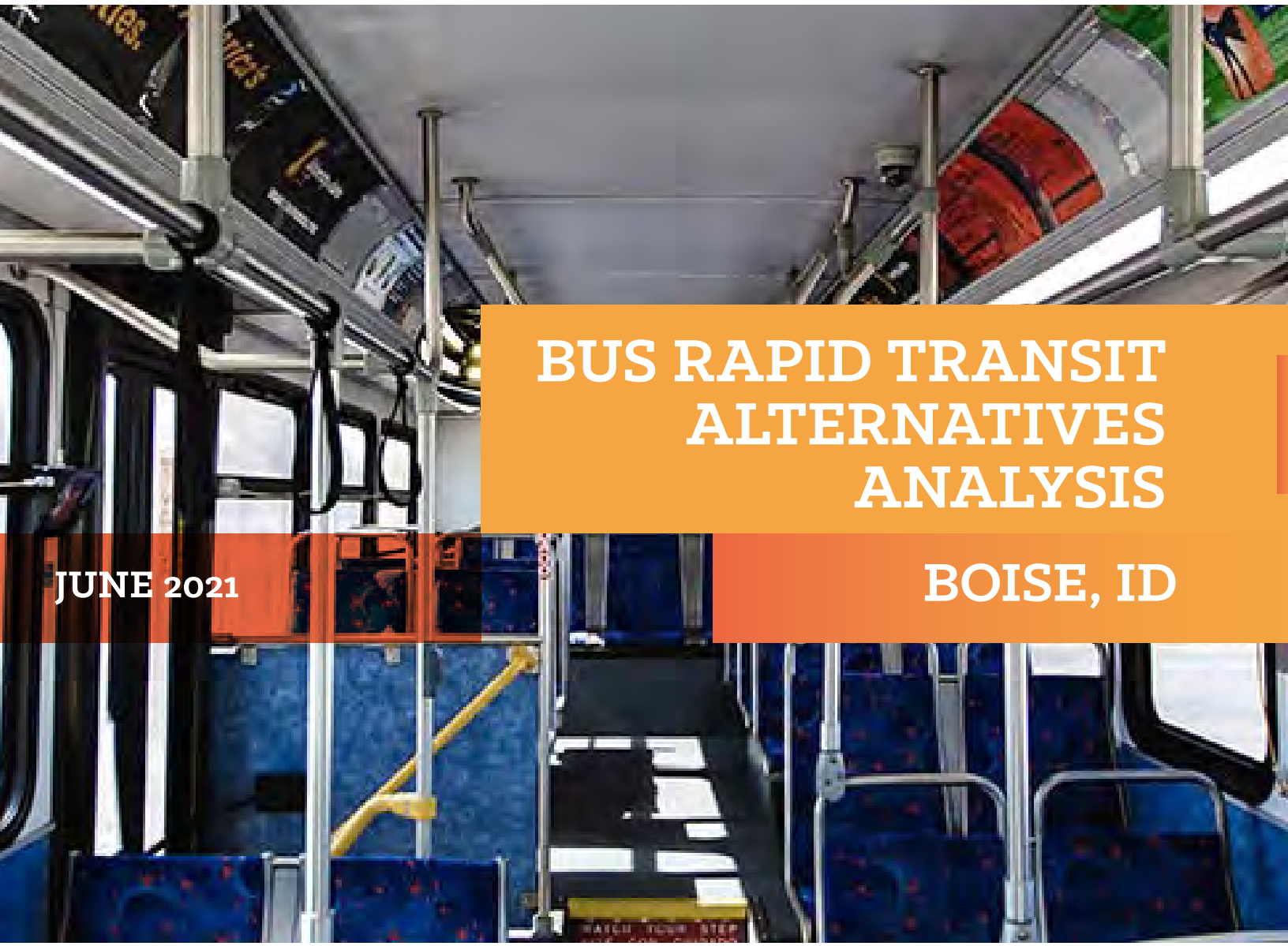
BUILDING A BETTER
State Street



BUS RAPID TRANSIT ALTERNATIVES ANALYSIS

JUNE 2021

BOISE, ID

valleyregionaltransit

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All photographs in this document are sourced from VRT.

EXECUTIVE SUMMARY

The State Street Transit Alternatives Analysis identifies a Locally Preferred Alternative for transit service in downtown Boise. This Alternatives Analysis was led by Valley Regional Transit, in partnership with members of the State Street Technical Team: the City of Boise, the City of Eagle, Garden City, the Capital City Development Corporation, Ada County, Ada County Highway District, the Community Planning Association of Southwest Idaho, and the Idaho Transportation Department.

The Locally Preferred Alternative meets goals agreed upon by the State Street Technical Team, which built on previous State Street planning efforts and other regional plans. These goals include improving mobility and access; minimizing negative impacts on key local resources while supporting economic development; and providing cost-effective transit service. The Alternatives Analysis process evaluated four different alignments through a two-tiered process, using criteria tied to the three key goals.

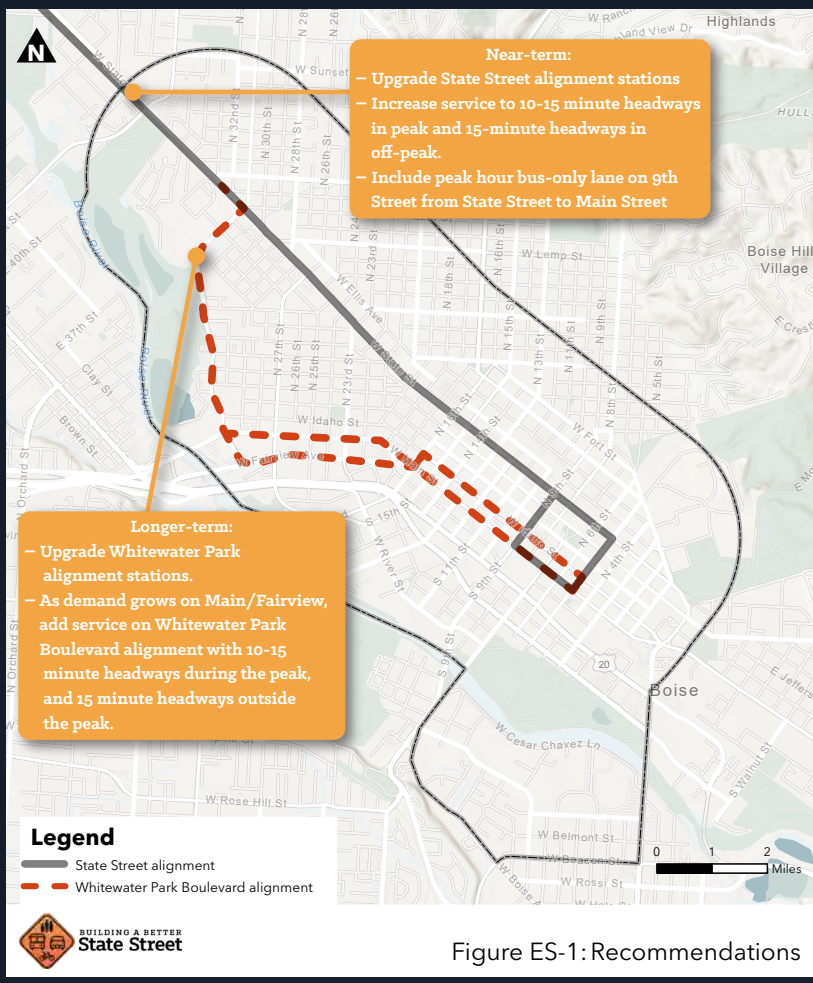


Figure ES-1: Recommendations

The Locally Preferred Alternative is shown in Figure ES-1. It includes 10- to 15-minute headways in the peak period and 15-minute headways for the remainder of the daily span of service, with upgraded station amenities along State Street between Main Street Station. These improvements can be implemented in the near term.

Demographic projections indicate that household and employment densities along the Main/Fairview corridor will reach transit-supportive levels by 2035. When this occurs, VRT should add service. This service would have up to 10- to 15-minute headways during the peak, and 15-minute headways during the off-peak. When the added service is implemented, VRT should also upgrade the stations along Whitewater Park Boulevard. Stations along Main and Fairview will likely have been upgraded already through a separate Best in Class transit improvement project.

INTRODUCTION

STUDY PURPOSE

The purpose of this State Street Transit Alternatives Analysis is to identify a Locally Preferred Alternative for transit service in downtown Boise. The analysis establishes goals, objectives, and evaluation criteria for comparing transit alternatives, and recommends a preferred transit alternative for the corridor as well as next steps.

STUDY PARTNERS AND RESPONSIBILITIES

This Alternatives Analysis was led by Valley Regional Transit (VRT), in partnership with members of the State Street Technical Team: the City of Boise, the City of Eagle, Garden City, the Capital City Development Corporation, Ada County, Ada County Highway District (ACHD), the Community Planning Association of Southwest Idaho (COMPASS), and the Idaho Transportation Department (ITD). The State Street Technical Team (SSTT) provided crucial guidance, information, modeling support, and document review throughout the planning process, without which this analysis would not have been possible.

STATE STREET PLANNING HISTORY

Since 2004, transportation partners in the Treasure Valley have been studying the future of State Street. Past planning efforts served as a critical foundation for this analysis, including the following documents:

- **The State Street Corridor Strategic Plan Study Final Report**, prepared for ACHD and the City of Boise in 2004;
- **The State Street Corridor Market Strategy**, prepared for the City of Boise, ACHD, and the State Street Steering Committee in 2007;
- **The State Street Corridor Transit Oriented Development Guidelines**, led by the City of Boise and with a partnership of regional agencies and local municipalities in 2008;
- **The State Street Transit and Traffic Operational Plan (TTOP)**, prepared for ACHD, City of Boise, and VRT in 2011;
- **The State Street Programming and Finance Plan**, prepared for ACHD, the City of Boise, VRT, the State Street Coordinating Committee in 2012; and
- **The State Street Corridor Transit Oriented Development Plan**, prepared for a partnership of agencies along the corridor in 2019.

These documents provided valuable background context and served as the basis for the goals, objectives, and evaluation criteria for assessing the transit alignments discussed in this study.

STUDY AREA CHARACTERISTICS

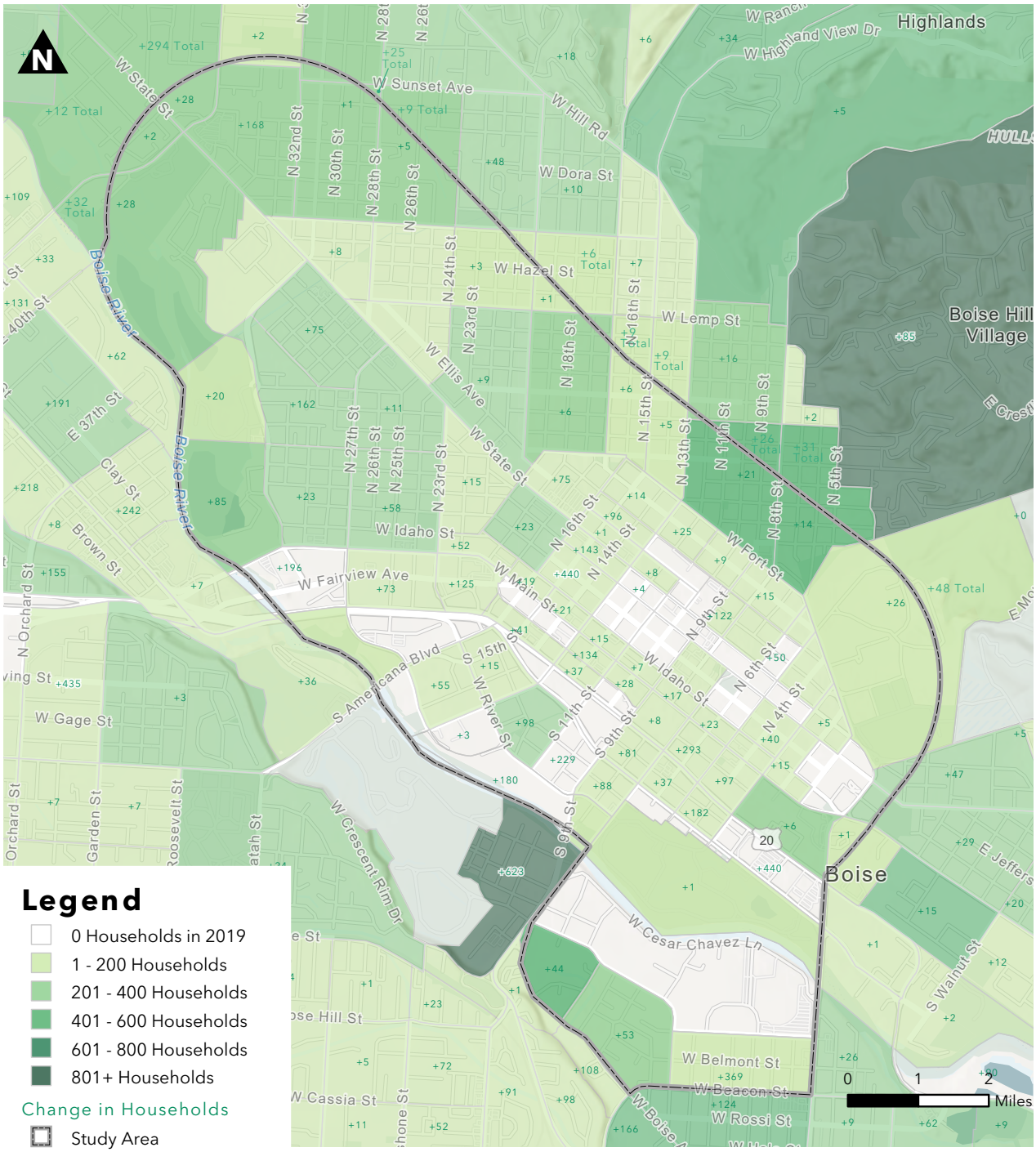
Socioeconomic conditions, transportation networks, and other factors influence the need and demand for transit improvements. This section provides an overview of population and employment projections, as well as a summary of the existing transportation network and available services. More information is available in **Appendix A, Base and Future Year Conditions Technical Memorandum**.

POPULATION AND EMPLOYMENT CONDITIONS

Information on current and projected household and employment totals within the study area was provided by COMPASS, which is the metropolitan planning organization (MPO) for the Treasure Valley. The MPO provides data on the number of households, population, and jobs within small geographic areas called traffic analysis zones (TAZ's), both for existing conditions and several future year horizons. For the purpose of this study, the analysis focused on a base year of 2019, and a future horizon year of 2035, to be consistent with opening-year assumptions contained within the State Street Traffic and Transit Operations Plan.

The number of households along a potential transit corridor influences transit ridership: the more people along a corridor, the more potential riders. Figure 1 shows the current and projected households within each TAZ in the study area. Based on the COMPASS data provided in the TAZ's, there are currently 1,541 households within the study area, and 4,698 households projected to be within the study area by 2035, a total increase of 3,157. Within the study area, some of the most concentrated changes are expected in the neighborhood between 13th-15th Street, from Jefferson Street to Idaho Street. Within these few blocks, an additional 440 housing units are anticipated by 2035. Outside of this area, changes in the number of projected households are somewhat smaller, although additional pockets of growth are dispersed throughout the study area as shown in Figure 1.

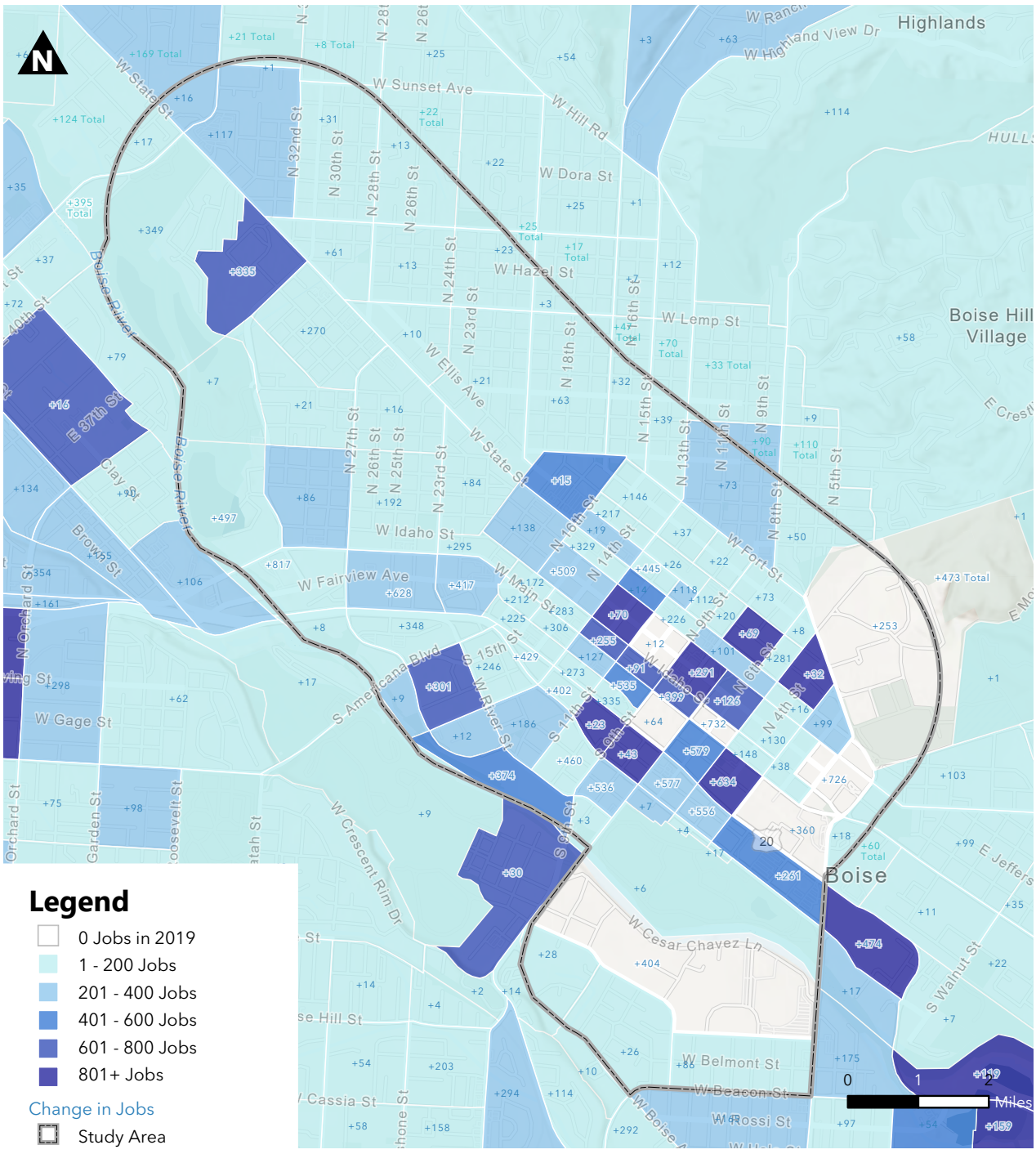
Concentrations of jobs also can be significant contributors to transit ridership, encouraging residents of other parts of the region to take transit to commute to work. The COMPASS data indicated that there are currently 3,829 jobs within the study area, and 12,595 jobs projected to be within the study area by 2035, a total increase of 8,766. Figure 2 provides a map of current and projected employment by TAZ. Future growth patterns in the study area reflect trends already underway: the model data suggests that a significant amount of additional employment growth is expected along the Main Street and Fairview Avenue corridors, especially near their intersections with Whitewater Park Boulevard. Growth is anticipated at the northwest corner of Main Street and Whitewater Park Boulevard as well as the current ITD campus (at the southwest corner of State Street and Whitewater Park Boulevard). Both of these sites have been the focus of high-level planning exercises around future growth, and the ITD campus was identified as a Tier 1 Station Area in the 2019 State Street Corridor Transit-Oriented Development Plan. That plan recommends a mix of land uses at the ITD campus site, including office, single family residential, multi-family residential, and open space. Currently, neither site has active development plans in place, and ITD has no current plans to vacate its campus. However, future employment projections from COMPASS include some level of change in these areas.



Source: Community Planning Association (COMPASS)

Demographics

Figure 1: Change in Households between 2019 and 2035



Source: Community Planning Association (COMPASS)

Demographics

Figure 2: Change in Employment between 2019 and 2035

LAND USE

The study area encapsulates a mostly-built-out section of the City of Boise. Boise's downtown area is in the southeast section of the study area, capturing the region's highest density of jobs as well as areas of high-density housing. Main Street Station is a transit hub in the heart of downtown, creating an anchor along with the Grove Plaza and the CenturyLink arena. In the northeast part of the study area, the State Capitol Building and supporting state office buildings bring a significant number of employees into the downtown area from around the region. West of downtown, land uses gradually transition from high-density housing and intensive commercial development to shorter multi-story office and commercial buildings, shifting more fully to residential development west of 17th Street.

Between State Street and Main Street, from roughly 17th Street west to Whitewater Park Boulevard, single family homes are the predominant land use, with some exceptions. Along the State Street corridor, land uses outside the downtown core tend to be one- and two-story commercial interspersed with single-family residential districts. The Main/Fairview couplets have been the focus of redevelopment in the area, with new residential and commercial growth occurring mostly between 23rd Street and Whitewater Park Boulevard.

Additional near-term development projects are under construction or about to enter the construction phase in the study area. All near-term future development plans discussed by the project team were shared with COMPASS to ensure that future growth projections for households and jobs incorporated anticipated development projects. These include the following residential and commercial projects identified by City of Boise staff:

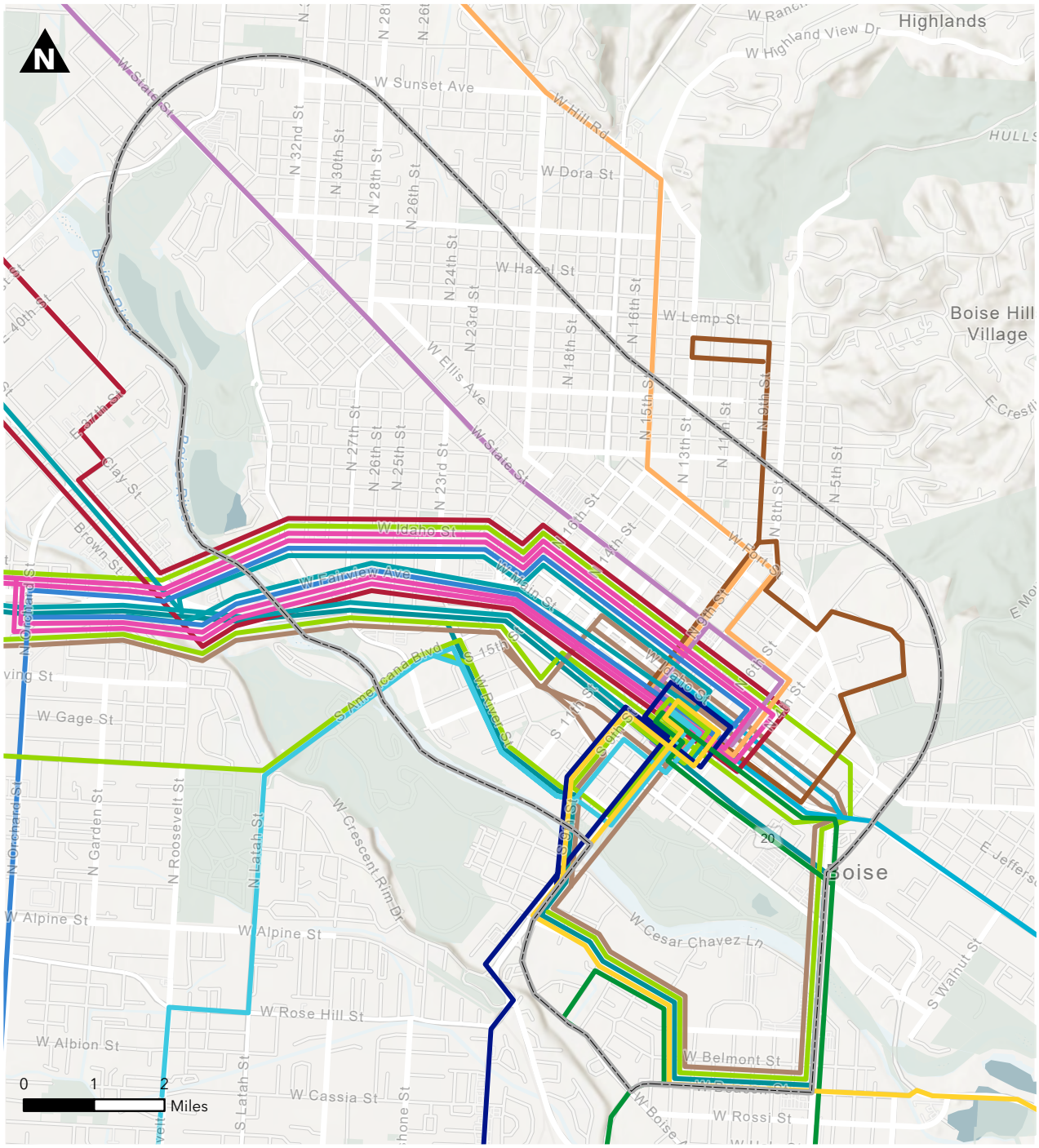
- **11th and Idaho:** 180,000 square feet of office space to be completed by late 2021
- **5th and Front:** 138-room hotel, completed in 2020
- **6th and Front:** the Vanguard Apartments, 75 units and 2,700 square feet of retail space, to be completed by late 2021
- **512 W. Grove Street:** a mixed-use project with 114 residential units and 8,000 square feet of retail space, to be completed by late 2021
- **116 S. 6th Street:** a mixed-use project with 60 residential units, 9,000 square feet of office space, and 5,000 square feet of retail space, to be completed by late 2021
- **139 E. Main Street:** the Ronald McDonald House, with 47 rooms, completed in 2020
- **529-535 S. 15th Street:** the River Street Lofts, with 10 residential units, completed in 2020
- **323 W. Broad Street:** the Cartee, with 161 residential units, to be completed in late 2021

TRANSPORTATION CONDITIONS

TRANSIT

Valley Regional Transit (VRT) provides bus service in Ada and Canyon Counties. VRT operates 23 total routes: 18 fixed routes in Ada County, one in Canyon County, and four intercounty routes between Ada County and Canyon County. In the study area, there are 18 routes in service. All bus routes that travel within the study area are summarized in Figure 3.

VRT provided average weekday transit boardings and alightings for each bus stop in the study area, reflecting a typical day in October 2019. This represents ridership trends prior to the COVID-19 impacts on transit ridership and overall travel. October also reflects a time of year when people are generally commuting to and from work in a typical pattern, elementary and secondary schools are in session, and students are commuting to colleges and universities in the region as well. As shown in Figure 4, several of the highest-ridership stops in the study area are focused along State Street, serving destinations such as the government complex northeast of downtown, the downtown core, Boise High School, the Downtown Boise YWCA, and other destinations along the commercial sections of State Street west of downtown.



Source: Valley Regional Transit (VRT)

LEGEND

- 01: Harris Ranch via Parkcenter
- 02: Broadway
- 03: Vista
- 04: Roosevelt
- 05: Emerald
- 06: Orchard
- 07A: Fairview Ustick
- 07B: Fairview - Towne Square Mall
- 08x: Five Mile Chinden
- 09: State Street
- 10: Hill Road
- 11: Garden City
- 16: VA/Hyde Park Loop
- 17: Warm Springs
- 29: Overland
- 40: Nampa/Meridian Express
- 43: Caldwell Express
- 45: BSU Express
- Study Area

Transit

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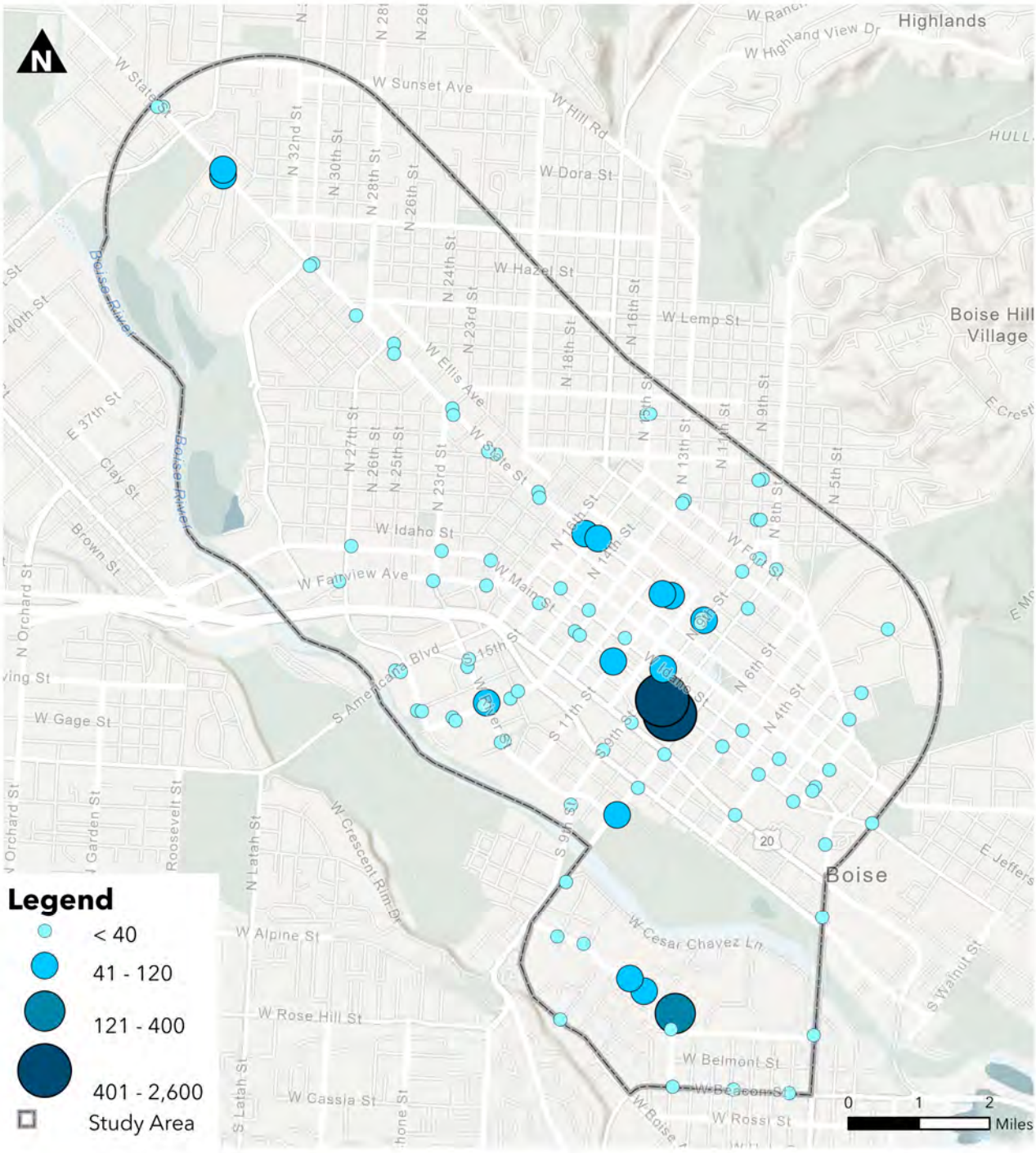
Figure 3: Study Area Transit Routes

Layout view only. Many routes overlap.



Source: Valley Regional Transit (VRT). October 2019.

BUILDING A BETTER State Street

Transit

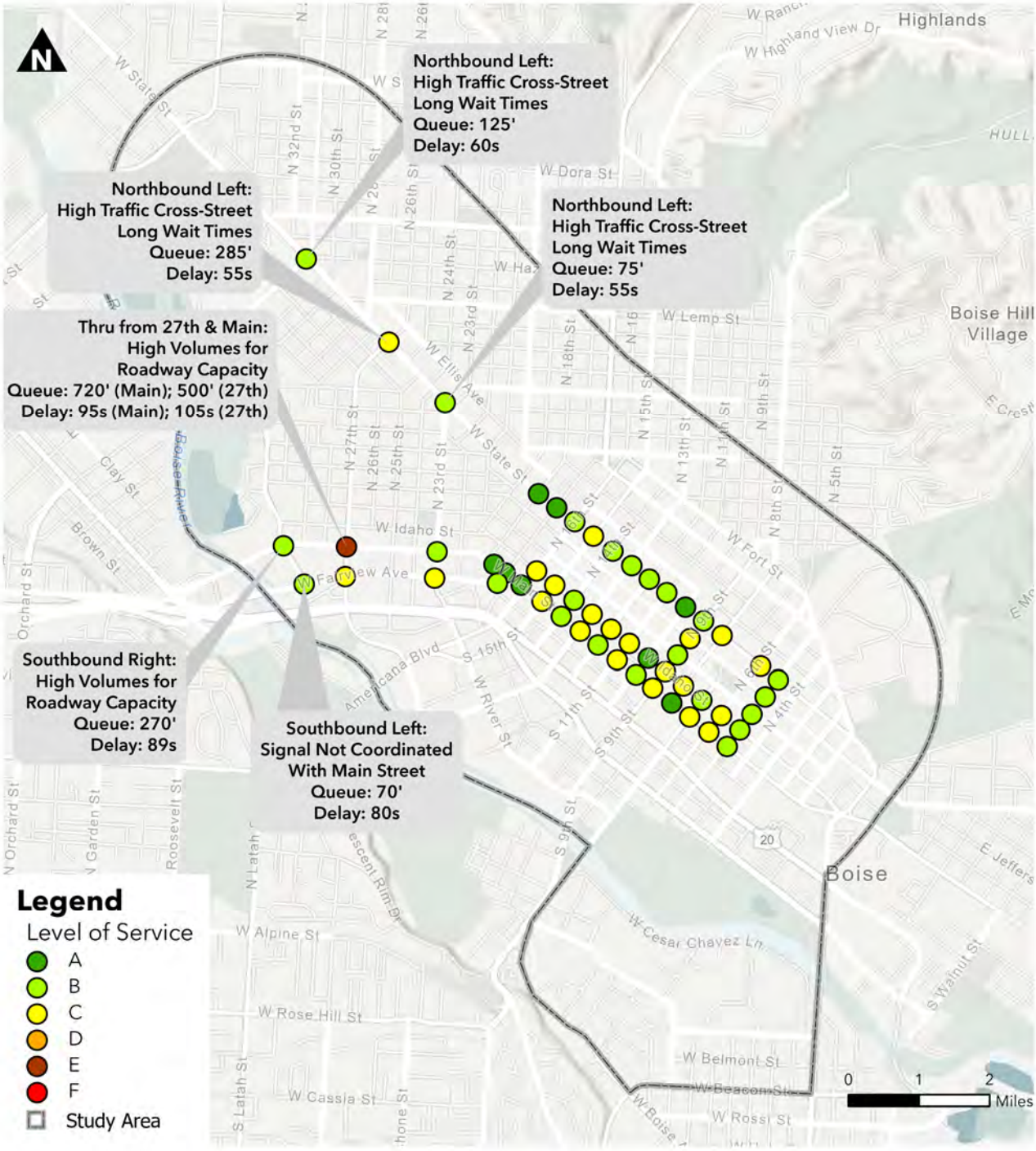
Figure 4: Average Weekday Transit Boardings and Alightings

WALKING AND BICYCLING

Active transportation conditions vary widely throughout the study area. In the heart of downtown Boise, pedestrian and bicyclist conditions are very good: sidewalks are typically wider than normal, able to accommodate the higher numbers of pedestrians typically seen in urban environments; block sizes are small; high-visibility crosswalks are common; and a range of on-street bicycle facility types are often available. Outside of downtown, infrastructure conditions are still generally good: high-visibility crosswalks are striped on major corridors like Whitewater Park Boulevard and 27th Street, sidewalks are available and consistent, bike facilities are available on several major corridors, and block sizes are small.

TRAFFIC

Traffic conditions in the study area are generally acceptable today. ACHD's traffic model provided information on traffic level of service, or LOS (a measurement of delay experienced by drivers at intersections), along the study corridors during the morning, midday, and evening peak hours. LOS is represented along a scale of A through F, with "A" representing the best conditions and "F" representing the worst. In Ada County, if drivers along the study routes experience an average delay of 55 seconds (indicating a LOS "E") or more at a signalized intersection, that intersection is considered as having a failing level of service according to ACHD's standards. Throughout the study area, the evening peak hour experienced the most delay throughout the day. Figure 5 shows current evening peak hour LOS results, which served as a base for the analysis of the impacts of the proposed route alternatives.



All queues shown are 95th Percentile.
Source: Ada County Highway District (ACHD).

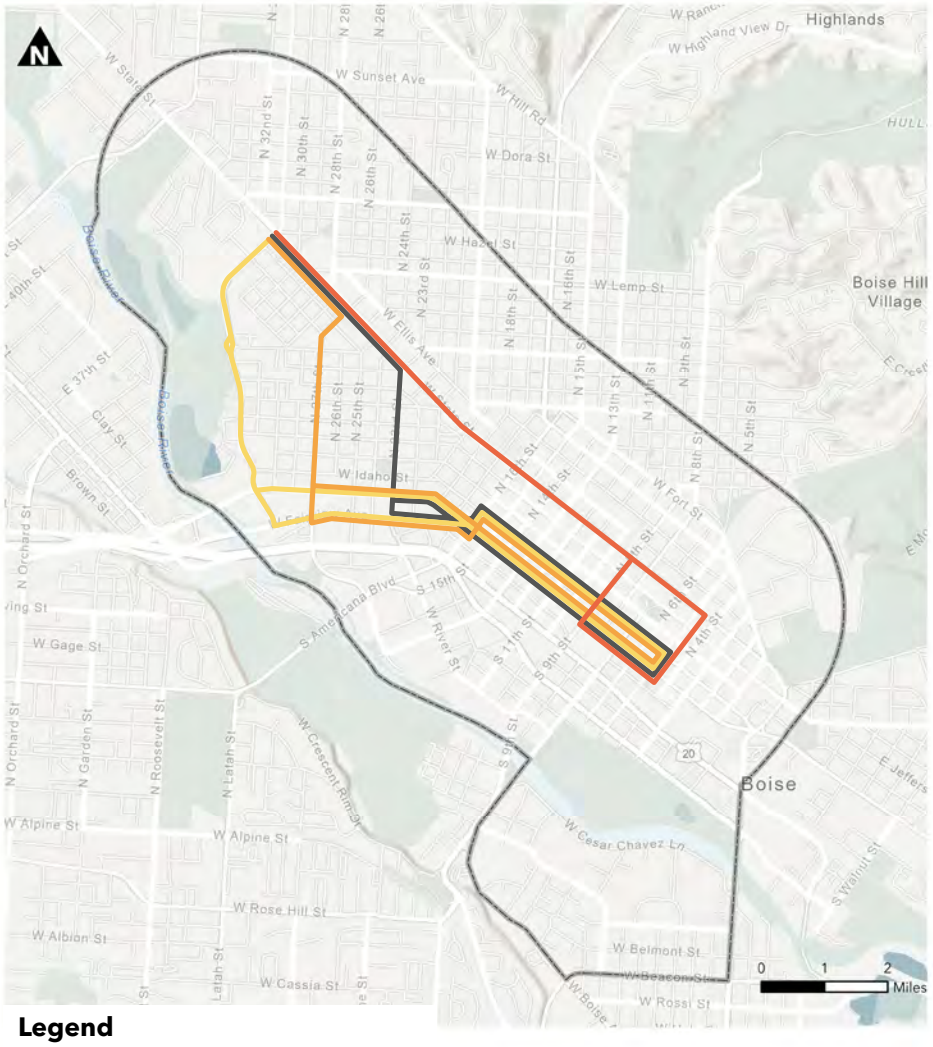
Traffic

Figure 5: Level of Service (LOS) at Study Intersections
2019 PM Peak Hour

SCREENING OF ALTERNATIVES

LONG LIST OF ALTERNATIVES

Four alternatives were originally identified for consideration, Main Street Station in downtown Boise. The four alternatives were developed by VRT with input from the SSTT. The initial alternatives followed State Street, 23rd Street, 27th Street, and Whitewater Park Boulevard, and are shown in Figure 6. More information about the alternatives can be found in **Appendix B, Route Descriptions Technical Memorandum**.



Legend

- 27th Street Alignment
- 23rd Street Alignment
- State Street Alignment
- Whitewater Park Boulevard Alignment

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Figure 6: Initial Alternatives

Layout view only. All routes have some overlap.

TIER 1 SCREENING

The initial alternatives were screened based on goals derived from previous studies and work efforts. These goals reflected work completed as part of multiple State Street corridor studies from 2004 through 2019, ACHD roadway and bikeway plans, several City of Boise land use and transportation plans, district plans prepared by CCDC, and transit plans prepared by VRT. The goals and objectives for the corridor included the following:

GOAL: IMPROVE MOBILITY AND ACCESS

Objective: Create transportation choices that are convenient, safe, and affordable for people of all ages and abilities

Objective: Increase transit ridership and service while balancing traffic and transit needs

Objective: Improve multi-modal connections and access to existing transit systems

GOAL: MINIMIZE NEGATIVE IMPACTS ON KEY LOCAL RESOURCES WHILE SUPPORTING ECONOMIC DEVELOPMENT

Objective: Avoid, minimize, and mitigate negative impacts to key local resources, including neighborhood, land use, and environmentally-sensitive areas

Objective: Build public support for transit and complete street concepts

GOAL: PROVIDE COST-EFFECTIVE TRANSIT SERVICE

Objective: Match transportation investment to level of travel demand in study area

These goals and objectives were the foundation for a Tier 1 screening process, intended to narrow the field of alignments to three potential candidates. The initial set of alignments were screened based on the following criteria, which were tied to the goals and objectives:

Operational criteria including:

- Transit travel time from Whitewater Park Boulevard to Main Street Station, for morning inbound buses and evening outbound buses;
- The number of traffic signals along each alignment;
- Impacted corridors (calculated as the miles of alignment operating at greater than 75% capacity, using volume/capacity ratios from the 2019 COMPASS travel demand model);

Land use criteria including:

- Population density (using population per acre calculations from COMPASS travel demand model input data);
- Employment density (using jobs per acre calculations from COMPASS travel demand model input data); and
- Number of major destinations served.

The 23rd Street alignment was screened out based on its performance on these criteria, and the State Street, 27th Street, and Whitewater Park Boulevard alignments moved forward to Tier 2 screening.

TIER 2 SCREENING CRITERIA

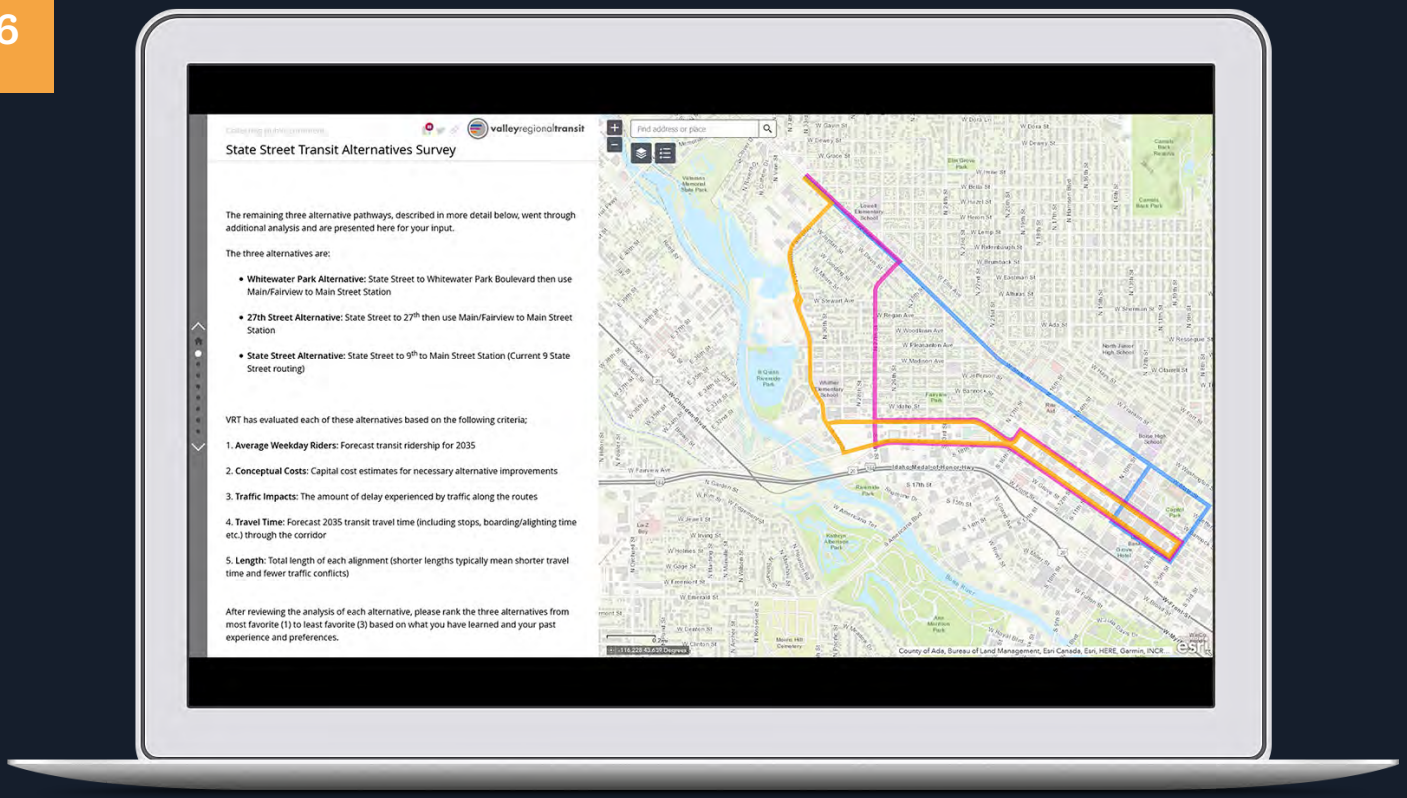
The Tier 2 screening process included a more in-depth analysis of the three remaining alternatives and ultimately identified a locally preferred alternative for further planning and design purposes. The Tier 2 process focused on the following criteria:

- **Intersection LOS**, using ACHD's Synchro traffic microsimulation model adapted to 2035 conditions;
- **Average weekday transit ridership in 2035**, from the COMPASS travel demand model;
- **One-way trip distance and travel time in 2035**, from the route's western terminus in Star to Main Street Station, from the COMPASS travel demand model;
- **Conceptual cost estimates** for infrastructure improvements associated with the alignments;
- **Households and jobs in 2035** that will be accessible within a 10-minute walking distance from station areas for each alignment; and
- **Level of public support**, as indicated in public outreach activities conducted in late 2020 through early 2021.

Table 1 shows the results of the Tier 2 screening process. As shown in the table, the State Street alignment ranked the highest based on the Tier 2 screening criteria.

TABLE 1. TIER 2 PROCESS SCREENING RESULTS

SCORING CRITERIA		ALIGNMENT SCORES		
Criteria	**Definition and Scoring of Criteria**	**State Street**	**27th Street**	**Whitewater Park Blvd**
Traffic Level of Service	*Number of intersections at LOS E or F in 2035 with this build alternative*	3	3	4
Traffic Level of Service Score	3 = best 1 = worst	3	3	2
Ridership	*Average weekday daily ridership in 2035*	1,110	1,510	1,440
Ridership Score	3 = highest 1 = lowest	1	3	2
Distance	*One-way trip distance from Star to Main Street Station*	17.2	17.4	17.6
Distance Score	3 = shortest 1 = longest	3	2	1
Time	*Minutes to complete one-way trip*	41.1	42.6	42.2
Time Score	3 = fastest 1 = slowest	3	1	2
Conceptual Costs	*Estimated cost of infrastructure improvements*	$40,400	$112,980	$1,630,580
Conceptual Costs Score	3 = least expensive 1 = most expensive	3	2	1
Household Accessibility	*Number of households accessible within a 10-minute walking distance of stops*	6,391	7,126	6,829
Household Accessibility Score	3 = most households accessible 1 = least households accessible	1	3	2
Job Accessibility	*Number of jobs accessible within a 10-minute walking distance of stops*	41,253	43,204	43,171
Job Accessibility Score	3 = most jobs accessible 1 =least jobs accessible	1	3	2
SUM OF TIER 2 TECHNICAL CRITERIA SCORES		**15**	**17**	**12**
Public Support (General Public)	*Number of respondents ranking alignment as first choice*	78	55	58
Public Support (General Public) Score	3 = most support 1 = least support	3	1	2
Public Support (Transit Riders)	*Number of transit rider respondents ranking alignment first choice*	31	25	21
Public Support (Transit Riders) Score	3 = most support 1 = least support	3	2	1
SUM OF TIER 2 PUBLIC SUPPORT CRITERIA SCORES		**6**	**3**	**3**
OVERALL TIER 2 CRITERIA SCORES		**21**	**20**	**15**



PUBLIC OUTREACH

This Alternatives Analysis took place during the COVID-19 pandemic, which limited the opportunities for in-person public engagement activities. To gauge support for the transit alignments, VRT led an **online public outreach campaign** from late November 2020 through mid-February 2021. This involved VRT's first-ever online GIS survey, which was similar to a public open house and helped to inform the public and solicit feedback on the transit alternatives. The survey presented information about the three route alignments and their Tier 2 screening scores. Participants ranked each alignment in order of preference and provided open-ended comments. The survey asked respondents to note their current level of transit activity: whether they were frequent riders, occasional riders, or rode infrequently or not at all.

VRT also distributed paper copies of the survey to human service agencies, which gathered survey responses from individuals who were unable to access the online survey. As part of this effort, VRT requested the help of volunteers from the refugee community, relying on their knowledge and relationships to overcome language and cultural barriers.

VRT also specifically reached out to neighborhood organizations to ensure they knew about the project and the online outreach campaign, and to solicit their feedback. The West End Neighborhood Association, a neighborhood group affected by the various alternatives, requested that VRT representatives prepare a presentation to their constituents, which was held in January 2021. The West End Neighborhood Association also distributed 150 flyers to neighborhood residents letting them know about the study and the survey, and provided paper copies of the survey to those who needed them.

As a result of these efforts, VRT received 164 responses online, and 28 paper copies of the survey. The tabulated results from the public outreach process are noted in Table 2.

TABLE 2. SURVEY RESPONDENTS PREFERRED ALIGNMENTS

ALIGNMENT	RANKED 1ST CHOICE	RANKED 2ND CHOICE	RANKED 3RD CHOICE
All Survey Responses			
Whitewater Park Boulevard	58	79	53
27th Street	55	63	72
State Street	78	48	65
Frequent or Occasional Transit Riders			
Whitewater Park Boulevard	21	37	23
27th Street	25	28	26
State Street	31	15	31

Source: VRT

As the table indicates, survey respondents preferred State Street over the other alignments, regardless of whether they were transit riders or not. Common themes heard from survey respondents included:

- The State Street alignment provides good access to a range of services and destinations.
- Respondents wanted to preserve existing transit service on State Street.
- Whitewater Park Boulevard would be a good way to access parks and community amenities, as well as planned future growth along the Main/Fairview couplet.
- Previous investments by ACHD added capacity on Whitewater to lessen the burden on 27th, which then received a road diet. Respondents were concerned that this would negate that investment.

More information about the analysis of alternatives can be found in **Appendix C, Alternatives Screening Technical Memorandum**.

LOCALLY PREFERRED ALTERNATIVE

DESCRIPTION

The SSTT recommends a two-phased approach to implementing a locally preferred alternative. This approach includes the recommendations described below.

NEAR-TERM RECOMMENDATIONS

In the near-term, VRT should increase transit service headways and upgrade station amenities along the State Street alignment between Main Street Station. This transit route will offer 10- to 15-minute headways in the peak period and 15-minute headways for the remainder of the daily span of service. VRT could implement several prioritization measures to facilitate faster transit movement along the State Street alignment, such as:

- Installing southbound transit signage on 9th Street between State and Main, indicating that the on-street parking lane is a bus-only bypass lane during the weekday peak hours
- Restriping lanes on 9th Street between State and Main to make space for a peak-hour bus bypass lane
- Restricting southbound east-side parking during peak hours to accommodate the bus bypass lane

LONG-TERM RECOMMENDATIONS

When household and employment densities along the Main and Fairview corridors reach appropriate levels, and after State Street frequencies and investments described above are met, VRT should consider meeting the increased travel demand by. This service would connect riders from communities west of Boise to destinations along those routes. This would be supplemental to the proposed service on State Street, which would retain the frequencies described above. The Whitewater Park Boulevard and Main/Fairview service could have service frequencies as high as 10-15 minutes during the peak and 15-minute headways in the off peak. It is recommended that this additional service be scheduled with the service on State Street such that transit headways west of State Street/Whitewater Park Boulevard would be 5-7.5 minutes during the peak and 7.5 minutes in the off-peak. Final service recommendations should be developed within the context of the transit network needs at that time and review other options which may be available at that time including micro-transit. It is anticipated that household and employment densities would reach the appropriate levels by 2035, as indicated in this analysis, although it is possible that densities could increase to anticipated levels prior to 2035.

The long-term recommendations are shown in Figure 7 and could include the following measures to prioritize transit movements:

Whitewater Park Boulevard and State Street

- Widen Whitewater Park Boulevard to provide bus bypass lane and install northbound left turn transit signal (this could be an optional improvement, as an alternate to signal priority alone)
- Reprogram pre-emption equipment to provide transit pre-emption

Whitewater Park Boulevard and Main Street

- Install southbound through transit signal
- Replace southbound raised median with a bus-only lane

Whitewater Park Boulevard and Fairview Avenue

- Install southbound left turn transit signal
- Replace southbound raised median with a bus-only lane

While the 27th Street also scored highly, the project team and the SSTT opted to remove the 27th Street alternative from consideration following the Tier 2 screening process. This is because previous transportation investments by ACHD as well as CCDC local district plans emphasized other priorities on 27th Street, through a lane reduction and striping a bike lane. While traffic analyses indicated that there was still adequate capacity to serve transit investments on that corridor, SSTT members and neighborhood representatives indicated that a 27th Street alignment would be inconsistent with previous commitments made along that corridor. Furthermore, survey respondents (including those who currently use transit) indicated that 27th Street was their least preferred alignment. This suggests that larger public and political support for this alignment may be limited. In addition, while the Whitewater Park Boulevard alignment does not yet have significant transit-supportive land use, the planned high density and intensity development along that corridor is projected to eventually support more ridership.

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Figure 7: Recommendations

CONCEPTUAL COST ESTIMATES

The infrastructure improvement costs associated with the Locally Preferred Alternative are relatively minimal: roughly $30,000 in 2021 dollars to provide signage and striping indicating transit-only lanes during peak periods. This does not include costs for station area improvements or for the additional vehicles necessary to provide the proposed headways.

If and when the Whitewater Park Boulevard alignment is implemented, additional infrastructure investment will be needed to prioritize transit movements through the Whitewater, Main, and Fairview corridors, which may be more congested in the future. The cost for these improvements is estimated to be $1.6 million in 2021 dollars. This includes the following improvements:

- A bus-only left turn lane for outbound buses at the intersection of Whitewater Park Boulevard and State Street, which could require widening the west corner of the intersection and will necessitate adding signal infrastructure pertaining to the transit-only lane;
- A bus-only lane for inbound buses at the intersection of Whitewater Park Boulevard and Main Street, created by converting the existing raised concrete median at the southbound leg of that intersection and adding transit-specific signal heads to the intersection; and
- A bus-only left turn lane at the intersection of Whitewater Park Boulevard and Fairview Avenue, created by converting the existing raised concrete median at the southbound leg of that intersection and adding transit-specific signal heads to the intersection.

However, these costs could be reduced substantially if VRT opts to apply transit signal priority strategies at the Whitewater Park Boulevard intersection with State Street instead of queue bypass lanes. The cost estimates and their underlying assumptions are provided in **Appendix D, Cost Estimates Technical Memorandum**.

NEXT STEPS

VRT and the SSTT should continue working towards implementation. This can include updating the Federal Transit Administration Region 10 office on the results of this analysis and the desired path forward. The administration's officials may be able to offer funding resources or grant opportunities that are most appropriate to the scale of this project.

In addition, VRT and the SSTT should keep collaborating as partners to implement the Locally Preferred Alternative. VRT should continue working with ACHD to identify and address transportation concerns, and to explore the application of transit signal priority along the State Street corridor. VRT should also continue facilitating discussions with ACHD, COMPASS, and jurisdictions along the State Street corridor to clarify plans for lanes on State Street, and ensure understanding of assumptions contained within the Regional Transportation Plan, COMPASS's travel demand model, and ACHD's traffic models regarding lanes and their operation. This could result in a Memorandum of Understanding that would be signed by all parties with jurisdiction over parts of the corridor.

APPENDICES

A. Base and Future Conditions Technical Memorandum

B. Route Descriptions Technical Memorandum

C. Alternatives Screening Technical Memorandum

D. Cost Estimate Technical Memorandum

A. BASE AND FUTURE CONDITIONS TECHNICAL MEMORANDUM

FEHR PEERS

MEMORANDUM

Date: May 13, 2021

To: Stephen Hunt, Valley Regional Transit

From: Fehr & Peers

Subject: State Street Transit Alternatives Analysis: Base and Future Year Conditions

UT20-2200

Introduction

This technical memorandum summarizes the base and future year transportation conditions in the study area for the State Street Transit Alternatives Analysis. This memorandum includes the following information:

- Study area demographics and land use
- Transit routes and ridership
- Active transportation routes both existing and planned
- Current traffic level of service
- Projected background traffic level of service (2035)
- Projected traffic level of service for the transit alternatives (2035)

The project study area includes Downtown Boise, West Downtown, and West End neighborhoods, as well as the surrounding neighborhoods. The study area is generally bound by the southern portions of the North End and Sunset neighborhoods to the north, Boise State University and adjacent neighborhoods to the south, the western portion of the East End neighborhood to the east, and the Boise River to the west.

Study Area Land Use and Demographics

Existing Land Use, Key Activity Centers, and Near-Term Development

The study area encapsulates a mostly-built-out section of the City of Boise. Boise's downtown area is in the southeast section of the study area, capturing the region's highest density of jobs as well as areas of high-density housing. Main Street Station is a transit hub in the heart of downtown, creating an anchor along with the Grove Plaza and the CenturyLink arena. In the northeast part of the study area, the State Capitol Building and supporting state office buildings bring a significant number of employees into the downtown area from around the region. West of downtown, land uses gradually transition from high-density housing and intensive commercial development to shorter multi-story office and commercial buildings, shifting more fully to residential development west of 17th Street.

Between State Street and Main Street, from roughly 17th Street west to Whitewater Park Boulevard, single family homes are the predominant land use, with some exceptions. Along the State Street corridor, land uses outside the downtown core tend to be one- and two-story commercial interspersed with single-family residential districts. The Main/Fairview couplets have been the focus of redevelopment in the area, with new residential and commercial growth occurring mostly between 23rd Street and Whitewater Park Boulevard.

Additional near-term development projects are under construction or about to enter the construction phase in the study area. All near-term future development plans discussed by the project team were shared with COMPASS, the Treasure Valley metropolitan planning organization (MPO), to ensure that future growth projections for households and jobs incorporated anticipated development projects. These include the following residential and commercial projects identified by City of Boise staff:

- 11th & Idaho: 180,000 square feet of office space to be completed by late 2021
- 5th & Front: 138-room hotel, completed in 2020
- 6th & Front: the Vanguard Apartments, 75 units and 2,700 square feet of retail space, to be completed by late 2021
- 512 W. Grove Street: a mixed-use project with 114 residential units and 8,000 square feet of retail space, to be completed by late 2021

- 116 S. 6th Street: a mixed-use project with 60 residential units, 9,000 square feet of office space, and 5,000 square feet of retail space, to be completed by late 2021
- 139 E. Main Street: the Ronald McDonald House, with 47 rooms, completed in 2020
- 529-535 S. 15th Street: the River Street Lofts, with 10 residential units, completed in 2020
- 323 W. Broad Street: the Cartee, with 161 residential units, to be completed in late 2021

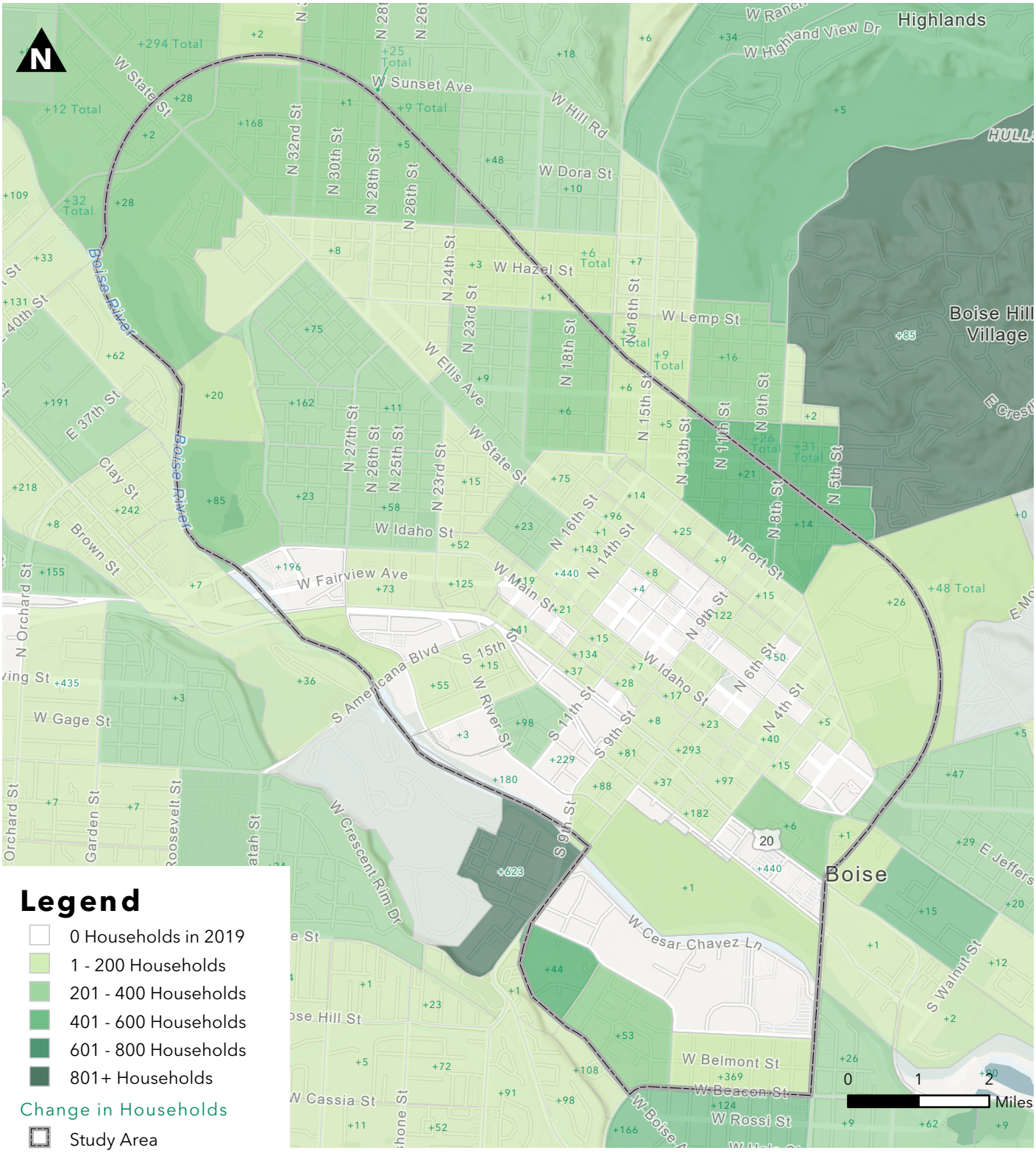
Current and Future Household and Employment Totals

Information on current and projected household and employment totals within the study area was provided by COMPASS. The MPO provides data on the number of households, population, and jobs within small geographic areas called traffic analysis zones (TAZ's), both for existing conditions and several future year horizons. For the purpose of this study, the analysis focused on a "base year" of 2019, and a future horizon year of 2035, to be consistent with opening-year assumptions contained within the State Street Traffic and Transit Operations Plan.

The number of households along a potential transit corridor influences transit ridership: the more people along a corridor, the more potential riders. Based on the COMPASS data provided in the TAZ's, there are currently 1,541 households within the study area, and 4,698 households projected to be within the study area by 2035, a total increase of 3,157. Within the study area, some of the most concentrated changes are expected in the neighborhood between 13th-15th Street, from Jefferson Street to Idaho Street. Within these few blocks, an additional 440 housing units are anticipated by 2035. Outside of this area, changes in the number of projected households are somewhat smaller, although additional pockets of growth are dispersed throughout the study area as shown in Figure 1.

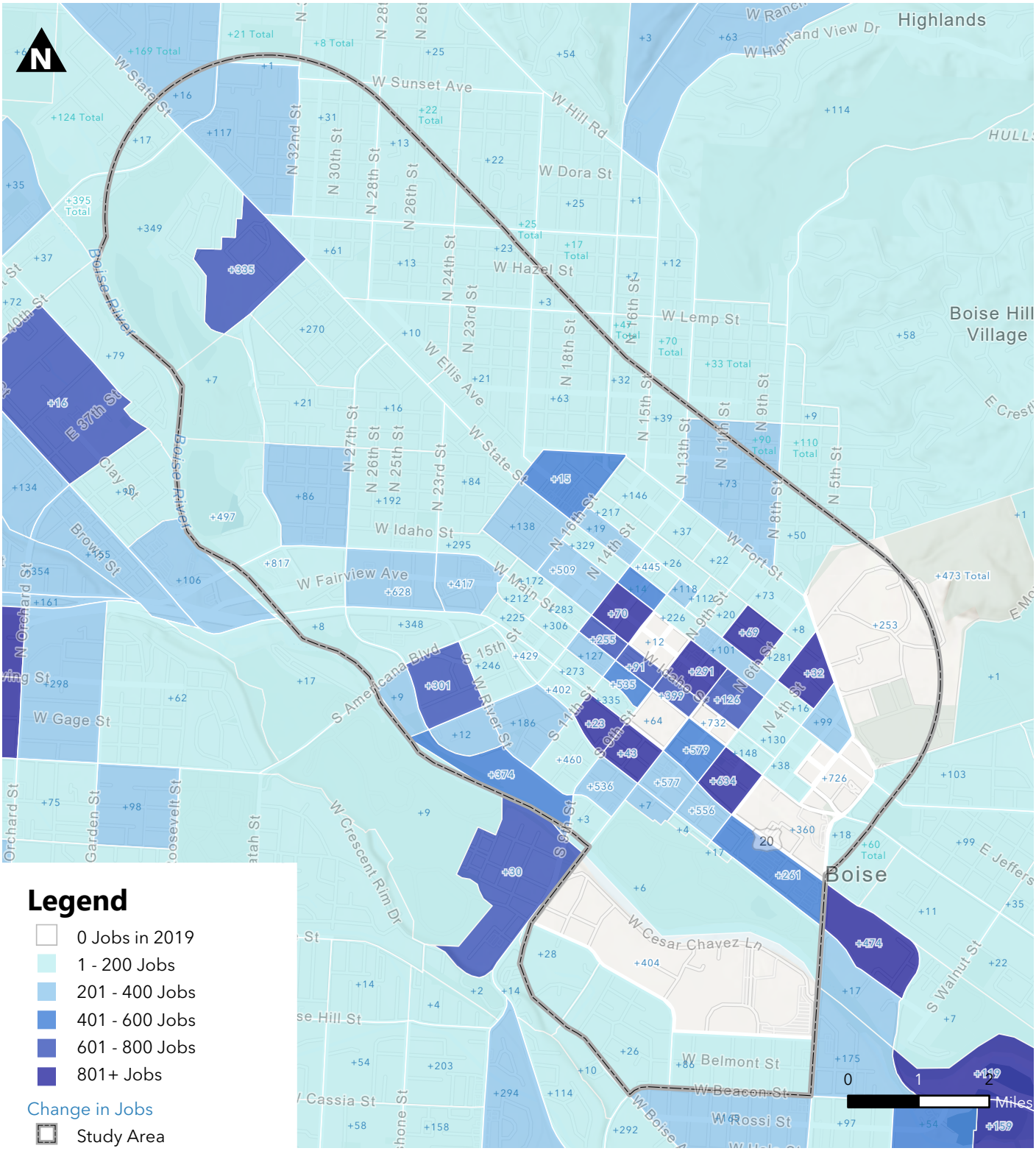
Concentrations of jobs also can be significant contributors to transit ridership, encouraging residents of other parts of the region to take transit to commute to work. The COMPASS data indicated that there are currently 3,829 jobs within the study area, and 12,595 jobs projected to be within the study area by 2035, a total increase of 8,766. Future growth patterns in the study area reflect trends already underway: the model data suggests that a significant amount of additional employment growth is expected along the Main Street and Fairview Avenue corridors, especially near their intersections with Whitewater Park Boulevard. Growth is anticipated at the northwest corner of Main Street and Whitewater Park Boulevard as well as the current Idaho Transportation Department (ITD) campus (at the southwest corner of State Street and Whitewater Park Boulevard). Both of these sites have been the focus of high-level planning exercises around future growth, and

the ITD campus was identified as a Tier 1 Station Area in the 2019 State Street Corridor Transit-Oriented Development Plan. That plan recommends a mix of land uses at the ITD campus site, including office, single family residential, multi-family residential, and open space. Currently, neither site has active development plans in place, and ITD has no current plans to vacate its campus. However, future employment projections from COMPASS include some level of change in these areas.



Source: Community Planning Association (COMPASS)

Figure 1: Change in Households between 2019 and 2035



Source: Community Planning Association (COMPASS)

Figure 2: Change in Employment between 2019 and 2035

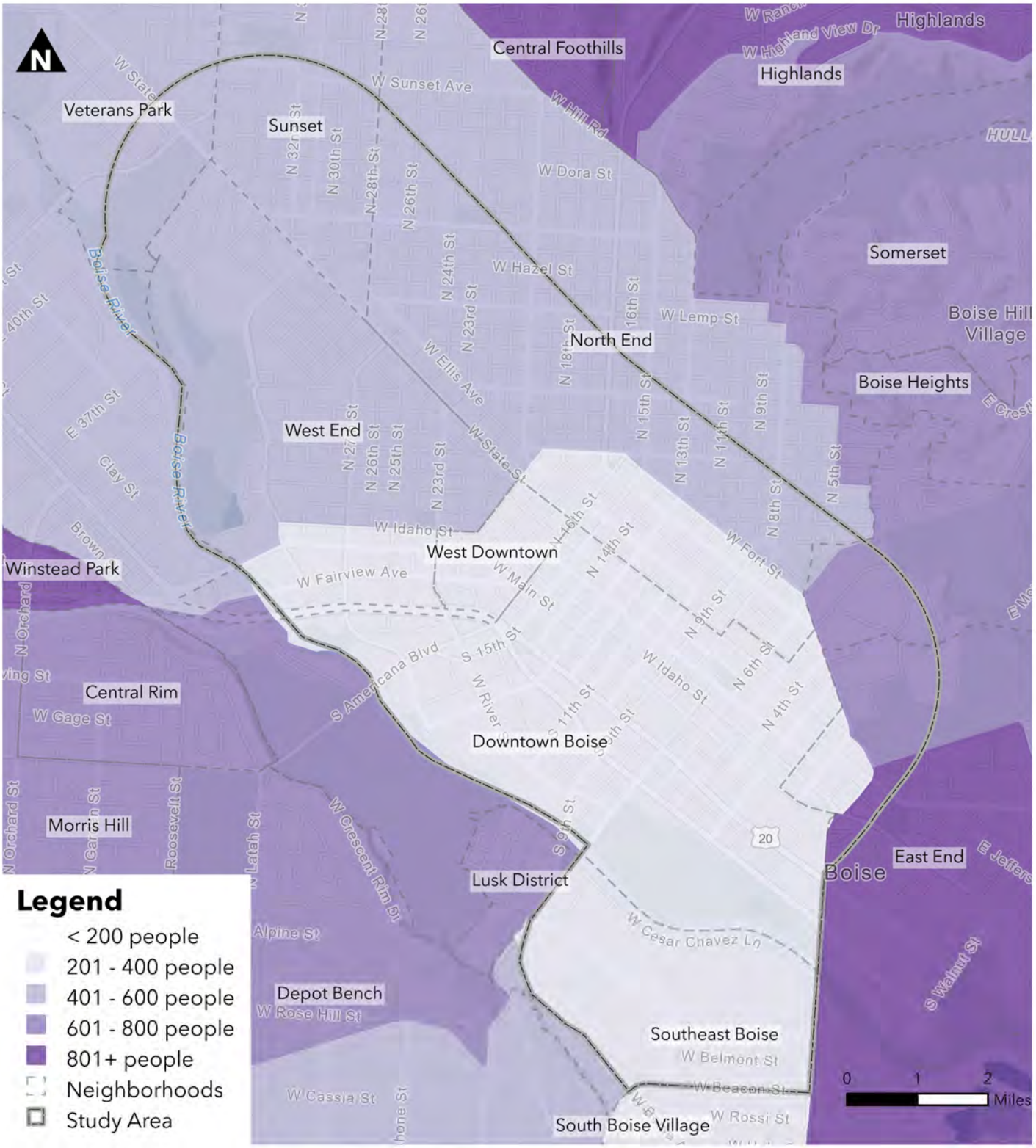
Transit Dependent Populations

The American Community Survey (ACS), from the U.S. Census Bureau, helps identify and track populations that may be at a disproportionately high risk of facing constraints and challenges relating to transportation, healthcare, finances, and access to basic goods and services, and would therefore be more reliant on transit to meet their daily needs. These include people that are 65 or over, 18 or younger, have no vehicles, or are of low-income. The sections below and accompanying maps describe information obtained from the U.S. Census Bureau, 2019 ACS data.

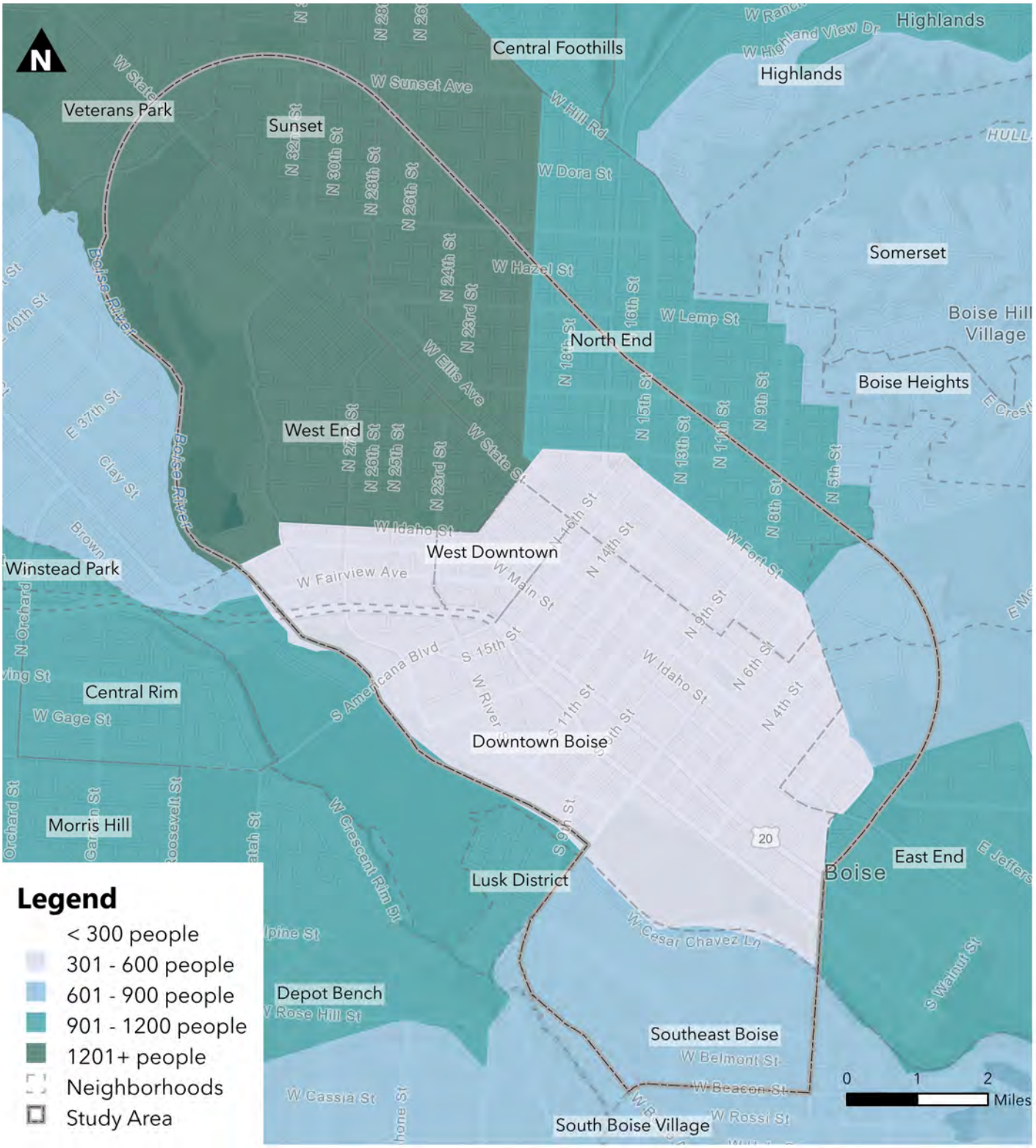
Residents who are over 65 or less than 18 years old are more likely to rely on transit, friends or family to meet their transportation needs. In Boise, there are more people 65 years old and older east of downtown, and south of the Boise River, but less so within the study area. Boise residents 18 years old or younger are more concentrated west of 18th Street, in the West End neighborhood within the study area, and in the neighborhoods north of State Street, west of 18th Street. Residents over 65 or under 18 years old are shown in Figures 3 and 4.

Households without vehicles in the study area are mostly concentrated in downtown Boise, with lower concentrations north of downtown, west of State Street. Zero-vehicle households are often common in areas of higher density (like downtown Boise), where they have increased access to employment opportunities and other amenities within walking, biking, or a reasonable transit distance from home. In comparison, zero vehicle households outside of downtown cores often are farther away from key opportunities and destinations, often without adequate transit coverage. Within the study area, the neighborhoods around downtown Boise and the West End also have a higher count of low-income households[1] compared to the surrounding areas, indicating that there may be more transit-dependent people living in these areas. Households without vehicles and low-income households are shown in Figures 5 and 6.

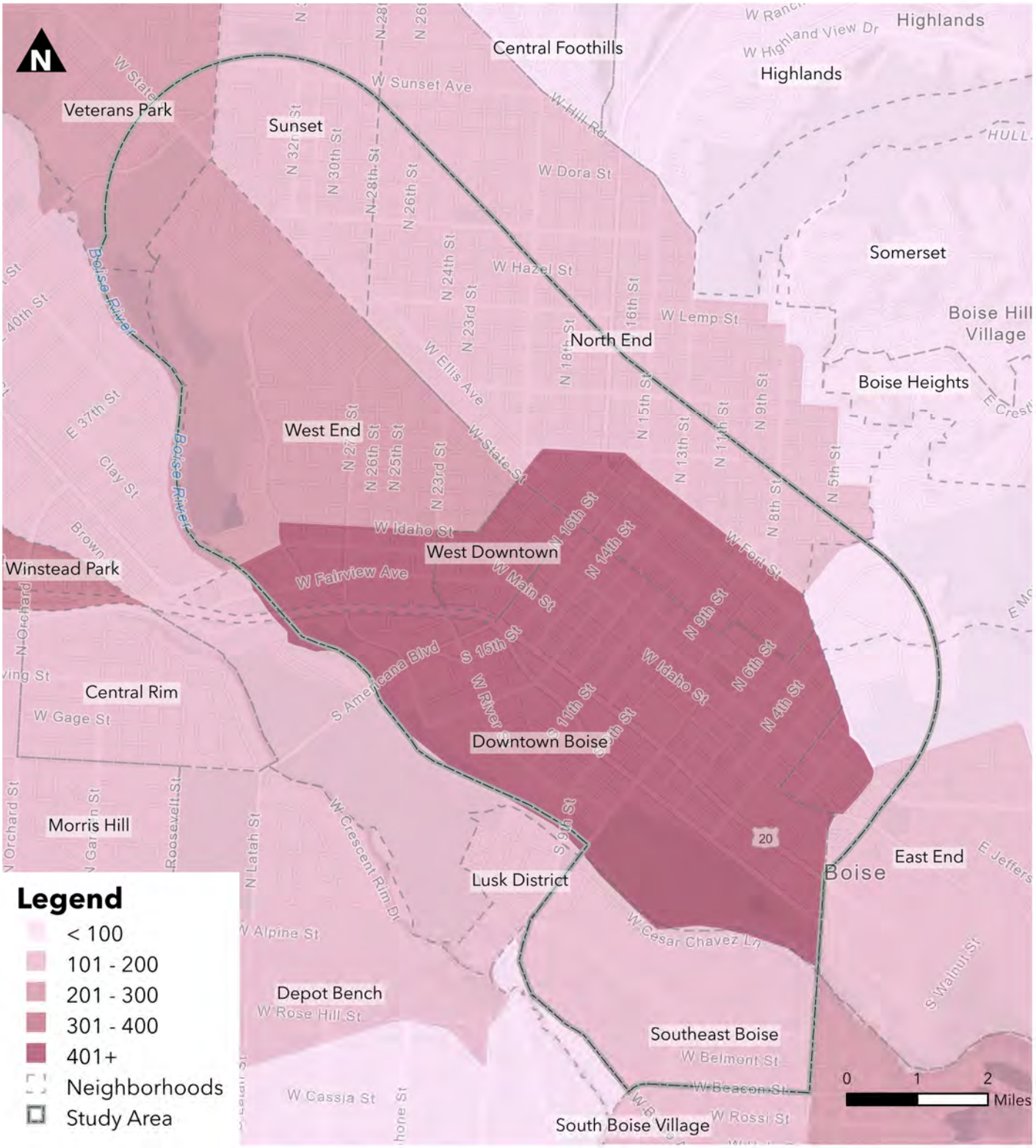
[1] *Low-income households are a measure of the population whose income in the past 12 months is below federal poverty level, a measure of income issued by the U.S. Department of Health and Human Services. More information can be found here: https://www.census.gov/topics/income-poverty/poverty/about.html*



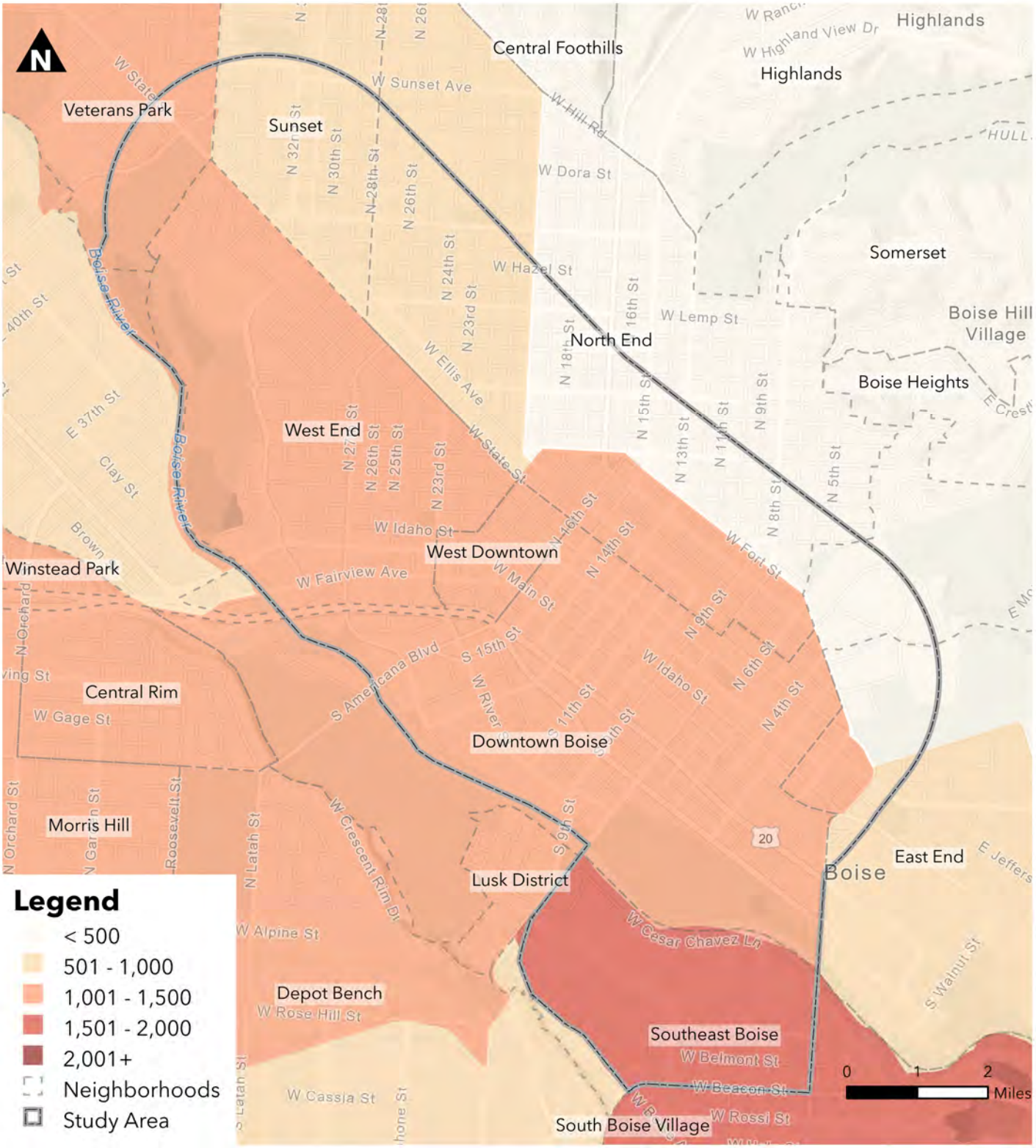
Source: U.S. Census Bureau; American Community Survey, 2019 American Community Survey 1-Year Estimates



Source: U.S. Census Bureau; American Community Survey, 2019 American Community Survey 1-Year Estimates



Source: U.S. Census Bureau; American Community Survey, 2019 American Community Survey 1-Year Estimates



Source: U.S. Census Bureau; American Community Survey, 2019 American Community Survey 1-Year Estimates

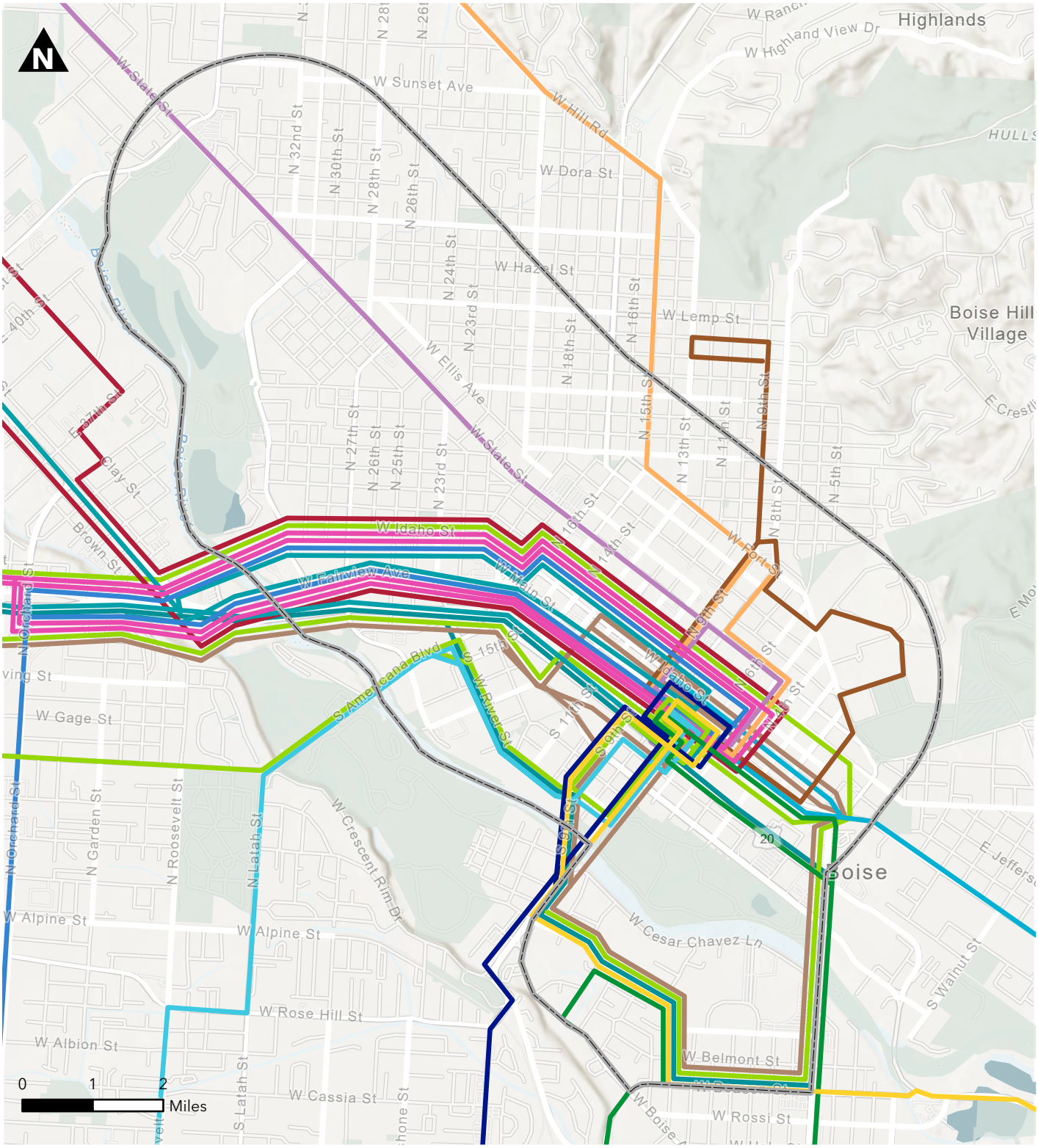
Transit

Valley Regional Transit (VRT) provides bus service in Ada and Canyon Counties. VRT operates 23 total routes: 18 fixed routes in Ada County, one in Canyon County, and four intercounty routes between Ada County and Canyon County. In the study area, there are 18 routes in service. All bus routes that travel within the study area are summarized in Table 1 and shown in Figure 7.

Table 1: Transit Lines Serving Study Area

Line Name	Route Length (mi)	Min Headway (minutes)	Max Headway (minutes)	Avg Daily Boardings (2019)
01: Harris Ranch via Parkcenter				
02: Broadway	9.4	29	60	264
03: Vista	4.4	15	30	398
04: Roosevelt	7.0	30	87	146
05: Emerald	4.9	30	60	313
06: Orchard	7.2	30	60	257
07A: Fairview Ustick	6.3	60	60	198
07B: Fairview - Towne Square Mall	5.9	60	60	306
08x: Five Mile Chinden	20.8	45	82	110
09: State Street	6.0	15	30	800
10: Hill Road	6.7	60	60	219
11: Garden City	5.2	60	60	27
16: VA/Hyde Park Loop	2.8	60	60	39
17: Warm Springs	2.3	29	60	77
29: Overland	6.6	30	60	255
40: Nampa/Meridian Express	31.8	28	43	156
43: Caldwell Express	31.5	30	30	50
45: BSU Express	18.7	35	82	46

Source: 2019 route data from VRT, Remix.



Source: Valley Regional Transit (VRT)

LEGEND

- 01: Harris Ranch via Parkcenter
- 02: Broadway
- 03: Vista
- 04: Roosevelt
- 05: Emerald
- 06: Orchard
- 07A: Fairview Ustick
- 07B: Fairview - Towne Square Mall
- 08x: Five Mile Chinden
- 09: State Street
- 10: Hill Road
- 11: Garden City
- 16: VA/Hyde Park Loop
- 17: Warm Springs
- 29: Overland
- 40: Nampa/Meridian Express
- 43: Caldwell Express
- 45: BSU Express
- Study Area

Figure 7: Study Area Transit Routes

Layout view only. Many routes overlap.

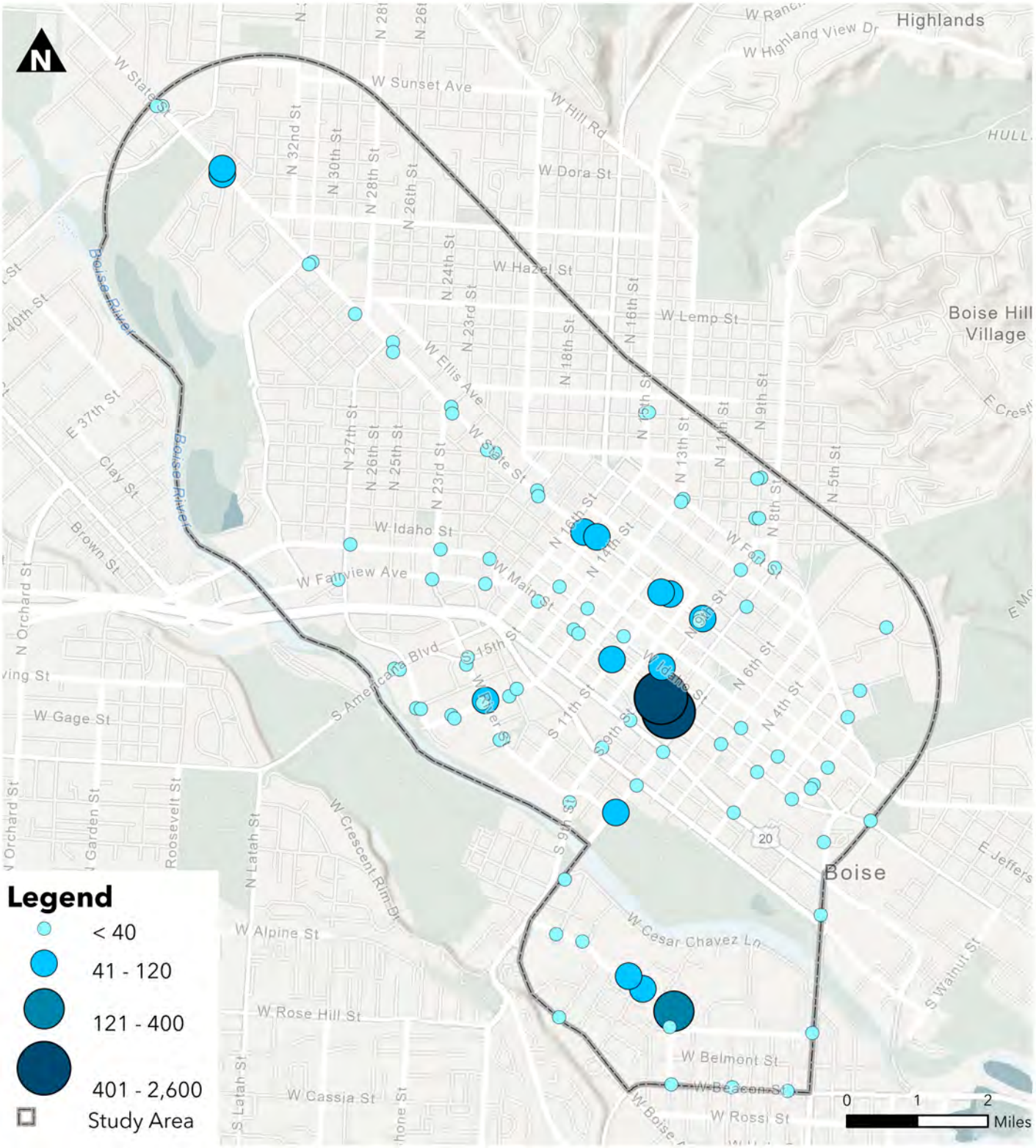
Current Transit Ridership

VRT provided average weekday transit boardings and alightings for each bus stop in the study area, reflecting a typical day in October 2019. This represents ridership trends prior to the COVID-19 impacts on transit ridership and overall travel. October also reflects a time of year when people are generally commuting to and from work in a typical pattern, elementary and secondary schools are in session, and students are commuting to colleges and universities in the region as well. Within the study area, stop-level activity is concentrated in several locations:

- State Street/Clover Drive on Route 9 (State Street)
- State Street/15th Street on Route 9
- State Street/11th Street, on Route 9 near the Downtown Boise YWCA and Boise High School
- State Street/9th Street, the nearest inbound stop on Route 9 to the state government complexes and a transfer point between Route 9 and Route 10 (Hill Road); this stop also serves outbound Route 16 (VA/Hyde Park Loop)
- 11th Street/Main Street, on the west side of downtown on Route 7B (Fairview/Towne Square Mall); this stop also serves the inbound 11 (Garden City), inbound 43 (Caldwell Express), outbound 4 (Roosevelt), outbound 6 (Orchard), outbound 7A (Fairview Ustick), and the inbound 8x (Five Mile Chinden)
- 9th Street/Idaho Street, in the heart of downtown and also a transfer point between Route 9 and Route 7B; also serves the outbound 43, inbound 8x, and the outbound 40 (Nampa/Meridian Express)
- River Street/13th Street, on Route 5 (Emerald) and Route 45 (BSU Express)
- River Street/Capitol Boulevard, near the entrance to Julia Davis Park with multiple overlapping routes: the outbound 1 (Harris Ranch via Parkcenter), outbound 3 (Vista), outbound 40, and outbound 5 (Emerald)
- University Drive/Joyce Street, near the Quad at Boise State University, with multiple overlapping routes: the inbound 1, inbound and outbound 40, outbound 43, and inbound/outbound 45
- University Drive/Lincoln Avenue, near the heart of the Boise State University Campus, serving the outbound 40, outbound 43, and inbound 45 multiple overlapping routes
- Main Street Station, in the heart of downtown and a connecting point or terminus for many VRT routes including the 1, 2, 3, 4, 5, 6, and 7

As shown in Table 1, Route 9 on State Street has the highest average daily boardings of all VRT's bus routes. As noted above and in Figure 8, several of the highest-ridership stops in the study area are focused along State Street, serving destinations such as the government complex northeast of

downtown, the downtown core, Boise High School, the Downtown Boise YWCA, and other destinations along the commercial sections of State Street west of downtown.



Source: Valley Regional Transit (VRT). October 2019.

Figure 8: Average Weekday Transit Boardings and Alightings

Active Transportation

This section summarizes existing and proposed active transportation facilities in the study area. Active transportation conditions vary widely throughout the study area. In the heart of downtown Boise, pedestrian and bicyclists conditions are very good: sidewalks are typically wider than normal, able to accommodate the higher numbers of pedestrians typically seen in urban environments; block sizes are small; high-visibility crosswalks are common; and a range of on-street bicycle facility types are often available. Outside of downtown, infrastructure conditions are still generally good: high-visibility crosswalks are striped on major corridors like Whitewater Park Boulevard and 27th Street, sidewalks are available and consistent, bike facilities are available on several major corridors, and block sizes are small. The following section outlines specific active transportation facilities, which are shown in Figure 9.

Existing Pedestrian Facilities

Typical pedestrian facilities, such as sidewalks, crosswalks, and pedestrian signals, are generally provided throughout the study area. Currently there are 108 miles[2] of completed sidewalks in the study area. There are also 1,019 crosswalks[2], with a high concentration of crossings located downtown and along State Street. The Boise River Greenbelt, a paved multi-use bicycle and pedestrian trail, crosses through the study area as it follows the Boise River alignment as shown in Figure 9.

Existing Bicycle Facilities

A brief description of the different types of existing bicycle facilities in the study area is presented below. For more information on bike facility types and classifications, see the Bike Facility Matrix in the 2018 Roadways to Bikeways Master Plan Update (provided as Exhibit 1 to this technical memorandum). Locations of these facilities are shown in Figure 9.

Bike Friendly Route: also referred to as a Neighborhood Bike Route, these routes are designed to provide low-stress options for bicycle travel on local or collector streets with low motorized traffic volumes and speeds of no more than 25 mph. There are nearly twelve miles of road classified as a Bike Friendly Route in the study area, including Bannock Street, Ellis Avenue, and Resseguie Street.

[2] Source: Community Planning Association (COMPASS)

Bike Lane: a separated portion of the road designated for exclusive use by bicyclists using lane markings and signage. Bike lanes are most often on collector streets where motorized vehicle speed is between 15 and 40 mph, and the average annual daily traffic (AADT) is between 0 and 20,000 vehicles. Approximately twelve miles of bike lanes exist throughout the study area including Main Street, 15th Street, and 16th Street, 27th Street, and Whitewater Park Boulevard.


Bike Lane at Whitewater Park Blvd and Woodlawn Ave

Sharrows/Shared Roadway: routes where bicyclists and motorized vehicles operate in the same travel lane, often denoted by shared lane markings. These facility types are used in areas with a posted speed limit of 30 mph or below and an AADT of between 0 and 10,000 vehicles. In the study area, nearly four miles of these shared roadways exist on 13th Street, 3rd Street, Bannock Street, Fort Street, and Jefferson Street.


Shared Roadway with Sharrow markings at Bannock St and 13th St

Buffered Bike Lanes: bike lanes with a striped buffer separating the cyclists from adjacent traffic lanes. Buffers are represented by two solid white lines, at least 18 inches apart, and with diagonal hatching, if the buffers are more than three feet wide. These types of facilities help cyclists pass one another more easily and avoid the "door zone" adjacent to parked cars. Within the study area there are buffered bike lanes on some sections of Main Street and Fairview Avenue west of downtown.


Buffered Bike Lanes at Capitol Blvd and Broad St

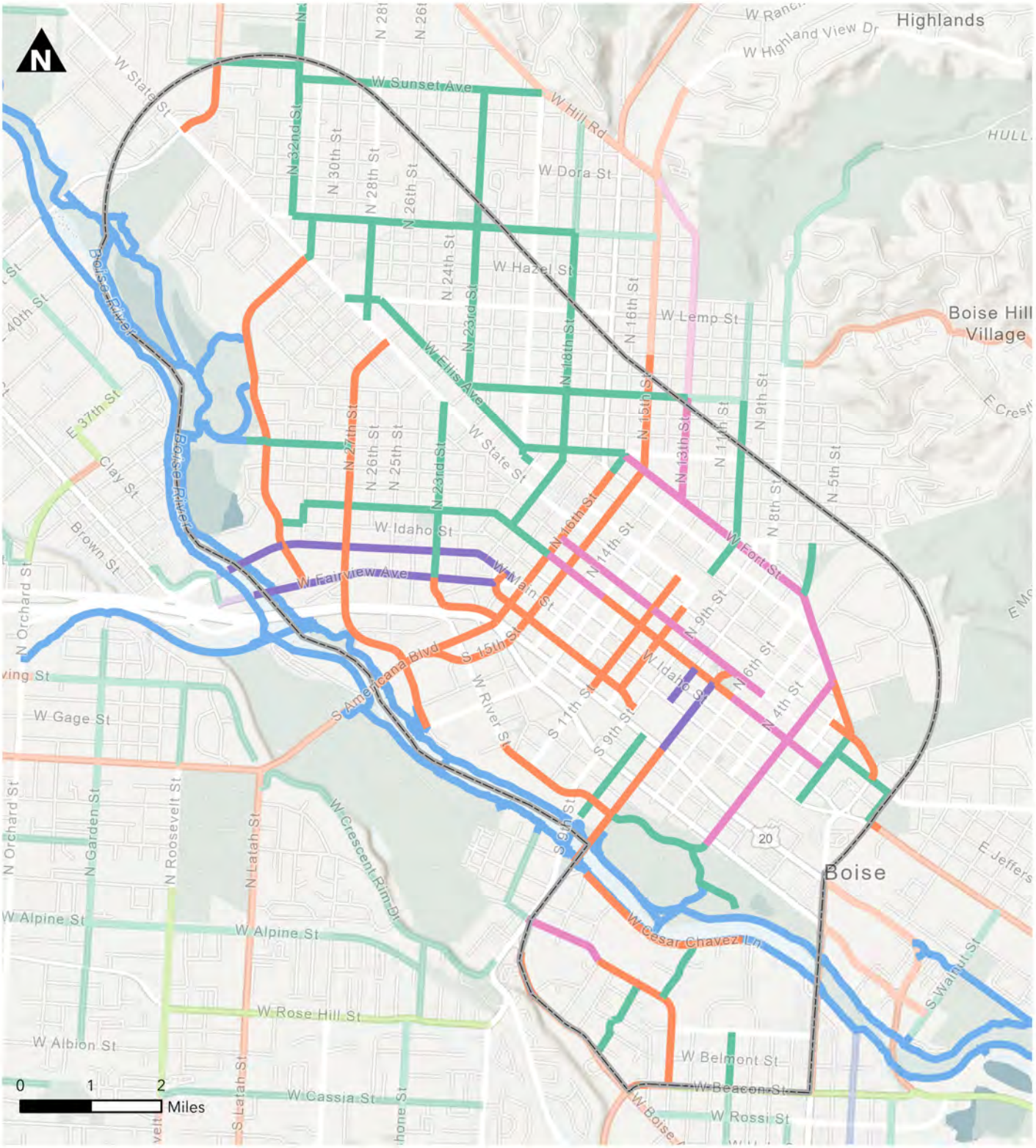
Separated Bike Lanes: bike lanes separated from adjacent traffic lanes by curbing, on-street parking, planters, or other physical barriers. Within the study area, there are separated bike lanes on Capitol Boulevard downtown.


Separated Bike Lane on Capitol Blvd at Main Street

Planned Active Transportation Projects

The ACHD 2020-2024 Integrated Five-Year Work Plan, along with other existing plans, provides a complete assessment of the active transportation network. It outlines specific projects and focused programs to improve and enhance the active transportation experience in Boise, including low-stress bike route options, enhanced pedestrian crossings (Accessible Pedestrian Signals (APS), Pedestrian Hybrid Beacon (PHB), and Rectangular Rapid Flashing Beacon (RRFB)), and safe sidewalks with a cohesive sidewalk network. These recommendations, as well as relevant projects from the Capital City Development Corporation Five-Year Capital Improvement Plan (2020-2024),

are attached as Exhibit 2 to this report. The plan also identifies recommendations for ADA accessibility, zoning and design review, and implementation and funding of the specific elements of each project.



Source: Ada County Highway District (ACHD)

LEGEND

- Bike Friendly Route
- Buffered Bike Lane
- Bike Lane
- Bikeway
- Sharrow
- Shoulder Bikeway
- Boise River Greenbelt
- Study Area

Traffic

2019 Model Origins & Analysis Methodology

The ACHD Synchro model was created by ACHD and includes vehicular, bicycle, and pedestrian counts for nearly every intersection in the county for the AM, Midday, and PM peak hours. Data was collected from 2000 to 2018. The Synchro model was used to assess traffic level of service conditions for the signalized intersections along the study corridors. Level of service (LOS) is a term that describes the operating performance of an intersection or roadway. LOS is measured quantitatively and reported on a scale from A to F, with A representing the best performance and F the worst. Table 2 provides a brief description of each LOS letter designation and an accompanying average delay per vehicle for both signalized and unsignalized intersections. The Highway Capacity Manual, 6th Edition (HCM 6) methodology was used in this study to remain consistent with "state of the practice" professional standards. This methodology has different quantitative evaluations for signalized and unsignalized intersections. For signalized intersections, the LOS is provided for the overall intersection (weighted average of all approach delays). The study area in this analysis consisted of only signalized intersections, thus LOS will be provided for the overall intersection.

Table 2: Level of Service Descriptions

LOS	Description	Signalized Intersections	Unsignalized Intersections
		Avg. Delay (sec/veh)[1]	Avg. Delay (sec/veh)[2]
A	*Free Flow / Insignificant Delay* Extremely favorable progression. Individual users are virtually unaffected by others in the traffic stream.	< 10.0	< 10.0
B	*Stable Operations / Minimum Delays* Good progression. The presence of other users in the traffic stream becomes noticeable.	> 10.0 to 20.0	> 10.0 to 15.0
C	*Stable Operations / Acceptable Delays* Fair progression. The operation of individual users is affected by interactions with others in the traffic stream	> 20.0 to 35.0	> 15.0 to 25.0
D	*Approaching Unstable Flows / Tolerable Delays* Marginal progression. Operating conditions are noticeably more constrained.	> 35.0 to 55.0	> 25.0 to 35.0

E	*Unstable Operations / Significant Delays Can Occur* Poor progression. Operating conditions are at or near capacity.	> 55.0 to 80.0	> 35.0 to 50.0
F	*Forced, Unpredictable Flows / Excessive Delays* Unacceptable progression with forced or breakdown of operating conditions.	> 80.0	> 50.0

1. Overall intersection LOS and average delay (seconds/vehicle) for all approaches.
2. Worst approach LOS and delay (seconds/vehicle) only.

Source: Fehr & Peers descriptions, based on *Highway Capacity Manual, 6th Edition*.

2019 Existing Conditions Results

Using the provided Synchro model from ACHD and the HCM 6th Edition delay thresholds (HCM 2000 used for select intersections, see Table 3), the existing background AM, Midday, and PM peak hour LOS were computed for each study intersection. In Ada County, LOS E (55 seconds or more) or below is considered failing level of delay for Principal Arterials and Minor Arterials and LOS D (35 seconds or more) or below is considered failing level of delay for Collectors. In this study, all study intersections are considered either a Principal Arterial or a Minor Arterial. Thus, LOS D (or less than 55 seconds of delay) or above is considered acceptable. The results of this analysis for the AM, Midday, and PM peak hours are reported in Table 3 (see Exhibit 3 for detailed LOS reports). These results serve as a base for the analysis of the impacts of the proposed route alternatives.

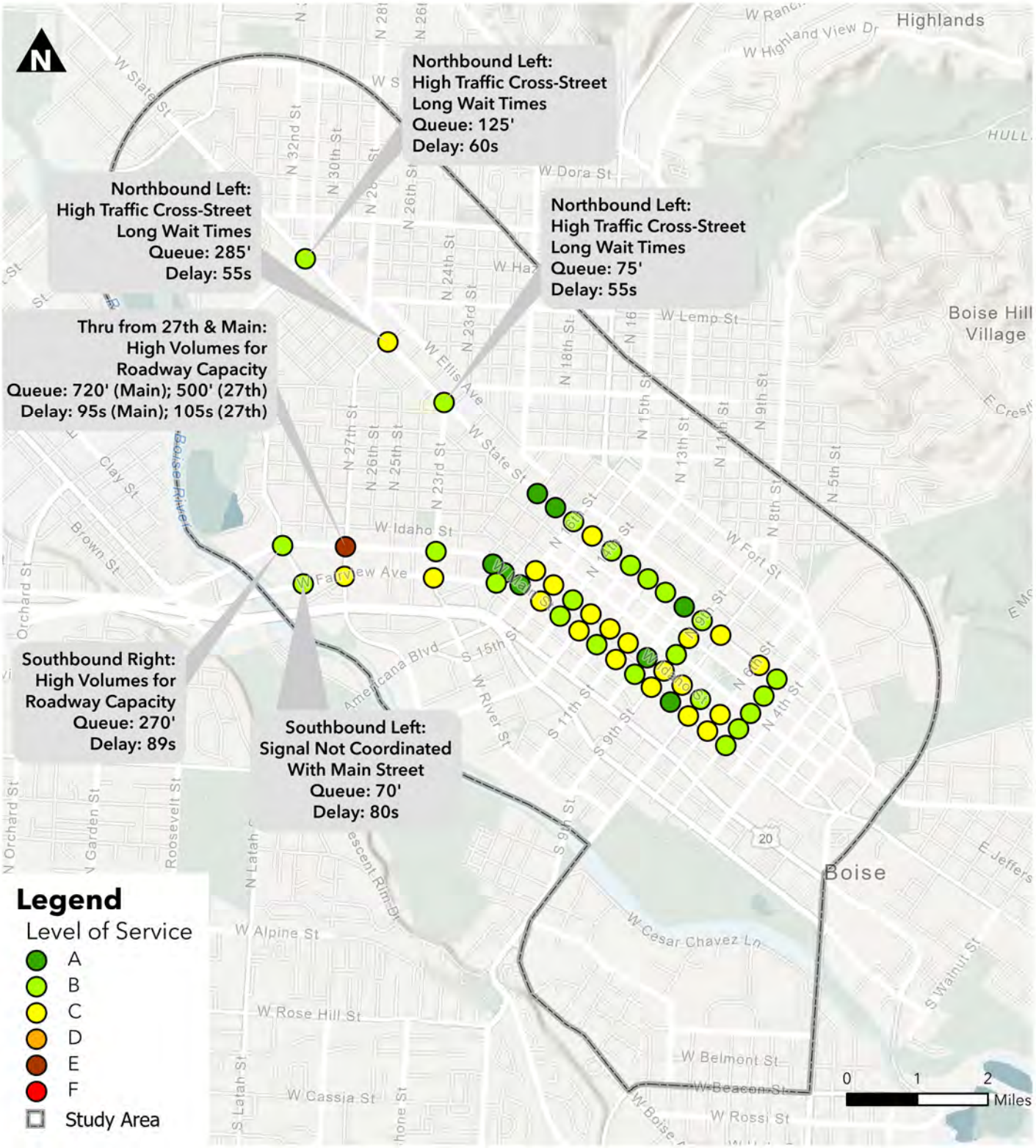
Table 3: Existing 2019 Background Conditions AM, Midday, & PM Peak Hour Level of Service

Intersection				2019 Background
ID	Location	Period	Control	LOS / Sec/Veh[2]
1	State Street & 9th Street	AM	Signal	B / 15
		MID		B / 12
		PM		B / 13
2	State Street & 15th Street	AM	Signal	B / 13
		MID		B / 18
		PM		C / 26
3[1]	State Street & 26th/27th Street	AM	Signal	C / 20
		MID		C / 24
		PM		C / 32
4[1]	State Street & Whitewater Park Boulevard	AM	Signal	C / 22

		MID		B / 11
		PM		B / 19
5	Idaho Street & 9th Street	AM	Signal	C / 20
		MID		C / 23
		PM		C / 27
6	Idaho Street & 15th Street	AM	Signal	C / 21
		MID		C / 21
		PM		C / 28
7	Main Street & 9th Street	AM	Signal	C / 24
		MID		C / 24
		PM		C / 29
8	Main Street & 15th Street	AM	Signal	B / 18
		MID		B / 17
		PM		C / 21
9	Main Street & 27th Street	AM	Signal	D / 38
		MID		C / 21
		PM		**E / 76**
10[1]	Main Street & Whitewater Park Boulevard	AM	Signal	B / 17
		MID		B / 12
		PM		B / 16
11	Fairview Avenue & 27th Street	AM	Signal	D / 47
		MID		B / 20
		PM		C / 32
12[1]	Fairview Avenue & Whitewater Park Boulevard	AM	Signal	B / 11
		MID		A / 6
		PM		B / 11

[1]Intersections analyzed with HCM 2000 where infeasible to analyze with HCM 6 due to phasing or speed limitations.
[2]Bolded intersection LOS & Sec/Veh indicate failing levels of delay

Comparing the AM, Midday, and PM LOS, it was found that the PM peak hour experienced the most delay of the three peak hours for the majority of study intersections. In order to simulate worst delay conditions, future background and future plus project conditions were analyzed in the PM peak hour. Figure 10 presents the Existing 2019 PM Background LOS results shown in Table 3. This serves as a base for the analysis of the impacts of the proposed route alternatives.



All queues shown are 95th Percentile.
Source: Ada County Highway District (ACHD).

Figure 10: Level of Service (LOS) at Study Intersections 2019 PM Peak Hour

Observations of Traffic Trends

As shown in Table 3, the intersection at Main Street & 27th Street operates at failing LOS during the PM peak hour due to heavy side-street through volumes and few gaps along Main Street for right-turning vehicles. All other study intersections operate at acceptable LOS.

Although all other study intersections operate at acceptable LOS, there are some individual movements that experience high delays. Common trends throughout the network include difficult northbound left-turn movements from side streets onto State Street due to high volumes on State Street. Left-turning vehicles from Whitewater Park Boulevard onto Fairview Ave also experience high levels of delay since the signal is coordinated with the eastbound direction. Signal timing adjustments will improve the delay at these intersections.

Background 2035 Future Conditions

Fehr & Peers projected 2035 volumes using linear annual growth rates based on ACHD's Travel Demand Model of the area, in coordination with VRT, COMPASS, and ACHD. The increase in projected volume between the 2019 and 2035 Ada County models indicated between 7.1% and 16.9% growth per year, depending on the segment of road in the study area. The growth rates were applied to the existing 2019 background PM volumes to formulate the traffic volumes for the future 2035 PM background conditions. Only the PM peak hour was analyzed to simulate worst conditions as it is the hour with the highest volume of traffic. The results of this 2035 background condition for the study intersections are found in Table 4.

Table 4: Background 2035 Future Conditions PM Peak Hour Level of Service

Intersection				2019 Background	2035 Background
ID	Location	Period	Control	LOS / Sec/Veh[2]	LOS / Sec/Veh[2]
1	State Street & 9th Street	PM	Signal	B / 13	B / 16
2	State Street & 15th Street	PM	Signal	C / 26	C / 28
3[1]	State Street & 26th/27th Street	PM	Signal	C / 32	**F / 97**
4[1]	State Street & Whitewater Park Boulevard	PM	Signal	B / 19	**F / 85**
5	Idaho Street & 9th Street	PM	Signal	C / 27	C / 31
6	Idaho Street & 15th Street	PM	Signal	C / 28	C / 23

7	Main Street & 9th Street	PM	Signal	C / 29	D / 45
8	Main Street & 15th Street	PM	Signal	C / 21	B / 18
9	Main Street & 27th Street	PM	Signal	**E / 76**	**F / 153**
10[1]	Main Street & Whitewater Park Boulevard	PM	Signal	B / 16	D / 43
11	Fairview Avenue & 27th Street	PM	Signal	C / 32	C / 33
12[1]	Fairview Avenue & Whitewater Park Boulevard	PM	Signal	B / 11	B / 10

[1]Intersections analyzed with HCM 2000 where infeasible to analyze with HCM 6 due to phasing or speed limitations.

[2]Bolded intersection LOS & Sec/Veh indicate failing levels of delay

The 2035 background scenario takes into account signal optimization at the study intersections, thus some intersections experience an overall improvement in LOS. However, the intersections at State Street and 26th/27th Street and at State Street and Whitewater Park Boulevard decline into unacceptable LOS in the 2035 background scenario. The intersection at State Street and 26th/27th Street experiences enough of an increase in traffic on the minor movements to cause the intersection to fall into an unacceptable level of delay. The intersection at State Street and Whitewater Park Boulevard experiences unacceptable delay in the 2035 background scenario due to an increase in traffic from the area's planned mixed-use development.

Build 2035 Future Conditions

The 2035 Build conditions utilize the 2035 background condition volumes with the addition of select transit infrastructure improvements on the proposed route alternatives as outlined below. Transit Signal Priority (TSP), Transit Pre-Emption, and transit queue bypass lanes were considered for this analysis. TSP modifies the normal signal operation process to better accommodate transit vehicles. Transit Pre-Emption acts similarly as an emergency vehicle in that an oncoming bus will interrupt the normal signal operation. Queue bypass lanes are short, dedicated lanes at an intersection which allow specified vehicles (in this case, transit), to bypass the queue of vehicles stopped at a red light. This would minimize the seconds of delay for transit and prevent a bus waiting several cycles to pass through a green light. For intersections that include TSP as an improvement, Fehr & Peers developed a statistical method to best estimate the realistic impacts of these signal improvements since the Synchro software does not specifically analyze TSP. Two scenarios were prepared for each alternative: one with TSP for every cycle and one without TSP for any cycle. A weighted average of the delay between the two models was calculated based on the likelihood that a bus will trigger TSP during the given peak hour. These calculations were based off a five-minute bus headway. Fehr

& Peers opted to not include a passenger vehicle trip reduction with the proposed project in the analysis in order to remain conservative in the LOS results. The results for each of the 2035 plus project condition alternatives are found in Tables 5-7 and a summary of all alternatives is included in the Traffic Summary section.

Alternative 1: Whitewater Park Boulevard Results

Under the Whitewater Park Boulevard alternative, 2035 background LOS is maintained at all intersections except at the intersection at Main Street and Whitewater Park Boulevard. The following location-specific infrastructure improvements are assumed for this scenario's LOS analysis:

- Whitewater Park Boulevard & State Street: Transit signal pre-emption
- Whitewater Park Boulevard & Main Street: Transit signal pre-emption and inbound (southbound) queue bypass lane
- Whitewater Park Boulevard & Fairview Avenue: Transit signal pre-emption and inbound (southbound) queue bypass lane

Table 5 summarizes the level of service for the study intersections along the Alternative 1 route under 2035 conditions.

Table 5: Alternative 1 2035 Future Conditions PM Peak Hour Level of Service

Intersection				2035 Background	2035 Build
ID	Location	Period	Control	LOS / Sec/Veh[2]	LOS / Sec/Veh[2]
4[1]	State Street & Whitewater Park Boulevard	PM	Signal	**F / 85**	**F / 96**
5	Idaho Street & 9th Street	PM	Signal	C / 31	C / 32
6	Idaho Street & 15th Street	PM	Signal	C / 23	C / 24
7	Main Street & 9th Street	PM	Signal	D / 45	D / 48
8	Main Street & 15th Street	PM	Signal	B / 18	B / 18
9	Main Street & 27th Street	PM	Signal	**F / 153**	**F / 155**
10[1]	Main Street & Whitewater Park Boulevard	PM	Signal	D / 43	**E / 56**
11	Fairview Avenue & 27th Street	PM	Signal	C / 33	C / 33
12[1]	Fairview Avenue & Whitewater Park Boulevard	PM	Signal	B / 10	B / 12

[1]Intersections analyzed with HCM 2000 where infeasible to analyze with HCM 6 due to phasing or speed limitations.
[2]Bolded intersection LOS & Sec/Veh indicate failing levels of delay

The increase in delay at the Main Street/Whitewater Park Boulevard intersection is similar to other intersections that also facilitate a bus turning movement. However, at this particular location, the added delay brought the intersection to 56 seconds of delay, which means this intersection will now function at LOS E rather than LOS D. This also happens to be the break point between an acceptable and unacceptable level of delay; many transportation agencies, including ACHD, consider LOS E and LOS F to be unacceptable. Thus, Alternative 1 is the only alternative that causes a change in future LOS designation compared to future background conditions, although that change is limited to one intersection along the corridor.

Alternative 2: 27th Street Results

The 2035 background LOS is maintained at all intersections under Alternative 2. The following location-specific infrastructure improvements are assumed for this scenario's LOS analysis:

- Whitewater Park Boulevard & State Street: Transit signal pre-emption
- 27th Street & Main Street: Transit signal pre-emption and inbound queue bypass lane

Table 6 summarizes the LOS for the study intersections along the Alternative 2 route under 2035 conditions.

Table 6: Alternative 2 2035 Future Conditions PM Peak Hour Level of Service

Intersection				2035 Background	2035 Build
ID	Location	Period	Control	LOS / Sec/Veh[2]	LOS / Sec/Veh[2]
3[1]	State Street & 26th/27th Street	PM	Signal	**F / 97**	**F / 111**
4[1]	State Street & Whitewater Park Boulevard	PM	Signal	**F / 85**	**F / 98**
5	Idaho Street & 9th Street	PM	Signal	C / 31	C / 31
6	Idaho Street & 15th Street	PM	Signal	C / 23	C / 23
7	Main Street & 9th Street	PM	Signal	D / 45	D / 46
8	Main Street & 15th Street	PM	Signal	B / 18	B / 18
9	Main Street & 27th Street	PM	Signal	**F / 153**	**F / 173**
11	Fairview Avenue & 27th Street	PM	Signal	C / 33	C / 34

[1]Intersections analyzed with HCM 2000 where infeasible to analyze with HCM 6 due to phasing or speed limitations.

[2]Bolded intersection LOS & Sec/Veh indicate failing levels of delay

The greatest increases in delay are at intersections which facilitate bus turning movements. While some intersections experience an increased level of delay, most of these intersections experience a slight increase of one or two seconds of delay. Intersections with increases of 10-20 seconds of delay were already at failing conditions in the 2035 Background condition. Thus the bus does not greatly impact traffic operations along this route.

Alternative 3: State Street Results

The Alternative 3 LOS is maintained at all intersections under Alternative 3. The following location-specific infrastructure improvements are assumed for this scenario's LOS analysis:

- State Street & Whitewater Park Boulevard: Transit signal pre-emption
- State Street & 27th Street: Transit signal pre-emption
- 9th Street & Main Street: Transit signal pre-emption

Table 7 summarizes the LOS in more detail for the study intersections along the Alternative 3 route under 2035 conditions.

Table 7: Alternative 3 2035 Future Conditions PM Peak Hour Level of Service

Intersection				2035 Background	2035 Build
ID	Location	Period	Control	LOS & /Sec/Veh[2]	LOS / Sec/Veh[2]
1	State Street & 9th Street	PM	Signal	B / 16	B / 16
2	State Street & 15th Street	PM	Signal	C / 28	C / 28
3[1]	State Street & 26th/27th Street	PM	Signal	**F / 97**	**F / 110**
4[1]	State Street & Whitewater Park Boulevard	PM	Signal	**F / 85**	**F / 96**
5	Idaho Street & 9th Street	PM	Signal	C / 31	C / 32
7	Main Street & 9th Street	PM	Signal	D / 45	D / 54

[1]Intersections analyzed with HCM 2000 where infeasible to analyze with HCM 6 due to phasing or speed limitations.

[2]Bolded intersection LOS & Sec/Veh indicate failing levels of delay

While some intersections experience an increased level of delay, most of these intersections experience a slight increase of one or two seconds of delay. Intersections with increases of 10-20 seconds of delay were already at failing conditions in the 2035 Background condition. Therefore the bus does not greatly impact traffic operations along this route.

Traffic Summary

Table 8 summarizes and compares the results for the 2019 and 2035 background scenarios, as well as the results for all three 2035 build scenarios.

Table 8: Future 2035 Conditions PM Peak Hour Level of Service

Intersection				2019 Background	2035 Background	2035 Alt. 1	2035 Alt. 2	2035 Alt. 3
ID	Location	Period	Control	LOS / Sec/Veh[2]	LOS / Sec/Veh[2]	LOS / Sec/Veh[2]	LOS / Sec/Veh[2]	LOS / Sec/Veh[2]
1	State Street & 9th Street	PM	Signal	B / 15	B / 16	-	-	B / 16
2	State Street & 15th Street	PM	Signal	B / 13	C / 28	-	-	C / 28
3[1]	State Street & 26th/27th Street	PM	Signal	C / 21	**F / 97**	-	**F / 111**	**F / 110**
4[1]	State Street & Whitewater Park Boulevard	PM	Signal	C / 21	**F / 85**	**F / 96**	**F / 98**	**F / 96**
5	Idaho Street & 9th Street	PM	Signal	C / 20	C / 31	C / 32	C / 31	C / 32
6	Idaho Street & 15th Street	PM	Signal	C / 21	C / 23	C / 24	C / 23	-
7	Main Street & 9th Street	PM	Signal	C / 24	D / 45	D / 48	D / 46	D / 54
8	Main Street & 15th Street	PM	Signal	B / 18	B / 18	B / 18	B / 18	-
9	Main Street & 27th Street	PM	Signal	D / 38	**F / 153**	**F / 155**	**F / 173**	-
10[1]	Main Street& Whitewater Park Boulevard	PM	Signal	**F / 308**	D / 43	**E / 56**	-	-
11	Fairview Avenue & 27th Street	PM	Signal	D / 47	C / 33	C / 33	C / 34	-
12[1]	Fairview Avenue & Whitewater Park Boulevard	PM	Signal	B / 12	B / 10	B / 12	-	-

[1]Intersections analyzed with HCM 2000 where infeasible to analyze with HCM 6 due to phasing or speed limitations.

[2]Bolded intersection LOS & Sec/Veh indicate failing levels of delay

Overall, the introduction of a bus service with a five-minute headway does not substantially impact traffic operations. All alternatives except Alternative 1 maintain the Background level of service. In Alternative 1, the delay at the intersection of Whitewater Park Boulevard and Main Street increased from LOS D to LOS E. The delay of 56 seconds that this intersection may experience is one second

over the LOS E threshold of 55 seconds and thus is one second over the limit for an acceptable LOS. This analysis was conducted in a conservative manner in order to simulate worst traffic conditions. No reduction in background traffic was assumed as is typically caused by shift from vehicular travel to transit due to the introduction of a high-capacity bus route. Along with upgraded stations and traffic delay mitigations (such as transit signal pre-emption and queue bypass lanes), high-capacity bus routes tend to attract more of a shift from personal vehicles to transit than a basic bus network typically would attract, thus lowering the base vehicular traffic.

Bike Facility Matrix

Planned Active Transportation Projects

Project Name	Description	Est Project Cost
Front St. & Myrtle St. Improvements	Enhanced Crosswalk Treatment, post micro sealing	$200,000
S. 10th St. & W. Front St.	Signalized Crossing	$200,000
S. 12th St. & W. Front St	Signalized Crossing	$200,000
S. 5th St. & W. Myrtle St	Signalized Crossing	$200,000
Neighborhood Traffic Calming - S. 8th St. & W. River St.	Bike/Ped Raised Intersection	$200,000
Vista Ave and Nez Perce St	Install a PHB	$259,000
Hays St and 10th St and 11th St	Install a Rectangular Rapid Flashing Beacon (RRFB)	$321,000
Overland Rd and Phillippi St	Install a PHB	$304,000
11th St Maintenance and Bikeway, State/Heron	Complete roadway maintenance on 11th St from Fort to Heron and implement the 11TH St Bikeway Concept	$1,043,000
Cassia St Bikeway and Pedestrian Improvements	Improve Cassia St as a bikeway from Franklin to Kootenai. Includes pavement rehab, sidewalk, pedestrian bridge and enhanced pedestrian crossings	$3,186,000
Kootenai St Traffic Calming, Orchard/Vista	Implement components of the Kootenai St Traffic Calming Concept Study	$1,477,000
Downtown Boise Implementation (2019) - HB312 Project	Accessible pedestrian signal at 16th St and Idaho St.	
Downtown Boise Implementation (2019) - HB312 Project	Enhanced pedestrian crossings at State and 12th and State and 14th	
Residential Capital Maintenance (2019) - HB312 Project	Pavement rehabilitation and pedestrian ramps on residential streets identified as part of ACHD's Pavement Management Program	
Federal Aid Capital Maintenance (2020) - Phase 1, 2, 3	Pavement rehabilitation and upgrade of adjacent pedestrian ramps on identified arterial and collector road segments.	$5,576,000 $2,262,000 $300,000
Federal Aid Capital Maintenance (2021) - Phase 1, 2, 3	Pavement rehabilitation and upgrade of adjacent pedestrian ramps on identified arterial and collector road segments.	$4,948,000 $2,120,000 $300,000
Residential Capital Maintenance (2020) - HB312 Project	Pavement rehabilitation and pedestrian ramps on residential streets identified as part of ACHD's Pavement Management Program.	$3,095,000
Bikeway Signage (2022)	Install wayfinding and bikeway signage on improved bikeways. Corridors include: Cloverdale Rd (Overland / Franklin), MainSt & Fairview Ave (Greenbelt/ Grove St), Protest Hill Bikeway, and Orchard Hill Bikeway.	$65,000
Columbia Village Bikeway, Hwy 21 / Boise Ave	Improve select streets (Holcomb, Yamhill, Lake Forest, Grand Forest) in Columbia Village as a bikeway to include wayfinding, signage, crossings, and markings.	$192,000
Nez Perce St Bikeway, Orchard St / Columbus St	Improve Nez Perce St as a low-stress bikeway to include wayfinding and bikeway signage, enhanced crossings, and markings.	$205,000
Northwest Boise Bikeway, Horseshoe Bend Rd / 36th St	Improve select streets in Northwest Boise as a bikeway to include wayfinding, signage, enhanced crossings, and markings.	$132,000
Pleasanton Ave Bikeway, Greenbelt / 23rd St	Improve Pleasanton Ave as a bikeway to include wayfinding and bikeway signage and markings.	$107,000
Shoshone St Bikeway, Canal St / CapitalBlvd	Improve Shoshone St as a bikeway network to include wayfinding, bikeway signage, a mini roundabout, enhanced connections at Overland, and markings.	$446,000
Allumbaugh St, Fairview Ave / Northview St	Complete curb, gutter, and sidewalk on the west side of Allumbaugh St, between Fairview Ave and Northview St.	$479,000
Coston St, Bannock St/ Franklin St	Complete sidewalk on the west side of Coston, from Bannock to Franklin.	$173,000
Eckert Rd and Arrow Junction Dr Pedestrian Crossing	Install crosswalk, curb ramps and lighting to improve pedestrian connectivity and safety at the intersection of Eckert Rd and Arrow Junction Dr.	$66,000
Holcomb Rd, Mimosa Way / Amity Rd	Construct sidewalk on the east side of Holcomb Rd from Mendota to Amity. Includes bike lane and wayfinding signage from Amity to Mimosa and an enhanced crossing at Amity.	$139,000
Horseshoe Bend Rd, State St / Hill Rd	Construct a pathway on the east side of Horseshoe Bend Rd as per the NW Boise Neighborhood Plan. Includes precast bridge, pedestrian crossing (Utahna St), and bikeway signage.	$658,000
Liberty St Sidewalk and Bikeway, Douglas St / Denton St	Complete sidewalk on the east side of Liberty St, between Douglas St and Denton St. Install bikeway signage between Franklin Rd and Emerald St.	$483,000
Maple Grove Rd and Edna St Pedestrian Crossing	Install an enhanced pedestrian crossing (PHB) across Maple Grove Rd at Edna St.	$184,000
McMillan Rd, Westview Dr / Maple Grove Rd	Complete sidewalk on the south side and a pathway on the north side from Westview to Maple Grove. Includes an enhanced crossing at Mitchell.	$765,000
Overland Rd and Phillippi St Pedestrian Crossing	Install an enhanced crossing (PHB) across Overland Rd at Phillippi St.	$265,000
Overland Rd, Columbus St / Federal Way	Complete curb, gutter and sidewalk on Overland, Columbus to Federal Way.	$94,000

Planned Active Transportation Projects

Project Name	Description	Est Project Cost
Phillippi St, Malad St / Targee St	Complete curb, gutter and sidewalk from Malad to Targee.	$504,000
Phillippi St, Targee St / Overland Rd	Construct curb, gutter, and sidewalk on the east side of Phillippi from Targee to Overland. Includes partial road rehabilitation.	$901,000
Roosevelt St, Rose Hill St / Emerald St	Construct sidewalk on the west side of Roosevelt from Rose Hill to Emerald.	$1,234,000
Vista Ave and Nez Perce St Pedestrian Crossing	Install an enhanced crossing on Vista at Nez Perce, including bike push buttons. Includes relocation of bus stops closer to Nez Perce from Spaulding in coordination with Valley Regional Transit.	$227,000
5th St and Fort St and Hays St	Improve intersection for pedestrians, bicyclists, and motorists.	$0
Safe Sidewalk Program (2020)	Repair existing damaged sidewalk, replace on-compliant curb ramps, and fill in small sidewalk gaps to high priority locations. Project includes the Castle Hills, Pierce Park Meadows, and Gary Lane Meadows #5 subdivisions in northwest Boise.	$1,600,000
Safe Sidewalk Program (2021)	Repair existing damaged sidewalk, replace non-compliant curb ramps, and fill in small sidewalk gaps to high priority locations. Project includes the area of Fairview Ave to Northview St, Allumbaugh St / Curtis Rd.	$1,600,000
Safe Sidewalk Program (2022)	Repair existing damaged sidewalk, replace non-compliant curb ramps, and fill in small sidewalk gaps to high priority locations. Project includes the area of Edna St to McMillan Rd, Shamrock Ave/ Five Mile Rd.	$1,600,000
9th St and Washington St Pedestrian Crossing	Install an enhanced crossing (RRFB) on 9th St at Washington St.	$141,000
13th St Traffic Calming (Phase 1), Fort St / Hill Rd	Implement components of the 13th St Traffic Calming Concept Study, including bulbouts at select intersections and an enhanced pedestrian crossing (RRFB) of 13th St at Resseguie St.	$408,000
28th St, Hazel St / Irene St	Construct bulb-outs at corners of the 28th St intersections of Irene St, Bella St, and Hazel St to provide traffic calming.	$352,000
38th St, Bush Ave / Sunset Ave	Extend roadway and complete sidewalk on both sides of38th St from Bush Ave to Sunset Ave.	$370,000
Bogart Ln, SH 44 (State St) / Sloan St	Install an asphalt path with raised curb on the east side of Bogart between Pocono and Caswell and curb, gutter, and sidewalk on the east side at Sloan. Includes an enhanced pedestrian crossing at Bogartand Sloan.	$252,000
Bogus Basin Rd, Curling Dr / 550' N/O Curling Dr	Install curb, gutter, and sidewalk on both sides of Bogus Basin in a 550' gap north of Curling Dr.	$42,000
Boise Ave and Linden St Pedestrian Crossing	Install an enhanced crossing (RRFB) on Boise Ave at Linden St.	$123,000
Broadway Ave and Boise Ave	Improve intersection for bikes and pedestrians. Includes accessible pedestrian signal.	$301,000
Cassia St Bikeway and Pedestrian Improvements	Improve Cassia St as a bikeway from Franklin to Kootenai and sidewalk from Franklin Park to Curtis and Latah to Shoshone. Includes pavement rehabilitation, mini roundabout at Shoshone, pedestrian bridge at Cassia Park, and enhance pedestrian crossings.	$2,933,000
Christine St, Northview St / Ustick Rd	Construct sidewalk on both sides of Christine, from Northview to Ustick. Includes roadway rehabilitation.	$1,014,000
Columbus St, Overland Rd / Kootenai St	Construct curb, gutter and sidewalk on Columbus from Overland to Kootenai.	$336,000
Cory Ln, Mitchell St/ Maple Grove Rd	Complete sidewalk on the north side of Cory Ln from Maple Grove Rd to Mitchell St.	$195,000
Enhanced School Crossings - Meridian Middle School and Capital High School	Install enhanced pedestrian crossings (RRFBs) on West 08th St in front of Meridian Middle School and on Milwaukee St next to Capital High School at the existing crosswalks.	$148,000
Franklin St, McKinley St / Pierce St	Construct sidewalks on the north side of Franklin St, between McKinley St and Pierce St.	$374,000
Garden St, Bethel St/ Emerald St	Construct sidewalks on the both sides of Garden St, between Bethel St and Emerald St.	$939,000
Garden St, Franklin Rd / Bethel St	Construct sidewalks on the both sides of Garden St, between Franklin Rd and Bethel St.	$989,000
Hays St at 11th St and 12th St Pedestrian Crossings	Install enhanced crossings (RRFB) and pedestrian ramps to cross Hays St at 11th St and 12th St . 11th St crossing to be coordinated with the 11th St Maintenance and Bikeway project.	$275,000
Hazel St, 28th St / 26th St	Construct detached sidewalk on the south side of Hazel St, between 28th St and 26th St.	$39,000
Kootenai St, Vista Ave / Federal Way	Construct curb, gutter, sidewalks and bike lanes on Kootenai St from Vista Ave to Federal Way. Project includes removal of on-street parking.	$106,000
Linda Vista Ln, Canterbury Dr / Ustick Rd	Complete curb, gutter, and sidewalk on west side of Linda Vista Ln from Canterbury Dr to Ustick Rd.	$760,000
McMillan Rd and Leather Way Pedestrian Crossing	Install an enhanced crossing (PHB) on McMillan Rd at Leather Way.	$48,000
Milwaukee St, Marcum St / Ustick Rd	Install curb, gutter, and sidewalk on the west side of Milwaukee St from Marcum St to Ustick Rd. Sidewalk would be placed between the canal and the roadway.	$971,000
Pierce St, Washington St / Shenandoah Dr	Complete sidewalks on Pierce St from Washington to Shenandoah to improve pedestrian safety for students walking to Roosevelt Elementary.	$517,000
Ustick Rd and Milwaukee St School Zone	Expand the existing school zone by installing new school zone flashers on all legs of the intersection to improve student safety.	$29,000
Warm Springs Ave and Straughan Ave Pedestrian Crossing	Install an enhance pedestrian crossing (RRFB) on Warm Springs Ave at Straughan Ave.	$156,000
Warm Springs Ave, Glacier Dr / Glacier Dr	Construct sidewalk on the north side of Warm Springs Ave from 320' northwest of Glacier Dr to the southeast corner of Riverland Terrace Subdivision.	$292,000
Fairview Ave and Curtis Rd Accessible Pedestrian Signal	Replace pedestrian poles with Accessible Pedestrian Signal-compatible push buttons and replace pedestrian ramps with ADA compliant ramps.	$392,000
Fairview Ave and Milwaukee St Accessible Pedestrian Signal	Replace pedestrian poles with Accessible Pedestrian Signals and replace pedestrian ramps with ADA compliant ramps.	$229,000
Fairview Ave and Orchard St	Replace pedestrian poles with Accessible Pedestrian Signal-compatible push buttons and replace pedestrian ramps with directional ramps.	$521,000
Orchard St and Franklin Rd Accessible Pedestrian Signal	Install Accessible Pedestrian Signals at the Franklin Rd and Orchard St intersection to enhance accessibility in compliance with the Americans with Disabilities Act.	$84,000

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	0	910	190	15	235	0	0	0	0	20	665	110
Future Volume (veh/h)	0	910	190	15	235	0	0	0	0	20	665	110
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00				1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1772	1772	1772	1772	0				1772	1843	1772
Adj Flow Rate, veh/h	0	1096	202	17	270	0				29	792	122
Peak Hour Factor	0.88	0.83	0.94	0.88	0.87	0.88				0.69	0.84	0.90
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1526	280	111	1572	0				37	1067	456
Arrive On Green	0.00	1.00	1.00	1.00	1.00	0.00				0.10	0.10	0.10
Sat Flow, veh/h	0	2922	520	92	3001	0				121	3466	1481
Grp Volume(v), veh/h	0	649	649	147	140	0				440	381	122
Grp Sat Flow(s),veh/h/ln	0	1683	1670	1480	1532	0				1837	1751	1481
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0				15.2	13.7	4.9
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0				15.2	13.7	4.9
Prop In Lane	0.00		0.31	0.12		0.00				0.07		1.00
Lane Grp Cap(c), veh/h	0	906	899	859	825	0				565	539	456
V/C Ratio(X)	0.00	0.72	0.72	0.17	0.17	0.00				0.78	0.71	0.27
Avail Cap(c_a), veh/h	0	906	899	859	825	0				565	539	456
HCM Platoon Ratio	1.00	2.00	2.00	2.00	2.00	1.00				0.33	0.33	0.33
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0				27.0	26.4	22.4
Incr Delay (d2), s/veh	0.0	4.8	5.0	0.4	0.4	0.0				10.1	7.7	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.2	1.2	0.1	0.1	0.0				8.9	7.4	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	4.8	5.0	0.4	0.4	0.0				37.2	34.0	23.9
LnGrp LOS	A	A	A	A	A	A				D	C	C
Approach Vol, veh/h		1298			287						943	
Approach Delay, s/veh		4.9			0.4						34.2	
Approach LOS		A			A						C	

Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		40.0		25.0		40.0						
Change Period (Y+Rc), s		5.0		5.0		5.0						
Max Green Setting (Gmax), s		35.0		20.0		35.0						
Max Q Clear Time (g_c+I1), s		0.0		0.0		0.0						
Green Ext Time (p_c), s		0.0		0.0		0.0						

Intersection Summary												
HCM 6th Ctrl Delay			15.3									
HCM 6th LOS			B									

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	120	1195	0	0	435	40	85	345	80	0	0	0
Future Volume (veh/h)	120	1195	0	0	435	40	85	345	80	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.98			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1772	1843	0	0	1843	1772	1772	1772	1772			
Adj Flow Rate, veh/h	150	1299	0	0	565	68	108	421	107			
Peak Hour Factor	0.80	0.92	0.95	0.95	0.77	0.59	0.79	0.82	0.75			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	506	2183	0	0	1479	178	437	687	173			
Arrive On Green	0.19	1.00	0.00	0.00	0.47	0.47	0.26	0.26	0.26			
Sat Flow, veh/h	1688	3593	0	0	3235	377	1688	2653	668			
Grp Volume(v), veh/h	150	1299	0	0	314	319	108	266	262			
Grp Sat Flow(s),veh/h/ln	1688	1751	0	0	1751	1770	1688	1683	1638			
Q Serve(g_s), s	0.0	0.0	0.0	0.0	9.8	9.9	4.3	11.8	12.0			
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	9.8	9.9	4.3	11.8	12.0			
Prop In Lane	1.00		0.00	0.00		0.21	1.00		0.41			
Lane Grp Cap(c), veh/h	506	2183	0	0	824	833	437	436	424			
V/C Ratio(X)	0.30	0.60	0.00	0.00	0.38	0.38	0.25	0.61	0.62			
Avail Cap(c_a), veh/h	506	2183	0	0	824	833	437	436	424			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.63	0.63	0.00	0.00	1.00	1.00	0.95	0.95	0.95			
Uniform Delay (d), s/veh	15.2	0.0	0.0	0.0	14.5	14.5	24.9	27.7	27.8			
Incr Delay (d2), s/veh	0.1	0.8	0.0	0.0	1.3	1.3	1.3	5.9	6.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.8	0.2	0.0	0.0	4.1	4.1	1.9	5.4	5.4			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.3	0.8	0.0	0.0	15.9	15.9	26.2	33.6	34.1			
LnGrp LOS	B	A	A	A	B	B	C	C	C			
Approach Vol, veh/h		1449			633			636				
Approach Delay, s/veh		2.3			15.9			32.6				
Approach LOS		A			B			C				

Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	13.0	45.0				58.0		27.0				
Change Period (Y+Rc), s	5.0	5.0				5.0		5.0				
Max Green Setting (Gmax), s	8.0	40.0				53.0		22.0				
Max Q Clear Time (g_c+I1), s	2.0	0.0				0.0		0.0				
Green Ext Time (p_c), s	0.1	0.0				0.0		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			12.5									
HCM 6th LOS			B									

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	5	1250	285	23	430	9	123	26	48	42	112	13
Future Volume (vph)	5	1250	285	23	430	9	123	26	48	42	112	13
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Lane Width	10	12	14	10	12	12	10	13	12	12	10	12
Total Lost time (s)	6.0	5.0	5.0	6.0	5.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.91		0.95	0.95		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.93		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.99		0.95	1.00	
Satd. Flow (prot)	1608	3446	1644	1608	4937		1528	1628		1723	1666	
Flt Permitted	0.46	1.00	1.00	0.10	1.00		0.95	0.99		0.95	1.00	
Satd. Flow (perm)	777	3446	1644	173	4937		1528	1628		1723	1666	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	6	1420	324	26	489	10	140	30	55	48	127	15
RTOR Reduction (vph)	0	0	79	0	1	0	0	29	0	0	3	0
Lane Group Flow (vph)	6	1420	245	26	498	0	115	81	0	48	139	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA		Split	NA	
Protected Phases	1	6		5	2		8	8		4	4	
Permitted Phases	6		6	2								
Actuated Green, G (s)	90.2	88.6	88.6	96.6	91.8		15.7	15.7		17.9	17.9	
Effective Green, g (s)	90.2	88.6	88.6	96.6	91.8		15.7	15.7		17.9	17.9	
Actuated g/C Ratio	0.60	0.59	0.59	0.64	0.61		0.10	0.10		0.12	0.12	
Clearance Time (s)	6.0	5.0	5.0	6.0	5.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	476	2035	971	157	3021		159	170		205	198	
v/s Ratio Prot	0.00	c0.41		c0.01	0.10		c0.08	0.05		0.03	c0.08	
v/s Ratio Perm	0.01		0.15	c0.10								
v/c Ratio	0.01	0.70	0.25	0.17	0.16		0.72	0.48		0.23	0.70	
Uniform Delay, d1	12.0	21.4	14.8	16.0	12.6		65.0	63.3		59.8	63.5	
Progression Factor	0.62	0.51	0.21	0.91	0.92		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	1.9	0.6	0.2	0.1		12.9	0.8		0.2	8.9	
Delay (s)	7.4	12.8	3.7	14.8	11.6		77.9	64.1		60.1	72.4	
Level of Service	A	B	A	B	B		E	E		E	E	
Approach Delay (s)		11.1			11.8			71.1			69.3	
Approach LOS		B			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	63.2%	ICU Level of Service	B
Analysis Period (min)	15		
Description: Count Date: 1/22/2015			

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	5	1345	390	75	535	10	90	10	30	20	140	1
Future Volume (vph)	5	1345	390	75	535	10	90	10	30	20	140	1
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Lane Width	10	13	12	12	12	12	12	12	12	11	12	12
Total Lost time (s)	6.0	5.5	5.5	6.0	5.5		6.0	5.5		6.0	6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.89		1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1608	3561	1542	1723	3437		3343	1608		1666	1812	
Flt Permitted	0.44	1.00	1.00	0.12	1.00		0.95	1.00		0.73	1.00	
Satd. Flow (perm)	747	3561	1542	209	3437		3343	1608		1280	1812	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	5	1387	402	77	552	10	93	10	31	21	144	1
RTOR Reduction (vph)	0	0	83	0	1	0	0	26	0	0	0	0
Lane Group Flow (vph)	5	1387	319	77	561	0	93	15	0	21	145	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA		pm+pt	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2						4	4	
Actuated Green, G (s)	93.3	92.1	92.1	104.9	97.9		8.6	23.7		23.0	18.8	
Effective Green, g (s)	93.3	92.1	92.1	104.9	97.9		8.6	23.7		23.0	18.8	
Actuated g/C Ratio	0.62	0.61	0.61	0.70	0.65		0.06	0.16		0.15	0.13	
Clearance Time (s)	6.0	5.5	5.5	6.0	5.5		6.0	5.5		6.0	6.0	
Vehicle Extension (s)	3.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	471	2186	946	216	2243		191	254		207	227	
v/s Ratio Prot	0.00	c0.39		c0.02	0.16		c0.03	c0.01		0.00	c0.08	
v/s Ratio Perm	0.01		0.21	0.23						0.01		
v/c Ratio	0.01	0.63	0.34	0.36	0.25		0.49	0.06		0.10	0.64	
Uniform Delay, d1	10.7	18.3	14.1	13.9	10.8		68.6	53.7		54.4	62.4	
Progression Factor	1.00	1.00	1.00	1.52	0.72		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	1.4	1.0	0.4	0.0		0.7	0.0		0.1	4.3	
Delay (s)	10.8	19.7	15.1	21.4	7.8		69.3	53.7		54.5	66.7	
Level of Service	B	B	B	C	A		E	D		D	E	
Approach Delay (s)		18.7			9.5			64.5			65.1	
Approach LOS		B			A			E			E	

Intersection Summary			
HCM 2000 Control Delay	21.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	23.5
Intersection Capacity Utilization	74.5%	ICU Level of Service	D
Analysis Period (min)	15		
Description: Count Date: 1/21/2014			

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	135	255	0	0	0	0	0	650	35
Future Volume (veh/h)	0	0	0	135	255	0	0	0	0	0	650	35
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.98
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach					No						No	
Adj Sat Flow, veh/h/ln				1772	1772	0				0	1772	1772
Adj Flow Rate, veh/h				161	287	0				0	730	41
Peak Hour Factor				0.84	0.89	0.89				0.89	0.89	0.85
Percent Heavy Veh, %				2	2	0				0	2	2
Cap, veh/h				642	1215	0				0	2088	117
Arrive On Green				0.13	0.13	0.00				0.00	0.15	0.15
Sat Flow, veh/h				1336	3182	0				0	4840	262
Grp Volume(v), veh/h				172	276	0				0	502	269
Grp Sat Flow(s),veh/h/ln				1438	1467	0				0	1612	1717
Q Serve(g_s), s				6.9	5.5	0.0				0.0	9.1	9.2
Cycle Q Clear(g_c), s				7.0	5.5	0.0				0.0	9.1	9.2
Prop In Lane				0.94		0.00				0.00		0.15
Lane Grp Cap(c), veh/h				682	1174	0				0	1439	766
V/C Ratio(X)				0.25	0.23	0.00				0.00	0.35	0.35
Avail Cap(c_a), veh/h				682	1174	0				0	1439	766
HCM Platoon Ratio				0.33	0.33	1.00				1.00	0.33	0.33
Upstream Filter(I)				1.00	1.00	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				20.0	19.3	0.0				0.0	19.2	19.3
Incr Delay (d2), s/veh				0.9	0.5	0.0				0.0	0.7	1.3
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				2.6	2.0	0.0				0.0	3.9	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				20.8	19.8	0.0				0.0	19.9	20.5
LnGrp LOS				C	B	A				A	B	C
Approach Vol, veh/h					448						771	
Approach Delay, s/veh					20.2						20.1	
Approach LOS					C						C	

Timer - Assigned Phs	2	4
Phs Duration (G+Y+Rc), s	31.0	34.0
Change Period (Y+Rc), s	5.0	5.0
Max Green Setting (Gmax), s	26.0	29.0
Max Q Clear Time (g_c+I1), s	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	20.1
HCM 6th LOS	C

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	251	65	32	468	0	0	0	0
Future Volume (veh/h)	0	0	0	0	251	65	32	468	0	0	0	0
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00			
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach					No			No				
Adj Sat Flow, veh/h/ln				0	1772	1772	1772	1843	0			
Adj Flow Rate, veh/h				0	273	71	35	509	0			
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %				0	2	2	2	2	0			
Cap, veh/h				0	1785	442	85	1293	0			
Arrive On Green				0.00	0.15	0.15	0.13	0.13	0.00			
Sat Flow, veh/h				0	4026	958	220	3454	0			
Grp Volume(v), veh/h				0	225	119	291	253	0			
Grp Sat Flow(s),veh/h/ln				0	1612	1599	1832	1751	0			
Q Serve(g_s), s				0.0	3.9	4.2	9.5	8.6	0.0			
Cycle Q Clear(g_c), s				0.0	3.9	4.2	9.5	8.6	0.0			
Prop In Lane				0.00		0.60	0.12		0.00			
Lane Grp Cap(c), veh/h				0	1488	738	705	673	0			
V/C Ratio(X)				0.00	0.15	0.16	0.41	0.38	0.00			
Avail Cap(c_a), veh/h				0	1488	738	705	673	0			
HCM Platoon Ratio				1.00	0.33	0.33	0.33	0.33	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	16.5	16.6	21.6	21.2	0.0			
Incr Delay (d2), s/veh				0.0	0.2	0.5	1.8	1.6	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln				0.0	1.4	1.5	4.8	4.1	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				0.0	16.7	17.1	23.4	22.8	0.0			
LnGrp LOS				A	B	B	C	C	A			
Approach Vol, veh/h					344			544				
Approach Delay, s/veh					16.8			23.1				
Approach LOS					B			C				

Timer - Assigned Phs	2	4
Phs Duration (G+Y+Rc), s	35.0	30.0
Change Period (Y+Rc), s	5.0	5.0
Max Green Setting (Gmax), s	30.0	25.0
Max Q Clear Time (g_c+I1), s	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	20.7
HCM 6th LOS	C

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	0	840	180	0	0	0	0	0	0	115	905	0
Future Volume (veh/h)	0	840	180	0	0	0	0	0	0	115	905	0
Initial Q (Qb), veh	0	0	0							0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00							1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00							1.00	1.00	1.00
Work Zone On Approach		No									No	
Adj Sat Flow, veh/h/ln	0	1772	1772							1772	1772	0
Adj Flow Rate, veh/h	0	913	196							125	984	0
Peak Hour Factor	0.92	0.92	0.92							0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2							2	2	0
Cap, veh/h	0	1780	381							247	1664	0
Arrive On Green	0.00	0.15	0.15							0.13	0.13	0.00
Sat Flow, veh/h	0	4150	853							437	4305	0
Grp Volume(v), veh/h	0	737	372							410	699	0
Grp Sat Flow(s),veh/h/ln	0	1612	1618							1663	1467	0
Q Serve(g_s), s	0.0	13.7	13.8							11.7	14.6	0.0
Cycle Q Clear(g_c), s	0.0	13.7	13.8							15.0	14.6	0.0
Prop In Lane	0.00		0.53							0.30		0.00
Lane Grp Cap(c), veh/h	0	1439	722							737	1174	0
V/C Ratio(X)	0.00	0.51	0.51							0.56	0.60	0.00
Avail Cap(c_a), veh/h	0	1439	722							737	1174	0
HCM Platoon Ratio	1.00	0.33	0.33							0.33	0.33	1.00
Upstream Filter(I)	0.00	1.00	1.00							1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	21.2	21.2							23.4	23.3	0.0
Incr Delay (d2), s/veh	0.0	1.3	2.6							3.0	2.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0							0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	6.0	6.4							7.2	6.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	22.5	23.8							26.4	25.5	0.0
LnGrp LOS	A	C	C							C	C	A
Approach Vol, veh/h		1109									1109	
Approach Delay, s/veh		22.9									25.8	
Approach LOS		C									C	

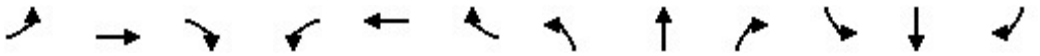
Timer - Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		34.0		31.0								
Change Period (Y+Rc), s		5.0		5.0								
Max Green Setting (Gmax), s		29.0		26.0								
Max Q Clear Time (g_c+I1), s		0.0		0.0								
Green Ext Time (p_c), s		0.0		0.0								

Intersection Summary												
HCM 6th Ctrl Delay			24.4									
HCM 6th LOS			C									

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	100	1080	0	0	0	0	0	350	135	0	0	0
Future Volume (veh/h)	100	1080	0	0	0	0	0	350	135	0	0	0
Initial Q (Qb), veh	0	0	0				0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	0.90			
Work Zone On Approach		No						No				
Adj Sat Flow, veh/h/ln	1772	1772	0				0	1772	1772			
Adj Flow Rate, veh/h	109	1174	0				0	380	147			
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92			
Percent Heavy Veh, %	2	2	0				0	2	2			
Cap, veh/h	210	1922	0				0	1347	541			
Arrive On Green	0.45	0.45	0.00				0.00	0.13	0.13			
Sat Flow, veh/h	319	4453	0				0	3455	1351			
Grp Volume(v), veh/h	476	807	0				0	380	147			
Grp Sat Flow(s),veh/h/ln	1692	1467	0				0	1683	1351			
Q Serve(g_s), s	9.0	13.7	0.0				0.0	6.6	6.4			
Cycle Q Clear(g_c), s	13.9	13.7	0.0				0.0	6.6	6.4			
Prop In Lane	0.23		0.00				0.00		1.00			
Lane Grp Cap(c), veh/h	823	1309	0				0	1347	541			
V/C Ratio(X)	0.58	0.62	0.00				0.00	0.28	0.27			
Avail Cap(c_a), veh/h	823	1309	0				0	1347	541			
HCM Platoon Ratio	1.00	1.00	1.00				1.00	0.33	0.33			
Upstream Filter(I)	1.00	1.00	0.00				0.00	1.00	1.00			
Uniform Delay (d), s/veh	13.7	13.8	0.0				0.0	19.8	19.7			
Incr Delay (d2), s/veh	2.9	2.2	0.0				0.0	0.5	1.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	5.3	4.4	0.0				0.0	2.8	2.2			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.7	15.9	0.0				0.0	20.3	20.9			
LnGrp LOS	B	B	A				A	C	C			
Approach Vol, veh/h		1283						527				
Approach Delay, s/veh		16.2						20.5				
Approach LOS		B						C				

Timer - Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		34.0		31.0								
Change Period (Y+Rc), s		5.0		5.0								
Max Green Setting (Gmax), s		29.0		26.0								
Max Q Clear Time (g_c+I1), s		0.0		0.0								
Green Ext Time (p_c), s		0.0		0.0								

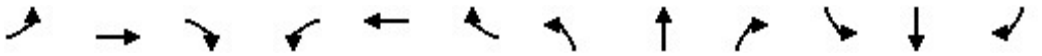
Intersection Summary												
HCM 6th Ctrl Delay			17.5									
HCM 6th LOS			B									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	40	680	25	160	220	0	0	470	165
Future Volume (veh/h)	0	0	0	40	680	25	160	220	0	0	470	165
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1800	1772	1800	1772	1772	0	0	1772	1772
Adj Flow Rate, veh/h				45	800	38	176	262	0	0	547	212
Peak Hour Factor				0.88	0.85	0.65	0.91	0.84	0.90	0.90	0.86	0.78
Percent Heavy Veh, %				0	2	0	2	2	0	0	2	2
Cap, veh/h				85	1629	79	259	1063	0	0	532	206
Arrive On Green				0.28	0.28	0.28	0.20	1.00	0.00	0.00	0.44	0.44
Sat Flow, veh/h				311	5925	286	1688	1772	0	0	1215	471
Grp Volume(v), veh/h				254	401	228	176	262	0	0	0	759
Grp Sat Flow(s),veh/h/ln				1756	1524	1718	1688	1772	0	0	0	1686
Q Serve(g_s), s				9.8	8.8	8.9	3.0	0.0	0.0	0.0	0.0	35.0
Cycle Q Clear(g_c), s				9.8	8.8	8.9	3.0	0.0	0.0	0.0	0.0	35.0
Prop In Lane				0.18		0.17	1.00		0.00	0.00		0.28
Lane Grp Cap(c), veh/h				483	838	472	259	1063	0	0	0	738
V/C Ratio(X)				0.53	0.48	0.48	0.68	0.25	0.00	0.00	0.00	1.03
Avail Cap(c_a), veh/h				483	838	472	259	1063	0	0	0	738
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				0.99	0.99	0.99	0.98	0.98	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				24.6	24.2	24.2	29.2	0.0	0.0	0.0	0.0	22.5
Incr Delay (d2), s/veh				4.0	1.9	3.5	6.9	0.5	0.0	0.0	0.0	40.8
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				4.4	3.2	3.9	3.2	0.2	0.0	0.0	0.0	21.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				28.6	26.1	27.7	36.1	0.5	0.0	0.0	0.0	63.3
LnGrp LOS				C	C	C	D	A	A	A	A	F
Approach Vol, veh/h					883			438			759	
Approach Delay, s/veh					27.3			14.8			63.3	
Approach LOS					C			B			E	

Timer - Assigned Phs	2	3	4				8					
Phs Duration (G+Y+Rc), s	27.0	13.0	40.0				53.0					
Change Period (Y+Rc), s	5.0	5.0	5.0				5.0					
Max Green Setting (Gmax), s	22.0	8.0	35.0				48.0					
Max Q Clear Time (g_c+I1), s	0.0	0.0	0.0				0.0					
Green Ext Time (p_c), s	0.0	0.0	0.0				0.0					

Intersection Summary												
HCM 6th Ctrl Delay		37.8										
HCM 6th LOS		D										

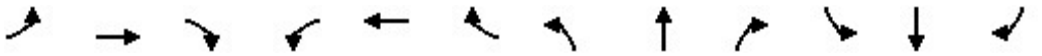


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	10	880	70	10	185	0	0	295	455
Future Volume (vph)	0	0	0	10	880	70	10	185	0	0	295	455
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	12	11	12	12	16	12
Total Lost time (s)					6.0	6.0	6.0	6.0			6.0	6.0
Lane Util. Factor					0.91	1.00	1.00	0.95			0.95	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					4813	1500	1676	3241			3610	1500
Flt Permitted					1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)					4813	1500	1676	3241			3610	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.50	0.91	0.77	0.75	0.71	0.92	0.92	0.90	0.75
Adj. Flow (vph)	0	0	0	20	967	91	13	261	0	0	328	607
RTOR Reduction (vph)	0	0	0	0	0	59	0	0	0	0	0	103
Lane Group Flow (vph)	0	0	0	0	987	32	13	261	0	0	328	504
Parking (#/hr)											0	
Turn Type				Perm	NA	Perm	Prot	NA			NA	Perm
Protected Phases					2		3	8			4	
Permitted Phases				2		2						4
Actuated Green, G (s)					28.2	28.2	1.2	39.8			32.6	32.6
Effective Green, g (s)					28.2	28.2	1.2	39.8			32.6	32.6
Actuated g/C Ratio					0.35	0.35	0.01	0.50			0.41	0.41
Clearance Time (s)					6.0	6.0	6.0	6.0			6.0	6.0
Vehicle Extension (s)					2.0	2.0	2.0	2.0			2.0	2.0
Lane Grp Cap (vph)					1696	528	25	1612			1471	611
v/s Ratio Prot							0.01	c0.08			0.09	
v/s Ratio Perm					0.21	0.02						c0.34
v/c Ratio					0.58	0.06	0.52	0.16			0.22	0.82
Uniform Delay, d1					21.1	17.1	39.1	11.0			15.4	21.2
Progression Factor					0.58	0.04	1.19	0.99			1.00	1.00
Incremental Delay, d2					1.0	0.1	8.0	0.0			0.0	8.5
Delay (s)					13.2	0.9	54.6	10.9			15.5	29.6
Level of Service					B	A	D	B			B	C
Approach Delay (s)		0.0			12.2			13.0			24.7	
Approach LOS		A			B			B			C	

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)	80.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	64.1%	ICU Level of Service	C
Analysis Period (min)	15		

Description: Count Date: 11/9/2016

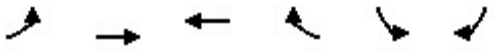
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	145	1330	390	0	0	0	0	205	45	80	345	0
Future Volume (veh/h)	145	1330	390	0	0	0	0	205	45	80	345	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99				1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1843	1843	1772				0	1772	1772	1772	1772	0
Adj Flow Rate, veh/h	171	1622	557				0	244	53	89	383	0
Peak Hour Factor	0.85	0.82	0.70				0.83	0.84	0.85	0.90	0.90	0.83
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	768	1628	544				0	968	429	488	775	0
Arrive On Green	0.14	0.14	0.14				0.00	0.29	0.29	0.17	0.88	0.00
Sat Flow, veh/h	1755	3722	1243				0	3455	1494	1688	1772	0
Grp Volume(v), veh/h	171	1457	722				0	244	53	89	383	0
Grp Sat Flow(s),veh/h/ln	1755	1677	1611				0	1683	1494	1688	1772	0
Q Serve(g_s), s	6.9	34.7	35.0				0.0	4.5	2.1	0.0	3.8	0.0
Cycle Q Clear(g_c), s	6.9	34.7	35.0				0.0	4.5	2.1	0.0	3.8	0.0
Prop In Lane	1.00		0.77				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	768	1467	705				0	968	429	488	775	0
V/C Ratio(X)	0.22	0.99	1.02				0.00	0.25	0.12	0.18	0.49	0.00
Avail Cap(c_a), veh/h	768	1467	705				0	968	429	488	775	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	0.88	0.88	0.88				0.00	1.00	1.00	0.09	0.09	0.00
Uniform Delay (d), s/veh	22.2	34.1	34.2				0.0	21.9	21.1	18.1	3.1	0.0
Incr Delay (d2), s/veh	0.6	20.4	38.1				0.0	0.6	0.6	0.0	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	19.5	22.3				0.0	1.8	0.8	1.1	0.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.8	54.5	72.3				0.0	22.5	21.6	18.1	3.3	0.0
LnGrp LOS	C	D	F				A	C	C	B	A	A
Approach Vol, veh/h		2350						297			472	
Approach Delay, s/veh		57.7						22.4			6.1	
Approach LOS		E						C			A	

Timer - Assigned Phs				4		6	7	8				
Phs Duration (G+Y+Rc), s				40.0		40.0	12.0	28.0				
Change Period (Y+Rc), s				5.0		5.0	5.0	5.0				
Max Green Setting (Gmax), s				35.0		35.0	7.0	23.0				
Max Q Clear Time (g_c+I1), s				0.0		0.0	0.0	0.0				
Green Ext Time (p_c), s				0.0		0.0	0.0	0.0				

Intersection Summary			
HCM 6th Ctrl Delay			46.5
HCM 6th LOS			D



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	205	1405	0	0	305	0
Future Volume (vph)	205	1405	0	0	305	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)		5.5			6.0	
Lane Util. Factor		0.86			0.97	
Frt		1.00			1.00	
Flt Protected		0.99			0.95	
Satd. Flow (prot)		6027			3252	
Flt Permitted		0.99			0.95	
Satd. Flow (perm)		6027			3252	
Peak-hour factor, PHF	0.77	0.89	0.92	0.92	0.90	0.92
Adj. Flow (vph)	266	1579	0	0	339	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1845	0	0	339	0
Turn Type	Perm	NA			Prot	
Protected Phases		6			4	
Permitted Phases	6					
Actuated Green, G (s)		55.8			12.7	
Effective Green, g (s)		55.8			12.7	
Actuated g/C Ratio		0.70			0.16	
Clearance Time (s)		5.5			6.0	
Vehicle Extension (s)		2.0			2.0	
Lane Grp Cap (vph)		4203			516	
v/s Ratio Prot					c0.10	
v/s Ratio Perm		0.31				
v/c Ratio		0.44			0.66	
Uniform Delay, d1		5.3			31.6	
Progression Factor		1.00			1.12	
Incremental Delay, d2		0.3			2.3	
Delay (s)		5.6			37.8	
Level of Service		A			D	
Approach Delay (s)		5.6	0.0		37.8	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	10.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	11.5
Intersection Capacity Utilization	92.8%	ICU Level of Service	F
Analysis Period (min)	15		

Description: Count Date: 11/9/2016

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	0	570	150	35	440	0	0	0	0	20	445	110
Future Volume (veh/h)	0	570	150	35	440	0	0	0	0	20	445	110
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	0.98		1.00				1.00		0.93
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1595	1595	1595	1595	0				1620	1659	1620
Adj Flow Rate, veh/h	0	600	165	44	518	0				25	506	133
Peak Hour Factor	0.92	0.95	0.91	0.80	0.85	0.91				0.79	0.88	0.83
Percent Heavy Veh, %	0	2	2	2	2	0				0	2	0
Cap, veh/h	0	1177	323	133	1333	0				38	801	223
Arrive On Green	0.00	1.00	1.00	1.00	1.00	0.00				0.11	0.11	0.11
Sat Flow, veh/h	0	2398	636	136	2697	0				114	2367	658
Grp Volume(v), veh/h	0	391	374	286	276	0				364	0	300
Grp Sat Flow(s),veh/h/ln	0	1515	1439	1382	1379	0				1653	0	1485
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0				13.7	0.0	12.5
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0				13.7	0.0	12.5
Prop In Lane	0.00		0.44	0.15		0.00				0.07		0.44
Lane Grp Cap(c), veh/h	0	769	731	765	700	0				559	0	503
V/C Ratio(X)	0.00	0.51	0.51	0.37	0.39	0.00				0.65	0.00	0.60
Avail Cap(c_a), veh/h	0	769	731	765	700	0				559	0	503
HCM Platoon Ratio	1.00	2.00	2.00	2.00	2.00	1.00				0.33	0.33	0.33
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0				25.2	0.0	24.7
Incr Delay (d2), s/veh	0.0	2.4	2.5	1.4	1.7	0.0				5.8	0.0	5.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.5	0.5	0.3	0.3	0.0				6.8	0.0	5.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	2.4	2.5	1.4	1.7	0.0				30.9	0.0	29.8
LnGrp LOS	A	A	A	A	A	A				C	A	C
Approach Vol, veh/h		765			562						664	
Approach Delay, s/veh		2.5			1.5						30.4	
Approach LOS		A			A						C	

Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		38.0		27.0		38.0						
Change Period (Y+Rc), s		5.0		5.0		5.0						
Max Green Setting (Gmax), s		33.0		22.0		33.0						
Max Q Clear Time (g_c+I1), s		0.0		0.0		0.0						
Green Ext Time (p_c), s		0.0		0.0		0.0						

Intersection Summary												
HCM 6th Ctrl Delay			11.5									
HCM 6th LOS			B									

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	75	705	0	0	640	35	205	380	45	0	0	0
Future Volume (veh/h)	75	705	0	0	640	35	205	380	45	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1772	1843	0	0	1772	1772	1772	1772	1772			
Adj Flow Rate, veh/h	94	742	0	0	696	44	214	396	60			
Peak Hour Factor	0.80	0.95	0.98	0.98	0.92	0.80	0.96	0.96	0.75			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	467	2142	0	0	1399	88	457	792	119			
Arrive On Green	0.24	1.00	0.00	0.00	0.44	0.44	0.09	0.09	0.09			
Sat Flow, veh/h	1688	3593	0	0	3303	203	1688	2928	440			
Grp Volume(v), veh/h	94	742	0	0	364	376	214	226	230			
Grp Sat Flow(s),veh/h/ln	1688	1751	0	0	1683	1734	1688	1683	1685			
Q Serve(g_s), s	0.0	0.0	0.0	0.0	13.3	13.3	10.2	10.9	11.0			
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	13.3	13.3	10.2	10.9	11.0			
Prop In Lane	1.00		0.00	0.00		0.12	1.00		0.26			
Lane Grp Cap(c), veh/h	467	2142	0	0	733	755	457	455	456			
V/C Ratio(X)	0.20	0.35	0.00	0.00	0.50	0.50	0.47	0.50	0.50			
Avail Cap(c_a), veh/h	467	2142	0	0	733	755	457	455	456			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33			
Upstream Filter(I)	0.63	0.63	0.00	0.00	0.86	0.86	0.91	0.91	0.91			
Uniform Delay (d), s/veh	16.3	0.0	0.0	0.0	17.3	17.3	32.9	33.2	33.3			
Incr Delay (d2), s/veh	0.0	0.3	0.0	0.0	2.1	2.0	3.1	3.5	3.6			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.1	0.1	0.0	0.0	5.4	5.5	5.0	5.3	5.4			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.4	0.3	0.0	0.0	19.4	19.3	36.0	36.7	36.9			
LnGrp LOS	B	A	A	A	B	B	D	D	D			
Approach Vol, veh/h		836			740			670				
Approach Delay, s/veh		2.1			19.3			36.5				
Approach LOS		A			B			D				

Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	15.0	42.0				57.0		28.0				
Change Period (Y+Rc), s	5.0	5.0				5.0		5.0				
Max Green Setting (Gmax), s	10.0	37.0				52.0		23.0				
Max Q Clear Time (g_c+I1), s	2.0	0.0				0.0		0.0				
Green Ext Time (p_c), s	0.0	0.0				0.0		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			18.0									
HCM 6th LOS			B									

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	15	742	144	32	778	18	117	51	28	21	47	19
Future Volume (vph)	15	742	144	32	778	18	117	51	28	21	47	19
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	12	14	10	12	12	10	13	12	12	10	12
Total Lost time (s)	6.0	5.0	5.0	6.0	5.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.91		0.95	0.95		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.96		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.99		0.95	1.00	
Satd. Flow (prot)	1565	3353	1600	1565	4801		1486	1642		1676	1574	
Flt Permitted	0.32	1.00	1.00	0.31	1.00		0.95	0.99		0.95	1.00	
Satd. Flow (perm)	523	3353	1600	516	4801		1486	1642		1676	1574	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	15	765	148	33	802	19	121	53	29	22	48	20
RTOR Reduction (vph)	0	0	56	0	1	0	0	13	0	0	12	0
Lane Group Flow (vph)	15	765	92	33	820	0	102	88	0	22	56	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA		Split	NA	
Protected Phases	1	6		5	2		8	8		7	7	
Permitted Phases	6		6	2								
Actuated Green, G (s)	83.6	80.4	80.4	86.8	82.0		13.5	13.5		8.3	8.3	
Effective Green, g (s)	83.6	80.4	80.4	86.8	82.0		13.5	13.5		8.3	8.3	
Actuated g/C Ratio	0.64	0.62	0.62	0.67	0.63		0.10	0.10		0.06	0.06	
Clearance Time (s)	6.0	5.0	5.0	6.0	5.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	361	2073	989	383	3028		154	170		107	100	
v/s Ratio Prot	0.00	c0.23		c0.00	0.17		c0.07	0.05		0.01	c0.04	
v/s Ratio Perm	0.03		0.06	0.05								
v/c Ratio	0.04	0.37	0.09	0.09	0.27		0.66	0.52		0.21	0.56	
Uniform Delay, d1	8.4	12.3	10.0	7.8	10.7		56.1	55.2		57.7	59.1	
Progression Factor	1.13	1.66	4.62	0.95	0.95		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.5	0.2	0.0	0.2		8.0	1.1		0.3	3.8	
Delay (s)	9.5	20.8	46.5	7.5	10.4		64.1	56.2		58.1	62.9	
Level of Service	A	C	D	A	B		E	E		E	E	
Approach Delay (s)		24.7			10.3			60.2			61.7	
Approach LOS		C			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	23.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	49.6%	ICU Level of Service	A
Analysis Period (min)	15		

Description: Count Date: 1/22/2015

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	7	887	88	41	889	10	86	16	31	11	25	4
Future Volume (vph)	7	887	88	41	889	10	86	16	31	11	25	4
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Lane Width	10	13	12	12	12	12	12	12	12	11	12	12
Total Lost time (s)	6.0	5.5	5.5	6.0	5.5		6.0	5.5		6.0	6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.90		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1608	3561	1542	1723	3440		3343	1632		1666	1777	
Flt Permitted	0.31	1.00	1.00	0.25	1.00		0.95	1.00		0.73	1.00	
Satd. Flow (perm)	522	3561	1542	452	3440		3343	1632		1272	1777	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	7	914	91	42	916	10	89	16	32	11	26	4
RTOR Reduction (vph)	0	0	31	0	0	0	0	28	0	0	4	0
Lane Group Flow (vph)	7	914	60	42	926	0	89	20	0	11	26	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA		pm+pt	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2						4	4	
Actuated Green, G (s)	85.4	85.4	85.4	88.1	88.1		9.2	14.5		9.6	7.2	
Effective Green, g (s)	85.4	85.4	85.4	88.1	88.1		9.2	14.5		9.6	7.2	
Actuated g/C Ratio	0.66	0.66	0.66	0.68	0.68		0.07	0.11		0.07	0.06	
Clearance Time (s)	6.0	5.5	5.5	6.0	5.5		6.0	5.5		6.0	6.0	
Vehicle Extension (s)	3.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	359	2339	1012	352	2331		236	182		101	98	
v/s Ratio Prot	0.00	c0.26		0.00	c0.27		c0.03	0.01		0.00	c0.01	
v/s Ratio Perm	0.01		0.04	0.08						0.01		
v/c Ratio	0.02	0.39	0.06	0.12	0.40		0.38	0.11		0.11	0.27	
Uniform Delay, d1	7.8	10.3	8.0	8.1	9.2		57.7	51.9		56.1	58.9	
Progression Factor	0.74	0.66	0.28	0.70	0.74		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.5	0.1	0.1	0.5		0.4	0.1		0.2	0.5	
Delay (s)	5.7	7.3	2.4	5.8	7.3		58.0	52.0		56.3	59.4	
Level of Service	A	A	A	A	A		E	D		E	E	
Approach Delay (s)		6.8			7.3			55.9			58.6	
Approach LOS		A			A			E			E	

Intersection Summary			
HCM 2000 Control Delay	11.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	23.5
Intersection Capacity Utilization	53.1%	ICU Level of Service	A
Analysis Period (min)	15		
Description: Count Date: 1/21/2014			

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	210	495	0	0	0	0	0	675	60
Future Volume (veh/h)	0	0	0	210	495	0	0	0	0	0	675	60
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.83
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach					No						No	
Adj Sat Flow, veh/h/ln				1595	1595	0				0	1595	1595
Adj Flow Rate, veh/h				250	544	0				0	734	79
Peak Hour Factor				0.84	0.91	0.93				0.93	0.92	0.76
Percent Heavy Veh, %				2	2	0				0	2	2
Cap, veh/h				545	1140	0				0	1744	185
Arrive On Green				0.13	0.13	0.00				0.00	0.15	0.15
Sat Flow, veh/h				1108	2982	0				0	4053	414
Grp Volume(v), veh/h				297	497	0				0	542	271
Grp Sat Flow(s),veh/h/ln				1318	1321	0				0	1451	1421
Q Serve(g_s), s				13.8	11.3	0.0				0.0	11.0	11.3
Cycle Q Clear(g_c), s				13.8	11.3	0.0				0.0	11.0	11.3
Prop In Lane				0.84		0.00				0.00		0.29
Lane Grp Cap(c), veh/h				629	1056	0				0	1295	634
V/C Ratio(X)				0.47	0.47	0.00				0.00	0.42	0.43
Avail Cap(c_a), veh/h				629	1056	0				0	1295	634
HCM Platoon Ratio				0.33	0.33	1.00				1.00	0.33	0.33
Upstream Filter(I)				1.00	1.00	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				22.9	21.8	0.0				0.0	20.1	20.2
Incr Delay (d2), s/veh				2.5	1.5	0.0				0.0	1.0	2.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				5.2	4.1	0.0				0.0	4.4	4.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				25.4	23.3	0.0				0.0	21.0	22.3
LnGrp LOS				C	C	A				A	C	C
Approach Vol, veh/h					794						813	
Approach Delay, s/veh					24.1						21.5	
Approach LOS					C						C	

Timer - Assigned Phs	2		4
Phs Duration (G+Y+Rc), s	31.0		34.0
Change Period (Y+Rc), s	5.0		5.0
Max Green Setting (Gmax), s	26.0		29.0
Max Q Clear Time (g_c+I1), s	0.0		0.0
Green Ext Time (p_c), s	0.0		0.0

Intersection Summary	
HCM 6th Ctrl Delay	22.8
HCM 6th LOS	C

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	425	100	50	450	0	0	0	0
Future Volume (veh/h)	0	0	0	0	425	100	50	450	0	0	0	0
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00			
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach					No			No				
Adj Sat Flow, veh/h/ln				0	1595	1595	1595	1659	0			
Adj Flow Rate, veh/h				0	462	109	54	489	0			
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %				0	2	2	2	2	0			
Cap, veh/h				0	1525	350	127	1210	0			
Arrive On Green				0.00	0.14	0.14	0.14	0.14	0.00			
Sat Flow, veh/h				0	3683	812	306	2996	0			
Grp Volume(v), veh/h				0	376	195	290	253	0			
Grp Sat Flow(s),veh/h/ln				0	1451	1449	1643	1576	0			
Q Serve(g_s), s				0.0	7.6	7.8	10.5	9.5	0.0			
Cycle Q Clear(g_c), s				0.0	7.6	7.8	10.5	9.5	0.0			
Prop In Lane				0.00		0.56	0.19		0.00			
Lane Grp Cap(c), veh/h				0	1250	624	683	654	0			
V/C Ratio(X)				0.00	0.30	0.31	0.43	0.39	0.00			
Avail Cap(c_a), veh/h				0	1250	624	683	654	0			
HCM Platoon Ratio				1.00	0.33	0.33	0.33	0.33	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	19.1	19.2	20.9	20.5	0.0			
Incr Delay (d2), s/veh				0.0	0.6	1.3	1.9	1.7	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln				0.0	2.7	2.9	4.9	4.2	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				0.0	19.7	20.5	22.9	22.2	0.0			
LnGrp LOS				A	B	C	C	C	A			
Approach Vol, veh/h					571			543				
Approach Delay, s/veh					20.0			22.6				
Approach LOS					C			C				

Timer - Assigned Phs	2	4
Phs Duration (G+Y+Rc), s	33.0	32.0
Change Period (Y+Rc), s	5.0	5.0
Max Green Setting (Gmax), s	28.0	27.0
Max Q Clear Time (g_c+I1), s	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	21.3
HCM 6th LOS	C

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	0	525	250	0	0	0	0	0	0	160	825	0
Future Volume (veh/h)	0	525	250	0	0	0	0	0	0	160	825	0
Initial Q (Qb), veh	0	0	0							0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00							1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00							1.00	1.00	1.00
Work Zone On Approach		No									No	
Adj Sat Flow, veh/h/ln	0	1595	1595							1595	1595	0
Adj Flow Rate, veh/h	0	571	272							174	897	0
Peak Hour Factor	0.92	0.92	0.92							0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2							2	2	0
Cap, veh/h	0	1163	539							344	1559	0
Arrive On Green	0.00	0.13	0.13							0.15	0.15	0.00
Sat Flow, veh/h	0	3051	1347							593	3625	0
Grp Volume(v), veh/h	0	570	273							394	677	0
Grp Sat Flow(s),veh/h/ln	0	1451	1352							1446	1321	0
Q Serve(g_s), s	0.0	11.8	12.2							14.6	15.5	0.0
Cycle Q Clear(g_c), s	0.0	11.8	12.2							16.5	15.5	0.0
Prop In Lane	0.00		1.00							0.44		0.00
Lane Grp Cap(c), veh/h	0	1161	541							725	1178	0
V/C Ratio(X)	0.00	0.49	0.50							0.54	0.57	0.00
Avail Cap(c_a), veh/h	0	1161	541							725	1178	0
HCM Platoon Ratio	1.00	0.33	0.33							0.33	0.33	1.00
Upstream Filter(I)	0.00	1.00	1.00							1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	22.1	22.2							22.3	22.0	0.0
Incr Delay (d2), s/veh	0.0	1.5	3.3							2.9	2.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0							0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.7	4.8							6.9	5.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	23.6	25.6							25.2	24.0	0.0
LnGrp LOS	A	C	C							C	C	A
Approach Vol, veh/h		843									1071	
Approach Delay, s/veh		24.2									24.4	
Approach LOS		C									C	

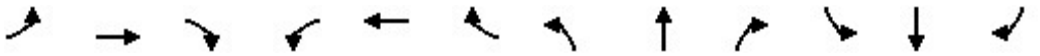
Timer - Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		31.0		34.0								
Change Period (Y+Rc), s		5.0		5.0								
Max Green Setting (Gmax), s		26.0		29.0								
Max Q Clear Time (g_c+I1), s		0.0		0.0								
Green Ext Time (p_c), s		0.0		0.0								

Intersection Summary												
HCM 6th Ctrl Delay			24.3									
HCM 6th LOS			C									

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	20	600	0	0	0	0	0	410	120	0	0	0
Future Volume (veh/h)	20	600	0	0	0	0	0	410	120	0	0	0
Initial Q (Qb), veh	0	0	0				0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	0.90			
Work Zone On Approach		No						No				
Adj Sat Flow, veh/h/ln	1595	1595	0				0	1595	1595			
Adj Flow Rate, veh/h	22	652	0				0	446	130			
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92			
Percent Heavy Veh, %	2	2	0				0	2	2			
Cap, veh/h	85	1728	0				0	1305	524			
Arrive On Green	0.42	0.42	0.00				0.00	0.14	0.14			
Sat Flow, veh/h	61	4291	0				0	3110	1216			
Grp Volume(v), veh/h	254	420	0				0	446	130			
Grp Sat Flow(s),veh/h/ln	1580	1321	0				0	1515	1216			
Q Serve(g_s), s	0.0	7.2	0.0				0.0	8.6	6.2			
Cycle Q Clear(g_c), s	7.2	7.2	0.0				0.0	8.6	6.2			
Prop In Lane	0.09		0.00				0.00		1.00			
Lane Grp Cap(c), veh/h	716	1097	0				0	1305	524			
V/C Ratio(X)	0.35	0.38	0.00				0.00	0.34	0.25			
Avail Cap(c_a), veh/h	716	1097	0				0	1305	524			
HCM Platoon Ratio	1.00	1.00	1.00				1.00	0.33	0.33			
Upstream Filter(I)	1.00	1.00	0.00				0.00	1.00	1.00			
Uniform Delay (d), s/veh	13.2	13.2	0.0				0.0	19.6	18.5			
Incr Delay (d2), s/veh	1.4	1.0	0.0				0.0	0.7	1.1			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	2.6	2.1	0.0				0.0	3.4	1.9			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.6	14.2	0.0				0.0	20.3	19.6			
LnGrp LOS	B	B	A				A	C	B			
Approach Vol, veh/h		674						576				
Approach Delay, s/veh		14.4						20.1				
Approach LOS		B						C				

Timer - Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		32.0		33.0								
Change Period (Y+Rc), s		5.0		5.0								
Max Green Setting (Gmax), s		27.0		28.0								
Max Q Clear Time (g_c+I1), s		0.0		0.0								
Green Ext Time (p_c), s		0.0		0.0								

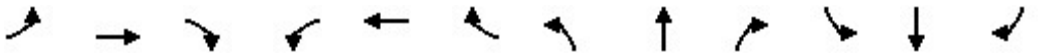
Intersection Summary												
HCM 6th Ctrl Delay			17.0									
HCM 6th LOS			B									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	75	840	70	235	285	0	0	215	130
Future Volume (veh/h)	0	0	0	75	840	70	235	285	0	0	215	130
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1800	1843	1800	1772	1772	0	0	1772	1772
Adj Flow Rate, veh/h				104	866	86	264	310	0	0	265	146
Peak Hour Factor				0.72	0.97	0.81	0.89	0.92	0.95	0.95	0.81	0.89
Percent Heavy Veh, %				0	2	0	2	2	0	0	2	2
Cap, veh/h				186	1663	167	478	987	0	0	336	185
Arrive On Green				0.30	0.30	0.30	0.34	1.00	0.00	0.00	0.31	0.31
Sat Flow, veh/h				619	5543	557	1688	1772	0	0	1069	589
Grp Volume(v), veh/h				305	483	268	264	310	0	0	0	411
Grp Sat Flow(s),veh/h/ln				1812	1585	1738	1688	1772	0	0	0	1658
Q Serve(g_s), s				9.9	8.8	8.9	0.0	0.0	0.0	0.0	0.0	15.8
Cycle Q Clear(g_c), s				9.9	8.8	8.9	0.0	0.0	0.0	0.0	0.0	15.8
Prop In Lane				0.34		0.32	1.00		0.00	0.00		0.36
Lane Grp Cap(c), veh/h				544	951	521	478	987	0	0	0	521
V/C Ratio(X)				0.56	0.51	0.51	0.55	0.31	0.00	0.00	0.00	0.79
Avail Cap(c_a), veh/h				544	951	521	478	987	0	0	0	521
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				0.96	0.96	0.96	0.94	0.94	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				20.6	20.2	20.3	18.1	0.0	0.0	0.0	0.0	21.9
Incr Delay (d2), s/veh				4.0	1.9	3.5	1.3	0.8	0.0	0.0	0.0	11.5
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				4.4	3.2	3.8	3.0	0.2	0.0	0.0	0.0	7.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				24.6	22.1	23.7	19.3	0.8	0.0	0.0	0.0	33.4
LnGrp LOS				C	C	C	B	A	A	A	A	C
Approach Vol, veh/h					1056			574			411	
Approach Delay, s/veh					23.2			9.3			33.4	
Approach LOS					C			A			C	

Timer - Assigned Phs	2	3	4				8					
Phs Duration (G+Y+Rc), s	26.0	17.0	27.0				44.0					
Change Period (Y+Rc), s	5.0	5.0	5.0				5.0					
Max Green Setting (Gmax), s	21.0	12.0	22.0				39.0					
Max Q Clear Time (g_c+I1), s	0.0	0.0	0.0				0.0					
Green Ext Time (p_c), s	0.0	0.0	0.0				0.0					

Intersection Summary												
HCM 6th Ctrl Delay		21.4										
HCM 6th LOS		C										

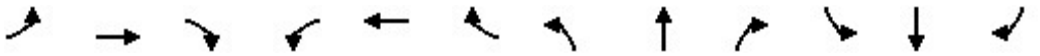


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	10	1040	120	10	175	0	0	120	230
Future Volume (vph)	0	0	0	10	1040	120	10	175	0	0	120	230
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	12	16	12	12	16	12
Total Lost time (s)					6.0	6.0	6.0	6.0			6.0	6.0
Lane Util. Factor					0.91	1.00	1.00	0.95			0.95	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					4815	1500	1676	3800			3610	1500
Flt Permitted					1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)					4815	1500	1676	3800			3610	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.69	0.87	0.80	0.67	0.88	0.92	0.92	0.89	0.90
Adj. Flow (vph)	0	0	0	14	1195	150	15	199	0	0	135	256
RTOR Reduction (vph)	0	0	0	0	0	65	0	0	0	0	0	119
Lane Group Flow (vph)	0	0	0	0	1209	85	15	199	0	0	135	137
Parking (#/hr)											0	
Turn Type				Perm	NA	Perm	Prot	NA			NA	Perm
Protected Phases					2		3	8			4	
Permitted Phases				2		2						4
Actuated Green, G (s)					39.7	39.7	1.0	18.3			11.3	11.3
Effective Green, g (s)					39.7	39.7	1.0	18.3			11.3	11.3
Actuated g/C Ratio					0.57	0.57	0.01	0.26			0.16	0.16
Clearance Time (s)					6.0	6.0	6.0	6.0			6.0	6.0
Vehicle Extension (s)					2.0	2.0	2.0	2.0			2.0	2.0
Lane Grp Cap (vph)					2730	850	23	993			582	242
v/s Ratio Prot							0.01	c0.05			0.04	
v/s Ratio Perm					0.25	0.06						c0.09
v/c Ratio					0.44	0.10	0.65	0.20			0.23	0.57
Uniform Delay, d1					8.8	7.0	34.3	20.1			25.6	27.1
Progression Factor					0.61	0.09	1.54	0.90			1.00	1.00
Incremental Delay, d2					0.4	0.2	40.0	0.0			0.1	1.8
Delay (s)					5.7	0.8	92.9	18.1			25.6	28.9
Level of Service					A	A	F	B			C	C
Approach Delay (s)		0.0			5.2			23.4			27.8	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	11.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	48.7%	ICU Level of Service	A
Analysis Period (min)	15		

Description: Count Date: 11/9/2016

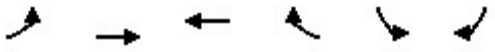
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	130	575	155	0	0	0	0	310	55	70	190	0
Future Volume (veh/h)	130	575	155	0	0	0	0	310	55	70	190	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1843	1843	1772				0	1772	1843	1772	1772	0
Adj Flow Rate, veh/h	138	625	182				0	365	70	104	216	0
Peak Hour Factor	0.94	0.92	0.85				0.93	0.85	0.79	0.67	0.88	0.93
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	852	1886	538				0	770	354	351	658	0
Arrive On Green	0.16	0.16	0.16				0.00	0.23	0.23	0.14	0.74	0.00
Sat Flow, veh/h	1755	3882	1109				0	3455	1548	1688	1772	0
Grp Volume(v), veh/h	138	538	269				0	365	70	104	216	0
Grp Sat Flow(s),veh/h/ln	1755	1677	1637				0	1683	1548	1688	1772	0
Q Serve(g_s), s	4.7	10.0	10.2				0.0	6.6	2.6	0.0	2.9	0.0
Cycle Q Clear(g_c), s	4.7	10.0	10.2				0.0	6.6	2.6	0.0	2.9	0.0
Prop In Lane	1.00		0.68				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	852	1629	795				0	770	354	351	658	0
V/C Ratio(X)	0.16	0.33	0.34				0.00	0.47	0.20	0.30	0.33	0.00
Avail Cap(c_a), veh/h	852	1629	795				0	770	354	351	658	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	0.97	0.97	0.97				0.00	1.00	1.00	0.55	0.55	0.00
Uniform Delay (d), s/veh	17.1	19.3	19.4				0.0	23.4	21.8	22.6	6.0	0.0
Incr Delay (d2), s/veh	0.4	0.5	1.1				0.0	2.1	1.3	0.3	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	4.2	4.4				0.0	2.7	1.0	1.4	1.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.5	19.8	20.5				0.0	25.5	23.1	22.9	6.8	0.0
LnGrp LOS	B	B	C				A	C	C	C	A	A
Approach Vol, veh/h		945						435			320	
Approach Delay, s/veh		19.7						25.1			12.0	
Approach LOS		B						C			B	

Timer - Assigned Phs				4		6	7	8				
Phs Duration (G+Y+Rc), s				31.0		39.0	10.0	21.0				
Change Period (Y+Rc), s				5.0		5.0	5.0	5.0				
Max Green Setting (Gmax), s				26.0		34.0	5.0	16.0				
Max Q Clear Time (g_c+I1), s				0.0		0.0	0.0	0.0				
Green Ext Time (p_c), s				0.0		0.0	0.0	0.0				

Intersection Summary												
HCM 6th Ctrl Delay			19.6									
HCM 6th LOS			B									



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	225	800	0	0	145	0
Future Volume (vph)	225	800	0	0	145	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)		5.5			6.0	
Lane Util. Factor		0.86			0.97	
Frt		1.00			1.00	
Flt Protected		0.99			0.95	
Satd. Flow (prot)		6008			3252	
Flt Permitted		0.99			0.95	
Satd. Flow (perm)		6008			3252	
Peak-hour factor, PHF	0.92	0.86	0.92	0.92	0.92	0.92
Adj. Flow (vph)	245	930	0	0	158	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1175	0	0	158	0
Turn Type	Perm	NA			Prot	
Protected Phases		6			4	
Permitted Phases	6					
Actuated Green, G (s)		50.7			7.8	
Effective Green, g (s)		50.7			7.8	
Actuated g/C Ratio		0.72			0.11	
Clearance Time (s)		5.5			6.0	
Vehicle Extension (s)		2.0			2.0	
Lane Grp Cap (vph)		4351			362	
v/s Ratio Prot					c0.05	
v/s Ratio Perm		0.20				
v/c Ratio		0.27			0.44	
Uniform Delay, d1		3.3			29.0	
Progression Factor		1.00			0.91	
Incremental Delay, d2		0.2			0.3	
Delay (s)		3.5			26.6	
Level of Service		A			C	
Approach Delay (s)		3.5	0.0		26.6	
Approach LOS		A	A		C	

Intersection Summary			
HCM 2000 Control Delay	6.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	11.5
Intersection Capacity Utilization	71.0%	ICU Level of Service	C
Analysis Period (min)	15		

Description: Count Date: 11/9/2016

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	0	430	130	35	740	0	0	0	0	20	570	130
Future Volume (veh/h)	0	430	130	35	740	0	0	0	0	20	570	130
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	0.99		1.00				1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1639	1639	1639	1639	0				1639	1639	1639
Adj Flow Rate, veh/h	0	494	149	45	796	0				32	640	155
Peak Hour Factor	0.93	0.87	0.87	0.77	0.93	0.93				0.63	0.89	0.84
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1244	373	104	1505	0				48	1000	452
Arrive On Green	0.00	1.00	1.00	1.00	1.00	0.00				0.11	0.11	0.11
Sat Flow, veh/h	0	2435	705	90	2921	0				145	3044	1375
Grp Volume(v), veh/h	0	326	317	437	404	0				360	312	155
Grp Sat Flow(s),veh/h/ln	0	1557	1501	1520	1417	0				1632	1557	1375
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0				14.8	13.4	7.3
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0				14.8	13.4	7.3
Prop In Lane	0.00		0.47	0.10		0.00				0.09		1.00
Lane Grp Cap(c), veh/h	0	823	793	860	749	0				536	512	452
V/C Ratio(X)	0.00	0.40	0.40	0.51	0.54	0.00				0.67	0.61	0.34
Avail Cap(c_a), veh/h	0	823	793	860	749	0				536	512	452
HCM Platoon Ratio	1.00	2.00	2.00	2.00	2.00	1.00				0.33	0.33	0.33
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0				27.6	26.9	24.2
Incr Delay (d2), s/veh	0.0	1.4	1.5	2.1	2.8	0.0				6.6	5.3	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.3	0.3	0.5	0.6	0.0				7.4	6.3	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	1.4	1.5	2.1	2.8	0.0				34.1	32.3	26.3
LnGrp LOS	A	A	A	A	A	A				C	C	C
Approach Vol, veh/h		643			841						827	
Approach Delay, s/veh		1.5			2.4						32.0	
Approach LOS		A			A						C	

Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		42.0		28.0		42.0						
Change Period (Y+Rc), s		5.0		5.0		5.0						
Max Green Setting (Gmax), s		37.0		23.0		37.0						
Max Q Clear Time (g_c+I1), s		0.0		0.0		0.0						
Green Ext Time (p_c), s		0.0		0.0		0.0						

Intersection Summary												
HCM 6th Ctrl Delay			12.7									
HCM 6th LOS			B									

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	95	580	0	0	1115	80	250	715	35	0	0	0
Future Volume (veh/h)	95	580	0	0	1115	80	250	715	35	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1821	1894	0	0	1894	1821	1821	1821	1821			
Adj Flow Rate, veh/h	114	659	0	0	1212	101	272	786	42			
Peak Hour Factor	0.83	0.88	0.95	0.95	0.92	0.79	0.92	0.91	0.84			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	264	2193	0	0	1665	138	512	986	53			
Arrive On Green	0.13	1.00	0.00	0.00	0.50	0.50	0.30	0.30	0.30			
Sat Flow, veh/h	1734	3693	0	0	3456	280	1734	3339	178			
Grp Volume(v), veh/h	114	659	0	0	648	665	272	407	421			
Grp Sat Flow(s),veh/h/ln	1734	1799	0	0	1799	1842	1734	1730	1787			
Q Serve(g_s), s	0.0	0.0	0.0	0.0	29.8	30.0	13.8	22.8	22.8			
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	29.8	30.0	13.8	22.8	22.8			
Prop In Lane	1.00		0.00	0.00		0.15	1.00		0.10			
Lane Grp Cap(c), veh/h	264	2193	0	0	891	912	512	511	528			
V/C Ratio(X)	0.43	0.30	0.00	0.00	0.73	0.73	0.53	0.80	0.80			
Avail Cap(c_a), veh/h	264	2193	0	0	891	912	512	511	528			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.82	0.82	0.00	0.00	1.00	1.00	0.73	0.73	0.73			
Uniform Delay (d), s/veh	35.5	0.0	0.0	0.0	20.9	20.9	30.9	34.1	34.1			
Incr Delay (d2), s/veh	0.3	0.3	0.0	0.0	5.2	5.1	2.9	9.2	8.9			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	2.6	0.1	0.0	0.0	13.5	13.8	6.2	10.8	11.2			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.8	0.3	0.0	0.0	26.1	26.0	33.8	43.3	43.0			
LnGrp LOS	D	A	A	A	C	C	C	D	D			
Approach Vol, veh/h		773			1313			1100				
Approach Delay, s/veh		5.5			26.1			40.8				
Approach LOS		A			C			D				

Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	12.0	57.0				69.0		36.0				
Change Period (Y+Rc), s	5.0	5.0				5.0		5.0				
Max Green Setting (Gmax), s	7.0	52.0				64.0		31.0				
Max Q Clear Time (g_c+I1), s	0.0	0.0				0.0		0.0				
Green Ext Time (p_c), s	0.0	0.0				0.0		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			26.2									
HCM 6th LOS			C									

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	25	695	170	45	1495	45	305	135	45	20	50	15
Future Volume (vph)	25	695	170	45	1495	45	305	135	45	20	50	15
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Lane Width	11	12	12	11	12	12	11	11	12	11	11	12
Total Lost time (s)	6.0	5.0	5.0	6.0	5.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.91		0.95	0.95		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.97		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.99		0.95	1.00	
Satd. Flow (prot)	1666	3446	1542	1666	4927		1582	1597		1666	1679	
Flt Permitted	0.07	1.00	1.00	0.25	1.00		0.95	0.99		0.95	1.00	
Satd. Flow (perm)	130	3446	1542	446	4927		1582	1597		1666	1679	
Peak-hour factor, PHF	0.82	0.90	0.84	0.67	0.94	0.83	0.86	0.77	0.73	0.68	0.89	0.67
Adj. Flow (vph)	30	772	202	67	1590	54	355	175	62	29	56	22
RTOR Reduction (vph)	0	0	111	0	2	0	0	8	0	0	12	0
Lane Group Flow (vph)	30	772	91	67	1642	0	295	289	0	29	66	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA		Split	NA	
Protected Phases	1	6		5	2		8	8		4	4	
Permitted Phases	6		6	2								
Actuated Green, G (s)	58.6	53.8	53.8	62.6	55.8		28.1	28.1		8.3	8.3	
Effective Green, g (s)	58.6	53.8	53.8	62.6	55.8		28.1	28.1		8.3	8.3	
Actuated g/C Ratio	0.49	0.45	0.45	0.52	0.46		0.23	0.23		0.07	0.07	
Clearance Time (s)	6.0	5.0	5.0	6.0	5.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	124	1544	691	301	2291		370	373		115	116	
v/s Ratio Prot	0.01	0.22		c0.01	c0.33		c0.19	0.18		0.02	c0.04	
v/s Ratio Perm	0.11		0.06	0.10								
v/c Ratio	0.24	0.50	0.13	0.22	0.72		0.80	0.77		0.25	0.57	
Uniform Delay, d1	19.0	23.5	19.4	15.5	25.8		43.3	43.0		52.9	54.1	
Progression Factor	0.79	1.09	2.79	0.91	0.88		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	1.2	0.4	0.1	1.6		10.6	8.8		0.4	3.8	
Delay (s)	15.4	26.8	54.6	14.2	24.2		53.9	51.8		53.3	57.9	
Level of Service	B	C	D	B	C		D	D		D	E	
Approach Delay (s)		32.0			23.8			52.8			56.6	
Approach LOS		C			C			D			E	

Intersection Summary			
HCM 2000 Control Delay	32.3	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)	23.0
Intersection Capacity Utilization	68.0%	ICU Level of Service	C
Analysis Period (min)	15		
Description: Count Date: 1/22/2015			

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	22	820	106	16	1684	4	218	64	36	18	30	4
Future Volume (vph)	22	820	106	16	1684	4	218	64	36	18	30	4
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Lane Width	10	13	12	12	12	12	12	12	12	11	12	12
Total Lost time (s)	6.0	5.5	5.5	6.0	5.5		6.0	5.5		6.0	6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.95		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1608	3561	1542	1723	3445		3343	1716		1666	1783	
Flt Permitted	0.05	1.00	1.00	0.30	1.00		0.95	1.00		1.00	1.00	
Satd. Flow (perm)	91	3561	1542	543	3445		3343	1716		1753	1783	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	23	845	109	16	1736	4	225	66	37	19	31	4
RTOR Reduction (vph)	0	0	41	0	0	0	0	19	0	0	4	0
Lane Group Flow (vph)	23	845	68	16	1740	0	225	84	0	19	31	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA		pm+pt	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2						4	4	
Actuated Green, G (s)	78.6	74.7	74.7	75.0	72.9		13.7	17.3		6.0	6.0	
Effective Green, g (s)	78.6	74.7	74.7	75.0	72.9		13.7	17.3		6.0	6.0	
Actuated g/C Ratio	0.65	0.62	0.62	0.62	0.61		0.11	0.14		0.05	0.05	
Clearance Time (s)	6.0	5.5	5.5	6.0	5.5		6.0	5.5		6.0	6.0	
Vehicle Extension (s)	3.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	108	2216	959	360	2092		381	247		87	89	
v/s Ratio Prot	c0.01	0.24		0.00	c0.51		c0.07	c0.05		0.01	c0.02	
v/s Ratio Perm	0.13		0.04	0.03						0.01		
v/c Ratio	0.21	0.38	0.07	0.04	0.83		0.59	0.34		0.22	0.35	
Uniform Delay, d1	16.7	11.2	8.9	8.8	18.7		50.5	46.2		54.8	55.1	
Progression Factor	1.25	0.71	1.00	0.60	0.78		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.5	0.1	0.0	3.3		1.6	0.3		0.5	0.9	
Delay (s)	21.7	8.4	9.1	5.2	17.8		52.1	46.5		55.2	56.0	
Level of Service	C	A	A	A	B		D	D		E	E	
Approach Delay (s)		8.8			17.7			50.4			55.7	
Approach LOS		A			B			D			E	

Intersection Summary			
HCM 2000 Control Delay	19.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	23.5
Intersection Capacity Utilization	70.2%	ICU Level of Service	C
Analysis Period (min)	15		
Description: Count Date: 1/21/2014			

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	290	1060	0	0	0	0	0	635	45
Future Volume (veh/h)	0	0	0	290	1060	0	0	0	0	0	635	45
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.87
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach					No						No	
Adj Sat Flow, veh/h/ln				1639	1639	0				0	1639	1639
Adj Flow Rate, veh/h				305	1128	0				0	738	56
Peak Hour Factor				0.95	0.94	0.88				0.88	0.86	0.80
Percent Heavy Veh, %				2	2	0				0	2	2
Cap, veh/h				501	1639	0				0	1498	113
Arrive On Green				0.17	0.17	0.00				0.00	0.12	0.12
Sat Flow, veh/h				838	3411	0				0	4342	315
Grp Volume(v), veh/h				510	923	0				0	523	271
Grp Sat Flow(s),veh/h/ln				1400	1357	0				0	1492	1526
Q Serve(g_s), s				24.2	22.4	0.0				0.0	11.5	11.7
Cycle Q Clear(g_c), s				24.2	22.4	0.0				0.0	11.5	11.7
Prop In Lane				0.60		0.00				0.00		0.21
Lane Grp Cap(c), veh/h				782	1357	0				0	1065	545
V/C Ratio(X)				0.65	0.68	0.00				0.00	0.49	0.50
Avail Cap(c_a), veh/h				782	1357	0				0	1065	545
HCM Platoon Ratio				0.33	0.33	1.00				1.00	0.33	0.33
Upstream Filter(I)				1.00	1.00	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				24.7	24.0	0.0				0.0	24.9	25.0
Incr Delay (d2), s/veh				4.2	2.8	0.0				0.0	1.6	3.2
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				9.8	8.5	0.0				0.0	4.8	5.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				28.9	26.7	0.0				0.0	26.5	28.2
LnGrp LOS				C	C	A				A	C	C
Approach Vol, veh/h					1433						794	
Approach Delay, s/veh					27.5						27.1	
Approach LOS					C						C	

Timer - Assigned Phs	2		4
Phs Duration (G+Y+Rc), s	40.0		30.0
Change Period (Y+Rc), s	5.0		5.0
Max Green Setting (Gmax), s	35.0		25.0
Max Q Clear Time (g_c+I1), s	0.0		0.0
Green Ext Time (p_c), s	0.0		0.0

Intersection Summary	
HCM 6th Ctrl Delay	27.4
HCM 6th LOS	C

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	780	130	75	755	0	0	0	0
Future Volume (veh/h)	0	0	0	0	780	130	75	755	0	0	0	0
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00			
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach					No			No				
Adj Sat Flow, veh/h/ln				0	1639	1639	1639	1639	0			
Adj Flow Rate, veh/h				0	848	141	82	821	0			
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %				0	2	2	2	2	0			
Cap, veh/h				0	1658	274	118	1245	0			
Arrive On Green				0.00	0.14	0.14	0.14	0.14	0.00			
Sat Flow, veh/h				0	4015	639	276	2988	0			
Grp Volume(v), veh/h				0	653	336	482	421	0			
Grp Sat Flow(s),veh/h/ln				0	1492	1524	1625	1557	0			
Q Serve(g_s), s				0.0	14.2	14.3	19.8	17.8	0.0			
Cycle Q Clear(g_c), s				0.0	14.2	14.3	19.8	17.8	0.0			
Prop In Lane				0.00		0.42	0.17		0.00			
Lane Grp Cap(c), veh/h				0	1278	653	697	667	0			
V/C Ratio(X)				0.00	0.51	0.51	0.69	0.63	0.00			
Avail Cap(c_a), veh/h				0	1278	653	697	667	0			
HCM Platoon Ratio				1.00	0.33	0.33	0.33	0.33	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	23.3	23.3	25.7	24.8	0.0			
Incr Delay (d2), s/veh				0.0	1.5	2.9	5.6	4.5	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln				0.0	5.8	6.3	9.5	8.1	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				0.0	24.7	26.2	31.3	29.3	0.0			
LnGrp LOS				A	C	C	C	C	A			
Approach Vol, veh/h					989			903				
Approach Delay, s/veh					25.2			30.3				
Approach LOS					C			C				

Timer - Assigned Phs	2	4
Phs Duration (G+Y+Rc), s	35.0	35.0
Change Period (Y+Rc), s	5.0	5.0
Max Green Setting (Gmax), s	30.0	30.0
Max Q Clear Time (g_c+I1), s	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	27.7
HCM 6th LOS	C

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	0	590	270	0	0	0	0	0	0	100	1325	0
Future Volume (veh/h)	0	590	270	0	0	0	0	0	0	100	1325	0
Initial Q (Qb), veh	0	0	0							0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00							1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00							1.00	1.00	1.00
Work Zone On Approach		No									No	
Adj Sat Flow, veh/h/ln	0	1639	1639							1639	1639	0
Adj Flow Rate, veh/h	0	641	293							109	1440	0
Peak Hour Factor	0.92	0.92	0.92							0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2							2	2	0
Cap, veh/h	0	1080	484							185	2018	0
Arrive On Green	0.00	0.12	0.12							0.17	0.17	0.00
Sat Flow, veh/h	0	3170	1355							248	4170	0
Grp Volume(v), veh/h	0	632	302							573	976	0
Grp Sat Flow(s),veh/h/ln	0	1492	1395							1569	1357	0
Q Serve(g_s), s	0.0	14.1	14.4							18.4	23.9	0.0
Cycle Q Clear(g_c), s	0.0	14.1	14.4							24.2	23.9	0.0
Prop In Lane	0.00		0.97							0.19		0.00
Lane Grp Cap(c), veh/h	0	1065	498							845	1357	0
V/C Ratio(X)	0.00	0.59	0.61							0.68	0.72	0.00
Avail Cap(c_a), veh/h	0	1065	498							845	1357	0
HCM Platoon Ratio	1.00	0.33	0.33							0.33	0.33	1.00
Upstream Filter(I)	0.00	1.00	1.00							1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	26.1	26.2							24.6	24.6	0.0
Incr Delay (d2), s/veh	0.0	2.4	5.4							4.3	3.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0							0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	5.9	6.0							11.0	9.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	28.5	31.6							28.9	27.9	0.0
LnGrp LOS	A	C	C							C	C	A
Approach Vol, veh/h		934									1549	
Approach Delay, s/veh		29.5									28.3	
Approach LOS		C									C	

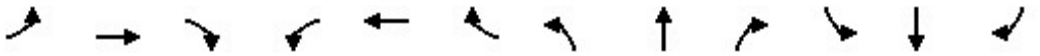
Timer - Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		30.0		40.0								
Change Period (Y+Rc), s		5.0		5.0								
Max Green Setting (Gmax), s		25.0		35.0								
Max Q Clear Time (g_c+I1), s		0.0		0.0								
Green Ext Time (p_c), s		0.0		0.0								

Intersection Summary	
HCM 6th Ctrl Delay	28.7
HCM 6th LOS	C

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	95	500	0	0	0	0	0	700	155	0	0	0
Future Volume (veh/h)	95	500	0	0	0	0	0	700	155	0	0	0
Initial Q (Qb), veh	0	0	0				0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	0.90			
Work Zone On Approach		No						No				
Adj Sat Flow, veh/h/ln	1639	1639	0				0	1639	1639			
Adj Flow Rate, veh/h	103	543	0				0	761	168			
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92			
Percent Heavy Veh, %	2	2	0				0	2	2			
Cap, veh/h	291	1399	0				0	1468	589			
Arrive On Green	0.39	0.39	0.00				0.00	0.16	0.16			
Sat Flow, veh/h	565	3762	0				0	3196	1250			
Grp Volume(v), veh/h	240	406	0				0	761	168			
Grp Sat Flow(s),veh/h/ln	1478	1357	0				0	1557	1250			
Q Serve(g_s), s	5.4	7.6	0.0				0.0	15.7	8.3			
Cycle Q Clear(g_c), s	8.1	7.6	0.0				0.0	15.7	8.3			
Prop In Lane	0.43		0.00				0.00		1.00			
Lane Grp Cap(c), veh/h	644	1047	0				0	1468	589			
V/C Ratio(X)	0.37	0.39	0.00				0.00	0.52	0.29			
Avail Cap(c_a), veh/h	644	1047	0				0	1468	589			
HCM Platoon Ratio	1.00	1.00	1.00				1.00	0.33	0.33			
Upstream Filter(I)	1.00	1.00	0.00				0.00	1.00	1.00			
Uniform Delay (d), s/veh	15.6	15.5	0.0				0.0	22.3	19.1			
Incr Delay (d2), s/veh	1.7	1.1	0.0				0.0	1.3	1.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	2.9	2.3	0.0				0.0	6.7	2.8			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.3	16.6	0.0				0.0	23.6	20.3			
LnGrp LOS	B	B	A				A	C	C			
Approach Vol, veh/h		646						929				
Approach Delay, s/veh		16.9						23.0				
Approach LOS		B						C				

Timer - Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		32.0		38.0								
Change Period (Y+Rc), s		5.0		5.0								
Max Green Setting (Gmax), s		27.0		33.0								
Max Q Clear Time (g_c+I1), s		0.0		0.0								
Green Ext Time (p_c), s		0.0		0.0								

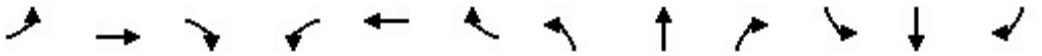
Intersection Summary		
HCM 6th Ctrl Delay		20.5
HCM 6th LOS		C



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	40	1765	80	455	610	0	0	235	120
Future Volume (veh/h)	0	0	0	40	1765	80	455	610	0	0	235	120
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1850	1821	1850	1821	1821	0	0	1821	1821
Adj Flow Rate, veh/h				53	1961	99	535	685	0	0	283	150
Peak Hour Factor				0.75	0.90	0.81	0.85	0.89	0.88	0.88	0.83	0.80
Percent Heavy Veh, %				0	2	0	2	2	0	0	2	2
Cap, veh/h				46	1808	94	498	971	0	0	265	140
Arrive On Green				0.37	0.37	0.37	0.50	1.00	0.00	0.00	0.24	0.24
Sat Flow, veh/h				124	4869	253	1734	1821	0	0	1112	589
Grp Volume(v), veh/h				776	644	693	535	685	0	0	0	433
Grp Sat Flow(s),veh/h/ln				1815	1657	1774	1734	1821	0	0	0	1702
Q Serve(g_s), s				39.0	39.0	39.0	26.0	0.0	0.0	0.0	0.0	25.0
Cycle Q Clear(g_c), s				39.0	39.0	39.0	26.0	0.0	0.0	0.0	0.0	25.0
Prop In Lane				0.07		0.14	1.00		0.00	0.00		0.35
Lane Grp Cap(c), veh/h				674	616	659	498	971	0	0	0	405
V/C Ratio(X)				1.15	1.05	1.05	1.07	0.71	0.00	0.00	0.00	1.07
Avail Cap(c_a), veh/h				674	616	659	498	971	0	0	0	405
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				0.85	0.85	0.85	0.72	0.72	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				33.0	33.0	33.0	24.7	0.0	0.0	0.0	0.0	40.0
Incr Delay (d2), s/veh				82.1	46.2	46.8	55.9	3.1	0.0	0.0	0.0	64.2
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				31.7	22.8	24.5	14.7	0.8	0.0	0.0	0.0	17.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				115.1	79.2	79.8	80.6	3.1	0.0	0.0	0.0	104.2
LnGrp LOS				F	F	F	F	A	A	A	A	F
Approach Vol, veh/h					2113			1220			433	
Approach Delay, s/veh					92.6			37.1			104.2	
Approach LOS					F			D			F	

Timer - Assigned Phs	2	3	4					8				
Phs Duration (G+Y+Rc), s	44.0	31.0	30.0					61.0				
Change Period (Y+Rc), s	5.0	5.0	5.0					5.0				
Max Green Setting (Gmax), s	39.0	26.0	25.0					56.0				
Max Q Clear Time (g_c+I1), s	0.0	0.0	0.0					0.0				
Green Ext Time (p_c), s	0.0	0.0	0.0					0.0				

Intersection Summary												
HCM 6th Ctrl Delay		76.0										
HCM 6th LOS		E										

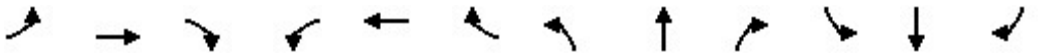


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	5	1820	290	15	420	0	0	135	300
Future Volume (vph)	0	0	0	5	1820	290	15	420	0	0	135	300
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Lane Width	12	12	12	12	12	12	11	11	12	12	11	11
Total Lost time (s)					6.0	6.0	6.0	6.0			6.0	6.0
Lane Util. Factor					0.91	1.00	1.00	0.95			0.95	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					4950	1542	1666	3331			3165	1490
Flt Permitted					1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)					4950	1542	1666	3331			3165	1490
Peak-hour factor, PHF	0.92	0.92	0.92	0.42	0.92	0.85	0.57	0.79	0.92	0.92	0.90	0.85
Adj. Flow (vph)	0	0	0	12	1978	341	26	532	0	0	150	353
RTOR Reduction (vph)	0	0	0	0	0	74	0	0	0	0	0	88
Lane Group Flow (vph)	0	0	0	0	1990	267	26	532	0	0	150	265
Parking (#/hr)											0	
Turn Type				Perm	NA	Perm	Prot	NA			NA	Perm
Protected Phases					2		3	8			4	
Permitted Phases				2		2						4
Actuated Green, G (s)					60.5	60.5	4.4	32.5			22.1	22.1
Effective Green, g (s)					60.5	60.5	4.4	32.5			22.1	22.1
Actuated g/C Ratio					0.58	0.58	0.04	0.31			0.21	0.21
Clearance Time (s)					6.0	6.0	6.0	6.0			6.0	6.0
Vehicle Extension (s)					2.0	2.0	2.0	2.0			2.0	2.0
Lane Grp Cap (vph)					2852	888	69	1031			666	313
v/s Ratio Prot							0.02	c0.16			0.05	
v/s Ratio Perm					0.40	0.17						c0.18
v/c Ratio					0.70	0.30	0.38	0.52			0.23	0.85
Uniform Delay, d1					15.8	11.4	49.0	29.8			34.4	39.8
Progression Factor					0.27	0.06	1.26	1.20			1.00	1.00
Incremental Delay, d2					0.1	0.1	1.2	0.2			0.1	18.1
Delay (s)					4.3	0.8	63.0	35.8			34.4	57.9
Level of Service					A	A	E	D			C	E
Approach Delay (s)		0.0			3.8			37.1			50.9	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	16.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	65.3%	ICU Level of Service	C
Analysis Period (min)	15		

Description: Count Date: 11/9/2016

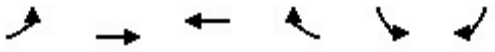
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	255	680	185	0	0	0	0	705	55	55	225	0
Future Volume (veh/h)	255	680	185	0	0	0	0	705	55	55	225	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99				1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1821	1821	1821				0	1821	1894	1821	1821	0
Adj Flow Rate, veh/h	283	731	257				0	839	66	64	262	0
Peak Hour Factor	0.90	0.93	0.72				0.92	0.84	0.83	0.86	0.86	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	826	1732	601				0	1055	484	251	780	0
Arrive On Green	0.16	0.16	0.16				0.00	0.30	0.30	0.15	0.86	0.00
Sat Flow, veh/h	1734	3636	1263				0	3551	1587	1734	1821	0
Grp Volume(v), veh/h	283	665	323				0	839	66	64	262	0
Grp Sat Flow(s),veh/h/ln	1734	1657	1584				0	1730	1587	1734	1821	0
Q Serve(g_s), s	15.3	19.0	19.3				0.0	23.4	3.2	0.0	3.0	0.0
Cycle Q Clear(g_c), s	15.3	19.0	19.3				0.0	23.4	3.2	0.0	3.0	0.0
Prop In Lane	1.00		0.80				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	826	1578	754				0	1055	484	251	780	0
V/C Ratio(X)	0.34	0.42	0.43				0.00	0.80	0.14	0.25	0.34	0.00
Avail Cap(c_a), veh/h	826	1578	754				0	1055	484	251	780	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	0.95	0.95	0.95				0.00	1.00	1.00	0.09	0.09	0.00
Uniform Delay (d), s/veh	29.6	31.2	31.3				0.0	33.5	26.5	37.7	4.5	0.0
Incr Delay (d2), s/veh	1.1	0.8	1.7				0.0	6.2	0.6	0.0	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.3	8.6	8.5				0.0	10.7	1.3	1.4	1.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.7	32.0	33.0				0.0	39.7	27.1	37.7	4.6	0.0
LnGrp LOS	C	C	C				A	D	C	D	A	A
Approach Vol, veh/h		1271						905			326	
Approach Delay, s/veh		32.0						38.8			11.1	
Approach LOS		C						D			B	

Timer - Assigned Phs				4		6	7	8				
Phs Duration (G+Y+Rc), s				50.0		55.0	13.0	37.0				
Change Period (Y+Rc), s				5.0		5.0	5.0	5.0				
Max Green Setting (Gmax), s				45.0		50.0	8.0	32.0				
Max Q Clear Time (g_c+I1), s				0.0		0.0	0.0	0.0				
Green Ext Time (p_c), s				0.0		0.0	0.0	0.0				

Intersection Summary												
HCM 6th Ctrl Delay			31.7									
HCM 6th LOS			C									



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	430	860	0	0	160	0
Future Volume (vph)	430	860	0	0	160	0
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850
Total Lost time (s)		5.5			6.0	
Lane Util. Factor		0.86			0.97	
Frt		1.00			1.00	
Flt Protected		0.98			0.95	
Satd. Flow (prot)		6134			3343	
Flt Permitted		0.98			0.95	
Satd. Flow (perm)		6134			3343	
Peak-hour factor, PHF	0.84	0.88	0.92	0.92	0.94	0.92
Adj. Flow (vph)	512	977	0	0	170	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1489	0	0	170	0
Turn Type	Perm	NA			Prot	
Protected Phases		6			4	
Permitted Phases	6					
Actuated Green, G (s)		83.7			9.8	
Effective Green, g (s)		83.7			9.8	
Actuated g/C Ratio		0.80			0.09	
Clearance Time (s)		5.5			6.0	
Vehicle Extension (s)		2.0			2.0	
Lane Grp Cap (vph)		4889			312	
v/s Ratio Prot					c0.05	
v/s Ratio Perm		0.24				
v/c Ratio		0.30			0.54	
Uniform Delay, d1		2.9			45.5	
Progression Factor		1.00			1.67	
Incremental Delay, d2		0.2			1.0	
Delay (s)		3.0			77.0	
Level of Service		A			E	
Approach Delay (s)		3.0	0.0		77.0	
Approach LOS		A	A		E	

Intersection Summary			
HCM 2000 Control Delay	10.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	11.5
Intersection Capacity Utilization	74.5%	ICU Level of Service	D
Analysis Period (min)	15		

Description: Count Date: 11/9/2016

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	0	430	130	35	740	0	0	0	0	20	570	130
Future Volume (veh/h)	0	430	130	35	740	0	0	0	0	20	570	130
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00				1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1639	1639	1639	1639	0				1639	1639	1639
Adj Flow Rate, veh/h	0	682	206	52	915	0				41	833	201
Peak Hour Factor	0.93	0.87	0.87	0.77	0.93	0.93				0.63	0.89	0.84
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1208	365	105	1432	0				49	1044	472
Arrive On Green	0.00	1.00	1.00	1.00	1.00	0.00				0.11	0.11	0.11
Sat Flow, veh/h	0	2430	709	93	2860	0				143	3046	1376
Grp Volume(v), veh/h	0	452	436	493	474	0				468	406	201
Grp Sat Flow(s),veh/h/ln	0	1557	1500	1461	1417	0				1632	1557	1376
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0				19.7	17.7	9.5
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0				19.7	17.7	9.5
Prop In Lane	0.00		0.47	0.11		0.00				0.09		1.00
Lane Grp Cap(c), veh/h	0	801	771	808	729	0				560	534	472
V/C Ratio(X)	0.00	0.56	0.57	0.61	0.65	0.00				0.84	0.76	0.43
Avail Cap(c_a), veh/h	0	801	771	808	729	0				560	534	472
HCM Platoon Ratio	1.00	2.00	2.00	2.00	2.00	1.00				0.33	0.33	0.33
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0				29.1	28.3	24.6
Incr Delay (d2), s/veh	0.0	2.9	3.0	3.4	4.5	0.0				13.8	9.8	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.6	0.6	0.8	0.9	0.0				10.6	8.7	3.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	2.9	3.0	3.4	4.5	0.0				42.9	38.1	27.4
LnGrp LOS	A	A	A	A	A	A				D	D	C
Approach Vol, veh/h		888			967						1075	
Approach Delay, s/veh		2.9			3.9						38.2	
Approach LOS		A			A						D	

Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		41.0		29.0		41.0						
Change Period (Y+Rc), s		5.0		5.0		5.0						
Max Green Setting (Gmax), s		36.0		24.0		36.0						
Max Q Clear Time (g_c+I1), s		0.0		0.0		0.0						
Green Ext Time (p_c), s		0.0		0.0		0.0						

Intersection Summary												
HCM 6th Ctrl Delay			16.2									
HCM 6th LOS			B									

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	95	580	0	0	1115	80	250	715	35	0	0	0
Future Volume (veh/h)	95	580	0	0	1115	80	250	715	35	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1821	1894	0	0	1894	1821	1821	1821	1821			
Adj Flow Rate, veh/h	149	857	0	0	1345	112	288	833	44			
Peak Hour Factor	0.83	0.88	0.95	0.95	0.92	0.79	0.92	0.91	0.84			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	234	2193	0	0	1665	138	512	986	52			
Arrive On Green	0.13	1.00	0.00	0.00	0.50	0.50	0.30	0.30	0.30			
Sat Flow, veh/h	1734	3693	0	0	3457	279	1734	3341	176			
Grp Volume(v), veh/h	149	857	0	0	718	739	288	431	446			
Grp Sat Flow(s),veh/h/ln	1734	1799	0	0	1799	1842	1734	1730	1787			
Q Serve(g_s), s	0.8	0.0	0.0	0.0	35.2	35.6	14.7	24.6	24.6			
Cycle Q Clear(g_c), s	0.8	0.0	0.0	0.0	35.2	35.6	14.7	24.6	24.6			
Prop In Lane	1.00		0.00	0.00		0.15	1.00		0.10			
Lane Grp Cap(c), veh/h	234	2193	0	0	891	912	512	511	528			
V/C Ratio(X)	0.64	0.39	0.00	0.00	0.81	0.81	0.56	0.84	0.84			
Avail Cap(c_a), veh/h	234	2193	0	0	891	912	512	511	528			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.82	0.82	0.00	0.00	1.00	1.00	0.73	0.73	0.73			
Uniform Delay (d), s/veh	40.1	0.0	0.0	0.0	22.2	22.3	31.3	34.7	34.7			
Incr Delay (d2), s/veh	3.6	0.4	0.0	0.0	7.7	7.7	3.2	11.9	11.6			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	3.6	0.1	0.0	0.0	16.3	16.9	6.6	12.0	12.3			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.6	0.4	0.0	0.0	29.9	30.1	34.5	46.7	46.3			
LnGrp LOS	D	A	A	A	C	C	C	D	D			
Approach Vol, veh/h		1006			1457			1165				
Approach Delay, s/veh		6.8			30.0			43.5				
Approach LOS		A			C			D				

Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	12.0	57.0				69.0		36.0				
Change Period (Y+Rc), s	5.0	5.0				5.0		5.0				
Max Green Setting (Gmax), s	7.0	52.0				64.0		31.0				
Max Q Clear Time (g_c+I1), s	0.0	0.0				0.0		0.0				
Green Ext Time (p_c), s	0.0	0.0				0.0		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			27.9									
HCM 6th LOS			C									

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	25	695	170	45	1495	45	305	135	45	20	50	15
Future Volume (vph)	25	695	170	45	1495	45	305	135	45	20	50	15
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Lane Width	11	12	12	11	12	12	11	11	12	11	11	12
Total Lost time (s)	6.0	5.0	5.0	6.0	5.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.91		0.95	0.95		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.97		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.99		0.95	1.00	
Satd. Flow (prot)	1666	3446	1542	1666	4927		1582	1598		1666	1678	
Flt Permitted	0.08	1.00	1.00	0.09	1.00		0.95	0.99		0.95	1.00	
Satd. Flow (perm)	138	3446	1542	163	4927		1582	1598		1666	1678	
Peak-hour factor, PHF	0.82	0.90	0.84	0.67	0.94	0.83	0.86	0.77	0.73	0.68	0.89	0.67
Growth Factor (vph)	126%	126%	126%	114%	114%	114%	224%	224%	224%	253%	253%	253%
Adj. Flow (vph)	38	973	255	77	1813	62	794	393	138	74	142	57
RTOR Reduction (vph)	0	0	131	0	3	0	0	6	0	0	10	0
Lane Group Flow (vph)	38	973	124	77	1872	0	659	660	0	74	189	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA		Split	NA	
Protected Phases	1	6		5	2		8	8		4	4	
Permitted Phases	6		6	2								
Actuated Green, G (s)	57.4	51.0	51.0	60.6	52.6		55.0	55.0		13.0	13.0	
Effective Green, g (s)	57.4	51.0	51.0	60.6	52.6		55.0	55.0		13.0	13.0	
Actuated g/C Ratio	0.38	0.34	0.34	0.40	0.35		0.37	0.37		0.09	0.09	
Clearance Time (s)	6.0	5.0	5.0	6.0	5.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	118	1171	524	146	1727		580	585		144	145	
v/s Ratio Prot	0.01	0.28		c0.03	c0.38		c0.42	0.41		0.04	c0.11	
v/s Ratio Perm	0.11		0.08	0.18								
v/c Ratio	0.32	0.83	0.24	0.53	1.08		1.14	1.13		0.51	1.30	
Uniform Delay, d1	36.8	45.5	35.5	33.0	48.7		47.5	47.5		65.5	68.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	6.9	1.1	1.6	48.4		80.9	77.6		1.3	177.4	
Delay (s)	37.4	52.5	36.6	34.6	97.1		128.4	125.1		66.8	245.9	
Level of Service	D	D	D	C	F		F	F		E	F	
Approach Delay (s)		48.8			94.6			126.7			197.4	
Approach LOS		D			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	97.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	97.9%	ICU Level of Service	F
Analysis Period (min)	15		

Description: Count Date: 1/22/2015

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	22	820	106	16	1684	4	218	64	36	18	30	4
Future Volume (vph)	22	820	106	16	1684	4	218	64	36	18	30	4
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Lane Width	10	13	12	12	12	12	12	12	12	11	12	12
Total Lost time (s)	6.0	5.5	5.5	6.0	5.5	5.5	6.0	5.5		6.0	6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1608	3561	1542	1723	3446	1542	3343	1715		1666	1783	
Flt Permitted	0.05	1.00	1.00	0.18	1.00	1.00	0.95	1.00		0.73	1.00	
Satd. Flow (perm)	78	3561	1542	334	3446	1542	3343	1715		1275	1783	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor (vph)	134%	134%	134%	141%	141%	141%	123%	123%	123%	156%	156%	156%
Adj. Flow (vph)	30	1133	146	23	2448	6	276	81	46	29	48	6
RTOR Reduction (vph)	0	0	59	0	0	2	0	14	0	0	4	0
Lane Group Flow (vph)	30	1133	87	23	2448	4	276	113	0	29	50	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA		pm+pt	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2		2				4	4	
Actuated Green, G (s)	90.5	86.3	86.3	88.7	85.4	85.4	23.4	29.4		8.5	8.5	
Effective Green, g (s)	90.5	86.3	86.3	88.7	85.4	85.4	23.4	29.4		8.5	8.5	
Actuated g/C Ratio	0.62	0.60	0.60	0.61	0.59	0.59	0.16	0.20		0.06	0.06	
Clearance Time (s)	6.0	5.5	5.5	6.0	5.5	5.5	6.0	5.5		6.0	6.0	
Vehicle Extension (s)	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	93	2119	917	235	2029	908	539	347		82	104	
v/s Ratio Prot	c0.01	0.32		0.00	c0.71		c0.08	c0.07		0.01	c0.03	
v/s Ratio Perm	0.19		0.06	0.06		0.00				0.01		
v/c Ratio	0.32	0.53	0.09	0.10	1.21	0.00	0.51	0.32		0.35	0.48	
Uniform Delay, d1	34.2	17.4	12.6	12.9	29.8	12.3	55.6	49.3		65.4	66.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.0	1.0	0.2	0.1	97.8	0.0	0.3	0.2		1.0	1.3	
Delay (s)	36.2	18.4	12.8	13.0	127.6	12.3	55.9	49.5		66.4	67.4	
Level of Service	D	B	B	B	F	B	E	D		E	E	
Approach Delay (s)		18.2			126.3			53.9			67.0	
Approach LOS		B			F			D			E	

Intersection Summary			
HCM 2000 Control Delay	85.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	23.5
Intersection Capacity Utilization	98.2%	ICU Level of Service	F
Analysis Period (min)	15		

Description: Count Date: 1/21/2014

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	290	1060	0	0	0	0	0	635	45
Future Volume (veh/h)	0	0	0	290	1060	0	0	0	0	0	635	45
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.88
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach					No						No	
Adj Sat Flow, veh/h/ln				1639	1639	0				0	1639	1639
Adj Flow Rate, veh/h				385	1421	0				0	1432	109
Peak Hour Factor				0.95	0.94	0.88				0.88	0.86	0.80
Percent Heavy Veh, %				2	2	0				0	2	2
Cap, veh/h				471	1517	0				0	1613	123
Arrive On Green				0.46	0.46	0.00				0.00	0.38	0.38
Sat Flow, veh/h				830	3421	0				0	4341	319
Grp Volume(v), veh/h				650	1156	0				0	1019	522
Grp Sat Flow(s),veh/h/ln				1403	1357	0				0	1492	1529
Q Serve(g_s), s				30.0	26.0	0.0				0.0	20.7	20.8
Cycle Q Clear(g_c), s				30.0	26.0	0.0				0.0	20.7	20.8
Prop In Lane				0.59		0.00				0.00		0.21
Lane Grp Cap(c), veh/h				736	1253	0				0	1147	588
V/C Ratio(X)				0.88	0.92	0.00				0.00	0.89	0.89
Avail Cap(c_a), veh/h				736	1253	0				0	1147	588
HCM Platoon Ratio				1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				17.6	16.4	0.0				0.0	18.7	18.7
Incr Delay (d2), s/veh				14.6	12.6	0.0				0.0	10.3	17.9
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				11.5	9.3	0.0				0.0	8.2	9.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				32.1	29.0	0.0				0.0	29.0	36.6
LnGrp LOS				C	C	A				A	C	D
Approach Vol, veh/h					1806						1541	
Approach Delay, s/veh					30.1						31.6	
Approach LOS					C						C	

Timer - Assigned Phs	2	4
Phs Duration (G+Y+Rc), s	35.0	30.0
Change Period (Y+Rc), s	5.0	5.0
Max Green Setting (Gmax), s	30.0	25.0
Max Q Clear Time (g_c+I1), s	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	30.8
HCM 6th LOS	C

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	780	130	75	755	0	0	0	0
Future Volume (veh/h)	0	0	0	0	780	130	75	755	0	0	0	0
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00			
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach					No			No				
Adj Sat Flow, veh/h/ln				0	1639	1639	1639	1639	0			
Adj Flow Rate, veh/h				0	1043	174	111	1116	0			
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %				0	2	2	2	2	0			
Cap, veh/h				0	1352	225	133	1405	0			
Arrive On Green				0.00	0.35	0.35	0.48	0.48	0.00			
Sat Flow, veh/h				0	4010	643	275	2989	0			
Grp Volume(v), veh/h				0	805	412	656	571	0			
Grp Sat Flow(s),veh/h/ln				0	1492	1523	1625	1557	0			
Q Serve(g_s), s				0.0	14.4	14.5	21.0	18.0	0.0			
Cycle Q Clear(g_c), s				0.0	14.4	14.5	21.0	18.0	0.0			
Prop In Lane				0.00		0.42	0.17		0.00			
Lane Grp Cap(c), veh/h				0	1044	533	786	753	0			
V/C Ratio(X)				0.00	0.77	0.77	0.83	0.76	0.00			
Avail Cap(c_a), veh/h				0	1044	533	786	753	0			
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	17.4	17.4	13.4	12.6	0.0			
Incr Delay (d2), s/veh				0.0	5.5	10.4	10.2	7.1	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln				0.0	5.3	6.1	8.5	6.6	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				0.0	22.9	27.8	23.6	19.7	0.0			
LnGrp LOS				A	C	C	C	B	A			
Approach Vol, veh/h					1217			1227				
Approach Delay, s/veh					24.5			21.8				
Approach LOS					C			C				

Timer - Assigned Phs	2	4
Phs Duration (G+Y+Rc), s	26.0	34.0
Change Period (Y+Rc), s	5.0	5.0
Max Green Setting (Gmax), s	21.0	29.0
Max Q Clear Time (g_c+I1), s	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	23.2
HCM 6th LOS	C

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	0	590	270	0	0	0	0	0	0	100	1325	0
Future Volume (veh/h)	0	590	270	0	0	0	0	0	0	100	1325	0
Initial Q (Qb), veh	0	0	0							0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00							1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00							1.00	1.00	1.00
Work Zone On Approach		No									No	
Adj Sat Flow, veh/h/ln	0	1639	1639							1639	1639	0
Adj Flow Rate, veh/h	0	1013	464							151	2002	0
Peak Hour Factor	0.92	0.92	0.92							0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2							2	2	0
Cap, veh/h	0	1072	491							195	2005	0
Arrive On Green	0.00	0.12	0.12							0.50	0.50	0.00
Sat Flow, veh/h	0	3148	1374							267	4145	0
Grp Volume(v), veh/h	0	1007	470							799	1354	0
Grp Sat Flow(s),veh/h/ln	0	1492	1392							1563	1357	0
Q Serve(g_s), s	0.0	23.5	23.5							31.8	34.8	0.0
Cycle Q Clear(g_c), s	0.0	23.5	23.5							35.0	34.8	0.0
Prop In Lane	0.00		0.99							0.19		0.00
Lane Grp Cap(c), veh/h	0	1065	497							843	1357	0
V/C Ratio(X)	0.00	0.95	0.95							0.95	1.00	0.00
Avail Cap(c_a), veh/h	0	1065	497							843	1357	0
HCM Platoon Ratio	1.00	0.33	0.33							1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00							1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	30.2	30.2							17.8	17.5	0.0
Incr Delay (d2), s/veh	0.0	17.2	28.8							20.8	23.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0							0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	11.7	12.5							16.4	14.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	47.4	59.0							38.6	41.3	0.0
LnGrp LOS	A	D	E							D	D	A
Approach Vol, veh/h		1477									2153	
Approach Delay, s/veh		51.1									40.3	
Approach LOS		D									D	

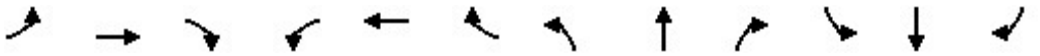
Timer - Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		30.0		40.0								
Change Period (Y+Rc), s		5.0		5.0								
Max Green Setting (Gmax), s		25.0		35.0								
Max Q Clear Time (g_c+I1), s		0.0		0.0								
Green Ext Time (p_c), s		0.0		0.0								

Intersection Summary		
HCM 6th Ctrl Delay		44.7
HCM 6th LOS		D

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	95	500	0	0	0	0	0	700	155	0	0	0
Future Volume (veh/h)	95	500	0	0	0	0	0	700	155	0	0	0
Initial Q (Qb), veh	0	0	0				0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	0.90			
Work Zone On Approach		No						No				
Adj Sat Flow, veh/h/ln	1639	1639	0				0	1639	1639			
Adj Flow Rate, veh/h	177	929	0				0	1050	232			
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92			
Percent Heavy Veh, %	2	2	0				0	2	2			
Cap, veh/h	299	1241	0				0	1472	591			
Arrive On Green	0.35	0.35	0.00				0.00	0.47	0.47			
Sat Flow, veh/h	593	3726	0				0	3196	1250			
Grp Volume(v), veh/h	410	696	0				0	1050	232			
Grp Sat Flow(s),veh/h/ln	1470	1357	0				0	1557	1250			
Q Serve(g_s), s	12.7	12.4	0.0				0.0	14.8	6.6			
Cycle Q Clear(g_c), s	13.8	12.4	0.0				0.0	14.8	6.6			
Prop In Lane	0.43		0.00				0.00		1.00			
Lane Grp Cap(c), veh/h	602	938	0				0	1472	591			
V/C Ratio(X)	0.68	0.74	0.00				0.00	0.71	0.39			
Avail Cap(c_a), veh/h	602	938	0				0	1472	591			
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00				0.00	1.00	1.00			
Uniform Delay (d), s/veh	16.3	15.8	0.0				0.0	11.5	9.4			
Incr Delay (d2), s/veh	6.1	5.3	0.0				0.0	3.0	2.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	5.0	4.0	0.0				0.0	4.9	1.9			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.4	21.1	0.0				0.0	14.5	11.3			
LnGrp LOS	C	C	A				A	B	B			
Approach Vol, veh/h		1106						1282				
Approach Delay, s/veh		21.6						13.9				
Approach LOS		C						B				

Timer - Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		24.0		31.0								
Change Period (Y+Rc), s		5.0		5.0								
Max Green Setting (Gmax), s		19.0		26.0								
Max Q Clear Time (g_c+I1), s		0.0		0.0								
Green Ext Time (p_c), s		0.0		0.0								

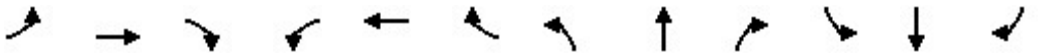
Intersection Summary												
HCM 6th Ctrl Delay			17.5									
HCM 6th LOS			B									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	40	1765	80	455	610	0	0	235	120
Future Volume (veh/h)	0	0	0	40	1765	80	455	610	0	0	235	120
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1850	1821	1850	1821	1821	0	0	1821	1821
Adj Flow Rate, veh/h				62	2294	116	680	870	0	0	388	206
Peak Hour Factor				0.75	0.90	0.81	0.85	0.89	0.88	0.88	0.83	0.80
Percent Heavy Veh, %				0	2	0	2	2	0	0	2	2
Cap, veh/h				48	1873	97	469	981	0	0	291	154
Arrive On Green				0.38	0.38	0.38	0.24	0.54	0.00	0.00	0.26	0.26
Sat Flow, veh/h				124	4870	253	1734	1821	0	0	1112	590
Grp Volume(v), veh/h				906	751	815	680	870	0	0	0	594
Grp Sat Flow(s),veh/h/ln				1815	1657	1774	1734	1821	0	0	0	1703
Q Serve(g_s), s				50.0	50.0	50.0	31.0	54.9	0.0	0.0	0.0	34.0
Cycle Q Clear(g_c), s				50.0	50.0	50.0	31.0	54.9	0.0	0.0	0.0	34.0
Prop In Lane				0.07		0.14	1.00		0.00	0.00		0.35
Lane Grp Cap(c), veh/h				698	637	682	469	981	0	0	0	445
V/C Ratio(X)				1.30	1.18	1.19	1.45	0.89	0.00	0.00	0.00	1.33
Avail Cap(c_a), veh/h				698	637	682	469	981	0	0	0	445
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				0.85	0.85	0.85	0.41	0.41	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				40.0	40.0	40.0	47.7	26.5	0.0	0.0	0.0	48.0
Incr Delay (d2), s/veh				142.9	94.1	99.3	207.4	5.4	0.0	0.0	0.0	165.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				49.4	36.5	40.0	41.5	24.8	0.0	0.0	0.0	34.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				182.9	134.1	139.3	255.1	31.9	0.0	0.0	0.0	213.0
LnGrp LOS				F	F	F	F	C	A	A	A	F
Approach Vol, veh/h					2472			1550			594	
Approach Delay, s/veh					153.7			129.8			213.0	
Approach LOS					F			F			F	

Timer - Assigned Phs	2	3	4					8				
Phs Duration (G+Y+Rc), s	55.0	36.0	39.0					75.0				
Change Period (Y+Rc), s	5.0	5.0	5.0					5.0				
Max Green Setting (Gmax), s	50.0	31.0	34.0					70.0				
Max Q Clear Time (g_c+I1), s	0.0	0.0	0.0					0.0				
Green Ext Time (p_c), s	0.0	0.0	0.0					0.0				

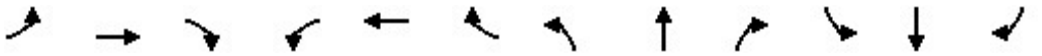
Intersection Summary												
HCM 6th Ctrl Delay		153.3										
HCM 6th LOS		F										



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	5	1820	290	15	420	0	0	135	300
Future Volume (vph)	0	0	0	5	1820	290	15	420	0	0	135	300
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Lane Width	12	12	12	12	12	12	11	11	12	12	11	11
Total Lost time (s)					6.0	6.0	6.0	6.0			6.0	6.0
Lane Util. Factor					0.91	1.00	1.00	0.95			0.95	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					4950	1542	1666	3331			3165	1490
Flt Permitted					1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)					4950	1542	1666	3331			3165	1490
Peak-hour factor, PHF	0.92	0.92	0.92	0.42	0.92	0.85	0.57	0.79	0.92	0.92	0.90	0.85
Growth Factor (vph)	100%	100%	100%	112%	112%	112%	180%	180%	180%	166%	166%	166%
Adj. Flow (vph)	0	0	0	13	2216	382	47	957	0	0	249	586
RTOR Reduction (vph)	0	0	0	0	0	53	0	0	0	0	0	67
Lane Group Flow (vph)	0	0	0	0	2229	329	47	957	0	0	249	519
Parking (#/hr)											0	
Turn Type				Perm	NA	Perm	Prot	NA			NA	Perm
Protected Phases					2		3	8			4	
Permitted Phases				2		2						4
Actuated Green, G (s)					46.0	46.0	4.0	42.0			32.0	32.0
Effective Green, g (s)					46.0	46.0	4.0	42.0			32.0	32.0
Actuated g/C Ratio					0.46	0.46	0.04	0.42			0.32	0.32
Clearance Time (s)					6.0	6.0	6.0	6.0			6.0	6.0
Vehicle Extension (s)					2.0	2.0	2.0	2.0			2.0	2.0
Lane Grp Cap (vph)					2277	709	66	1399			1012	476
v/s Ratio Prot							0.03	c0.29			0.08	
v/s Ratio Perm					0.45	0.21						c0.35
v/c Ratio					0.98	0.46	0.71	0.68			0.25	1.09
Uniform Delay, d1					26.5	18.5	47.4	23.6			25.1	34.0
Progression Factor					1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2					14.5	2.2	25.9	1.1			0.0	68.2
Delay (s)					41.0	20.7	73.3	24.7			25.1	102.2
Level of Service					D	C	E	C			C	F
Approach Delay (s)		0.0			38.1			27.0			79.2	
Approach LOS		A			D			C			E	

Intersection Summary			
HCM 2000 Control Delay	43.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	82.2%	ICU Level of Service	E
Analysis Period (min)	15		
Description: Count Date: 11/9/2016			

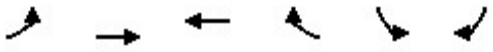
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	255	680	185	0	0	0	0	705	55	55	225	0
Future Volume (veh/h)	255	680	185	0	0	0	0	705	55	55	225	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99				1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1821	1821	1821				0	1821	1894	1821	1821	0
Adj Flow Rate, veh/h	431	1111	391				0	1041	82	100	411	0
Peak Hour Factor	0.90	0.93	0.72				0.92	0.84	0.83	0.86	0.86	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	768	1604	564				0	989	453	202	754	0
Arrive On Green	0.44	0.44	0.44				0.00	0.29	0.29	0.06	0.41	0.00
Sat Flow, veh/h	1734	3622	1274				0	3551	1585	1734	1821	0
Grp Volume(v), veh/h	431	1017	485				0	1041	82	100	411	0
Grp Sat Flow(s),veh/h/ln	1734	1657	1581				0	1730	1585	1734	1821	0
Q Serve(g_s), s	12.9	17.3	17.3				0.0	20.0	2.7	0.0	11.9	0.0
Cycle Q Clear(g_c), s	12.9	17.3	17.3				0.0	20.0	2.7	0.0	11.9	0.0
Prop In Lane	1.00		0.81				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	768	1468	700				0	989	453	202	754	0
V/C Ratio(X)	0.56	0.69	0.69				0.00	1.05	0.18	0.50	0.54	0.00
Avail Cap(c_a), veh/h	768	1468	700				0	989	453	202	754	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.86	0.86	0.86				0.00	1.00	1.00	0.09	0.09	0.00
Uniform Delay (d), s/veh	14.5	15.7	15.7				0.0	25.0	18.8	31.1	15.5	0.0
Incr Delay (d2), s/veh	2.5	2.3	4.8				0.0	43.6	0.9	0.2	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	6.3	6.5				0.0	13.7	1.1	1.6	4.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.0	18.0	20.5				0.0	68.6	19.7	31.3	15.8	0.0
LnGrp LOS	B	B	C				A	F	B	C	B	A
Approach Vol, veh/h		1933						1123			511	
Approach Delay, s/veh		18.4						65.0			18.8	
Approach LOS		B						E			B	

Timer - Assigned Phs				4		6	7	8				
Phs Duration (G+Y+Rc), s				34.0		36.0	9.0	25.0				
Change Period (Y+Rc), s				5.0		5.0	5.0	5.0				
Max Green Setting (Gmax), s				29.0		31.0	4.0	20.0				
Max Q Clear Time (g_c+I1), s				0.0		0.0	0.0	0.0				
Green Ext Time (p_c), s				0.0		0.0	0.0	0.0				

Intersection Summary												
HCM 6th Ctrl Delay			33.1									
HCM 6th LOS			C									



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	430	860	0	0	160	0
Future Volume (vph)	430	860	0	0	160	0
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850
Total Lost time (s)		5.5			6.0	
Lane Util. Factor		0.86			0.97	
Frt		1.00			1.00	
Flt Protected		0.98			0.95	
Satd. Flow (prot)		6134			3343	
Flt Permitted		0.98			0.95	
Satd. Flow (perm)		6134			3343	
Peak-hour factor, PHF	0.84	0.88	0.92	0.92	0.94	0.92
Growth Factor (vph)	149%	149%	100%	100%	181%	181%
Adj. Flow (vph)	763	1456	0	0	308	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	2219	0	0	308	0
Turn Type	Perm	NA			Prot	
Protected Phases		6			4	
Permitted Phases	6					
Actuated Green, G (s)		79.4			14.1	
Effective Green, g (s)		79.4			14.1	
Actuated g/C Ratio		0.76			0.13	
Clearance Time (s)		5.5			6.0	
Vehicle Extension (s)		2.0			2.0	
Lane Grp Cap (vph)		4638			448	
v/s Ratio Prot					c0.09	
v/s Ratio Perm		0.36				
v/c Ratio		0.48			0.69	
Uniform Delay, d1		4.9			43.3	
Progression Factor		1.00			1.00	
Incremental Delay, d2		0.4			3.5	
Delay (s)		5.2			46.8	
Level of Service		A			D	
Approach Delay (s)		5.2	0.0		46.8	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	10.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	11.5
Intersection Capacity Utilization	91.4%	ICU Level of Service	F
Analysis Period (min)	15		
Description: Count Date: 11/9/2016			

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	22	820	106	16	1684	4	218	64	36	18	30	4
Future Volume (vph)	22	820	106	16	1684	4	218	64	36	18	30	4
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Lane Width	10	13	12	12	12	12	12	12	12	11	12	12
Total Lost time (s)	6.0	5.5	5.5	6.0	5.5	5.5	6.0	5.5		6.0	6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1516	3526	1527	1706	3413	1527	3343	1716		1666	1784	
Flt Permitted	0.05	1.00	1.00	0.18	1.00	1.00	0.95	1.00		0.73	1.00	
Satd. Flow (perm)	74	3526	1527	332	3413	1527	3343	1716		1275	1784	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor (vph)	134%	134%	134%	141%	141%	141%	122%	122%	122%	157%	157%	157%
Adj. Flow (vph)	30	1133	146	23	2448	6	274	80	45	29	49	6
RTOR Reduction (vph)	0	0	59	0	0	2	0	14	0	0	4	0
Lane Group Flow (vph)	30	1133	87	23	2448	4	274	111	0	29	51	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	12	0	0	0	0	0	0	0	0	0	0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA		pm+pt	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2		2				4	4	
Actuated Green, G (s)	90.7	86.5	86.5	88.9	85.6	85.6	23.2	29.2		8.5	8.5	
Effective Green, g (s)	90.7	86.5	86.5	88.9	85.6	85.6	23.2	29.2		8.5	8.5	
Actuated g/C Ratio	0.63	0.60	0.60	0.61	0.59	0.59	0.16	0.20		0.06	0.06	
Clearance Time (s)	6.0	5.5	5.5	6.0	5.5	5.5	6.0	5.5		6.0	6.0	
Vehicle Extension (s)	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	88	2103	910	234	2014	901	534	345		82	104	
v/s Ratio Prot	c0.01	0.32		0.00	c0.72		c0.08	c0.06		0.01	c0.03	
v/s Ratio Perm	0.20		0.06	0.06		0.00				0.01		
v/c Ratio	0.34	0.54	0.10	0.10	1.22	0.00	0.51	0.32		0.35	0.49	
Uniform Delay, d1	34.3	17.4	12.5	12.9	29.7	12.2	55.7	49.4		65.4	66.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.3	1.0	0.2	0.1	101.8	0.0	0.3	0.2		1.0	1.3	
Delay (s)	36.6	18.4	12.7	12.9	131.5	12.2	56.1	49.6		66.4	67.5	
Level of Service	D	B	B	B	F	B	E	D		E	E	
Approach Delay (s)		18.2			130.1			54.1			67.1	
Approach LOS		B			F			D			E	

Intersection Summary			
HCM 2000 Control Delay	87.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	23.5
Intersection Capacity Utilization	98.1%	ICU Level of Service	F
Analysis Period (min)	15		

Description: Count Date: 1/21/2014

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	290	1060	0	0	0	0	0	635	45
Future Volume (veh/h)	0	0	0	290	1060	0	0	0	0	0	635	45
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.88
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach					No						No	
Adj Sat Flow, veh/h/ln				1626	1626	0				0	1639	1639
Adj Flow Rate, veh/h				388	1432	0				0	1447	110
Peak Hour Factor				0.95	0.94	0.88				0.88	0.86	0.80
Percent Heavy Veh, %				3	3	0				0	2	2
Cap, veh/h				468	1505	0				0	1613	123
Arrive On Green				0.46	0.46	0.00				0.00	0.38	0.38
Sat Flow, veh/h				823	3394	0				0	4341	319
Grp Volume(v), veh/h				656	1164	0				0	1029	528
Grp Sat Flow(s),veh/h/ln				1392	1347	0				0	1492	1529
Q Serve(g_s), s				30.0	26.7	0.0				0.0	21.1	21.1
Cycle Q Clear(g_c), s				30.0	26.7	0.0				0.0	21.1	21.1
Prop In Lane				0.59		0.00				0.00		0.21
Lane Grp Cap(c), veh/h				730	1243	0				0	1147	588
V/C Ratio(X)				0.90	0.94	0.00				0.00	0.90	0.90
Avail Cap(c_a), veh/h				730	1243	0				0	1147	588
HCM Platoon Ratio				1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				17.8	16.6	0.0				0.0	18.8	18.8
Incr Delay (d2), s/veh				16.0	14.3	0.0				0.0	11.0	19.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				12.0	9.7	0.0				0.0	8.4	9.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				33.9	30.9	0.0				0.0	29.8	37.8
LnGrp LOS				C	C	A				A	C	D
Approach Vol, veh/h					1820						1557	
Approach Delay, s/veh					31.9						32.5	
Approach LOS					C						C	

Timer - Assigned Phs	2	4
Phs Duration (G+Y+Rc), s	35.0	30.0
Change Period (Y+Rc), s	5.0	5.0
Max Green Setting (Gmax), s	30.0	25.0
Max Q Clear Time (g_c+I1), s	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	32.2
HCM 6th LOS	C

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	780	130	75	755	0	0	0	0
Future Volume (veh/h)	0	0	0	0	780	130	75	755	0	0	0	0
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00			
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach					No			No				
Adj Sat Flow, veh/h/ln				0	1626	1626	1639	1639	0			
Adj Flow Rate, veh/h				0	1051	175	112	1124	0			
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %				0	3	3	2	2	0			
Cap, veh/h				0	1342	223	133	1405	0			
Arrive On Green				0.00	0.35	0.35	0.48	0.48	0.00			
Sat Flow, veh/h				0	3980	637	276	2989	0			
Grp Volume(v), veh/h				0	811	415	661	575	0			
Grp Sat Flow(s),veh/h/ln				0	1480	1511	1625	1557	0			
Q Serve(g_s), s				0.0	14.7	14.8	21.2	18.2	0.0			
Cycle Q Clear(g_c), s				0.0	14.7	14.8	21.2	18.2	0.0			
Prop In Lane				0.00		0.42	0.17		0.00			
Lane Grp Cap(c), veh/h				0	1036	529	786	753	0			
V/C Ratio(X)				0.00	0.78	0.78	0.84	0.76	0.00			
Avail Cap(c_a), veh/h				0	1036	529	786	753	0			
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	17.5	17.5	13.5	12.7	0.0			
Incr Delay (d2), s/veh				0.0	5.9	11.1	10.6	7.3	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln				0.0	5.4	6.3	8.7	6.7	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				0.0	23.4	28.6	24.0	20.0	0.0			
LnGrp LOS				A	C	C	C	B	A			
Approach Vol, veh/h					1226			1236				
Approach Delay, s/veh					25.1			22.1				
Approach LOS					C			C				

Timer - Assigned Phs	2	4
Phs Duration (G+Y+Rc), s	26.0	34.0
Change Period (Y+Rc), s	5.0	5.0
Max Green Setting (Gmax), s	21.0	29.0
Max Q Clear Time (g_c+I1), s	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	23.6
HCM 6th LOS	C

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	0	590	270	0	0	0	0	0	0	100	1325	0
Future Volume (veh/h)	0	590	270	0	0	0	0	0	0	100	1325	0
Initial Q (Qb), veh	0	0	0							0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00							1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00							1.00	1.00	1.00
Work Zone On Approach		No									No	
Adj Sat Flow, veh/h/ln	0	1626	1626							1639	1639	0
Adj Flow Rate, veh/h	0	1032	472							152	2016	0
Peak Hour Factor	0.92	0.92	0.92							0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3							2	2	0
Cap, veh/h	0	1064	486							195	2005	0
Arrive On Green	0.00	0.12	0.12							0.50	0.50	0.00
Sat Flow, veh/h	0	3125	1362							267	4144	0
Grp Volume(v), veh/h	0	1025	479							805	1363	0
Grp Sat Flow(s),veh/h/ln	0	1480	1381							1563	1357	0
Q Serve(g_s), s	0.0	24.2	24.2							31.9	35.0	0.0
Cycle Q Clear(g_c), s	0.0	24.2	24.2							35.0	35.0	0.0
Prop In Lane	0.00		0.99							0.19		0.00
Lane Grp Cap(c), veh/h	0	1057	493							843	1357	0
V/C Ratio(X)	0.00	0.97	0.97							0.96	1.00	0.00
Avail Cap(c_a), veh/h	0	1057	493							843	1357	0
HCM Platoon Ratio	1.00	0.33	0.33							1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00							1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	30.5	30.5							17.9	17.5	0.0
Incr Delay (d2), s/veh	0.0	21.4	33.8							21.9	25.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0							0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	12.5	13.4							16.8	14.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	51.9	64.3							39.8	42.9	0.0
LnGrp LOS	A	D	E							D	F	A
Approach Vol, veh/h		1504									2168	
Approach Delay, s/veh		55.8									41.8	
Approach LOS		E									D	

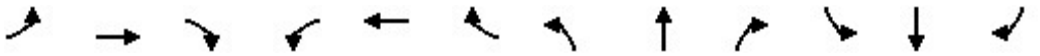
Timer - Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		30.0		40.0								
Change Period (Y+Rc), s		5.0		5.0								
Max Green Setting (Gmax), s		25.0		35.0								
Max Q Clear Time (g_c+I1), s		0.0		0.0								
Green Ext Time (p_c), s		0.0		0.0								

Intersection Summary	
HCM 6th Ctrl Delay	47.5
HCM 6th LOS	D

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	95	500	0	0	0	0	0	700	155	0	0	0
Future Volume (veh/h)	95	500	0	0	0	0	0	700	155	0	0	0
Initial Q (Qb), veh	0	0	0				0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	0.90			
Work Zone On Approach		No						No				
Adj Sat Flow, veh/h/ln	1613	1613	0				0	1639	1639			
Adj Flow Rate, veh/h	179	940	0				0	1058	234			
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92			
Percent Heavy Veh, %	4	4	0				0	2	2			
Cap, veh/h	296	1221	0				0	1472	591			
Arrive On Green	0.35	0.35	0.00				0.00	0.47	0.47			
Sat Flow, veh/h	585	3666	0				0	3196	1250			
Grp Volume(v), veh/h	415	704	0				0	1058	234			
Grp Sat Flow(s),veh/h/ln	1447	1336	0				0	1557	1250			
Q Serve(g_s), s	13.3	12.9	0.0				0.0	14.9	6.7			
Cycle Q Clear(g_c), s	14.4	12.9	0.0				0.0	14.9	6.7			
Prop In Lane	0.43		0.00				0.00		1.00			
Lane Grp Cap(c), veh/h	593	923	0				0	1472	591			
V/C Ratio(X)	0.70	0.76	0.00				0.00	0.72	0.40			
Avail Cap(c_a), veh/h	593	923	0				0	1472	591			
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00				0.00	1.00	1.00			
Uniform Delay (d), s/veh	16.4	16.0	0.0				0.0	11.6	9.4			
Incr Delay (d2), s/veh	6.7	6.0	0.0				0.0	3.1	2.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	5.2	4.2	0.0				0.0	4.9	1.9			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.1	22.0	0.0				0.0	14.6	11.4			
LnGrp LOS	C	C	A				A	B	B			
Approach Vol, veh/h		1119						1292				
Approach Delay, s/veh		22.4						14.0				
Approach LOS		C						B				

Timer - Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		24.0		31.0								
Change Period (Y+Rc), s		5.0		5.0								
Max Green Setting (Gmax), s		19.0		26.0								
Max Q Clear Time (g_c+I1), s		0.0		0.0								
Green Ext Time (p_c), s		0.0		0.0								

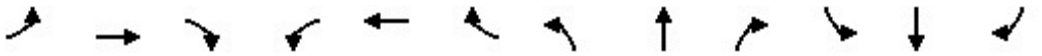
Intersection Summary												
HCM 6th Ctrl Delay			17.9									
HCM 6th LOS			B									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	40	1765	80	455	610	0	0	235	120
Future Volume (veh/h)	0	0	0	40	1765	80	455	610	0	0	235	120
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj				0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1850	1807	1850	1821	1821	0	0	1821	1821
Adj Flow Rate, veh/h				62	2294	116	680	870	0	0	388	206
Peak Hour Factor				0.75	0.90	0.81	0.85	0.89	0.88	0.88	0.83	0.80
Percent Heavy Veh, %				0	3	0	2	2	0	0	2	2
Cap, veh/h				47	1828	95	469	981	0	0	291	154
Arrive On Green				0.38	0.38	0.38	0.24	0.54	0.00	0.00	0.26	0.26
Sat Flow, veh/h				121	4752	246	1734	1821	0	0	1112	590
Grp Volume(v), veh/h				878	765	829	680	870	0	0	0	594
Grp Sat Flow(s),veh/h/ln				1714	1644	1761	1734	1821	0	0	0	1703
Q Serve(g_s), s				50.0	50.0	50.0	31.0	54.9	0.0	0.0	0.0	34.0
Cycle Q Clear(g_c), s				50.0	50.0	50.0	31.0	54.9	0.0	0.0	0.0	34.0
Prop In Lane				0.07		0.14	1.00		0.00	0.00		0.35
Lane Grp Cap(c), veh/h				659	632	677	469	981	0	0	0	445
V/C Ratio(X)				1.33	1.21	1.22	1.45	0.89	0.00	0.00	0.00	1.33
Avail Cap(c_a), veh/h				659	632	677	469	981	0	0	0	445
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				0.85	0.85	0.85	0.40	0.40	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				40.0	40.0	40.0	47.7	26.5	0.0	0.0	0.0	48.0
Incr Delay (d2), s/veh				158.0	106.7	112.1	207.3	5.2	0.0	0.0	0.0	165.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				49.4	38.4	42.1	41.5	24.7	0.0	0.0	0.0	34.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				198.0	146.7	152.1	255.0	31.7	0.0	0.0	0.0	213.0
LnGrp LOS				F	F	F	F	C	A	A	A	F
Approach Vol, veh/h					2472			1550			594	
Approach Delay, s/veh					166.7			129.7			213.0	
Approach LOS					F			F			F	

Timer - Assigned Phs	2	3	4					8				
Phs Duration (G+Y+Rc), s	55.0	36.0	39.0					75.0				
Change Period (Y+Rc), s	5.0	5.0	5.0					5.0				
Max Green Setting (Gmax), s	50.0	31.0	34.0					70.0				
Max Q Clear Time (g_c+I1), s	0.0	0.0	0.0					0.0				
Green Ext Time (p_c), s	0.0	0.0	0.0					0.0				

Intersection Summary												
HCM 6th Ctrl Delay		160.2										
HCM 6th LOS		F										

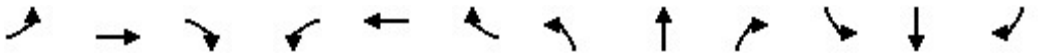


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	5	1820	290	15	420	0	0	135	300
Future Volume (vph)	0	0	0	5	1820	290	15	420	0	0	135	300
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Lane Width	12	12	12	12	12	12	11	11	12	12	11	11
Total Lost time (s)					6.0	6.0	6.0	6.0			6.0	6.0
Lane Util. Factor					0.91	1.00	1.00	0.95			0.95	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					4902	1453	1666	3331			3074	1448
Flt Permitted					1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)					4902	1453	1666	3331			3074	1448
Peak-hour factor, PHF	0.92	0.92	0.92	0.42	0.92	0.85	0.57	0.79	0.92	0.92	0.90	0.85
Growth Factor (vph)	100%	100%	100%	112%	112%	112%	185%	185%	185%	166%	166%	166%
Adj. Flow (vph)	0	0	0	13	2216	382	49	984	0	0	249	586
RTOR Reduction (vph)	0	0	0	0	0	53	0	0	0	0	0	67
Lane Group Flow (vph)	0	0	0	0	2229	329	49	984	0	0	249	519
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	12	0	0	0	0	0	0
Parking (#/hr)											0	
Turn Type				Perm	NA	Perm	Prot	NA			NA	Perm
Protected Phases					2		3	8			4	
Permitted Phases				2		2						4
Actuated Green, G (s)					46.0	46.0	4.0	42.0			32.0	32.0
Effective Green, g (s)					46.0	46.0	4.0	42.0			32.0	32.0
Actuated g/C Ratio					0.46	0.46	0.04	0.42			0.32	0.32
Clearance Time (s)					6.0	6.0	6.0	6.0			6.0	6.0
Vehicle Extension (s)					2.0	2.0	2.0	2.0			2.0	2.0
Lane Grp Cap (vph)					2254	668	66	1399			983	463
v/s Ratio Prot							0.03	c0.30			0.08	
v/s Ratio Perm					0.45	0.23						c0.36
v/c Ratio					0.99	0.49	0.74	0.70			0.25	1.12
Uniform Delay, d1					26.7	18.9	47.5	23.9			25.2	34.0
Progression Factor					1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2					16.5	2.6	32.0	1.3			0.0	79.5
Delay (s)					43.3	21.4	79.5	25.2			25.2	113.5
Level of Service					D	C	E	C			C	F
Approach Delay (s)		0.0			40.1			27.8			87.2	
Approach LOS		A			D			C			F	

Intersection Summary			
HCM 2000 Control Delay	46.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	82.2%	ICU Level of Service	E
Analysis Period (min)	15		

Description: Count Date: 11/9/2016

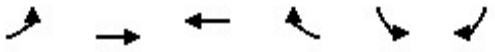
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	255	680	185	0	0	0	0	705	55	55	225	0
Future Volume (veh/h)	255	680	185	0	0	0	0	705	55	55	225	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99				1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1807	1807	1807				0	1821	1894	1821	1821	0
Adj Flow Rate, veh/h	431	1111	391				0	1041	82	100	411	0
Peak Hour Factor	0.90	0.93	0.72				0.92	0.84	0.83	0.86	0.86	0.92
Percent Heavy Veh, %	3	3	3				0	2	2	2	2	0
Cap, veh/h	762	1591	560				0	989	453	202	754	0
Arrive On Green	0.44	0.44	0.44				0.00	0.29	0.29	0.06	0.41	0.00
Sat Flow, veh/h	1721	3593	1264				0	3551	1585	1734	1821	0
Grp Volume(v), veh/h	431	1017	485				0	1041	82	100	411	0
Grp Sat Flow(s),veh/h/ln	1721	1644	1569				0	1730	1585	1734	1821	0
Q Serve(g_s), s	13.0	17.5	17.5				0.0	20.0	2.7	0.0	11.9	0.0
Cycle Q Clear(g_c), s	13.0	17.5	17.5				0.0	20.0	2.7	0.0	11.9	0.0
Prop In Lane	1.00		0.81				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	762	1456	695				0	989	453	202	754	0
V/C Ratio(X)	0.57	0.70	0.70				0.00	1.05	0.18	0.50	0.54	0.00
Avail Cap(c_a), veh/h	762	1456	695				0	989	453	202	754	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.84	0.84	0.84				0.00	1.00	1.00	0.09	0.09	0.00
Uniform Delay (d), s/veh	14.5	15.7	15.7				0.0	25.0	18.8	31.1	15.5	0.0
Incr Delay (d2), s/veh	2.6	2.4	4.9				0.0	43.6	0.9	0.2	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	6.3	6.5				0.0	13.7	1.1	1.6	4.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.0	18.1	20.6				0.0	68.6	19.7	31.3	15.8	0.0
LnGrp LOS	B	B	C				A	F	B	C	B	A
Approach Vol, veh/h		1933						1123			511	
Approach Delay, s/veh		18.5						65.0			18.8	
Approach LOS		B						E			B	

Timer - Assigned Phs				4		6	7	8				
Phs Duration (G+Y+Rc), s				34.0		36.0	9.0	25.0				
Change Period (Y+Rc), s				5.0		5.0	5.0	5.0				
Max Green Setting (Gmax), s				29.0		31.0	4.0	20.0				
Max Q Clear Time (g_c+I1), s				0.0		0.0	0.0	0.0				
Green Ext Time (p_c), s				0.0		0.0	0.0	0.0				

Intersection Summary												
HCM 6th Ctrl Delay			33.2									
HCM 6th LOS			C									



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	430	860	0	0	160	0
Future Volume (vph)	430	860	0	0	160	0
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850
Total Lost time (s)		5.5			6.0	
Lane Util. Factor		0.86			0.97	
Frt		1.00			1.00	
Flt Protected		0.98			0.95	
Satd. Flow (prot)		6134			3100	
Flt Permitted		0.98			0.95	
Satd. Flow (perm)		6134			3100	
Peak-hour factor, PHF	0.84	0.88	0.92	0.92	0.94	0.92
Growth Factor (vph)	151%	151%	100%	100%	185%	185%
Adj. Flow (vph)	773	1476	0	0	315	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	2249	0	0	315	0
Heavy Vehicles (%)	2%	2%	2%	2%	10%	10%
Turn Type	Perm	NA			Prot	
Protected Phases		6			4	
Permitted Phases	6					
Actuated Green, G (s)		78.4			15.1	
Effective Green, g (s)		78.4			15.1	
Actuated g/C Ratio		0.75			0.14	
Clearance Time (s)		5.5			6.0	
Vehicle Extension (s)		2.0			2.0	
Lane Grp Cap (vph)		4580			445	
v/s Ratio Prot					c0.10	
v/s Ratio Perm		0.37				
v/c Ratio		0.49			0.71	
Uniform Delay, d1		5.3			42.8	
Progression Factor		1.00			1.00	
Incremental Delay, d2		0.4			4.2	
Delay (s)		5.7			47.0	
Level of Service		A			D	
Approach Delay (s)		5.7	0.0		47.0	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	11.5
Intersection Capacity Utilization	91.4%	ICU Level of Service	F
Analysis Period (min)	15		

Description: Count Date: 11/9/2016

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	22	820	106	16	1684	4	218	64	36	18	30	4
Future Volume (vph)	22	820	106	16	1684	4	218	64	36	18	30	4
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Lane Width	10	13	12	12	12	12	12	12	12	11	12	12
Total Lost time (s)	12.0	5.5	5.5	6.0	5.5	5.5	6.0	5.5		6.0	6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1516	3526	1527	1706	3413	1527	3343	1716		1666	1784	
Flt Permitted	0.05	1.00	1.00	0.20	1.00	1.00	0.95	1.00		0.73	1.00	
Satd. Flow (perm)	74	3526	1527	357	3413	1527	3343	1716		1275	1784	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor (vph)	134%	134%	134%	141%	141%	141%	122%	122%	122%	157%	157%	157%
Adj. Flow (vph)	30	1133	146	23	2448	6	274	80	45	29	49	6
RTOR Reduction (vph)	0	0	59	0	0	3	0	14	0	0	4	0
Lane Group Flow (vph)	30	1133	87	23	2448	3	274	111	0	29	51	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	12	0	0	0	0	0	0	0	0	0	0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA		pm+pt	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2		2				4	4	
Actuated Green, G (s)	90.8	86.5	86.5	82.8	79.5	79.5	23.2	29.2		8.5	8.5	
Effective Green, g (s)	90.8	86.5	86.5	82.8	79.5	79.5	23.2	29.2		8.5	8.5	
Actuated g/C Ratio	0.63	0.60	0.60	0.57	0.55	0.55	0.16	0.20		0.06	0.06	
Clearance Time (s)	12.0	5.5	5.5	6.0	5.5	5.5	6.0	5.5		6.0	6.0	
Vehicle Extension (s)	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	89	2103	910	234	1871	837	534	345		82	104	
v/s Ratio Prot	c0.01	c0.32		0.00	c0.72		c0.08	c0.06		0.01	c0.03	
v/s Ratio Perm	0.20		0.06	0.05		0.00				0.01		
v/c Ratio	0.34	0.54	0.10	0.10	1.31	0.00	0.51	0.32		0.35	0.49	
Uniform Delay, d1	34.3	17.4	12.5	14.5	32.8	14.8	55.7	49.4		65.4	66.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.2	1.0	0.2	0.1	142.7	0.0	0.3	0.2		1.0	1.3	
Delay (s)	36.5	18.4	12.7	14.6	175.5	14.8	56.1	49.6		66.4	67.5	
Level of Service	D	B	B	B	F	B	E	D		E	E	
Approach Delay (s)		18.2			173.6			54.1			67.1	
Approach LOS		B			F			D			E	

Intersection Summary			
HCM 2000 Control Delay	112.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	29.5
Intersection Capacity Utilization	98.1%	ICU Level of Service	F
Analysis Period (min)	15		
Description: Count Date: 1/21/2014			
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	290	1060	0	0	0	0	0	635	45
Future Volume (veh/h)	0	0	0	290	1060	0	0	0	0	0	635	45
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.88
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach					No						No	
Adj Sat Flow, veh/h/ln				1626	1626	0				0	1639	1639
Adj Flow Rate, veh/h				388	1432	0				0	1447	110
Peak Hour Factor				0.95	0.94	0.88				0.88	0.86	0.80
Percent Heavy Veh, %				3	3	0				0	2	2
Cap, veh/h				468	1505	0				0	1613	123
Arrive On Green				0.46	0.46	0.00				0.00	0.38	0.38
Sat Flow, veh/h				823	3394	0				0	4341	319
Grp Volume(v), veh/h				656	1164	0				0	1029	528
Grp Sat Flow(s),veh/h/ln				1392	1347	0				0	1492	1529
Q Serve(g_s), s				30.0	26.7	0.0				0.0	21.1	21.1
Cycle Q Clear(g_c), s				30.0	26.7	0.0				0.0	21.1	21.1
Prop In Lane				0.59		0.00				0.00		0.21
Lane Grp Cap(c), veh/h				730	1243	0				0	1147	588
V/C Ratio(X)				0.90	0.94	0.00				0.00	0.90	0.90
Avail Cap(c_a), veh/h				730	1243	0				0	1147	588
HCM Platoon Ratio				1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				17.8	16.6	0.0				0.0	18.8	18.8
Incr Delay (d2), s/veh				16.0	14.3	0.0				0.0	11.0	19.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				12.0	9.7	0.0				0.0	8.4	9.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				33.9	30.9	0.0				0.0	29.8	37.8
LnGrp LOS				C	C	A				A	C	D
Approach Vol, veh/h					1820						1557	
Approach Delay, s/veh					31.9						32.5	
Approach LOS					C						C	

Timer - Assigned Phs	2	4
Phs Duration (G+Y+Rc), s	35.0	30.0
Change Period (Y+Rc), s	5.0	5.0
Max Green Setting (Gmax), s	30.0	25.0
Max Q Clear Time (g_c+I1), s	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	32.2
HCM 6th LOS	C

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	780	130	75	755	0	0	0	0
Future Volume (veh/h)	0	0	0	0	780	130	75	755	0	0	0	0
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00			
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach					No			No				
Adj Sat Flow, veh/h/ln				0	1626	1626	1639	1639	0			
Adj Flow Rate, veh/h				0	1051	175	112	1124	0			
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %				0	3	3	2	2	0			
Cap, veh/h				0	1342	223	133	1405	0			
Arrive On Green				0.00	0.35	0.35	0.48	0.48	0.00			
Sat Flow, veh/h				0	3980	637	276	2989	0			
Grp Volume(v), veh/h				0	811	415	661	575	0			
Grp Sat Flow(s),veh/h/ln				0	1480	1511	1625	1557	0			
Q Serve(g_s), s				0.0	14.7	14.8	21.2	18.2	0.0			
Cycle Q Clear(g_c), s				0.0	14.7	14.8	21.2	18.2	0.0			
Prop In Lane				0.00		0.42	0.17		0.00			
Lane Grp Cap(c), veh/h				0	1036	529	786	753	0			
V/C Ratio(X)				0.00	0.78	0.78	0.84	0.76	0.00			
Avail Cap(c_a), veh/h				0	1036	529	786	753	0			
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	17.5	17.5	13.5	12.7	0.0			
Incr Delay (d2), s/veh				0.0	5.9	11.1	10.6	7.3	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln				0.0	5.4	6.3	8.7	6.7	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				0.0	23.4	28.6	24.0	20.0	0.0			
LnGrp LOS				A	C	C	C	B	A			
Approach Vol, veh/h					1226			1236				
Approach Delay, s/veh					25.1			22.1				
Approach LOS					C			C				

Timer - Assigned Phs	2	4
Phs Duration (G+Y+Rc), s	26.0	34.0
Change Period (Y+Rc), s	5.0	5.0
Max Green Setting (Gmax), s	21.0	29.0
Max Q Clear Time (g_c+I1), s	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	23.6
HCM 6th LOS	C

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	0	590	270	0	0	0	0	0	0	100	1325	0
Future Volume (veh/h)	0	590	270	0	0	0	0	0	0	100	1325	0
Initial Q (Qb), veh	0	0	0							0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00							1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00							1.00	1.00	1.00
Work Zone On Approach		No									No	
Adj Sat Flow, veh/h/ln	0	1626	1626							1639	1639	0
Adj Flow Rate, veh/h	0	1032	472							152	2016	0
Peak Hour Factor	0.92	0.92	0.92							0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3							2	2	0
Cap, veh/h	0	1064	486							195	2005	0
Arrive On Green	0.00	0.12	0.12							0.50	0.50	0.00
Sat Flow, veh/h	0	3125	1362							267	4144	0
Grp Volume(v), veh/h	0	1025	479							805	1363	0
Grp Sat Flow(s),veh/h/ln	0	1480	1381							1563	1357	0
Q Serve(g_s), s	0.0	24.2	24.2							31.9	35.0	0.0
Cycle Q Clear(g_c), s	0.0	24.2	24.2							35.0	35.0	0.0
Prop In Lane	0.00		0.99							0.19		0.00
Lane Grp Cap(c), veh/h	0	1057	493							843	1357	0
V/C Ratio(X)	0.00	0.97	0.97							0.96	1.00	0.00
Avail Cap(c_a), veh/h	0	1057	493							843	1357	0
HCM Platoon Ratio	1.00	0.33	0.33							1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00							1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	30.5	30.5							17.9	17.5	0.0
Incr Delay (d2), s/veh	0.0	21.4	33.8							21.9	25.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0							0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	12.5	13.4							16.8	14.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	51.9	64.3							39.8	42.9	0.0
LnGrp LOS	A	D	E							D	F	A
Approach Vol, veh/h		1504									2168	
Approach Delay, s/veh		55.8									41.8	
Approach LOS		E									D	

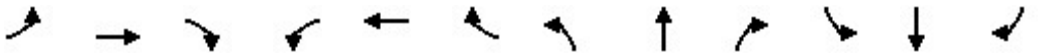
Timer - Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		30.0		40.0								
Change Period (Y+Rc), s		5.0		5.0								
Max Green Setting (Gmax), s		25.0		35.0								
Max Q Clear Time (g_c+I1), s		0.0		0.0								
Green Ext Time (p_c), s		0.0		0.0								

Intersection Summary	
HCM 6th Ctrl Delay	47.5
HCM 6th LOS	D

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	95	500	0	0	0	0	0	700	155	0	0	0
Future Volume (veh/h)	95	500	0	0	0	0	0	700	155	0	0	0
Initial Q (Qb), veh	0	0	0				0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	0.90			
Work Zone On Approach		No						No				
Adj Sat Flow, veh/h/ln	1613	1613	0				0	1639	1639			
Adj Flow Rate, veh/h	179	940	0				0	1058	234			
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92			
Percent Heavy Veh, %	4	4	0				0	2	2			
Cap, veh/h	296	1221	0				0	1472	591			
Arrive On Green	0.35	0.35	0.00				0.00	0.47	0.47			
Sat Flow, veh/h	585	3666	0				0	3196	1250			
Grp Volume(v), veh/h	415	704	0				0	1058	234			
Grp Sat Flow(s),veh/h/ln	1447	1336	0				0	1557	1250			
Q Serve(g_s), s	13.3	12.9	0.0				0.0	14.9	6.7			
Cycle Q Clear(g_c), s	14.4	12.9	0.0				0.0	14.9	6.7			
Prop In Lane	0.43		0.00				0.00		1.00			
Lane Grp Cap(c), veh/h	593	923	0				0	1472	591			
V/C Ratio(X)	0.70	0.76	0.00				0.00	0.72	0.40			
Avail Cap(c_a), veh/h	593	923	0				0	1472	591			
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00				0.00	1.00	1.00			
Uniform Delay (d), s/veh	16.4	16.0	0.0				0.0	11.6	9.4			
Incr Delay (d2), s/veh	6.7	6.0	0.0				0.0	3.1	2.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	5.2	4.2	0.0				0.0	4.9	1.9			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.1	22.0	0.0				0.0	14.6	11.4			
LnGrp LOS	C	C	A				A	B	B			
Approach Vol, veh/h		1119						1292				
Approach Delay, s/veh		22.4						14.0				
Approach LOS		C						B				

Timer - Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		24.0		31.0								
Change Period (Y+Rc), s		5.0		5.0								
Max Green Setting (Gmax), s		19.0		26.0								
Max Q Clear Time (g_c+I1), s		0.0		0.0								
Green Ext Time (p_c), s		0.0		0.0								

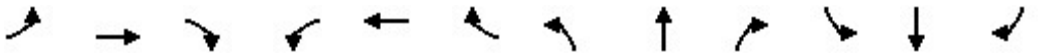
Intersection Summary												
HCM 6th Ctrl Delay			17.9									
HCM 6th LOS			B									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	40	1765	80	455	610	0	0	235	120
Future Volume (veh/h)	0	0	0	40	1765	80	455	610	0	0	235	120
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj				0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1850	1807	1850	1821	1821	0	0	1821	1821
Adj Flow Rate, veh/h				62	2294	116	680	870	0	0	388	206
Peak Hour Factor				0.75	0.90	0.81	0.85	0.89	0.88	0.88	0.83	0.80
Percent Heavy Veh, %				0	3	0	2	2	0	0	2	2
Cap, veh/h				52	2047	106	469	897	0	0	239	127
Arrive On Green				0.43	0.43	0.43	0.24	0.49	0.00	0.00	0.22	0.22
Sat Flow, veh/h				121	4752	246	1734	1821	0	0	1111	590
Grp Volume(v), veh/h				878	765	829	680	870	0	0	0	594
Grp Sat Flow(s),veh/h/ln				1714	1644	1761	1734	1821	0	0	0	1700
Q Serve(g_s), s				56.0	56.0	56.0	31.0	60.4	0.0	0.0	0.0	28.0
Cycle Q Clear(g_c), s				56.0	56.0	56.0	31.0	60.4	0.0	0.0	0.0	28.0
Prop In Lane				0.07		0.14	1.00		0.00	0.00		0.35
Lane Grp Cap(c), veh/h				738	708	759	469	897	0	0	0	366
V/C Ratio(X)				1.19	1.08	1.09	1.45	0.97	0.00	0.00	0.00	1.62
Avail Cap(c_a), veh/h				738	708	759	469	897	0	0	0	366
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				0.85	0.85	0.85	0.40	0.40	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				37.0	37.0	37.0	47.7	32.1	0.0	0.0	0.0	51.0
Incr Delay (d2), s/veh				96.5	55.1	58.8	207.3	13.2	0.0	0.0	0.0	292.2
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				42.4	32.5	35.6	41.5	29.4	0.0	0.0	0.0	41.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				133.5	92.1	95.8	255.0	45.3	0.0	0.0	0.0	343.2
LnGrp LOS				F	F	F	F	D	A	A	A	F
Approach Vol, veh/h					2472			1550			594	
Approach Delay, s/veh					108.0			137.3			343.2	
Approach LOS					F			F			F	

Timer - Assigned Phs	2	3	4					8				
Phs Duration (G+Y+Rc), s	61.0	36.0	33.0					69.0				
Change Period (Y+Rc), s	5.0	5.0	5.0					5.0				
Max Green Setting (Gmax), s	56.0	31.0	28.0					64.0				
Max Q Clear Time (g_c+I1), s	0.0	0.0	0.0					0.0				
Green Ext Time (p_c), s	0.0	0.0	0.0					0.0				

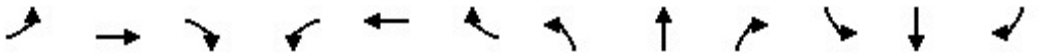
Intersection Summary	
HCM 6th Ctrl Delay	148.1
HCM 6th LOS	F



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	5	1820	290	15	420	0	0	135	300
Future Volume (vph)	0	0	0	5	1820	290	15	420	0	0	135	300
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Lane Width	12	12	12	12	12	12	11	11	12	12	11	11
Total Lost time (s)					12.0	12.0	6.0	6.0			6.0	6.0
Lane Util. Factor					0.91	1.00	1.00	0.95			0.95	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					4902	1453	1666	3331			3074	1448
Flt Permitted					1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)					4902	1453	1666	3331			3074	1448
Peak-hour factor, PHF	0.92	0.92	0.92	0.42	0.92	0.85	0.57	0.79	0.92	0.92	0.90	0.85
Growth Factor (vph)	100%	100%	100%	112%	112%	112%	185%	185%	185%	166%	166%	166%
Adj. Flow (vph)	0	0	0	13	2216	382	49	984	0	0	249	586
RTOR Reduction (vph)	0	0	0	0	0	54	0	0	0	0	0	119
Lane Group Flow (vph)	0	0	0	0	2229	328	49	984	0	0	249	467
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	12	0	0	0	0	0	0
Parking (#/hr)											0	
Turn Type				Perm	NA	Perm	Prot	NA			NA	Perm
Protected Phases					2		3	8			4	
Permitted Phases				2		2						4
Actuated Green, G (s)					44.6	44.6	4.0	37.4			27.4	27.4
Effective Green, g (s)					44.6	44.6	4.0	37.4			27.4	27.4
Actuated g/C Ratio					0.45	0.45	0.04	0.37			0.27	0.27
Clearance Time (s)					12.0	12.0	6.0	6.0			6.0	6.0
Vehicle Extension (s)					2.0	2.0	2.0	2.0			2.0	2.0
Lane Grp Cap (vph)					2186	648	66	1245			842	396
v/s Ratio Prot							0.03	c0.30			0.08	
v/s Ratio Perm					0.45	0.23						c0.32
v/c Ratio					1.02	0.51	0.74	0.79			0.30	1.18
Uniform Delay, d1					27.7	19.8	47.5	27.8			28.7	36.3
Progression Factor					1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2					24.4	2.8	32.0	3.3			0.1	103.8
Delay (s)					52.1	22.6	79.5	31.1			28.7	140.1
Level of Service					D	C	E	C			C	F
Approach Delay (s)		0.0			47.8			33.4			106.9	
Approach LOS		A			D			C			F	

Intersection Summary			
HCM 2000 Control Delay	55.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	91.6%	ICU Level of Service	F
Analysis Period (min)	15		
Description: Count Date: 11/9/2016			

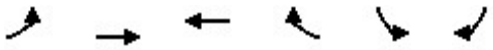
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	255	680	185	0	0	0	0	705	55	55	225	0
Future Volume (veh/h)	255	680	185	0	0	0	0	705	55	55	225	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99				1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1807	1807	1807				0	1821	1894	1821	1821	0
Adj Flow Rate, veh/h	431	1111	391				0	1041	82	100	411	0
Peak Hour Factor	0.90	0.93	0.72				0.92	0.84	0.83	0.86	0.86	0.92
Percent Heavy Veh, %	3	3	3				0	2	2	2	2	0
Cap, veh/h	762	1591	560				0	989	453	202	754	0
Arrive On Green	0.44	0.44	0.44				0.00	0.29	0.29	0.06	0.41	0.00
Sat Flow, veh/h	1721	3593	1264				0	3551	1585	1734	1821	0
Grp Volume(v), veh/h	431	1017	485				0	1041	82	100	411	0
Grp Sat Flow(s),veh/h/ln	1721	1644	1569				0	1730	1585	1734	1821	0
Q Serve(g_s), s	13.0	17.5	17.5				0.0	20.0	2.7	0.0	11.9	0.0
Cycle Q Clear(g_c), s	13.0	17.5	17.5				0.0	20.0	2.7	0.0	11.9	0.0
Prop In Lane	1.00		0.81				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	762	1456	695				0	989	453	202	754	0
V/C Ratio(X)	0.57	0.70	0.70				0.00	1.05	0.18	0.50	0.54	0.00
Avail Cap(c_a), veh/h	762	1456	695				0	989	453	202	754	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.81	0.81	0.81				0.00	1.00	1.00	0.09	0.09	0.00
Uniform Delay (d), s/veh	14.5	15.7	15.7				0.0	25.0	18.8	31.1	15.5	0.0
Incr Delay (d2), s/veh	2.5	2.3	4.7				0.0	43.6	0.9	0.2	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	6.3	6.5				0.0	13.7	1.1	1.6	4.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.0	18.0	20.4				0.0	68.6	19.7	31.3	15.8	0.0
LnGrp LOS	B	B	C				A	F	B	C	B	A
Approach Vol, veh/h		1933						1123			511	
Approach Delay, s/veh		18.4						65.0			18.8	
Approach LOS		B						E			B	

Timer - Assigned Phs				4		6	7	8				
Phs Duration (G+Y+Rc), s				34.0		36.0	9.0	25.0				
Change Period (Y+Rc), s				5.0		5.0	5.0	5.0				
Max Green Setting (Gmax), s				29.0		31.0	4.0	20.0				
Max Q Clear Time (g_c+I1), s				0.0		0.0	0.0	0.0				
Green Ext Time (p_c), s				0.0		0.0	0.0	0.0				

Intersection Summary												
HCM 6th Ctrl Delay			33.1									
HCM 6th LOS			C									



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	430	860	0	0	160	0
Future Volume (vph)	430	860	0	0	160	0
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850
Total Lost time (s)		11.5			6.0	
Lane Util. Factor		0.86			0.97	
Frt		1.00			1.00	
Flt Protected		0.98			0.95	
Satd. Flow (prot)		6134			3100	
Flt Permitted		0.98			0.95	
Satd. Flow (perm)		6134			3100	
Peak-hour factor, PHF	0.84	0.88	0.92	0.92	0.94	0.92
Growth Factor (vph)	151%	151%	100%	100%	185%	185%
Adj. Flow (vph)	773	1476	0	0	315	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	2249	0	0	315	0
Heavy Vehicles (%)	2%	2%	2%	2%	10%	10%
Turn Type	Perm	NA			Prot	
Protected Phases		6			4	
Permitted Phases	6					
Actuated Green, G (s)		72.4			15.1	
Effective Green, g (s)		72.4			15.1	
Actuated g/C Ratio		0.69			0.14	
Clearance Time (s)		11.5			6.0	
Vehicle Extension (s)		2.0			2.0	
Lane Grp Cap (vph)		4229			445	
v/s Ratio Prot					c0.10	
v/s Ratio Perm		0.37				
v/c Ratio		0.53			0.71	
Uniform Delay, d1		8.0			42.8	
Progression Factor		1.00			1.00	
Incremental Delay, d2		0.5			4.2	
Delay (s)		8.5			47.0	
Level of Service		A			D	
Approach Delay (s)		8.5	0.0		47.0	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	17.5
Intersection Capacity Utilization	96.4%	ICU Level of Service	F
Analysis Period (min)	15		

Description: Count Date: 11/9/2016

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	25	695	170	45	1495	45	305	135	45	20	50	15
Future Volume (vph)	25	695	170	45	1495	45	305	135	45	20	50	15
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Lane Width	11	12	12	11	12	12	11	11	12	11	11	12
Total Lost time (s)	6.0	5.0	5.0	6.0	5.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.91		0.95	0.95		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.97		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.99		0.95	1.00	
Satd. Flow (prot)	1649	3413	1527	1649	4879		1582	1597		1666	1678	
Flt Permitted	0.08	1.00	1.00	0.09	1.00		0.95	0.99		0.95	1.00	
Satd. Flow (perm)	136	3413	1527	162	4879		1582	1597		1666	1678	
Peak-hour factor, PHF	0.82	0.90	0.84	0.67	0.94	0.83	0.86	0.77	0.73	0.68	0.89	0.67
Growth Factor (vph)	126%	126%	126%	114%	114%	114%	228%	228%	228%	250%	250%	250%
Adj. Flow (vph)	38	973	255	77	1813	62	809	400	141	74	140	56
RTOR Reduction (vph)	0	0	131	0	3	0	0	6	0	0	10	0
Lane Group Flow (vph)	38	973	124	77	1872	0	671	673	0	74	186	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA		Split	NA	
Protected Phases	1	6		5	2		8	8		4	4	
Permitted Phases	6		6	2								
Actuated Green, G (s)	57.4	51.0	51.0	60.6	52.6		55.0	55.0		13.0	13.0	
Effective Green, g (s)	57.4	51.0	51.0	60.6	52.6		55.0	55.0		13.0	13.0	
Actuated g/C Ratio	0.38	0.34	0.34	0.40	0.35		0.37	0.37		0.09	0.09	
Clearance Time (s)	6.0	5.0	5.0	6.0	5.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	116	1160	519	144	1710		580	585		144	145	
v/s Ratio Prot	0.01	0.29		c0.03	c0.38		c0.42	0.42		0.04	c0.11	
v/s Ratio Perm	0.11		0.08	0.19								
v/c Ratio	0.33	0.84	0.24	0.53	1.09		1.16	1.15		0.51	1.28	
Uniform Delay, d1	36.8	45.7	35.5	33.0	48.7		47.5	47.5		65.5	68.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	7.3	1.1	1.9	52.6		88.8	86.0		1.3	169.4	
Delay (s)	37.4	53.0	36.6	34.9	101.3		136.3	133.5		66.8	237.9	
Level of Service	D	D	D	C	F		F	F		E	F	
Approach Delay (s)		49.3			98.7			134.9			191.0	
Approach LOS		D			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	101.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	98.3%	ICU Level of Service	F
Analysis Period (min)	15		
Description: Count Date: 1/22/2015			

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	22	820	106	16	1684	4	218	64	36	18	30	4
Future Volume (vph)	22	820	106	16	1684	4	218	64	36	18	30	4
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Lane Width	10	13	12	12	12	12	12	12	12	11	12	12
Total Lost time (s)	6.0	5.5	5.5	6.0	5.5	5.5	6.0	5.5		6.0	6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1516	3526	1527	1706	3413	1527	3343	1716		1666	1784	
Flt Permitted	0.05	1.00	1.00	0.18	1.00	1.00	0.95	1.00		0.73	1.00	
Satd. Flow (perm)	74	3526	1527	332	3413	1527	3343	1716		1275	1784	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor (vph)	134%	134%	134%	141%	141%	141%	122%	122%	122%	157%	157%	157%
Adj. Flow (vph)	30	1133	146	23	2448	6	274	80	45	29	49	6
RTOR Reduction (vph)	0	0	59	0	0	2	0	14	0	0	4	0
Lane Group Flow (vph)	30	1133	87	23	2448	4	274	111	0	29	51	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	12	0	0	0	0	0	0	0	0	0	0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA		pm+pt	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2		2				4	4	
Actuated Green, G (s)	90.7	86.5	86.5	88.9	85.6	85.6	23.2	29.2		8.5	8.5	
Effective Green, g (s)	90.7	86.5	86.5	88.9	85.6	85.6	23.2	29.2		8.5	8.5	
Actuated g/C Ratio	0.63	0.60	0.60	0.61	0.59	0.59	0.16	0.20		0.06	0.06	
Clearance Time (s)	6.0	5.5	5.5	6.0	5.5	5.5	6.0	5.5		6.0	6.0	
Vehicle Extension (s)	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	88	2103	910	234	2014	901	534	345		82	104	
v/s Ratio Prot	c0.01	0.32		0.00	c0.72		c0.08	c0.06		0.01	c0.03	
v/s Ratio Perm	0.20		0.06	0.06		0.00				0.01		
v/c Ratio	0.34	0.54	0.10	0.10	1.22	0.00	0.51	0.32		0.35	0.49	
Uniform Delay, d1	34.3	17.4	12.5	12.9	29.7	12.2	55.7	49.4		65.4	66.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.3	1.0	0.2	0.1	101.8	0.0	0.3	0.2		1.0	1.3	
Delay (s)	36.6	18.4	12.7	12.9	131.5	12.2	56.1	49.6		66.4	67.5	
Level of Service	D	B	B	B	F	B	E	D		E	E	
Approach Delay (s)		18.2			130.1			54.1			67.1	
Approach LOS		B			F			D			E	

Intersection Summary			
HCM 2000 Control Delay	87.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	23.5
Intersection Capacity Utilization	98.1%	ICU Level of Service	F
Analysis Period (min)	15		

Description: Count Date: 1/21/2014

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	290	1060	0	0	0	0	0	635	45
Future Volume (veh/h)	0	0	0	290	1060	0	0	0	0	0	635	45
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.88
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach					No						No	
Adj Sat Flow, veh/h/ln				1626	1626	0				0	1639	1639
Adj Flow Rate, veh/h				385	1421	0				0	1432	109
Peak Hour Factor				0.95	0.94	0.88				0.88	0.86	0.80
Percent Heavy Veh, %				3	3	0				0	2	2
Cap, veh/h				468	1505	0				0	1613	123
Arrive On Green				0.46	0.46	0.00				0.00	0.38	0.38
Sat Flow, veh/h				824	3394	0				0	4341	319
Grp Volume(v), veh/h				650	1156	0				0	1019	522
Grp Sat Flow(s),veh/h/ln				1392	1347	0				0	1492	1529
Q Serve(g_s), s				30.0	26.3	0.0				0.0	20.7	20.8
Cycle Q Clear(g_c), s				30.0	26.3	0.0				0.0	20.7	20.8
Prop In Lane				0.59		0.00				0.00		0.21
Lane Grp Cap(c), veh/h				730	1243	0				0	1147	588
V/C Ratio(X)				0.89	0.93	0.00				0.00	0.89	0.89
Avail Cap(c_a), veh/h				730	1243	0				0	1147	588
HCM Platoon Ratio				1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				17.7	16.5	0.0				0.0	18.7	18.7
Incr Delay (d2), s/veh				15.3	13.4	0.0				0.0	10.3	17.9
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				11.7	9.4	0.0				0.0	8.2	9.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				33.0	29.9	0.0				0.0	29.0	36.6
LnGrp LOS				C	C	A				A	C	D
Approach Vol, veh/h					1806						1541	
Approach Delay, s/veh					31.0						31.6	
Approach LOS					C						C	

Timer - Assigned Phs	2	4
Phs Duration (G+Y+Rc), s	35.0	30.0
Change Period (Y+Rc), s	5.0	5.0
Max Green Setting (Gmax), s	30.0	25.0
Max Q Clear Time (g_c+I1), s	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	31.3
HCM 6th LOS	C

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	780	130	75	755	0	0	0	0
Future Volume (veh/h)	0	0	0	0	780	130	75	755	0	0	0	0
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00			
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach					No			No				
Adj Sat Flow, veh/h/ln				0	1626	1626	1639	1639	0			
Adj Flow Rate, veh/h				0	1043	174	111	1116	0			
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %				0	3	3	2	2	0			
Cap, veh/h				0	1341	223	133	1405	0			
Arrive On Green				0.00	0.35	0.35	0.48	0.48	0.00			
Sat Flow, veh/h				0	3979	638	275	2989	0			
Grp Volume(v), veh/h				0	805	412	656	571	0			
Grp Sat Flow(s),veh/h/ln				0	1480	1511	1625	1557	0			
Q Serve(g_s), s				0.0	14.6	14.6	21.0	18.0	0.0			
Cycle Q Clear(g_c), s				0.0	14.6	14.6	21.0	18.0	0.0			
Prop In Lane				0.00		0.42	0.17		0.00			
Lane Grp Cap(c), veh/h				0	1036	529	786	753	0			
V/C Ratio(X)				0.00	0.78	0.78	0.83	0.76	0.00			
Avail Cap(c_a), veh/h				0	1036	529	786	753	0			
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	17.4	17.4	13.4	12.6	0.0			
Incr Delay (d2), s/veh				0.0	5.7	10.8	10.2	7.1	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln				0.0	5.3	6.2	8.5	6.6	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				0.0	23.1	28.2	23.6	19.7	0.0			
LnGrp LOS				A	C	C	C	B	A			
Approach Vol, veh/h					1217			1227				
Approach Delay, s/veh					24.9			21.8				
Approach LOS					C			C				

Timer - Assigned Phs	2	4
Phs Duration (G+Y+Rc), s	26.0	34.0
Change Period (Y+Rc), s	5.0	5.0
Max Green Setting (Gmax), s	21.0	29.0
Max Q Clear Time (g_c+I1), s	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	23.3
HCM 6th LOS	C

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	0	590	270	0	0	0	0	0	0	100	1325	0
Future Volume (veh/h)	0	590	270	0	0	0	0	0	0	100	1325	0
Initial Q (Qb), veh	0	0	0							0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00							1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00							1.00	1.00	1.00
Work Zone On Approach		No									No	
Adj Sat Flow, veh/h/ln	0	1626	1626							1639	1639	0
Adj Flow Rate, veh/h	0	1026	470							151	2002	0
Peak Hour Factor	0.92	0.92	0.92							0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3							2	2	0
Cap, veh/h	0	1063	487							195	2005	0
Arrive On Green	0.00	0.12	0.12							0.50	0.50	0.00
Sat Flow, veh/h	0	3123	1363							267	4145	0
Grp Volume(v), veh/h	0	1020	476							799	1354	0
Grp Sat Flow(s),veh/h/ln	0	1480	1381							1563	1357	0
Q Serve(g_s), s	0.0	24.0	24.0							31.8	34.8	0.0
Cycle Q Clear(g_c), s	0.0	24.0	24.0							35.0	34.8	0.0
Prop In Lane	0.00		0.99							0.19		0.00
Lane Grp Cap(c), veh/h	0	1057	493							843	1357	0
V/C Ratio(X)	0.00	0.97	0.97							0.95	1.00	0.00
Avail Cap(c_a), veh/h	0	1057	493							843	1357	0
HCM Platoon Ratio	1.00	0.33	0.33							1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00							1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	30.4	30.4							17.8	17.5	0.0
Incr Delay (d2), s/veh	0.0	20.5	32.8							20.8	23.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0							0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	12.3	13.2							16.4	14.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	50.9	63.2							38.6	41.3	0.0
LnGrp LOS	A	D	E							D	D	A
Approach Vol, veh/h		1496									2153	
Approach Delay, s/veh		54.8									40.3	
Approach LOS		D									D	

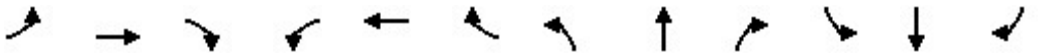
Timer - Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		30.0		40.0								
Change Period (Y+Rc), s		5.0		5.0								
Max Green Setting (Gmax), s		25.0		35.0								
Max Q Clear Time (g_c+I1), s		0.0		0.0								
Green Ext Time (p_c), s		0.0		0.0								

Intersection Summary												
HCM 6th Ctrl Delay			46.2									
HCM 6th LOS			D									

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	95	500	0	0	0	0	0	700	155	0	0	0
Future Volume (veh/h)	95	500	0	0	0	0	0	700	155	0	0	0
Initial Q (Qb), veh	0	0	0				0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	0.90			
Work Zone On Approach		No						No				
Adj Sat Flow, veh/h/ln	1613	1613	0				0	1639	1639			
Adj Flow Rate, veh/h	179	940	0				0	1058	234			
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92			
Percent Heavy Veh, %	4	4	0				0	2	2			
Cap, veh/h	296	1221	0				0	1472	591			
Arrive On Green	0.35	0.35	0.00				0.00	0.47	0.47			
Sat Flow, veh/h	585	3666	0				0	3196	1250			
Grp Volume(v), veh/h	415	704	0				0	1058	234			
Grp Sat Flow(s),veh/h/ln	1447	1336	0				0	1557	1250			
Q Serve(g_s), s	13.3	12.9	0.0				0.0	14.9	6.7			
Cycle Q Clear(g_c), s	14.4	12.9	0.0				0.0	14.9	6.7			
Prop In Lane	0.43		0.00				0.00		1.00			
Lane Grp Cap(c), veh/h	593	923	0				0	1472	591			
V/C Ratio(X)	0.70	0.76	0.00				0.00	0.72	0.40			
Avail Cap(c_a), veh/h	593	923	0				0	1472	591			
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00				0.00	1.00	1.00			
Uniform Delay (d), s/veh	16.4	16.0	0.0				0.0	11.6	9.4			
Incr Delay (d2), s/veh	6.7	6.0	0.0				0.0	3.1	2.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	5.2	4.2	0.0				0.0	4.9	1.9			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.1	22.0	0.0				0.0	14.6	11.4			
LnGrp LOS	C	C	A				A	B	B			
Approach Vol, veh/h		1119						1292				
Approach Delay, s/veh		22.4						14.0				
Approach LOS		C						B				

Timer - Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		24.0		31.0								
Change Period (Y+Rc), s		5.0		5.0								
Max Green Setting (Gmax), s		19.0		26.0								
Max Q Clear Time (g_c+I1), s		0.0		0.0								
Green Ext Time (p_c), s		0.0		0.0								

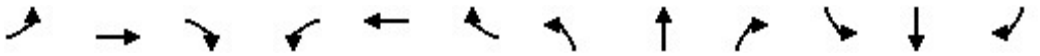
Intersection Summary												
HCM 6th Ctrl Delay			17.9									
HCM 6th LOS			B									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	40	1765	80	455	610	0	0	235	120
Future Volume (veh/h)	0	0	0	40	1765	80	455	610	0	0	235	120
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj				0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1850	1807	1850	1821	1821	0	0	1821	1821
Adj Flow Rate, veh/h				62	2294	116	685	877	0	0	388	206
Peak Hour Factor				0.75	0.90	0.81	0.85	0.89	0.88	0.88	0.83	0.80
Percent Heavy Veh, %				0	3	0	2	2	0	0	2	2
Cap, veh/h				47	1828	95	469	981	0	0	291	154
Arrive On Green				0.38	0.38	0.38	0.24	0.54	0.00	0.00	0.26	0.26
Sat Flow, veh/h				121	4752	246	1734	1821	0	0	1112	590
Grp Volume(v), veh/h				878	765	829	685	877	0	0	0	594
Grp Sat Flow(s),veh/h/ln				1714	1644	1761	1734	1821	0	0	0	1703
Q Serve(g_s), s				50.0	50.0	50.0	31.0	55.7	0.0	0.0	0.0	34.0
Cycle Q Clear(g_c), s				50.0	50.0	50.0	31.0	55.7	0.0	0.0	0.0	34.0
Prop In Lane				0.07		0.14	1.00		0.00	0.00		0.35
Lane Grp Cap(c), veh/h				659	632	677	469	981	0	0	0	445
V/C Ratio(X)				1.33	1.21	1.22	1.46	0.89	0.00	0.00	0.00	1.33
Avail Cap(c_a), veh/h				659	632	677	469	981	0	0	0	445
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				0.85	0.85	0.85	0.39	0.39	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				40.0	40.0	40.0	47.7	26.7	0.0	0.0	0.0	48.0
Incr Delay (d2), s/veh				158.0	106.7	112.1	211.9	5.4	0.0	0.0	0.0	165.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				49.4	38.4	42.1	42.1	25.2	0.0	0.0	0.0	34.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				198.0	146.7	152.1	259.6	32.1	0.0	0.0	0.0	213.0
LnGrp LOS				F	F	F	F	C	A	A	A	F
Approach Vol, veh/h					2472			1562			594	
Approach Delay, s/veh					166.7			131.9			213.0	
Approach LOS					F			F			F	

Timer - Assigned Phs		2	3	4				8				
Phs Duration (G+Y+Rc), s		55.0	36.0	39.0				75.0				
Change Period (Y+Rc), s		5.0	5.0	5.0				5.0				
Max Green Setting (Gmax), s		50.0	31.0	34.0				70.0				
Max Q Clear Time (g_c+I1), s		0.0	0.0	0.0				0.0				
Green Ext Time (p_c), s		0.0	0.0	0.0				0.0				

Intersection Summary												
HCM 6th Ctrl Delay			160.9									
HCM 6th LOS			F									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	255	680	185	0	0	0	0	705	55	55	225	0
Future Volume (veh/h)	255	680	185	0	0	0	0	705	55	55	225	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99				1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1807	1807	1807				0	1821	1894	1821	1821	0
Adj Flow Rate, veh/h	431	1111	391				0	1049	83	100	411	0
Peak Hour Factor	0.90	0.93	0.72				0.92	0.84	0.83	0.86	0.86	0.92
Percent Heavy Veh, %	3	3	3				0	2	2	2	2	0
Cap, veh/h	762	1591	560				0	989	453	202	754	0
Arrive On Green	0.44	0.44	0.44				0.00	0.29	0.29	0.06	0.41	0.00
Sat Flow, veh/h	1721	3593	1264				0	3551	1585	1734	1821	0
Grp Volume(v), veh/h	431	1017	485				0	1049	83	100	411	0
Grp Sat Flow(s),veh/h/ln	1721	1644	1569				0	1730	1585	1734	1821	0
Q Serve(g_s), s	13.0	17.5	17.5				0.0	20.0	2.8	0.0	11.9	0.0
Cycle Q Clear(g_c), s	13.0	17.5	17.5				0.0	20.0	2.8	0.0	11.9	0.0
Prop In Lane	1.00		0.81				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	762	1456	695				0	989	453	202	754	0
V/C Ratio(X)	0.57	0.70	0.70				0.00	1.06	0.18	0.50	0.54	0.00
Avail Cap(c_a), veh/h	762	1456	695				0	989	453	202	754	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.85	0.85	0.85				0.00	1.00	1.00	0.09	0.09	0.00
Uniform Delay (d), s/veh	14.5	15.7	15.7				0.0	25.0	18.8	31.1	15.5	0.0
Incr Delay (d2), s/veh	2.6	2.4	4.9				0.0	46.3	0.9	0.2	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	6.3	6.5				0.0	14.1	1.1	1.6	4.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.1	18.1	20.6				0.0	71.3	19.7	31.3	15.8	0.0
LnGrp LOS	B	B	C				A	F	B	C	B	A
Approach Vol, veh/h		1933						1132			511	
Approach Delay, s/veh		18.5						67.5			18.8	
Approach LOS		B						E			B	

Timer - Assigned Phs				4		6	7	8				
Phs Duration (G+Y+Rc), s				34.0		36.0	9.0	25.0				
Change Period (Y+Rc), s				5.0		5.0	5.0	5.0				
Max Green Setting (Gmax), s				29.0		31.0	4.0	20.0				
Max Q Clear Time (g_c+I1), s				0.0		0.0	0.0	0.0				
Green Ext Time (p_c), s				0.0		0.0	0.0	0.0				

Intersection Summary												
HCM 6th Ctrl Delay			34.1									
HCM 6th LOS			C									

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	25	695	170	45	1495	45	305	135	45	20	50	15
Future Volume (vph)	25	695	170	45	1495	45	305	135	45	20	50	15
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Lane Width	11	12	12	11	12	12	11	11	12	11	11	12
Total Lost time (s)	6.0	5.0	5.0	6.0	5.0		6.0	6.0		12.0	12.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.91		0.95	0.95		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.97		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.99		0.95	1.00	
Satd. Flow (prot)	1649	3413	1527	1649	4879		1582	1597		1666	1678	
Flt Permitted	0.08	1.00	1.00	0.08	1.00		0.95	0.99		0.95	1.00	
Satd. Flow (perm)	145	3413	1527	140	4879		1582	1597		1666	1678	
Peak-hour factor, PHF	0.82	0.90	0.84	0.67	0.94	0.83	0.86	0.77	0.73	0.68	0.89	0.67
Growth Factor (vph)	126%	126%	126%	114%	114%	114%	228%	228%	228%	250%	250%	250%
Adj. Flow (vph)	38	973	255	77	1813	62	809	400	141	74	140	56
RTOR Reduction (vph)	0	0	130	0	2	0	0	6	0	0	9	0
Lane Group Flow (vph)	38	973	125	77	1873	0	671	673	0	74	187	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA		Split	NA	
Protected Phases	1	6		5	2		8	8		4	4	
Permitted Phases	6		6	2								
Actuated Green, G (s)	54.4	48.0	48.0	57.6	49.6		54.0	54.0		12.0	12.0	
Effective Green, g (s)	54.4	48.0	48.0	57.6	49.6		54.0	54.0		12.0	12.0	
Actuated g/C Ratio	0.36	0.32	0.32	0.38	0.33		0.36	0.36		0.08	0.08	
Clearance Time (s)	6.0	5.0	5.0	6.0	5.0		6.0	6.0		12.0	12.0	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	115	1084	485	133	1602		565	571		132	133	
v/s Ratio Prot	0.01	0.29		c0.03	c0.38		c0.42	0.42		0.04	c0.11	
v/s Ratio Perm	0.10		0.08	0.19								
v/c Ratio	0.33	0.90	0.26	0.58	1.17		1.19	1.18		0.56	1.40	
Uniform Delay, d1	38.2	49.2	38.3	35.7	50.7		48.5	48.5		67.0	69.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	11.6	1.3	3.8	83.2		101.2	97.2		3.2	220.8	
Delay (s)	38.8	60.8	39.5	39.4	133.9		149.7	145.7		70.2	290.3	
Level of Service	D	E	D	D	F		F	F		E	F	
Approach Delay (s)		55.8			130.2			147.7			229.9	
Approach LOS		E			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	121.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	151.0	Sum of lost time (s)	29.0
Intersection Capacity Utilization	103.3%	ICU Level of Service	G
Analysis Period (min)	15		
Description: Count Date: 1/22/2015			

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	22	820	106	16	1684	4	218	64	36	18	30	4
Future Volume (vph)	22	820	106	16	1684	4	218	64	36	18	30	4
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Lane Width	10	13	12	12	12	12	12	12	12	11	12	12
Total Lost time (s)	12.0	5.5	5.5	6.0	5.5	5.5	6.0	5.5		6.0	6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1516	3526	1527	1706	3413	1527	3343	1716		1666	1784	
Flt Permitted	0.05	1.00	1.00	0.20	1.00	1.00	0.95	1.00		0.73	1.00	
Satd. Flow (perm)	74	3526	1527	357	3413	1527	3343	1716		1275	1784	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor (vph)	134%	134%	134%	141%	141%	141%	122%	122%	122%	157%	157%	157%
Adj. Flow (vph)	30	1133	146	23	2448	6	274	80	45	29	49	6
RTOR Reduction (vph)	0	0	59	0	0	3	0	14	0	0	4	0
Lane Group Flow (vph)	30	1133	87	23	2448	3	274	111	0	29	51	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	12	0	0	0	0	0	0	0	0	0	0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA		pm+pt	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2		2				4	4	
Actuated Green, G (s)	90.8	86.5	86.5	82.8	79.5	79.5	23.2	29.2		8.5	8.5	
Effective Green, g (s)	90.8	86.5	86.5	82.8	79.5	79.5	23.2	29.2		8.5	8.5	
Actuated g/C Ratio	0.63	0.60	0.60	0.57	0.55	0.55	0.16	0.20		0.06	0.06	
Clearance Time (s)	12.0	5.5	5.5	6.0	5.5	5.5	6.0	5.5		6.0	6.0	
Vehicle Extension (s)	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	89	2103	910	234	1871	837	534	345		82	104	
v/s Ratio Prot	c0.01	c0.32		0.00	c0.72		c0.08	c0.06		0.01	c0.03	
v/s Ratio Perm	0.20		0.06	0.05		0.00				0.01		
v/c Ratio	0.34	0.54	0.10	0.10	1.31	0.00	0.51	0.32		0.35	0.49	
Uniform Delay, d1	34.3	17.4	12.5	14.5	32.8	14.8	55.7	49.4		65.4	66.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.2	1.0	0.2	0.1	142.7	0.0	0.3	0.2		1.0	1.3	
Delay (s)	36.5	18.4	12.7	14.6	175.5	14.8	56.1	49.6		66.4	67.5	
Level of Service	D	B	B	B	F	B	E	D		E	E	
Approach Delay (s)		18.2			173.6			54.1			67.1	
Approach LOS		B			F			D			E	

Intersection Summary			
HCM 2000 Control Delay	112.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	29.5
Intersection Capacity Utilization	98.1%	ICU Level of Service	F
Analysis Period (min)	15		

Description: Count Date: 1/21/2014

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	290	1060	0	0	0	0	0	635	45
Future Volume (veh/h)	0	0	0	290	1060	0	0	0	0	0	635	45
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.88
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach					No						No	
Adj Sat Flow, veh/h/ln				1626	1626	0				0	1639	1639
Adj Flow Rate, veh/h				385	1421	0				0	1432	109
Peak Hour Factor				0.95	0.94	0.88				0.88	0.86	0.80
Percent Heavy Veh, %				3	3	0				0	2	2
Cap, veh/h				468	1505	0				0	1613	123
Arrive On Green				0.46	0.46	0.00				0.00	0.38	0.38
Sat Flow, veh/h				824	3394	0				0	4341	319
Grp Volume(v), veh/h				650	1156	0				0	1019	522
Grp Sat Flow(s),veh/h/ln				1392	1347	0				0	1492	1529
Q Serve(g_s), s				30.0	26.3	0.0				0.0	20.7	20.8
Cycle Q Clear(g_c), s				30.0	26.3	0.0				0.0	20.7	20.8
Prop In Lane				0.59		0.00				0.00		0.21
Lane Grp Cap(c), veh/h				730	1243	0				0	1147	588
V/C Ratio(X)				0.89	0.93	0.00				0.00	0.89	0.89
Avail Cap(c_a), veh/h				730	1243	0				0	1147	588
HCM Platoon Ratio				1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				17.7	16.5	0.0				0.0	18.7	18.7
Incr Delay (d2), s/veh				15.3	13.4	0.0				0.0	10.3	17.9
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				11.7	9.4	0.0				0.0	8.2	9.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				33.0	29.9	0.0				0.0	29.0	36.6
LnGrp LOS				C	C	A				A	C	D
Approach Vol, veh/h					1806						1541	
Approach Delay, s/veh					31.0						31.6	
Approach LOS					C						C	

Timer - Assigned Phs	2	4
Phs Duration (G+Y+Rc), s	35.0	30.0
Change Period (Y+Rc), s	5.0	5.0
Max Green Setting (Gmax), s	30.0	25.0
Max Q Clear Time (g_c+I1), s	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	31.3
HCM 6th LOS	C

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	780	130	75	755	0	0	0	0
Future Volume (veh/h)	0	0	0	0	780	130	75	755	0	0	0	0
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00			
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach					No			No				
Adj Sat Flow, veh/h/ln				0	1626	1626	1639	1639	0			
Adj Flow Rate, veh/h				0	1043	174	111	1116	0			
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %				0	3	3	2	2	0			
Cap, veh/h				0	1341	223	133	1405	0			
Arrive On Green				0.00	0.35	0.35	0.48	0.48	0.00			
Sat Flow, veh/h				0	3979	638	275	2989	0			
Grp Volume(v), veh/h				0	805	412	656	571	0			
Grp Sat Flow(s),veh/h/ln				0	1480	1511	1625	1557	0			
Q Serve(g_s), s				0.0	14.6	14.6	21.0	18.0	0.0			
Cycle Q Clear(g_c), s				0.0	14.6	14.6	21.0	18.0	0.0			
Prop In Lane				0.00		0.42	0.17		0.00			
Lane Grp Cap(c), veh/h				0	1036	529	786	753	0			
V/C Ratio(X)				0.00	0.78	0.78	0.83	0.76	0.00			
Avail Cap(c_a), veh/h				0	1036	529	786	753	0			
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	17.4	17.4	13.4	12.6	0.0			
Incr Delay (d2), s/veh				0.0	5.7	10.8	10.2	7.1	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln				0.0	5.3	6.2	8.5	6.6	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				0.0	23.1	28.2	23.6	19.7	0.0			
LnGrp LOS				A	C	C	C	B	A			
Approach Vol, veh/h					1217			1227				
Approach Delay, s/veh					24.9			21.8				
Approach LOS					C			C				

Timer - Assigned Phs	2	4
Phs Duration (G+Y+Rc), s	26.0	34.0
Change Period (Y+Rc), s	5.0	5.0
Max Green Setting (Gmax), s	21.0	29.0
Max Q Clear Time (g_c+I1), s	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	23.3
HCM 6th LOS	C

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	0	590	270	0	0	0	0	0	0	100	1325	0
Future Volume (veh/h)	0	590	270	0	0	0	0	0	0	100	1325	0
Initial Q (Qb), veh	0	0	0							0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00							1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00							1.00	1.00	1.00
Work Zone On Approach		No									No	
Adj Sat Flow, veh/h/ln	0	1626	1626							1639	1639	0
Adj Flow Rate, veh/h	0	1026	470							151	2002	0
Peak Hour Factor	0.92	0.92	0.92							0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3							2	2	0
Cap, veh/h	0	1063	487							195	2005	0
Arrive On Green	0.00	0.12	0.12							0.50	0.50	0.00
Sat Flow, veh/h	0	3123	1363							267	4145	0
Grp Volume(v), veh/h	0	1020	476							799	1354	0
Grp Sat Flow(s),veh/h/ln	0	1480	1381							1563	1357	0
Q Serve(g_s), s	0.0	24.0	24.0							31.8	34.8	0.0
Cycle Q Clear(g_c), s	0.0	24.0	24.0							35.0	34.8	0.0
Prop In Lane	0.00		0.99							0.19		0.00
Lane Grp Cap(c), veh/h	0	1057	493							843	1357	0
V/C Ratio(X)	0.00	0.97	0.97							0.95	1.00	0.00
Avail Cap(c_a), veh/h	0	1057	493							843	1357	0
HCM Platoon Ratio	1.00	0.33	0.33							1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00							1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	30.4	30.4							17.8	17.5	0.0
Incr Delay (d2), s/veh	0.0	20.5	32.8							20.8	23.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0							0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	12.3	13.2							16.4	14.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	50.9	63.2							38.6	41.3	0.0
LnGrp LOS	A	D	E							D	D	A
Approach Vol, veh/h		1496									2153	
Approach Delay, s/veh		54.8									40.3	
Approach LOS		D									D	

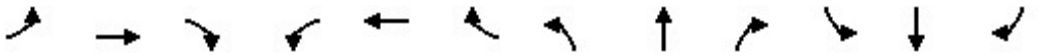
Timer - Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		30.0		40.0								
Change Period (Y+Rc), s		5.0		5.0								
Max Green Setting (Gmax), s		25.0		35.0								
Max Q Clear Time (g_c+I1), s		0.0		0.0								
Green Ext Time (p_c), s		0.0		0.0								

Intersection Summary												
HCM 6th Ctrl Delay			46.2									
HCM 6th LOS			D									

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	95	500	0	0	0	0	0	700	155	0	0	0
Future Volume (veh/h)	95	500	0	0	0	0	0	700	155	0	0	0
Initial Q (Qb), veh	0	0	0				0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	0.90			
Work Zone On Approach		No						No				
Adj Sat Flow, veh/h/ln	1613	1613	0				0	1639	1639			
Adj Flow Rate, veh/h	179	940	0				0	1058	234			
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92			
Percent Heavy Veh, %	4	4	0				0	2	2			
Cap, veh/h	296	1221	0				0	1472	591			
Arrive On Green	0.35	0.35	0.00				0.00	0.47	0.47			
Sat Flow, veh/h	585	3666	0				0	3196	1250			
Grp Volume(v), veh/h	415	704	0				0	1058	234			
Grp Sat Flow(s),veh/h/ln	1447	1336	0				0	1557	1250			
Q Serve(g_s), s	13.3	12.9	0.0				0.0	14.9	6.7			
Cycle Q Clear(g_c), s	14.4	12.9	0.0				0.0	14.9	6.7			
Prop In Lane	0.43		0.00				0.00		1.00			
Lane Grp Cap(c), veh/h	593	923	0				0	1472	591			
V/C Ratio(X)	0.70	0.76	0.00				0.00	0.72	0.40			
Avail Cap(c_a), veh/h	593	923	0				0	1472	591			
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00				0.00	1.00	1.00			
Uniform Delay (d), s/veh	16.4	16.0	0.0				0.0	11.6	9.4			
Incr Delay (d2), s/veh	6.7	6.0	0.0				0.0	3.1	2.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	5.2	4.2	0.0				0.0	4.9	1.9			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.1	22.0	0.0				0.0	14.6	11.4			
LnGrp LOS	C	C	A				A	B	B			
Approach Vol, veh/h		1119						1292				
Approach Delay, s/veh		22.4						14.0				
Approach LOS		C						B				

Timer - Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		24.0		31.0								
Change Period (Y+Rc), s		5.0		5.0								
Max Green Setting (Gmax), s		19.0		26.0								
Max Q Clear Time (g_c+I1), s		0.0		0.0								
Green Ext Time (p_c), s		0.0		0.0								

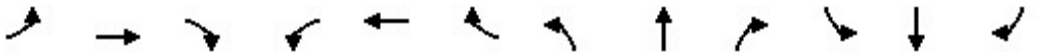
Intersection Summary												
HCM 6th Ctrl Delay			17.9									
HCM 6th LOS			B									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	40	1765	80	455	610	0	0	235	120
Future Volume (veh/h)	0	0	0	40	1765	80	455	610	0	0	235	120
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj				0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1850	1807	1850	1821	1821	0	0	1821	1821
Adj Flow Rate, veh/h				62	2294	116	685	877	0	0	388	206
Peak Hour Factor				0.75	0.90	0.81	0.85	0.89	0.88	0.88	0.83	0.80
Percent Heavy Veh, %				0	3	0	2	2	0	0	2	2
Cap, veh/h				44	1742	90	453	947	0	0	282	150
Arrive On Green				0.37	0.37	0.37	0.23	0.52	0.00	0.00	0.25	0.25
Sat Flow, veh/h				121	4752	246	1734	1821	0	0	1112	590
Grp Volume(v), veh/h				878	765	829	685	877	0	0	0	594
Grp Sat Flow(s),veh/h/ln				1714	1644	1761	1734	1821	0	0	0	1702
Q Serve(g_s), s				55.0	55.0	55.0	35.0	66.9	0.0	0.0	0.0	38.0
Cycle Q Clear(g_c), s				55.0	55.0	55.0	35.0	66.9	0.0	0.0	0.0	38.0
Prop In Lane				0.07		0.14	1.00		0.00	0.00		0.35
Lane Grp Cap(c), veh/h				628	603	646	453	947	0	0	0	431
V/C Ratio(X)				1.40	1.27	1.28	1.51	0.93	0.00	0.00	0.00	1.38
Avail Cap(c_a), veh/h				628	603	646	453	947	0	0	0	431
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				0.85	0.85	0.85	0.39	0.39	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				47.5	47.5	47.5	55.6	33.3	0.0	0.0	0.0	56.0
Incr Delay (d2), s/veh				186.7	132.0	137.9	235.4	7.6	0.0	0.0	0.0	183.9
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				55.7	44.3	48.5	46.1	31.3	0.0	0.0	0.0	38.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				234.2	179.5	185.4	291.0	40.9	0.0	0.0	0.0	239.9
LnGrp LOS				F	F	F	F	D	A	A	A	F
Approach Vol, veh/h					2472			1562			594	
Approach Delay, s/veh					200.9			150.6			239.9	
Approach LOS					F			F			F	

Timer - Assigned Phs	2	3	4					8				
Phs Duration (G+Y+Rc), s	67.0	40.0	43.0					83.0				
Change Period (Y+Rc), s	12.0	5.0	5.0					5.0				
Max Green Setting (Gmax), s	55.0	35.0	38.0					78.0				
Max Q Clear Time (g_c+I1), s	0.0	0.0	0.0					0.0				
Green Ext Time (p_c), s	0.0	0.0	0.0					0.0				

Intersection Summary												
HCM 6th Ctrl Delay		188.9										
HCM 6th LOS		F										



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	255	680	185	0	0	0	0	705	55	55	225	0
Future Volume (veh/h)	255	680	185	0	0	0	0	705	55	55	225	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99				1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1807	1807	1807				0	1821	1894	1821	1821	0
Adj Flow Rate, veh/h	431	1111	391				0	1049	83	100	411	0
Peak Hour Factor	0.90	0.93	0.72				0.92	0.84	0.83	0.86	0.86	0.92
Percent Heavy Veh, %	3	3	3				0	2	2	2	2	0
Cap, veh/h	762	1591	560				0	989	453	202	754	0
Arrive On Green	0.44	0.44	0.44				0.00	0.29	0.29	0.06	0.41	0.00
Sat Flow, veh/h	1721	3593	1264				0	3551	1585	1734	1821	0
Grp Volume(v), veh/h	431	1017	485				0	1049	83	100	411	0
Grp Sat Flow(s),veh/h/ln	1721	1644	1569				0	1730	1585	1734	1821	0
Q Serve(g_s), s	13.0	17.5	17.5				0.0	20.0	2.8	0.0	11.9	0.0
Cycle Q Clear(g_c), s	13.0	17.5	17.5				0.0	20.0	2.8	0.0	11.9	0.0
Prop In Lane	1.00		0.81				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	762	1456	695				0	989	453	202	754	0
V/C Ratio(X)	0.57	0.70	0.70				0.00	1.06	0.18	0.50	0.54	0.00
Avail Cap(c_a), veh/h	762	1456	695				0	989	453	202	754	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.85	0.85	0.85				0.00	1.00	1.00	0.09	0.09	0.00
Uniform Delay (d), s/veh	14.5	15.7	15.7				0.0	25.0	18.8	31.1	15.5	0.0
Incr Delay (d2), s/veh	2.6	2.4	4.9				0.0	46.3	0.9	0.2	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	6.3	6.5				0.0	14.1	1.1	1.6	4.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.1	18.1	20.6				0.0	71.3	19.7	31.3	15.8	0.0
LnGrp LOS	B	B	C				A	F	B	C	B	A
Approach Vol, veh/h		1933						1132			511	
Approach Delay, s/veh		18.5						67.5			18.8	
Approach LOS		B						E			B	

Timer - Assigned Phs				4		6	7	8				
Phs Duration (G+Y+Rc), s				34.0		36.0	9.0	25.0				
Change Period (Y+Rc), s				5.0		5.0	5.0	5.0				
Max Green Setting (Gmax), s				29.0		31.0	4.0	20.0				
Max Q Clear Time (g_c+I1), s				0.0		0.0	0.0	0.0				
Green Ext Time (p_c), s				0.0		0.0	0.0	0.0				

Intersection Summary			
HCM 6th Ctrl Delay		34.1	
HCM 6th LOS		C	

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	0	430	130	35	740	0	0	0	0	20	570	130
Future Volume (veh/h)	0	430	130	35	740	0	0	0	0	20	570	130
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00				1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1613	1613	1613	1613	0				1639	1639	1639
Adj Flow Rate, veh/h	0	682	206	52	915	0				41	833	201
Peak Hour Factor	0.93	0.87	0.87	0.77	0.93	0.93				0.63	0.89	0.84
Percent Heavy Veh, %	0	4	4	4	4	0				2	2	2
Cap, veh/h	0	1188	359	104	1410	0				49	1044	472
Arrive On Green	0.00	1.00	1.00	1.00	1.00	0.00				0.11	0.11	0.11
Sat Flow, veh/h	0	2391	698	91	2815	0				143	3046	1376
Grp Volume(v), veh/h	0	452	436	493	474	0				468	406	201
Grp Sat Flow(s),veh/h/ln	0	1532	1476	1438	1394	0				1632	1557	1376
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0				19.7	17.7	9.5
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0				19.7	17.7	9.5
Prop In Lane	0.00		0.47	0.11		0.00				0.09		1.00
Lane Grp Cap(c), veh/h	0	788	759	796	717	0				560	534	472
V/C Ratio(X)	0.00	0.57	0.57	0.62	0.66	0.00				0.84	0.76	0.43
Avail Cap(c_a), veh/h	0	788	759	796	717	0				560	534	472
HCM Platoon Ratio	1.00	2.00	2.00	2.00	2.00	1.00				0.33	0.33	0.33
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0				29.1	28.3	24.6
Incr Delay (d2), s/veh	0.0	3.0	3.1	3.6	4.7	0.0				13.8	9.8	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.7	0.7	0.8	0.9	0.0				10.6	8.7	3.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	3.0	3.1	3.6	4.7	0.0				42.9	38.1	27.4
LnGrp LOS	A	A	A	A	A	A				D	D	C
Approach Vol, veh/h		888			967						1075	
Approach Delay, s/veh		3.1			4.2						38.2	
Approach LOS		A			A						D	

Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		41.0		29.0		41.0						
Change Period (Y+Rc), s		5.0		5.0		5.0						
Max Green Setting (Gmax), s		36.0		24.0		36.0						
Max Q Clear Time (g_c+I1), s		0.0		0.0		0.0						
Green Ext Time (p_c), s		0.0		0.0		0.0						

Intersection Summary												
HCM 6th Ctrl Delay			16.3									
HCM 6th LOS			B									

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	95	580	0	0	1115	80	250	715	35	0	0	0
Future Volume (veh/h)	95	580	0	0	1115	80	250	715	35	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1792	1864	0	0	1879	1807	1821	1821	1821			
Adj Flow Rate, veh/h	149	857	0	0	1345	112	288	833	44			
Peak Hour Factor	0.83	0.88	0.95	0.95	0.92	0.79	0.92	0.91	0.84			
Percent Heavy Veh, %	4	4	0	0	3	3	2	2	2			
Cap, veh/h	230	2159	0	0	1652	137	512	986	52			
Arrive On Green	0.13	1.00	0.00	0.00	0.50	0.50	0.30	0.30	0.30			
Sat Flow, veh/h	1707	3635	0	0	3429	277	1734	3341	176			
Grp Volume(v), veh/h	149	857	0	0	718	739	288	431	446			
Grp Sat Flow(s),veh/h/ln	1707	1771	0	0	1785	1827	1734	1730	1787			
Q Serve(g_s), s	1.0	0.0	0.0	0.0	35.6	36.0	14.7	24.6	24.6			
Cycle Q Clear(g_c), s	1.0	0.0	0.0	0.0	35.6	36.0	14.7	24.6	24.6			
Prop In Lane	1.00		0.00	0.00		0.15	1.00		0.10			
Lane Grp Cap(c), veh/h	230	2159	0	0	884	905	512	511	528			
V/C Ratio(X)	0.65	0.40	0.00	0.00	0.81	0.82	0.56	0.84	0.84			
Avail Cap(c_a), veh/h	230	2159	0	0	884	905	512	511	528			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.82	0.82	0.00	0.00	1.00	1.00	0.73	0.73	0.73			
Uniform Delay (d), s/veh	40.3	0.0	0.0	0.0	22.4	22.5	31.3	34.7	34.7			
Incr Delay (d2), s/veh	4.0	0.4	0.0	0.0	8.0	8.1	3.2	11.9	11.6			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	3.7	0.1	0.0	0.0	16.4	17.0	6.6	12.0	12.3			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.3	0.4	0.0	0.0	30.4	30.6	34.5	46.7	46.3			
LnGrp LOS	D	A	A	A	C	C	C	D	D			
Approach Vol, veh/h		1006			1457			1165				
Approach Delay, s/veh		6.9			30.5			43.5				
Approach LOS		A			C			D				

Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	12.0	57.0				69.0		36.0				
Change Period (Y+Rc), s	5.0	5.0				5.0		5.0				
Max Green Setting (Gmax), s	7.0	52.0				64.0		31.0				
Max Q Clear Time (g_c+I1), s	0.0	0.0				0.0		0.0				
Green Ext Time (p_c), s	0.0	0.0				0.0		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			28.1									
HCM 6th LOS			C									

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	25	695	170	45	1495	45	305	135	45	20	50	15
Future Volume (vph)	25	695	170	45	1495	45	305	135	45	20	50	15
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Lane Width	11	12	12	11	12	12	11	11	12	11	11	12
Total Lost time (s)	6.0	5.0	5.0	6.0	5.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.91		0.95	0.95		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.97		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.99		0.95	1.00	
Satd. Flow (prot)	1649	3413	1527	1649	4879		1582	1598		1666	1678	
Flt Permitted	0.08	1.00	1.00	0.09	1.00		0.95	0.99		0.95	1.00	
Satd. Flow (perm)	136	3413	1527	162	4879		1582	1598		1666	1678	
Peak-hour factor, PHF	0.82	0.90	0.84	0.67	0.94	0.83	0.86	0.77	0.73	0.68	0.89	0.67
Growth Factor (vph)	126%	126%	126%	114%	114%	114%	226%	226%	226%	255%	255%	255%
Adj. Flow (vph)	38	973	255	77	1813	62	802	396	139	75	143	57
RTOR Reduction (vph)	0	0	131	0	3	0	0	6	0	0	9	0
Lane Group Flow (vph)	38	973	124	77	1872	0	666	665	0	75	191	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA		Split	NA	
Protected Phases	1	6		5	2		8	8		4	4	
Permitted Phases	6		6	2								
Actuated Green, G (s)	57.4	51.0	51.0	60.6	52.6		55.0	55.0		13.0	13.0	
Effective Green, g (s)	57.4	51.0	51.0	60.6	52.6		55.0	55.0		13.0	13.0	
Actuated g/C Ratio	0.38	0.34	0.34	0.40	0.35		0.37	0.37		0.09	0.09	
Clearance Time (s)	6.0	5.0	5.0	6.0	5.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	116	1160	519	144	1710		580	585		144	145	
v/s Ratio Prot	0.01	0.29		c0.03	c0.38		c0.42	0.42		0.05	c0.11	
v/s Ratio Perm	0.11		0.08	0.19								
v/c Ratio	0.33	0.84	0.24	0.53	1.09		1.15	1.14		0.52	1.32	
Uniform Delay, d1	36.8	45.7	35.5	33.0	48.7		47.5	47.5		65.5	68.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	7.3	1.1	1.9	52.6		85.5	80.8		1.6	182.6	
Delay (s)	37.4	53.0	36.6	34.9	101.3		133.0	128.3		67.1	251.1	
Level of Service	D	D	D	C	F		F	F		E	F	
Approach Delay (s)		49.3			98.7			130.6			200.9	
Approach LOS		D			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	100.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	98.2%	ICU Level of Service	F
Analysis Period (min)	15		
Description: Count Date: 1/22/2015			

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	22	820	106	16	1684	4	218	64	36	18	30	4
Future Volume (vph)	22	820	106	16	1684	4	218	64	36	18	30	4
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Lane Width	10	13	12	12	12	12	12	12	12	11	12	12
Total Lost time (s)	6.0	5.5	5.5	6.0	5.5	5.5	6.0	5.5		6.0	6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1516	3526	1527	1706	3413	1527	3343	1716		1666	1784	
Flt Permitted	0.05	1.00	1.00	0.18	1.00	1.00	0.95	1.00		0.73	1.00	
Satd. Flow (perm)	74	3526	1527	332	3413	1527	3343	1716		1275	1784	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor (vph)	134%	134%	134%	142%	142%	142%	122%	122%	122%	157%	157%	157%
Adj. Flow (vph)	30	1133	146	23	2465	6	274	80	45	29	49	6
RTOR Reduction (vph)	0	0	59	0	0	2	0	14	0	0	4	0
Lane Group Flow (vph)	30	1133	87	23	2465	4	274	111	0	29	51	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	12	0	0	0	0	0	0	0	0	0	0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA		pm+pt	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2		2				4	4	
Actuated Green, G (s)	90.7	86.5	86.5	88.9	85.6	85.6	23.2	29.2		8.5	8.5	
Effective Green, g (s)	90.7	86.5	86.5	88.9	85.6	85.6	23.2	29.2		8.5	8.5	
Actuated g/C Ratio	0.63	0.60	0.60	0.61	0.59	0.59	0.16	0.20		0.06	0.06	
Clearance Time (s)	6.0	5.5	5.5	6.0	5.5	5.5	6.0	5.5		6.0	6.0	
Vehicle Extension (s)	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	88	2103	910	234	2014	901	534	345		82	104	
v/s Ratio Prot	c0.01	0.32		0.00	c0.72		c0.08	c0.06		0.01	c0.03	
v/s Ratio Perm	0.20		0.06	0.06		0.00				0.01		
v/c Ratio	0.34	0.54	0.10	0.10	1.22	0.00	0.51	0.32		0.35	0.49	
Uniform Delay, d1	34.3	17.4	12.5	12.9	29.7	12.2	55.7	49.4		65.4	66.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.3	1.0	0.2	0.1	105.4	0.0	0.3	0.2		1.0	1.3	
Delay (s)	36.6	18.4	12.7	12.9	135.1	12.2	56.1	49.6		66.4	67.5	
Level of Service	D	B	B	B	F	B	E	D		E	E	
Approach Delay (s)		18.2			133.7			54.1			67.1	
Approach LOS		B			F			D			E	

Intersection Summary			
HCM 2000 Control Delay	89.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	23.5
Intersection Capacity Utilization	98.6%	ICU Level of Service	F
Analysis Period (min)	15		

Description: Count Date: 1/21/2014

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	290	1060	0	0	0	0	0	635	45
Future Volume (veh/h)	0	0	0	290	1060	0	0	0	0	0	635	45
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.88
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach					No						No	
Adj Sat Flow, veh/h/ln				1639	1639	0				0	1613	1613
Adj Flow Rate, veh/h				388	1432	0				0	1440	110
Peak Hour Factor				0.95	0.94	0.88				0.88	0.86	0.80
Percent Heavy Veh, %				2	2	0				0	4	4
Cap, veh/h				471	1517	0				0	1587	121
Arrive On Green				0.46	0.46	0.00				0.00	0.38	0.38
Sat Flow, veh/h				830	3421	0				0	4270	315
Grp Volume(v), veh/h				656	1164	0				0	1025	525
Grp Sat Flow(s),veh/h/ln				1403	1357	0				0	1468	1505
Q Serve(g_s), s				30.0	26.3	0.0				0.0	21.4	21.5
Cycle Q Clear(g_c), s				30.0	26.3	0.0				0.0	21.4	21.5
Prop In Lane				0.59		0.00				0.00		0.21
Lane Grp Cap(c), veh/h				736	1253	0				0	1129	579
V/C Ratio(X)				0.89	0.93	0.00				0.00	0.91	0.91
Avail Cap(c_a), veh/h				736	1253	0				0	1129	579
HCM Platoon Ratio				1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				17.7	16.5	0.0				0.0	18.9	18.9
Incr Delay (d2), s/veh				15.3	13.3	0.0				0.0	12.1	20.5
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				11.8	9.5	0.0				0.0	8.5	10.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				33.0	29.8	0.0				0.0	31.0	39.4
LnGrp LOS				C	C	A				A	C	D
Approach Vol, veh/h					1820						1550	
Approach Delay, s/veh					31.0						33.9	
Approach LOS					C						C	

Timer - Assigned Phs	2		4
Phs Duration (G+Y+Rc), s	35.0		30.0
Change Period (Y+Rc), s	5.0		5.0
Max Green Setting (Gmax), s	30.0		25.0
Max Q Clear Time (g_c+I1), s	0.0		0.0
Green Ext Time (p_c), s	0.0		0.0

Intersection Summary	
HCM 6th Ctrl Delay	32.3
HCM 6th LOS	C

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	0	590	270	0	0	0	0	0	0	100	1325	0
Future Volume (veh/h)	0	590	270	0	0	0	0	0	0	100	1325	0
Initial Q (Qb), veh	0	0	0							0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00							1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00							1.00	1.00	1.00
Work Zone On Approach		No									No	
Adj Sat Flow, veh/h/ln	0	1639	1639							1626	1626	0
Adj Flow Rate, veh/h	0	1026	470							152	2016	0
Peak Hour Factor	0.92	0.92	0.92							0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2							3	3	0
Cap, veh/h	0	1072	491							194	1989	0
Arrive On Green	0.00	0.12	0.12							0.50	0.50	0.00
Sat Flow, veh/h	0	3148	1374							265	4112	0
Grp Volume(v), veh/h	0	1020	476							805	1363	0
Grp Sat Flow(s),veh/h/ln	0	1492	1392							1551	1347	0
Q Serve(g_s), s	0.0	23.8	23.8							31.9	35.0	0.0
Cycle Q Clear(g_c), s	0.0	23.8	23.8							35.0	35.0	0.0
Prop In Lane	0.00		0.99							0.19		0.00
Lane Grp Cap(c), veh/h	0	1065	497							836	1347	0
V/C Ratio(X)	0.00	0.96	0.96							0.96	1.01	0.00
Avail Cap(c_a), veh/h	0	1065	497							836	1347	0
HCM Platoon Ratio	1.00	0.33	0.33							1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00							1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	30.3	30.3							18.1	17.5	0.0
Incr Delay (d2), s/veh	0.0	19.1	31.1							23.2	27.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0							0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	12.1	13.0							17.2	14.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	49.4	61.4							41.3	45.1	0.0
LnGrp LOS	A	D	E							D	F	A
Approach Vol, veh/h		1496									2168	
Approach Delay, s/veh		53.2									43.7	
Approach LOS		D									D	

Timer - Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		30.0		40.0								
Change Period (Y+Rc), s		5.0		5.0								
Max Green Setting (Gmax), s		25.0		35.0								
Max Q Clear Time (g_c+I1), s		0.0		0.0								
Green Ext Time (p_c), s		0.0		0.0								

Intersection Summary												
HCM 6th Ctrl Delay			47.6									
HCM 6th LOS			D									

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	0	430	130	35	740	0	0	0	0	20	570	130
Future Volume (veh/h)	0	430	130	35	740	0	0	0	0	20	570	130
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00				1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1613	1613	1613	1613	0				1639	1639	1639
Adj Flow Rate, veh/h	0	682	206	52	915	0				41	833	201
Peak Hour Factor	0.93	0.87	0.87	0.77	0.93	0.93				0.63	0.89	0.84
Percent Heavy Veh, %	0	4	4	4	4	0				2	2	2
Cap, veh/h	0	1188	359	104	1410	0				49	1044	472
Arrive On Green	0.00	1.00	1.00	1.00	1.00	0.00				0.11	0.11	0.11
Sat Flow, veh/h	0	2391	698	91	2815	0				143	3046	1376
Grp Volume(v), veh/h	0	452	436	493	474	0				468	406	201
Grp Sat Flow(s),veh/h/ln	0	1532	1476	1438	1394	0				1632	1557	1376
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0				19.7	17.7	9.5
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0				19.7	17.7	9.5
Prop In Lane	0.00		0.47	0.11		0.00				0.09		1.00
Lane Grp Cap(c), veh/h	0	788	759	796	717	0				560	534	472
V/C Ratio(X)	0.00	0.57	0.57	0.62	0.66	0.00				0.84	0.76	0.43
Avail Cap(c_a), veh/h	0	788	759	796	717	0				560	534	472
HCM Platoon Ratio	1.00	2.00	2.00	2.00	2.00	1.00				0.33	0.33	0.33
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0				29.1	28.3	24.6
Incr Delay (d2), s/veh	0.0	3.0	3.1	3.6	4.7	0.0				13.8	9.8	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.7	0.7	0.8	0.9	0.0				10.6	8.7	3.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	3.0	3.1	3.6	4.7	0.0				42.9	38.1	27.4
LnGrp LOS	A	A	A	A	A	A				D	D	C
Approach Vol, veh/h		888			967						1075	
Approach Delay, s/veh		3.1			4.2						38.2	
Approach LOS		A			A						D	

Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		41.0		29.0		41.0						
Change Period (Y+Rc), s		5.0		5.0		5.0						
Max Green Setting (Gmax), s		36.0		24.0		36.0						
Max Q Clear Time (g_c+I1), s		0.0		0.0		0.0						
Green Ext Time (p_c), s		0.0		0.0		0.0						

Intersection Summary												
HCM 6th Ctrl Delay			16.3									
HCM 6th LOS			B									

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	95	580	0	0	1115	80	250	715	35	0	0	0
Future Volume (veh/h)	95	580	0	0	1115	80	250	715	35	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1792	1864	0	0	1879	1807	1821	1821	1821			
Adj Flow Rate, veh/h	149	857	0	0	1345	112	288	833	44			
Peak Hour Factor	0.83	0.88	0.95	0.95	0.92	0.79	0.92	0.91	0.84			
Percent Heavy Veh, %	4	4	0	0	3	3	2	2	2			
Cap, veh/h	230	2159	0	0	1652	137	512	986	52			
Arrive On Green	0.13	1.00	0.00	0.00	0.50	0.50	0.30	0.30	0.30			
Sat Flow, veh/h	1707	3635	0	0	3429	277	1734	3341	176			
Grp Volume(v), veh/h	149	857	0	0	718	739	288	431	446			
Grp Sat Flow(s),veh/h/ln	1707	1771	0	0	1785	1827	1734	1730	1787			
Q Serve(g_s), s	1.0	0.0	0.0	0.0	35.6	36.0	14.7	24.6	24.6			
Cycle Q Clear(g_c), s	1.0	0.0	0.0	0.0	35.6	36.0	14.7	24.6	24.6			
Prop In Lane	1.00		0.00	0.00		0.15	1.00		0.10			
Lane Grp Cap(c), veh/h	230	2159	0	0	884	905	512	511	528			
V/C Ratio(X)	0.65	0.40	0.00	0.00	0.81	0.82	0.56	0.84	0.84			
Avail Cap(c_a), veh/h	230	2159	0	0	884	905	512	511	528			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.82	0.82	0.00	0.00	1.00	1.00	0.73	0.73	0.73			
Uniform Delay (d), s/veh	40.3	0.0	0.0	0.0	22.4	22.5	31.3	34.7	34.7			
Incr Delay (d2), s/veh	4.0	0.4	0.0	0.0	8.0	8.1	3.2	11.9	11.6			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	3.7	0.1	0.0	0.0	16.4	17.0	6.6	12.0	12.3			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.3	0.4	0.0	0.0	30.4	30.6	34.5	46.7	46.3			
LnGrp LOS	D	A	A	A	C	C	C	D	D			
Approach Vol, veh/h		1006			1457			1165				
Approach Delay, s/veh		6.9			30.5			43.5				
Approach LOS		A			C			D				

Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	12.0	57.0				69.0		36.0				
Change Period (Y+Rc), s	5.0	5.0				5.0		5.0				
Max Green Setting (Gmax), s	7.0	52.0				64.0		31.0				
Max Q Clear Time (g_c+I1), s	0.0	0.0				0.0		0.0				
Green Ext Time (p_c), s	0.0	0.0				0.0		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			28.1									
HCM 6th LOS			C									

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	25	695	170	45	1495	45	305	135	45	20	50	15
Future Volume (vph)	25	695	170	45	1495	45	305	135	45	20	50	15
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Lane Width	11	12	12	11	12	12	11	11	12	11	11	12
Total Lost time (s)	12.0	5.0	5.0	6.0	5.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.91		0.95	0.95		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.97		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.99		0.95	1.00	
Satd. Flow (prot)	1649	3413	1527	1649	4879		1582	1598		1666	1678	
Flt Permitted	0.08	1.00	1.00	0.12	1.00		0.95	0.99		0.95	1.00	
Satd. Flow (perm)	134	3413	1527	215	4879		1582	1598		1666	1678	
Peak-hour factor, PHF	0.82	0.90	0.84	0.67	0.94	0.83	0.86	0.77	0.73	0.68	0.89	0.67
Growth Factor (vph)	126%	126%	126%	114%	114%	114%	226%	226%	226%	255%	255%	255%
Adj. Flow (vph)	38	973	255	77	1813	62	802	396	139	75	143	57
RTOR Reduction (vph)	0	0	136	0	3	0	0	7	0	0	10	0
Lane Group Flow (vph)	38	973	119	77	1872	0	666	664	0	75	190	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA		Split	NA	
Protected Phases	1	6		5	2		8	8		4	4	
Permitted Phases	6		6	2								
Actuated Green, G (s)	58.4	52.0	52.0	55.6	47.6		50.0	50.0		12.0	12.0	
Effective Green, g (s)	58.4	52.0	52.0	55.6	47.6		50.0	50.0		12.0	12.0	
Actuated g/C Ratio	0.40	0.36	0.36	0.38	0.33		0.34	0.34		0.08	0.08	
Clearance Time (s)	12.0	5.0	5.0	6.0	5.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	120	1223	547	161	1601		545	551		137	138	
v/s Ratio Prot	0.01	c0.29		c0.03	c0.38		c0.42	0.42		0.05	c0.11	
v/s Ratio Perm	0.11		0.08	0.16								
v/c Ratio	0.32	0.80	0.22	0.48	1.17		1.22	1.21		0.55	1.38	
Uniform Delay, d1	34.6	41.7	32.3	32.0	48.7		47.5	47.5		63.9	66.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	5.4	0.9	0.8	83.4		115.6	108.9		2.4	208.1	
Delay (s)	35.1	47.1	33.3	32.8	132.1		163.1	156.4		66.3	274.6	
Level of Service	D	D	C	C	F		F	F		E	F	
Approach Delay (s)		44.0			128.1			159.8			217.8	
Approach LOS		D			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	119.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	29.0
Intersection Capacity Utilization	98.2%	ICU Level of Service	F
Analysis Period (min)	15		
Description: Count Date: 1/22/2015			

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	22	820	106	16	1684	4	218	64	36	18	30	4
Future Volume (vph)	22	820	106	16	1684	4	218	64	36	18	30	4
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Lane Width	10	13	12	12	12	12	12	12	12	11	12	12
Total Lost time (s)	10.0	5.5	5.5	6.0	5.5	5.5	6.0	5.5		6.0	6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1516	3526	1527	1706	3413	1527	3343	1716		1666	1784	
Flt Permitted	0.05	1.00	1.00	0.19	1.00	1.00	0.95	1.00		0.73	1.00	
Satd. Flow (perm)	74	3526	1527	349	3413	1527	3343	1716		1275	1784	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor (vph)	134%	134%	134%	142%	142%	142%	122%	122%	122%	157%	157%	157%
Adj. Flow (vph)	30	1133	146	23	2465	6	274	80	45	29	49	6
RTOR Reduction (vph)	0	0	59	0	0	3	0	14	0	0	4	0
Lane Group Flow (vph)	30	1133	87	23	2465	3	274	111	0	29	51	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	12	0	0	0	0	0	0	0	0	0	0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA		pm+pt	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2		2				4	4	
Actuated Green, G (s)	90.8	86.5	86.5	84.8	81.5	81.5	23.2	29.2		8.5	8.5	
Effective Green, g (s)	90.8	86.5	86.5	84.8	81.5	81.5	23.2	29.2		8.5	8.5	
Actuated g/C Ratio	0.63	0.60	0.60	0.58	0.56	0.56	0.16	0.20		0.06	0.06	
Clearance Time (s)	10.0	5.5	5.5	6.0	5.5	5.5	6.0	5.5		6.0	6.0	
Vehicle Extension (s)	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	89	2103	910	234	1918	858	534	345		82	104	
v/s Ratio Prot	c0.01	c0.32		0.00	c0.72		c0.08	c0.06		0.01	c0.03	
v/s Ratio Perm	0.20		0.06	0.06		0.00				0.01		
v/c Ratio	0.34	0.54	0.10	0.10	1.29	0.00	0.51	0.32		0.35	0.49	
Uniform Delay, d1	34.3	17.4	12.5	13.9	31.8	13.9	55.7	49.4		65.4	66.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.2	1.0	0.2	0.1	132.4	0.0	0.3	0.2		1.0	1.3	
Delay (s)	36.5	18.4	12.7	14.0	164.2	13.9	56.1	49.6		66.4	67.5	
Level of Service	D	B	B	B	F	B	E	D		E	E	
Approach Delay (s)		18.2			162.4			54.1			67.1	
Approach LOS		B			F			D			E	

Intersection Summary			
HCM 2000 Control Delay	106.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	27.5
Intersection Capacity Utilization	98.6%	ICU Level of Service	F
Analysis Period (min)	15		

Description: Count Date: 1/21/2014

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	290	1060	0	0	0	0	0	635	45
Future Volume (veh/h)	0	0	0	290	1060	0	0	0	0	0	635	45
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.88
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach					No						No	
Adj Sat Flow, veh/h/ln				1639	1639	0				0	1613	1613
Adj Flow Rate, veh/h				388	1432	0				0	1440	110
Peak Hour Factor				0.95	0.94	0.88				0.88	0.86	0.80
Percent Heavy Veh, %				2	2	0				0	4	4
Cap, veh/h				471	1517	0				0	1587	121
Arrive On Green				0.46	0.46	0.00				0.00	0.38	0.38
Sat Flow, veh/h				830	3421	0				0	4270	315
Grp Volume(v), veh/h				656	1164	0				0	1025	525
Grp Sat Flow(s),veh/h/ln				1403	1357	0				0	1468	1505
Q Serve(g_s), s				30.0	26.3	0.0				0.0	21.4	21.5
Cycle Q Clear(g_c), s				30.0	26.3	0.0				0.0	21.4	21.5
Prop In Lane				0.59		0.00				0.00		0.21
Lane Grp Cap(c), veh/h				736	1253	0				0	1129	579
V/C Ratio(X)				0.89	0.93	0.00				0.00	0.91	0.91
Avail Cap(c_a), veh/h				736	1253	0				0	1129	579
HCM Platoon Ratio				1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				17.7	16.5	0.0				0.0	18.9	18.9
Incr Delay (d2), s/veh				15.3	13.3	0.0				0.0	12.1	20.5
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				11.8	9.5	0.0				0.0	8.5	10.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				33.0	29.8	0.0				0.0	31.0	39.4
LnGrp LOS				C	C	A				A	C	D
Approach Vol, veh/h					1820						1550	
Approach Delay, s/veh					31.0						33.9	
Approach LOS					C						C	

Timer - Assigned Phs	2	4
Phs Duration (G+Y+Rc), s	35.0	30.0
Change Period (Y+Rc), s	5.0	5.0
Max Green Setting (Gmax), s	30.0	25.0
Max Q Clear Time (g_c+I1), s	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	32.3
HCM 6th LOS	C

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	0	590	270	0	0	0	0	0	0	100	1325	0
Future Volume (veh/h)	0	590	270	0	0	0	0	0	0	100	1325	0
Initial Q (Qb), veh	0	0	0							0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00							1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00							1.00	1.00	1.00
Work Zone On Approach		No									No	
Adj Sat Flow, veh/h/ln	0	1639	1639							1626	1626	0
Adj Flow Rate, veh/h	0	1026	470							152	2016	0
Peak Hour Factor	0.92	0.92	0.92							0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2							3	3	0
Cap, veh/h	0	1154	529							174	1945	0
Arrive On Green	0.00	0.38	0.38							0.16	0.16	0.00
Sat Flow, veh/h	0	3148	1374							287	4083	0
Grp Volume(v), veh/h	0	1020	476							800	1368	0
Grp Sat Flow(s),veh/h/ln	0	1492	1392							1544	1347	0
Q Serve(g_s), s	0.0	41.6	41.6							62.8	64.0	0.0
Cycle Q Clear(g_c), s	0.0	41.6	41.6							64.0	64.0	0.0
Prop In Lane	0.00		0.99							0.19		0.00
Lane Grp Cap(c), veh/h	0	1147	535							793	1326	0
V/C Ratio(X)	0.00	0.89	0.89							1.01	1.03	0.00
Avail Cap(c_a), veh/h	0	1147	535							793	1326	0
HCM Platoon Ratio	1.00	1.00	1.00							0.33	0.33	1.00
Upstream Filter(I)	0.00	1.00	1.00							1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	37.4	37.4							55.7	54.4	0.0
Incr Delay (d2), s/veh	0.0	10.4	19.4							34.1	33.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0							0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	16.6	16.9							35.5	29.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	47.8	56.8							89.9	87.7	0.0
LnGrp LOS	A	D	E							F	F	A
Approach Vol, veh/h		1496									2168	
Approach Delay, s/veh		50.7									88.5	
Approach LOS		D									F	

Timer - Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		61.0		69.0								
Change Period (Y+Rc), s		11.0		5.0								
Max Green Setting (Gmax), s		50.0		64.0								
Max Q Clear Time (g_c+I1), s		0.0		0.0								
Green Ext Time (p_c), s		0.0		0.0								

Intersection Summary	
HCM 6th Ctrl Delay	73.1
HCM 6th LOS	E

B. ROUTE DESCRIPTIONS TECHNICAL MEMORANDUM

BUILDING A BETTER State Street

MEMORANDUM

Date: February 23, 2021

To: Stephen Hunt, Valley Regional Transit

From: Mary Sizemore, Fehr & Peers
Maria Vyas, Fehr & Peers

Subject: State Street Transit Alternatives Analysis: Potential Stop Locations

UT20-2200

The State Street bus route alternative analysis includes three different alignments, each with its own set of bus stops. This document outlines the route of each alignment and its stops including any landmarks along the way as well as a list of modified or eliminated stops. Stops along the route were chosen based on conversations with VRT and the factors outlined in VRT's Bus Stop Location and Transit Amenities Development Guidelines. Some important ones include:

- Spacing: 0.25mi to 0.5mi for dense areas.
- Trip Generators: proximity to large job, commercial, or residential centers.
- Relation to intersection: far-side stops are preferred over near-side stops for pedestrian safety and efficiency of all vehicles through the intersection.
- Right-of-Way (ROW): ample ROW is available for passenger boarding and alighting in compliance with the Americans with Disabilities Act (ADA).

These factors influence the use of existing stops, modifications to existing stops, and the addition of new stops. Some stops are marked as "potential" to indicate locations that meet most but not all of the above factors. These stops will require further discussion with VRT to determine their final eligibility.

Whitewater Park Boulevard Alignment

Inbound buses will travel southeast on State Street and stop at the Idaho Transportation Department building before turning right onto southbound Whitewater Park Boulevard. Buses will then travel along Whitewater Park Boulevard with stops at Pleasanton Avenue and Main Street, passing Esther Simplot Park. Buses will then turn left at Fairview Avenue to travel east through the new and planned high-density development towards downtown, stopping at 27th Street, 24th Street, and 18th Street. Buses will then continue southeast onto Main Street, stopping at 15th Street and 11th Street. Buses will continue down Main Street, turn right onto southwest

Capitol Boulevard, then turn right to enter the underground Main Street station (Main Street & Capitol Boulevard).

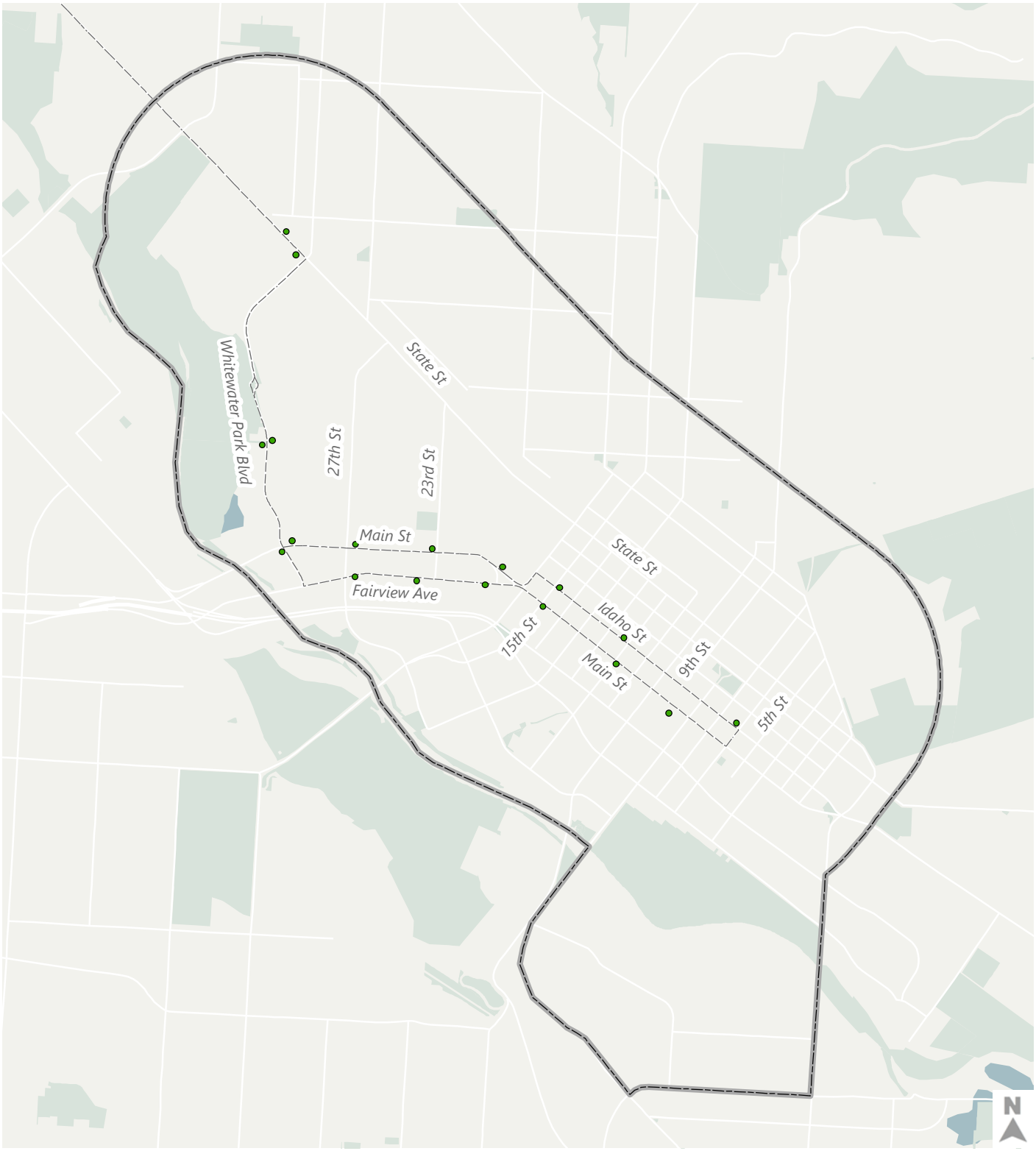
Outbound buses will depart Main Street Station by heading southeast on Main Street before turning left onto northbound 5th Street. Buses will make another left turn onto Idaho Street and stop near 5th Street & Idaho Street. Buses will continue northwest on Idaho Street, stopping at 11th Street and 15th Street to provide service to the commercial heart of downtown. At 16th Street, buses will make a left turn and then a right turn onto westbound Main Street. Buses will continue on Main Street with stops at 17th Street, 23rd Street, 27th Street, and Whitewater Park Boulevard before turning right onto northbound Whitewater Park Boulevard. Buses will stop at Pleasanton Avenue, continue past Esther Simplot Park, and turn left onto State Street with a stop at 32nd Street before continuing northwest.

Table 1. Whitewater Alignment Stops – Existing, New, and Modified

Stop Name	Corner	Action	Comment
State & Whitewater	SE→SW	Modify	Move to near side of intersection for ITD building
Whitewater & Pleasanton	SW	Add	Near park, apartments, and active transportation infrastructure
Main & Whitewater	SW	Add	Near planned high-density development
Fairview & 27th	SW→SE	Modify	Move to far side of intersection
Fairview & 24th	SE	Modify	Move stop to far side of 24th near new high-density development.
Fairview & 18th	SE	No Changes	
Main & 15th	SW→SE	Modify	Move to far side of intersection
Main & 13th	SE	Skip	Stop spacing too close. 790' to next stop
Main & 11th	SW→SE	Modify	Move to far side of intersection
Main Street Station	-	No Changes	
Idaho & 5th	NE→NW	Modify	Move across 5th Street for far-side transfers
Idaho & 9th	NW	Skip	Stop spacing too close. 42 existing on/off; 400' to next stop.
Idaho & 11th	NW	No Changes	Stop will serve new development.
Idaho & 13th	NW	Skip	Stop spacing too close. 580' to next stop.
Idaho & 15th	NE	No Changes	
Main & 18th →17th	NE	Modify	Move from 18th to 17th for sight line safety, ROW, bike lane access
Main & 24th →23rd	NW	Modify	Provides a pair for the stop at 24th on Fairview
Main & 27th	NW	Modify	Keep near-side. Move east for right-turn movement.
Main & Whitewater	NE	Add	Near high-density development
Whitewater & Pleasanton	NE	Add	Near park, apartments, and active transportation infrastructure
State & 32nd	NE	Add	Maintain even stop spacing

Source: Fehr & Peers.

Below are a map of the stops and sample cross-sections along the alignment:

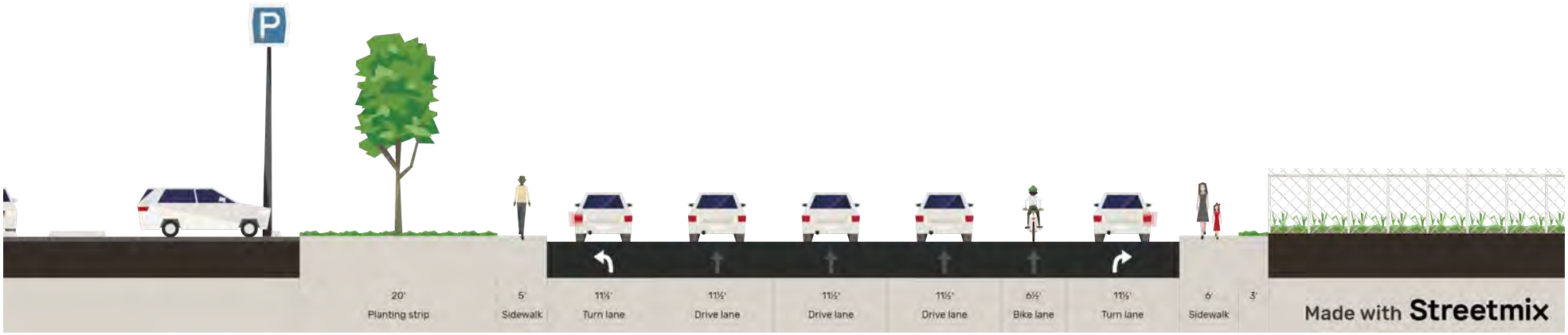


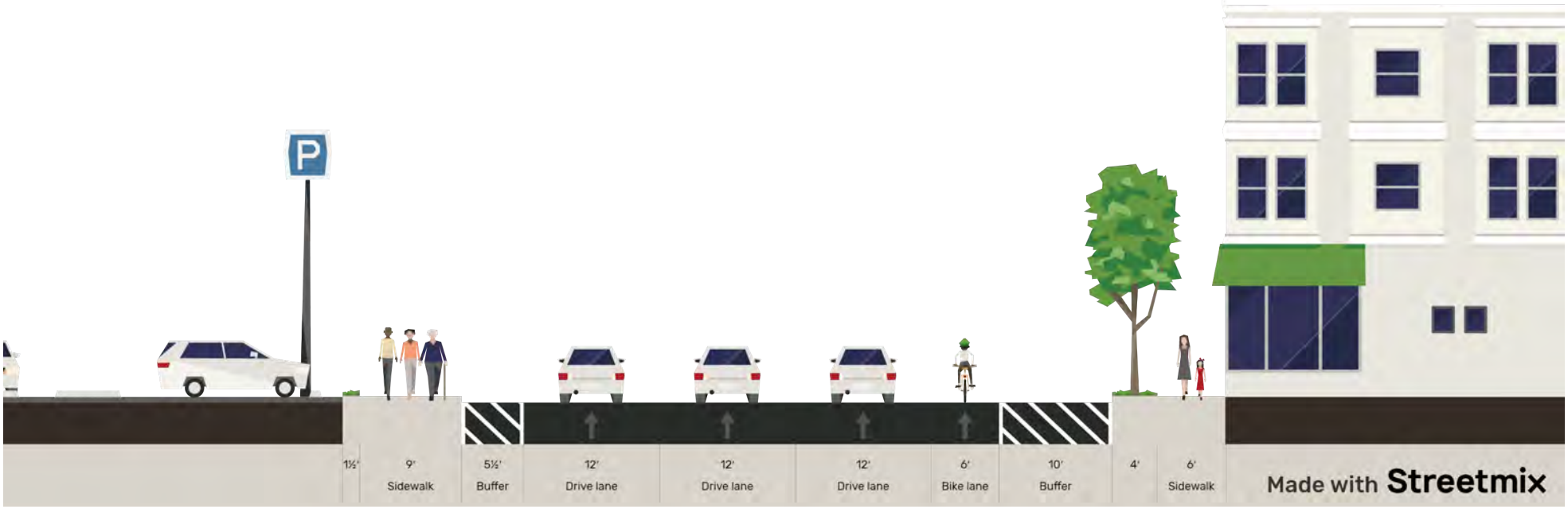
LEGEND

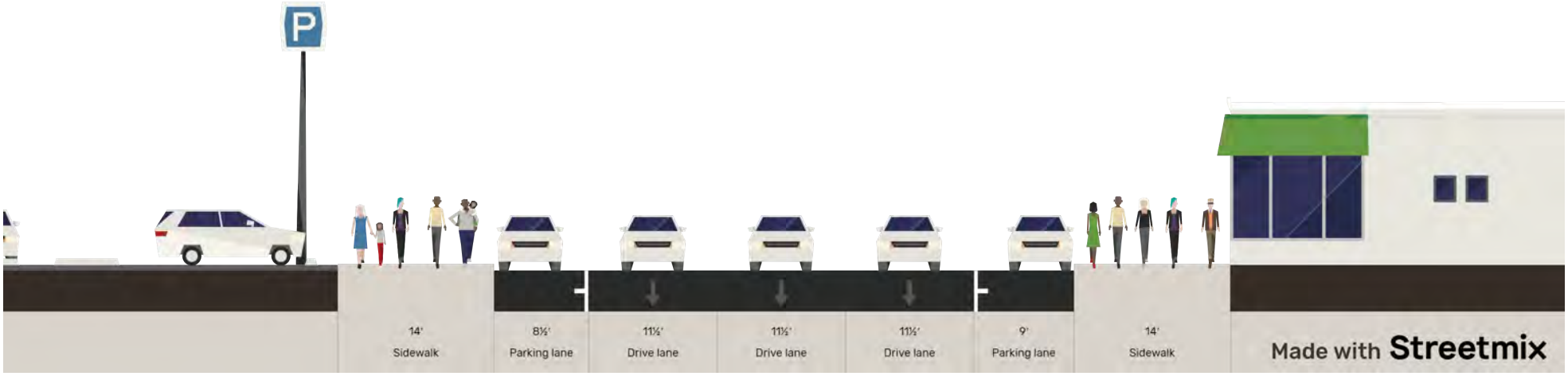
- Recommended
- Potential
- Alignment

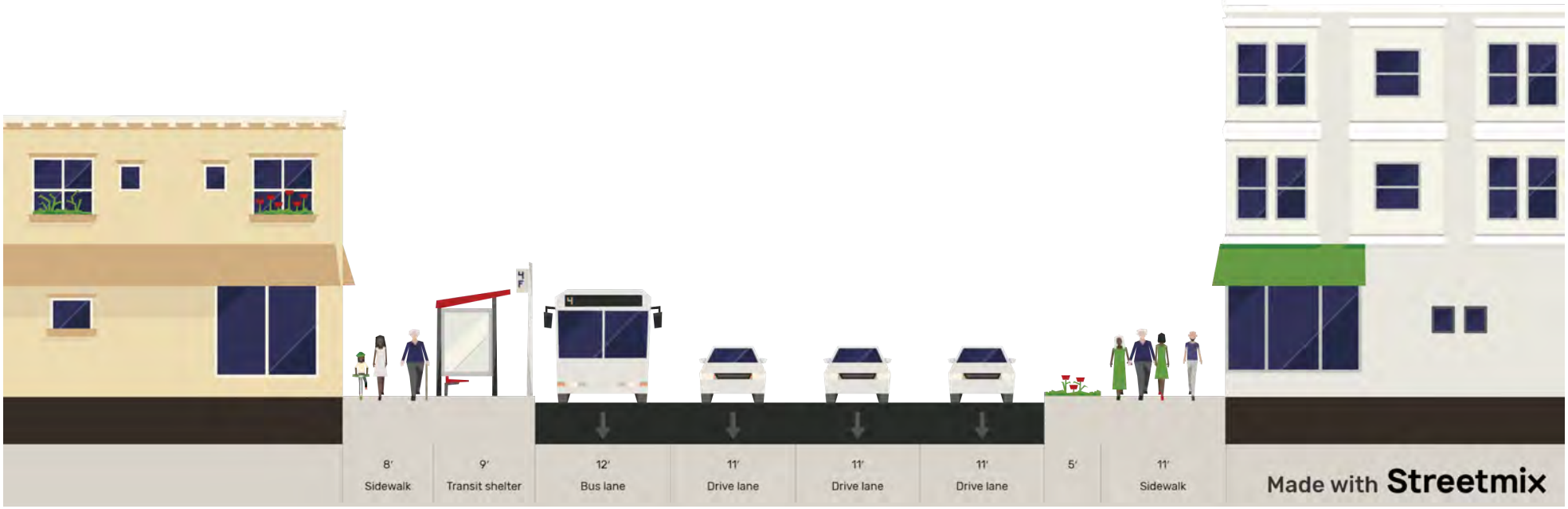
Potential Stop Locations - Whitewater Park Boulevard

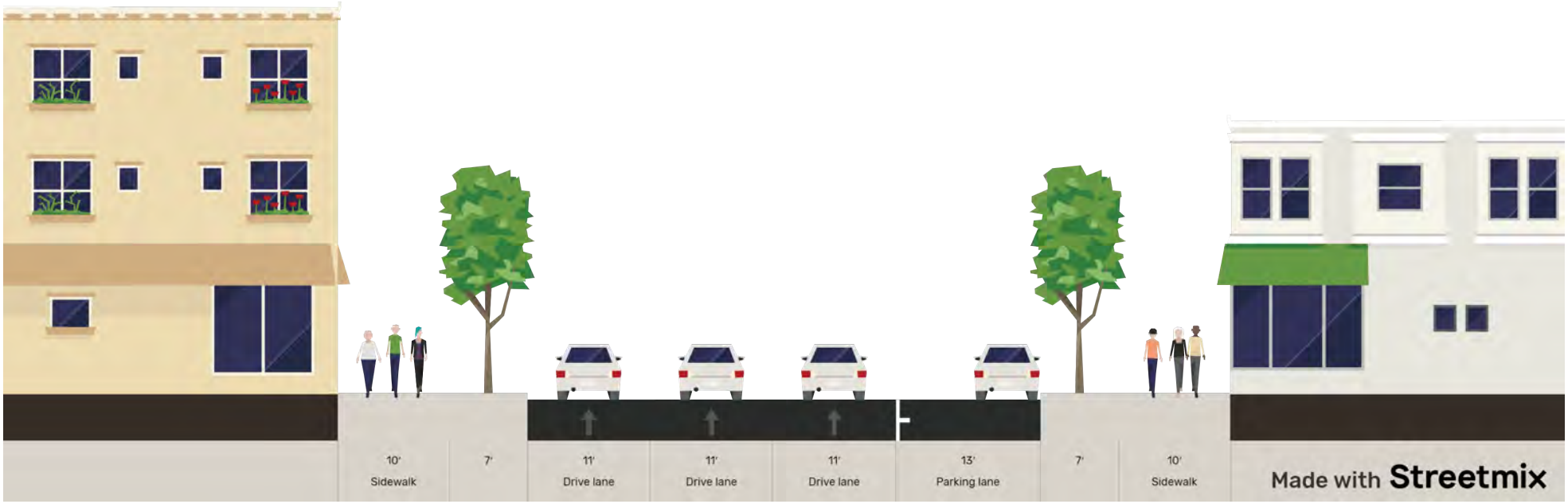

3'
9'
Sidewalk
6'
Bike lane
10½'
Drive lane
10½'
Drive lane
12'
Center turn lane
10½'
Drive lane
10½'
Drive lane
6'
Bike lane
9'
Sidewalk
3'
Made with Streetmix

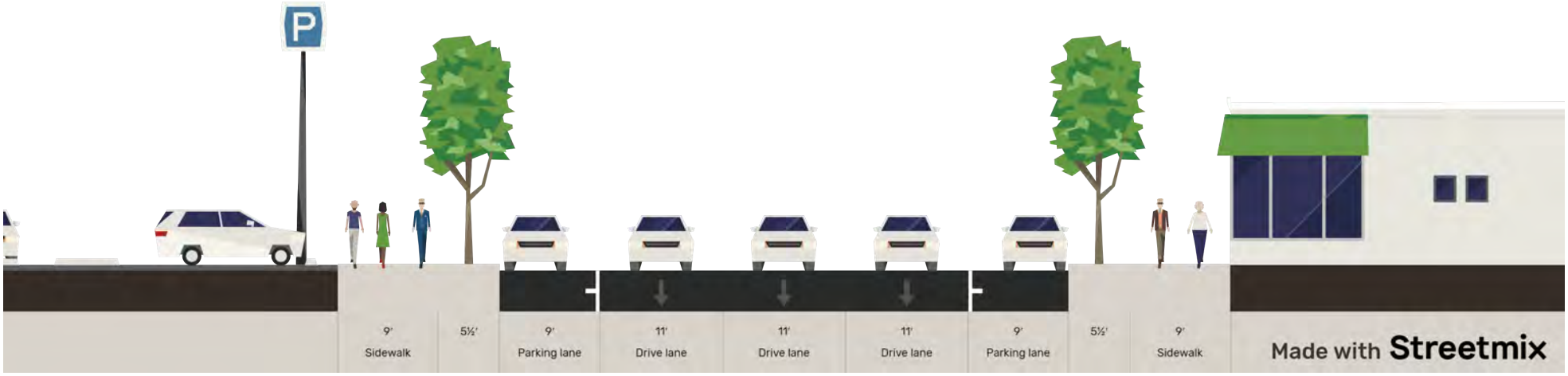

20'
Planting strip
5'
Sidewalk
11½'
Turn lane
11½'
Drive lane
11½'
Drive lane
11½'
Drive lane
6½'
Bike lane
11½'
Turn lane
6'
Sidewalk
3'
Made with Streetmix

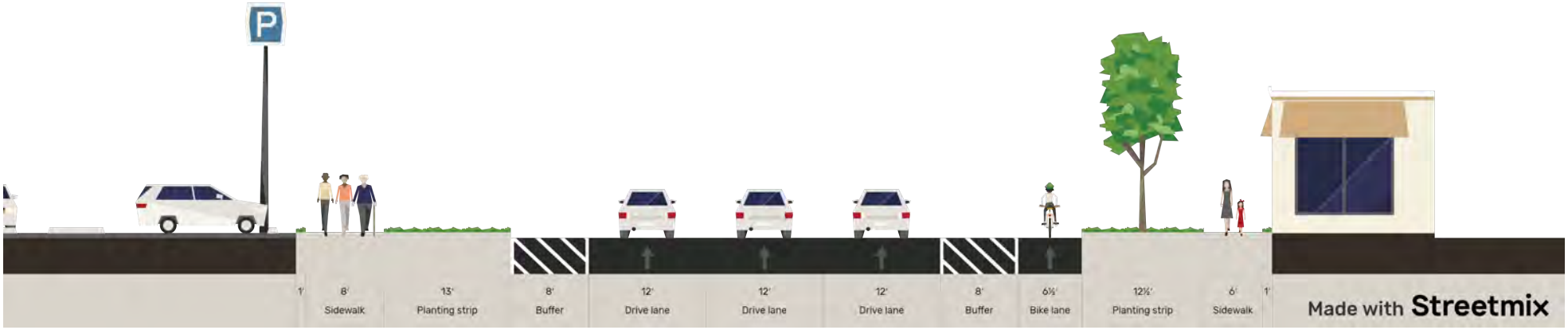

1½'
9'
Sidewalk
5½'
Buffer
12'
Drive lane
12'
Drive lane
12'
Drive lane
6'
Bike lane
10'
Buffer
4'
6'
Sidewalk
Made with Streetmix


14'
Sidewalk
8½'
Parking lane
11½'
Drive lane
11½'
Drive lane
11½'
Drive lane
9'
Parking lane
14'
Sidewalk
Made with Streetmix


8′
Sidewalk
9′
Transit shelter
12′
Bus lane
11′
Drive lane
11′
Drive lane
11′
Drive lane
5′
11′
Sidewalk
Made with Streetmix


10'
Sidewalk
7'
11'
Drive lane
11'
Drive lane
11'
Drive lane
13'
Parking lane
7'
10'
Sidewalk
Made with Streetmix


9'
Sidewalk
5½'
9'
Parking lane
11'
Drive lane
11'
Drive lane
11'
Drive lane
9'
Parking lane
5½'
9'
Sidewalk
Made with Streetmix


1'
8'
Sidewalk
13'
Planting strip
8'
Buffer
12'
Drive lane
12'
Drive lane
12'
Drive lane
8'
Buffer
6½'
Bike lane
12½'
Planting strip
6'
Sidewalk
1'
Made with Streetmix

27th Street Alignment

Inbound buses will travel southeast on State Street, stopping at the Idaho Transportation Department building before turning right onto 27th Street. Buses will stop on 27th Street at State Street with a potential stop at Pleasanton Avenue. Buses will then turn left at Fairview Avenue to travel east through the new and planned high-density development towards downtown, stopping at 27th Street, 24th Street, and 18th Street. Buses will then continue southeast onto Main Street, stopping at 15th Street and 11th Street. Buses will continue down Main Street, turn right onto southwest Capitol Boulevard, then turn right to enter the underground Main Street station (Main Street & Capitol Boulevard).

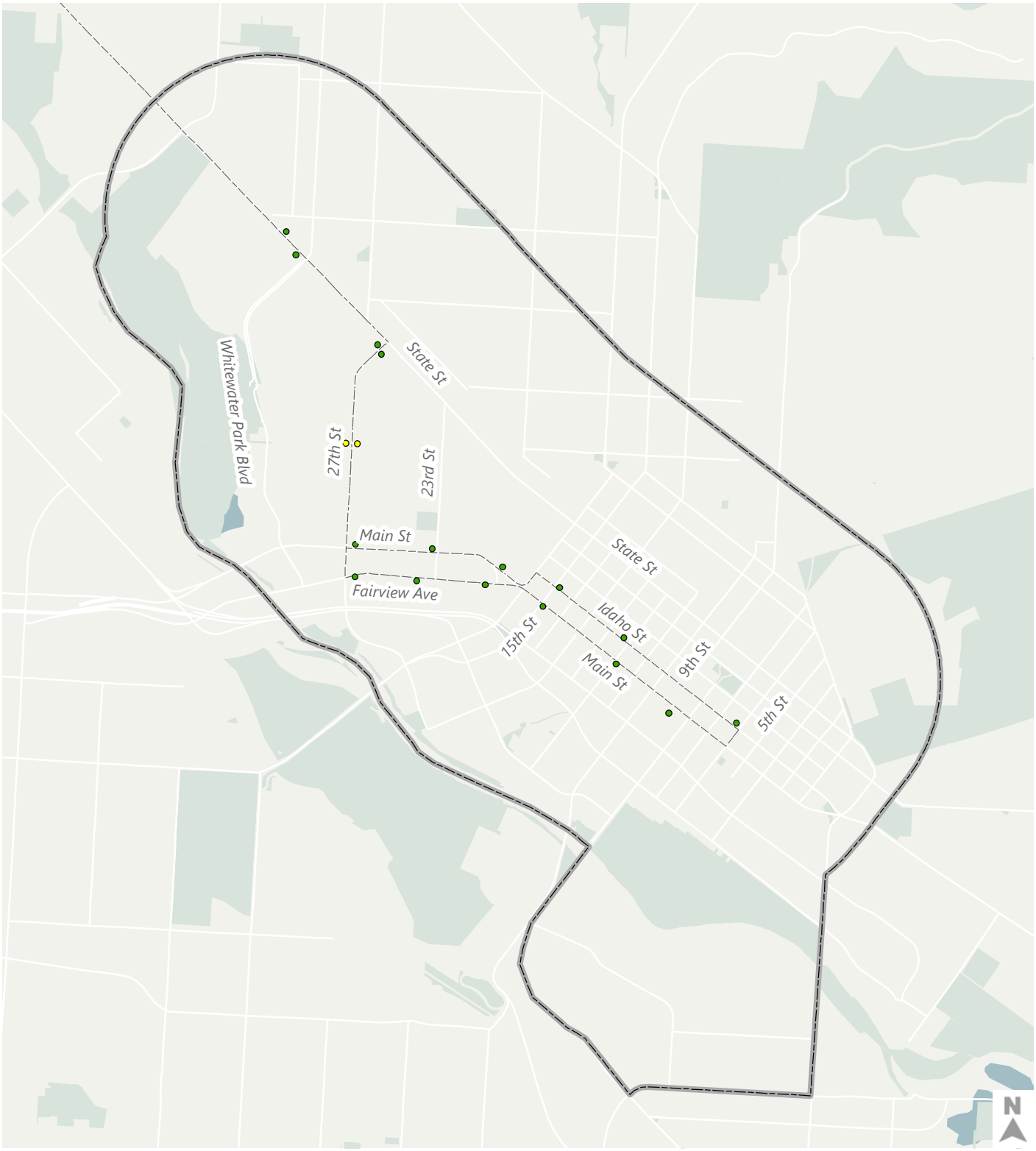
Outbound buses will depart Main Street Station by heading southeast on Main Street before turning left onto northbound 5th Street. Buses will make another left turn onto Idaho Street and stop near 5th Street & Idaho Street. Buses will continue northwest on Idaho Street, stopping at 11th Street and 15th Street to provide service to the commercial heart of downtown. At 16th Street, buses will make a left turn and then a right turn onto westbound Main Street. Buses will continue on Main Street with stops at 17th Street, 23rd Street, 27th Street before turning right onto northbound 27th Street. Buses will stop at Pleasanton Avenue (potential) and just south of State Street before making a left turn to head northwest-bound on State Street. Buses will stop at 32nd St before continuing northwest.

Table 2. 27th Street Alignment Stops – Existing, New, and Modified

Stop Name	Corner	Action	Comment
State & Whitewater	SE	Modify	Move to near side of intersection for ITD building (SW corner)
State & 27th → 27th & State	SW→NW	Modify	Move to 27th Street for far-side placement
27th & Pleasanton	SW	Add (Potential)	Near bicycle infrastructure to Esther Simplot Park
Fairview & 27th	SW→SE	Modify	Move to far side of intersection
Fairview & 24th	SE	Modify	Move stop to far side of 24th near new high-density development.
Fairview & 18th	SW	No Changes	
Main & 15th	SW→SE	Modify	Move to far side of intersection
Main & 13th	SE	Skip	Stop spacing too close. 790' to next stop
Main & 11th	SW→SE	Modify	Move to far side of intersection
Main Street Station	-	No Changes	
Idaho & 5th	NE→NW	Modify	Move across 5th Street for far-side transfers
Idaho & 9th	NW	Skip	Stop spacing too close. 42 existing on/off; 400' to next stop.
Idaho & 11th	NW	No Changes	Stop will serve new development.
Idaho & 13th	NW	Skip	Stop spacing too close. 580' to next stop.
Idaho & 15th	NE	No Changes	
Main & 18th →17th	NE	Modify	Move from 18th to 17th for sight line safety, ROW, bike lane access
Main & 24th →23rd	NW	Modify	Provides a pair for the stop at 24th on Fairview
Main & 27th	NW	Modify	Keep near-side. Move east for right-turn movement.
27th & Pleasanton	NE	Add (Potential)	Near bicycle infrastructure to Esther Simplot Park
State & 27th →27th & State	NE	Modify	Move stop off of State Street & before left-turn movement
State and 32nd	NE	Add	Maintain even stop spacing

Source: Fehr & Peers.

Below are a map of the stops and sample cross-sections along the alignment:

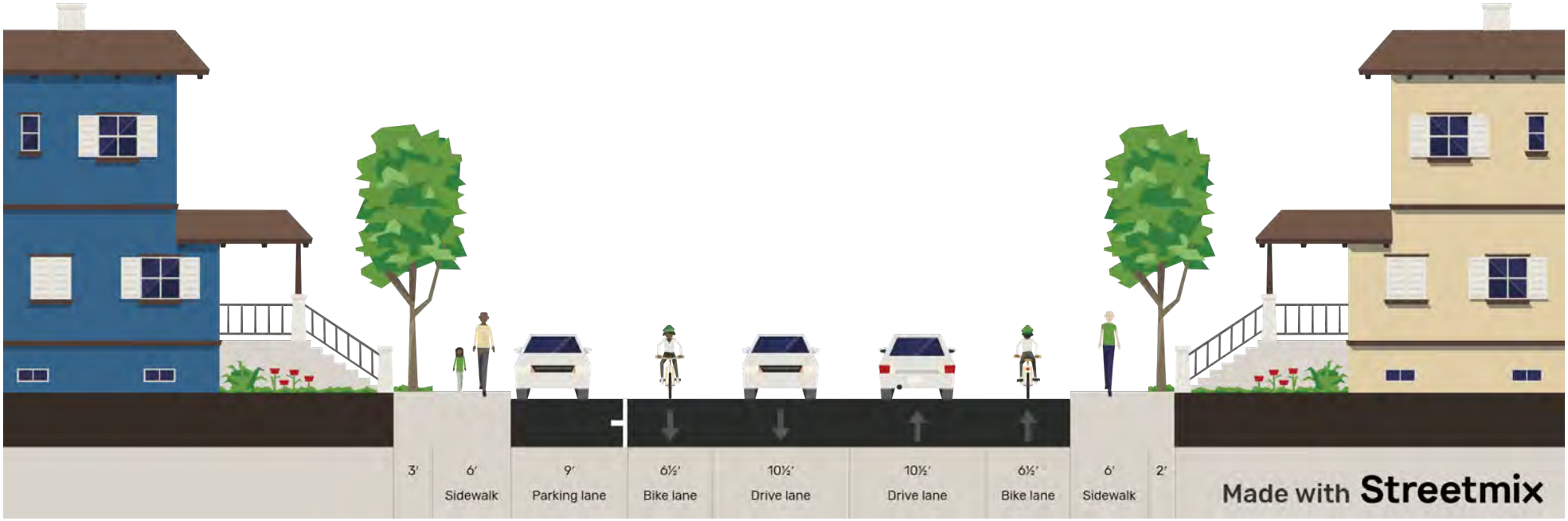


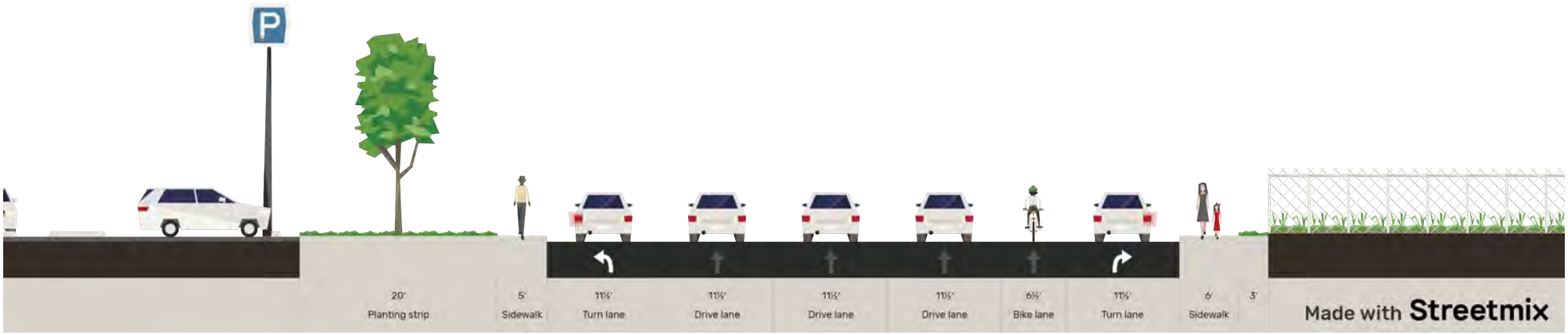
LEGEND

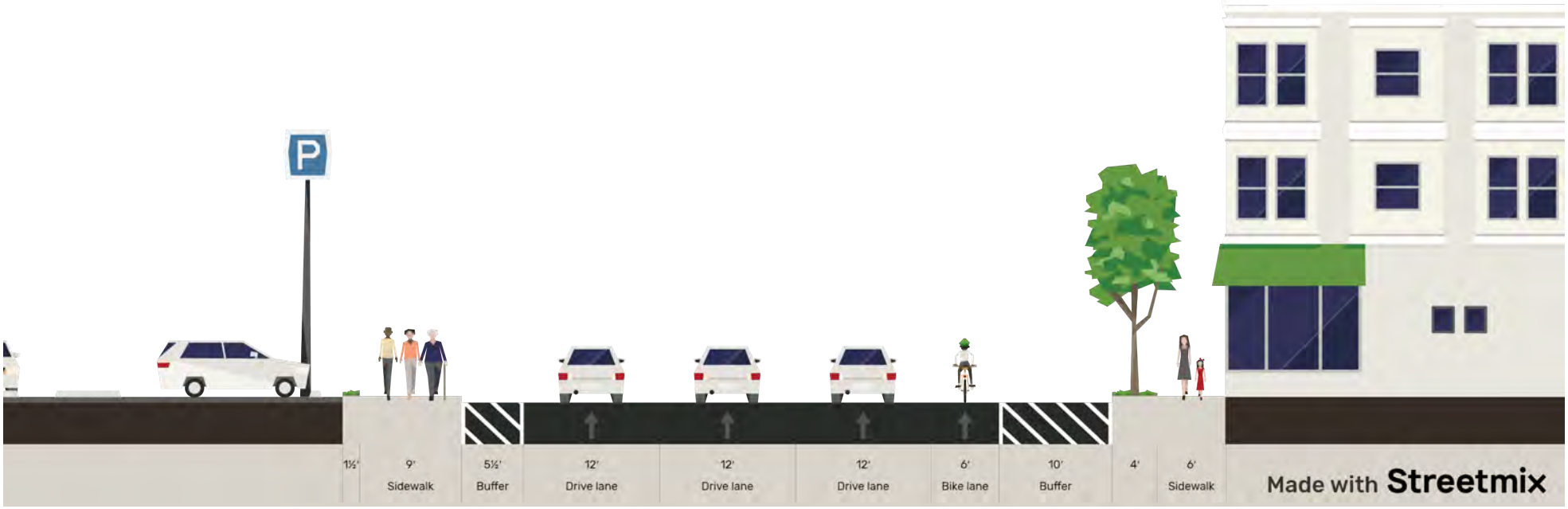
- Recommended
- Potential
- Alignment

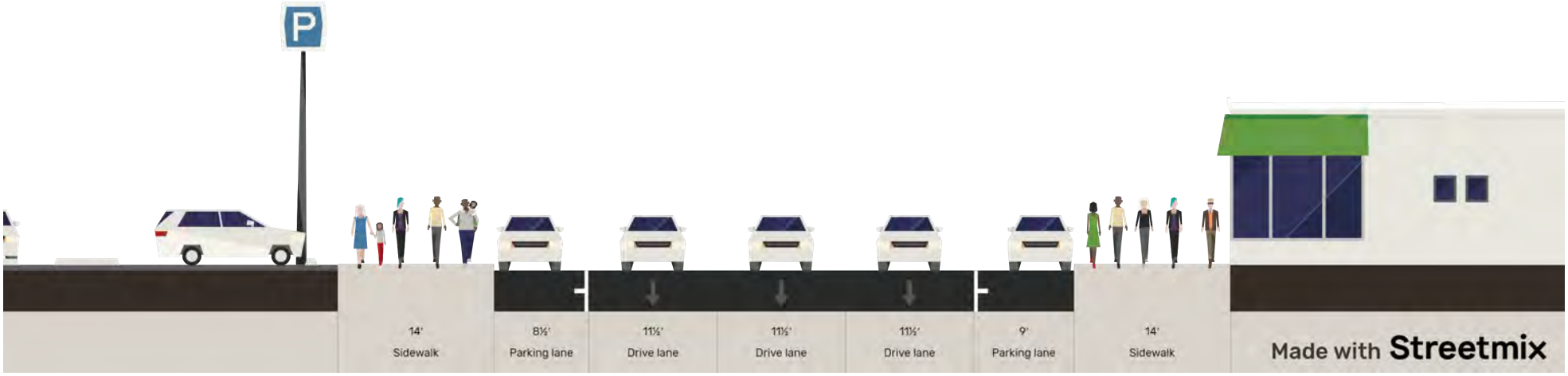
Transit

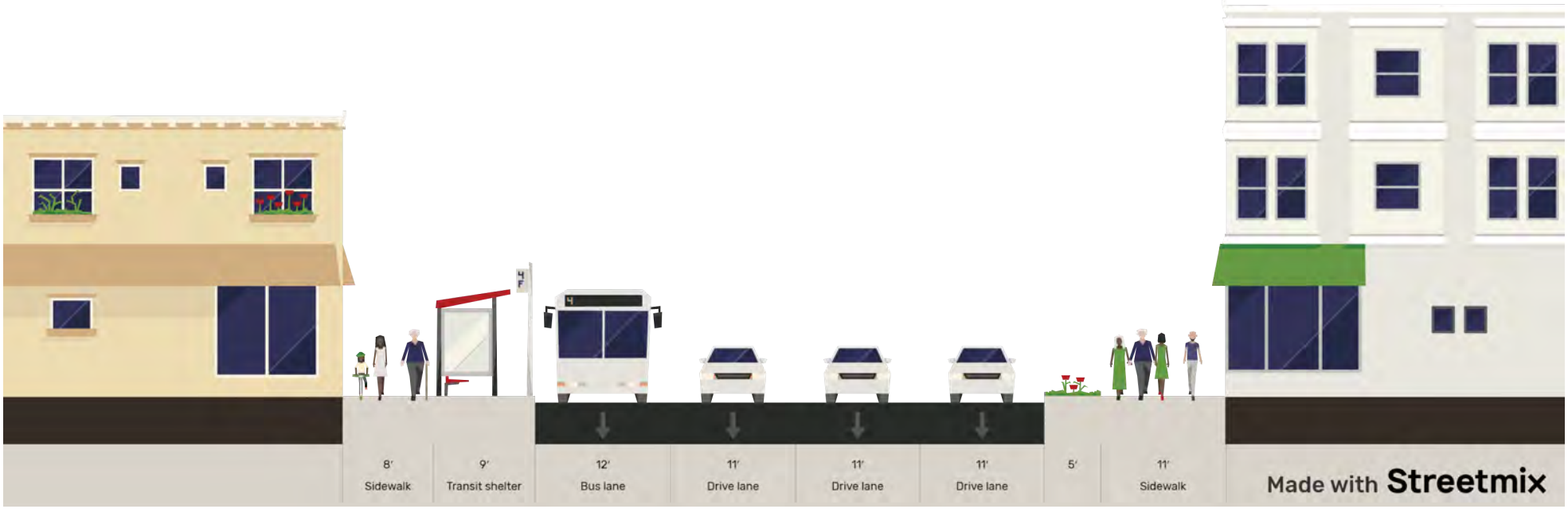
Potential Stop Locations - 27th Street

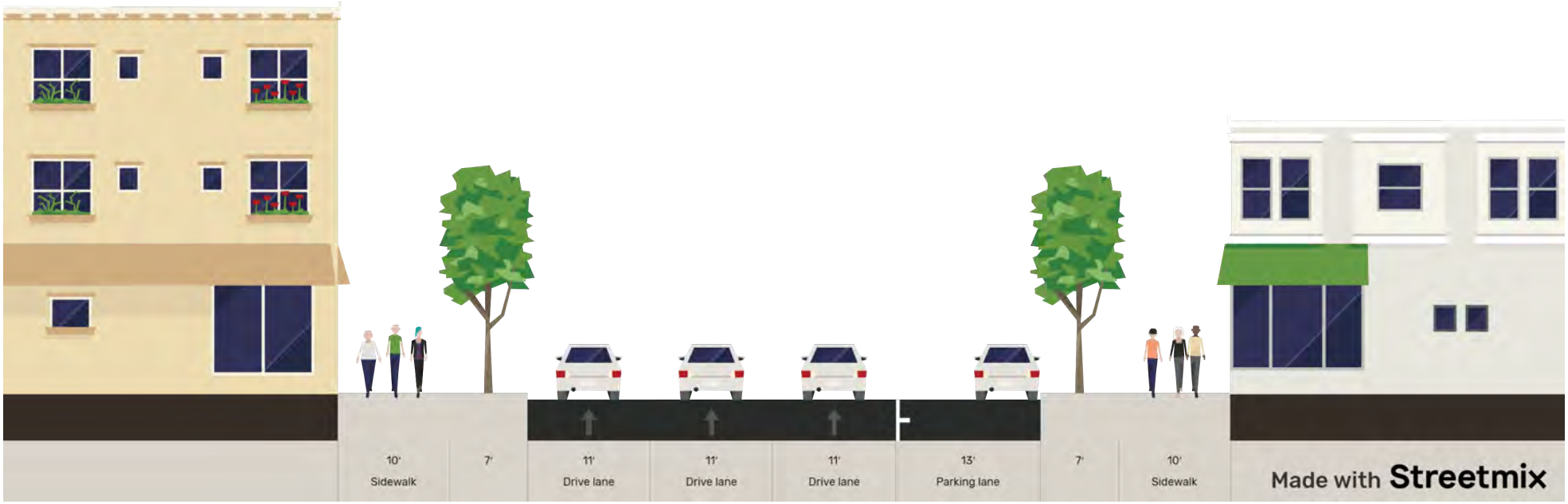

3'
6'
Sidewalk
9'
Parking lane
6½'
Bike lane
10½'
Drive lane
10½'
Drive lane
6½'
Bike lane
6'
Sidewalk
2'
Made with Streetmix

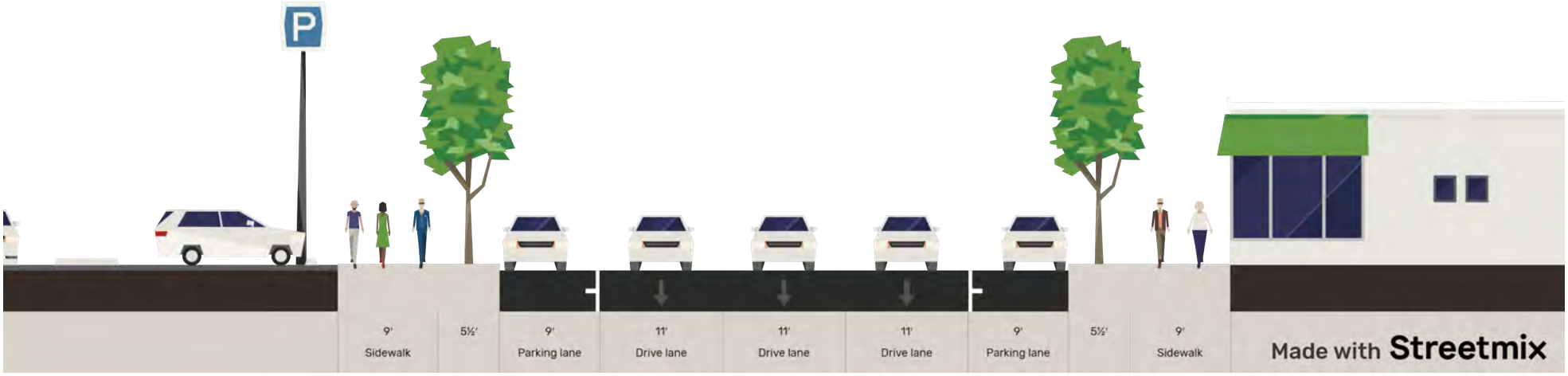

20'
Planting strip
5'
Sidewalk
11½'
Turn lane
11½'
Drive lane
11½'
Drive lane
11½'
Drive lane
6½'
Bike lane
11½'
Turn lane
6'
Sidewalk
3'
Made with Streetmix

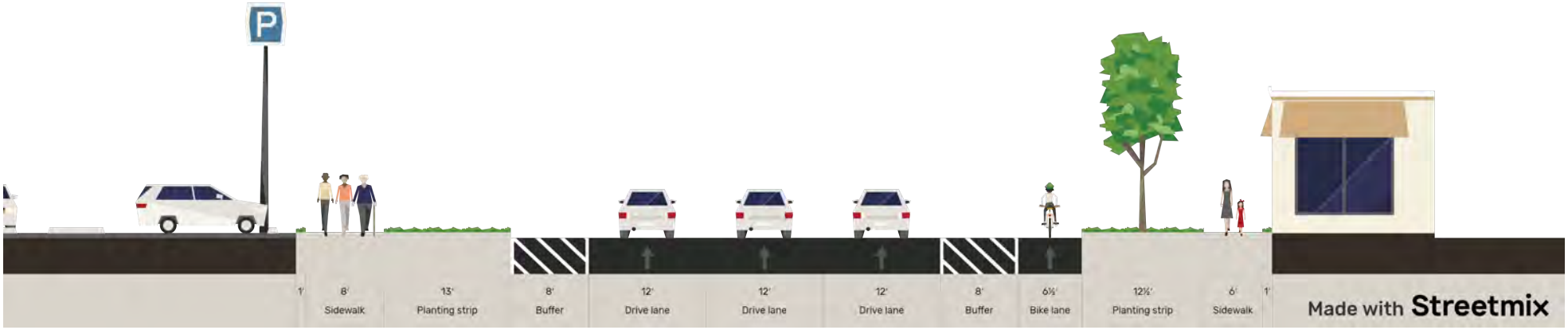

1½'
9'
Sidewalk
5½'
Buffer
12'
Drive lane
12'
Drive lane
12'
Drive lane
6'
Bike lane
10'
Buffer
4'
6'
Sidewalk
Made with Streetmix


14'
Sidewalk
8½'
Parking lane
11½'
Drive lane
11½'
Drive lane
11½'
Drive lane
9'
Parking lane
14'
Sidewalk
Made with Streetmix


8′
Sidewalk
9′
Transit shelter
12′
Bus lane
11′
Drive lane
11′
Drive lane
11′
Drive lane
5′
11′
Sidewalk
Made with Streetmix


10'
Sidewalk
7'
11'
Drive lane
11'
Drive lane
11'
Drive lane
13'
Parking lane
7'
10'
Sidewalk
Made with Streetmix


9'
Sidewalk
5½'
9'
Parking lane
11'
Drive lane
11'
Drive lane
11'
Drive lane
9'
Parking lane
5½'
9'
Sidewalk
Made with Streetmix


1'
8'
Sidewalk
13'
Planting strip
8'
Buffer
12'
Drive lane
12'
Drive lane
12'
Drive lane
8'
Buffer
6½'
Bike lane
12½'
Planting strip
6'
Sidewalk
1'
Made with Streetmix

State Street Alignment

Inbound buses will travel southeast on State Street, stopping at the Idaho Transportation Department building, 27th Street, 23rd Street, 18th Street, 15th Street, and 11th Street, serving the Boise High School and the Downtown YMCA via the 11th Street stop. Buses will then turn right onto southwest 9th Street, stopping at Bannock Street (potential). Buses will then enter the commercial heart of downtown and turn left onto Main Street, then right onto southwest Capitol Boulevard, then turn right to enter the underground Main Street station (Main Street & Capitol Boulevard).

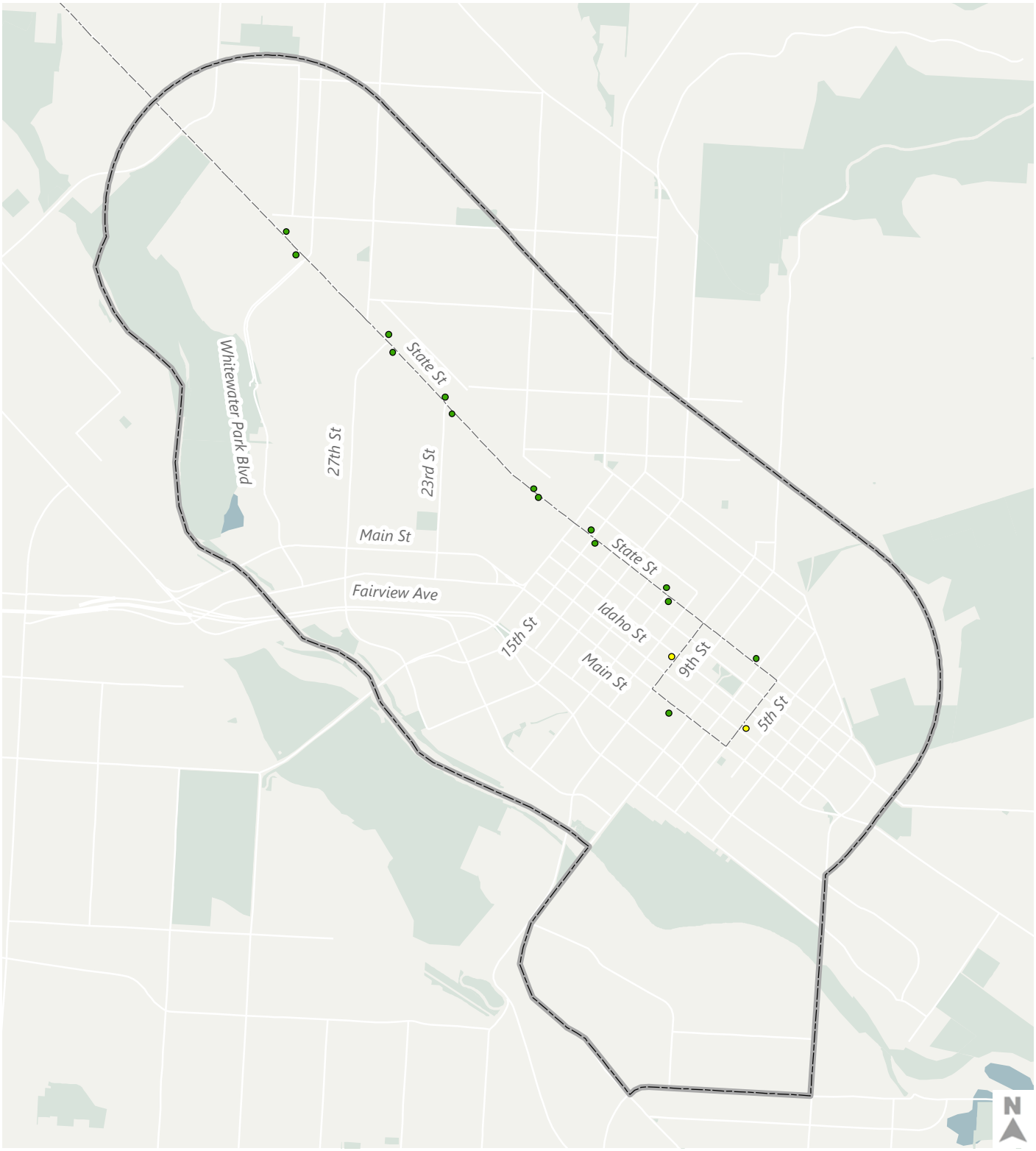
Outbound buses will depart Main Street Station by heading southeast on Main Street before turning left onto northbound 5th Street. Buses will stop at Idaho Street (potential) and then make another left turn onto State Street and stop near 6th Street & State Street behind the Capitol Building. Buses will pass by Boise High School and the Downtown YMCA and continue northwest on State Street, stopping at 11th Street, 15th Street, 18th Street, 23rd Street, 27th Street, and 32nd Street before continuing northwest.

Table 3. State Street Alignment Stops – Existing, New, and Modified

Stop Name	Corner	Action	Comment
State & Whitewater	SE	Modify	Move to near side of intersection for ITD building (SW corner)
State & 29th	SW	Eliminate	Close stop spacing. 20 existing on/off; 875' to next stop.
State & 27th	SW	No Changes	
State & 23rd	SE	No Changes	
State & 21st	SW	Eliminate	Close stop spacing, small trip generator. 4 existing on/off; 980' to next stop.
State & 18th	SE	No Changes	
State & 15th	SW→SE	Modify	Move to far side of intersection
State & 11th	SW→SE	Modify	Move to far side of intersection
State & 9th	SW	Eliminate	Close stop spacing. 25 existing on/off; 615' to next stop.
9th & Bannock	SW	Add (Potential)	Provide at-grade stop near downtown restaurants
Main Street Station	-	No Changes	
Idaho & 5th	NE	Add (Potential)	Provide NB stop for transfer
State & 6th	NW	Add	Provide access to government buildings
State & 9th	NW	Eliminate	Close stop spacing. 37 existing on/off; 790' to next stop.
State & 11th	NE→NW	Modify	Move to far side of intersection
State & 15th	NE→NW	Modify	Move to far side of intersection
State & 18th	NW	No Changes	
State & 21st	NE	Eliminate	Close stop spacing, small trip generator. 6 existing on/off; 990' to next stop.
State & 23rd	NE→NW	Modify	Move to far side of intersection
State & 26th	NE→NW	Modify	Move to far side of intersection
State & 31st → 32nd	NE→NW	Modify	Move to far side of intersection at 32nd

Source: Fehr & Peers.

Below is a map of the stops.

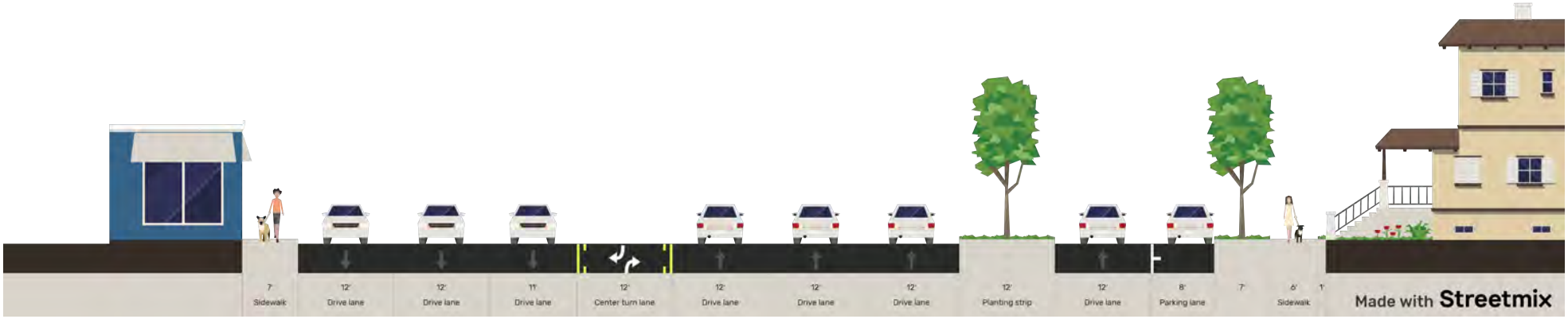


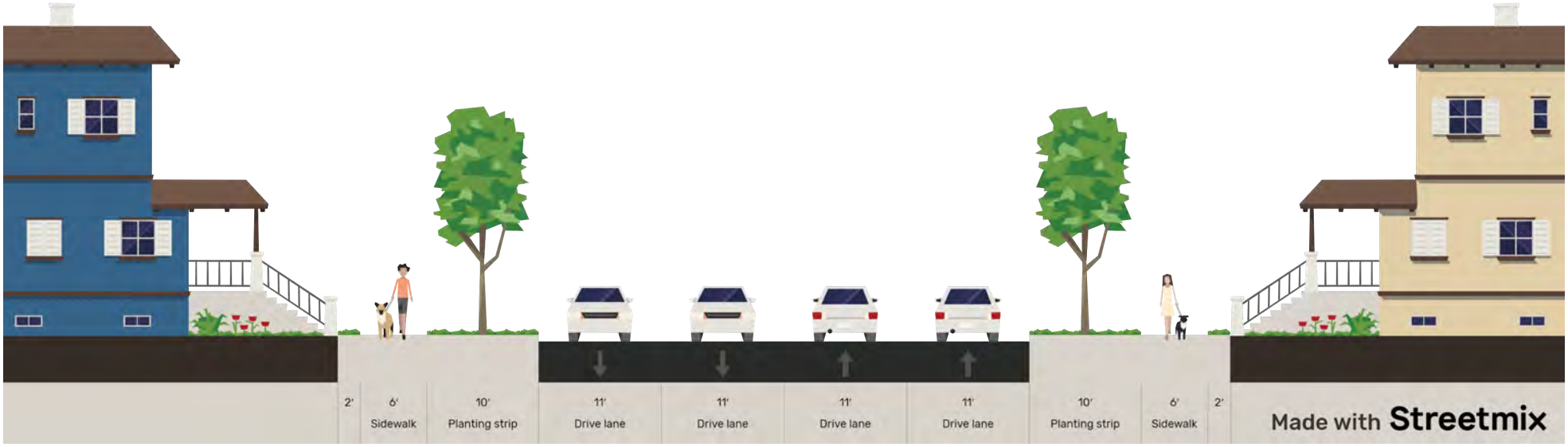
LEGEND

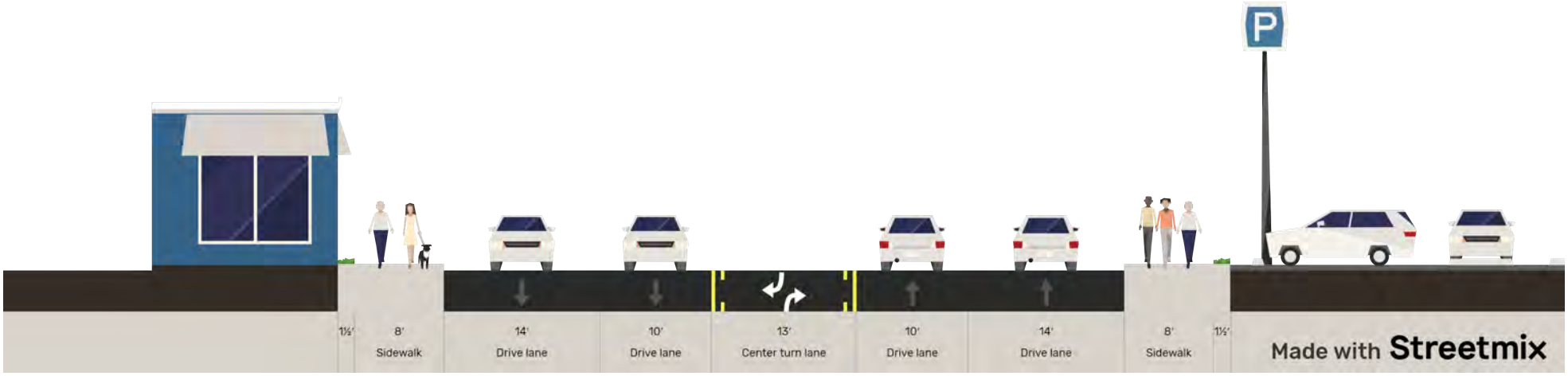
- Recommended
- Potential
- Alignment

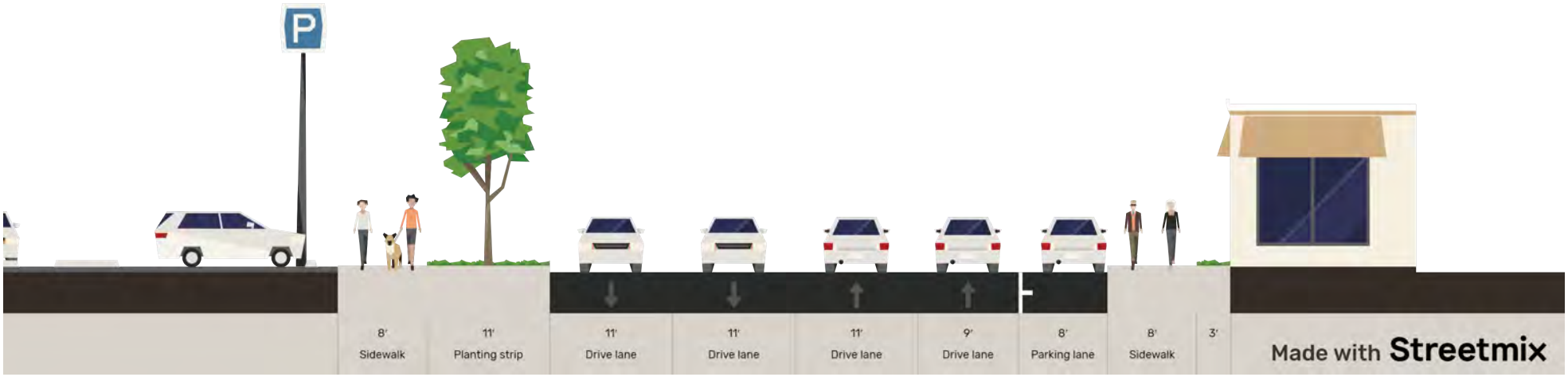
Transit

Potential Stop Locations - State Street


7'
Sidewalk
12'
Drive lane
12'
Drive lane
11'
Drive lane
12'
Center turn lane
12'
Drive lane
12'
Drive lane
12'
Drive lane
12'
Planting strip
12'
Drive lane
8'
Parking lane
7'
6'
Sidewalk
1'
Made with Streetmix


2'
6'
Sidewalk
10'
Planting strip
11'
Drive lane
11'
Drive lane
11'
Drive lane
11'
Drive lane
10'
Planting strip
6'
Sidewalk
2'
Made with Streetmix


P
1½'
8'
Sidewalk
14'
Drive lane
10'
Drive lane
13'
Center turn lane
10'
Drive lane
14'
Drive lane
8'
Sidewalk
1½'
Made with Streetmix


8'
Sidewalk
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Planting strip
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Drive lane
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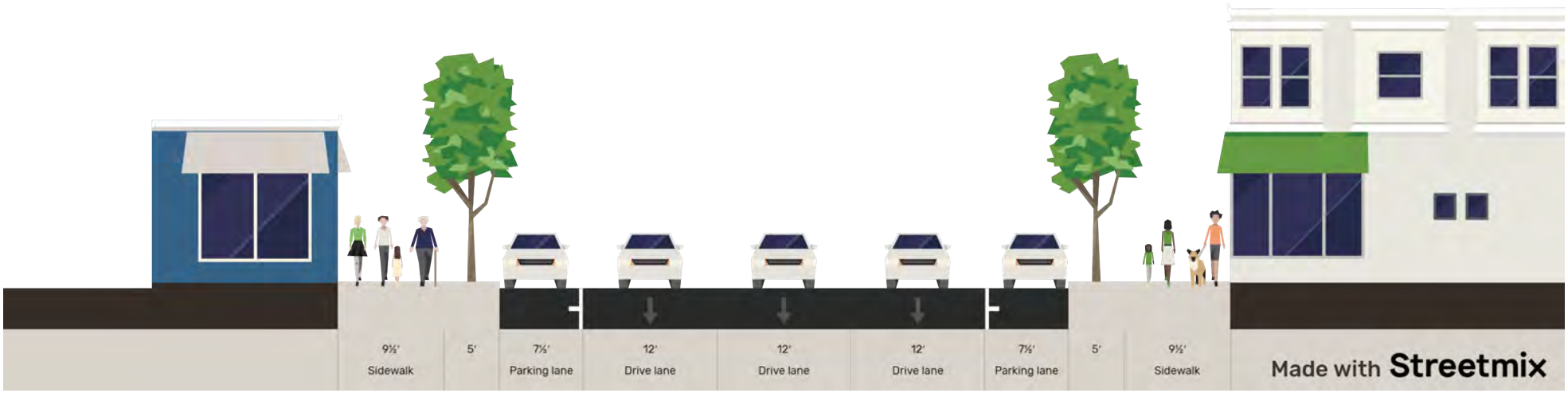
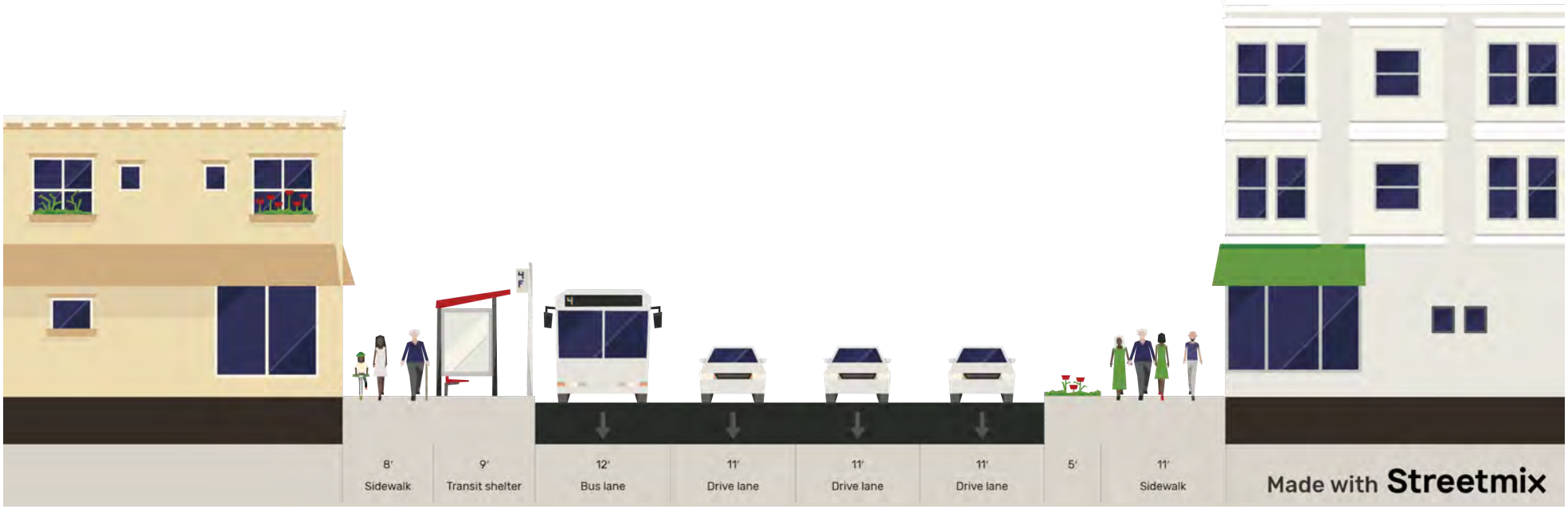
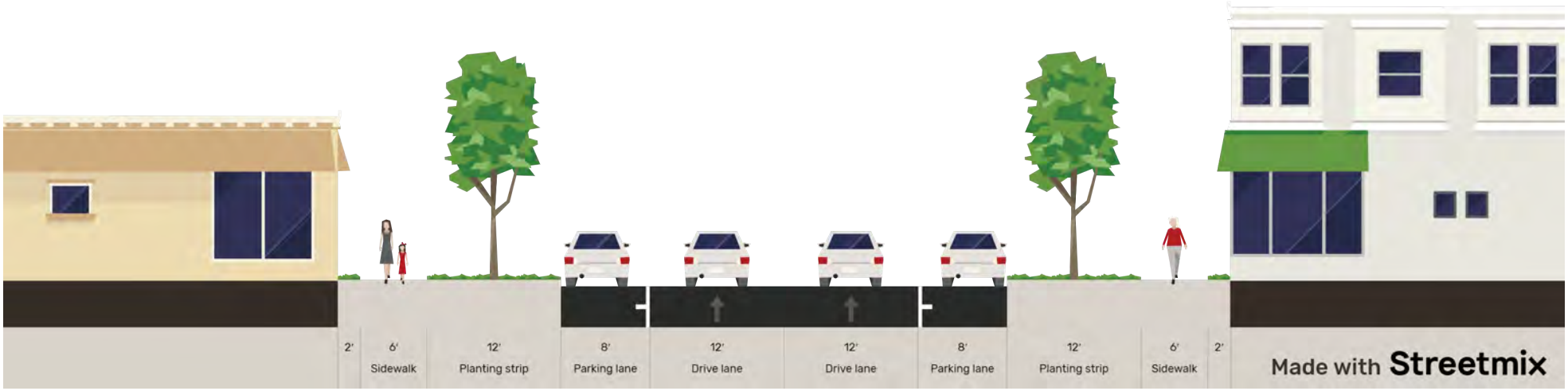
Drive lane
9'
Drive lane
8'
Parking lane
8'
Sidewalk
3'
Made with Streetmix


9½'
Sidewalk
5'
7½'
Parking lane
12'
Drive lane
12'
Drive lane
12'
Drive lane
7½'
Parking lane
5'
9½'
Sidewalk
Made with Streetmix


8′
Sidewalk
9′
Transit shelter
12′
Bus lane
11′
Drive lane
11′
Drive lane
11′
Drive lane
5′
11′
Sidewalk
Made with Streetmix


2'
6'
Sidewalk
12'
Planting strip
8'
Parking lane
12'
Drive lane
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Drive lane
8'
Parking lane
12'
Planting strip
6'
Sidewalk
2'
Made with Streetmix


7'
Sidewalk
10'
Planting strip
13½'
Drive lane
13½'
Drive lane
10'
Planting strip
6'
Sidewalk
Made with Streetmix

C. ALTERNATIVES SCREENING TECHNICAL MEMORANDUM

BUILDING A BETTER State Street

MEMORANDUM

Date: June 2021

To: Valley Regional Transit

From: Fehr & Peers

Subject: State Street Transit Alternatives Analysis: Alternatives Screening Process

UT20-2200

Introduction

This technical memorandum describes the evaluation of alignment alternatives for the State Street transit project. It includes discussion of the alignments under consideration, and the decisions made by the project team to narrow the field of alternatives to an eventual preferred alignment.

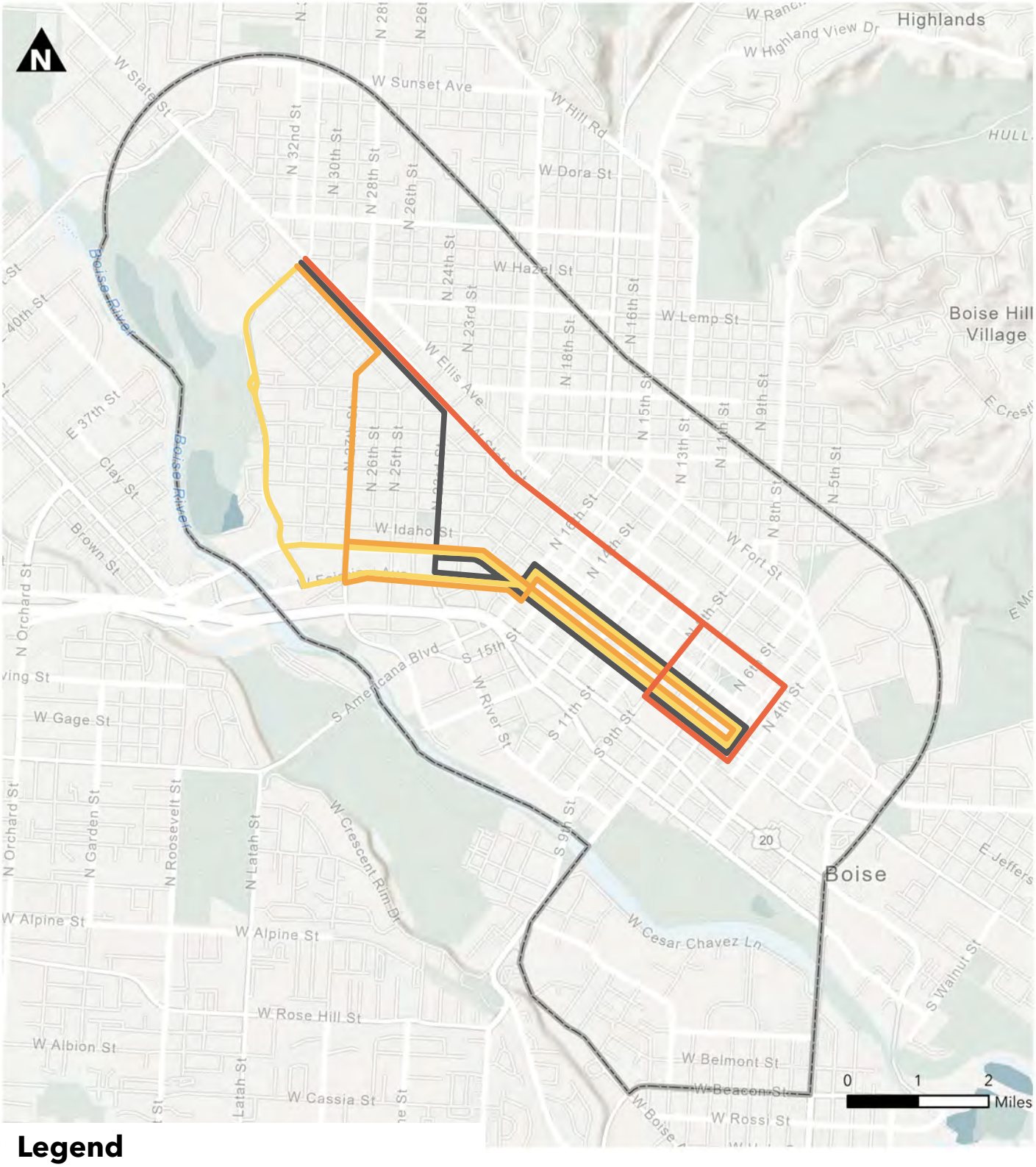
Overall Process

Four alternatives were originally identified for consideration, connecting Treasure Valley communities such as Star and Eagle to the Main Street Station in downtown Boise. The four alternatives were developed by Valley Regional Transit (VRT) with input from the State Street Technical Team (SSTT), which included representatives from the Ada County Highway District (ACHD), the Community Planning Association of Southwest Idaho (COMPASS), the City of Boise, Ada County, and the Idaho Transportation Department (ITD). The project team and the SSTT identified qualitative and quantitative screening criteria to assess whether each initial alternative met regional goals. Criteria were organized into two tiers. Tier 1 criteria were used to screen the initial alternatives from four alternatives to three. The remaining three alternatives were then evaluated using a combination of Tier 1 and Tier 2 criteria, and the highest-scoring alternative was selected as the locally preferred alternative (LPA) for the future transit route.

Initial Alternatives

The four initial alternatives are described below and shown in Figure 1.

- **State Street**: inbound buses would travel southeast on State Street, and turn right onto southwest 9th Street. Buses would then enter the commercial heart of downtown and turn left onto Main Street, then turn right to enter the underground Main Street station from Main Street & Capitol Boulevard. Outbound buses would depart Main Street Station by heading southeast on Main Street and turning left onto northbound 5th Street. Buses would then make another left turn onto State Street and continue northwest.
- **23rd Street**: inbound buses would travel southeast on State Street and turn right onto southbound 23rd Street. They would then turn left at Fairview Avenue to travel east towards downtown, and continue southeast onto Main Street. From Main Street, buses would turn right onto southwest Capitol Boulevard to enter the underground Main Street station. Outbound buses would head southeast on Main Street before turning left onto northbound 5th Street. Buses would make another left turn onto Idaho Street, continuing northwest until 16th Street. At 16th Street, buses would make a left turn and then a right turn onto westbound Main Street. Buses would continue on Main Street before turning right onto northbound 23rd Street. Buses would then make a left turn to head northwest-bound on State Street.
- **27th Street**: Inbound buses would travel southeast on State Street, turning right onto 27th Street. Buses would then turn left at Fairview Avenue to travel east towards downtown, and continue southeast onto Main Street. From Main Street, buses would turn right onto southwest Capitol Boulevard to enter the underground Main Street station. Outbound buses would head southeast on Main Street before turning left onto northbound 5th Street. Buses would make another left turn onto Idaho Street, continuing northwest until 16th Street. At 16th Street, buses would make a left turn and then a right turn onto westbound Main Street. Buses would continue on Main Street before turning right onto northbound 27th Street. Buses would then make a left turn to head northwest-bound on State Street.
- **Whitewater Park Boulevard**: Inbound buses would travel southeast on State Street before turning right onto southbound Whitewater Park Boulevard. Buses would then turn left at Fairview Avenue to travel east towards downtown. Buses would then continue southeast onto Main Street, turn right onto southwest Capitol Boulevard, and enter the underground Main Street station. Outbound buses would depart Main Street Station by heading southeast on Main Street before turning left onto northbound 5th Street. Buses would make another left turn onto Idaho Street, continuing northwest until 16th Street. At 16th Street, buses would make a left turn and then a right turn onto westbound Main Street. Buses would continue on Main Street before turning right onto northbound Whitewater Park Boulevard. Buses would then turn left onto State Street and continue northwest.



Legend

- 27th Street Alignment
- 23rd Street Alignment
- State Street Alignment
- Whitewater Park Boulevard Alignment

Screening Criteria

The project team developed screening criteria based on previous planning efforts within the State Street corridor. These include:

- The State Street Corridor Strategic Plan Study Final Report, prepared for ACHD and the City of Boise in 2004;
- The State Street Corridor Market Strategy, prepared for the City of Boise, ACHD, and the State Street Steering Committee in 2007;
- The State Street Corridor Transit Oriented Development Guidelines, led by the City of Boise and with a partnership of regional agencies and local municipalities in 2008;
- The State Street Transit and Traffic Operational Plan (TTOP), prepared for ACHD, City of Boise, and VRT in 2011;
- The State Street Programming and Finance Plan, prepared for ACHD, the City of Boise, VRT, the State Street Coordinating Committee in 2012; and
- The State Street Corridor Transit Oriented Development Plan, prepared for a partnership of agencies along the corridor in 2019.

In addition, other documents provided context and guidance for transportation in the study area, including:

- ACHD's 2020-2024 Integrated Five-Year Work Plan;
- ACHD's Roadways to Bikeways Master Plan;
- ACHD's implementation plans for corridor improvements on State Street between 1st Street and 16th Street;
- Blueprint Boise;
- Boise's Transportation Action Plan;
- The Boise Circulator Study;
- CCDC's 30th Street Urban Renewal District plans;
- CCDC's Westside Refresh Plan;
- CCDC's Capital Improvements Plan, 2020-2024;
- VRT's Valley Connect Plan; and
- VRT's Bus Stop Location and Transit Amenities Development Guidelines.

Combined, these documents provided a body of regional policy and direction, from which some general goal statements could be derived for the corridor. These goals included:

- Improve mobility and access;
- Minimize negative impacts on key local resources while supporting economic development; and

- Provide cost-effective transit services.

These goal statements were in turn supported by objectives and qualitative or quantitative criteria, which could be used to rank alignment alternatives. Table 1 shows the objectives and criteria used to support the goals.

Table 1: Study Objectives and Evaluation Criteria

Objectives	Evaluation Criteria
Goal: Improve mobility and access	
Create transportation choices that are convenient, safe, and affordable for people of all ages and abilities	Population density
	Employment density
Increase transit ridership and service while balancing transit and traffic needs	Total new daily transit boardings
	Major destinations served
	Level of impact on current traffic operations
	Observed travel time on corridor in study area
	Projected transit travel time end-to-end in study area
Improve multi-modal connections and access to existing transit systems	Projected population, household, and employment within 10-minute walk of bus stops
Goal: Minimize negative impacts on key local resources while supporting economic development	
Avoid, minimize, and mitigate negative impacts to key local resources, including neighborhood, land use, and environmentally-sensitive areas	Number of potentially impacted transportation facilities along alignments in study area (incl. # of signals)
Build public support for transit and complete street concepts	Level of public support indicated through outreach events
Goal: Provide cost-effective transit services	
Match transportation investment to level of travel demand in study area	Conceptual capital costs

The goals, objectives, and criteria for evaluating alignment alternatives were approved by the SSTT in June 2020, prior to a group discussion to conduct the Tier 1 screening. The criteria were applied in both the Tier 1 and Tier 2 screening processes to refine the range of alternatives and identify those that most closely align with regional goals.

Tier 1 Screening

The purpose of the Tier 1 screening process was to eliminate one of the initial alternatives, allowing the project team to focus on three alignments for more detailed analysis in Tier 2. The Tier 1 screening process used the following criteria:

- Operational criteria including:
    - Transit travel time from Whitewater Park Boulevard to Main Street Station, for morning inbound buses and evening outbound buses;
    - The number of traffic signals along each alignment;

    - Impacted corridors (calculated as the miles of alignment operating at greater than 75% capacity, using volume/capacity ratios for the 2019 model year from the official version of the COMPASS regional travel demand model as of February 2020);
- Land use criteria including:
    - Population density (using population per acre calculations from COMPASS travel demand model input data);
    - Employment density (using jobs per acre calculations from COMPASS travel demand model input data); and
    - Number of major destinations served.

Table 2 summarizes how each of the four alignments ranked on these criteria. The operational criteria were calculated by the consultant team and VRT, and the land use criteria were scored collaboratively by the SSTT in a meeting in June 2020. More detailed information on the population, employment and overall land use characteristics of the study area can be found in the Base and Future Year Technical Memorandum.

Table 2: Tier 1 Screening Results

Scoring Criteria			Alignment Scores			
	Criteria	*Definition and Scoring of Criteria*	*State Street*	*23rd Street*	*27th Street*	*Whitewater Park Blvd*
Operational	AM Inbound Travel Time	Time (in minutes) from Whitewater Park Boulevard to Main Street Station	11.1	10.4	11.1	11.9
	AM Inbound Travel Time Score	4= Fastest 1=Slowest	3	4	3	2
	PM Outbound Travel Time	Time (in minutes) from Main Street Station to Whitewater Park Boulevard	12.6	12.8	12.1	12.8
	PM Outbound Travel Time Score	4= Fastest 1=Slowest	3	2	4	2
	Number of Signals	Count of Signalized Intersections Along Each Alignment	38	36	36	35
	Number of Signals Score	4=Least 1=Most	2	3	3	4
	Impacted Corridors	Miles of alignment operating at greater than 75% of capacity (bi-directional) in 2019.	0.84	1.55	2.53	1.08
	Impacted Corridors Score	4=Lowest # of impacted miles 1=Highest # of impacted miles	4	2	1	3
Combined Operational Score			**12**	**11**	**11**	**11**
Land Use	Current Population Density	Areas of population density served by the alignment	Downtown neighborhoods, residential areas along State Street	Downtown, neighborhoods south of State Street	Downtown, neighborhoods south of State Street	Downtown, corner of Main/ Whitewater, less overall residential density than other alignments
	Current Population Density Score	4=Most population served 1=Least population served	4	4	4	3
	Current Employment Density	Areas of employment density served by the alignment	Downtown, State Street commercial corridor, Capitol	Downtown, Fairview/Main commercial zones	Downtown, Fairview/Main commercial zones	Downtown, Fairview/Main commercial zones
	Current Employment Density Score	4=Most employment served 1=Least employment served	3	3	4	4
	Destinations Served	Major or important destinations within one city block of the alignment	16	12	12	13
	Score for destinations served	4=Most destinations 1=Least destinations	4	2	2	3
Combined Land Use Score			**11**	**9**	**10**	**10**
Combined Operational and Land Use Score			***23***	***20***	***21***	***21***

As shown in Table 2, the alignments are similar from an operational standpoint. There is very little difference in evening outbound travel times, and only a small difference in morning inbound travel times. However, congested sections of corridor are considerably more prevalent on some corridors than others. Specifically, 27th Street has much longer sections of congestion compared to State Street, although the State Street alignment has several more traffic signals. Population and employment density along the alignment corridors were generally similar, with new growth along the Fairview/Main corridors adding jobs and households. At the same time, the State Street corridor offers better connectivity to established residential neighborhoods and the Capitol/state office building complex.

Table 2 shows the combined operational and land use scores for the four alternatives. The SSTT agreed that the 23rd Street alignment, which represented the lowest score, should be screened

out. The project team then moved forward with analysis of the State Street, 27th Street, and Whitewater Park Boulevard alignments.

Tier 2 Screening

The Tier 2 screening process included a more in-depth analysis of the three remaining alternatives and ultimately identified a locally preferred alternative for further planning and design purposes. The Tier 2 process focused on the following criteria:

- Intersection level of service (LOS), using ACHD's Synchro traffic microsimulation model adapted to 2035 conditions;
- Average weekday transit ridership in 2035, from the official version of the COMPASS travel demand model as of September 2020;
- One-way trip distance and travel time in 2035, from the route's western terminus in Star to Main Street Station, from the official travel demand model;
- Conceptual cost estimates for infrastructure improvements associated with the alignments;
- Households and jobs in 2035 that will be accessible within a 10-minute walking distance from station areas for each alignment; and
- Level of public support, as indicated in public outreach activities conducted in late 2020 through early 2021.

The 2035 horizon year reflected the implementation time frame identified in the original State Street Transit and Traffic Operating Plan (TTOP). Intersection LOS using the Synchro model was prepared by the project team and reviewed by ACHD staff. The Synchro model network was developed in coordination with VRT, ACHD, and COMPASS staff to ensure appropriate assumptions were made regarding the identification of study intersections, volume growth rates, and transit accommodations at key intersections. More detail on the LOS analysis is provided in the Base and Future Year Technical Memorandum.

COMPASS conducted future model runs using agreed-upon transit parameters to estimate 2035 average weekday ridership and transit travel times. Transit parameters included assumptions regarding bus dwell times (20 seconds per station), transit vehicle travel speeds (10% slower than congested vehicle speeds), and standard industry model parameters for fare costs and transfer penalties. The transit travel times reflected the average of the inbound and outbound trip times, as the inbound and outbound trips are not identical.

The project team developed conceptual cost estimates for transit priority treatments at or adjacent to key intersections and along study routes. Unit costs were derived from ITD resources. More information on the conceptual cost estimates is provided in the Cost Estimation Technical Memorandum.

COMPASS led the analysis of accessibility using the regional travel demand model. The analysis considered the number of households and jobs projected within a 10-minute walking distance of stops located along each proposed alignment in 2035. The walking distance was measured using the street and sidewalk network around each stop, and the numbers expressed in the table below represent the total number of jobs and households captured within that walking distance.

VRT led a public outreach effort from late November 2020 through mid-February 2021, using a survey which presented information about the three route alignments and their Tier 2 screening scores. Participants ranked each alignment in order of preference and provided open-ended comments. VRT asked participants to note their current level of transit activity, whether they were frequent riders, occasional riders, or rode infrequently or not at all. VRT ultimately received 192 responses to the survey, which was available online. VRT also distributed paper copies of the survey to human service agencies, which gathered survey responses from individuals who were unable to access the online survey. The agency received 164 responses online, and 28 paper copies of the survey. The tabulated results from the public outreach process are noted in Table 3.

Table 3: Public Outreach Results

Alignment	Ranked 1st Choice	Ranked 2nd Choice	Ranked 3rd Choice
All Survey Responses			
Whitewater Park Boulevard	58	79	53
27th Street	55	63	72
State Street	78	48	65
Frequent or Occasional Transit Riders			
Whitewater Park Boulevard	21	37	23
27th Street	25	28	26
State Street	31	15	31
Source: VRT			

Common themes heard from survey respondents included:

- The State Street alignment provides good access to a range of services and destinations.
- Respondents wanted to preserve existing transit service on State Street.
- Whitewater Park Boulevard would be a good way to access parks and community amenities, as well as planned future growth along the Main/Fairview couplet.
- Previous investments by ACHD added capacity on Whitewater to lessen the burden on 27th, which then received a road diet. Respondents were concerned that this would negate that investment.
- 27th Street alignment offered closer service to residents of the neighborhoods along that route.

Table 4 below summarizes the results of the Tier 2 screening analysis.

Table 4: Tier 2 Screening Analysis

Scoring Criteria		Alignment Scores		
Criteria	*Definition and Scoring of Criteria*	*State Street*	*27th Street*	*Whitewater Park Blvd*
Traffic Level of Service	Number of intersections at LOS E or F in 2035 with this build alternative	3	3	4
Traffic Level of Service Score	**3=best 1=worst**	**3**	**3**	**2**
Ridership	Average weekday daily ridership in 2035	1,110	1,510	1,440
Ridership Score	**3=highest 1=lowest**	**1**	**3**	**2**
Distance	One-way trip distance from Star to Main Street Station	17.2	17.4	17.6
Distance Score	**3=shortest 1=longest**	**3**	**2**	**1**
Time	Minutes to complete one-way trip	41.1	42.6	42.2
Time Score	**3=fastest 1=slowest**	**3**	**1**	**2**
Conceptual Costs	Estimated cost of infrastructure improvements	$ 40,400	$ 112,980	$ 1,630,580
Conceptual Costs Score	**3=least expensive 1=most expensive**	**3**	**2**	**1**
Household Accessibility	Number of households accessible within a 10-minute walking distance of stops	6,391	7,126	6,829
Household Accessibility Score	**3=most households accessible 1=least households accessible**	**1**	**3**	**2**
Job Accessibility	Number of jobs accessible within a 10-minute walking distance of stops	41,253	43,204	43,171
Job Accessibility Score	**3=most jobs accessible 1=least jobs accessible**	**1**	**3**	**2**
Sum of Tier 2 Technical Criteria Scores		**15**	**17**	**12**
Public Support (General Public)	Number of respondents ranking alignment as first choice	78	55	58
Public Support (General Public) Score	**3=most support 1=least support**	**3**	**1**	**2**
Public Support (Transit Riders)	Number of transit-rider respondents ranking alignment as first choice	31	25	21
Public Support (Transit Riders) Score	**3=most support 1=least support**	**3**	**2**	**1**
Sum of Tier 2 Public Support Criteria Scores		**6**	**3**	**3**
Overall Tier 2 Criteria Scores		**21**	**20**	**15**

As shown in Table 4, after incorporating public support the State Street alignment scored higher than the other alignments.

Recommendation

The State Street Technical Team recommends a two-phased approach to implementing the preferred alternative. This approach includes the following:

- In the near term, increase transit service headways and upgrade station amenities along the State Street alignment between the western terminus in Star and Main Street Station

    - This transit route will offer 10- to 15-minute headways in the peak period and 15-minute headways for the remainder of the daily span of service
    - This service could include the following measures to prioritize transit movements along the route:
        - Install southbound transit signage on 9th Street between State and Main, indicating that the on-street parking lane is a bus-only lane during the weekday peak hours
        - Restripe lanes on 9th Street between State and Main to make space for a peak-hour bus bypass lane
        - Restrict southbound east-side parking during peak hours to accommodate the bus bypass lane
- When household and employment densities along the Main and Fairview corridors reach appropriate levels, and after State Street frequencies and investments described above are met, VRT should consider meeting the increased travel demand by providing additional service along Whitewater Park Boulevard and Main/Fairview. This service would connect riders from communities west of Boise to destinations along those routes. This would be supplemental to the proposed service on State Street, which would retain the frequencies described above. The Whitewater Park Boulevard and Main/Fairview service could have service frequencies as high as 10-15 minutes during the peak and 15 minute headways in the off peak. It is recommended that this additional service be scheduled with the service on State Street such that transit headways west of State Street/Whitewater Park Boulevard would be 5-7.5 minutes during the peak and 7.5 minutes in the off-peak. Final service recommendations should be developed within the context of the transit network needs at that time and review other options which may be available at that time including micro-transit. It is anticipated that household and employment densities would reach the appropriate levels by 2035, as indicated in this analysis, although it is possible that densities could increase to anticipated levels prior to 2035.
    - When the additional service along Whitewater/Main/Fairview is implemented, VRT would also upgrade the stations along Whitewater Park Boulevard. It is assumed that stations along the Main and Fairview corridors would have been upgraded already through a separate Best in Class transit improvement project.
    - This service could include the following measures to prioritize transit movements along the route:
        - Whitewater Park Boulevard & State Street
            - Widen Whitewater Park Boulevard to provide bus bypass lane & install northbound left turn transit signal (optional)

        - Reprogram pre-emption equipment to provide transit pre-emption
    - Whitewater Park Boulevard & Main Street
        - Install southbound through transit signal
        - Replace southbound raised median with a bus-only lane
    - Whitewater Park Boulevard & Fairview Avenue
        - Install southbound left turn transit signal
        - Replace southbound raised median with a bus-only lane

This recommendation is shown in the figure below.

Figure 2-F ecommendations

This recommendation is based on several key issues:

- Previous investment and plans discouraged transit investments on 27th Street. Furthermore, survey respondents (including those who currently use transit) indicated that 27th Street was their least preferred alignment. This suggests that larger public and political support for this alignment may be limited.
- While the Whitewater Park Boulevard alignment does not yet have significant transit-supportive land use, the planned high density and intensity development along that corridor will eventually support more ridership. The higher cost estimates for the Whitewater Park Boulevard alignment could also be decreased if VRT opts to apply transit signal priority strategies instead of queue bypass lanes.
- State Street represents a low-cost option to test increasing service and amenities, from which point additional service extensions could spin off.

VRT and the SSTT should continue working towards implementation through these next steps:

- Update the Federal Transit Administration Region 10 office on the results of this analysis and the desired path forward. The administration's officials may be able to offer funding resources or grant opportunities that are most appropriate to the scale of this project.
- Continue working with ACHD to identify and address transportation concerns, and to explore the application of TSP along the State Street corridor.
- Continue facilitating discussions with ACHD, COMPASS, and jurisdictions along the State Street corridor to clarify plans for the HOV/transit lane on State Street. These discussions should include an open discussion of assumptions contained within the Regional Transportation Plan, COMPASS's travel demand model, and ACHD's Synchro model regarding the HOV lanes and their operation. These agencies need to establish a clear understanding of the lanes and document it in writing, possibly in the form of a Memorandum of Understanding that would be signed by all parties with jurisdiction over parts of the corridor.

D. COST ESTIMATE TECHNICAL MEMORANDUM

FEHR PEERS

MEMORANDUM

Date: June 18, 2021

To: Stephen Hunt, Valley Regional Transit

From: Chris Bender, Fehr & Peers
Maria Vyas, Fehr & Peers

Subject: State Street Transit Alternatives Analysis: Planning-Level Cost Estimate

UT20-2200

The State Street Transit Alternatives Analysis evaluated alignment alternatives for high-capacity transit service between Star and downtown Boise. The alignment alternatives were ranked based on several quantitative criteria, including the conceptual capital costs associated with each alignment alternative. This memorandum outlines the methodology used to generate cost estimates for the following modifications:

- Whitewater Park Boulevard Alignment
    - Whitewater Park Boulevard & State Street
        - Widen Whitewater Park Boulevard to provide bus bypass lane & install northbound left turn transit signal *(optional)*[1]
        - Reprogram pre-emption equipment to provide transit pre-emption
    - Whitewater Park Boulevard & Main Street
        - Install southbound through transit signal
        - Replace southbound raised median with a bus-only lane
    - Whitewater Park Boulevard & Fairview Avenue
        - Install southbound left turn transit signal
        - Replace southbound raised median with a bus-only lane

[1] Widening Whitewater Park Boulevard to provide a northbound left turn lane at State Street is optional and represents the high-end cost of mitigations required for the Whitewater Park Boulevard Alignment. There is no cost associated with reprogramming pre-emption equipment.

27th Street Alignment

- 27th Street & State Street
  - Reprogram pre-emption equipment to provide transit pre-emption
- 27th Street & Main Street
  - Update southbound signal
  - Restripe southbound striped median with a bus-only lane

- State Street Alignment
  - 9th Street between State Street & Main,
    - Install southbound transit signage,
    - Restripe lanes on 9th between State Street & Main to make room for bus bypass lane
    - Restrict southbound east parking in peak hours to use as bus bypass,

The following steps outline how the cost estimates for the proposed modifications were developed:

1. Fehr & Peers outlined a list of required materials for each of the proposed intersection and roadway modifications.
2. Based on measurements from aerial imagery and engineering judgement Fehr & Peers also approximated the quantities of the various materials required for the proposed modifications.
3. To develop unit costs for the materials assumed to be required to construct the modifications, Fehr & Peers referred to average unit prices of those materials published by ITD. The published unit prices include estimates submitted by contractors for state-funded construction projects from January 2013 to August 2020.
4. Since this is a planning-level cost estimate, Fehr & Peers developed average unit costs for each line item assumed to be required for the proposed modifications.
5. By multiplying the material quantities by the average unit costs, Fehr & Peers obtained the "construction subtotal costs" for each modification.
6. To better estimate the full cost of each modification, Fehr & Peers also assumed that a percentage of the total cost of the construction would need to be reserved for "design and project management costs" as well as "construction soft costs." The soft costs were intended to account for permit fees, mobilization, traffic control, inspection, and construction management.
7. Finally, an additional contingency cost was assumed for each mitigation to account for unforeseen costs of construction.

The following tables include (1) a combined summary of the costs for the proposed modifications and (2) detailed cost estimates for modifications at each intersection or roadway segment. Right-of-way costs were not included in these estimates. While most of the alternatives under consideration do not require additional right-of-way, the Whitewater Park Boulevard alternative may require right-of-way at the intersection of Whitewater and State Street, noted as "optional" in the descriptions above and the table below. The cost of this option would be some degree higher given the need to acquire right-of-way.

State Street BRT AA

Conceptual Cost by Alignment

Alignment	Improvement Location	Cost per location	Total cost
Whitewater	Whitewater at State *(optional cost)*	*$ 612,700*	$990,600 - $1,603,300
	Whitewater at Main	$ 520,900	
	Whitewater at Fairview	$ 469,700	
27th Street	27th at Main	$ 109,600	$ 109,600
State Street	9th Street, State - Main	$ 30,800	$ 30,800

Whitewater Park Blvd Alignment - Whitewater Park Blvd at State street (optional)

Prioritization	Item	Quantity	Unit	Unit Cost	Total
NB left turn transit signal	Signal - Conductors & Conduits	160	**LF**	$ 40.00	$ 6,400
	Signal - Equipment - Transit Signal	1	**EA**	$ 1,500.00	$ 1,500
	Roadway Sign	5	**EA**	$ 360.00	$ 1,800
Widen west corner of Whitewater for queue bypass lane	Excavation	1,625	**CY**	$ 22.00	$ 35,750
	Full pavement section	260	**SY**	$ 41.00	$ 10,660
	Curb & Gutter	585	**LF**	$ 43.00	$ 25,155
	Concrete Sidewalk	520	**SY**	$ 86.00	$ 44,720
	Landcaping	7,313	**SF**	$ 13.00	$ 95,063
	Traffic Stripe	1,170	**LF**	$ 1.00	$ 1,170
	Signal Modification (one pole)	1	**LS**	$ 50,000.00	$ 50,000
				Construction Subtotal	$ 272,218
				Design, Environmental, Project Management *25%*	$ 68,100
				Construction Soft Costs (Permits, Mobilization, Traffic Control, Inspection, CM) *25%*	$ 68,100
				Subtotal Total	$ 408,418
				Contingency *50%*	$ 204,200
				Total	$ 612,618

Whitewater Park Blvd Alignment - Whitewater Park Blvd at Main Street

Prioritization	Item	Quantity	Unit	Unit Cost	Total
SB through transit signal	Signal - Conductors & Conduits	360	**LF**	$ 40.00	$ 14,400
	Signal - Equipment - Transit Signal	1	**EA**	$ 1,500.00	$ 1,500
Replace median with bus-only lane.	Excavation (Median Removal)	533	**CY**	$ 22.00	$ 11,733
	Full pavement section	4,800	**SF**	$ 41.00	$ 196,800
	Traffic Stripe & Markings	1	**LS**	$ 10,000.00	$ 10,000
	Roadway Sign	5	**EA**	$ 360.00	$ 1,800
	Signal Modification (one pole)	1	**LS**	$ 50,000.00	$ 50,000
				Construction Subtotal	$ 286,233
				Construction Management 15%	$ 42,900
				Mobilization 15%	$ 42,900
				Traffic Control 10%	$ 28,600
				Subtotal Total	$ 400,633
				Contingency 30%	$ 120,200
				Total	$ 520,833

Whitewater Park Blvd Alignment - Whitewater Park Blvd at Fairview Avenue

Prioritization	Item	Quantity	Unit	Unit Cost	Total
SB left turn transit signal	Signal - Conductors & Conduits	350	**LF**	$ 40.00	$ 14,000
	Signal - Equipment - Transit Signal	1	**EA**	$ 1,500.00	$ 1,500
Replace median with bus-only lane.	Excavation (Median Removal)	462	**CY**	$ 22.00	$ 10,169
	Full pavement section	4,160	**SF**	$ 41.00	$ 170,560
	Traffic Stripe & Markings	1	**LS**	$ 10,000.00	$ 10,000
	Roadway Sign	5	**EA**	$ 360.00	$ 1,800
	Signal Modification (one pole)	1	**LS**	$ 50,000.00	$ 50,000
				Construction Subtotal	$ 258,029
				Construction Management 15%	$ 38,700
				Mobilization 15%	$ 38,700
				Traffic Control 10%	$ 25,800
				Subtotal Total	$ 361,229
				Contingency 30%	$ 108,400
				Total	$ 469,629

27th Street Alignment - 27th Street at Main Street

Prioritization	Item	Quantity	Unit	Unit Cost	Total
SB signal update, restripe median as bus-only lane.	Remove Traffic Stripe	260	**LF**	$ 2.00	$ 520
	Traffic Stripe	260	**LF**	$ 1.00	$ 260
	Roadway Sign	5	**EA**	$ 360.00	$ 1,800
	Signal Modification (one pole)	1	**LS**	$ 50,000.00	$ 50,000
	Signal - Conductors & Conduits	155	**LF**	$ 40.00	$ 6,200
	Signal - Equipment - Transit Signal	1	**EA**	$ 1,500.00	$ 1,500
				Construction Subtotal	$ 60,280
				Construction Management 15%	$ 9,000
				Mobilization 15%	$ 9,000
				Traffic Control 10%	$ 6,000
				Subtotal Total	$ 84,280
				Contingency 30%	$ 25,300
				Total	$ 109,580

State Street Alignment - 9th Street between State/Main

Prioritization	Item	Quantity	Unit	Unit Cost	Total
SB transit signage	Roadway Sign	12	**EA**	$ 360.00	$ 4,320
Restrict SB parking on east side of 9th during peak hours to allow bus to bypass traffic	Remove Traffic Stripe	4,200	**LF**	$ 2.00	$ 8,400
	Traffic Stripe	4,200	**LF**	$ 1.00	$ 4,200
				Construction Subtotal	$ 16,920
				Construction Management 15%	$ 2,500
				Mobilization 15%	$ 2,500
				Traffic Control 10%	$ 1,700
				Subtotal Total	$ 23,620
				Contingency 30%	$ 7,100
				Total	$ 30,720

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