to-keep-bicyclists-outside-door-zone-you-need-a-buffer/	8/25/2022 11:52 AM
385	Do not reduce any lanes for cars. The congestion is bad already, reducing lanes will make this worse. We have a bike path on the greenway, make it safer for people to use and you will	8/25/2022 10:30 AM

	provide the need your trying to address here. One more thing, if the viaduct ever needs closed how would you route I-5 traffic through town with the reduced lanes?	
386	Thanks for working on this! I feel like I am one of the lone bikers in Medford (biking from south Medford to Central Point for work). Improving visibility and accessibility to walking and bicycling infrastructure would help folks who aren't as comfortable get out more I think.	8/25/2022 9:26 AM
387	Please don't let a vocal minority of backward minded people keep Medford from making positive progress in allowing access to all. Adding increased foot & bicycle traffic is a boon to all businesses on downtown medford, and will give the city a fighting chance at finally having the vibrant and lively downtown look and feel that has been a constant struggle to find.	8/25/2022 8:24 AM
388	I love that there will be more bike friendly lanes !!!	8/25/2022 7:44 AM
389	NO BUILD . DO NOT WASTE OUR MONEY ON THIS WASTE OF SPACE . WE DO NOT HAVE ENOUGH BICYCLIST TO BUILD ANY OF THIS . YOUVE ALRWADY RUINED THE FLOW OF TRAFFIC AND MADE MEDFORD SO FUCKUNG HORRIBLE . STOP BUILDING DUMB SHIT .	8/25/2022 12:20 AM
390	Dont build anything! Stop ruining medford's already shitty flow of traffic. You guys need to focus on this horrible towns already devastating problems. Fuck your stupid fucking bike lanes. Focus on the drugs, the pedophilia, the child porn, the robbery, the violence, the homeless, the fucking crime for god sake. Make people use the fucking Greenway you have already wasted all our fuckin money on. Fuck your stupid idea!! DONT CHANGE ANYTHING NO MORE BUILDING	8/25/2022 12:16 AM
391	- People living downtown would like to have the same privileges as affluent neighborhoods for efficient and quick access to driving and roads, which bike lanes will negative affect. - There is already a bike/pedestrian lane in Medford, the greenway. The greenway connects housing, businesses, downtown, work, and parks. The greenway is unsafe, and full of transients, crime, drugs, needles, garbage, dangerous dogs, human waste, shopping carts, parks that are unsafe for kids to play at, and a creek that is contaminated with garbage and human waste. Instead of building something that already exists, clean up the greenway and turn it into a safe and cleaned pedestrian/bike road. - New bike lanes will turn into places where more vagrants, crime, human waste, garbage, shopping carts, abandoned vehicles, drugs, needles, etc. will collect. If the intention is to improve traffic to downtown for downtown business and housing to develop, then clean up downtown from vagrants, garbage, shopping carts, drugs, crime, needles, etc. , and make it clean and safe. Even if 10 bike lanes are created, people won't feel safe going to downtown. See example, Portland downtown. - The current roads are fine, and appear to accommodate future driving traffic needs for new businesses and housing downtown Medford.	8/24/2022 10:36 PM
392	Please do not spend the time, energy or money on this. Please focus on the mental health, drug addiction and the combination of the two. That is a much more pressing issue. I realize these funds may not be allocated for such things, but to spend this money in the face of these unmet needs is tone deaf and will contribute to a growing animosity and resentment towards municipal governance. Please care more about the safety from crime and addiction than bike lanes.	8/24/2022 10:08 PM
393	Why no acknowledgment of the Bear Creek Greenway for north/south biking and walking? If people were using that expensive greenway more- maybe it would be be a home for tents? Population has grown - but our streets and sidewalks haven’t - yet you want to reduce throughput on the main arterials? How about more bridges over Bear Creek/I5 so people don’t have to drive as far to even access crossways? Bike lanes are great in big cities who have enough bike traffic to justify and land to accommodate. I wish we were Barcelona or Portland, but is this really just a money grab for some grants to do public works? Congestion is getting worse all the time and I’d like to believe this would be an improvement, but I don’t. Did you also consider how different our weather extremes are in Medford- compared to say Eugene or Portland - colder on the winter and much hotter in the summer- which also would affect these types of mobility - you want to bike through downtown when it’s 110+ degrees? Doubtful	8/24/2022 9:12 PM
394	Please do not decrease lanes for traffic. As a bike rider, I have plenty of options for different routes to get where I need to go.	8/24/2022 7:17 PM
395	Pedestrian safety can always be improved by strategic high visibility crossings. I support this proposal and would need to see actual pedestrian traffic study numbers to vote on which crossings should be given priority. As for bottlenecking traffic and decreasing available	8/24/2022 6:58 PM

	parking, it's already very difficult to get around town and park to support businesses. With the nearby exclusive bike path, it is foolish to choke down major corridors. If the biking-able population levels justify more bike lanes, there are many adjacent and parallel roads that could have bike lines reserved for such a purpose instead of the major roads proposed here. Public transit is more accessible. It supports people, disabled and non-disabled, young and elderly, and all economic levels. Increased options for public transport should be a higher focus instead of making it harder to get around Medford, which already suffers from congested traffic, long lights, and the resulting idling cars spewing exhaust into the air.	
396	The congestion is bad now, no change!!	8/24/2022 6:50 PM
397	California had a similar down town nightmare with homeless and run down old areas .. they transformed it into western university of health sciences campus and its fabulous now .. how about expanding our college campus and eliminate the old buildings and one way streets. Bikes will be a welcome option but revamping that area calls for renovation and forward thinking for years to come for our children and the continued efforts to offer education and trades all in one location. Would make security easier as well	8/24/2022 6:44 PM
398	We need to focus on making the Greenway bike path safe for everyone first. I drive these areas mentioned at different times, and do not see alot of bicycle traffic. I see plenty of serious bike riders that wear bike helmets and safety reflectors in Ashland. In Medford it is adults on small bikes, no helmets, looking for drugs.	8/24/2022 6:05 PM
399	Use the Greenway bike path we already pay money on.	8/24/2022 5:57 PM
400	THIS DOESNT FEEL LIKE AN ADEQUATE PUBLIC INPUT INTERFACE. ONLY PEOPLE WHO KNOW WILL COME HERE TO TAKE THE SURVEY. LARGE SCALE PROJECTS THAT EFFECT THE ENTIRE TOWN SHOULD BE PUT TO A VOTE AND GO UNDER MUCH MORE SCRUTINY.	8/24/2022 5:01 PM
401	Excellent approach to engaging the public (meaning me)! My experience in Montreal, which has bi-directional bike lanes is that they can be troublesome. They adopted them so they could plow the snow better(!) I found them dangerous as people passed the slower riders, or when slower riders would just wander about within the combined width, and lastly, when people were crossing the street, they often forgot to look for bi-directional traffic.	8/24/2022 4:14 PM
402	I would love to see a more bikable and walkable place.	8/24/2022 2:56 PM
403	In spite of what the City Council of Ashland may publicly report, a majority of Ashland residents will never understand why the road diet happened. It has created major congestion in an already complicated area. Also consider Phoenix and their rollback of the road diet. It isn't necessary in our towns, and unless a rail line or some other public transport besides buses (who need the roads) is instituted, this is just a waste of energy and money.	8/24/2022 2:46 PM
404	I am so excited for this. As primarily a bike commuter this eases so much anxiety. I won’t have to choose do I double my time to ride on slightly less dangerous roads or do I take the risk and get somewhere faster? There are not many bikes on those roads, but this WILL make bike travel safer through town therefore increasing the amount of bikes on the road and decrease the amount of cars. Thank you!	8/24/2022 1:59 PM
405	Please make sure there is enough space for bikes!	8/24/2022 1:45 PM
406	I will always prefer separated bike lanes, with a curb, to keep distracted drivers away from bicyclists.	8/24/2022 1:24 PM
407	Ongoing maintenance is far more important that the original construction. Any new bicycle paths must be kept clean of rocks and road debris and excessive weed growth. Unfortunately, many Medford Street Sweepers push all the road debris into the existing bicycle paths.	8/24/2022 12:58 PM
408	No build	8/24/2022 10:00 AM
409	Many people from the surrounding areas of Eagle point, Shady Cove, White City, Grants Pass, Rogue River, Gold Hill, Williams, Applegate, Jacksonville, Ashland, Talent and Phoenix etc have to DRIVE their vehicles to downtown Medford. They will not be able to bike from their houses. The elderly, handicapped and infirm will not be biking from their houses. Medford is not a big city needing with a BART, MAX and bike lanes and never will be. The perceived need for these bike lanes at the expense of car lanes is clearly being made by people living in big cities like Portland and Seattle that have either have an agenda or they do not have common	8/24/2022 5:46 AM

	sense. Either option screams that they do not care about the actual concerns of our areas tax payers.	
410	Many people from the surrounding areas of Eagle point, Shady Cove, White City, Grants Pass, Rogue River, Gold Hill, Williams, Applegate, Jacksonville, Ashland, Talent and Phoenix etc have to DRIVE their vehicles to downtown Medford. They will not be able to bike from their houses. The elderly, handicapped and infirm will not be biking from their houses. Medford is not a big city needing with a BART, MAX and bike lanes and never will be. The perceived need for these bike lanes at the expense of car lanes is clearly being made by people living in big cities like Portland and Seattle that have either have an agenda or they do not have common sense. Either option screams that they do not care about the actual concerns of our areas tax payers.	8/24/2022 5:46 AM
411	This doesn't work well in Jackson County's more rural areas. And in Portland many folks really disagree with how things are done and are mad it was rammed down their throat.	8/23/2022 7:17 PM
412	Please do not move forward with any Bicycle Facility Design roadway changes. The traffic congestion they create is annoying and force impatient drivers onto alternate routes, thus increasing traffic in other areas. The time added to our drive time is adding to the climate change problem. If bicycle doesn't increase substantially or if the scooter fad (Bird type) does catch on, perhaps a "rider's lane" or Bicycle Facility Design type lane should be added to the existing sidewalks to accommodate these individuals. Maybe even a temporary, limited duration situation as so few citizens are biking or scootering most of the year.	8/23/2022 2:36 PM
413	Thank you for the efforts at traffic management and safety. As has been the experience in the Rogue Valley, application of Road Diets have not been beneficial f or the residents. The resulting bottlenecks of traffic have slowed traffic flow. Many drivers seek alternate routes through residential areas. The forced traffic jams add to pollution as vehicles are delayed in reaching their destinations. Traffic and pedestrian safety is compromised as frustrated and impatient drivers block intersections and crosswalks while trying to move through the constricted Road Diet areas. Please take the time to reassess the wants and needs of our communities which are not satisfied by the realities of the Road Diet theory.	8/23/2022 10:13 AM
414	I am strongly against this. This was done on East Jackson street and inhibited up the flow of traffic there. Its constant waiting and long lines at rush hour. If you want to proceed you need to let the people you represent vote on the issue. You know we won't vote for it though. No one in their right mind would. Just pave the roads; don't try and re-invent them.	8/23/2022 9:32 AM
415	You should leave the roads how they are now. Traffic is already bad as it is, if you get rid of a lane then it will only get worse. For example north Columbus Ave used to be 2 lanes on both side. Now it's one lane and traffic is terrible during rush hours and it's only going to get worse.	8/23/2022 9:27 AM
416	I've only lived in Medford a couple years, and I have rarely seen ANY biking on the streets in question. But the vehicle traffic increases every year. If it ain't broke, don't fix it.	8/23/2022 9:04 AM
417	bike path alongside the rail corridor would be a great use of underutilized area. path could be separated from rail line with a simple chain link fence for safety.	8/23/2022 8:41 AM
418	"No build".....Do not buy into the Portland mindset of "utopia" here in southern Oregon. Bike usage in southern Oregon is recreational, not daily commuting. Like the true ridership numbers on RVTD, bicycle usage of our current dedicated lanes is minimal. Further sacrifice of motor vehicle movement, parking, freedom, and safety is not warrented.	8/23/2022 8:01 AM
419	As someone who regularly cycles to move around Medford, I am wondering about paving a bike path through downtown alongside the train tracks. The train corridor through town is car free and generous enough to accommodate bike lanes off to the side. Personally, while I laud your motives of increasing safety and mobility for those using Central, Riverside and E. Main, even with the improvements you suggest, I don't think I would be comfortable using those routes. There is simply far too much traffic on those streets. The railroad corridor is close enough to Riverside/Central that it seems cyclists would be willing to detour to use traffic-free cycling lanes. E. Main, of course, would still need improved bike lanes. Thank you for your efforts to increase safety and mobility for all in downtown Medford.	8/23/2022 7:17 AM
420	We the people do no want this mess you are creating.	8/23/2022 12:22 AM
421	On city arterials, highest priority should be car and truck traffic, multi-lanes. Bicycle lanes can be built on secondary streets, often just one block away. Medford is too hot, and the population trending too old, for bicycle transportation priorities, other than dedicated current recreational	8/22/2022 4:17 PM

	paths such as Bear Creek Greenway. Build it and they will come is NOT going to happen here. Climate, topography, age mix, dispersal of retail outlets, etc. is not a recipe for more bike lanes. But, there will be more vehicle traffic which requires multi-lane arterials.	
422	Seems like when we do this we are sacrificing an extra lane on these streets and we end up with further traffic congestion. I am opposed to the idea, but it probably wont matter in the end. Somehow cyclists have become a priority over everyone else.	8/22/2022 4:09 PM
423	instead of putting bike lanes and a road diet on the main arterial roads as proposed, it would make more sense to put bike lanes on less congested streets adjacent to these main thoroughfares. please choose wisely	8/22/2022 2:27 PM
424	how will you handle traffic demand at congested intersections through peak demand hours??? ever do a cost - benefit analysis? who's this really serving? Honestly think this is a bad idea...	8/22/2022 1:11 PM
425	Please stop attempting to change the roads for the benefit of a minority of the population. As a pedestrian, and responsible citizen, I have used the existing crosswalks and traffic signals which are more than sufficient. Reduction of the available lanes of travel for motorized vehicles is frustrating and insulting.	8/22/2022 11:48 AM
426	I am strongly opposed to any and all of these changes. The lane reductions that have already been completed add congestion and I almost never see the bike lanes utilized. There are not enough bike commuters to make it worth the negative impact on motorists. As a tax paying Medford resident, I am strongly opposed to this. If there is incentive being offered by the state or federal government, I believe it is the taxpayers right to know. Given the obvious foolishness of this sort of proposal, I must question the true motive behind this sort of proposal.	8/22/2022 11:43 AM
427	You have already screwed up Columbus and nothing but tweekers are on bikes there and they still cross over and ride where ever they want. Downtown is already to congested with not enough parking. You are killing the business downtown. We are NOT Portland!!!	8/22/2022 9:25 AM
428	On Central, the one way separated looks much better. Both because it feels safer as a rider, and also because there are trees in the separation. The trees are important. The street will look much better, and for a bicyclist with no air conditioning, street trees make the ride much more comfortable.	8/22/2022 8:23 AM
429	I live downtown and the only people who use bike lanes/bicycle are transients/homeless. Just like the expensive project: the greenway that no one uses except for the above mentioned. It is not a good, safe or useable idea.	8/22/2022 8:22 AM
430	With the age of our population we should make the roads more auto friendly.	8/22/2022 7:53 AM
431	Please, this is not Portland. I drive through Phoenix everyday. I have never seen a bicycle on 99. NEVER. I had friends in town yesterday from Denmark. Majority of them ride bikes, fine. Until a majority of people in Oregon are riding bikes, cater to the tax payers paying for these roads.	8/22/2022 7:51 AM
432	I would vote for no build. There is already plenty of congestion, while hardly any cyclists to be seen anywhere. These options would be a large waste of money only to see the congestion worsen.	8/22/2022 7:48 AM
433	Do not reduce any streets for the very few bicycles. They can use Bear Creek Greenway!	8/22/2022 7:26 AM
434	No bicycle lane. Roads are for the vehicles that paid for them. Automobiles not bicycles and bicycles should be on the bike path not homeless peoples campground. And also the speeds are so low downtown a bicycle commuter can keep up in the normal flow of traffic. Lived here all my life. Tired of the homeless problem too. NO BUILD OPTION!	8/22/2022 7:01 AM
435	No bicycle lane. Roads are for the vehicles that paid for them. Automobiles not bicycles and bicycles should be on the bike path not homeless peoples campground. And also the speeds are so low downtown a bicycle commuter can keep up in the normal flow of traffic. Lived here all my life. Tired of the homeless problem too. NO BUILD OPTION!	8/22/2022 7:01 AM
436	It’s time for change we need better infrastructure for bikes/PEOPLE!	8/21/2022 8:03 PM
437	Here’s the thing you’re gonna hear a lot of opposition to removing a lane. I think that’s to be expected and it has such a bigger impact being able to safely bike throughout downtown. and	8/21/2022 8:02 PM

	adding dedicated bike lane is a step in the right direction. I think it’s about creating a much more enjoyable city for the future	
438	Other than the comments already entered, this really needs to be thought through much more. Better sidewalks are needed on Court for sure. There are areas where the homeless that roam the streets make it unsafe, even if you had the best plans for a bike/walking/rolling path. The basics need to be addressed first. Improving pedestrian crossings is a good idea.	8/21/2022 4:33 PM
439	Scrap this road diet plan in its entirety. 1. These roads are already too narrow to accomodate the heavy traffic load we currently experience in this city. 2. Construction would congest these busy, high traffic roads, which leads to accidents and other problems. 3. If we were going to endure the mess of road construction, it would be beneficial to create more lanes, turn offs, parking, and etc for automobiles. Businesses are negatively impacted when the roads leading to them are inaccessible or congested. At least build better access for those businesses if you're going to the trouble and expense of road construction! 4. Bear Creek is already a biking road, we don't need more infrastructure. This new bike lane would not be used because no one uses them currently to commute. A dedicated bicyclist would be riding no matter the conditions, and we can see that the use is already extremely low. 5. Most pedestrians and bikers do not feel safe using these roads because of the out of control homeless population. It will not be fixed with a bike lane. The danger of homeless tramps will persist. 6. We are not a walking and biking city. We are a driving city. Bike lanes will not change that culture or eliminate the necessity for better roads for drivers. In fact, it will add problems to our roads. Our roads in this town have been dieting for 30 years. It's time to fatten them up.	8/20/2022 5:04 PM
440	It’s hard enough to get through town as it is and in an emergency you will create a Bottleneck situation like Paradise CA. No more bike lanes. I never see them used as it is!	8/20/2022 4:15 PM
441	Attention to protecting bikes at itersections from turning motor vehicles crossing the bike lane.	8/20/2022 2:40 PM
442	Do not get rid of any parking. There isn't enough bike traffic to justify making bike lanes	8/20/2022 12:23 PM
443	No build. These streets are already traffic nightmares, our streets were not well planned for our population and have not been maintained to even handle the current load of traffic. This reduction will be nothing short of a disaster, no one will want to be down town when they have to deal with bumper to bumper grid lock which means our local businesses will suffer greatly. I don't even like driving on these roads now and this project just makes it worse. Bear Creek already follows all of these roads giving great riding access safely to cyclists which doesn't have traffic problems unlike these proposed streets already do. Instead take this tax money you want to spend and actually use it to improve the flow of traffic not make bike lanes that will barely be used in comparison to the vehicle traffic. Motor vehicles are the majority on these streets it makes no logical sense to make motorist suffer and kill local businesses for a minority who use those streets.	8/20/2022 11:09 AM
444	Changes were made to Columbus and 100% of the folks who live and use the street do not really approve of them. The traffic is sometimes backed up so much that you cannot safely enter onto Columbus or cross it now. I live on Western Ave and there are times when I cannot cross the street. I'm also an avid bike rider and it has made many upset and I've actually seen more accidents. Question: why are there not more bike lanes around South High? There are bike lanes that come from S Stage then end a block before the school where there is a slight bend in Columbus. Makes it dangerous to ride or to walk through that area for students.	8/20/2022 7:54 AM
445	The tweakers that ride bikes do not use bike lanes or follow traffic rules. The road diet on Columbus is terrible. Longer times sitting at intersections no use of bike lanes. Why would I want to go down town if I know it will be more congested? If you're wanting to kill downtown it's working. Go build your fairy tail somewhere else. And how are you taxing the bicycle users to pay for this? If the money is coming from the gas tax you are stealing from the drivers that pay it. And if you are using general fund dollars you are stealing from other much needed infrastructure projects. Reality check. The people with enough money to afford to shop downtown don't live with in peddling distance. They drive an automobile.	8/19/2022 7:51 PM
446	I am strongly opposed to any and all of these changes. The lane reductions that have already been completed add congestion and I almost never see the bike lanes utilized. There are not enough bike commuters to make it worth the negative impact on motorists. As a tax paying Medford resident, I am strongly opposed to this.	8/19/2022 6:51 PM
447	Please do not remove lanes of traffic to create bike lanes. Downtown Medford is a joke and creating bike lanes from existing lanes for vehicles won't do anything but prevent the little	8/19/2022 6:51 PM

	amount of people that do go downtown from going. Until you actually create a downtown worth going to, you shouldn't bother with alternative transportation routes.	
448	Please do not remove lanes of traffic to create bike lanes. Downtown Medford is a joke and creating bike lanes from existing lanes for vehicles won't do anything but prevent the little amount of people that do go downtown from going. Until you actually create a downtown worth going to, you shouldn't bother with alternative transportation routes.	8/19/2022 6:51 PM
449	These bike lanes seem like a good idea in concept however, the few we have already installed have caused major traffic backups. For example, take N. Columbus St. in the morning. While people are going to work and school (and in the evening when people are returning), the traffic is so backed up that people make illegal u-turns and and rush down side streets to get around the traffic. Since we've lost one lane, it will take 15 minutes sometimes just to get from McAndrews to W. Main Street on N. Columbus. The number of bicyclists compared to the number of motor vehicles on that street does not balance out to make such a change. I hope when you're considering these other streets you will do intensive research on traffic. I avoid S. Columbus now because of the traffic and choose to go around (detour) to get home.	8/19/2022 10:28 AM
450	Considering all the traffic Medford has now, I don't know why we are trying to take away driving lanes. Like Columbus is a disaster now, waiting 30 min at the Main/ Columbus street light just to get home after work because you took away the double lane. Imagine how much more backed up traffic will be if you get ride of traffic lanes on these proposed streets. We should be expanding lanes with our growth, not taking them away & funneling everyone into ONE lane. You are asking for road rage accidents to happen.	8/19/2022 9:16 AM
451	Please quit catering to the vocal minority who loudly demand bike lanes, get you to expend an inordinate amount of time and money to provide them, and then they go largely unused. The complainers got their way and then go back to their previous mode of transportation. Use our limited funds more wisely. Thanks.	8/18/2022 10:09 AM
452	Please make safe bike lanes and safe for pedestrians. I do not like the two way bike lanes, I like one way bike lanes. The one way bike lanes and parking	8/18/2022 7:09 AM
453	NO BUILD!!!	8/17/2022 10:20 PM
454	Would you relocate buildings to put in place a third lane? I mean that’s a lot to accomplish… I don’t think downsizing to one lane (for cars) is a good idea for a growing population…	8/17/2022 9:48 PM
455	No more road diets….. PERIOD	8/17/2022 11:57 AM
456	Decreasing the auto lanes will restrict traffic flow. The minimum change is the best option if you absolutely must change this. Bike lanes are fine if the bikes stay in the lane not just ride on the traffic side on the line.	8/17/2022 8:00 AM
457	No build leave roads as they are	8/17/2022 7:22 AM
458	no build, this is ridiculous	8/17/2022 7:16 AM
459	No build.	8/17/2022 7:12 AM
460	No more road diets in Medford please!! The most recent one on Jackson is terrible, as is Columbus on a busy morning. I live on a side street of Columbus and get people FLYING down my street after they get sick of waiting on Columbus for a 4- way stop that is 5 blocks away.	8/16/2022 7:37 PM
461	Please do not change these roads from the lanes they currently have. If anything, Court/Central and Riverside could be leveled out a bit, retaining the 3 lanes on both.	8/16/2022 7:23 PM
462	there are not enough bikes to warrant the loss and increase in congestion on the roads	8/16/2022 6:36 PM
463	No build	8/16/2022 6:22 PM
464	No build	8/16/2022 5:27 PM
465	I'm grateful the city of Medford is planning to make some changes and I hope they all come to fruition! As someone who rides my bike downtown multiple times a week, I do not always feel safe in the current set up since it is very car-centric. I hope this is an indication of a larger trend and we continue to expand and improve our infrastructure to better serve cyclists and pedestrians!	8/16/2022 4:22 PM
466	No Build	8/16/2022 4:13 PM

467	NO BUILD!!	8/16/2022 4:03 PM
468	Bikers need to stay OFF OF MEDFORD's busiest and congested roads without you widening those streets. There are PLENTY of alternate bike options. Especially if you clean up the bike path through town!	8/16/2022 3:35 PM
469	Leave the roads the way they are	8/16/2022 3:35 PM
470	This would horrible for our town. We are at high risk for fires this would make getting out of town difficult. Not to mention all the Congestion it would cause.	8/16/2022 1:46 PM
471	Thank you for the study and being willing to increase the safety of those choosing alternate transportation. I think that enforcement of existing codes/laws needs to be on the books as well. I favor two-way separated bike infrastructure, but anything helps if it gets bikes out of the main path of traffic.	8/16/2022 1:23 PM
472	Please do not do this. Let us spend the money on MORE important things like the homeless, a bigger jail, CRIME!	8/16/2022 10:41 AM
473	This is going to detrimentally impact traffic. Busses are going to have to make stops all along this route. That means cars that are used to driving in THREE lanes using 1 to yield to busses, are going to be limited to 2 lanes using 1 to yield to busses. Traffic is already horrible along here with three lanes. I cannot imagine how congested it will be if there is a reduction in lanes. Also did this take out a massive amount of street parking? Yikes down town there already isn't enough free parking. Parking on the street is much safer than having to go down a few blocks past homes less people to a dark lot. Too bad the nice bike path that runs parallel to this route is swarmed with homeless people and is no longer usable. Keep bikes off busy roads.	8/16/2022 10:32 AM
474	The percentage of people that commute to work by bicycle in Oregon is 1.90% (retrieved from: https://thebikeadviser.com/bike-commuting-united-states/). In 2022, Medford's population is/was 88,008 (retrieved from: https://worldpopulationreview.com/us-cities/medford-or-population). 1.9% of Medford's population works out to 1,672 cycling commuters. From a fiscally responsible viewpoint, and as a tax-paying Medford resident, I believe it is grossly negligent to allocate tax payer funds to any large scale expenditure that will benefit only 1.9% of our residents. Additionally as a woman, I strongly object to this plan that inequitably accommodates men. Per thebikeadviser.com website, men make up 77% of all cyclers and thus cycling is an outdoor activity dominated by men. Per the same website, male bike commuters, at 71% of all cycling commuters, more than doubles the percentage of female commuters at 29%. I hate to say this, but it appears that this plan is sexist and thus I implore you to abandon it for this reason as well. A. Thompson Medford, OR	8/15/2022 9:34 PM
475	Especially with regard to Riverside and Central, it's important to factor in safe and easy access to Greenway (especially if need to cross traffic lanes). Regarding the Greenway, may want to consider a "bypass" option for the Hawthorne Park/I-5 viaduct section. I'm OK using that section, but MANY people will not use it because of safety concerns (note that this includes simply a fear of running into people hanging out on the path, especially under bridges where visibility can be challenging).	8/15/2022 2:27 PM
476	I believe that you will constrict the flow of traffic through the downtown area by adding these additional bike paths. We have a bike path currently for North/South travel. I rarely see much bike travel in the downtown area currently. I frequent this area of Medford and do not want to change the free flow for vehicle traffic. If there is another catastrophic fire event, we need as much vehicle traffic flow as possible! We are NOT Portland or a metropolitan area now or in the reasonable future. DO NOT SPEND MY TAX DOLLARS ON THIS PROPOSAL! Long time Medford resident and true stakeholder/taxpayer! Carol Robbins	8/14/2022 6:03 PM
477	None	8/14/2022 5:29 PM
478	I cycle regularly for recreation and for errands. I am grateful for the cycling infrastructure that allows me to do this as much as I can but would so appreciate there being more viable options for me to ride across town and feel safe. Thank you for taking the time to consider improving cycling options which I think can be a valuable asset to the city of Medford and the over health and safety of Medford residents.	8/14/2022 4:24 PM
479	Downtown businesses will suffer, current roads changed to these models get nearly zero usage, the bike path gets you to most areas of town and this proposal is to satisfy a very small portion of people in this town that have too much influence.	8/14/2022 3:34 PM

480	please do not narrow the streets. already messed up columbus making it two lanes, super congested and not convenient. we don't need a 'road diet'.	8/14/2022 1:29 PM
481	For better guidelines consult: Project for Public Spaces P.O. Box 1073 New York, NY 10276-1073 info@pps.org Project for Public Spaces provides excellent examples of good and really bad city planning designs with respect to traffic and pedestrian movement. Before coming up with innovative concepts, consult the Department of Transportation's Highway Design Manual as well as DMV rules and regulation. Such things as two-way bicycle lanes adjacent to motor vehicle traffic is pretty frightening and down right dangerous when it comes to left or right turning traffic. Some of these ideas are very counterproductive and will continue to have people refer to Medford as Dreadford. E. Lippman (elippman@aol.com)	8/14/2022 12:30 PM
482	Two votes against ANY bike lane changes from Mike Bower and Helen Bower. Leave the streets alone, please. Enough with traffic snarls created for minimum benefit.	8/14/2022 12:24 PM
483	The photograph featured in the ad about RCC's Open House in the Mail Tribune on August 14, 2022, depicting two-way bicycle traffic separated from vehicle traffic should be immediately deleted. It shows a very dangerous concept of traffic movement which would seriously endanger bicyclists at both intersections and mid-blocks. Whose designed this concept is ignorant of legal traffic flow concepts with respect to left or right turning vehicles of all kinds: both motor vehicles and bicycles. If the design shown in the photograph were employed, it would result in confusion and possibly a high rate of injury and death for bicyclists. Please delete it. Please consult the Transportation Department's Traffic Design Manual and the DMV rules of the road before coming up with any more innovative new ideas. E. Lippman (elippman@aol.com)	8/14/2022 12:19 PM
484	There is no reason to add any bike lane configuration at all. Bikers do fine riding in the traffic flow, I have managed all my life to ride a bike without a specified bike lane. I vote NO to further car snags.	8/14/2022 12:19 PM
485	I am a male cyclist 45 ys old, and my wife and I cycle multiple times a week. 1) never use sharrows, waste of money and does not increase safety. 2) leave central alone, too political. 3) install 2 way separated on both east main and riverside. Use a curb and flags, not just flags, they will be destroyed. My wife and I are very excited this is being addressed and will be added to the community. We feel the safety of cyclists is being addressed adequately and the future of cycling looks positive in the rogue valley due to this direction. Matt Robinson Pm4him@gmail.com	8/13/2022 11:23 AM
486	No changes.	8/13/2022 7:38 AM
487	No build is the best option.	8/12/2022 12:27 PM
488	Stop messing with the roads! We do not have that many bikes to be removing car lanes for bike lanes. The new Columbus intersection is terrible. The plans for Mc Andrew's and Crater Lake are terrible. The Phoenix interchange is the worst change yet. We need to be working on the flow of vehicles, not bicycles.	8/12/2022 10:00 AM
489	Bike lanes are not market driven. This is purely political and the people do not consent to this narrowing of car lanes.	8/12/2022 8:56 AM
490	With the down town businesses being driven out, by force potential customers to the mega malls and big box stores. Does the city of medford plan to condem the properties as a loss of tax revenue then convert them to a vertical hoomeless camp?	8/12/2022 12:56 AM
491	Where do cars park? Please leave these streets alone!	8/12/2022 12:19 AM
492	No build	8/11/2022 11:18 PM
493	Don't narrow the road unless you plan to pay for the eventual damage done to my vehicle by people that damn near side swipe me daily! Make the road signs more visible, and maybe use the Greenway and alleys for a bike path. Well, AFTER you remove the homeless scum that lives there.	8/11/2022 8:45 PM
494	No Build	8/11/2022 8:23 PM
495	No Build	8/11/2022 8:22 PM
496	STOP THE ROAD DIETS! Stop trying to push your personal agenda down the throat's of taxpaying citizens. I am calling you out Christina and Kyle Macnair! You should be fired for	8/11/2022 7:50 PM

	what you did with Columbus.	
497	NO BUILD PLAN! Enhanced crosswalks are a good idea. Decreasing lanes of traffic are a BAD idea. Most of the roads have been here since Medford was half the size it is now. The roads need to grow in lanes, not shrink. People take the path of least resistance. Decreasing automobile traffic flow is bad for residents and bad for our small businesses that are already struggling. When I ride a bike, I follow the rules of the road and I have no problems sharing the road with cars. If you build a new road, take enough space for cats and wheels. For the orders roads, leave them alone!	8/11/2022 7:26 PM
498	Don't need it. Waste of time and money	8/11/2022 7:15 PM
499	Don't need it. Waste of time and money	8/11/2022 7:14 PM
500	No this is not a good idea streets are moving like crap and bikes do not pay taxes to maintain the road if they want it pay a bike tax and they pay for it not me	8/11/2022 6:50 PM
501	Most of these options look great! I hope any one of them actually gets built. How do we citizens hold our city accountable and ensure that our bike/ped facilities get built sooner rather than later?	8/11/2022 11:30 AM
502	On Main Street I want to see concrete separators between vehicular traffic and bicycles either one or two way. More importantly, these separators should be landscaped with trees and scrubs to create a pleasant aesthetic for our downtown core. The more greenery the better. This is a perfect opportunity to make this happen. It will soften the streetscape and look amazing! The architect showed a concrete separator at Court and Central with trees. This is what I envision. Why on earth would we do that at that location and not in the heart of our downtown?! Mind boggling....	8/11/2022 11:23 AM
503	Thanks so much for providing an opportunity for feedback and input. It's really helpful to see the various options. The stakes of these decisions are clearly much higher for those who regularly commute by walking or biking (i.e their lives and health vs. a driver's commute time and convenience). For that reason, I think the final decision should be weighted toward active transit commuters' safety by adjusting for the inequity of impact (i.e. life vs. time or money).	8/10/2022 1:25 PM
504	This is a terrible idea. Riverside and central are the alternative to I5. If this plan goes through this will cram local and interstate traffic to virtually 1 lane. Go visualize what happens when construction narrows both these roads. Vehicle traffic is not going to decrease largely due to the workforce commute to medford. Lastly how much vehicle traffic is there versus wheeled. There is no need to pander to a minuscule percentage. This is not Portland that’s why we live here. Keep the Portland dumb shit ideas in Portland	8/10/2022 12:54 PM
505	Why not "service" the road-user-tax payers, and forget the non-existent bicycle riders who-generally- are not?? This is especially prudent given that the majority of the facilities under study are statutorily 20 MPH speed limited. I don't think it is at all unreasonable to have "sharrows" if the speed of the traffic is functionally the speed of the bicycles! If you are worried about pedestrians, please cite LOCAL injury/ fatality data that the supports the need to make ANY changes there!!	8/10/2022 11:13 AM
506	Medford is not Portland! The only people riding bikes are derelicts that don't follow biking laws/lanes anyways. New development like southeast plan it is fine to standardize for Multimodal but to redesign substandard streets to accommodate is ridiculous and a poor use of the publics money! What happened to value added engineering? Seems to have been replaced with Political added engineering!	8/10/2022 7:45 AM
507	These are all terrible concepts. You are ruining the road for no reason. You may claim climate protection as your reason, but in practice this is actively worse for it. Painting Road, resealing asphalt, and road construction will only increase the carbon footprint, while increasing the need for cars to idle as the decrease in throughput causes more traffic. Instead of doing things because they sound nice to you and the firm that you are paying millions to thinks its a fantastic idea to encourage alternative travel methods, actually think of the direct impact that you will have. The only reason to do this is to force people into buying parking permits due to limited parking. Will that happen, no. You will decrease downtown foot traffic, increase your carbon footprint, and place that directly on the property owners that fund these inane projects because they have no choice. You have ruined Columbus already and Mcandrews is next, why not continue and put a bike lane on I-5? It will increase tourism, or whatever garbage justification you give to yourself.	8/9/2022 3:58 PM

508	I ride my bike regularly to my office in downtown medford. I don't think I would change my route to E Main St going against the traffic. The lights are currently timed (for traffic) and going down the side streets are sufficient comfortable.	8/9/2022 3:55 PM
509	Some mobility options don't include/demonstrate connectivity between existing trail systems and these bicycle lanes. For example, the two way proteced lane on Riverside across from The Commons doesn't indicate how those wanting to access the greenway would take a right/left turn. It may inadvertently put bicyclists in greater danger. The same is true for the separated bike land option that's often intersected by driveways - how does this improve cycling infrastructure?	8/9/2022 3:43 PM

Attachment B – Map Comments

OBJECTID	Comment	Category	x	y
1	There needs to be a flashing light at this intersection even if Main becomes 2 lanes. It's always been a dangerous intersection because of cars coming off Riverside. They always tend to speed through this corridor. I've had my business at 309 East Main for over 20 years and this crossing is the worst I've seen in downtown. Many times drivers don't see pedestrians waiting on the curb. If there were a flashing yellow light like the one on Riverside, this would reduce potential accidents!	General Comment	-122.871	42.32709
2	This intersection is also dangerous. Flashing yellow lights solar powered would eliminate or serious reduce accidents with pedestrians. Just like at Bartett and Main. Same issue.	General Comment	-122.871	42.32612
3	Enhancement if this pedestrian crossing would make it much safer for me to walk across the street here.	Recommended Pedestrian Crossing	-122.881	42.33799
4	Enhancement if this pedestrian crossing would make it much safer for me to walk across the street here.	Recommended Pedestrian Crossing	-122.875	42.33539
5	Enhancement if this pedestrian crossing would make it much safer for me to walk across the street here.	Recommended Pedestrian Crossing	-122.873	42.3326
6	Enhancement if this pedestrian crossing would make it much safer for me to walk across the street here.	Recommended Pedestrian Crossing	-122.867	42.32155
7	Enhancement if this pedestrian crossing would make it much safer for me to walk across the street here.	Recommended Pedestrian Crossing	-122.867	42.32184
8	Enhancement if this pedestrian crossing would make it much safer for me to walk across the street here.	Recommended Pedestrian Crossing	-122.865	42.31854
9	Enhancement if this pedestrian crossing would make it much safer for me to walk across the street here.	Recommended Pedestrian Crossing	-122.864	42.3187
10	Enforcement of this already existing enhanced crossing is nearly non-existent and vehicles do not yield right of way for pedestrians as they should. Why are new ones going to make any difference? I'm all for them, but they need to come with actual enforcement.	Recommended Pedestrian Crossing	-122.869	42.32553

11	I see a lot of people crossing here to get to/from the Winco shopping center. Maybe pair with another crossing at Central and Boyd.	Recommended Pedestrian Crossing	-122.863	42.31702
12	Recommend putting a crossing at 12th & Central to pair with the signal at 12th & Riverside. Seems better than 13th in my opinion.	Recommended Pedestrian Crossing	-122.868	42.32251
13	I see people crossing here. There is a lot of activity in this area.	Recommended Pedestrian Crossing	-122.872	42.32923
19	I am strongly and completely opposed to your proposal to reduce the number of traffic lanes on Court/Central/Riverside/main streets from three down to two! We are a growing community with growing traffic capacity and parking needs. Many of these areas already have limited parking. All of these areas already have improved sidewalks‘s and all of them have a comparatively low amount of foot and bicycle traffic. The fact that you are considering spending taxpayers dollars is ludicrous!	General Comment	-122.868	42.32148
20	We 2 are strongly opposed to your proposal to reduce the number of traffic lanes on Court/Central/Riverside/Main streets from three down to two! Though we are a growing community with growing traffic capacity and parking needs, we need to use/fix what we already have. Clean up Bear Creek Greenway so those paths can once again be used for what they were intended bike, rolling (whatever that is) and walking paths. The foot/bike traffic is very low is those areas so consider these changes a waste	General Comment	-122.874	42.32462
21	Plenty of people cross this section of road to get in/out of WinCo plaza. Putting the crossing here would also still allow vehicle traffic to U-turn or enter the plaza as well	Recommended Pedestrian Crossing	-122.864	42.31745
22	When I worked in this area, I had to cross right here. Not the easiest road to cross without a dedicated crossing. Ive also seen countless people who cross right after the bend in the road, where it is extremely difficult for drivers to see them.	Recommended Pedestrian Crossing	-122.864	42.31722

23	Riverside Ave. between Jackson and McAndrews is extremely uncomfortable and dangerous for pedestrian traffic, especially so on the West side. Sidewalks are poorly maintained and overgrown in some areas, made worse by the fact that they are extremely narrow and filled with obstacles such as light poles etc. Almost every time I have walked this road, i have had to step into the overgrown weeds to avoid other pedestrians, and worse, cyclists. A crossing here would at least let me use the good side	Recommended Pedestrian Crossing	-122.874	42.33537
24	There are enough crossings now and not any need for bicycle lanes. Check out the paved alleys for possible bike routes.	General Comment	-122.874	42.32824
25	It would seem to me that the amount of people needing to cross Riverside is large. Perhaps we might consider closing off traffic along Riverside on certain days of the week, or at certain times, when there is less likely to be traffic? Especially as an experiment to collect more data on foot traffic prevalence when cars aren't around. Maybe traffic could be redirected around the areas with higher pedestrian traffic? Maybe Central could be a two way street?	General Comment	-122.868	42.3237
26		General Comment	-122.868	42.32361
27	This seems like a pretty good candidate for a crossing, not out of necessity, but just out of convenience.	Recommended Pedestrian Crossing	-122.877	42.32418
28	Need to do a better job helping bicyclists and foot traffic feel safe. Bikes and skateboards are moving to the sidewalk causing challenges for people walking or individuals in mobility devices. An option that allows bicyclist to travel in both directions down riverside would limit bikes and skateboards on the sidewalk.	General Comment	-122.867	42.3223
29	Leave our streets alone. We dont need this.	General Comment	-122.874	42.34731

30	The Existing designated bicycle route North/South on Bartlett to Niantic to Beatty Sts. allows cyclists to traverse streets already designated at 20MPH with decreased volumes of traffic,especially commercial trucks. The same could be said for the East/West 6th. St. Route. Do nothing and reassess bicycle travel in Medford. Finally, look to expanding Evergreen St. North and South proximal to the railroad for a “Trail Next to the Rail” Which is essentially a straight shot through town.	General Comment	-122.875	42.33276
31		General Comment	-122.875	42.32641
32	I don't cross there, but I can see if people are trying, it could be dangerous.	General Comment	-122.881	42.33804
33	Ped crossing location	Recommended Pedestrian Crossing	-122.875	42.33113
34	Requested by residents in Liberty Park Plan	Recommended Pedestrian Crossing	-122.874	42.33119
35	Greenway access point needed	General Comment	-122.874	42.33522
36	connect multimodal to Clark Street	Recommended Pedestrian Crossing	-122.879	42.33414
37	Improve connection to ped bridge from crossing location	General Comment	-122.869	42.3258
38	Three-way intersection with proposed transit stops nearby. Most of the traffic comes from Court and Edwards. Transit only travels south on Court/Central s anyone getting off must cross if heading into Liberty Park neighorhood.	Recommended Pedestrian Crossing	-122.881	42.33552
39	Busy intersection for pedestrians. The parking garage at Middleford generates a lot of foot traffic. Also small businesses along 6th get a lot of foot traffic.	Recommended Pedestrian Crossing	-122.873	42.32748
40	Besides Edwards this is the only direct connection between Court/Central and Riverside. Also Valley School has moved here and if you look at the commercial on the east side of Riverside, Manzanita is near the center for residents to cross to a lot of businesses.	Recommended Pedestrian Crossing	-122.876	42.33815

41	The area has several shopping centers with large parking lots. Some people park and walk between REI and RVMALL for example. Also RVTD provides SB service on Court so passengers coming from/to RVMall must use Ohio and cross these two intersections.	Recommended Pedestrian Crossing	-122.879	42.34285
42	Same comment as before for other Ohio crossing about this being a high use transit corridor for passengers and people walking between major shopping districts.	Recommended Pedestrian Crossing	-122.88	42.34292
43	A pedestrian was struck and killed at this intersection. This should warrant enhanced crossing features in itself. However, Stewart is used by cyclists but dread this intersection to getting to businesses on the other side of Hwy 99. This area has failing intersection and will continue to get more congested. Enhancing this crossing substantially along with connecting to paths would help attract people to walk and bike.	Recommended Pedestrian Crossing	-122.86	42.3129
44	The Main St. ped traffic crosses just to the west of here on a blind corner. Having an RRFB or similar device with advance warning to drivers right about here would help. This isn't where the crossing would be, it's where the driver would be warned of someone crossing ahead.	Recommended Pedestrian Crossing	-122.869	42.32789
45	Would be great to see the plans to create a Greenway connection and enhance this park area come to fruition	General Comment	-122.875	42.33844
46	a mid-block in this block or one to the north might work, or just add a crossing at 5th.	Recommended Pedestrian Crossing	-122.872	42.32884
47	Driver yielding here is not great, curb extensions/reconfiguring the street will help, but could also consider other enhancements.	Recommended Pedestrian Crossing	-122.871	42.327
48	Agree with other comment to west	Recommended Pedestrian Crossing	-122.868	42.32791
49	Blocks on Riverside/Court are loooong, need as many ped crossings as possible to help keep driver speed down, increase access, etc.	Recommended Pedestrian Crossing	-122.867	42.32068

50	As a general comment for this entire project, I would suggest you attempt, instead, to increase traffic lanes and/or improve parking options throughout the downtown. Perhaps more dedicated parking garages would help to improve the opportunity to shop downtown. As it is, both the traffic and parking are difficult at best. Please stop trying to restrict vehicular traffic throughout Medford! I'm not a business owner in the downtown area, but I believe this would not help them.	General Comment	-122.881	42.33841
51	Recommend crossing here. Vehicle traffic does not recognize these cross streets in this area because they are half blocks. Lots of school traffic and the light at Crater lake is very long.	Recommended Pedestrian Crossing	-122.861	42.33114
52	Same as previous comment. Need more crossings in this strangely designed area. Lots of foot traffic from two schools.	Recommended Pedestrian Crossing	-122.859	42.33115
53	Two way bike lane on Main St is not the best solution, but since there is no proposed one-way bike lane on fourth St, as there should be, the two-lane on Main St is absolutely necessary.	General Comment	-122.875	42.32535
54	Need to add a two-way bike lane here on 4th st. One-way bike lane on Main and 6th going opposite directions.	General Comment	-122.876	42.32815
55	The separated bike lanes with landscaping greatly improve the look of downtown and also provide a buffer from traffic for those businesses located here. If they have outdoor restaurant seating, which should be promoted, this will greatly enhance the experience.	General Comment	-122.871	42.32788
56	I think that it is better that the direction(s) of bicycle traffic flow and the automotive traffic flow on any section of street be the same. Otherwise, an automobile driver pulling out from a side street may not be looking for bicycle cross-traffic in the appropriate directions.	General Comment	-122.874	42.32573
57	Another big waste of tax payers money. This bike lane is not needed...we are not Portland.	General Comment	-122.875	42.32053