Memorandum

To: *Seattle Department of Transportation*

From: *CDM Smith*

Date: *December 18, 2019*

Subject: FINAL SDOT Route 40: Task 5.1 Traffic Analysis Methods and Assumptions

CDM Smith prepared this memorandum to describe the process, methodology, and assumptions related to traffic analysis for the SDOT Route 40 Northgate to Downtown Transit Improvements project. This memo covers the study corridor, study segments and intersections, traffic data collection, analysis approach and modeling tools, model inputs and outputs, and measures of effectiveness to be used in this traffic analysis. Finally, reporting is described at the end of the memo.

Introduction

This section provides an overview of the study corridor, segments, and intersections where traffic analysis will be conducted.

Study Corridor

The study corridor follows the existing Route 40 corridor between the Westlake Ave N / Harrison St intersection (southern end) and the N Northgate Way / Meridian Ave N intersection (northern end).

Study Segments and Intersections

The traffic analysis will focus on twenty intersections grouped into seven study segments identified as key areas to improve transit reliability. Each segment includes at least one study intersection.

The study segments and intersections are as follows:

- **Segment 1 – Westlake**
  - Westlake Ave N/Republican St
  - Westlake Ave N/Mercer St
  - Westlake Ave N/Valley St
  - Westlake Ave N/9th Ave N

- **Segment 2 – Fremont**
  - 4th Ave N, Nickerson St, Dexter Ave N, Westlake Ave N
  - Fremont Ave N/ N 34th St
  - Fremont Ave N/ N35th St
  - Fremont Pl N/ N 36th St/ Evanston Ave N
  - N 36th St/ Dayton Ave N
  - N 36th St/ Phinney Ave N
  - N 36th St/1st Ave NW
  - Leary Way NW/NW 39th St
- **Segment 3– North end of Ballard Bridge**
  - NW Leary Way/ 14th Ave NW
  - NW Leary Way/ 15th Ave NW
  - Leary Ave NW/NW Dock Pl
- **Segment 4 – Leary into Ballard/Market**
  - Leary Ave NW/ NW Market St
  - NW Market St/ 24th Ave NW
- **Segment 5 –** NW 85th St/ 15th Ave NW Intersection
- **Segment 6 -** Holman Rd NW/ Greenwood Ave N/ N 105th St Intersection
- **Segment 7 -** Aurora Ave N/N 105th St Intersection

Traffic Data Collection

This section presents the types and sources of data collected for traffic analysis.

Traffic Counts

SDOT provided intersection turning movement counts at the twenty study intersections for weekday peak periods (at least two hours in the morning and two hours in the afternoon). These counts include vehicle classification as well as bicycle and pedestrian volumes.

SDOT's counts were conducted between 2014 and 2019. To ensure that all counts are recent, CDM Smith is recounting the intersections with counts more than three years old. CDM Smith counts were performed in November 2019.

Signal Timing Data

The signal timing cards with current signal timing settings in the AM and PM peak hours were provided by SDOT for all Study Segment signalized intersections.

Speed Limits

Existing posted speed limits along the study corridor will be obtained using Google Street View information, SDOT's draft Complete Streets Checklists, and SDOT's GIS Streets data for the Study Segments. It is noted that arterial speed limits may be lowered to 25 mph in the future due to the Vision Zero program. This change will be considered when preparing future travel times.

Geometric Layouts

Existing geometric layouts and channelization to be coded into the traffic models will be obtained through Google Street View, field visit observations, and the 2019 Master City Drawing (CADD) provided by SDOT.

Leading Pedestrian Intervals

Locations of LPI evaluation are included with the draft Complete Streets Checklist.

Existing Year Traffic Operations

Traffic analysis will be conducted for the existing year (2019) traffic operations. The following sections describe the tasks in this analysis.

Peak Hour Determination

Table 1 shows the distribution of peak hours identified from the historical turning movement counts for the nine of the 20 study intersections received from SDOT and the 2019 counts for 11 of the 20 study intersections.

Table 1 Distribution of Peak Hours

AM		PM	
Peak Hour	Number of Intersections	PM Hour	Number of Intersections
7:00-8:00	1	4:30-5:30	2
7:30-8:30	1	4:45-5:45	6
7:45-8:45	8	5:00-6:00	9
8:00-9:00	10	5:15-6:15	1
		6:15-6:30	2

Source: CDM Smith Calculations. Based on the historical counts data received from SDOT and 2019 CDM Smith counts

Based on the number of intersections with specific peak hour windows, the prevalent AM peak hour was found to be 8:00-9:00 while the prevalent PM peak hour was found to be 5:00-6:00. These AM and PM peak hours will be the time basis for traffic analysis. If SDOT provides a seasonable factor, the counts will be adjusted seasonally.

Traffic Volume Development

2019 counts have been collected at 11 of the 20 study intersections. For the remaining nine intersections, historical counts will be adjusted to 2019 volumes by applying traffic growth rates derived from a combination of sources:

- Comparison of counts taken at the same locations over several years
- Historical ADT volumes for the study corridor to be provided by SDOT, if available
- Growth rate(s) used in the recent relevant studies, such as the Route 44 - Transit-Plus Multimodal Corridor project.

If the identified growth rates are similar among the study segments, the same average growth rate will be applied for the entire study corridor. Otherwise, different growth rates may be used for different segments. The proposed growth rate(s) will be shared with SDOT for approval.

The approved growth rates will then be applied to adjust the older turning movement counts into the existing year (2019) volumes.

A balanced set of 2019 AM and PM peak hour traffic volumes will be developed for the seven study segments, including the 20 study intersections.

Synchro Analysis

CDM Smith will develop Synchro, version 10.1 traffic models for the 2019 AM and PM peak hours at the 20 study intersections.

The Synchro models provided by SDOT will be used as the starting point. CDM Smith will review and update the geometric layouts and signal timings coded in the models, as necessary. Volumes coded in the models will be updated to reflect the balanced 2019 traffic volumes.

The Synchro model outputs will include delay and level of service (LOS) for the overall intersection and for each approach, and queue length by movement for the study intersections.

Vissim Analysis

CDM Smith will develop a 2019 PM peak hour Vissim, version 11 traffic micro-simulation model for Segment 2 (Fremont) that includes eight intersections. The existing geometric layouts, signal timings, and volumes will be coded in the Vissim model. The existing PM Vissim model will be calibrated for volume throughput, travel time, and visual inspection of congestion patterns based

on the calibration targets in Section 6 of WSDOT's Protocol for Vissim Simulation document. The number of simulation runs used to collect model outputs will also be based on the same guidelines.

The Vissim model outputs will include: delay and LOS for the overall intersection and for each approach, volume throughput, and vehicle travel time (for general traffic and bus separately) along the corridor.

Horizon Year No Build Traffic Operations

Traffic analysis will be conducted for the horizon year (still to be determined) traffic operations. The following sections describe the tasks under this analysis.

Traffic Volume Development

Historical tube counts (to be provided by SDOT) along arterials in or near the corridor will be reviewed to identify traffic annual growth rates within the study corridor. If the identified growth rates are similar among the study segments, the same average growth rate will be applied for the entire study corridor. Otherwise, different growth rates may be used for different segments. The proposed growth rate(s) will be shared with SDOT for approval.

The approved growth rates will be applied to grow the existing year (2019) volumes into the future horizon year volumes.

A balanced set of horizon year AM and PM peak hour traffic volumes will be developed for the seven study segments, including up to 20 study intersections for Synchro and up to eight study intersections in the PM peak period for Vissim analysis.

Future Committed Projects

Committed future projects identified in existing plans and documentation review will be incorporated into the horizon year traffic models where applicable.

Synchro Analysis

The Synchro traffic analysis models for the AM and PM peak hours for up to 20 study intersections in the horizon year No Build scenario will be developed. Existing geometric layouts will be maintained, with potential changes based on future committed projects. Volumes in the existing Synchro models will be updated to reflect the balanced horizon year AM and PM peak hour volumes. Signal cycle length will be kept unchanged while the splits and offsets for the signalized intersections will be re-optimized in the Synchro models.

The Synchro outputs will include delay and LOS by overall intersection and by approach and queue length by movement for the study intersections.

Vissim Analysis

The Vissim traffic simulation models for the PM peak hour for up to eight study intersections in Segment 2 under the horizon year No Build scenario will be developed. Existing geometric layouts

will be maintained, with potential changes based on background projects. Signal timings will reflect that in the horizon year No Build Synchro models. Volumes will match the balanced horizon year PM peak hour traffic volumes.

The Vissim outputs will include volume throughput and vehicle travel time (for general traffic and bus separately) along the corridor.

Horizon Year Build Traffic Operations

Traffic analysis will be conducted for the horizon year Build traffic operations. The following sections describe the tasks under this analysis.

Traffic Volume Development

The forecasted traffic volumes will be the same in the No Build and Build conditions. However, depending on the change to the roadway characteristics introduced under Build conditions (such as road closures, turn restrictions, lane re-purposing, or roadway capacity changes), future traffic patterns could change as a result of the potential improvement concepts and traffic diversion anticipated to occur. These travel pattern adjustments will be based on engineering judgement and input from SDOT (no modeling).

Study Segment Improvement Concepts

For initial screening/concept identification, the effects of up to four improvement concepts on traffic operations in each study segment will be evaluated. For final screening/concept refinement, up to two improvement concepts in each study segment will be evaluated. The improvement concepts will be coded into the traffic models where applicable.

Synchro Analysis

The Synchro traffic analysis models for the AM and PM peak hours for up to 20 study intersections will be developed. Geometric layouts will include improvement concepts where applicable. Volumes in the horizon year Build Synchro models will be based on the same AM and PM peak hour volumes coded in the horizon year No Build models. Signal timings (phasing, cycle length, and splits) will be optimized in the Synchro models due to potential changes in geometric layouts, capacity, and lane configurations at the study intersections.

The Synchro outputs will include delay and LOS by overall intersection and by approach, and queue length by movement for the study intersections.

Vissim Analysis

The Vissim traffic simulation models for the PM peak hour for up to eight study intersections in Segment 2 under the horizon year Build scenario will be developed. Optimized signal timings in the horizon year Build Synchro models will be utilized. Volumes will match the balanced horizon year PM peak hour traffic volumes.

The Vissim outputs will include volume throughput and vehicle travel time (for general traffic and bus separately) along the corridor.

Measures of Effectiveness

The measures of effectiveness include delay and LOS by overall intersection and by approach, and queue length by movement from the Synchro models, and vehicle travel time (for general traffic and bus separately) through the segment from the Vissim models. The results of these measures of effectiveness, along with other inputs, including effects on bus improvements, will inform the evaluation of improvement concepts and the identification of a preferred alternative.

Corridor-wide Improvement Concepts

For initial screening/concept identification, up to three improvement concepts covering the whole study corridor will be identified. For final screening/concept refinement, up to two corridor-wide improvement concepts will be developed. Each corridor-wide concept will be made up of specific improvements from the study segment alternatives and may include additional improvements such as bus bulbs, stop consolidation, and/or offboard payment. Effects of these additional improvements will be evaluated empirically using experience from other projects and King County Metro.

Overall Improvement

The overall improvement in total study corridor bus travel time for the AM and PM peak hours in the horizon year will be estimated by summing up travel time savings identified from the traffic models for the study segments, as well as empirically assessing the effect of the corridor-wide improvement concepts.

Reporting

Results of the traffic analysis will be provided in tables and charts where applicable during the evaluation stages and final results will be provided in the Memorandum on Transportation Analysis Findings in Task 5.8 along with other results.

No interim deliverables other than the results tables and graphs are included in the scope of work. Deliverables for Task 5.2 are as follows:

Task 5.2.1 Existing Year Traffic Operations

- Draft and Final traffic operations tables and exhibits and model calibration statistics in PDF format for existing conditions models
- Draft and Final Synchro and Vissim existing conditions model files
- Existing conditions models meeting Draft and Final agenda and summary in PDF

Task 5.2.2 Horizon Year No-Build Traffic Operations

- Draft and Final traffic operations tables and exhibits in PDF format for a single horizon year No-Build conditions
- Final Synchro and Vissim single horizon year No-Build conditions model files

Task 5.2.3 Horizon Year Build Traffic Operations

- Draft and Final traffic operations tables and exhibits
- Draft and Final Synchro and Vissim model files

The traffic analysis process and existing conditions models will be discussed in the Task 5.2.1 meeting. No other meetings are scoped in Task 5. Discussion of traffic analysis results are covered in meetings scoped in Task 6.2 and Task 6.3 as well as Task 2.4.2 if needed.

FINAL
MEMORANDUM

Route 40 Transit Improvement Project
Task 5.8 - Memorandum on Transportation Analysis Findings

Seattle Department of Transportation
Seattle, WA

January 2021

CDM Smith

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1.0 Introduction

The purpose of this document is to summarize the findings of transportation analysis, issues, and needs regarding existing traffic, transit, traffic signals, intelligent transportation systems (ITS), safety, pedestrian/bicycle, and land use conditions along the Route 40 corridor in Seattle, Washington, as shown in Figure 1. The key findings of this analysis are presented in the following sections within this memorandum. The memo is intended to be used as a tool to inform an alternatives analysis conducted as part of Task 6: Concept Development, Evaluation, and Selection.

Much of the analysis in this memorandum was conducted during the COVID-19 pandemic, and the analysis was concluded before its end. The existing conditions and findings do not reflect the impact of the pandemic and assume that post-pandemic transit characteristics would resemble normal operations and ridership.

Figure 1: Route 40 Study Area
Source: CDM Smith

2.0 Traffic Analysis

2.1 Traffic Analysis Methods and Assumptions

This section describes the traffic analysis process, methodology, and assumptions for the SDOT Route 40 Northgate to Downtown Transit Improvements project. It covers the study corridor, study segments and intersections, traffic data collection, analysis approach and modeling tools, model inputs and outputs, and measures of effectiveness to be used in this traffic analysis. The report has been used as a tool for the alternative analysis conducted as part of Task 6: Concept Development, Evaluation, and Selection.

2.1.1 Study Segments and Study Intersections

As shown in Figure 1 in Section 1.0, the study corridor follows the existing Route 40 between the Westlake Ave N/Harrison St intersection (southern end) and the N Northgate Way/Meridian Ave N intersection (northern end).

The traffic analysis focused on 20 intersections grouped into six study segments identified as key areas to improve transit reliability. Each segment includes at least one study intersection. The study segments and intersections are as follows:

- **Westlake Segment**
  - Westlake Ave N/Republican St
  - Westlake Ave N/Mercer St
  - Westlake Ave N/Valley St
  - Westlake Ave N/9th Ave N
- **Fremont Segment**
  - 4th Ave N, Nickerson St, Dexter Ave N, Westlake Ave N
  - Fremont Ave N/N 34th St
  - Fremont Ave N/N 35th St
  - Fremont Pl N/N 36th St/Evanston Ave N
  - N 36th St/Dayton Ave N
  - N 36th St/Phinney Ave N
  - N 36th St/1st Ave NW
  - Leary Way NW/NW 39th St
- **Ballard Bridge Segment**
  - NW Leary Way/14th Ave NW
  - NW Leary Way/15th Ave NW
  - Leary Ave NW/NW Dock Pl
- **Ballard/Market Segment**
  - Leary Ave NW/NW Market St
  - NW Market St/24th Ave NW

- Leary Ave NW/20th Ave NW/NW Vernon Pl

- **Greenwood Segment**
  - Holman Rd NW/Greenwood Ave N/ 105th St Intersection

- **Aurora Segment**
  - Aurora Ave N/N 105th St Intersection

2.1.2 Traffic Data Collection

This section presents the types and sources of data collected for traffic analysis.

Traffic Counts

SDOT provided intersection turning movement counts at the 20 study intersections for weekday peak periods (at least two hours in the morning and two hours in the afternoon). These counts include vehicle classification as well as bicycle and pedestrian volumes.

SDOT's counts were conducted between 2014 and 2019. To ensure that all counts were recent, CDM Smith conducted additional counts where SDOT's counts were more than three years old.

Signal Timing Data

The signal timing cards with current signal timing settings in the AM and PM peak hours were provided by SDOT for all study segment signalized intersections.

Speed Limits

Existing posted speed limits along the study corridor were obtained using Google Street View information, SDOT's draft Complete Streets Checklists, and SDOT's GIS Streets data for the study segments. It was noted that arterial speed limits may be lowered to 25 mph in the future due to the Vision Zero program. This change was considered when preparing future travel times.

Geometric Layouts

Existing geometric layouts and channelization coded into the traffic models were obtained through Google Street View, field visit observations, and the 2019 Master City Drawing (CADD) provided by SDOT.

Leading Pedestrian Intervals (LPIs)

Locations of LPI evaluation points were included in SDOT's draft Complete Streets Checklist.

2.1.3 Existing Year Analysis Approach

A traffic analysis was conducted for the existing year (2019) traffic operations. The following sections describe the tasks in this analysis.

Peak Hour Determination

Table 1 shows the distribution of peak hours identified from the historical turning movement counts for nine of the 20 study intersections received from SDOT and the 2019 counts for 11 of the 20 study intersections.

Table 1: Distribution of Peak Hours

AM		PM	
Peak Hour	**Number of Intersections**	**PM Hour**	**Number of Intersections**
7:00-8:00	1	4:30-5:30	2
7:30-8:30	1	4:45-5:45	6
7:45-8:45	8	5:00-6:00	9
8:00-9:00	10	5:15-6:15	1
		6:15-6:30	2

Source: CDM Smith Calculations. Based on the historical counts data received from SDOT and 2019 CDM Smith counts.

Based on the number of intersections with specific peak hour windows, the prevalent AM peak hour was found to be 8 am to 9 am while the prevalent PM peak hour was found to be 5 pm to 6 pm. These AM and PM peak hours were the time basis for traffic analysis. Despite the minor discrepancies in peak hours, the differences between the peak hour windows were small enough that it was not necessary to factor any counts to ensure absolute consistency.

Traffic Volume Development

2019 counts were collected at 11 of the 20 study intersections. For the remaining nine intersections, historical counts were adjusted to 2019 volumes by applying traffic growth rates derived from a combination of sources:

- Comparison of counts taken at the same locations over several years
- Historical average annual daily traffic (AADT) volumes for the study corridor provided by SDOT, if available
- Growth rate(s) used in the recent relevant studies, such as the Route 44 - Transit-Plus Multimodal Corridor project

Individual growth rates were developed for each segment, which ranged between 0.0% and 0.5%. The same growth rate was used for AM and PM peaks for each segment. The proposed growth rate(s) were shared with and approved by SDOT. Based on the proposed growth rate review, SDOT determined that no growth rates needed to be applied to adjust the older turning movement counts into the existing year (2019) volumes.

A balanced set of 2019 AM and PM peak hour traffic volumes was developed for the study segments, including the 20 study intersections. SDOT reviewed, provided comments, and approved the final balanced traffic volumes.

Synchro Analysis

Traffic models were developed using Synchro Version 10.1 for the 2019 AM and PM peak hours at the 20 study intersections. The Synchro models provided by SDOT were used as the starting point. CDM Smith reviewed and updated the geometric layouts and signal timings coded in the models, as necessary. Volumes coded in the models were updated to reflect the balanced 2019 traffic volumes. The Synchro model outputs included delay and level of service (LOS) for the overall intersection and for each approach, and queue length by movement for the study intersections.

Additional information, including the Synchro Operations Summary and Synchro Queue Length Summary, is included in Appendix A.

Vissim Analysis

A 2019 PM peak hour traffic micro-simulation model was developed using Vissim, Version 11, for the Fremont segment, which includes eight intersections. The existing geometric layouts, signal timings, and volumes were coded in the Vissim model. The existing conditions PM Vissim model was calibrated for volume throughput, travel time, and visual inspection of congestion patterns based on the calibration targets in Section 6 of Washington State DOT's Protocol for Vissim Simulation document. The number of simulation runs used to collect model outputs was also based on the same guidelines.

The Vissim model outputs included: delay and LOS for the overall intersection and for each approach, volume throughput, and vehicle travel time (for general traffic and bus separately) along the corridor.

Additional information including the Existing Year Vissim Modeling Calibration Summary, Existing PM Peak Hour Vissim Operations, and Existing PM Peak Hour Vissim Travel Times and Speeds are included in Appendix A.

2.1.4 Horizon Year No Build Traffic Analysis Approach

A traffic analysis was conducted for the horizon year (2040) No Build traffic operations. The following sections describe the tasks under this analysis.

Traffic Volume Development

Historical tube counts (provided by SDOT) along arterials in or near the corridor were reviewed to identify traffic annual growth rates within the study corridor. Individual growth rates were developed for each segment, which ranged between 0.0% and 0.5%. The same growth rate was used for AM and PM peaks for each segment. The proposed growth rate(s) were shared with and approved by SDOT. The approved growth rates were applied to grow the existing year (2019) volumes into the future horizon year volumes.

A balanced set of horizon year AM and PM peak hour traffic volumes was developed for the study segments, including the 20 study intersections for Synchro and the eight study intersections in the PM peak period for Vissim analysis. SDOT reviewed, provided comment, and approved the growth rates and volumes.

Future Committed Projects

Committed future projects identified in existing plans and documentation review were incorporated into the horizon year traffic models where applicable.

Synchro Analysis

The Synchro traffic analysis models were developed for the AM and PM peak hours for the 20 study intersections in the horizon year No Build scenario. In general, existing geometric layouts were maintained. The existing layout was updated in one location along 34th St to reflect a committed bike lanes project. Volumes in the existing Synchro models were updated to reflect the

balanced horizon year AM and PM peak hour volumes. Signal cycle length was kept unchanged while the splits and offsets for the signalized intersections were re-optimized in the Synchro models.

The Synchro outputs included delay and LOS by overall intersection as well as by approach and queue length by movement for the study intersections.

Vissim Analysis

The Vissim traffic simulation model was developed for the PM peak hour for eight study intersections in the Fremont segment under the horizon year No Build scenario. As with the Synchro analysis, existing geometric layouts were maintained, except for one location to incorporate a committed bike lanes project on 34th St. The No Build Vissim model used optimized splits developed in the Synchro model as well as the growth rates assumed above. The Vissim outputs include volume throughput and vehicle travel time (for general traffic and buses separately) along the corridor.

2.1.5 Horizon Year Build Traffic Analysis Approach

A traffic analysis was conducted for the horizon year (2040) Build traffic operations. The following sections describe the tasks under this analysis.

Traffic Volume Development

The forecasted traffic volumes were kept consistent across the No Build and Build conditions. However, depending on the change to the roadway characteristics introduced under Build conditions (such as road closures, turn restrictions, lane re-purposing, or roadway capacity changes), future traffic patterns could change as a result of the Route 40 potential improvement concepts and traffic diversion anticipated to occur. These travel pattern adjustments were based on engineering judgement and input from SDOT (no modeling).

Study Segment Improvement Concepts

For initial screening/concept identification, the effects of several improvement concepts on traffic operations in each study segment were evaluated. Next, concepts were packaged into four improvement packages in each study segment and evaluated. The improvement concepts were coded into the traffic models where applicable. Ultimately, two refined packages were developed and evaluated.

Synchro Analysis

The Synchro traffic analysis models were developed for the AM and PM peak hours for the 20 study intersections. Geometric layouts include improvement concepts where applicable. Volumes in the horizon year Build Synchro models are based on the same AM and PM peak hour volumes coded in the horizon year No Build models. Signal timings (phasing, cycle length, and splits) were optimized in the Synchro models due to potential changes in geometric layouts, capacity, and lane configurations at the study intersections. The leading pedestrian/bicycle interval operation was coded to the Fremont Ave/N 34th St intersection as a background project in the horizon year.

The Synchro outputs include delay and LOS by overall intersection and by approach, and queue length by movement for the study intersections.

Vissim Analysis

The Vissim traffic simulation models were developed for the PM peak hour for the eight study intersections in the Fremont segment under the horizon year Build scenarios. Optimized signal timings in the horizon year Build Synchro models were utilized. Volumes match the balanced horizon year PM peak hour traffic volumes. The leading pedestrian/bicycle interval operation was coded to the Fremont Ave/N 34th St intersection as a background project in the horizon year

The Vissim outputs include volume throughput and vehicle travel time (for general traffic and buses separately) along the corridor.

Measures of Effectiveness

The measures of effectiveness include:

- Delay and LOS by overall intersection and by approach from Synchro models
- Queue length by movement from Synchro models
- Vehicle travel time (for general traffic and buses separately) through the segment from the Vissim model

The results of these measures of effectiveness, along with other inputs such as effects on bus travel time, informed the evaluation of improvement concepts and the identification of a preferred alternative.

Corridor-wide and Outside Segment Improvement Concepts

Corridor-wide improvements identified in the evaluation process include off-board fare payment, speed limit reduction to 25 mph, and transit signal priority. Additional concepts, such as stop consolidation and bus bulbs, were identified in the evaluation process and advanced despite being located outside of the identified study segments. Corridor-wide improvements and concepts located outside of the segments were not considered in the traffic analysis. In cases where the project could be accurately defined, the effects of these additional improvements were evaluated empirically using standard industry benchmarks. Memorandum 6.2: Concept Identification and Refinement provides additional details regarding this approach.

Overall Improvement

The overall improvement in total study corridor bus travel time for the AM and PM peak hours in the horizon year was estimated by summing up travel time savings identified from the traffic models for the study segments, as well as empirically assessing the effect of the corridor-wide improvement concepts.

2.2 Existing Year Traffic Operations

Traffic operations along the Route 40 corridor inform bus speed and reliability. The following section summarizes current traffic operations and performance. Additional information on existing year traffic operations can be found in the Task 3 Existing Conditions Memo.

The vehicular corridor travel time and corresponding speeds for general traffic were collected from INRIX data, a third-party source for detailed travel time data. Average vehicular travel times and speeds were collected for the AM peak hour (8 am to– 9 am) and PM peak hour (5 pm to– 6

pm) on Monday through Friday during October 2019. The corridor travel times within the Fremont segment were used to calibrate the Vissim microsimulation traffic model. Additionally, Synchro modeling was used to analyze traffic operations as noted in Section 2.1.

2.2.1 Travel Time and Speed for General Traffic and Transit

Table 2 compares the travel time and speed for general traffic and transit during the AM and PM peak hours. The table shows that travel times for transit are about 40% longer in the northbound direction and 30% longer in the southbound direction during both the AM and PM peaks. This difference in travel time results from the time it takes for buses to dwell at each station as well as the slower operational characteristics of buses as compared to autos. For the AM peak hour (8 am to 9 am), 17% of the travel time is dwell time in the northbound direction and 23% of the travel time is dwell time in the southbound direction. For the PM peak hour (5 pm to– 6 pm), 22% of the travel time is dwell time in the northbound direction and 19% of the travel time is dwell time in the southbound direction.

Table 2: Comparison of General Traffic and Transit Travel Time Along the Study Corridor

		General Traffic		Transit		Percent Difference		
Direction	Distance (mi)	Travel Speed (mph)	Travel Time (min)	Travel Speed (mph)	Travel Time (min)	Travel Speed (mph)	Travel Time (min)	Direction
AM Peak Hour (8 am to 9 am)								
Northbound	9.1	18.9	28.7	14.0	39.3	-26%	37%	Northbound
Southbound	9.1	16.5	33.0	12.8	43.0	-22%	30%	Southbound
PM Peak Hour (5 pm to 6 pm)								
Northbound	9.1	15.5	35.2	11.2	49.2	-28%	40%	Northbound
Southbound	9.1	17.4	31.3	13.5	40.6	-22%	30%	Southbound

Source: INRIX; King County Metro AVL Data; CDM Smith calculations

2.2.2 Level of Service Findings

Based on the Synchro and Vissim modeling analysis, the following findings are relevant to this study:

- Major intersections along the study corridor that operate at LOS E or worse in at least one of the AM or PM peak hours include:
  - Westlake Ave N/Mercer St
  - Westlake Ave N/Dexter Ave N/Nickerson St/4th Ave N
  - Fremont Ave N/N 34th St (primarily due to the heavy northbound traffic and conflicting bicycles)
  - Holman Rd/Greenwood Ave N/N 105th St
  - Aurora Ave N/N 105th St
- Intersections Route 40 buses travel through with long queues (Synchro-reported 95th percentile queue length larger than 400 feet) either in the AM or PM peak hour are:
  - Southbound-left turn at Westlake Ave N/9th Ave N
  - Southbound-left turn at 4th Ave N/Nickerson St/Dexter Ave N/Westlake Ave N

- Northbound-through at Fremont Ave N/N 34th St
- Northbound-through at Leary Way NW/NW 39th St
- Westbound-left turn (bear left) and northeastbound-right turn (bear right) at Holman Rd/Greenwood Ave N/N 105th St
- Eastbound-through and westbound-through at Aurora Ave N/N 105th St

- The northbound approach of the Fremont Ave N/N 34th St intersection is heavily congested in the Fremont Bridge area during the PM peak hour. There is noticeable conflict between right-turning vehicular traffic and bicycles sharing the road in the northbound direction. The heavy pedestrian volumes crossing on the crosswalks at the Fremont Ave N/N 34th St and at Fremont Ave N/N 35th St intersections also cause delay to the turning vehicles and those queued behind. The outside lane between N 34th St/N 35th St on Fremont Ave N in the northbound direction has noticeable conflict among buses (Route 40, 31/32, and 62), bicycles, and right-turn vehicles.

Figure 2 and Figure 3 show existing level of service at intersections within the study sections during the AM and PM peaks, respectively. The delay, LOS, and queue length results reported from existing year Synchro and Vissim models and the Vissim model calibration results are presented in Appendix A.

Figure 2: Study Area Existing AM Level of Service
Source: SDOT, CDM Smith

Figure 3:. Study Area Existing PM Level of Service
Source: SDOT, CDM Smith

2.3 Horizon Year No Build Traffic Operations

Synchro and Vissim models were updated with the developed horizon year volumes to reflect the horizon year No Build conditions. Signal splits and coordination offsets were optimized using Synchro's optimization function. Based on the Synchro and Vissim modeling analysis, the following findings are relevant to this study:

- It is expected that the following major intersections along the study corridor will operate at LOS E or worse in at least one of the AM or PM peak hours in 2040 No Build conditions:
  - Westlake Ave N/Mercer St
  - Westlake Ave N/Dexter Ave N/Nickerson St/4th Ave N
  - Fremont Ave N/N 34th St (primarily due to the heavy northbound traffic and conflicting bicycles)
  - Holman Rd/Greenwood Ave N/N 105th St
  - Aurora Ave N/N 105th St

- Intersections Route 40 buses travel through with long queues (Synchro-reported 95th percentile queue length larger than 400 feet) either in the AM or PM peak hour are:
  - Southbound-left turn at Westlake Ave N/9th Ave N
  - Southbound-left turn at 4th Ave N/Nickerson St/Dexter Ave N/Westlake Ave N
  - Northbound-left at Fremont Ave N/N 35th St
  - Northbound-through at Leary Way NW/NW 39th St
  - Westbound-through at NW Leary Way/15th Ave NW NB
  - Westbound-through at NW Leary Way/15th Ave NW SB
  - Westbound-left turn (bear left) and northeast bound-right turn (bear right) at Holman Rd/Greenwood Ave N/N 105th St
  - Eastbound-through and westbound-through at Aurora Ave N/N 105th St

- Comparing horizon year No Build and existing conditions scenarios, there is no growth of vehicular traffic in the Westlake segment and the Fremont Bridge area of the Fremont segment. Bicycle growth is high (22%) in the Fremont Bridge area. There is slight growth of vehicular traffic (CAGR ranging from 0.25% to 0.5%) for other areas of the Fremont segment and other segments.

  Traffic conditions generally remain similar or worsen under horizon year No Build conditions compared to existing conditions. Areas identified as congested under the existing conditions remain congested in the future. Delays for a few locations are reduced due to signal splits and offsets optimization. But it was found that signal optimization alone could not alleviate the congestion areas observed in existing conditions.

- Under both the horizon year No Build and existing conditions scenarios, the northbound approach of the Fremont Ave N/N 34th St intersection would be heavily congested in the Fremont Bridge area during the PM peak hour. The conflict between right-turning vehicular traffic and bicycles on road in the northbound direction is anticipated to persist. It is worth noting that as part of SDOT's N 34th St Mobility Improvements project, a separated/protected bicycle lane would be provided starting from just past the Fremont

Bridge to near the N 34th St intersection. Bicyclists are expected to experience higher level of safety and comfort while cycling on Fremont Bridge in the northbound direction. The conflict area between vehicular traffic and bicycles would be shorter. This change has been reflected in the future year No Build and Build Vissim models. Due to the leading pedestrian/bicycle interval operation, vehicular traffic on the westbound, northbound, and southbound approaches at the Fremont Ave N/N 34th St intersection would experience a three seconds loss of green time in their phases.

- Under both the horizon year No Build and existing conditions scenarios, the heavy pedestrian volumes crossing on the crosswalks at the Fremont Ave N/N 34th St and at Fremont Ave N/N 35th St intersections cause delay to the turning vehicles and vehicles queued behind. The outside lane between N 34th St/N 35th St on Fremont Ave N in the northbound direction has noticeable conflict among buses (Route 40, 31/32, and 62), bicycles, and right-turn vehicles.

Figure 4 and Figure 5 show future year No Build level of service at intersections within the study sections during the AM and PM peaks, respectively. The delay, LOS, and queue length results reported from horizon year No Build Synchro and Vissim models are presented in Appendix A.

Figure 4: Study Area No Build AM Level of Service

Source: SDOT, CDM Smith

Figure 5: Study Area No Build PM Level of Service
Source: SDOT, CDM Smith

2.4 Horizon Year Build Traffic Operations

As noted in Section 2.1.5, several improvement project groupings, Alternatives A-D, were assessed in the Level 2 Evaluation. Based on the results of this evaluation, the advancing improvements were grouped into Alternatives E and F refined alternatives. In general, Alternative F represents the most extensive improvements available; Alternative E represents a set of comprehensive yet slightly less extensive improvements. Alternative F includes all the improvements in Alternative E plus a several additional concepts require more design/construction considerations and/or may have more significant changes to current traffic patterns. For details on the evaluation process, see Task 6.3: Corridor Evaluations Report.

The Synchro and Vissim models were updated to reflect proposed improvements in Alternatives E and F for the horizon year Build conditions. Signal splits and coordination offsets were optimized using Synchro's optimization function. Cycle lengths were optimized wherever necessary. Based on the Synchro and Vissim modeling analysis, it is expected that the following major intersections along the study corridor would operate at LOS E or worse in at least one of the AM or PM peak hours in 2040 Build (Alternative E) conditions:

- Westlake Ave N/Mercer St
- Westlake Ave N/Dexter Ave N/Nickerson St/4th Ave N
- Fremont Ave N/N 34th St (primarily due to the heavy northbound traffic and conflicting bicycles)
- Fremont Ave N/N 35th St
- Holman Rd/Greenwood Ave N/N 105th St
- Aurora Ave N/N 105th St

In most cases, these intersections that perform at LOS E or worse under the Build Alternative also perform at LOS E or worse under the No Build Alternative. The two exceptions are the Fremont Ave N/N 35th St intersection in the PM peak hour and the Aurora Ave N/N 105th St intersection in the AM peak hour. For all other intersections, the traffic conditions would stay similar or would not deteriorate significantly in Alternative E compared to No Build conditions.

The decreased level of service at the Fremont Ave N/N 35th St intersection in the PM peak hour is attributable to the introduction of a new protected left-turn phase for the westbound-left buses (Routes 31/32 and 62).

For the Aurora Ave N/N 105th St intersection, the Synchro results show that delay would increase significantly in the AM peak hour, reducing level of service from LOS D in the No Build Alternative to LOS E in the Build Alternative. This is attributable to adding a bus lane and removing one general-purpose travel lane in the eastbound direction.

The Holman Rd/Greenwood Ave N/N 105th intersection is already be congested in the No Build conditions – operating at LOS E in the AM peak hour and LOS F in the PM peak hour. However, the Synchro results show that delay would increase significantly in both peaks. This is attributable to adding a bus lane and removing one general-purpose travel lane in the northeastbound and westbound directions.

Like the Alternative E conditions, it is expected that the following major intersections along the study corridor would operate at LOS E or worse in at least one of the AM or PM peak hours in 2040 Build (Alternative F) conditions:

- Westlake Ave N/Mercer St
- Westlake Ave N/Dexter Ave N/Nickerson St/4th Ave N
- Fremont Ave N/N 34th St (primarily due to the heavy northbound traffic and conflicting bicycles)
- Fremont Ave N/N 35th St
- Holman Rd/Greenwood Ave N/N 105th St
- Aurora Ave N/N 105th St

The addition of a queue jump transit lane approaching Fremont Bridge on the westbound approach at the Westlake Ave N/Dexter Ave N/Nickerson St/4th Ave N intersection as part of Alternative F would degrade LOS from E to F as compared to Alternative E.

Due to restricting right turns from northbound Fremont Ave N to eastbound 35th St and shifting traffic to eastbound 34th St, the overall delay at the Fremont Ave N/N 34th St would increase, but LOS would remain consistent.

Conversely, the dual northbound-left configuration at the NW Leary Way/15th Ave NW NB intersection in Alternative F reduces delay at both NW Leary Way/15th Ave NW NB and NW Leary Way/15th Ave NW SB intersections. However, this configuration requires two through lanes merging into one through lane on NW Leary Way west of the 15th Ave NW SB intersection.

For all other intersections, the traffic conditions would be similar to that in Alternative E.

The only locations along the Route 40 Corridor with long queues (i.e. Synchro-reported 95th percentile queue length larger than 400 feet) either in the AM or PM peak hour in both Alternatives E and F are:

- Northbound-left at Fremont Ave N/N 35th St
- Northbound-through at Leary Way NW/NW 39th St
- Southbound-left turn at 4th Ave N/Nickerson St/Dexter Ave N/Westlake Ave N

There are no bus-only lanes proposed at these three locations. Detailed queue length information can be found in **Appendix A**.

Table 3 includes a summary of the estimated change for bus travel time for the Fremont segment in Alternatives E and F as compared to the No Build using the Vissim model. In the southbound direction, travel times improve in both Alternatives E and F by 0.4 to 0.5 minutes (6% to 7%). This is mainly attributable to implementing transit signal priority (TSP) and the bus only lanes (on Fremont Pl/Ave N southbound from N 36th St to N 34th St in Alternative E and on N 36th St/Fremont Pl N/Fremont Ave N southbound from 1st Ave NW to N 34th St in Alternative F).

In the northbound direction, travel time improves in Alternative E by 0.5 minute (6%) while worsens in Alternative F by 0.8 minutes (10%). The deterioration in travel time is attributable to

increased congestion on N 36th St from Fremont Pl N to 1st Ave NW due to through lanes reduced to one lane past Phinney Ave N.

It should be noted that TSP was not coded at the Fremont Ave N/N 34th St and Fremont Ave N/N 35th St intersections in order to preserve the signal coordination between these two intersections in the Vissim models. Observations of the working models showed that TSP would disrupt the synchronization of green time on Fremont Ave N northbound and therefore create unnecessary congestion and intersection blockage at the Fremont Ave N/N 34th St intersection. Also, due to reduced green time, the delay for the N 34th St westbound approach would be exceptionally high. This is the model limitation. If TSP is to be installed at these two intersections, it is important to preserve signal coordination and leave enough green time for the N 34th St westbound approach.

Table 3: Route 40 Bus Travel Times in Fremont Segment Comparison

		No Build	Build (Alt E)			Build (Alt F)		
Direction	Distance	Travel Time (min)	Travel Time (min)	Difference (min)	Percent Difference	Travel Time (min)	Difference (min)	Percent Difference
Northbound	1.04	8.2	7.7	-0.5	-6%	9.0	0.8	+10%
Southbound	1.02	6.9	6.5	-0.4	-6%	6.4	-0.5	-7%

Source: CDM Smith calculations

2.4.1 Reliability Analysis

Since Vissim modeling was only scoped for the Freemont Study Segment (Segment 2) and only for the afternoon peak, this is the only Segment where reliability can be tested. (Synchro was used for the remainder of the modeling and does not provide reliability measures.) A sensitivity analysis was conducted to evaluate how reliable the bus travel times are if the key conditions change (i.e. background traffic volumes and bus stop dwell times) in Alternatives E and F. A scenario was created in which the background traffic volumes and bus dwell times were increased by 10%. For the data to be meaningful, there must be several simulation "runs" each with a unique "seed" number to create random events. To do this, a random number is generated to determine the seed number that will be used for the series of simulations. The Vissim models were run five times and the maximum travel times were collected.

Table 4 shows the results of comparing the maximum travel times to the average travel times collected without the 10% increase. This comparison is similar to comparing the median and 95th percentile travel times using the actual transit travel time data. The results show that Alternatives E and F are similar in terms of reliability. In the northbound direction, the percent difference is higher in Alternative E but the maximum travel time in Alternative F is still higher than Alternative E. In the southbound direction, the percent difference is slightly higher in Alternative F but the maximum travel time in Alternative E is still higher than Alternative F.

Table 4: Route 40 Bus Travel Times in Fremont Segment Sensitivity Analysis

	Build (Alt E)			Build (Alt F)		
Direction	Average Travel Time (min)	Maximum Travel Time (min)	Percent Difference	Average Travel Time (min)	Maximum Travel Time (min)	Percent Difference
Northbound	7.8	9.6	23%	9.3	10.7	15%
Southbound	6.5	6.9	6%	6.1	6.5	7%

Source: CDM Smith calculations

3.0 Multimodal Analysis and Access

While the City of Seattle continues to grow, efforts are underway to make it more accessible via multimodal transportation modes. The Pedestrian Master Plan aims to make Seattle the most walkable city in the nation while the Vision Zero policy framework aims to eliminate traffic-related deaths. To achieve these goals, access to a safe and reliable transportation network for pedestrians, bicyclists, transit riders, car drivers, and truck drivers is crucial. The current roadway network cannot support additional vehicles, particularly single occupancy vehicles traveling on City streets during peak periods. Roadway expansion is not a preferred option as the City aims to reduce emissions through shifts to alternative modes, nor is it even an option in constrained sections of the corridor. To prepare for future growth and travel demand, and encourage use of non-motorized transportation, this project analyzes the need for facilities such as wider sidewalks, curb ramps, curb extensions at key intersections to reduce crossing distances, marked crosswalks, and signal timing adjustments. Support also includes development of bicycle facilities in line with the Bicycle Master Plan

Route 40 passes through neighborhoods in which 15% to 50% of people take transit to work. In addition, the route provides connections between Northgate and downtown and other high-capacity transit services such as the RapidRide E and D Lines, Route 44, Streetcar, as well as direct access to the future Northgate Link station along with various local and regional bus routes at Northgate Transit Center.

3.1 Existing Pedestrian Network

According to the City of Seattle's sidewalk inventory, sidewalks connect pedestrians and transit users to nearby streets, businesses, and residences along the Route 40 study corridor and within the study segments. Where traditional sidewalks may be missing, trail systems are provided such as the Cheshiahud Lake Union Loop. The presence of signalized crossings and crosswalks provides insight into the ability for pedestrians to safely cross the street in a timely manner. Figure 6 depicts the presence of signalized crossings and crosswalks. Intersections that do not have pedestrian signals or crosswalks exist along the study corridor; however, these are not present within the study segments. The Fremont and Ballard/Market segments are the only study segments that contain study intersections with a crosswalk but no pedestrian signal. The lack of signals may indicate pedestrians are waiting a long time to cross the street. The remaining study intersections in the study segments contain both signals and crosswalks.

Figure 6: Presence of Signals and Crosswalks throughout the Route 40 Study Corridor
Source: SDOT

3.1.1 Existing Pedestrian Counts

Areas of high pedestrian activity were calculated based on traffic counts at study intersections within the study segments. Each segment has a varied number of intersections within it that were reviewed. More detailed information on existing pedestrian counts can be found in the Task 3 Existing Conditions Memo.

Generally, the southern segments closer to downtown Seattle have higher pedestrian counts, including Westlake Ave N/Mercer St and Westlake Ave N/Republican St, while northern segments have lower pedestrian counts. Pedestrian counts are higher in the PM peak period (4 pm to– 6 pm) than the AM peak period (7 am to– 9 am) as shown in Figures 7 and 8.

Figure 7: Pedestrian Counts by Intersection, AM Peak Period
Source: City of Seattle

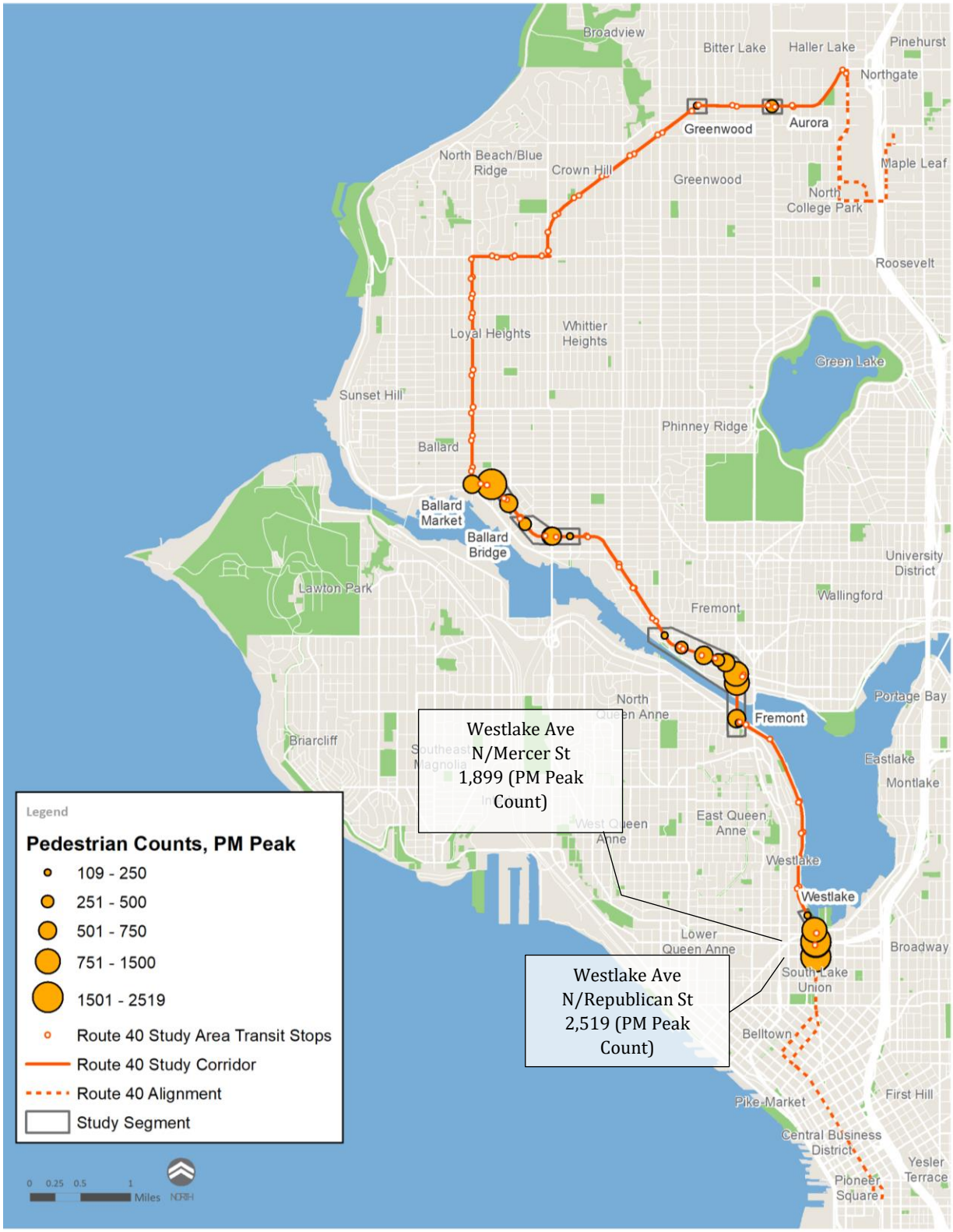


Figure 8: Pedestrian Counts by Intersection, PM Peak Period
Source: City of Seattle

Segments with notably high pedestrian counts include:

- Westlake
- Fremont
- Ballard/Market

Intersections with notably high pedestrian counts include:

- Westlake Ave N/Republican St intersection (Westlake segment)
- Westlake Ave N/Mercer St intersection (Westlake segment)
- NW Leary Way/NW Market St intersection (Ballard/Market segment)

When study segment pedestrian counts are averaged based on the number of intersections, similar results occur but are not identical: the Westlake segment has the highest pedestrian counts, followed by Ballard/Market and Fremont segments.

3.2 Planned Pedestrian Network

The Pedestrian Master Plan (PMP), adopted in June 2017, establishes policies, programs, and a Priority Investment Network (PIN) to coordinate resources and support Seattle's Vision Zero mission to eliminate traffic-related deaths and serious injuries on city streets by 2030. The PIN is focused on schools and transit service routes, such as Route 40. The entire study corridor is identified as part of the PIN. The first step identified in this Plan is to improve pedestrian facilities including creating safer crossing conditions. Crossing-the-roadways improvements include shortening crossing distances, providing controlled crossing spaces with pedestrian signals, and providing ramps where they are missing. It is anticipated the Route 40 Transit Plus Multi-modal projects will be designed and built within the timeframe of PMP PM 2020-2024 Implementation timeline.

3.2.1 Walksheds to Frequent Transit Network Stops

South of 85th St, the sidewalk grid is complete and robust within walking distance of transit nodes. North of 85th St, however, a significant number of streets in Segments 5 and 6 lack sidewalks, which impacts safe transit accessibility for all users. It is not within the scope of this project to propose new sidewalks in these Segments.

3.2.2 Curb Ramp and Accessibility Improvements

Improvements to curb ramps and accessibility will be performed only within the areas directly impacted by project work to meet requirements outlined by the Right-of-Way Opening and Restoration Rules 2017 (ROWORR) for sidewalk and ramp restoration. Improvements desired by internal or external stakeholders, such as SDOT's ADA Accessibility or Pedestrian Master Plan groups, will require additional Project coordination and possible scope expansion.

3.3 Existing Bicycle Network

According to Seattle's 2018 Bicycle Facilities inventory, which includes all on the ground infrastructure varying from dedicated off-street trails to shared roadways markings (sharrows),

most bicycle facilities exist on streets adjacent to the Route 40 study corridor. The following summarizes the existing neighborhood greenway connections along the corridor:

- **17th Ave NW/NW Dock Pl** – Existing signalized crossing of Route 40 Project Corridor.
- **NW 58th St/24th Ave NW** – Existing Rectangular Rapid Flashing Beacon (RRFB) crossing with existing Route 40 transit stops within one block providing a multimodal node.
- **17th Ave NW/NW 85th St** – Existing Rectangular Rapid Flashing Beacon (RRFB) crossing with existing Route 40 transit stops approximately two-to-three blocks away.
- **NW 92nd St/13th NW/ Holman Rd NW** – Existing ground-level signalized and overhead crossing with existing Route 40 transit stops within one block providing a multimodal node. This crossing was significantly upgraded in 2019 as part of North Seattle NGW (North Sector Project 7).
- **Interurban Trail (Fremont Ave N)/ N 105th St** – Existing signalized crossing of Route 40 Project Corridor with existing Route 40 transit stops within one block providing a multimodal node.
- **N 100th St/ College Way N** – Existing unsignalized crossing with existing Route 40 transit stops within one block providing a multimodal node. Intersection will be upgraded as part of Northgate Ped/Bike Bridge Project.

Note that all of these features are outside study segment limits except the first one.

There are intersections of importance within the study segments where bicycle facilities exist on streets perpendicular to the study corridor and the intersections must consider bicycle traffic. These intersections include:

- Westlake Ave N/Aloha St (Westlake segment)
- Westlake Ave N/Valley St (Westlake segment)
- N 34th St/Fremont Ave NW (Fremont segment)
- Westlake Ave N/4th Ave N/Dexter Ave N (Fremont segment)
- NW Dock Pl/Leary Ave NW (Ballard Bridge segment)
- Greenwood Ave N/Holman Rd (Greenwood segment)

Within the project limits of the Westlake, Fremont, Ballard Bridge, and Ballard/Market Segments, the Burke-Gilman Trail, Interbay Trail, Westlake Cycle Track, & Dexter Ave N multiuse facilities provide high-quality routes for people biking parallel to Route 40 Corridor. The most recent investment, the Westlake Cycle Track, was built in 2016 connecting Northwest Seattle and Downtown Seattle. Ongoing investments in the Burke-Gilman Trail in the Ballard vicinity, also known as the Missing Link, are currently under construction or under litigation. It is not

anticipated that the Route 40 Transit Plus Multimodal project will have impacts upon existing multiuse infrastructure running parallel to Route 40 Corridor.

3.3.1 Bicycle Traffic Volumes

Higher bicycle volumes may indicate intersections and approaches where bicycle improvements may benefit the safety and reliability of the City's bicycle network.

Study intersection approaches with high bicycle volumes (> 100 bicycles per hour) in the AM peak hour include:

- Southbound approach at the Westlake Ave N/9th Ave N intersection
- Southbound approach at the Westlake Ave N/Dexter Ave N/Nickerson St/4th Ave N intersection
- Eastbound approach at the Fremont Ave N/N 34th St intersection.

The intersection approaches with somewhat high (50 to 100 bicycles per hour) in the AM include:

- Westbound approach at the Fremont Ave N/N 34th St intersection
- Southbound approach at the Fremont Ave N/N 34th St intersection
- Southbound approach at the Fremont Ave N/N 35th St intersection

At the total intersection level, heavy bicycle traffic travels through the Westlake Ave N/9th Ave N intersection and in the Fremont Bridge area. Westlake Ave N/9th Ave N is where the Westlake Cycle Track, mentioned earlier, connects with bicycle lanes on 9th Ave N into downtown Seattle. The Fremont Bridge area is a vital bicycle connection across the Lake Washington Ship Canal.

The intersection approaches with high bicycle volumes (> 100 bicycles per hour) in the PM peak hour include:

- Northbound approach at the Westlake Ave N/9th Ave N intersection
- Northbound approach at the Westlake Ave N/Dexter Ave N/Nickerson St/4th Ave N, Fremont Ave N/N 34th St intersection
- Northbound approach at the Fremont Ave N/N 35th St intersection
- Westbound approach at the Fremont Ave N/N 34th St intersection.

At the intersection level, as in the AM peak hour, heavy bicycle travels through the Westlake Ave N/9th Ave N intersection and in the Fremont Bridge area.

This pattern change conforms to the expectation that in the AM peak hour, the dominant bicycle traffic heads toward the downtown area, while in the PM peak hour bicycle traffic leaves the downtown area. Additional information on bicycle traffic volumes and bicycle crashes can be found in the Task 3 Existing Condition Memo.

3.4 Planned Bicycle Network

The Bicycle Master Plan (BMP), updated in 2019, provides an overall vision for the future of bicycling in Seattle, including a proposed citywide bicycle network to be designed and built over time. There are portions of the Route 40 study corridor that are part of the City's planned bicycle

network. Along most of the Route 40 study corridor, bicycle facilities are planned on adjacent streets or off-street facilities rather than along the Route 40. Because fewer cyclists ride along the corridor itself, intersections along the Route 40 corridor are the most likely points of conflict between buses and bikes. Intersections with planned bike facilities within study segments where bikes will interface with Route 40 include:

- Westlake Ave/Republican St (Westlake segment)
- Westlake Ave/W Florentina Ave (Fremont segment)
- NW 36th Ave/Phinney Ave (Fremont segment)
- NW 36th Ave/1st Ave NW (Fremont segment)
- Leary Way NW/NW 39th St (Fremont segment)
- NW Leary Way/14th Ave NW (Ballard Bridge segment)
- Leary Ave NW/20th Ave NW (Ballard/Market segment)
- 24th Ave NW/NW Market St (Ballard/Market segment)

3.4.1 New Connection Opportunities

The BMP provides a high-level perspective and guidance to all transportation projects within the city. During the analysis phase, the Route 40 Corridor Project has identified potential bicycle connections as part of a more detailed and specific analysis of on-the-ground conditions. These elements are not currently within the BMP and may require additional coordination with SDOT teams to determine direction forward. Refer to the Task 6.3 Corridor Evaluations Report for descriptions of the concept IDs described below.

- **Fremont Ave N from N 35th St to N 36th St** – Reconfiguring roadway lane widths to meet Streets Illustrated 2017 Guidelines, the Project Team has identified additional space to lay out an uphill Protected Bike Lane on Fremont Ave between N 35th St and N 36th St, providing safer separation between vehicles and people biking. This is shown as Concept ID 3.
- **22nd Ave NW from Ballard Ave NW to NW 58th St Greenway** – Reconfiguring roadway lane widths on 22nd Ave NW to meet Streets Illustrated 2017 Guidelines, the Project Team has identified additional space to lay out an uphill Protected Bike Lane connecting Central Ballard to NW 58th St Greenway. This is shown as part of Concept ID 30B. However, this bicycle connection is not identified in the BMP and there are potential challenges related to the Ballard Farmers Market operations on this segment that will need to be considered.
- **20th Ave NW from NW Market St to NW Vernon Pl** – Originally identified as a connection in the 2014 BMP, extending existing bike lanes on 20th Ave NW south beyond Market St has been removed from the current BMP. As part of Route 40 Corridor Project, the intersection of 20th Ave NW is proposed to be signalized and reconfigured as Concept ID 18; therefore,

the design recommendations will lay out this area to not preclude safe facilities for people biking should this connection be restored in the future.

As the Project Team advances design, new opportunities for enhancing bicycle connectivity may be found and/or changes to the proposed new connections may be evaluated.

4.0 Parking Analysis

This section outlines the existing on-street parking conditions summarized for the streets and corridors surrounding the Route 40 study corridor. The parking analysis evaluated the six study segments, specifically those with adjacent on street parking that could be impacted by improvements. It relied on recent parking counts from December 2019 and parking data from other recent studies. The parking study only includes on street parking spaces. A limited number of on street spaces are designated specifically for passenger loading, and commercial loading. Other recent studies evaluated off street parking lots available for public parking.

4.1 Data Collection

Field data was collected in mid-December 2019. Other data sources included recently collected parking data from the City of Seattle and other recent studies including the Burke Gilman Trail Missing Link Environmental Impact Statement (EIS) in 2017, which covers the same area as the Ballard Bridge and Ballard Market segments and provides in depth analysis of on and off-street parking,

Generally, parking counts were collected along block faces adjacent to Route 40 where parking is permitted. In the Fremont and Ballard Market segments, where there is considerable demand, parking occupancy was also collected on adjacent streets.

Parking counts were collected on Wednesday, December 18, 2019, to avoid impacts of school closures and holidays, during four periods: morning (8 am to 10 am), midday (11 am to 1 pm), afternoon (4 pm to 6 pm), and evening (7 pm to 9 pm).These counts were combined with other recent available parking occupancy data from the City. Parking counts from 2017 or later were considered as recent counts. Parking occupancy counts were not available for weekends nor were these counts scoped for this study, therefore weekend counts were not collected to combine with this data.

The six study segments for the Route 40 are provided in Figures 9-11.

Figure 9: Parking Blockfaces

Source: SDOT Parking Utilization Data 2017 – 2019

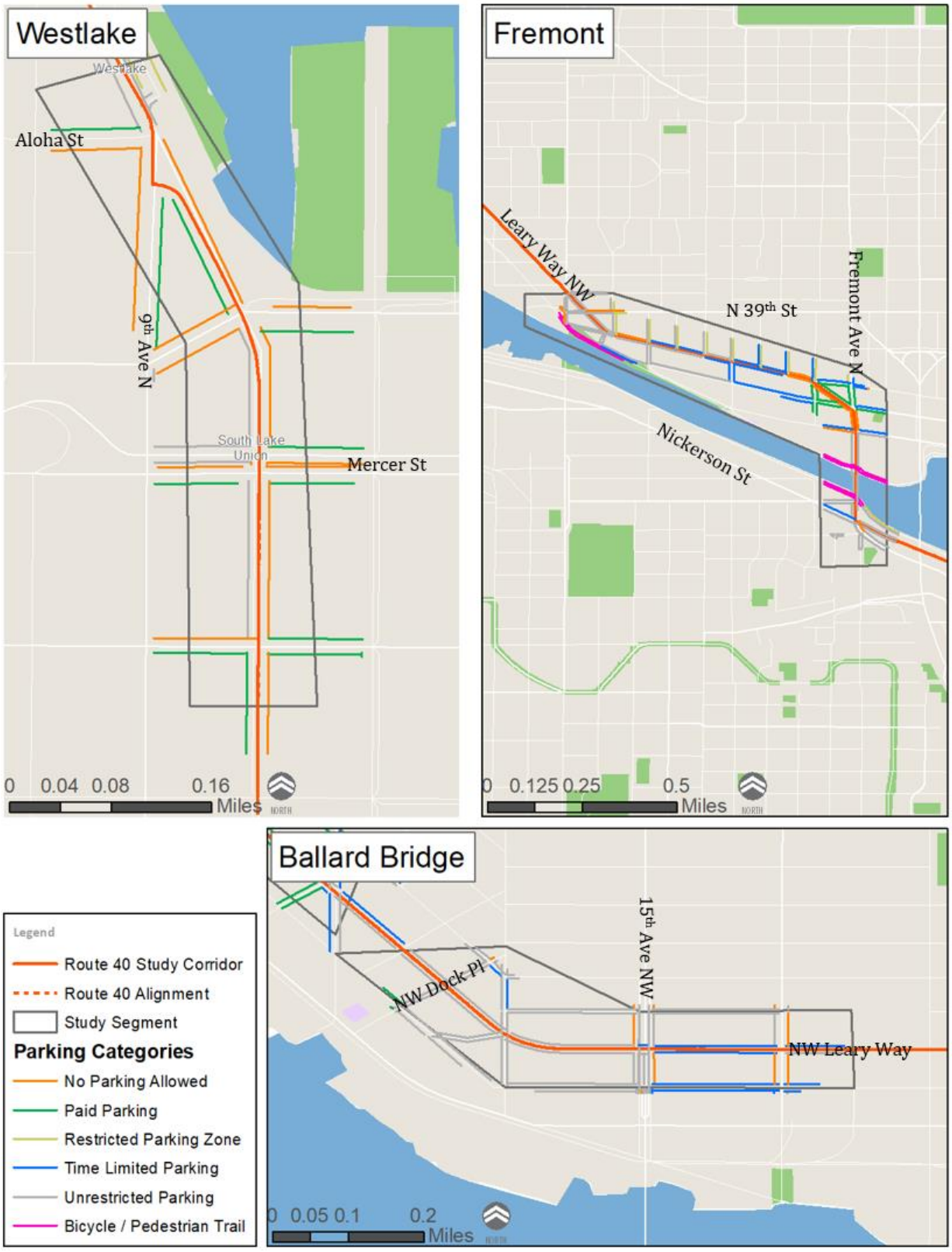


Figure 10: Parking Blockfaces – Westlake, Fremont, and Ballard Bridge
Source: SDOT Parking Utilization Data 2017 – 2019

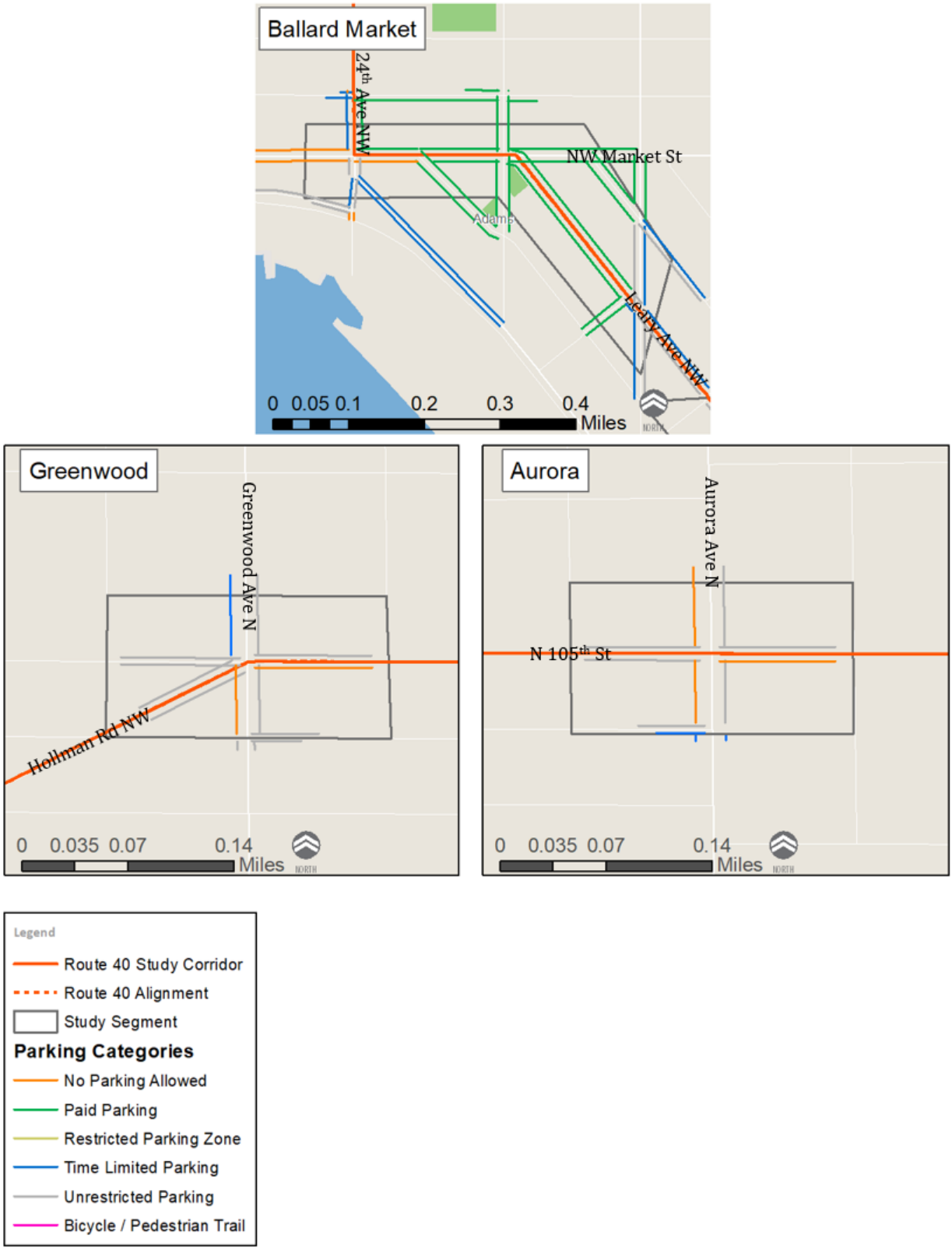


Figure 11: Parking Blockfaces – Ballard Market, Aurora, and Northgate
Source: SDOT Parking Utilization Data 2017 – 2019

4.2 Segment Parking Assessment and Observations

Using data provided and collected, the following is an assessment of parking in each study segment.

4.2.1 Westlake, Greenwood, and Aurora Segments

The Westlake, Greenwood, and Aurora segments have limited on-street arterial parking. Within the Westlake segment along Westlake Ave, on-street parking is only permitted between 9th and Valley on the south side of the street. Off-street parking is provided in public lots adjacent to Westlake Ave and South Lake Union Park. The Greenwood and Aurora segments contain intersections with little to no parking. The roadway is largely used for travel lanes. During the January 21, 2020 workshop with agency technical staff, it was noted that development activity is expected to increase in these neighborhoods as the demand for housing increases. In the Aurora segment, demand for parking and traffic patterns may change with the opening of light rail at Northgate.

4.2.2 Fremont, Ballard Bridge, and Ballard/Market Segments

Parking demand for these segments was estimated using a combination of available parking counts collected by SDOT in 2019 and field data collection in December 2019.

Because of the higher demand in the Fremont and Ballard/Market segments, parking was also assessed along side streets. In Fremont, the side streets north of the corridor have implemented residential parking zones on the east sides of the street. As shown in Table 5, overall parking utilization along the corridor ranges from 71% to 86% during the day. For some segments, the parking demand is over the theoretical capacity (assumed to be 20 feet per space) meaning vehicles are parking very close together. This is the case on N 36th St between Francis Ave and Dayton Ave. The highest demand in Fremont is midday and evenings. This level of demand results in vehicles circulating to find open spaces, causing additional area congestion. When the side streets are included, the utilization is even higher due to the high demands on the north-south, largely residential streets. For the entire area, demand ranges from 72% to 89% with the highest occupancies during the midday and evening.

For Ballard Bridge segment, the parking reflects the largely commercially focused uses. Parking is restricted in some cases to two hours and there are some segments that restrict overnight parking. As shown in Table 6, parking occupancy along the Route 40 corridor ranges from 39% in the morning to 79% in the midday consistent with commercial areas. Notably, for the segment of Leary Way east of 15th Ave NW vehicles park in landscaped medians adjacent to the curb. This may be due to a perception that the travel lanes are too narrow to accommodate a parking lane. Some vehicles were also observed to have parked on the roadway adjacent to the curb without impacting through travel. Side streets were observed to have excess on-street parking capacity. All the data used in this segment was collected in December 2019.

For the Ballard/Market segment, there is a high demand for parking in the afternoons and evenings. Table 7 summarizes parking utilization along the Route 40 corridor and the side streets. Most of the data for this segment was collected by the City in 2019. Notably, there is

construction occurring in Ballard that might impact parking demand. The highest parking demand along the route through Ballard was observed during the evening when available on street spots are 92% occupied and midday when on street spots are 80% occupied. Parking on side streets is also highly utilized in the afternoon (94%) and evening (99%). Overall, for the study area, parking is utilized between 33% during the morning peak and 96% during the evening.

Additional parking data is available from the Burke Gilman Trail Missing Link EIS, 2017. This study conducted a parking study for the two Ballard segments and included off-street parking. The Burke Gilman Trail study is consistent with the occupancy data collected for the two segments indicating higher use in the afternoons and evenings. While broad weekend parking data for these study segments was not available nor collected for the Route 40 corridor study, the Burke Gilman Trail study contrasted parking occupancy and utilization for weekdays and weekends, and it suggests lower use of parking spaces on the weekend. The study also notes that events like the weekly farmer's market in Ballard creates additional demand for parking.

Table 5: Fremont Segment Parking Summary

Parking along Route 40					8-10 AM				11-1PM				4-6PM				7-9PM			
Street	Side	From (West/North)	To (East/South)	Restrictions	Capacity	Notes	Veh	Use	Capacity	Notes	Veh	Use	Capacity	Notes	Veh		Capacity	Notes	Veh	Use
Fremont Ave	East	Fremont Place	N 34th Street	4-6PM	4		2	50%	4		4	100%	0		0	0%	4		4	100%
Fremont Ave	West	Fremont Place	N 34th Street	7-9 AM	0		0		6		6	100%	6		4	67%	6		6	100%
Fremont Place	NorthEast	Evanston	35th		7		8	114%	7		7	100%	7		7	100%	7		6	86%
Fremont Place	SouthWest	Evanston	35th		0		0		0		0		0		0		0		0	0%
N 36th Street	North	Dayton	Fremont Pl		1		0	0%	1		1	100%	1		1	100%	1		1	100%
N 36th Street	South	Dayton	Evanston		4		2	50%	4		3	75%	4		3	75%	4		3	75%
N 36th Street	South	Francis	Dayton		6		5	83%	6		8	133%	6		8	133%	6		9	150%
N 36th Street	North	Francis	Dayton		3		1	33%	3		3	100%	3		4	133%	3		4	133%
N 36th Street	South	Phinney	Francis		10		0	0%	10		3	30%	10		1	10%	10		1	10%
N 36th Street	North	Phinney	Francis		4		2	50%	4		4	100%	4		4	100%	4		4	100%
N 36th Street	South	Greenwood	Phinney		7		2	29%	7		5	71%	7		4	57%	7		6	86%
N 36th Street	North	Greenwood	Phinney		6		3	50%	6		4	67%	6		4	67%	6		6	100%
N 36th Street	South	Palatine	Greenwood		10		23	230%	10		12	120%	10		11	110%	10		13	130%
N 36th Street	North	Palatine	Greenwood		7		5	71%	7		6	86%	7		5	71%	7		7	100%
N 36th Street	South	1st NW	Palatine		6		4	67%	6		3	50%	6		4	67%	6		7	117%
N 36th Street	North	1st NW	Palatine		5		0	0%	5		4	80%	5		2	40%	5		8	160%
N 36th Street Leary	South	2nd NW	1st NW		17		15	88%	17		15	88%	17		12	71%	17		11	65%
NW 36th St	South	3rd Ave NW	Leary Way		9		4	44%	8		5	63%	9		3	33%	9		3	33%
NW 36th St	North	3rd Ave NW	Leary Way		11		10	91%	11		11	100%	11		8	73%	11		7	64%
NW 39th	South	Leary Way	2nd Avenue NW		6		2	33%	6		5	83%	6		4	67%	6		5	83%
			Route Summary		123		88		128		109		125		89		129		111	
							72%				**85%**				**71%**				**86%**	
Parking on Side Streets																				
N 36th St	North	Fremont Place	Fremont Ave		10		1	10%	10		9	90%	10		10	100%	10		8	80%
N 36th St	South	Fremont Place	Fremont Ave		11		5	45%	11		8	73%	11		8	73%	11		9	82%
Palatine Ave	East	NW 39th St	NE 36th		18	1 CV	14	78%	18	1 Cycle	15	83%	18		13	72%	18		10	56%
Greenwood Ave	West	NW 39th St	NE 36th		21	1 Cycle	17	81%	21	1 Cycle	19	90%	21		17	81%	21		24	114%
Phinney Av	West	NW 39th St	NE 36th		17		17	100%	17	1 Pod	16	94%	17		25	147%	17		24	141%
Phinney Av	East	NW 39th St	NE 36th		25		9	36%	25		22	88%	25		14	56%	25		15	60%
Greenwood Ave	East	NW 39th St	NE 36th		17		16	94%	17		14	82%	17		16	94%	17		17	100%
Palatine Ave	West	NW 39th St	NE 36th		15	1 CV	12	80%	15		14	93%	15		12	80%	15		13	87%
1st Avenue NW	West	NW 36th	Canal		7		7	100%	7		7	100%	7		5	71%	7		6	86%
1st Avenue NW	East	NW 36th	Canal		9		4	44%	9		7	78%	9		6	67%	9		8	89%
1st Avenue NW	West	NW 39th St	NE 36th		11		11	100%	11		12	109%	11		13	118%	11		13	118%
Bowdoin Pl	North	Leary Way	2nd Avenue NW		7		6	86%	7		8	114%	7		5	71%	7		4	57%
Bowdoin Pl	South	Leary Way	2nd Avenue NW		7		8	114%	7		10	143%	7		8	114%	7		7	100%
			Sidestreets Summary		**175**		**127**		**175**		**161**		**175**		**152**		**175**		**158**	
							73%				**92%**				**87%**				**90%**	
			Fremont Segment Subarea		***298***		***215***		***303***		***270***		***300***		***241***		***304***		***269***	
Source SDOT and Counts Dec 2019							***72%***				***89%***				***80%***				***88%***	

Source: SDOT and Counts Dec. 2019

Notes: Red Number reflect over capacity conditions; CV is commercial vehicle and cycle is motorcycles; Pod was storage pod; CLZ is commercial loading zone

Table 6: Ballard Bridge Segment Parking Summary

Parking Along Route 40					8-10 AM				11-1PM				4-6PM				7-9PM			
Street	Side	From (West/North)	To (East/South)	Restrictions	Capacity	Notes	Veh	Use	Capacity	Notes	Veh	Use	Capacity	Notes	Veh	Use	Capacity	Notes	Veh	Use
Leary Way	South	14th Ave	11th Ave	NP 2AM to 5AM	18		7	39%	18		14	78%	18		11	61%	18		4	22%
Leary Way	South	15th Ave	14th Ave	Load zone 2 Hr 7-6PM	13		6	46%	13		11	85%	13		8	62%	13		5	38%
Leary Way	South	17th Ave	15th Ave	No restrictions	21		15	71%	21		20	95%	21		19	90%	21		17	81%
Leary Way	South	Dock Pl	17th Ave	4 hr 7AM-6PM	16		9	56%	16		14	88%	16		13	81%	16		16	100%
Leary Way	South	Ione Pl	Dock Place	2 hr 7AM-6PM	8		0	0%	8		6	75%	8		7	88%	8		8	100%
Leary Way	North	Ione Pl	Dock Place	2 hr 7AM-6PM	6		3	50%	6	1 delivery	6	100%	6		4	67%	6		5	83%
Leary Way	North	Dock Pl	17th Ave	2 hr 7AM-6PM	11		2	18%	11		8	73%	11		10	91%	11		11	100%
Leary Way	North	17th Ave	15th Ave	4hr prk	13	CLZ	1	8%	13	CLZ	5	38%	13	CLZ	9	69%	13	CLZ	12	92%
Leary Way	North	15th Ave	14th Ave	2 hr 7-6PM	6		1	17%	6	Landscape	4	67%	6	Landscape	2	33%	6		4	67%
Leary Way	North	14th Ave	11th Ave		15		0	0%	15		0	0%	15		1	7%	15		0	0%
				Route Summary	**112**		**44**		**112**		**88**		**112**		**83**		**112**		**82**	
Source: Counts taken December 2019							**39%**				**79%**				**74%**				**73%**	

Source: SDOT and Counts Dec. 2019

Notes: Red Number reflect over capacity conditions; CV is commercial vehicle and cycle is motorcycle; Pod was storage pod; CLZ is commercial loading zone

Table 7: Ballard/Market Segment Parking Summary

Parking along Route 40					8-10 AM				11-1PM				4-6 PM				7-9 PM			
Street	Side	From (West/North)	To (East/South)	Restrictions	Capacity	Notes	Veh	Use	Capacity	Notes	Veh	Use	Capacity	Notes	Veh	Use	Capacity	Notes	Veh	Use
24th Avenue NW	East	Market St	NW 56th St	Paid Parking	6		6	100%	6		6	100%	6		6	100%	6		6	100%
24th Avenue NW	West	Market St	NW 56th St	Paid Parking	1		0	0%	1		1	100%	1		0	0%	1		1	100%
Market St	North	Leary Way	Ballard Ave NW	Paid Parking	4		3	75%	4		4	100%	4		4	100%	4		2	50%
Market St	South	Leary Way	Ballard Ave NW	Paid Parking	2		0	0%	2		1	50%	2		1	50%	2		2	100%
Market St	North	Ballard Ave	24th Ave	Paid Parking	6		3	50%	6		3	50%	6		6	100%	6		6	100%
Market St	South	Ballard Ave	24th Ave	Paid Parking	6		1	17%	6		6	100%	6		5	83%	6		6	100%
Leary Way	North	Market St	Ballard Ave NW	Paid Parking	13		1	8%	13		9	69%	13		1	8%	13		11	85%
Leary Way	South	Market St	Ballard Ave NW	Paid Parking	11		6	55%	11		9	82%	11		10	91%	11		11	100%
				Route Summary	**49**		**20**		**49**		**39**		**49**		**33**		**49**		**45**	
				Percentage Use			**41%**				**80%**				**67%**				**92%**	
Parking on Side Streets					8-10 AM				11-1PM				4-6 PM				7-9 PM			
24th Shilshole	East	Market	NW 54th St		6		4	67%	6		6	100%	6		6	100%	6		6	100%
24th Shilshole	West	Market	NW 54th St	90 degree ADA	17		7	41%	17		10	59%	17		17	100%	17		17	100%
22nd Avenue NW	East	Market St	NW 56th St	Paid Parking	5		1	20%	5		4	80%	5		3	60%	5		4	80%
22nd Avenue NW	West	Market St	NW 56th St	Paid Parking	5		3	60%	5		4	80%	5		5	100%	5		3	60%
Ballard Ave NW	Northeas	Market St	22nd Avenue NW	Paid Parking	14		1	7%	14		5	36%	14		12	86%	14		16	114%
Ballard Ave NW	Southwes	Market St	22nd Avenue NW	Paid Parking	42		9	21%	42		31	74%	42		41	98%	42		42	100%
				Sidestreet Summary	**89**		**25**		**89**		**60**		**89**		**84**		**89**		**88**	
				Percentage Use			**28%**				**67%**				**94%**				**99%**	
				Subarea Summary	***138***		***45***		***138***		***99***		***138***		***117***		***138***		***133***	
Source: Counts taken December 2019				***Percentage Use***			***33%***				***72%***				***85%***				***96%***	

Source: SDOT and Counts Dec. 2019; Notes: Red Number reflect over capacity conditions; CV is commercial vehicle and cycle is motorcycles; Pod was storage pod; CLZ is commercial loading zone

5.0 Ridership Analysis

Route 40 provides important transit connections for Northwest Seattle between Ballard, Fremont, Westlake, South Lake Union, and Denny Triangle. It also connects to the Northgate Transit Center where the future Northgate Link Station will open in 2021. Introduced in 2012, Route 40 currently has an average weekday daily ridership of approximately 13,400, which makes it the third highest ridership route in King County Metro's system. Large investments by the SDOT and King County Metro are being made to address peak-period crowding. Through the Seattle Transportation Benefit District (STBD), SDOT and King County Metro have also invested in all-day service frequency of 15 minutes or better, with peak-period, peak-direction frequencies of five minutes as well as Night Owl service.

Route 40 connects multiple Regional Growth Centers (RGCs), urban villages, and Manufacturing/Industrial Centers (MICs) between the Northgate neighborhood and downtown Seattle. In addition to providing direct service to these centers, the corridor is connected to several other major bus routes, offering transfer opportunities to reach more places of housing, employment, education, and recreation. The corridor hosts an unusually high number of transit-dependent people. Currently, 24% of households within ¼ mile of the route are without access to a personal vehicle and large percentages of people take the bus to work in the Ballard, Fremont, and Crown Hill neighborhoods.

However, bus service is often slow, unreliable, and overcrowded. Peak period travel times are an issue in both directions. Peak vs. off-peak travel times increase 35% inbound AM, 28% outbound AM, 59% outbound PM, and 54% inbound PM. Bus travel time is longer than general purpose traffic by 30% to 40% except for the Westlake and Fremont segments.

This section provides information about ridership along the Route 40 study corridor. Additional information can be found in the Task 3 Existing Conditions Memo.

5.1 Boardings and Alightings

According to Spring 2019 ridership data, transit boarding on the Route 40 is approximately 13,400 people per weekday, as shown in Table 8. Along Route 40, northbound boarding is higher than southbound, and the PM timeslot has the highest boardings of the day, accounting for 36% of total boardings. Figure 12 shows the average number of weekday boardings and alightings (ons and offs, respectively) for northbound stops along the entire Route 40. Figure 13 shows the average weekday boardings and alighting for southbound stops. These figures also depict what percentage of transit users at each stop are boarding or alighting.

Table 8: Route 40 Average Weekday Ridership

Route 40 Boarding	AM (5-9am)	Midday (9-3pm)	PM (3-7pm)	Evening (7-10pm)	Late Night/Owl (10pm-2am)	Total
Total	**2,997**	**3,716**	**4,847**	**1,396**	**421**	**13,378**
Northbound	1,145	1,677	3,150	854	245	7,071
Southbound	1,852	2,039	1,697	542	176	6,307

Source: King County Metro Automated Passenger Counts

In general, southbound stops have a higher percentage of boardings heading downtown and a higher percentage of alightings near downtown Seattle. The stops with the highest boardings and alightings are Fremont Ave N/N 34th St, Westlake Ave N/Mercer St, and Westlake Ave N/Harrison St. Northbound stops have a higher percentage of boardings in downtown Seattle and from Crown Hill to Haller Lake. The remainder of the northbound stops, from Westlake to Loyal Heights, have a higher percentage of alightings. The stops with the highest boardings and alightings are Fremont Ave N/N 34th St, Westlake Ave N/Harrison St, and NW Market St/Ballard Ave NW. This depicts two major patterns of travel for Route 40 transit riders: southbound boarding toward downtown and northbound alighting away from downtown. It also indicates the northern part of the route serves boardings toward North Seattle College and Northgate. Additional details regarding the ridership of stops within the study segments is provided in the next section.

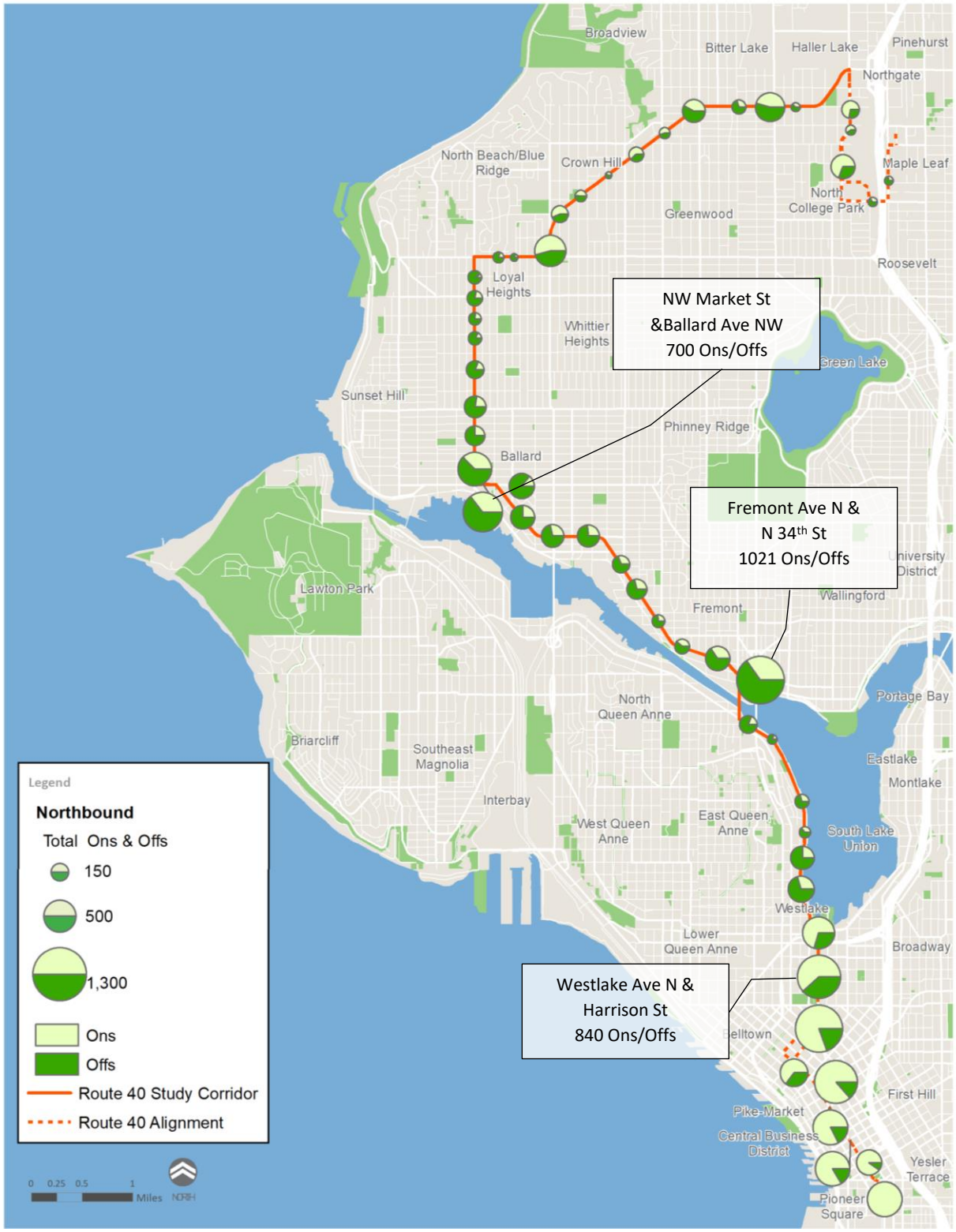


Figure 12: Northbound Daily Average Ons and Offs

Source: King County Metro

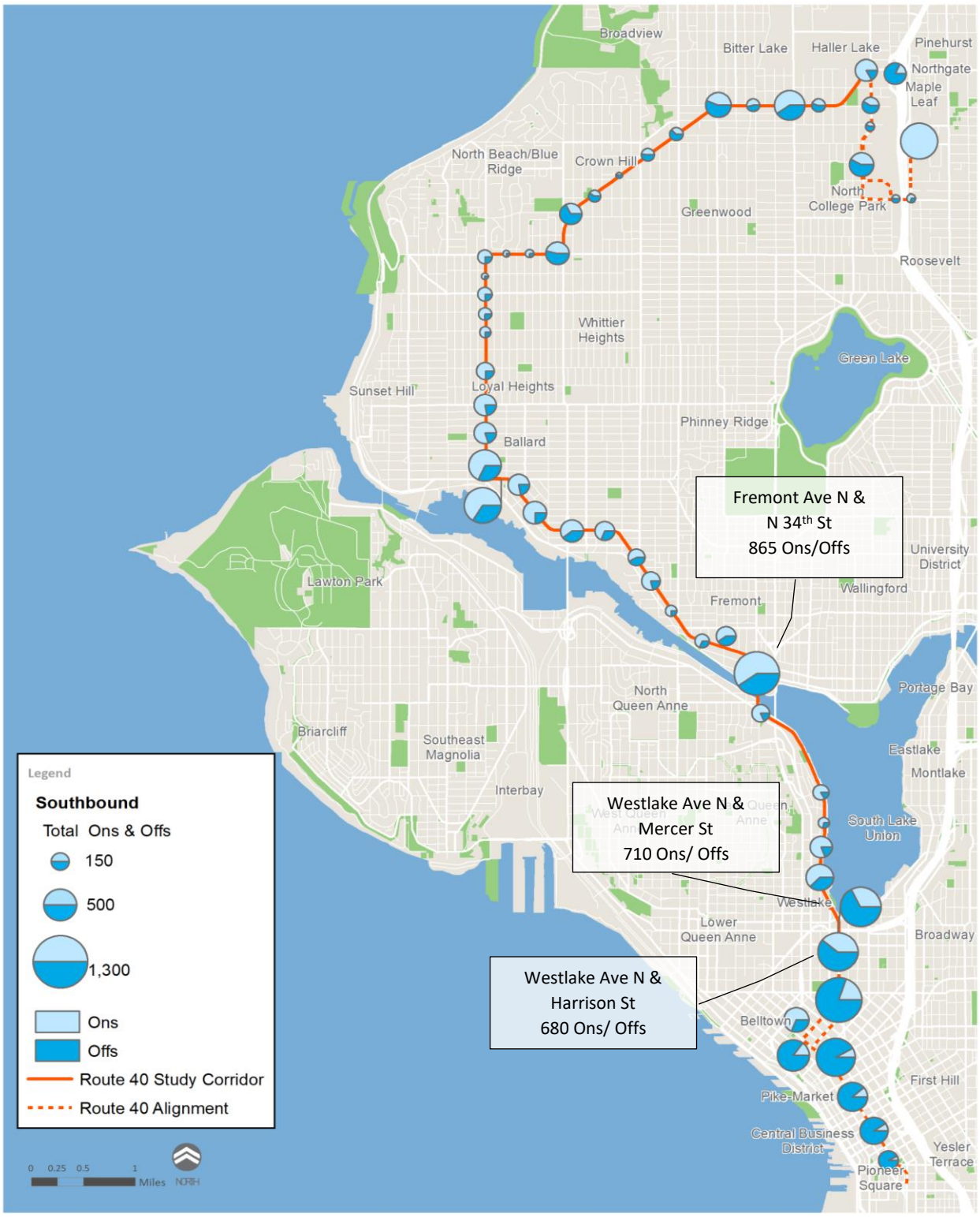


Figure 13: Southbound Daily Average Ons and Offs
Source: King County Metro

5.2 Segment Flow and Capacity

Study segment boardings and alightings account for 29% of total boardings and alightings along Route 40. Within the study segments, southbound boarding is higher than northbound. The Fremont segment has the highest number of boardings and alightings of the study segments. The stop at Fremont Ave N/N 34th St which facilitates transfers to several other routes as well as access to Fremont, has the highest boarding and alightings of the study segment bus stops. The Fremont segment boardings and alightings account for 10% of the Route 40 boardings and alightings.

Table 9: Route 40 Daily Average Boardings and Alightings by Segment

	Northbound		Southbound		
Stop Name & Segment	**Boardings**	**Alightings**	**Boardings**	**Alightings**	**Total**
Westlake					**1,165**
Westlake Ave N/Mercer St	320	480	231	134	
Fremont					**2,788**
Westlake Ave N/Westlake Ave N (Northbound) and Westlake Ave N/Dexter Ave N (Southbound)	27	114	113	26	
Fremont Ave N/N 34th St	355	666	515	350	
N 36th St/Dayton Ave N (Northbound) and N 36th St/Phinney Ave N (Southbound)	93	175	98	66	
NW 36th St/1st Ave NW (Northbound) and N 36th St/1st Ave NW (Southbound)	39	63	60	28	
Ballard Bridge					**944**
NW Leary Way/15th Ave NW	66	165	136	88	
Leary Ave NW/NW Ione Pl	64	190	176	58	
Ballard/Market					**1,765**
NW Market St/Ballard Ave NW	248	452	383	198	
Leary Ave NW/NW Vernon Pl	41	243	155	44	
N 105th St/Greenwood Ave N	123	157	99	135	
Aurora					**777**
N 105th St/Aurora Ave N	238	163	170	203	

Source: King County Metro

Existing capacity of the Route 40 buses was calculated per hour based on the frequency and span of bus service and the capacity of the buses used on the route, including seats and standing room. According to Pantograph data which provides real time data on bus service for Route 40, 93% of buses are 60-feet buses and 7% are 40-feet buses.

Capacity is highest in the AM and PM peak hours. The portion of Route 40 from the Westlake to Crown Hill Neighborhood has double the bus frequency, and capacity, during peak hours as compared to the remainder of the route. See Table 10 for more information on bus capacity.

Table 10: Existing Bus Capacity per Hour

Capacity Per Hour*						
Rt 40 Headways	**AM Peak**	**Midday**	**PM Peak**	**Evening**	**Saturday**	**Sunday**
Northbound to Northgate	562	374	562	374	374	374
Northbound to Crown Hill	562	374	1,124	374	374	374
Southbound from Northgate	562	374	562	374	374	374
Southbound from Crown Hill	1,124	374	562	374	374	374

Source: King County Metro Frequency and Span Data, Pantograph Data

**Based on Pantograph Data: 93% of buses are 60 ft, 7% of buses are 40 ft*

5.3 Weekday Travel Patterns by Time of Day

Figure 14 through Figure 17 further analyze weekday boardings and alightings by time of day for study segment transit stops. Like the patterns along the entire corridor, study segment stops are busiest during the PM time slot from 3 pm to 6 pm. The second most busy time period is midday from 9 am to 3 pm. Smaller amounts of activity are taking place in the evening, through the night, and early in the morning. Three study segment stops have notable morning activity, Westlake Ave N and Mercer St (likely due to commuter alightings in South Lake Union), Fremont Ave N and N 34th St (likely due to strong transfer activity and commuter boardings), and NW Market St and Ballard Ave NW (likely due to commuter boardings destined south). **Error! Reference source not found.**

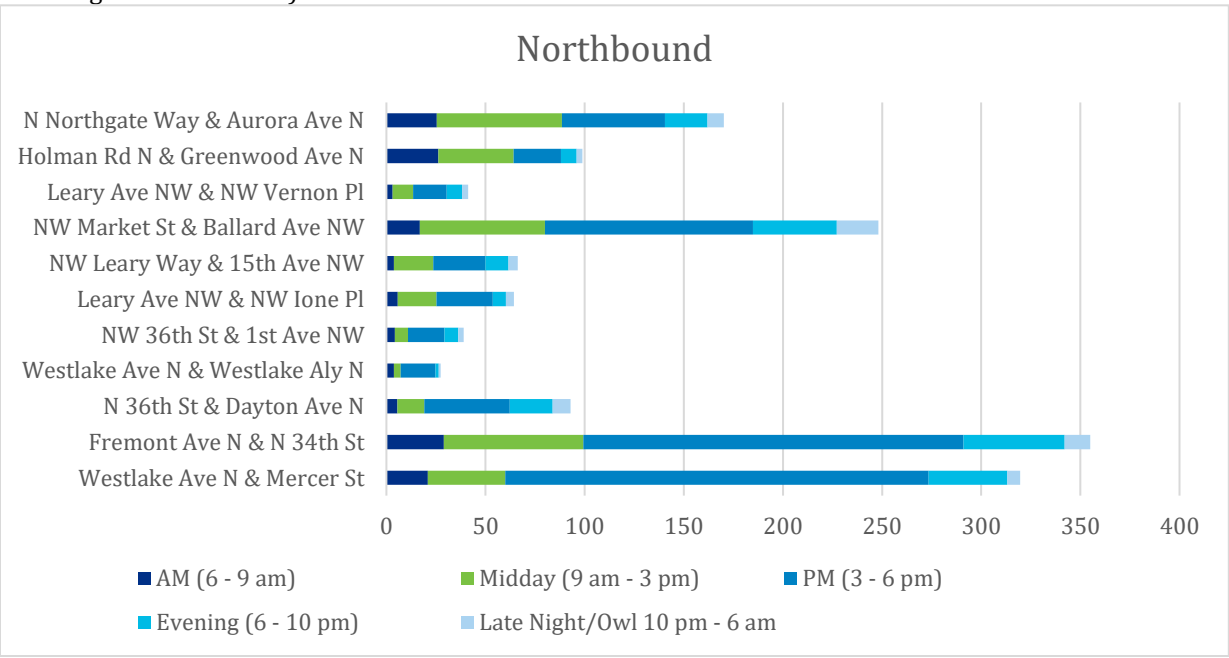


Figure 14: Study Segment Boardings by Stop and Time of Day, Northbound

Source: King County Metro

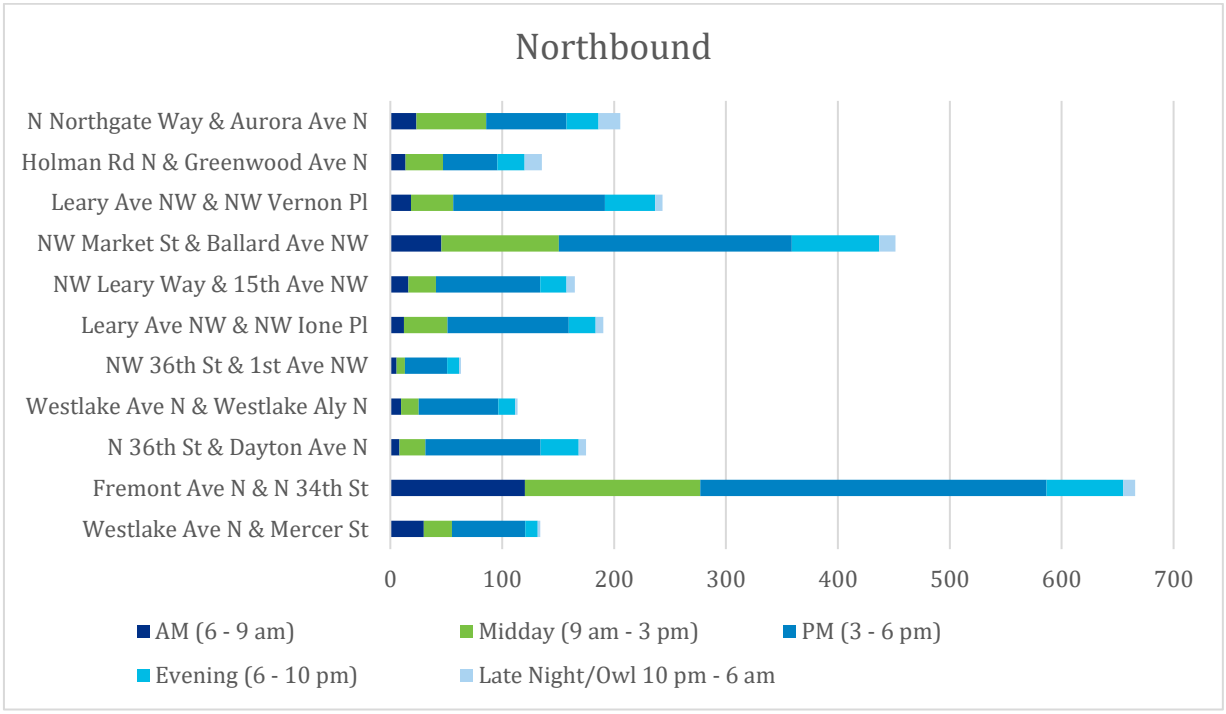


Figure 15: Study Segment Alightings by Stop and Time of Day, Northbound
Source: King County Metro

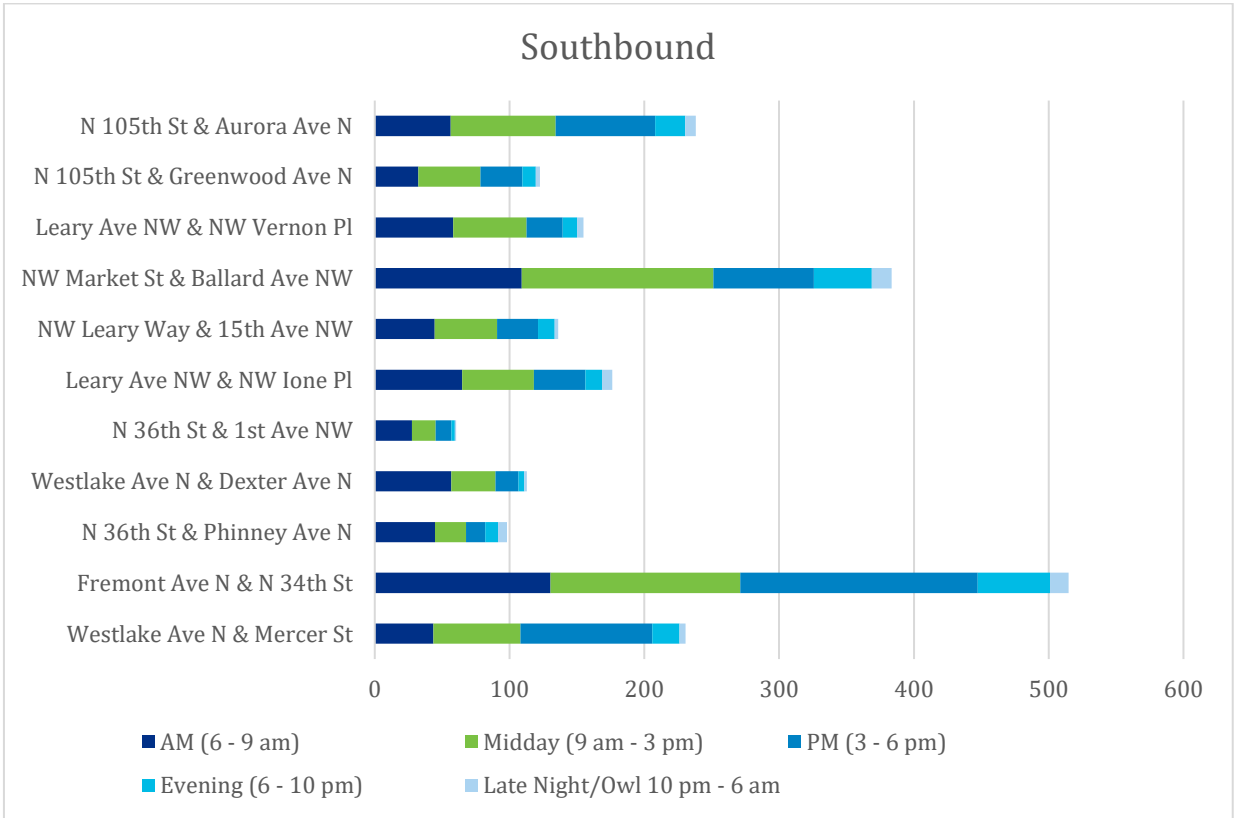


Figure 16: Study Segment Boardings by Stop and Time of Day, Southbound
Source: King County Metro

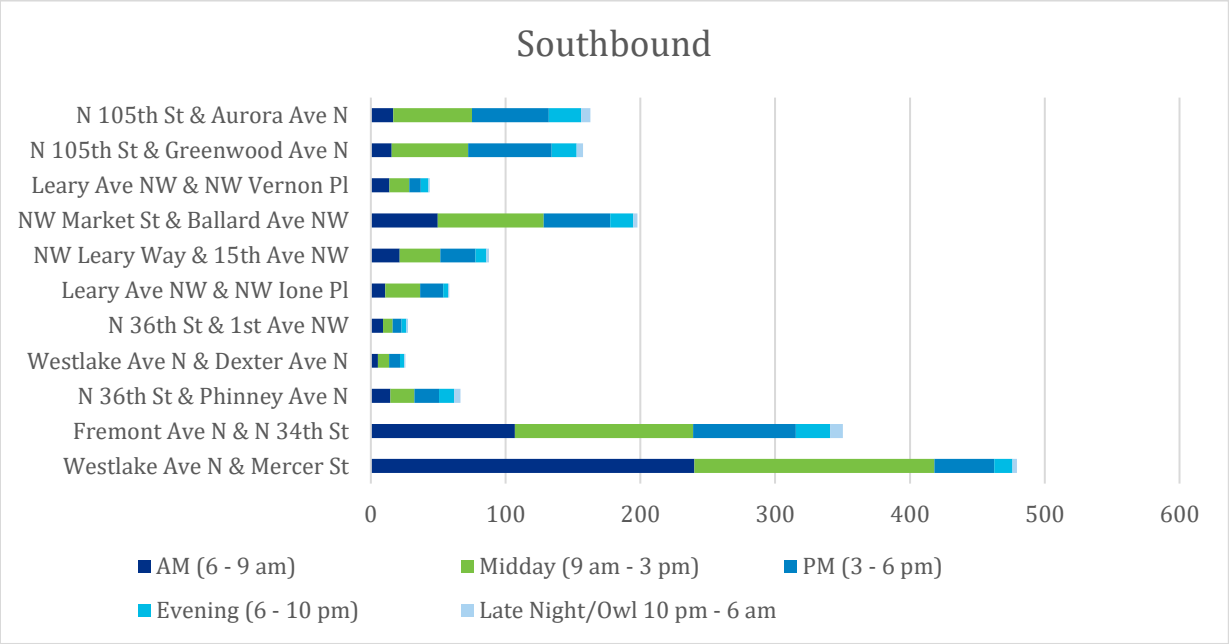


Figure 17: Study Segment Alightings by Stop and Time of Day, Southbound
Source: King County Metro

5.4 Corridor Travel Speeds

Mean commute travel time along the Route 40 corridor is shown in Table 11. In addition to the general traffic times, Route 40 bus travel times and speeds were derived from the King County Metro's Automatic Vehicle Location (AVL) data. The travel speed and travel time between two stops were calculated for each bus traveling on weekdays in April 2019 based on the time stamp at each bus stop, dwell time at each bus stop, and the distance between the two stops. Including dwell time at the stops ensures that end to end corridor travel times reflect passengers' experience. Average travel speeds and travel times for both directions along the study corridor were calculated for five time periods, shown in Table 11. The limits of the northbound and southbound corridors are as follows:

- Northbound: From the Westlake Ave N/Harrison St bus stop (including its dwell time) to the Meridian Ave N/N Northgate Way bus stop (not including its dwell time)
- Southbound: From the N Northgate Way/Meridian Ave N bus stop (including its dwell time) to the Westlake Ave N/Harrison St bus stop (not including its dwell time)

Table 11: Study Corridor Transit Travel Times and Speeds

Direction	Distance (mi)	Travel Speed (mph)	Travel Time (min)	Dwell Time (% of Travel Time)
AM (5 am to 9 am)				
Northbound	9.2	17.2	41.4	17%
Southbound	9.1	15.2	45.0	23%
AM Peak Hour (8 am to 9am)				
Northbound	9.2	16.0	43.5	17%
Southbound	9.1	14.6	49.1	22%

Direction	Distance (mi)	Travel Speed (mph)	Travel Time (min)	Dwell Time (% of Travel Time)
Midday (9 am to 3 pm)				
Northbound	9.2	16.3	44.3	20%
Southbound	9.1	15.8	43.9	23%
PM (3 pm to 7 pm)				
Northbound	9.2	13.7	51.8	21%
Southbound	9.1	15.2	49.0	22%
PM Peak Hour (5 pm to 6 pm)				
Northbound	9.2	13.4	51.6	22%
Southbound	9.1	15.7	46.9	19%
Evening (7 pm to 10 pm)				
Northbound	9.2	16.1	42.0	20%
Southbound	9.1	17.2	40.2	18%
Late Night (10p m to 12 am)				
Northbound	9.2	18.7	36.7	15%
Southbound	9.1	19.2	36.4	13%

Source: King County Metro AVL Data; CDM Smith calculations

The calculated travel speeds and travel times from the AVL data conform to expectations for patterns of bus travel times throughout the day. In the AM period (5 am to 9 am) and AM peak hour (8 am to 9 am), buses travel faster in the northbound direction, while in the PM period (3 pm to 7 pm), PM peak hour (5 pm to 6 pm), and Evening (7 pm to 10 pm) buses travel faster in the southbound direction. Northbound and southbound buses travel at similar speeds during midday (9 am to 3 pm) and late night (10 pm to 12 am).

Figure 18 through Figure 21 show the station to station average speed for the AM and PM peak hour, both northbound and southbound. In general, the data shows that the southbound travel time during the AM periods are greater than the PM periods. Conversely, the northbound travel time during the PM periods are greater than the AM periods. The slowest speeds on the corridor occur downtown, which is outside of the study corridor. Many of the other slowest segments include segments designated for improvements as part of this study including Westlake, Fremont, and Leary Way between 14th Ave/24th Ave. The intersection of Aurora Ave/105th St also experiences slow speeds. Additional information about bus speed and reliability can be found in the Task 3: Existing Conditions Memo as well as the Task 5.7: Speed & Reliability Analysis.

Figure 18: Average Travel Speed – AM Northbound
Source: King County Metro AVL Data; CDM Smith calculations

Figure 19: Average Travel Speed – AM Southbound
Source: King County Metro AVL Data; CDM Smith calculations

Figure 20: Average Travel Speed – PM Northbound
Source: King County Metro AVL Data; CDM Smith calculations

Figure 21: Average Travel Speed – PM Southbound

Source: King County Metro AVL Data; CDM Smith calculation

6.0 Summary of Findings

This section summarizes the findings from this transportation analysis, including issues and needs regarding existing traffic, transit, traffic signals, intelligent transportation systems (ITS), safety, pedestrian/bicycle, and land use conditions. These findings have been used to inform the alternatives analysis developed as part of Task 6: Concept Development, Evaluation, and Selection which provides recommendations for speed and reliability improvements along the corridor. The results of this corridor selection process, including a description of how the traffic modeling results for the Build Alternatives were incorporated into the alternatives analysis are included in the Task 6.3: Corridor Evaluations Report.

6.1 Traffic Analysis Summary

- Current travel times for transit are about 40% longer in the northbound direction and 30% longer in the southbound direction than general traffic travel speeds during both the AM and PM peaks.
- For the AM peak hour (8 am to 9 am), 17% of the travel time is dwell time in the northbound direction and 23% of the travel time is dwell time in the southbound direction. For the PM peak hour (5 pm to 6 pm), 22% of the travel time is dwell time in the northbound direction and 19% of the travel time is dwell time in the southbound direction.
- The Westlake, Fremont, Greenwood, and Aurora segments all contain study intersections that currently operate at LOS E or worse in at least one of the AM or PM peak hours.
- The Westlake, Fremont, Greenwood, and Aurora segments all contain intersections where buses currently travel through long queues in either the AM or PM peak hour.
- The northbound approach of the Fremont Ave N/N 34th St intersection is heavily congested in the Fremont Bridge area during the PM peak hour due to high traffic volumes, high bicycle volumes and resulting conflicts with traffic, and high pedestrian volumes.
- Based on the Synchro and Vissim modeling analysis, it is expected that six intersections along the study corridor would operate at LOS E or worse in at least one of the AM or PM peak hours in 2040 Build conditions. In most cases, these intersections that perform at LOS E or worse under the Build Alternative also perform at LOS E or worse under the No Build Alternative. The two exceptions are the Fremont Ave N/N 35th St intersection in the PM peak hour and the Aurora Ave N/N 105th St intersection in the AM peak hour. For all other intersections, the traffic conditions would stay similar or would not deteriorate significantly in Alternative E compared to No Build conditions.

6.2 Multimodal Analysis and Access Summary

- Sidewalks or trail networks are present along the entire Route 40 study corridor. The corridor is well developed, but some sections have substandard sidewalks. Addressing inadequate sidewalks may require a deviation from Streets Illustrated, as descried in the

Streets Illustrated deviations memo provided to SDOT. For example, bus bulbs in Fremont and Ballard would help improve stop capacity in key areas. These locations will be noted as design progresses.

- The Fremont and Ballard/Market segments are the only study segments that contain study intersections with a crosswalk but no pedestrian signal.
- The southern segments that are closer to downtown Seattle have higher pedestrian counts, while northern segments have lower pedestrian counts. Pedestrian counts are higher in the PM peak period (4 pm to 6 pm) than the AM peak period (7 am to 9 am).
- Segments with notably high pedestrian counts include the Westlake, Fremont, and Ballard/Market segments.
- The Westlake, Fremont, Ballard/Market, and Greenwood segments all contain intersections of importance where bicycle facilities exist on streets perpendicular to the study corridor and must consider bicycle traffic.
- The Westlake and Fremont segments both contain intersections with notably high bicycle volumes.
- The Westlake, Fremont, Ballard Bridge, and Ballard/Market segments all contain intersections with planned bike facilities where bikes will interface with Route 40.

6.3 Parking Summary

- There is increasing competition for curb space in the more urbanized areas of Seattle with increasing demand for vehicle parking, turn lanes, bike lanes, transit lanes, commercial loading, deliveries, and passenger loading. The Westlake segment has no on-street parking that could be repurposed for transit lanes or already restricted to transit during peak hours. This segment also has adjacent local off-street parking that serves South Lake Union Park and adjacent businesses and recreational uses. The Fremont and Ballard/Market segments have high parking demand and limited capacity to reduce or remove parking spaces. There are substantial demands for available curb space in these areas, specifically for parking. The Ballard Bridge segment has some flexibility to modify or adjust parking to accommodate channelization that helps transit. As these areas redevelop parking demands may change. The Greenwood and Aurora segments have smaller impacted areas and very little parking; however, where parking was permitted, it was readily available.

6.4 Ridership Analysis Summary

- Transit boarding on Route 40 is approximately 13,400 people per day. Along Route 40, northbound boarding is higher than southbound, and the PM timeslot has the highest boardings of the day, accounting for 36% of total boardings.
- In general, southbound stops have a higher percentage of boardings, heading downtown and a higher percentage of alightings, near downtown. Northbound stops have a higher

percentage of boarding in downtown and from the North Beach neighborhood to the Haller Lake neighborhood.

- Study segment boardings and alightings account for 29% of total boardings and alightings along Route 40. Within the study segments, southbound boarding is higher than northbound. The Fremont segment has the highest number of boardings and alightings of the segments.
- Capacity is highest in the AM and PM peak hours. The portion of Route 40 from the Westlake to Crown Hill neighborhoods has double the bus frequency, and capacity, during peak hours as compared to the remainder of the route.
- Study segment stops are busiest during the PM time slot from 3 pm to 6 pm. The second most busy time period is midday from 9 am to 3 pm. Smaller amounts of activity are taking place in the evening through the night and early in the morning.
- The slowest speeds on the corridor occur downtown, which is outside of the Route 40 corridor study area. Many of the other slowest segments include segments designated for improvements as part of this study including Westlake, Fremont, and Leary Way between 15th Ave/24th Ave, or Ballard Bridge. The intersection of Aurora Ave/105th St also experiences slow speeds.

Seattle Department of Transportation

MEMORANDUM

From: Elisabeth Wooton, Project Developer & Andrew Natzel, Transportation Operations Lead

To: File

Date: July 26, 2021

Subject: Route 40 Transit Plus Multimodal Corridor
Traffic Analysis Addendum for 30% Design (Refined Alternative)

Introduction

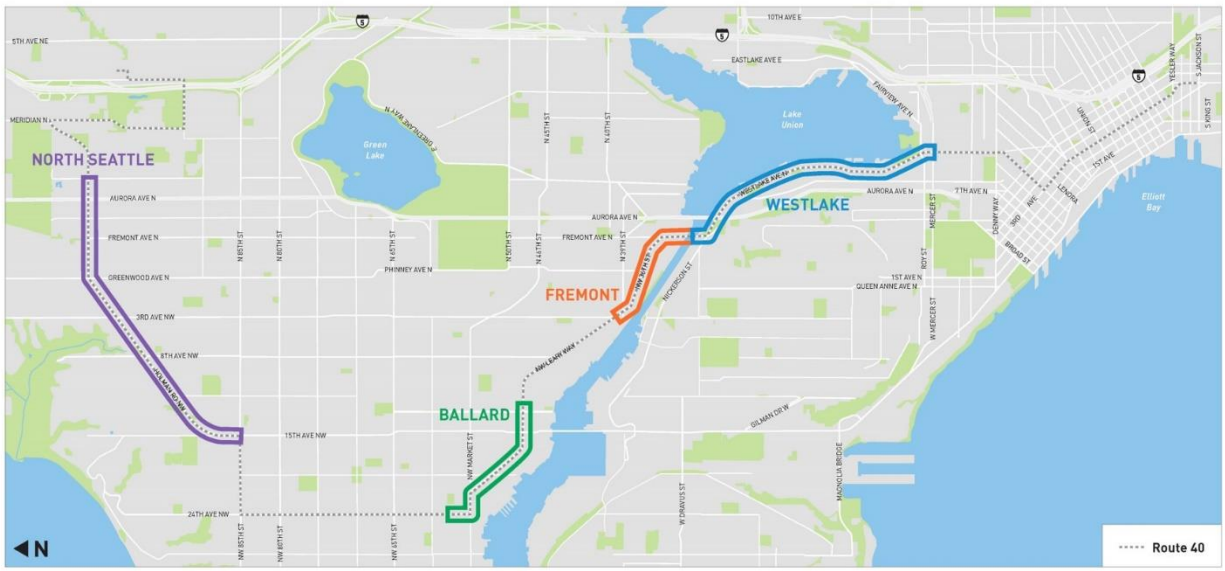
The purpose of this memo is to provide an update to the *Route 40 Transit Improvement Project Task 5.8 - Memorandum on Transportation Analysis Findings* prepared by CDM Smith in January 2021. At that time, roughly 10% design, the project team had chosen to move forward with the Alternative E improvement package. Since then, several modifications have been made to the proposed project to develop the Refined Alternative as included in the 30% design.

The following summarizes the current project scope and provides updated results for the level of service, queue, and travel time savings analyses to reflect the current proposal. Additional data is also provided specific to proposed turning movement changes, segments with proposed bus lanes and/or rechannelizations, and a proposed in-lane stop.

Project Scope

Several design modifications that were advanced in the 30% design (Refined Alternative), compared to the 10% design (Alternative E). More information on the decisions behind these design modifications can be found in the *Route 40 TPMC 30% Design (Refined Alternative) Development Memo*. **Figure 1** shows the four focus areas where improvements are proposed: Westlake, Fremont, Ballard, and North Seattle.

Figure 1. Route 40 TPMC Scope Overview Map



The current project scope, as included in the 30% design and updated traffic analysis, is summarized in **Table 1**.

Table 1. 30% Design (Refined Alternative) Scope Summary

Location	Proposed Scope Included in 30% Design
Westlake Ave N btwn Mercer St & Valley St	- Shorten NB left-turn lane and lengthen SB left-turn lane to increase storage approaching Mercer St
Westlake Ave N at 9th Ave N	- Center lane converted to transit only left turn lane (SB Westlake to Westlake) with one left-turn lane for GP and one thru lane for GP - Modify markings on south leg of 9th Ave to extend bike lane buffer to crosswalk - Signal head modifications and signal phasing changes (minor modification)
Westlake Ave N at Galer St (8th Ave N)	- New cabinet and new controller to support addition of protected NBL turn phasing - Install Accessible Pedestrian Signal (Accessible Pedestrian Signal (APS)) - Reconstruct curb ramps on NW corner
Westlake Ave N btwn SR 99 overpass and 4th Ave N	- Pavement restoration in northbound curbside lane
Westlake Ave N btwn 9th Ave N & 4th Ave N	- Bus only lanes in both directions on Westlake Ave N between 9th Ave N (South Lake Union) and Dexter Ave N (Fremont Bridge) - Queue jump SB at Highland Drive - Signal timing and signal head modification at Galer St - Concrete bus pads at SB bus zones on Westlake Ave N (Dexter Ave N, Crockett St, Blaine St, and 8th Ave N bus stop locations)

Table 1. 30% Design Scope Summary (continued)

Location	Proposed Scope Included in 30% Design
Westlake Ave N at Dexter Ave N/Nickerson St/4th Ave N	- Bicycle facility improvements in the SB direction between Fremont Bridge and Nickerson St with bike - Bike dots in NB lanes directing cyclists toward bike ramp approaching bridge
Fremont Ave N btwn N 34th St & N 35th St	- Sign and signal head modification to restrict NB left-turns from Fremont Ave N to N 34th St all day - Bus lanes in both directions on Fremont Ave N between N 34th St and N 35th St - Extend and split NB bus zone - Install bus stop amenities (pedestrian lighting, RTIS displays, and ORCA reader) - Curb to curb pavement restoration in concrete and corner drainage - Sidewalk spot repair - Reconstruct curb ramps on NW and NE corners at 34th St - New curb, full length - Flexipave in tree pits
Fremont Ave N btwn 35th St & 36th St	- NB protected bike lane on Fremont Ave N between N 35th St and N 36th St (design TBD)
N 35th St at Fremont Ave N	- Install WB transit only left-turn pocket on N 35th St - Remove parking on north curb - Signal timing and signal head modification - Install Accessible Pedestrian Signal (APS) (may require rebuilding curb ramps, up to three corners)
Fremont Pl N at N 35th St (west leg)	- Curb bulb and crosswalk realignment (western segment of 35th St)
N 36th St at Dayton Ave N	- Bus bulb on NW corner for WB bus zone and concrete bus pad - Install bus stop amenities (shelter and pedestrian lighting) - Pedestrian bulb on south side of intersection, connecting across the top of the "T" intersection - Bike racks
N 36th St at Phinney Ave N	- Pedestrian bulbs on NW, NE, and SW corners
N 36th St at 1st Ave N	- Bus bulbs at eastbound bus zone - Install bus stop amenities (shelter and pedestrian lighting) - New signal controller to support Transit Signal Priority (TSP)
N 36th St & Fremont Pl N btwn 2nd Ave N & Fremont Ave N	- SB bus only lane and center turn lane on N 36th St between 1st Ave N and Evanston Ave N - SB bus only lane on Fremont Pl between Evanston Ave N and Fremont Ave N - Install right-turn only (except buses) lane on N 36th St EB approaching 1st Ave - Signal head location modifications WB at Phinney Ave N, Dayton Ave N, 1st Ave N (minor modifications)
Leary Way NW at 8th Ave NW	- New signal controller to support Transit Signal Priority (TSP)

Table 1. 30% Design Scope Summary (continued)

Location	Proposed Scope Included in 30% Design
NW Leary Way at 11th Ave NW	- New signal controller to support Transit Signal Priority (TSP)
NW Leary Way btwn 17th Ave NW and 15th Ave NW	- Channelization modifications on EB approach (4-lane profile) - Install curbside right-turn, except buses, pocket on WB approach - Prohibit EB left at 15th Ave NW - Install signs - Signal timing modifications, signal head modifications, and new loops at 15th Ave - Signal head modifications at 14th Ave NW - New signal controllers at 15th Ave NW to support Transit Signal Priority (TSP) - Install Accessible Pedestrian Signal (APS) at 15th Ave NW - Curb ramp and sidewalk repair on NW and NE corners at 15th Ave NW
NW Leary Way at 14th Ave NW	- Install EB and WB left turn pockets at 14th Ave NW - Signal head modifications at 14th Ave NW - New signal controllers at 14th Ave NW and 15th Ave NW to support Transit Signal Priority (TSP)
Leary Ave NW btwn NW Ione Pl and NW Dock Pl	- Relocate NW Ione Pl bus stops to far side stops at NW Dock Pl - Update parking regs - Construct bus bulbs in both directions - Concrete bus pads in both directions - Construct shorth median islands at both stop locations - Install bus stop amenities (shelter, pedestrian lighting, and RTIS displays) - New signal controller and fiber to support Transit Signal Priority (TSP)
Leary Ave NW btwn 17th Ave NW and 20th Ave NW	- Modify lane configuration (4 to 3 lane rechannelization with center turn lane) - Install right-turn pocket (except buses) on NB approach to 20th Ave - Concrete paving restoration around curve near 17th Ave NW
Leary Ave NW at NW Vernon Pl and 20th Ave NW	- New traffic signal (includes Accessible Pedestrian Signal (APS)) - Small curb bulbs on three corners (NW, SW, and SE) - Large curb bulb on NE corner with driveway access - Relocate southern crosswalk and add crossbike markings - Bike lane markings on minor-leg approaches with bike detection - Median refuge island on Leary Ave and diverter island at south leg of 20th Ave NW to restrict NB 20th Ave NW to right-turn only movements
Leary Ave NW btwn 20th Ave NW and NW Market St (existing midblock crosswalk)	- Median pedestrian refuge island - Curb bulbs on west side of crosswalk - Rectangular Rapid Flashing Beacon (RRFB)
Leary Ave NW btwn 20th Ave NW and NW Market St	- NB bus only lane and center turn lane on Leary Ave btwn 20th Ave NW and NW Market St - Sign restriction of NB right turns from Leary Ave NW to NW Market St

Table 1. 30% Design Scope Summary (continued)

Location	Proposed Scope Included in 30% Design
NW Market St btwn 24th Ave NW and 22nd Ave NW	- Bus lane markings and channelization modifications on Market St between 24th Ave and 22nd Ave NW (no red paint prior to AAC project) - Install right-turn expect buses EB at 24th Ave and WB at 22nd Ave - Install signs to restrict EB and WB left turns at 22nd Ave NW - Extension of bus zones and bus bulbs in both directions to accommodate three coaches with clear landings at door areas - Relocation of utilities - Install bus stop amenities at EB bus zone (shelter, pedestrian lighting, RTIS displays, and ORCA reader) - Extend concrete bus pads to match extended bus zones in curbside lanes - Asphalt overlay in center lanes
24th Ave NW between NW Market St and NW 56th St	- Marking adjustments (center line, stop bar, and symbols) on 24th Ave NW to improve WB to NB right-turns for bus and other heavy vehicle movements - Adjust signal (video) detection location in SB left-turn lane on 24th Ave NW approaching NW Market St
NW 85th St between 16th Ave and 15th Ave	- Channelization modification on EB approach, shift center line slightly north to improve lane utilization - New signal controller at 15th Ave to support Transit Signal Priority (TSP)
Holman Rd NW at 15th Ave NW	- New signal controller to support Transit Signal Priority (TSP)
Holman Rd NW/NW 92nd St at 13th Ave NW	- New signal controller to support Transit Signal Priority (TSP)
Holman Rd NW btwn 3rd Ave NW and N 104th St	- NB bus lane in curbside lane between bus zone north of 3rd Ave NW and NW 104th St - Remove two-way center turn lane in this segment - Install signs to enforce a full-time left-turn restriction
N 105th St at Dayton Ave N	- New signal controller to support Transit Signal Priority (TSP)
N 105th St at Fremont Ave N	- New signal controller to support Transit Signal Priority (TSP)
N 105th St at Aurora Ave N (SR 99)	- Relocate EB bus stop flag to driveway (approximately an additional 75') - Construct landing area at door locations - Install bus stop amenities (shelter, pedestrian light, and RTIS display) - New signal controller to support Transit Signal Priority (TSP)
Meridian Ave N at N Northgate Way	- New signal controller to support Transit Signal Priority (TSP)

Updated Traffic Analysis

For the previous traffic analysis, CDM Smith used a combination of Synchro and Vissum (Fremont area) modeling software. However, only Synchro was used for the updated traffic analysis to develop the level of service, queue analysis, and transit travel time savings results included in this memo.

Level of Service

Table 2 summarizes the intersection operation results at the study intersections for the No Build and the Build (Refined Alternative) scenario for non-transit traffic. Both scenarios are based on forecasted traffic

volumes for the year 2040. The highlighted cells indicate where the LOS changed by at least one letter grade worse. More information on analysis methodology and assumptions can be found in CDM Smith's *Task 5.1 Traffic Analysis Methods and Assumptions Memo* (Dec 2020). Synchro outputs provided in **Attachment A**.

Table 2. Level of Service Results by Study Intersection

Intersection	Control Type	2040 No Build				2040 Build (Refined Alternative)			
		AM Peak		PM Peak		AM Peak		PM Peak	
		Delay (sec)	*LOS*	*Delay (sec)*	*LOS*	*Delay (sec)*	*LOS*	*Delay (sec)*	*LOS*
Westlake Ave N & Republican St	Signalized	17.1	B	13.8	B	17.1	B	13.8	B
Westlake Ave N & Mercer St	Signalized	287.0	F	101.5	F	287.0	F	101.5	F
Westlake Ave N & Valley St	Signalized	35.7	D	39.1	D	35.7	D	39.1	D
Westlake Ave N & 9th Ave N	Signalized	10.5	B	16.1	B	11.5	B	14.1	B
Westlake Ave N/Nickerson St & 4th Ave N/Dexter Ave N	Signalized	49.6	D	52.1	D	49.7	D	58.2	E
Fremont Ave N & N 34th St	Signalized	27.9	C	78.0	E	29.8	C	73.3	E
Fremont Ave N & N 35th St	Signalized	20.4	C	29.6	C	21.9	C	38.3	C
Fremont Pl N/N 36th St & Evanston Ave N	Signalized	15.2	B	21.6	C	42.6	D	24.0	C
N 36th St & Dayton Ave N	Signalized	1.6	A	2.5	A	4.9	A	3.8	A
N 36th St & Phinney Ave N	Signalized	7.3	A	10.0	B	8.4	A	28.9	C
NW 36th St & 1st Ave NW	Signalized	5.0	A	8.6	A	11.2	B	14.7	B
Leary Way NW & NW 39th St	Signalized	16.2	B	41.1	D	19.3	B	40.6	D
NW Leary Way & 14th Ave NW	Signalized	12.9	B	10.3	B	15.2	B	17.1	B
NW Leary Way & 15th Ave NW NB	Signalized	15.4	B	28.2	C	15.4	B	25.6	C
NW Leary Way& 15th Ave NW SB	Signalized	10.3	B	14.1	B	17.6	B	16.7	B
Leary Ave NW & 20th Ave NW	No Build: All-Way Stop Control Build: Signalized	10.3	B	24.0	C	10.5	B	12.3	B
NW Leary Way/22nd Ave NW & NW Market St	Signalized	32.6	C	37.6	D	32.3	C	38.1	D
NW Market St & 24th Ave NW	Signalized	34.4	C	40.5	D	34.3	C	40.6	D
NW 85th St & 15th Ave NW	Signalized	54.1	D	73.8	E	51.9	D	69.7	E
Holman Rd/N 105th & Greenwood Ave N	Signalized	69.8	E	270.5	F	69.8	E	270.5	F
N 105th St/Northgate Way & Aurora Ave N (SR 99)	Signalized	49.5	D	58.4	E	49.5	D	58.4	E

In the 2040 No Build scenario, the following five intersections are anticipated to operate at LOS E or worse in either or both the AM and/or PM peak hours:

- Westlake Avenue N / Mercer Street (AM and PM peak hours)
- Fremont Avenue N / N 34th Street (PM peak hour only)
- NW 85th Street / 15th Avenue NW (PM peak hour only)
- Holman Road N / N 105th Street / Greenwood Avenue N (AM and PM peak hours)

- N 105th Street / N Northgate Way / Aurora Ave N (PM peak hour only)

In the 2040 Build scenario (Refined Alternative), the five intersections listed above and the following additional intersection, is anticipated to operate at LOS E or worse in either or both the AM and/or PM peak hour as a result of the proposed project:

- Westlake Avenue N / Nickerson Street / 4th Avenue N / Dexter Avenue N (PM peak hour only)

In addition, level of service is expected to decrease by at least one letter grade as a result of the proposed project at the following three intersections in Fremont:

- Fremont Place N / N 36th Street / Evanston Ave N (AM peak hour only)
- N 36th Street / Phinney Avenue N (PM peak hour only)
- NW 36th Street / 1st Avenue NW (AM and PM peak hours)

While the project is expected to create additional delay at these intersections in Fremont, the intersection level of service is expected to operate at LOS D or better at all times of the day.

To better understand the anticipated impacts to non-transit traffic on the major arterials, **Table 3** shows the level of service results by approach at the four intersections expected to experience increased delay as a result of the project. The highlighted cells indicate increased delay on the arterial street in the 2040 Build Scenario.

Table 3. Level of Service Results by Approach for Non-Transit Traffic

Focus Area	Intersection	Control Type	Direction	2040 No Build				2040 Build (Refined Alternative)			
				AM Peak		PM Peak		AM Peak		PM Peak	
				Delay (sec)	*LOS*	*Delay (sec)*	*LOS*	*Delay (sec)*	*LOS*	*Delay (sec)*	*LOS*
Westlake	Westlake Ave N/Nickerson St & 4th Ave N/Dexter Ave	Signalized	EB	50.0	D	74.6	E	50.0	D	74.5	E
			WB	30.4	C	36.3	D	31.3	C	53.4	D
			NB	56.2	E	47.3	D	55.8	E	46.6	D
			SB	55.4	E	46.0	D	55.4	E	46.0	D
			Total	**49.6**	**D**	**52.1**	**D**	**49.7**	**D**	**58.2**	**E**
Fremont	Fremont Pl N/N 36th St & Evanston Ave N	Signalized	EB	14.2	B	17.3	B	51.0	D	21.9	C
			WB	12.4	B	16.1	B	26.0	C	15.8	B
			NB	22.8	C	34.8	C	28.2	C	39.6	D
			SWB	33.3	C	40.3	D	36.7	D	45.3	D
			Total	**15.2**	**B**	**21.6**	**C**	**42.6**	**D**	**24.0**	**C**
Fremont	N 36th St & Phinney Ave N	Signalized	EB	5.9	A	6.3	A	6.3	A	7.4	A
			WB	4.0	A	4.5	A	5.9	A	29.2	C
			NB	27.6	C	42.4	D	32.7	C	80.3	F
			SB	29.2	C	31.7	C	34.2	C	36.1	D
			Total	**7.3**	**A**	**10.0**	**B**	**8.4**	**A**	**28.9**	**C**
Fremont	NW 36th St & 1st Ave NW	Signalized	EB	4.8	A	4.4	A	12.6	B	9.6	A
			WB	3.1	A	9.4	A	2.9	A	7.7	A
			NB	19.7	B	16.2	B	33.5	C	64.9	E
			SB	19.5	B	13.7	B	33.0	C	37.1	D
			Total	**5.0**	**A**	**8.6**	**A**	**11.2**	**B**	**14.7**	**B**

The analysis expected impacts to arterial traffic are summarized below:

- Westlake Avenue N / Nickerson Street / 4th Avenue N / Dexter Avenue N: For non-transit westbound traffic, delay is expected to increase on Westlake Avenue N approaching 4th Avenue N (Fremont Bridge) in the PM peak hour by approximately 17 seconds

- Fremont Place N / N 36th Street / Evanston Ave N: For non-transit eastbound traffic, delay is expected to increase on N 36th Street approaching Evanston Ave N in the AM peak hour by approximately 37 seconds
- N 36th Street / Phinney Avenue N: For all westbound traffic, delay is expected to increase on N 36th Street approaching Phinney Ave N (westbound) in the AM peak hour by approximately 25 seconds
- NW 36th Street / 1st Avenue NW: For non-transit eastbound traffic, delay is expected to increase on NW 36th Street approaching 1st Ave NW in the AM peak hour by approximately 8 seconds

While additional delays are anticipated at these intersections, the arterial approaches impacted by the proposed project all remain within acceptable levels of operation (LOS D or better). As the project moves into design, design and/or operations modifications may be identified to reduce impacts to non-transit traffic.

Queues

Synchro was used to analyze and report queue lengths at each of the study intersections in both the AM and PM peak hour. **Table 4** shows the average queue length (50th percentile queue) by movement in both the 2040 No Build and 2040 Build (Refined Alternative) scenarios. The table also shows the difference between the two scenarios to indicate if the queue length is expected to increase, decrease, or remain the same as a result of the proposed project. The highlighted cells indicate where the average queue length is expected to increase in the 2040 Build scenario by 200-feet or greater. The results reported below are for non-transit traffic and do not reflect the reduced queue lengths for transit where there are proposed bus lanes.

Table 4. Average Queue Lengths by Intersection Movement

Intersection	Lane/Movement (Street)	50th Percentile Queue Length (ft)					
		No Build (2040)		Build (2040)		Change in AM Peak Queue Length (ft)	Change in PM Peak Queue Length (ft)
		AM Peak	PM Peak	AM Peak	PM Peak		
Westlake Ave N & 9th Ave N	WBR (Westlake)	30	80	30	60	0	-20
	NBT (9th Ave)	30	50	0	10	-30	-40
	SBL (Westlake)	60	70	130	110	70	40
	SBT (Westlake)	50	50	0	0	-50	-50
Westlake Ave N/Nickerson St & 4th Ave N/Dexter Ave	EBL (Nickerson)	220	330	220	330	0	0
	EBT (Nickerson)	480	150	480	150	0	0
	WBT (Westlake)	170	370	170	370	0	0
	WBR (Westlake)	60	250	110	630	50	380
	NBL (4th Ave)	160	130	160	130	0	0
	NBT (4th Ave)	40	110	10	70	-30	-40
	SBL (Dexter Ave)	340	110	340	110	0	0
	SBT (Dexter Ave)	170	130	170	130	0	0
Fremont Ave N & N 34th St	WBL (34th St)	120	200	130	220	10	20
	WBT (34th St)	40	70	40	90	0	20
	NBT (Fremont Ave)	70	310	60	310	-10	0
	NBR (Fremont Ave)	0	130	10	0	10	-130
	SBT (Fremont Ave)	160	150	230	310	70	160

Table 4. Average Queue Lengths by Intersection Movement (continued)

Intersection	Lane/Movement (Street)	50th Percentile Queue Length (ft)					
		No Build (2040)		Build (2040)		Change in AM Peak Queue Length (ft)	Change in PM Peak Queue Length (ft)
		AM Peak	PM Peak	AM Peak	PM Peak		
Fremont Ave N & N 35th St	EBT (Fremont Pl)	30	210	130	220	100	10
	EBR (Fremont Pl)	20	30	10	50	-10	20
	WBT (35th Ave)	70	180	60	170	-10	-10
	NBL (Fremont Ave)	90	80	70	130	-20	50
	NBT (Fremont Ave)	90	90	70	130	-20	40
	NBR (Fremont Ave)	10	0	0	0	-10	0
	SBL (Fremont Ave)	30	20	40	20	10	0
	SBT (Fremont Ave)	110	140	40	60	-70	-80
Fremont Pl N & N 36th St & Evanston Ave N	EBL (36th St)	50	60	50	0	0	-60
	EBT (36th St)	90	110	670	190	580	80
	WBL (36th St)	40	80	70	100	30	20
	WBT (36th St)	20	90	40	90	20	0
	NBL (Evanston)	10	110	10	130	0	20
	SWBR (Evanston)	0	0	0	10	0	10
N 36th St & Dayton Ave N	EBT (36th St)	20	90	50	150	30	60
	WBT (36th St)	10	60	20	60	10	0
	SBL (Dayton)	10	20	0	20	-10	0
N 36th St & Phinney Ave N	EBT (36th St)	170	40	20	280	-150	240
	WBT (36th St)	30	90	130	990	100	900
	NBT (Phinney)	20	110	20	140	0	30
	NBR (Phinney)	0	0	0	0	0	0
	SBT (Phinney)	40	10	40	10	0	0
NW 36th St & 1st Ave NW	EBT (36th St)	80	40	570	160	490	120
	WBT (36th St)	20	170	40	260	20	90
	NBT (1st Ave)	10	50	10	140	0	90
	SBT (1st Ave)	10	0	10	10	0	10
NW Leary Way & 14th Ave NW	EBT (Leary)	50	40	50	70	0	30
	WBT (Leary)	50	80	80	180	30	100
	NBL (14th Ave)	30	30	30	50	0	20
	NBT (14th Ave)	20	30	20	60	0	30
	SBL (14th Ave)	80	30	80	60	0	30
	SBT (14th Ave)	40	30	40	40	0	10
NW Leary Way & 15th Ave NW NB	EBT (Leary)	10	20	20	20	10	0
	WBT (Leary)	140	310	120	270	-20	-40
	NBL (15th Ave)	90	250	100	260	10	10
	NBT (15th Ave)	80	250	50	190	-30	-60
NW Leary Way & 15th Ave NW SB	EBT (Leary)	60	70	90	90	30	20
	WBL (Leary)	N/A	N/A	140	190	N/A	N/A
	WBT (Leary)	10	50	10	10	0	-40
	SBL (15th Ave)	60	110	70	110	10	0
	SBT (15th Ave(	50	100	60	100	10	0
Leary Ave NW & 20th Ave NW/Vernon Pl	NEBT (Vernon)	N/A	N/A	10	40	N/A	N/A
	SBT (20th Ave)	N/A	N/A	60	80	N/A	N/A
	SEBL (Leary)	N/A	N/A	0	0	N/A	N/A
	SEBT (Leary)	N/A	N/A	60	30	N/A	N/A
	NWBL (Leary)	N/A	N/A	40	140	N/A	N/A
	NWBT (Leary)	N/A	N/A	0	30	N/A	N/A
NW Market St & 22nd Ave NW & Leary Ave NW	EBT (Market)	100	110	100	130	0	20
	WBT (Market)	50	140	80	210	30	70
	NBT (22nd Ave)	20	130	20	130	0	0
	SBT (22nd Ave)	140	90	150	90	10	0
	NWBL (Leary Ave)	30	190	50	270	20	80

Table 4. Average Queue Lengths by Intersection Movement (continued)

Intersection	Lane/Movement (Street)	50th Percentile Queue Length (ft)					
		No Build (2040)		Build (2040)		Change in AM Peak Queue Length (ft)	Change in PM Peak Queue Length (ft)
		AM Peak	PM Peak	AM Peak	PM Peak		
NW Market St & 24th Ave NW	EBL (Market)	20	80	20	80	0	0
	EBT (Market)	140	130	140	120	0	-10
	WBL (Market)	30	60	30	60	0	0
	WBT (Market)	120	280	110	270	-10	-10
	WBR (Market)	0	40	0	40	0	0
	NBL (24th Ave)	90	210	90	210	0	0
	NBT (24th Ave)	60	240	60	240	0	0
	SBL (24th Ave)	70	110	70	110	0	0
	SBT (24th Ave)	330	190	330	190	0	0
	SBR (24th Ave)	0	0	0	0	0	0
NW 85th St & 15th Ave NW	EBT (85th St)	230	250	220	240	-10	-10
	WBT (85th St)	190	300	190	290	0	-10
	NBL (15th Ave)	40	90	40	90	0	0
	NBT (15th Ave)	200	580	200	550	0	-30
	SBL (15th Ave)	90	110	90	110	0	0
	SBT (15th Ave)	500	490	490	480	-10	-10
	SBR (15th Ave)	20	30	20	30	0	0
Holman Rd/N 105th & Greenwood Ave N	WBL (105th St)	390	1,120	390	1,120	0	0
	WBT (105th St)	370	1,030	370	1,030	0	0
	NBL (Greenwood)	40	190	40	190	0	0
	NBT (Greenwood)	90	350	90	350	0	0
	SBL (Greenwood)	70	60	70	60	0	0
	SBT (Greenwood)	260	690	260	690	0	0
	SBR (Greenwood)	550	530	550	530	0	0
	NEBL (Holman)	410	1,710	410	1,710	0	0
	NEBR (Holman)	250	1,560	250	1,560	0	0

The Synchro results indicate a significant increase in queue length, defined here as 200-feet or greater, for one or more movements at the following four intersections:

- Westlake Avenue N / Nickerson Street / 4th Avenue N / Dexter Avenue N: Increased queues for the right turn movement from Westlake Avenue N onto 4th Avenue N approaching the Fremont Bridge in the PM peak hour
- Fremont Place N / N 36th Street / Evanston Ave N: Increased queues for the eastbound through movement on Fremont Place N at Evanston Ave N in the AM peak hour
- N 36th Street / Phinney Avenue N: Increased delay for eastbound and westbound through traffic on N 36th Street in the PM peak hour
- NW 36th Street / 1st Avenue NW: Increased queues for the eastbound through movement on N 36th Street at 1st Ave N in the AM peak hour

These results are consistent with the level of service results which report increased delays at each of these intersections as a result of the project. As the project moves into design, design and/or operations modifications may be identified to reduce impacts to non-transit traffic.

Transit Travel Time Savings

A combination of methods was used to calculate the anticipated transit travel time savings within the Route 40 TPMC study segments including:

- Industry standard: Bus boarding bulbs, transit signal priority upgrades, and bus zone extensions
- Synchro analysis: Intersection operations change (markings change, turn restrictions, signal modification)
- Comparison to off-peak: Bus lanes

Table 5 summarizes the calculated transit travel time savings that are expected to be realized as a result of the proposed project. The transit travel times represent an average of the AM and PM peak hours and of travel direction. More detail on the calculations is provided in **Attachment B**.

Table 5. Estimated Transit Travel Time Savings by Study Segment

Focus Area Segment	Length of Segment (miles)	No Build Transit Travel Time (mins)	Build Transit Travel Time (mins)	Transit Travel Time Reduction (mins)	Percent Change
Westlake	3.5	24.5	22.2	2.3	9.4%
Fremont	1.7	8.2	7.1	1.2	14.3%
Ballard	1.6	10.0	8.8	1.2	12.1%
North Seattle	6.0	28.2	27.3	1.0	3.4%
Total Study Segments	12.8	71.0	65.3	5.7	8.0%

Overall, the project is expected to reduce transit travel times within the study segments by 5.7 minutes on average. The estimated reduction represents an 8% reduction in average transit travel time where improvements are proposed.

Additional Data

The following additional data was used to better understand potential non-transit impacts and inform design refinement decisions. All the data included here was collected prior to COVID-19.

Truck Turning Movements

All truck movements that may be impacted by the proposed changes, including curb modifications, marking modifications, and turn restrictions, were identified. For each location, turning movement and classification counts were analyzed to understand the existing freight use and help determine the appropriate design vehicle. In the case of turn restrictions, the most likely detour route was also identified although there may be additional alternative routes that trucks may choose to use. This data is summarized in the **Table 6** below. Raw turning movement count and classification data is included in **Attachment C**.

Table 6. Truck Volume Data for Movements with Proposed Modifications

Movement	Proposed Change	Truck Street Designation	Peak Hour Total Volume	Peak Hour Truck Volume *Total (Articulated)*	All Day (7A-7P) Truck Volume *Total (Articulated)*	Recommended Design Vehicle
Westlake Ave at 9th Ave						
SB Left	Channelization	Major to Major	569	14 (0)	182 (36)	WB-67
SB Thru	Channelization	Major to Major	915	13 (3)	135 (14)	N/A
Fremont Ave at 34th St						
NB Left	Prohibited	Major to None	44	0 (0)	11 (1)	N/A
Fremont Ave at 35th St						
WB Thru	Channelization	Minor to Major	125	10 (2)	20 (2)	N/A
WB Right	Channelization	Minor to None	20	3 (0)	13 (1)	SU-30
NB Right	Channelization	Major to Minor	73	1 (0)	20 (2)	SU-40
Fremont Pl at Evanston Ave						
WB Left	Detour	Major to None	45	4 (0)	*not available*	SU-40
36th Street at Dayton Ave						
WB Right	Channelization	Major to None	14	0 (0)	4 (0)	SU-30
36th St at Phinney Ave						
WB Right	Channelization	Major to None	9	0 (0)	8 (0)	SU-30
EB Right	Channelization	Major to None	80	0 (1)	12 (1)	SU-40
Leary Way at 14th Ave						
EB Left	Detour	Major to None	27	3 *(n/a)*	*not available*	WB-67
WB Left	Channelization	Major to None	23	1 *(n/a)*	*not available*	WB-67
EB Right	Channelization	Major to None	24	1 *(n/a)*	*not available*	WB-67
WB Right	Channelization	Major to None	76	5 *(n/a)*	*not available*	WB-67
Leary Way at 15th Ave						
EB Left	Prohibited	Major to Major	30	3 (2)	22 (6)	N/A
EB Right	Channelization	Major to Major	270	5 (0)	50 (9)	WB-67
WB Left	Channelization	Major to Major	317	15 (1)	159 (37)	WB-67
WB Right	Channelization	Major to Major	91	4 (1)	23 (4)	WB-67
Leary Ave at 20th Ave						
NB Left	Prohibited	None to Major	5	0 (0)	0 (0)	N/A
NB Thru	Prohibited	None to None	14	0 (0)	4(1)	N/A
NWB Right	Detour	Major to None	97	3 (0)	15 (0)	SU-40
Leary Ave at Market St						
NWB Right	Prohibited	Major to Major	24	1 *(n/a)*	*not available*	N/A

As the project moves into design, AutoTurn will be used to ensure that truck movements at these locations using the identified design vehicle are adequately accommodated according to Streets Illustrated standards.

Volume Data for Proposed Bus Lane/Lane Reduction Segments

Traffic and transit data was collected for each of the segments where the Route 40 TPMC project proposes to lane reduction, either to install bus lanes or implement rechannelization (4 lane-to-3 lane). The data was pulled from multiple sources including SDOT traffic counts, a recent UW study of commercial vehicle patterns, and King County Metro (Fall 2019). Average daily traffic count data is provided in **Attachment D**.

Data is reported for each segment by direction in **Table 7**. The traffic data represents the average weekday volumes for all traffic and commercial vehicles. The transit data includes the number of buses served by the stops/segment, average weekday passenger load, average number boarding and alightings per stop, and average dwell time per stop.

All but one of the segments with proposed lane reductions are below SDOT's 25,000 average weekday traffic (AWDT) threshold for considering rechannelization. The Holman Rd NW segment is above this threshold; however, no GP capacity reduction is proposed on this segment since the existing center left turn lane would be repurposed.

Table 7. Summary of Traffic Volume Data for Proposed Bus Lane/Lane Rechannelization Segments

Location	Proposal	Average Weekday Traffic (AWDT)	Average Weekday Ridership on Segment *(# of bus routes pre-COVID)*	Daily Commercial Vehicle (CV) Volume*	Average Boardings & Alightings per Stop *(average dwell time in secs)*
Westlake Ave *9th Ave to 4th Ave*	Bus Lanes	24,375	8,985 *(1)*	894	154 *(6.1)*
Fremont Ave *34th St to 35th St*	Bus Lanes	18,084	16,615 *(4)*	708 *(estimated)*	1885 *(34.5)*
36th St/Fremont Pl *Fremont Ave to 1st Ave*	SEB Bus Lane & Center Turn Lane	20,023	7,905 *(1)*	*not available*	167 *(10.5)*
Leary Ave *17th Ave to 20th Ave*	4-to-3 Lane Reduction	9,651	7,652 *(5)*	303	268 *(12)*
Leary Ave *20th Ave to Market St*	NWB Bus Lane & Center Turn Lane	9,651	7,652 *(5)*	303	279 *(10.5)*
Market St *22nd Ave to 24th Ave*	Bus Lanes	10,340	8,339 *(5)*	547	1289 *(27)*
Holman Rd *3rd Ave to 104th St*	NB Bus Lane (conversion of center turn lane)	16,501 (NB only)	946 *(1)*	*not available*	141 *(12)*

*CV includes lighter freight vehicles (vans, step vans, and pick-ups) which make up roughly 60% of the CV traffic in the Ballard/Interbay area. Source: http://depts.washington.edu/sctlctr/sites/default/files/SCTL_Task-Order-8-Ballard-Cordon-Data.pdf

In-Lane Stop

The Route 40 TPMC project is proposing one new in-lane stop at NW Dock Pl on Leary Ave NW in Ballard. The project recommends relocating the existing NW Ione Pl bus stops one block south to NW Dock Pl where there is an existing neighborhood greenway crossing. The concept is to construct bus boarding bulbs in both directions to facilitate in-lane stopping. The project is also recommending

rechannelization of Leary Avenue in this segment which would create a three-lane cross section, one travel lane in each direction and a two-way center turn-lane. As a result, vehicles traveling behind the bus would wait while the bus loaded and unloaded passengers at this stop. To prevent passing, the proposal includes short median islands in the center turn-lane next the bus zone in both directions.

To better understand the potential impacts of introducing in-lane stops at this location, we used Metro's data (Fall 2019) to understand how many buses stop and for how long during the peak hour in the AM and PM. **Table 8** summarizes the bus stop activity and estimates how often during the peak hour buses will be blocking traffic to serve bus riders.

Table 8. Average Bus Stop Activity and Dwell Time at Leary Avenue and Ione Place

Direction	Peak Hour	Bus Route	Peak Hour Bus Volume	Average Dwell Time by Route (secs)	Dwell Time per Peak Hour by Route (secs)	Total Dwell Time per Peak Hour (secs)	% of Peak Hour (bus blocking)
Southbound	AM	Route 40	10	18	180	228	6.33%
		Route 29	4	12	48		
	PM	Route 40	6	18	108	108	3.00%
		Route 29	-	-	-		
Northbound	AM	Route 40	6	12	72	72	2.00%
		Route 29	-	-	-		
	PM	Route 40	12	12	144	174	4.83%
		Route 29	5	6	30		

The total dwell time per peak hour was calculated to be between 102 seconds and 228 seconds, or between 2% and 6% of the time during the peak hour buses will be stopped to load and/or unload passengers. Off-peak, buses will be serving the stop even less frequently.

The number of vehicles using this segment during the peak hour varies by time of day and direction, but the highest hourly volume is observed in the PM peak hour in the northbound direction. During the PM peak hour on weekday, roughly 700 cars are traveling northbound on Leary Ave NW.

The peak hour factor (PHF) indicates how consistent the flow of traffic is during the peak hour. A PHF value of 1.0 indicates that the traffic volume in each 15-minute interval is consistent and therefore traffic flow is fairly even over the peak hour. On this segment during the PM Peak the PHF is calculated to be 0.944, meaning that of the 700 vehicles observed traveling northbound during the PM peak hour, it can be estimated that every minute there are roughly twelve cars passing by the bus stop.

Therefore, if the average dwell time at this stop during the peak hour is between 6 and 18 secs, it is expected that when a bus is serving the zone to load and unload passengers, between one and four vehicles will have to wait behind that bus. Outside of the peak hour, both traffic volumes and scheduled bus volumes are lower which means fewer vehicles will encounter a bus stopped to serve the stop.

Attachments

Attachment A 2040 No Build and 2040 Build Synchro Outputs
Attachment B Transit Travel Time Calculations
Attachment C Turning Movement Classification (TMC) Counts
Attachment D Average Daily Traffic (ADT) Counts
Attachment E 3-Year Crash History (for reference only)

Route 40 Transit Plus Multimodal Corridor

Traffic Analysis Addendum for 30% Design (Refined Alternative)

July 16, 2021

Attachments

Attachment A 2040 No Build and 2040 Build Synchro Outputs
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Seattle Department of Transportation

Attachment A

2040 No Build and 2040 Build Synchro Outputs

Route 40 Transit Plus Multimodal Corridor
Traffic Analysis Addendum for 30% Design (Refined Alternative)
July 16, 2021

Route 40 Synchro Report for 2040 No Build Intersections

- Westlake Ave & Republican St
- Westlake Ave & Mercer St
- Westlake Ave & Broad St/Valley St
- 9th Ave & Westlake Ave
- Dexter Ave/4th Ave & Nickerson St/Westlake Ave
- Fremont Ave & N 34th St
- Fremont Ave & Fremont Place/N 35th St
- Evanston Ave & N 36th St & Fremont Place
- N 36th St & Dayton Ave N
- Phinney Avenue N & N 36th St
- 1st Ave NW & NW 36th St/N 36th St
- NW Leary Way & NW 39th St
- 14th Ave NW & NW Leary Way
- 15th Ave NW NB & NW Leary Way
- 15th Ave NW SB & NW Leary Way
- NW Dock Pl & Leary Ave NW
- NW Vernon Pl/20th Ave NW & Leary Ave NW
- 22nd Ave NW & Leary Ave NW & NW Market St
- 24th Ave NW & NW Market St
- 15th Ave NW & NW 85th St
- Holman Rd NW & Greenwood Ave N & N 105th St
- Aurora Ave N & N 105th St

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	296	168	352	522
v/c Ratio	0.84	0.48	0.22	0.59
Control Delay	43.2	23.6	7.3	14.6
Queue Delay	0.0	0.0	0.0	0.2
Total Delay	43.2	23.6	7.3	14.8
Queue Length 50th (ft)	114	57	30	137
Queue Length 95th (ft)	#215	110	61	286
Internal Link Dist (ft)	220	255	281	406
Turn Bay Length (ft)				
Base Capacity (vph)	477	477	1586	878
Starvation Cap Reductn	0	0	0	42
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.62	0.35	0.22	0.62

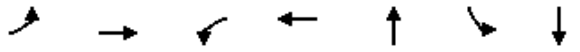
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	200	59	29	110	18	0	253	67	3	429	44
Future Volume (vph)	19	200	59	29	110	18	0	253	67	3	429	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			0.95			1.00	
Frpb, ped/bikes		0.89			0.97			0.93			0.95	
Flpb, ped/bikes		0.99			0.95			1.00			1.00	
Frt		0.97			0.98			0.97			0.99	
Flt Protected		1.00			0.99			1.00			1.00	
Satd. Flow (prot)		1145			1225			2689			1498	
Flt Permitted		0.98			0.92			1.00			1.00	
Satd. Flow (perm)		1121			1138			2689			1496	
Peak-hour factor, PHF	0.94	0.94	0.94	0.93	0.93	0.93	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	20	213	63	31	118	19	0	278	74	3	471	48
RTOR Reduction (vph)	0	13	0	0	6	0	0	26	0	0	4	0
Lane Group Flow (vph)	0	283	0	0	162	0	0	326	0	0	518	0
Confl. Peds. (#/hr)	226		274	274		226	265		128	128		265
Confl. Bikes (#/hr)			11			11			6			7
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	9%	9%	9%	7%	7%	7%
Parking (#/hr)		15			15							
Turn Type	Perm	NA		Perm	NA			NA		Perm	NA	
Protected Phases		4			4			2			6	
Permitted Phases	4			4						6		
Actuated Green, G (s)		21.5			21.5			41.9			41.9	
Effective Green, g (s)		22.0			22.0			42.4			42.4	
Actuated g/C Ratio		0.30			0.30			0.59			0.59	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		2.0			2.0			0.2			0.2	
Lane Grp Cap (vph)		340			345			1574			876	
v/s Ratio Prot								0.12				
v/s Ratio Perm		c0.25			0.14						c0.35	
v/c Ratio		0.83			0.47			0.21			0.59	
Uniform Delay, d1		23.5			20.5			7.1			9.5	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		15.1			0.4			0.3			0.7	
Delay (s)		38.6			20.8			7.4			10.2	
Level of Service		D			C			A			B	
Approach Delay (s)		38.6			20.8			7.4			10.2	
Approach LOS		D			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	17.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	72.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	58.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	10	1489	267	1350	305	164	264
v/c Ratio	0.11	1.59	5.68	0.56	0.68	1.53	0.64
Control Delay	65.0	304.2	2150.9	16.5	52.6	322.3	51.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	65.0	304.2	2150.9	16.5	52.6	322.3	51.5
Queue Length 50th (ft)	8	~659	~394	192	112	~193	205
Queue Length 95th (ft)	28	#787	#626	393	163	#358	287
Internal Link Dist (ft)		218		252	406		356
Turn Bay Length (ft)	90					135	
Base Capacity (vph)	124	937	47	2423	629	107	719
Starvation Cap Reductn	0	0	0	0	0	0	39
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	1.59	5.68	0.56	0.48	1.53	0.39

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	1	8	1215	51	27	221	1031	224	0	192	98	143
Future Volume (vph)	1	8	1215	51	27	221	1031	224	0	192	98	143
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	11	12	12	12	11	12	12	12	12	12
Total Lost time (s)		4.5	5.5			4.5	5.5			6.0		4.5
Lane Util. Factor		1.00	0.91			1.00	0.91			0.95		1.00
Frpb, ped/bikes		1.00	0.97			1.00	0.96			0.95		1.00
Flpb, ped/bikes		0.97	1.00			1.00	1.00			1.00		1.00
Frt		1.00	0.99			1.00	0.97			0.95		1.00
Flt Protected		0.95	1.00			0.95	1.00			1.00		0.95
Satd. Flow (prot)		1484	3933			1547	3825			2624		1518
Flt Permitted		1.00	1.00			0.08	1.00			1.00		0.95
Satd. Flow (perm)		1562	3933			126	3825			2624		1518
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.93	0.93	0.93	0.93	0.95	0.95	0.95	0.87
Adj. Flow (vph)	1	9	1429	60	29	238	1109	241	0	202	103	164
RTOR Reduction (vph)	0	0	2	0	0	0	15	0	0	42	0	0
Lane Group Flow (vph)	0	10	1487	0	0	267	1335	0	0	263	0	164
Confl. Peds. (#/hr)		111		323		323		111	160		91	91
Confl. Bikes (#/hr)				3							3	
Heavy Vehicles (%)	6%	6%	6%	6%	5%	5%	5%	5%	12%	12%	12%	7%
Parking (#/hr)			8	8			8	8				
Turn Type	custom	Prot	NA		custom	Prot	NA			NA		Prot
Protected Phases		7	4			3	8			2		1
Permitted Phases	7				3							
Actuated Green, G (s)		1.9	35.6			51.2	84.9			20.5		9.0
Effective Green, g (s)		2.4	36.1			51.7	85.4			21.0		9.5
Actuated g/C Ratio		0.02	0.26			0.37	0.62			0.15		0.07
Clearance Time (s)		5.0	6.0			5.0	6.0			6.5		5.0
Vehicle Extension (s)		2.0	2.0			2.0	2.0			2.0		2.0
Lane Grp Cap (vph)		27	1022			46	2353			397		103
v/s Ratio Prot			c0.38				0.35			0.10		c0.11
v/s Ratio Perm		0.01				c2.12						
v/c Ratio		0.37	1.45			5.80	0.57			0.66		1.59
Uniform Delay, d1		67.5	51.4			43.6	15.8			55.6		64.7
Progression Factor		1.00	1.00			1.00	1.00			1.00		1.00
Incremental Delay, d2		3.1	210.1			2208.2	0.2			3.2		307.3
Delay (s)		70.6	261.5			2251.8	16.0			58.8		371.9
Level of Service		E	F			F	B			E		F
Approach Delay (s)			260.2				385.1			58.8		
Approach LOS			F				F			E		

Intersection Summary			
HCM 2000 Control Delay	287.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	3.33		
Actuated Cycle Length (s)	138.8	Sum of lost time (s)	25.5
Intersection Capacity Utilization	93.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	230	0
Future Volume (vph)	230	0
Ideal Flow (vphpl)	1900	1900
Lane Width	12	12
Total Lost time (s)	6.0	
Lane Util. Factor	1.00	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	1598	
Flt Permitted	1.00	
Satd. Flow (perm)	1598	
Peak-hour factor, PHF	0.87	0.87
Adj. Flow (vph)	264	0
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	264	0
Confl. Peds. (#/hr)		160
Confl. Bikes (#/hr)		5
Heavy Vehicles (%)	7%	7%
Parking (#/hr)		
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	34.5	
Effective Green, g (s)	35.0	
Actuated g/C Ratio	0.25	
Clearance Time (s)	6.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	402	
v/s Ratio Prot	c0.17	
v/s Ratio Perm		
v/c Ratio	0.66	
Uniform Delay, d1	46.5	
Progression Factor	1.00	
Incremental Delay, d2	2.9	
Delay (s)	49.5	
Level of Service	D	
Approach Delay (s)	173.0	
Approach LOS	F	

Intersection Summary

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	374	84	209	31	445	350	343	6
v/c Ratio	0.69	0.14	0.54	0.13	0.63	0.72	0.46	0.01
Control Delay	38.1	24.2	11.1	20.3	47.2	29.8	27.8	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.5	0.7	0.0
Total Delay	38.1	24.2	11.1	20.3	47.2	30.3	28.6	0.0
Queue Length 50th (ft)	262	45	0	13	172	184	209	0
Queue Length 95th (ft)	356	82	70	30	247	248	281	0
Internal Link Dist (ft)	177	254			356		489	
Turn Bay Length (ft)			300	100		125		
Base Capacity (vph)	542	589	441	242	710	546	752	405
Starvation Cap Reductn	0	0	0	0	0	35	171	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.14	0.47	0.13	0.63	0.68	0.59	0.01

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	254	60	18	58	190	28	352	44	301	295	5
Future Volume (vph)	3	254	60	18	58	190	28	352	44	301	295	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	11	12	11	11	10	12	12	12
Total Lost time (s)		5.0			5.0	5.0	3.0	5.0		3.0	4.0	4.5
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	1.00	1.00
Frpb, ped/bikes		0.96			1.00	0.86	1.00	0.94		1.00	1.00	0.61
Flpb, ped/bikes		1.00			0.98	1.00	0.88	1.00		0.95	1.00	1.00
Frt		0.97			1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected		1.00			0.99	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1248			1487	1156	1253	2646		1498	1660	866
Flt Permitted		1.00			0.88	1.00	0.55	1.00		0.34	1.00	1.00
Satd. Flow (perm)		1247			1330	1156	731	2646		542	1660	866
Peak-hour factor, PHF	0.85	0.85	0.85	0.91	0.91	0.91	0.89	0.89	0.89	0.86	0.86	0.86
Adj. Flow (vph)	4	299	71	20	64	209	31	396	49	350	343	6
RTOR Reduction (vph)	0	5	0	0	0	171	0	5	0	0	0	3
Lane Group Flow (vph)	0	369	0	0	84	38	31	440	0	350	343	3
Confl. Peds. (#/hr)	63		56	56		63	84		130	130		84
Confl. Bikes (#/hr)			8			26			1			4
Heavy Vehicles (%)	6%	6%	6%	8%	8%	8%	10%	10%	10%	3%	3%	3%
Parking (#/hr)		8										
Turn Type	Perm	NA		Perm	NA	custom	pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		1	2			6		6
Actuated Green, G (s)		57.6			57.6	25.5	40.7	37.1		66.1	59.0	59.0
Effective Green, g (s)		57.1			57.1	24.0	41.7	36.6		66.6	59.5	59.0
Actuated g/C Ratio		0.43			0.43	0.18	0.31	0.28		0.50	0.45	0.44
Clearance Time (s)		4.5			4.5	3.5	3.5	4.5		3.5	4.5	4.5
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		536			572	209	245	729		459	744	385
v/s Ratio Prot							0.00	0.17		c0.15	0.21	
v/s Ratio Perm		c0.30			0.06	0.03	0.04			c0.23		0.00
v/c Ratio		0.69			0.15	0.18	0.13	0.60		0.76	0.46	0.01
Uniform Delay, d1		30.6			23.0	46.0	32.0	41.7		22.5	25.5	20.5
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		3.7			0.5	0.4	0.2	3.7		7.4	2.1	0.0
Delay (s)		34.3			23.5	46.4	32.2	45.4		29.9	27.5	20.6
Level of Service		C			C	D	C	D		C	C	C
Approach Delay (s)		34.3			39.9			44.6			28.6	
Approach LOS		C			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	35.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	132.7	Sum of lost time (s)	25.0
Intersection Capacity Utilization	65.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

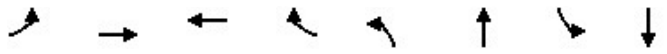
Lane Group	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	656	88	564	736
v/c Ratio	0.50	0.37	0.73	0.41
Control Delay	9.5	37.9	19.3	9.8
Queue Delay	0.5	0.0	0.0	0.0
Total Delay	10.0	37.9	19.3	9.8
Queue Length 50th (ft)	34	25	59	46
Queue Length 95th (ft)	244	117	468	265
Internal Link Dist (ft)		473		269
Turn Bay Length (ft)			160	
Base Capacity (vph)	1539	705	1424	2805
Starvation Cap Reductn	438	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.60	0.12	0.40	0.26

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	571	67	4	530	692
Future Volume (vph)	0	571	67	4	530	692
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	12	11
Total Lost time (s)		4.0	4.0		4.0	4.0
Lane Util. Factor		0.88	1.00		1.00	0.95
Frpb, ped/bikes		0.98	1.00		1.00	1.00
Flpb, ped/bikes		1.00	1.00		0.97	1.00
Frt		0.85	0.99		1.00	1.00
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		2298	1470		1512	3020
Flt Permitted		1.00	1.00		0.70	1.00
Satd. Flow (perm)		2298	1470		1114	3020
Peak-hour factor, PHF	0.87	0.87	0.81	0.81	0.94	0.94
Adj. Flow (vph)	0	656	83	5	564	736
RTOR Reduction (vph)	0	0	2	0	0	0
Lane Group Flow (vph)	0	656	86	0	564	736
Confl. Peds. (#/hr)		5		57	57	
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	6%	6%	15%	15%	4%	4%
Turn Type		custom	NA		custom	NA
Protected Phases		4	2		1	6
Permitted Phases		1			4	6
Actuated Green, G (s)		37.3	11.4		37.3	39.2
Effective Green, g (s)		38.3	11.9		38.3	39.7
Actuated g/C Ratio		0.56	0.18		0.56	0.59
Clearance Time (s)		4.5	4.5		4.5	4.5
Vehicle Extension (s)		2.0	0.2		2.0	0.2
Lane Grp Cap (vph)		1433	258		769	1768
v/s Ratio Prot		0.10	0.06		c0.26	c0.24
v/s Ratio Perm		0.19			c0.16	
v/c Ratio		0.46	0.33		0.73	0.42
Uniform Delay, d1		8.7	24.5		10.7	7.7
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.1	0.3		3.1	0.1
Delay (s)		8.7	24.8		13.9	7.8
Level of Service		A	C		B	A
Approach Delay (s)	8.7		24.8			10.4
Approach LOS	A		C			B

Intersection Summary			
HCM 2000 Control Delay	10.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	67.8	Sum of lost time (s)	15.0
Intersection Capacity Utilization	50.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	518	642	218	240	203	117	813	243
v/c Ratio	0.88	0.80	0.52	0.17	0.74	0.22	0.91	0.59
Control Delay	69.8	40.5	49.6	15.9	68.0	42.4	61.5	44.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.8	40.5	49.6	15.9	68.0	42.4	61.5	44.7
Queue Length 50th (ft)	222	480	168	59	159	39	343	165
Queue Length 95th (ft)	#315	#698	255	86	237	66	#457	256
Internal Link Dist (ft)		426	306			751		183
Turn Bay Length (ft)				100				
Base Capacity (vph)	588	806	421	1439	327	645	893	413
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.80	0.52	0.17	0.62	0.18	0.91	0.59

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	502	546	77	0	196	216	179	90	13	772	152	79
Future Volume (vph)	502	546	77	0	196	216	179	90	13	772	152	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5			4.5	4.5	6.5	6.5		5.5	5.5	
Lane Util. Factor	0.97	1.00			1.00	0.88	1.00	0.95		0.97	1.00	
Frpb, ped/bikes	1.00	0.99			1.00	1.00	1.00	0.99		1.00	0.89	
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.98			1.00	0.85	1.00	0.98		1.00	0.95	
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3400	1794			1759	2632	1703	3308		3367	1502	
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3400	1794			1759	2632	1703	3308		3367	1502	
Peak-hour factor, PHF	0.97	0.97	0.97	0.90	0.90	0.90	0.88	0.88	0.88	0.95	0.95	0.95
Adj. Flow (vph)	518	563	79	0	218	240	203	102	15	813	160	83
RTOR Reduction (vph)	0	4	0	0	0	0	0	9	0	0	15	0
Lane Group Flow (vph)	518	638	0	0	218	240	203	108	0	813	228	0
Confl. Peds. (#/hr)	47		30	30		47	21		21	21		21
Confl. Bikes (#/hr)			10			9			23			189
Heavy Vehicles (%)	3%	3%	3%	8%	8%	8%	6%	6%	6%	4%	4%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	6	2
Turn Type	Prot	NA			NA	custom	Split	NA		Split	NA	
Protected Phases	4	1 4			1	5	3	3		2	2	
Permitted Phases												
Actuated Green, G (s)	22.5	58.1			31.1	71.1	20.9	20.9		34.5	34.5	
Effective Green, g (s)	22.5	58.1			31.1	71.1	20.9	20.9		34.5	34.5	
Actuated g/C Ratio	0.17	0.45			0.24	0.55	0.16	0.16		0.27	0.27	
Clearance Time (s)	4.5				4.5	4.5	6.5	6.5		5.5	5.5	
Vehicle Extension (s)	3.0				2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	588	801			420	1439	273	531		893	398	
v/s Ratio Prot	c0.15	c0.36			0.12	0.09	c0.12	0.03		c0.24	0.15	
v/s Ratio Perm												
v/c Ratio	0.88	0.80			0.52	0.17	0.74	0.20		0.91	0.57	
Uniform Delay, d1	52.4	30.9			43.0	14.7	52.0	47.3		46.3	41.4	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	14.4	5.5			4.5	0.3	9.2	0.1		13.0	1.2	
Delay (s)	66.9	36.4			47.5	14.9	61.2	47.4		59.2	42.6	
Level of Service	E	D			D	B	E	D		E	D	
Approach Delay (s)		50.0			30.4			56.2			55.4	
Approach LOS		D			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	49.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	83.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	433	155	385	493	931
v/c Ratio	0.95	0.59	0.30	0.90	0.54
Control Delay	69.5	28.2	13.4	25.5	10.0
Queue Delay	0.0	0.0	0.0	0.0	0.4
Total Delay	69.5	28.2	13.4	25.5	10.3
Queue Length 50th (ft)	~124	37	65	3	161
Queue Length 95th (ft)	#203	#103	98	#138	268
Internal Link Dist (ft)		551	946		251
Turn Bay Length (ft)	120			160	
Base Capacity (vph)	455	263	1294	549	1713
Starvation Cap Reductn	0	0	0	0	302
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.95	0.59	0.30	0.90	0.66

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	377	54	81	42	312	454	0	852	41
Future Volume (vph)	0	0	0	377	54	81	42	312	454	0	852	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1300	1900	1900	1900
Lane Width	12	12	12	11	11	12	12	11	9	12	12	12
Total Lost time (s)				7.0	7.0			7.0	4.5		7.0	
Lane Util. Factor				0.97	1.00			0.95	1.00		0.95	
Frpb, ped/bikes				1.00	0.89			1.00	0.67		0.97	
Flpb, ped/bikes				1.00	1.00			0.99	1.00		1.00	
Frt				1.00	0.91			1.00	0.85		0.99	
Flt Protected				0.95	1.00			0.99	1.00		1.00	
Satd. Flow (prot)				3255	1426			3115	604		3241	
Flt Permitted				0.95	1.00			0.78	1.00		1.00	
Satd. Flow (perm)				3255	1426			2450	604		3241	
Peak-hour factor, PHF	0.25	0.25	0.25	0.87	0.87	0.87	0.92	0.92	0.92	0.96	0.96	0.96
Adj. Flow (vph)	0	0	0	433	62	93	46	339	493	0	888	43
RTOR Reduction (vph)	0	0	0	0	66	0	0	0	224	0	4	0
Lane Group Flow (vph)	0	0	0	433	89	0	0	385	269	0	927	0
Confl. Peds. (#/hr)	79		151	151		79	218		102	102		218
Confl. Bikes (#/hr)			32			9			9			67
Heavy Vehicles (%)	0%	0%	0%	4%	4%	4%	10%	10%	10%	6%	6%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	8	0
Turn Type				Split	NA		Perm	NA	Perm		NA	
Protected Phases		4		3	3			2			6	
Permitted Phases							2		2			
Actuated Green, G (s)				13.7	13.7			42.7	42.7		42.7	
Effective Green, g (s)				11.2	11.2			40.2	42.7		40.2	
Actuated g/C Ratio				0.14	0.14			0.50	0.53		0.50	
Clearance Time (s)				4.5	4.5			4.5	4.5		4.5	
Vehicle Extension (s)				0.2	0.2			0.2	0.2		0.2	
Lane Grp Cap (vph)				455	199			1231	322		1628	
v/s Ratio Prot				c0.13	0.06						0.29	
v/s Ratio Perm								0.16	c0.45			
v/c Ratio				0.95	0.45			0.31	0.84		0.57	
Uniform Delay, d1				34.1	31.6			11.7	15.7		13.9	
Progression Factor				1.00	1.00			1.00	1.00		0.61	
Incremental Delay, d2				31.7	7.1			0.7	22.0		1.3	
Delay (s)				65.8	38.6			12.4	37.7		9.7	
Level of Service				E	D			B	D		A	
Approach Delay (s)		0.0			58.7			26.6			9.7	
Approach LOS		A			E			C			A	

Intersection Summary			
HCM 2000 Control Delay	27.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	70.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	410	714	184	179	182	76	77	251
v/c Ratio	0.68	0.42	0.41	0.49	0.50	0.20	0.19	0.59
Control Delay	13.6	3.7	22.5	29.4	29.8	10.0	26.2	33.5
Queue Delay	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay	13.6	3.7	22.6	29.4	29.8	10.0	26.2	33.5
Queue Length 50th (ft)	27	23	65	88	89	5	31	109
Queue Length 95th (ft)	71	46	122	153	154	m37	66	184
Internal Link Dist (ft)	448		552		251			177
Turn Bay Length (ft)						40	85	
Base Capacity (vph)	604	1693	446	367	363	387	409	422
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	41	20	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.43	0.43	0.49	0.50	0.20	0.19	0.59

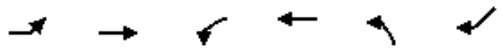
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	380	664	13	135	27	251	74	68	73	216	23
Future Volume (vph)	1	380	664	13	135	27	251	74	68	73	216	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0		5.0		5.0	5.0	5.0	6.0	6.0	
Lane Util. Factor		1.00	0.88		1.00		0.95	0.95	1.00	1.00	1.00	
Frpb, ped/bikes		1.00	1.00		0.97		1.00	1.00	0.87	1.00	0.98	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85		0.98		1.00	1.00	0.85	1.00	0.99	
Flt Protected		1.00	1.00		1.00		0.95	0.97	1.00	0.95	1.00	
Satd. Flow (prot)		1792	2682		1349		1588	1575	1265	1770	1807	
Flt Permitted		1.00	1.00		0.96		0.95	0.97	1.00	0.95	1.00	
Satd. Flow (perm)		1791	2682		1298		1588	1575	1265	1770	1807	
Peak-hour factor, PHF	0.93	0.93	0.93	0.95	0.95	0.95	0.90	0.90	0.90	0.95	0.95	0.95
Adj. Flow (vph)	1	409	714	14	142	28	279	82	76	77	227	24
RTOR Reduction (vph)	0	0	0	0	8	0	0	0	58	0	5	0
Lane Group Flow (vph)	0	410	714	0	176	0	179	182	18	77	246	0
Confl. Peds. (#/hr)	92		117	117		92	92		38	38		48
Confl. Bikes (#/hr)			1						9			107
Heavy Vehicles (%)	6%	6%	6%	17%	17%	17%	8%	8%	8%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	8	8	0	0	0
Parking (#/hr)				0	3	3						
Turn Type	Perm	NA	pt+ov	Perm	NA		Split	NA	Perm	Split	NA	
Protected Phases		4	4 2		4		2	2		1	1	
Permitted Phases	4			4					2			
Actuated Green, G (s)		26.5	50.0		26.5		18.0	18.0	18.0	18.0	18.0	
Effective Green, g (s)		27.0	50.5		27.0		18.5	18.5	18.5	18.5	18.5	
Actuated g/C Ratio		0.34	0.63		0.34		0.23	0.23	0.23	0.23	0.23	
Clearance Time (s)		5.5			5.5		5.5	5.5	5.5	6.5	6.5	
Lane Grp Cap (vph)		604	1693		438		367	364	292	409	417	
v/s Ratio Prot			0.27				0.11	c0.12		0.04	c0.14	
v/s Ratio Perm		c0.23			0.14				0.01			
v/c Ratio		0.68	0.42		0.40		0.49	0.50	0.06	0.19	0.59	
Uniform Delay, d1		22.8	7.4		20.3		26.6	26.7	24.0	24.7	27.4	
Progression Factor		0.38	0.41		1.00		0.91	0.91	5.01	1.00	1.00	
Incremental Delay, d2		4.7	0.6		2.7		4.4	4.6	0.4	1.0	6.0	
Delay (s)		13.3	3.6		23.0		28.7	29.1	120.5	25.7	33.4	
Level of Service		B	A		C		C	C	F	C	C	
Approach Delay (s)		7.2			23.0			44.8			31.6	
Approach LOS		A			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	73.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	NBL	SWR
Lane Group Flow (vph)	94	1122	68	385	92	95
v/c Ratio	0.50	0.65	0.41	0.23	0.22	0.15
Control Delay	50.4	11.7	51.9	6.4	10.5	0.5
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0
Total Delay	50.4	11.9	51.9	6.4	10.5	0.5
Queue Length 50th (ft)	52	93	36	21	9	0
Queue Length 95th (ft)	100	112	m74	40	34	0
Internal Link Dist (ft)		25		448	332	
Turn Bay Length (ft)	60		50			
Base Capacity (vph)	227	1739	196	1656	421	636
Starvation Cap Reductn	0	167	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.71	0.35	0.23	0.22	0.15

Intersection Summary

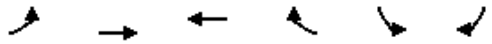
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	NBR2	SWL	SWR
Lane Configurations											
Traffic Volume (vph)	88	1018	37	60	331	8	22	24	27	0	70
Future Volume (vph)	88	1018	37	60	331	8	22	24	27	0	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.5		3.5	4.5		4.5				3.5
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00				1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99		0.96				1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00				1.00
Frt	1.00	0.99		1.00	1.00		0.91				0.86
Flt Protected	0.95	1.00		0.95	1.00		0.99				1.00
Satd. Flow (prot)	1736	3443		1687	3344		1397				1536
Flt Permitted	0.95	1.00		0.95	1.00		0.99				1.00
Satd. Flow (perm)	1736	3443		1687	3344		1397				1536
Peak-hour factor, PHF	0.94	0.94	0.94	0.88	0.88	0.88	0.79	0.79	0.79	0.74	0.74
Adj. Flow (vph)	94	1083	39	68	376	9	28	30	34	0	95
RTOR Reduction (vph)	0	3	0	0	2	0	50	0	0	0	86
Lane Group Flow (vph)	94	1119	0	68	383	0	42	0	0	0	9
Confl. Peds. (#/hr)	78		30	30		78			45		
Confl. Bikes (#/hr)			7						2		1
Heavy Vehicles (%)	4%	4%	4%	7%	7%	7%	16%	16%	16%	7%	7%
Turn Type	Prot	NA		Prot	NA		Prot				Over
Protected Phases	1	6		5	2		4				1
Permitted Phases											
Actuated Green, G (s)	7.3	39.6		6.6	38.9		21.3				7.3
Effective Green, g (s)	7.3	39.6		6.6	38.9		21.3				7.3
Actuated g/C Ratio	0.09	0.50		0.08	0.49		0.27				0.09
Clearance Time (s)	3.5	4.5		3.5	4.5		4.5				3.5
Vehicle Extension (s)	2.0	0.2		2.0	0.2		0.2				2.0
Lane Grp Cap (vph)	158	1704		139	1626		371				140
v/s Ratio Prot	c0.05	c0.33		0.04	0.11		c0.03				0.01
v/s Ratio Perm											
v/c Ratio	0.59	0.66		0.49	0.24		0.11				0.06
Uniform Delay, d1	34.9	15.1		35.1	11.9		22.2				33.2
Progression Factor	1.26	0.64		1.34	0.49		1.00				1.00
Incremental Delay, d2	3.6	1.8		0.9	0.3		0.6				0.1
Delay (s)	47.6	11.4		47.9	6.2		22.8				33.3
Level of Service	D	B		D	A		C				C
Approach Delay (s)		14.2			12.4		22.8			33.3	
Approach LOS		B			B		C			C	

Intersection Summary			
HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	SBL
Lane Group Flow (vph)	1283	399	32
v/c Ratio	0.48	0.15	0.10
Control Delay	1.3	0.9	22.4
Queue Delay	0.0	0.1	0.0
Total Delay	1.3	1.0	22.4
Queue Length 50th (ft)	20	7	10
Queue Length 95th (ft)	25	10	23
Internal Link Dist (ft)	470	71	789
Turn Bay Length (ft)			
Base Capacity (vph)	2701	2738	409
Starvation Cap Reductn	79	1135	0
Spillback Cap Reductn	25	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.49	0.25	0.08

Intersection Summary



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	6	1174	383	12	17	4
Future Volume (vph)	6	1174	383	12	17	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		3.5	
Lane Util. Factor		0.95	0.95		1.00	
Frpb, ped/bikes		1.00	1.00		0.98	
Flpb, ped/bikes		1.00	1.00		1.00	
Frt		1.00	1.00		0.97	
Flt Protected		1.00	1.00		0.96	
Satd. Flow (prot)		3504	3385		1752	
Flt Permitted		0.95	1.00		0.96	
Satd. Flow (perm)		3341	3385		1752	
Peak-hour factor, PHF	0.92	0.92	0.99	0.99	0.66	0.66
Adj. Flow (vph)	7	1276	387	12	26	6
RTOR Reduction (vph)	0	0	2	0	5	0
Lane Group Flow (vph)	0	1283	397	0	27	0
Confl. Peds. (#/hr)	15			15		51
Confl. Bikes (#/hr)				2		
Heavy Vehicles (%)	3%	3%	6%	6%	0%	0%
Turn Type	Perm	NA	NA		Prot	
Protected Phases		6	2		4	
Permitted Phases	6					
Actuated Green, G (s)		60.3	60.3		10.2	
Effective Green, g (s)		61.3	61.3		11.2	
Actuated g/C Ratio		0.77	0.77		0.14	
Clearance Time (s)		5.0	5.0		4.5	
Vehicle Extension (s)		0.2	0.2		1.0	
Lane Grp Cap (vph)		2560	2593		245	
v/s Ratio Prot			0.12		c0.02	
v/s Ratio Perm		c0.38				
v/c Ratio		0.50	0.15		0.11	
Uniform Delay, d1		3.5	2.5		30.0	
Progression Factor		0.15	0.23		1.00	
Incremental Delay, d2		0.6	0.1		0.1	
Delay (s)		1.2	0.7		30.1	
Level of Service		A	A		C	
Approach Delay (s)		1.2	0.7		30.1	
Approach LOS		A	A		C	

Intersection Summary			
HCM 2000 Control Delay	1.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	1331	413	38	14	102
v/c Ratio	0.52	0.21	0.15	0.04	0.35
Control Delay	7.0	5.0	25.5	5.2	27.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	7.0	5.0	25.5	5.2	27.1
Queue Length 50th (ft)	171	31	15	0	38
Queue Length 95th (ft)	226	60	35	7	67
Internal Link Dist (ft)	748	470	201		616
Turn Bay Length (ft)					
Base Capacity (vph)	2568	1924	345	427	389
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.52	0.21	0.11	0.03	0.26

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1170	81	45	348	8	31	0	11	53	17	9
Future Volume (vph)	0	1170	81	45	348	8	31	0	11	53	17	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0	4.0		4.0	
Lane Util. Factor		0.95			0.95			1.00	1.00		1.00	
Frpb, ped/bikes		1.00			1.00			1.00	0.94		0.99	
Flpb, ped/bikes		1.00			1.00			0.96	1.00		0.97	
Frt		0.99			1.00			1.00	0.85		0.98	
Flt Protected		1.00			0.99			0.95	1.00		0.97	
Satd. Flow (prot)		3454			3400			1674	1481		1729	
Flt Permitted		1.00			0.76			0.71	1.00		0.78	
Satd. Flow (perm)		3454			2591			1257	1481		1398	
Peak-hour factor, PHF	0.94	0.94	0.94	0.97	0.97	0.97	0.81	0.81	0.81	0.78	0.78	0.78
Adj. Flow (vph)	0	1245	86	46	359	8	38	0	14	68	22	12
RTOR Reduction (vph)	0	5	0	0	1	0	0	0	11	0	7	0
Lane Group Flow (vph)	0	1326	0	0	412	0	0	38	3	0	95	0
Confl. Peds. (#/hr)	46		31	31		46	45		33	33		45
Confl. Bikes (#/hr)			1			1			2			8
Heavy Vehicles (%)	3%	3%	3%	5%	5%	5%	3%	3%	3%	1%	1%	1%
Turn Type		NA		Perm	NA		D.Pm	NA	custom	Perm	NA	
Protected Phases		2			2			8			4	
Permitted Phases	2			2			4		4	4		
Actuated Green, G (s)		56.6			56.6			13.4	13.4		13.4	
Effective Green, g (s)		57.6			57.6			14.4	14.4		14.4	
Actuated g/C Ratio		0.72			0.72			0.18	0.18		0.18	
Clearance Time (s)		5.0			5.0			5.0	5.0		5.0	
Vehicle Extension (s)		0.2			0.2			1.0	1.0		1.0	
Lane Grp Cap (vph)		2486			1865			226	266		251	
v/s Ratio Prot		c0.38										
v/s Ratio Perm					0.16			0.03	0.00		c0.07	
v/c Ratio		0.53			0.22			0.17	0.01		0.38	
Uniform Delay, d1		5.1			3.7			27.7	26.9		28.9	
Progression Factor		1.00			0.99			1.00	1.00		1.00	
Incremental Delay, d2		0.8			0.3			0.1	0.0		0.4	
Delay (s)		5.9			4.0			27.9	26.9		29.2	
Level of Service		A			A			C	C		C	
Approach Delay (s)		5.9			4.0			27.6			29.2	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	7.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	72.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	1335	431	43	33
v/c Ratio	0.54	0.19	0.14	0.08
Control Delay	8.0	5.4	13.4	13.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	8.0	5.4	13.4	13.8
Queue Length 50th (ft)	80	18	10	9
Queue Length 95th (ft)	266	66	24	17
Internal Link Dist (ft)	303	748	246	294
Turn Bay Length (ft)				
Base Capacity (vph)	2445	2247	560	706
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.55	0.19	0.08	0.05

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	1149	103	18	385	2	20	5	12	7	11	6
Future Volume (vph)	3	1149	103	18	385	2	20	5	12	7	11	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5			4.5			4.5	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		0.99			1.00			0.99			0.99	
Flpb, ped/bikes		1.00			1.00			0.99			1.00	
Frt		0.99			1.00			0.96			0.97	
Flt Protected		1.00			1.00			0.97			0.99	
Satd. Flow (prot)		3441			3394			1527			1792	
Flt Permitted		0.95			0.89			0.83			0.91	
Satd. Flow (perm)		3284			3024			1298			1647	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.88	0.88	0.88	0.72	0.72	0.72
Adj. Flow (vph)	3	1222	110	19	410	2	23	6	14	10	15	8
RTOR Reduction (vph)	0	7	0	0	0	0	0	12	0	0	7	0
Lane Group Flow (vph)	0	1328	0	0	431	0	0	31	0	0	26	0
Confl. Peds. (#/hr)	28		34	34		28	19		16	16		19
Confl. Bikes (#/hr)						3			1			1
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	14%	14%	14%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Actuated Green, G (s)		35.8			35.8			7.8			7.8	
Effective Green, g (s)		35.8			35.8			7.8			7.8	
Actuated g/C Ratio		0.68			0.68			0.15			0.15	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		2235			2058			192			244	
v/s Ratio Prot												
v/s Ratio Perm		c0.40			0.14			c0.02			0.02	
v/c Ratio		0.59			0.21			0.16			0.11	
Uniform Delay, d1		4.5			3.1			19.5			19.4	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.3			0.0			0.1			0.1	
Delay (s)		4.8			3.1			19.7			19.5	
Level of Service		A			A			B			B	
Approach Delay (s)		4.8			3.1			19.7			19.5	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	5.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	52.6	Sum of lost time (s)	9.0
Intersection Capacity Utilization	55.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	16	492	7	414	331	1348
v/c Ratio	0.10	0.78	0.05	0.41	0.71	0.61
Control Delay	23.7	13.7	35.7	21.6	30.6	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.7	13.7	35.7	21.6	30.6	10.3
Queue Length 50th (ft)	4	12	2	55	97	97
Queue Length 95th (ft)	20	113	18	156	254	400
Internal Link Dist (ft)	602	497		290		2020
Turn Bay Length (ft)			100		100	
Base Capacity (vph)	607	1173	141	2154	1167	3320
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.42	0.05	0.19	0.28	0.41

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	3	2	31	4	403	7	397	0	318	1292	2
Future Volume (vph)	8	3	2	31	4	403	7	397	0	318	1292	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			0.97		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.98			0.88		1.00	1.00		1.00	1.00	
Flt Protected		0.97			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1465			1524		1685	3374		1736	3470	
Flt Permitted		0.57			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		858			1490		1685	3374		1736	3470	
Peak-hour factor, PHF	0.81	0.81	0.81	0.89	0.89	0.89	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	10	4	2	35	4	453	7	414	0	331	1346	2
RTOR Reduction (vph)	0	2	0	0	374	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	14	0	0	118	0	7	414	0	331	1348	0
Confl. Peds. (#/hr)	12		6	6		12	4		9	9		4
Confl. Bikes (#/hr)						3			1			
Heavy Vehicles (%)	23%	23%	23%	6%	6%	6%	7%	7%	7%	4%	4%	4%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			4		5	2		1	6	
Permitted Phases	4			4								
Actuated Green, G (s)		11.2			11.2		0.7	23.5		16.9	39.7	
Effective Green, g (s)		11.2			11.2		0.7	23.5		16.9	39.7	
Actuated g/C Ratio		0.17			0.17		0.01	0.35		0.25	0.60	
Clearance Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	0.2		2.0	0.2	
Lane Grp Cap (vph)		144			250		17	1190		440	2068	
v/s Ratio Prot							0.00	0.12		c0.19	c0.39	
v/s Ratio Perm		0.02			c0.08							
v/c Ratio		0.10			0.47		0.41	0.35		0.75	0.65	
Uniform Delay, d1		23.4			25.0		32.7	15.9		22.9	8.9	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1			0.5		5.8	0.1		6.3	0.6	
Delay (s)		23.5			25.5		38.5	16.0		29.3	9.5	
Level of Service		C			C		D	B		C	A	
Approach Delay (s)		23.5			25.5			16.3			13.4	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	66.6	Sum of lost time (s)	15.0
Intersection Capacity Utilization	80.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	620	663	62	107	176	294
v/c Ratio	0.30	0.33	0.32	0.16	0.64	0.40
Control Delay	5.9	5.8	28.9	17.7	38.8	15.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.9	5.8	28.9	17.7	38.8	15.6
Queue Length 50th (ft)	50	52	27	16	82	37
Queue Length 95th (ft)	105	109	52	31	128	62
Internal Link Dist (ft)	500	618		181		179
Turn Bay Length (ft)			140		140	
Base Capacity (vph)	2066	2022	344	1152	480	1209
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.33	0.18	0.09	0.37	0.24

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	521	33	31	484	102	54	67	26	171	163	122
Future Volume (vph)	29	521	33	31	484	102	54	67	26	171	163	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	14	11	14	14	11	14
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		0.95			0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			1.00		1.00	0.99		1.00	0.98	
Flpb, ped/bikes		1.00			1.00		0.99	1.00		0.99	1.00	
Frt		0.99			0.98		1.00	0.96		1.00	0.94	
Flt Protected		1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3281			3190		1794	3125		1842	3104	
Flt Permitted		0.90			0.91		0.50	1.00		0.68	1.00	
Satd. Flow (perm)		2974			2897		951	3125		1327	3104	
Peak-hour factor, PHF	0.94	0.94	0.94	0.93	0.93	0.93	0.87	0.87	0.87	0.97	0.97	0.97
Adj. Flow (vph)	31	554	35	33	520	110	62	77	30	176	168	126
RTOR Reduction (vph)	0	4	0	0	14	0	0	24	0	0	100	0
Lane Group Flow (vph)	0	616	0	0	649	0	62	83	0	176	194	0
Confl. Peds. (#/hr)	7		16	16		7	14		12	12		14
Confl. Bikes (#/hr)			3			1			4			17
Heavy Vehicles (%)	5%	5%	5%	6%	6%	6%	6%	6%	6%	3%	3%	3%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Actuated Green, G (s)		54.5			54.5		15.5	15.5		15.5	15.5	
Effective Green, g (s)		55.5			55.5		16.5	16.5		16.5	16.5	
Actuated g/C Ratio		0.69			0.69		0.21	0.21		0.21	0.21	
Clearance Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		0.2			0.2		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)		2063			2009		196	644		273	640	
v/s Ratio Prot								0.03			0.06	
v/s Ratio Perm		0.21			c0.22		0.07			c0.13		
v/c Ratio		0.30			0.32		0.32	0.13		0.64	0.30	
Uniform Delay, d1		4.7			4.8		27.0	25.9		29.1	26.9	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.4			0.4		0.3	0.0		3.9	0.1	
Delay (s)		5.1			5.3		27.3	25.9		32.9	27.0	
Level of Service		A			A		C	C		C	C	
Approach Delay (s)		5.1			5.3			26.4			29.2	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	12.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	65.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBT
Lane Group Flow (vph)	527	770	236	233
v/c Ratio	0.28	0.68	0.52	0.53
Control Delay	2.3	24.3	28.3	26.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	2.3	24.3	28.3	26.7
Queue Length 50th (ft)	13	142	87	77
Queue Length 95th (ft)	16	231	203	190
Internal Link Dist (ft)	18	500		709
Turn Bay Length (ft)				
Base Capacity (vph)	2450	1983	634	601
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	31	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.22	0.39	0.37	0.39

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	474	0	0	580	67	304	49	64	0	0	0
Future Volume (vph)	11	474	0	0	580	67	304	49	64	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	11	12	12	12
Total Lost time (s)		3.5			3.5		3.5	3.5				
Lane Util. Factor		0.95			0.95		0.95	0.95				
Frpb, ped/bikes		1.00			0.99		1.00	0.98				
Flpb, ped/bikes		1.00			1.00		1.00	1.00				
Frt		1.00			0.98		1.00	0.95				
Flt Protected		1.00			1.00		0.95	0.98				
Satd. Flow (prot)		3319			3246		1549	1449				
Flt Permitted		0.94			1.00		0.95	0.98				
Satd. Flow (perm)		3115			3246		1549	1449				
Peak-hour factor, PHF	0.92	0.92	0.92	0.84	0.84	0.84	0.89	0.89	0.89	0.92	0.92	0.92
Adj. Flow (vph)	12	515	0	0	690	80	342	55	72	0	0	0
RTOR Reduction (vph)	0	0	0	0	9	0	0	15	0	0	0	0
Lane Group Flow (vph)	0	527	0	0	761	0	236	218	0	0	0	0
Confl. Peds. (#/hr)	21					21			50	50		
Confl. Bikes (#/hr)			4			8						
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	7%	7%	7%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	7	0	0	0	0
Turn Type	custom	NA			NA		Split	NA				
Protected Phases		2 13			6		4	4				
Permitted Phases	13											
Actuated Green, G (s)		41.8			23.9		20.2	20.2				
Effective Green, g (s)		42.8			24.9		21.2	21.2				
Actuated g/C Ratio		0.60			0.35		0.30	0.30				
Clearance Time (s)					4.5		4.5	4.5				
Vehicle Extension (s)					3.5		2.5	2.5				
Lane Grp Cap (vph)		1877			1138		462	432				
v/s Ratio Prot					c0.23		c0.15	0.15				
v/s Ratio Perm		c0.17										
v/c Ratio		0.28			0.67		0.51	0.51				
Uniform Delay, d1		6.7			19.6		20.6	20.6				
Progression Factor		0.28			1.00		1.00	1.00				
Incremental Delay, d2		0.1			1.6		0.7	0.7				
Delay (s)		1.9			21.1		21.3	21.2				
Level of Service		A			C		C	C				
Approach Delay (s)		1.9			21.1			21.3			0.0	
Approach LOS		A			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	15.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	71.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	43.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	SBL	SBT
Lane Group Flow (vph)	655	1052	153	151
v/c Ratio	0.51	0.66	0.50	0.48
Control Delay	11.6	3.5	34.5	31.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	11.6	3.5	34.5	31.7
Queue Length 50th (ft)	58	13	63	55
Queue Length 95th (ft)	131	8	146	136
Internal Link Dist (ft)	571	18		1167
Turn Bay Length (ft)				
Base Capacity (vph)	1555	2189	594	591
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.42	0.48	0.26	0.26

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	285	298	343	541	0	0	0	0	200	41	29
Future Volume (vph)	0	285	298	343	541	0	0	0	0	200	41	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	12	12	12	11	11	11
Total Lost time (s)		-0.5			3.5					3.5	3.5	
Lane Util. Factor		0.95			0.95					0.95	0.95	
Frpb, ped/bikes		0.94			1.00					1.00	0.99	
Flpb, ped/bikes		1.00			0.99					1.00	1.00	
Frt		0.92			1.00					1.00	0.97	
Flt Protected		1.00			0.98					0.95	0.98	
Satd. Flow (prot)		2852			3212					1535	1510	
Flt Permitted		1.00			0.55					0.95	0.98	
Satd. Flow (perm)		2852			1807					1535	1510	
Peak-hour factor, PHF	0.89	0.89	0.89	0.84	0.84	0.84	0.92	0.92	0.92	0.89	0.89	0.89
Adj. Flow (vph)	0	320	335	408	644	0	0	0	0	225	46	33
RTOR Reduction (vph)	0	157	0	0	0	0	0	0	0	0	10	0
Lane Group Flow (vph)	0	498	0	0	1052	0	0	0	0	153	141	0
Confl. Peds. (#/hr)			42	42			30					30
Confl. Bikes (#/hr)			4			1						4
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	2%	2%	2%	8%	8%	8%
Turn Type		NA		custom	NA					Split	NA	
Protected Phases		2		1 4	4 16					3	3	
Permitted Phases				16								
Actuated Green, G (s)		23.9			44.1					13.4	13.4	
Effective Green, g (s)		28.9			46.1					14.4	14.4	
Actuated g/C Ratio		0.41			0.65					0.20	0.20	
Clearance Time (s)		4.5								4.5	4.5	
Vehicle Extension (s)		3.5								2.5	2.5	
Lane Grp Cap (vph)		1160			1592					311	306	
v/s Ratio Prot		0.17			c0.20					c0.10	0.09	
v/s Ratio Perm					c0.23							
v/c Ratio		0.43			0.66					0.49	0.46	
Uniform Delay, d1		15.1			7.6					25.1	24.9	
Progression Factor		1.00			0.26					1.00	1.00	
Incremental Delay, d2		0.3			0.9					0.9	0.8	
Delay (s)		15.4			2.9					26.0	25.7	
Level of Service		B			A					C	C	
Approach Delay (s)		15.4			2.9			0.0			25.8	
Approach LOS		B			A			A			C	

Intersection Summary			
HCM 2000 Control Delay	10.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	71.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	67.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	23	474	4	33	356	10	2	9	69	23	7	28
Future Vol, veh/h	23	474	4	33	356	10	2	9	69	23	7	28
Conflicting Peds, #/hr	4	0	12	12	0	4	6	0	19	19	0	6
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	79	79	79	91	91	91	42	42	42	92	92	92
Heavy Vehicles, %	5	5	5	6	6	6	1	1	1	0	0	0
Mvmt Flow	29	600	5	36	391	11	5	21	164	25	8	30

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	406	0	0	617	0	0	951	1151	334	861	1148	211
Stage 1	-	-	-	-	-	-	673	673	-	473	473	-
Stage 2	-	-	-	-	-	-	278	478	-	388	675	-
Critical Hdwy	4.2	-	-	4.22	-	-	7.52	6.52	6.92	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.52	5.52	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.52	5.52	-	6.5	5.5	-
Follow-up Hdwy	2.25	-	-	2.26	-	-	3.51	4.01	3.31	3.5	4	3.3
Pot Cap-1 Maneuver	1128	-	-	932	-	-	216	198	665	253	200	801
Stage 1	-	-	-	-	-	-	413	455	-	546	562	-
Stage 2	-	-	-	-	-	-	708	556	-	613	456	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1124	-	-	923	-	-	185	178	648	157	180	794
Mov Cap-2 Maneuver	-	-	-	-	-	-	185	178	-	157	180	-
Stage 1	-	-	-	-	-	-	393	433	-	523	532	-
Stage 2	-	-	-	-	-	-	634	527	-	411	434	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.9	17.5	23
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	477	1124	-	-	923	-	-	263
HCM Lane V/C Ratio	0.399	0.026	-	-	0.039	-	-	0.24
HCM Control Delay (s)	17.5	8.3	0.1	-	9.1	0.2	-	23
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	1.9	0.1	-	-	0.1	-	-	0.9

Intersection	
Intersection Delay, s/veh	10.3
Intersection LOS	B

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Vol, veh/h	3	2	13	174	15	19	19	210	4	20	126	84
Future Vol, veh/h	3	2	13	174	15	19	19	210	4	20	126	84
Peak Hour Factor	0.56	0.56	0.56	0.90	0.90	0.90	0.82	0.82	0.82	0.87	0.87	0.87
Heavy Vehicles, %	6	6	6	1	1	1	6	6	6	5	5	5
Mvmt Flow	5	4	23	193	17	21	23	256	5	23	145	97
Number of Lanes	0	1	0	0	1	0	0	2	0	0	2	0

Approach	NB	SB	SE	NW
Opposing Approach	SB	NB	NW	SE
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SE	NW	SB	NB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NW	SE	NB	SB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	8.7	11.3	10.1	9.7
HCM LOS	A	B	B	A

Lane	NBLn1	NWLn1	NWLn2	SELn1	SELn2	SBLn1
Vol Left, %	17%	24%	0%	15%	0%	84%
Vol Thru, %	11%	76%	43%	85%	96%	7%
Vol Right, %	72%	0%	57%	0%	4%	9%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	18	83	147	124	109	208
LT Vol	3	20	0	19	0	174
Through Vol	2	63	63	105	105	15
RT Vol	13	0	84	0	4	19
Lane Flow Rate	32	95	169	151	133	231
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.048	0.152	0.245	0.238	0.209	0.344
Departure Headway (Hd)	5.406	5.842	5.316	5.675	5.671	5.361
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	666	617	679	626	637	663
Service Time	3.411	3.542	3.016	3.474	3.371	3.453
HCM Lane V/C Ratio	0.048	0.154	0.249	0.241	0.209	0.348
HCM Control Delay	8.7	9.6	9.7	10.3	9.9	11.3
HCM Lane LOS	A	A	A	B	A	B
HCM 95th-tile Q	0.2	0.5	1	0.9	0.8	1.5

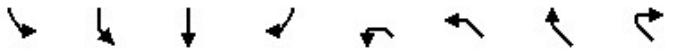
Lane Group	EBT	WBT	NBT	SBT	NWL
Lane Group Flow (vph)	338	231	32	244	177
v/c Ratio	0.50	0.29	0.08	0.53	0.23
Control Delay	31.2	25.7	29.1	37.7	18.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	31.2	25.7	29.1	37.7	18.3
Queue Length 50th (ft)	95	54	16	144	26
Queue Length 95th (ft)	126	74	21	186	50
Internal Link Dist (ft)	294	560	193	463	230
Turn Bay Length (ft)					
Base Capacity (vph)	670	787	414	457	784
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.50	0.29	0.08	0.53	0.23

Intersection Summary

Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Lane Configurations												
Traffic Volume (vph)	2	170	111	15	4	13	124	42	5	3	6	1
Future Volume (vph)	2	170	111	15	4	13	124	42	5	3	6	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	16	12	12
Total Lost time (s)		6.5					6.5			5.0		
Lane Util. Factor		0.95					0.95			1.00		
Frpb, ped/bikes		0.84					0.96			1.00		
Flpb, ped/bikes		1.00					0.98			0.95		
Frt		0.94					0.97			0.94		
Flt Protected		1.00					1.00			0.98		
Satd. Flow (prot)		2295					2772			1570		
Flt Permitted		0.95					0.90			0.89		
Satd. Flow (perm)		2189					2502			1426		
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.79	0.79	0.79	0.79	0.47	0.47	0.47	0.47
Adj. Flow (vph)	2	193	126	17	5	16	157	53	11	6	13	2
RTOR Reduction (vph)	0	3	0	0	0	0	25	0	0	0	0	0
Lane Group Flow (vph)	0	335	0	0	0	0	206	0	0	32	0	0
Confl. Peds. (#/hr)	64		40	39	40	39		64	157			
Confl. Bikes (#/hr)			1	1				2				
Heavy Vehicles (%)	16%	16%	16%	16%	10%	10%	10%	10%	20%	20%	20%	20%
Parking (#/hr)		5					5					
Turn Type	Perm	NA			Perm	Perm	NA		Perm	NA		
Protected Phases		2					6			4		
Permitted Phases	2				6	6			4			
Actuated Green, G (s)		33.5					33.5			32.0		
Effective Green, g (s)		33.5					33.5			32.0		
Actuated g/C Ratio		0.30					0.30			0.29		
Clearance Time (s)		6.5					6.5			5.0		
Lane Grp Cap (vph)		666					761			414		
v/s Ratio Prot												
v/s Ratio Perm		c0.15					0.08			0.02		
v/c Ratio		0.50					0.27			0.08		
Uniform Delay, d1		31.4					29.0			28.3		
Progression Factor		0.91					1.00			1.00		
Incremental Delay, d2		2.7					0.9			0.4		
Delay (s)		31.2					29.9			28.7		
Level of Service		C					C			C		
Approach Delay (s)		31.2					29.9			28.7		
Approach LOS		C					C			C		

Intersection Summary			
HCM 2000 Control Delay	32.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lane Configurations								
Traffic Volume (vph)	36	117	31	4	1	76	53	19
Future Volume (vph)	36	117	31	4	1	76	53	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	16	12	12	12	12	12
Total Lost time (s)			5.0			6.5		
Lane Util. Factor			1.00			0.97		
Frpb, ped/bikes			0.99			0.97		
Flpb, ped/bikes			1.00			1.00		
Frt			1.00			0.93		
Flt Protected			0.96			0.97		
Satd. Flow (prot)			2030			2992		
Flt Permitted			0.74			0.97		
Satd. Flow (perm)			1571			2992		
Peak-hour factor, PHF	0.77	0.77	0.77	0.77	0.84	0.84	0.84	0.84
Adj. Flow (vph)	47	152	40	5	1	90	63	23
RTOR Reduction (vph)	0	0	1	0	0	64	0	0
Lane Group Flow (vph)	0	0	243	0	0	113	0	0
Confl. Peds. (#/hr)				157				18
Confl. Bikes (#/hr)				8				1
Heavy Vehicles (%)	1%	1%	1%	1%	8%	8%	8%	8%
Parking (#/hr)								
Turn Type	Perm	Perm	NA		Perm	Prot		
Protected Phases			4			3		
Permitted Phases	4	4			3			
Actuated Green, G (s)			32.0			26.5		
Effective Green, g (s)			32.0			26.5		
Actuated g/C Ratio			0.29			0.24		
Clearance Time (s)			5.0			6.5		
Lane Grp Cap (vph)			457			720		
v/s Ratio Prot								
v/s Ratio Perm			c0.15			0.04		
v/c Ratio			0.53			0.16		
Uniform Delay, d1			32.7			32.9		
Progression Factor			1.00			1.00		
Incremental Delay, d2			4.4			0.5		
Delay (s)			37.1			33.4		
Level of Service			D			C		
Approach Delay (s)			37.1			33.4		
Approach LOS			D			C		

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	26	242	524	39	207	93	143	105	138	508	52
v/c Ratio	0.33	0.42	0.65	0.48	0.41	0.10	0.46	0.33	0.25	0.89	0.11
Control Delay	62.2	36.0	19.8	65.2	30.0	0.3	44.7	39.4	27.8	53.8	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.2	36.0	19.8	65.2	30.4	0.3	44.7	39.4	27.8	53.8	0.6
Queue Length 50th (ft)	18	140	196	28	120	0	94	64	69	328	0
Queue Length 95th (ft)	46	239	311	62	167	0	135	100	116	#465	2
Internal Link Dist (ft)		1194			73			53		202	
Turn Bay Length (ft)			100	50					100		
Base Capacity (vph)	79	576	863	83	501	965	390	401	608	640	500
Starvation Cap Reductn	0	0	0	0	64	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.42	0.61	0.47	0.47	0.10	0.37	0.26	0.23	0.79	0.10

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	213	461	33	176	79	120	79	9	134	493	50
Future Volume (vph)	23	213	461	33	176	79	120	79	9	134	493	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	12	12	12	12	12	11	11	12
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.93	1.00	1.00	0.93	1.00	0.98		1.00	1.00	0.77
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1752	1783	1463	1671	1539	1397	1752	1785		1694	1783	1205
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1752	1783	1463	1671	1539	1397	1752	1785		1694	1783	1205
Peak-hour factor, PHF	0.88	0.88	0.88	0.85	0.85	0.85	0.84	0.84	0.84	0.97	0.97	0.97
Adj. Flow (vph)	26	242	524	39	207	93	143	94	11	138	508	52
RTOR Reduction (vph)	0	0	70	0	0	34	0	4	0	0	0	35
Lane Group Flow (vph)	26	242	454	39	207	59	143	101	0	138	508	17
Confl. Peds. (#/hr)	38		27	27		38	66		44	44		66
Confl. Bikes (#/hr)			1			1						15
Heavy Vehicles (%)	3%	3%	3%	8%	8%	8%	3%	3%	3%	3%	3%	3%
Parking (#/hr)					5							
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA		Split	NA	Perm
Protected Phases	1	6	3	5	2	4	3	3		4	4	
Permitted Phases			6			2						4
Actuated Green, G (s)	3.0	33.7	53.4	3.3	34.0	69.3	19.7	19.7		35.3	35.3	35.3
Effective Green, g (s)	3.0	33.7	53.4	3.3	34.0	69.3	19.7	19.7		35.3	35.3	35.3
Actuated g/C Ratio	0.03	0.31	0.49	0.03	0.31	0.63	0.18	0.18		0.32	0.32	0.32
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	2.0	2.5	3.0	2.0	2.5	2.0	3.0	3.0		2.0	2.0	2.0
Lane Grp Cap (vph)	47	546	770	50	475	880	313	319		543	572	386
v/s Ratio Prot	0.01	0.14	c0.11	c0.02	0.13	0.02	0.08	0.06		0.08	c0.28	
v/s Ratio Perm			0.20			0.02						0.01
v/c Ratio	0.55	0.44	0.59	0.78	0.44	0.07	0.46	0.32		0.25	0.89	0.04
Uniform Delay, d1	52.8	30.6	20.4	53.0	30.3	7.9	40.4	39.3		27.6	35.5	25.7
Progression Factor	1.00	1.00	1.00	0.90	0.82	0.09	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	7.8	2.6	1.2	50.6	2.9	0.0	1.1	0.6		0.1	15.1	0.0
Delay (s)	60.6	33.2	21.6	98.3	27.6	0.7	41.4	39.9		27.7	50.5	25.7
Level of Service	E	C	C	F	C	A	D	D		C	D	C
Approach Delay (s)		26.4			28.4			40.8			44.2	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	34.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	72.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	515	451	46	821	104	1183	251
v/c Ratio	0.96	0.92	0.79	0.55	0.66	0.92	0.37
Control Delay	81.6	75.6	130.2	34.4	74.6	47.0	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.6	75.6	130.2	34.4	74.6	47.0	6.5
Queue Length 50th (ft)	225	192	39	198	85	504	18
Queue Length 95th (ft)	#341	#230	#115	255	144	#664	77
Internal Link Dist (ft)	193	252		634		98	
Turn Bay Length (ft)			240		150		
Base Capacity (vph)	534	507	58	1484	203	1284	680
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.89	0.79	0.55	0.51	0.92	0.37

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	263	174	52	170	145	50	42	660	87	100	1136	241
Future Volume (vph)	263	174	52	170	145	50	42	660	87	100	1136	241
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	9	9	12	9	9	12	11	10	12	11	10	11
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor		0.95			0.95		1.00	0.91		1.00	0.95	1.00
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	1.00	0.95
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt		0.98			0.98		1.00	0.98		1.00	1.00	0.85
Flt Protected		0.97			0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		2604			2590		1481	4021		1481	2861	1253
Flt Permitted		0.97			0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		2604			2590		1481	4021		1481	2861	1253
Peak-hour factor, PHF	0.95	0.95	0.95	0.81	0.81	0.81	0.91	0.91	0.91	0.96	0.96	0.96
Adj. Flow (vph)	277	183	55	210	179	62	46	725	96	104	1183	251
RTOR Reduction (vph)	0	7	0	0	10	0	0	12	0	0	0	119
Lane Group Flow (vph)	0	508	0	0	441	0	46	809	0	104	1183	132
Confl. Peds. (#/hr)	39		26	26		39	19		11	11		19
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	6%	6%	6%	6%	6%	6%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)		26.3			24.1		4.1	47.7		13.9	57.5	57.5
Effective Green, g (s)		26.3			24.1		4.1	47.7		13.9	57.5	57.5
Actuated g/C Ratio		0.20			0.19		0.03	0.37		0.11	0.44	0.44
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)		3.0			2.0		5.0	3.5		3.0	3.5	3.5
Lane Grp Cap (vph)		526			480		46	1475		158	1265	554
v/s Ratio Prot		c0.20			c0.17		c0.03	0.20		0.07	c0.41	
v/s Ratio Perm												0.11
v/c Ratio		0.97			0.92		1.00	0.55		0.66	0.94	0.24
Uniform Delay, d1		51.4			52.0		63.0	32.6		55.8	34.5	22.6
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		30.3			22.2		132.7	1.5		9.5	13.9	1.0
Delay (s)		81.7			74.2		195.6	34.1		65.3	48.4	23.6
Level of Service		F			E		F	C		E	D	C
Approach Delay (s)		81.7			74.2			42.7			45.5	
Approach LOS		F			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	54.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	91.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBR2	WBL	WBT	NBL	NBT	SBL	SBT	SBR	NEL	NER
Lane Group Flow (vph)	20	388	390	41	276	112	372	1162	875	408
v/c Ratio	0.03	1.02	0.97	0.67	0.28	0.30	0.74	0.94	0.98	0.86
Control Delay	0.1	103.0	89.6	110.0	33.7	31.8	46.8	50.8	76.5	46.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.1	103.0	89.6	110.0	33.7	31.8	46.8	50.8	76.5	46.3
Queue Length 50th (ft)	0	~393	370	37	87	67	263	548	410	245
Queue Length 95th (ft)	0	#610	#594	#101	127	113	#395	#727	#549	#451
Internal Link Dist (ft)			579		160		579		494	
Turn Bay Length (ft)				100		250		200		
Base Capacity (vph)	603	380	402	63	972	371	498	1230	891	476
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	1.02	0.97	0.65	0.28	0.30	0.75	0.94	0.98	0.86

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBR2	WBL2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	80	586	29	29	29	8	179	69	104	346	1079
Future Volume (vph)	14	80	586	29	29	29	8	179	69	104	346	1079
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		4.5	4.5			5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	1.00		0.95	0.95			1.00	0.95		1.00	1.00	0.88
Frpb, ped/bikes	1.00		1.00	1.00			1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00		0.94	1.00			0.97	1.00		0.99	1.00	1.00
Frt	0.86		1.00	0.99			1.00	0.96		1.00	1.00	0.85
Flt Protected	1.00		0.95	0.96			0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1536		1543	1626			1687	3284		1718	1827	2733
Flt Permitted	1.00		0.95	0.96			0.62	1.00		0.53	1.00	1.00
Satd. Flow (perm)	1536		1543	1626			1110	3284		958	1827	2733
Peak-hour factor, PHF	0.70	0.93	0.93	0.93	0.93	0.90	0.90	0.90	0.90	0.93	0.93	0.93
Adj. Flow (vph)	20	86	630	31	31	32	9	199	77	112	372	1160
RTOR Reduction (vph)	15	0	0	2	0	0	0	29	0	0	0	75
Lane Group Flow (vph)	5	0	388	388	0	0	41	247	0	112	372	1087
Confl. Peds. (#/hr)		19			11	7	7		13	13		7
Confl. Bikes (#/hr)					2							
Heavy Vehicles (%)	7%	5%	5%	5%	5%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Perm	Perm	Split	NA		custom	Prot	NA		D.P+P	NA	custom
Protected Phases			4	4			5	2		1	6 7	3 7
Permitted Phases	4	4				5				2		
Actuated Green, G (s)	34.5		34.5	34.5			6.4	41.2		49.0	37.6	58.2
Effective Green, g (s)	34.5		34.5	34.5			6.4	41.2		49.0	37.6	58.2
Actuated g/C Ratio	0.25		0.25	0.25			0.05	0.29		0.35	0.27	0.42
Clearance Time (s)	4.5		4.5	4.5			5.0	5.0		5.0		
Vehicle Extension (s)	2.0		2.0	2.0			2.0	2.0		2.0		
Lane Grp Cap (vph)	378		380	400			50	966		377	490	1136
v/s Ratio Prot				0.24				0.08		0.02	c0.20	c0.40
v/s Ratio Perm	0.00		0.25				c0.04			0.09		
v/c Ratio	0.01		1.02	0.97			0.82	0.26		0.30	0.76	0.96
Uniform Delay, d1	39.9		52.8	52.2			66.2	37.7		31.7	47.0	39.7
Progression Factor	1.00		1.00	1.00			1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.0		51.6	36.3			61.4	0.1		0.2	5.9	17.0
Delay (s)	39.9		104.4	88.6			127.6	37.8		31.9	53.0	56.7
Level of Service	D		F	F			F	D		C	D	E
Approach Delay (s)				96.5				49.4			54.1	
Approach LOS				F				D			D	

Intersection Summary			
HCM 2000 Control Delay	69.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	24.5
Intersection Capacity Utilization	88.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

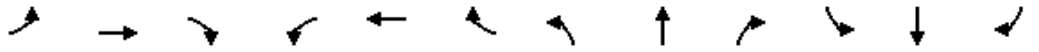
Movement	SBR2	NEL	NER	NER2
Lane Configurations				
Traffic Volume (vph)	2	544	673	14
Future Volume (vph)	2	544	673	14
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	
Lane Util. Factor		0.97	0.91	
Frpb, ped/bikes		1.00	0.91	
Flpb, ped/bikes		1.00	1.00	
Frt		0.95	0.85	
Flt Protected		0.97	1.00	
Satd. Flow (prot)		3283	1305	
Flt Permitted		0.97	1.00	
Satd. Flow (perm)		3283	1305	
Peak-hour factor, PHF	0.93	0.96	0.96	0.96
Adj. Flow (vph)	2	567	701	15
RTOR Reduction (vph)	0	0	124	0
Lane Group Flow (vph)	0	875	284	0
Confl. Peds. (#/hr)	7	11		19
Confl. Bikes (#/hr)				
Heavy Vehicles (%)	4%	3%	3%	3%
Turn Type		Prot	Perm	
Protected Phases		3		
Permitted Phases			3	
Actuated Green, G (s)		37.0	37.0	
Effective Green, g (s)		37.0	37.0	
Actuated g/C Ratio		0.26	0.26	
Clearance Time (s)		5.0	5.0	
Vehicle Extension (s)		2.0	2.0	
Lane Grp Cap (vph)		867	344	
v/s Ratio Prot		0.27		
v/s Ratio Perm			0.22	
v/c Ratio		1.01	0.83	
Uniform Delay, d1		51.5	48.5	
Progression Factor		1.00	1.00	
Incremental Delay, d2		32.9	19.9	
Delay (s)		84.4	68.4	
Level of Service		F	E	
Approach Delay (s)		79.3		
Approach LOS		E		

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	132	854	157	499	83	680	152	134	1299	170
v/c Ratio	0.71	0.97	0.90	0.59	0.79	0.51	0.25	0.74	0.87	0.26
Control Delay	76.4	72.2	102.4	45.9	103.6	32.6	7.4	79.3	41.3	11.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.4	72.2	102.4	45.9	103.6	32.6	7.4	79.3	41.3	11.5
Queue Length 50th (ft)	109	374	132	191	70	230	9	111	523	37
Queue Length 95th (ft)	174	#512	#258	261	#158	307	59	176	627	87
Internal Link Dist (ft)		1255		631		1016			609	
Turn Bay Length (ft)	180		350		450		150	230		150
Base Capacity (vph)	242	878	183	843	111	1332	613	244	1493	653
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.97	0.86	0.59	0.75	0.51	0.25	0.55	0.87	0.26

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	124	743	60	154	433	56	75	612	137	130	1260	165
Future Volume (veh/h)	124	743	60	154	433	56	75	612	137	130	1260	165
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.95	1.00		0.95	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	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			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1811	1811	1811	1811	1811	1811	1826	1826	1826
Adj Flow Rate, veh/h	132	790	64	157	442	57	83	680	152	134	1299	170
Peak Hour Factor	0.94	0.94	0.94	0.98	0.98	0.98	0.90	0.90	0.90	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	6	6	6	6	6	6	5	5	5
Cap, veh/h	157	831	67	181	819	105	108	1392	588	159	1504	645
Arrive On Green	0.09	0.25	0.25	0.10	0.27	0.27	0.06	0.40	0.40	0.09	0.43	0.43
Sat Flow, veh/h	1767	3287	266	1725	3048	390	1725	3441	1454	1739	3469	1488
Grp Volume(v), veh/h	132	424	430	157	248	251	83	680	152	134	1299	170
Grp Sat Flow(s),veh/h/ln	1767	1763	1791	1725	1721	1718	1725	1721	1454	1739	1735	1488
Q Serve(g_s), s	9.6	30.7	30.7	11.7	16.0	16.3	6.2	19.1	9.0	9.9	44.1	9.5
Cycle Q Clear(g_c), s	9.6	30.7	30.7	11.7	16.0	16.3	6.2	19.1	9.0	9.9	44.1	9.5
Prop In Lane	1.00		0.15	1.00		0.23	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	157	446	453	181	462	461	108	1392	588	159	1504	645
V/C Ratio(X)	0.84	0.95	0.95	0.87	0.54	0.54	0.77	0.49	0.26	0.84	0.86	0.26
Avail Cap(c_a), veh/h	245	447	455	186	462	461	113	1392	588	247	1504	645
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.3	47.8	47.8	57.3	40.6	40.7	60.0	28.7	25.7	58.1	33.3	23.5
Incr Delay (d2), s/veh	8.3	29.9	29.7	31.0	0.7	0.7	23.0	1.2	1.1	8.3	6.8	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	17.3	17.5	6.7	7.0	7.1	3.4	8.2	3.4	4.7	19.9	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.6	77.6	77.4	88.3	41.3	41.4	83.0	29.9	26.8	66.4	40.2	24.5
LnGrp LOS	E	E	E	F	D	D	F	C	C	E	D	C
Approach Vol, veh/h		986			656			915			1603	
Approach Delay, s/veh		76.1			52.6			34.2			40.7	
Approach LOS		E			D			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.4	57.1	18.6	37.9	12.7	60.9	16.5	39.9
Change Period (Y+Rc), s	4.5	4.5	5.0	5.0	4.5	4.5	5.0	5.0
Max Green Setting (Gmax), s	18.5	45.5	14.0	33.0	8.5	55.5	18.0	29.0
Max Q Clear Time (g_c+I1), s	11.9	21.1	13.7	32.7	8.2	46.1	11.6	18.3
Green Ext Time (p_c), s	0.1	10.4	0.0	0.1	0.0	8.1	0.1	1.3

Intersection Summary	
HCM 6th Ctrl Delay	49.5
HCM 6th LOS	D

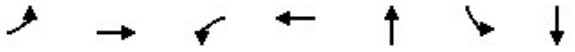
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	238	207	279	255
v/c Ratio	0.76	0.60	0.18	0.32
Control Delay	32.7	21.4	8.3	10.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	32.7	21.4	8.3	10.5
Queue Length 50th (ft)	70	50	21	43
Queue Length 95th (ft)	112	94	51	114
Internal Link Dist (ft)	220	255	335	406
Turn Bay Length (ft)				
Base Capacity (vph)	684	721	1523	790
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.35	0.29	0.18	0.32

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	102	37	34	94	46	1	208	17	0	207	9
Future Volume (vph)	47	102	37	34	94	46	1	208	17	0	207	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			0.95			1.00	
Frpb, ped/bikes		0.90			0.93			0.97			0.97	
Flpb, ped/bikes		0.96			0.94			1.00			1.00	
Frt		0.97			0.96			0.99			0.99	
Flt Protected		0.99			0.99			1.00			1.00	
Satd. Flow (prot)		1119			1152			2915			1438	
Flt Permitted		0.89			0.91			0.95			1.00	
Satd. Flow (perm)		1011			1059			2783			1438	
Peak-hour factor, PHF	0.78	0.78	0.78	0.84	0.84	0.84	0.81	0.81	0.81	0.85	0.85	0.85
Adj. Flow (vph)	60	131	47	40	112	55	1	257	21	0	244	11
RTOR Reduction (vph)	0	7	0	0	23	0	0	5	0	0	1	0
Lane Group Flow (vph)	0	231	0	0	184	0	0	274	0	0	254	0
Confl. Peds. (#/hr)	284		377	377		284	557		175	175		557
Confl. Bikes (#/hr)			8			16			14			4
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	7%	7%	7%	15%	15%	15%
Parking (#/hr)		15			15							
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		4			4			2			6	
Permitted Phases	4			4			2					
Actuated Green, G (s)		17.9			17.9			32.0			32.0	
Effective Green, g (s)		18.4			18.4			32.5			32.5	
Actuated g/C Ratio		0.31			0.31			0.55			0.55	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		2.0			2.0			0.2			0.2	
Lane Grp Cap (vph)		315			330			1535			793	
v/s Ratio Prot											c0.18	
v/s Ratio Perm		c0.23			0.17			0.10				
v/c Ratio		0.73			0.56			0.18			0.32	
Uniform Delay, d1		18.1			16.9			6.6			7.2	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		7.4			1.2			0.3			0.1	
Delay (s)		25.5			18.0			6.8			7.3	
Level of Service		C			B			A			A	
Approach Delay (s)		25.5			18.0			6.8			7.3	
Approach LOS		C			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	13.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	58.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	38.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	11	1438	97	1638	338	205	105
v/c Ratio	0.15	1.27	1.94	0.71	0.73	1.53	0.25
Control Delay	69.5	167.0	521.4	22.2	40.3	309.8	38.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.5	167.0	521.4	22.2	40.3	309.8	38.5
Queue Length 50th (ft)	9	~549	~125	276	86	~238	71
Queue Length 95th (ft)	32	#747	#228	531	138	#414	113
Internal Link Dist (ft)		218		252	406		356
Turn Bay Length (ft)	90					135	
Base Capacity (vph)	83	1136	50	2303	641	134	721
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	1.27	1.94	0.71	0.53	1.53	0.15

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	10	1332	6	8	80	1151	339	0	136	165	174	89
Future Volume (vph)	10	1332	6	8	80	1151	339	0	136	165	174	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	12	11	12	12	12	12	12	12
Total Lost time (s)	4.5	5.5			4.5	5.5			6.0		4.5	6.0
Lane Util. Factor	1.00	0.91			1.00	0.91			0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00			1.00	0.92			0.84		1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00			1.00		1.00	1.00
Frt	1.00	1.00			1.00	0.97			0.92		1.00	1.00
Flt Protected	0.95	1.00			0.95	1.00			1.00		0.95	1.00
Satd. Flow (prot)	1593	4204			1593	3766			2364		1438	1513
Flt Permitted	0.95	1.00			0.09	1.00			1.00		0.95	1.00
Satd. Flow (perm)	1593	4204			150	3766			2364		1438	1513
Peak-hour factor, PHF	0.93	0.93	0.93	0.91	0.91	0.91	0.91	0.89	0.89	0.89	0.85	0.85
Adj. Flow (vph)	11	1432	6	9	88	1265	373	0	153	185	205	105
RTOR Reduction (vph)	0	0	0	0	0	25	0	0	121	0	0	0
Lane Group Flow (vph)	11	1438	0	0	97	1613	0	0	217	0	205	105
Confl. Peds. (#/hr)	219		345		345		219	316		202	202	
Confl. Bikes (#/hr)							1			11		
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	6%	6%	6%	13%	13%
Parking (#/hr)		8	8			8	8					
Turn Type	Prot	NA		custom	Prot	NA			NA		Prot	NA
Protected Phases	7	4			3	8			2		1	6
Permitted Phases				3								
Actuated Green, G (s)	2.3	38.8			44.2	80.7			19.2		12.1	36.3
Effective Green, g (s)	2.8	39.3			44.7	81.2			19.7		12.6	36.8
Actuated g/C Ratio	0.02	0.29			0.33	0.59			0.14		0.09	0.27
Clearance Time (s)	5.0	6.0			5.0	6.0			6.5		5.0	6.5
Vehicle Extension (s)	2.0	2.0			2.0	2.0			2.0		2.0	2.0
Lane Grp Cap (vph)	32	1207			49	2235			340		132	407
v/s Ratio Prot	0.01	c0.34				0.43			c0.09		c0.14	0.07
v/s Ratio Perm					c0.65							
v/c Ratio	0.34	1.19			1.98	0.72			0.64		1.55	0.26
Uniform Delay, d1	66.1	48.8			46.1	19.8			55.2		62.1	39.3
Progression Factor	1.00	1.00			1.00	1.00			1.00		1.00	1.00
Incremental Delay, d2	2.3	94.6			505.5	1.0			2.9		282.6	0.1
Delay (s)	68.4	143.3			551.6	20.8			58.1		344.7	39.4
Level of Service	E	F			F	C			E		F	D
Approach Delay (s)		142.8				50.4			58.1			241.3
Approach LOS		F				D			E			F

Intersection Summary			
HCM 2000 Control Delay	101.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.50		
Actuated Cycle Length (s)	136.8	Sum of lost time (s)	25.5
Intersection Capacity Utilization	91.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	0
Future Volume (vph)	0
Ideal Flow (vphpl)	1900
Lane Width	12
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.85
Adj. Flow (vph)	0
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	316
Confl. Bikes (#/hr)	3
Heavy Vehicles (%)	13%
Parking (#/hr)	
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	403	156	454	15	480	422	302	43
v/c Ratio	0.79	0.26	0.70	0.08	0.80	0.78	0.38	0.16
Control Delay	46.4	27.8	9.7	20.9	61.1	33.5	23.5	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0
Total Delay	46.4	27.8	9.7	20.9	61.1	33.6	24.3	1.2
Queue Length 50th (ft)	300	90	0	6	213	228	148	0
Queue Length 95th (ft)	232	140	79	17	#295	175	145	0
Internal Link Dist (ft)	179	254			356		489	
Turn Bay Length (ft)			300	100		125		
Base Capacity (vph)	509	597	670	188	599	567	801	272
Starvation Cap Reductn	0	0	0	0	0	1	253	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.26	0.68	0.08	0.80	0.75	0.55	0.16

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	164	68	20	116	395	15	436	34	245	175	25
Future Volume (vph)	6	164	68	20	116	395	15	436	34	245	175	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	11	12	11	11	10	12	12	12
Total Lost time (s)		5.0			5.0	5.0	3.0	5.0		3.0	4.0	4.5
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	1.00	1.00
Frpb, ped/bikes		0.92			1.00	0.87	1.00	0.96		1.00	1.00	0.36
Flpb, ped/bikes		1.00			0.99	1.00	0.77	1.00		1.00	1.00	1.00
Frt		0.96			1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected		1.00			0.99	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1243			1561	1218	1162	2858		1547	1629	496
Flt Permitted		0.99			0.91	1.00	0.58	1.00		0.27	1.00	1.00
Satd. Flow (perm)		1236			1436	1218	704	2858		432	1629	496
Peak-hour factor, PHF	0.59	0.59	0.59	0.87	0.87	0.87	0.98	0.98	0.98	0.58	0.58	0.58
Adj. Flow (vph)	10	278	115	23	133	454	15	445	35	422	302	43
RTOR Reduction (vph)	0	8	0	0	0	335	0	3	0	0	0	22
Lane Group Flow (vph)	0	395	0	0	156	119	15	477	0	422	302	21
Confl. Peds. (#/hr)	90		64	64		90	260		202	202		260
Confl. Bikes (#/hr)			22			22			5			5
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	4%	4%	4%	5%	5%	5%
Parking (#/hr)		8										
Turn Type	Perm	NA		Perm	NA	custom	pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		1	2			6		6
Actuated Green, G (s)		55.0			55.0	36.7	32.8	30.4		70.6	64.7	64.7
Effective Green, g (s)		54.5			54.5	35.2	33.8	29.9		71.1	65.2	64.7
Actuated g/C Ratio		0.40			0.40	0.26	0.25	0.22		0.53	0.48	0.48
Clearance Time (s)		4.5			4.5	3.5	3.5	4.5		3.5	4.5	4.5
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		500			581	318	186	634		536	789	238
v/s Ratio Prot							0.00	0.17		c0.22	0.19	
v/s Ratio Perm		c0.32			0.11	0.10	0.02			c0.20		0.04
v/c Ratio		0.79			0.27	0.37	0.08	0.75		0.79	0.38	0.09
Uniform Delay, d1		35.0			26.7	40.7	38.2	48.9		22.4	22.0	18.9
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		8.1			1.1	0.7	0.2	8.0		7.5	1.4	0.7
Delay (s)		43.1			27.9	41.4	38.4	56.9		30.0	23.4	19.7
Level of Service		D			C	D	D	E		C	C	B
Approach Delay (s)		43.1			38.0			56.4			26.8	
Approach LOS		D			D			E			C	

Intersection Summary			
HCM 2000 Control Delay	39.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	134.6	Sum of lost time (s)	25.0
Intersection Capacity Utilization	76.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

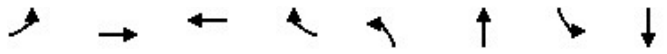
Lane Group	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	954	117	502	453
v/c Ratio	0.70	0.48	0.76	0.32
Control Delay	16.9	50.5	28.8	19.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	16.9	50.5	28.8	19.1
Queue Length 50th (ft)	82	45	68	47
Queue Length 95th (ft)	428	148	361	184
Internal Link Dist (ft)		472		268
Turn Bay Length (ft)			150	
Base Capacity (vph)	1834	520	1195	2461
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.52	0.23	0.42	0.18

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	887	70	23	432	390
Future Volume (vph)	0	887	70	23	432	390
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	12	11
Total Lost time (s)		4.0	4.0		4.0	4.0
Lane Util. Factor		0.88	1.00		1.00	0.95
Frpb, ped/bikes		0.98	0.95		1.00	1.00
Flpb, ped/bikes		1.00	1.00		0.90	1.00
Frt		0.85	0.97		1.00	1.00
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		2382	1495		1422	3049
Flt Permitted		1.00	1.00		0.68	1.00
Satd. Flow (perm)		2382	1495		1021	3049
Peak-hour factor, PHF	0.93	0.93	0.80	0.80	0.86	0.86
Adj. Flow (vph)	0	954	88	29	502	453
RTOR Reduction (vph)	0	0	7	0	0	0
Lane Group Flow (vph)	0	954	110	0	502	453
Confl. Peds. (#/hr)		24		143	143	
Confl. Bikes (#/hr)				22		
Heavy Vehicles (%)	2%	2%	5%	5%	3%	3%
Turn Type		custom	NA		custom	NA
Protected Phases		4	2		1	6
Permitted Phases		1			4	6
Actuated Green, G (s)		50.1	15.7		50.1	41.7
Effective Green, g (s)		51.1	16.2		51.1	42.2
Actuated g/C Ratio		0.57	0.18		0.57	0.47
Clearance Time (s)		4.5	4.5		4.5	4.5
Vehicle Extension (s)		2.0	0.2		2.0	0.2
Lane Grp Cap (vph)		1471	271		683	1442
v/s Ratio Prot		0.21	c0.07		c0.18	0.15
v/s Ratio Perm		0.19			c0.24	
v/c Ratio		0.65	0.40		0.73	0.31
Uniform Delay, d1		12.9	32.2		14.7	14.5
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.7	0.4		3.5	0.0
Delay (s)		13.7	32.6		18.3	14.6
Level of Service		B	C		B	B
Approach Delay (s)	13.7		32.6			16.5
Approach LOS	B		C			B

Intersection Summary			
HCM 2000 Control Delay	16.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	89.2	Sum of lost time (s)	15.0
Intersection Capacity Utilization	61.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	753	341	441	765	185	306	314	207
v/c Ratio	1.07	0.38	0.88	0.55	0.63	0.52	0.51	0.67
Control Delay	98.1	18.3	62.4	23.6	55.3	47.6	47.5	49.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	98.1	18.3	62.4	23.6	55.3	47.6	47.5	49.1
Queue Length 50th (ft)	~331	150	~367	245	128	108	113	125
Queue Length 95th (ft)	#453	226	#549	305	203	153	160	211
Internal Link Dist (ft)		428	311			772		219
Turn Bay Length (ft)				100				
Base Capacity (vph)	707	904	504	1393	368	733	617	311
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.07	0.38	0.88	0.55	0.50	0.42	0.51	0.67

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	693	192	121	0	388	673	168	272	6	301	102	97
Future Volume (vph)	693	192	121	0	388	673	168	272	6	301	102	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5			4.5	4.5	6.5	6.5		5.5	5.5	
Lane Util. Factor	0.97	1.00			1.00	0.88	1.00	0.95		0.97	1.00	
Frpb, ped/bikes	1.00	0.98			1.00	1.00	1.00	0.99		1.00	0.93	
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.94			1.00	0.85	1.00	1.00		1.00	0.93	
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3467	1730			1863	2787	1770	3506		3367	1545	
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3467	1730			1863	2787	1770	3506		3367	1545	
Peak-hour factor, PHF	0.92	0.92	0.92	0.88	0.88	0.88	0.91	0.91	0.91	0.96	0.96	0.96
Adj. Flow (vph)	753	209	132	0	441	765	185	299	7	314	106	101
RTOR Reduction (vph)	0	18	0	0	0	0	0	2	0	0	29	0
Lane Group Flow (vph)	753	323	0	0	441	765	185	304	0	314	178	0
Confl. Peds. (#/hr)	57		26	26		57	24		27	27		24
Confl. Bikes (#/hr)			7						170			26
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	2%	2%	2%	4%	4%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	6	2
Turn Type	Prot	NA			NA	custom	Split	NA		Split	NA	
Protected Phases	4	1 4			1	5	3	3		2	2	
Permitted Phases												
Actuated Green, G (s)	24.5	61.5			32.5	60.0	20.0	20.0		22.0	22.0	
Effective Green, g (s)	24.5	61.5			32.5	60.0	20.0	20.0		22.0	22.0	
Actuated g/C Ratio	0.20	0.51			0.27	0.50	0.17	0.17		0.18	0.18	
Clearance Time (s)	4.5				4.5	4.5	6.5	6.5		5.5	5.5	
Vehicle Extension (s)	3.0				2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	707	886			504	1393	295	584		617	283	
v/s Ratio Prot	c0.22	0.19			c0.24	c0.27	c0.10	0.09		0.09	0.12	
v/s Ratio Perm												
v/c Ratio	1.07	0.37			0.88	0.55	0.63	0.52		0.51	0.63	
Uniform Delay, d1	47.8	17.5			41.8	20.7	46.5	45.6		44.1	45.2	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	52.5	0.3			18.8	1.6	3.0	0.4		0.2	3.3	
Delay (s)	100.3	17.8			60.6	22.2	49.5	46.0		44.4	48.6	
Level of Service	F	B			E	C	D	D		D	D	
Approach Delay (s)		74.6			36.3			47.3			46.0	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	52.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	82.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	627	253	1080	626	694
v/c Ratio	0.81	0.61	0.66	1.18	0.43
Control Delay	45.7	25.0	23.1	109.9	15.3
Queue Delay	0.0	0.0	0.1	0.0	0.3
Total Delay	45.7	25.0	23.1	109.9	15.6
Queue Length 50th (ft)	195	74	307	~129	147
Queue Length 95th (ft)	#264	160	392	#343	m203
Internal Link Dist (ft)		538	902		272
Turn Bay Length (ft)	120			160	
Base Capacity (vph)	778	412	1644	529	1613
Starvation Cap Reductn	0	0	0	0	347
Spillback Cap Reductn	0	0	39	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.81	0.61	0.67	1.18	0.55

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	564	64	164	3	1034	601	0	586	52
Future Volume (vph)	0	0	0	564	64	164	3	1034	601	0	586	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1300	1900	1900	1900
Lane Width	12	12	12	11	11	12	12	11	9	12	12	12
Total Lost time (s)				7.0	7.0			7.0	4.5		7.0	
Lane Util. Factor				0.97	1.00			0.95	1.00		0.95	
Frpb, ped/bikes				1.00	0.85			1.00	0.48		0.95	
Flpb, ped/bikes				1.00	1.00			1.00	1.00		1.00	
Frt				1.00	0.89			1.00	0.85		0.99	
Flt Protected				0.95	1.00			1.00	1.00		1.00	
Satd. Flow (prot)				3385	1391			3419	464		3189	
Flt Permitted				0.95	1.00			0.95	1.00		1.00	
Satd. Flow (perm)				3385	1391			3261	464		3189	
Peak-hour factor, PHF	0.25	0.25	0.25	0.90	0.90	0.90	0.96	0.96	0.96	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	627	71	182	3	1077	626	0	637	57
RTOR Reduction (vph)	0	0	0	0	92	0	0	0	260	0	6	0
Lane Group Flow (vph)	0	0	0	627	161	0	0	1080	366	0	688	0
Confl. Peds. (#/hr)	105		153	153		105	331		117	117		331
Confl. Bikes (#/hr)			16			86			158			14
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	2%	2%	4%	4%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	8	0
Turn Type				Split	NA		Perm	NA	Perm		NA	
Protected Phases		4		3	3			2			6	
Permitted Phases							2		2			
Actuated Green, G (s)				25.5	25.5			50.9	50.9		50.9	
Effective Green, g (s)				23.0	23.0			48.4	50.9		48.4	
Actuated g/C Ratio				0.23	0.23			0.48	0.51		0.48	
Clearance Time (s)				4.5	4.5			4.5	4.5		4.5	
Vehicle Extension (s)				0.2	0.2			0.2	0.2		0.2	
Lane Grp Cap (vph)				778	319			1578	236		1543	
v/s Ratio Prot				c0.19	0.12						0.22	
v/s Ratio Perm								0.33	c0.79			
v/c Ratio				0.81	0.50			0.68	1.55		0.45	
Uniform Delay, d1				36.4	33.5			19.9	24.6		17.0	
Progression Factor				1.00	1.00			1.00	1.00		0.82	
Incremental Delay, d2				8.7	5.6			2.4	268.2		0.9	
Delay (s)				45.1	39.1			22.3	292.8		14.9	
Level of Service				D	D			C	F		B	
Approach Delay (s)		0.0			43.4			121.6			14.9	
Approach LOS		A			D			F			B	

Intersection Summary			
HCM 2000 Control Delay	78.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.20		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	65.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	325	555	289	617	630	115	32	232
v/c Ratio	0.76	0.29	0.96	0.88	0.90	0.30	0.10	0.70
Control Delay	41.1	2.9	80.3	26.1	28.7	2.1	34.9	49.8
Queue Delay	0.0	0.0	0.0	1.0	0.7	0.0	0.0	0.0
Total Delay	41.1	2.9	80.3	27.1	29.4	2.1	34.9	49.8
Queue Length 50th (ft)	206	28	177	84	86	0	17	137
Queue Length 95th (ft)	289	36	#344	#547	#569	m0	36	176
Internal Link Dist (ft)	420		538		272			170
Turn Bay Length (ft)						40	85	
Base Capacity (vph)	428	1945	302	704	701	378	324	332
Starvation Cap Reductn	0	0	0	15	8	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.29	0.96	0.90	0.91	0.30	0.10	0.70

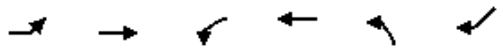
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	276	472	10	212	49	798	299	101	24	156	18
Future Volume (vph)	0	276	472	10	212	49	798	299	101	24	156	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0		5.0		5.0	5.0	5.0	6.0	6.0	
Lane Util. Factor		1.00	0.88		1.00		0.95	0.95	1.00	1.00	1.00	
Frpb, ped/bikes		1.00	1.00		0.90		1.00	1.00	0.49	1.00	0.98	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85		0.98		1.00	1.00	0.85	1.00	0.98	
Flt Protected		1.00	1.00		1.00		0.95	0.98	1.00	0.95	1.00	
Satd. Flow (prot)		1845	2760		1401		1665	1658	737	1752	1777	
Flt Permitted		1.00	1.00		0.90		0.95	0.98	1.00	0.95	1.00	
Satd. Flow (perm)		1845	2760		1270		1665	1658	737	1752	1777	
Peak-hour factor, PHF	0.85	0.85	0.85	0.94	0.94	0.94	0.88	0.88	0.88	0.75	0.75	0.75
Adj. Flow (vph)	0	325	555	11	226	52	907	340	115	32	208	24
RTOR Reduction (vph)	0	0	0	0	8	0	0	0	66	0	4	0
Lane Group Flow (vph)	0	325	555	0	281	0	617	630	49	32	228	0
Confl. Peds. (#/hr)	234		193	193		234	114		133	133		114
Confl. Bikes (#/hr)			2						170			11
Heavy Vehicles (%)	3%	3%	3%	5%	5%	5%	3%	3%	3%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	8	8	0	0	0
Parking (#/hr)				0	3	3						
Turn Type		NA	pt+ov	Perm	NA		Split	NA	Perm	Split	NA	
Protected Phases		4	4 2		4		2	2		1	1	
Permitted Phases				4					2			
Actuated Green, G (s)		22.7	70.0		22.7		41.8	41.8	41.8	18.0	18.0	
Effective Green, g (s)		23.2	70.5		23.2		42.3	42.3	42.3	18.5	18.5	
Actuated g/C Ratio		0.23	0.70		0.23		0.42	0.42	0.42	0.18	0.18	
Clearance Time (s)		5.5			5.5		5.5	5.5	5.5	6.5	6.5	
Lane Grp Cap (vph)		428	1945		294		704	701	311	324	328	
v/s Ratio Prot		0.18	0.20				0.37	c0.38		0.02	c0.13	
v/s Ratio Perm					c0.22				0.07			
v/c Ratio		0.76	0.29		0.96		0.88	0.90	0.16	0.10	0.69	
Uniform Delay, d1		35.8	5.4		37.9		26.5	26.9	17.8	33.8	38.1	
Progression Factor		0.79	0.46		1.00		0.47	0.48	0.12	1.00	1.00	
Incremental Delay, d2		11.7	0.4		42.5		12.0	14.0	0.9	0.6	11.5	
Delay (s)		40.1	2.9		80.5		24.5	26.8	3.0	34.4	49.6	
Level of Service		D	A		F		C	C	A	C	D	
Approach Delay (s)		16.6			80.5			23.7			47.8	
Approach LOS		B			F			C			D	

Intersection Summary			
HCM 2000 Control Delay	29.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	82.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	NBL	SWR
Lane Group Flow (vph)	121	595	123	983	301	280
v/c Ratio	0.61	0.36	0.64	0.59	0.60	0.65
Control Delay	49.6	12.7	57.2	11.9	26.6	12.7
Queue Delay	0.0	0.5	0.0	0.3	0.0	0.0
Total Delay	49.6	13.2	57.2	12.2	26.6	12.7
Queue Length 50th (ft)	56	111	84	91	113	1
Queue Length 95th (ft)	119	151	m95	m128	181	66
Internal Link Dist (ft)		2		420	331	
Turn Bay Length (ft)	60		50			
Base Capacity (vph)	345	1643	247	1668	504	541
Starvation Cap Reductn	0	594	0	191	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.57	0.50	0.67	0.60	0.52

Intersection Summary

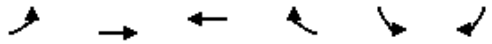
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	NBR2	SWL	SWR
Lane Configurations											
Traffic Volume (vph)	116	525	46	114	893	21	101	101	51	0	246
Future Volume (vph)	116	525	46	114	893	21	101	101	51	0	246
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.5		3.5	4.5		4.5				3.5
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00				1.00
Frpb, ped/bikes	1.00	0.97		1.00	0.99		0.92				1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00				1.00
Frt	1.00	0.99		1.00	1.00		0.92				0.86
Flt Protected	0.95	1.00		0.95	1.00		0.98				1.00
Satd. Flow (prot)	1770	3409		1770	3496		1536				1627
Flt Permitted	0.95	1.00		0.95	1.00		0.98				1.00
Satd. Flow (perm)	1770	3409		1770	3496		1536				1627
Peak-hour factor, PHF	0.96	0.96	0.96	0.93	0.93	0.93	0.84	0.84	0.84	0.88	0.88
Adj. Flow (vph)	121	547	48	123	960	23	120	120	61	0	280
RTOR Reduction (vph)	0	6	0	0	2	0	66	0	0	0	247
Lane Group Flow (vph)	121	589	0	123	981	0	235	0	0	0	33
Confl. Peds. (#/hr)	108		112	112		108			87		
Confl. Bikes (#/hr)			2			9			11		1
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	1%	1%
Turn Type	Prot	NA		Prot	NA		Prot				Over
Protected Phases	1	6		5	2		4				1
Permitted Phases											
Actuated Green, G (s)	11.3	48.0		11.0	47.7		28.5				11.3
Effective Green, g (s)	11.3	48.0		11.0	47.7		28.5				11.3
Actuated g/C Ratio	0.11	0.48		0.11	0.48		0.28				0.11
Clearance Time (s)	3.5	4.5		3.5	4.5		4.5				3.5
Vehicle Extension (s)	2.0	0.2		2.0	0.2		0.2				2.0
Lane Grp Cap (vph)	200	1636		194	1667		437				183
v/s Ratio Prot	0.07	0.17		c0.07	c0.28		c0.15				0.02
v/s Ratio Perm											
v/c Ratio	0.60	0.36		0.63	0.59		0.54				0.18
Uniform Delay, d1	42.2	16.3		42.6	19.0		30.2				40.2
Progression Factor	0.89	0.73		1.20	0.57		1.00				1.00
Incremental Delay, d2	3.4	0.6		2.1	0.7		4.7				0.2
Delay (s)	40.9	12.5		53.1	11.5		34.8				40.3
Level of Service	D	B		D	B		C				D
Approach Delay (s)		17.3			16.1		34.8			40.3	
Approach LOS		B			B		C			D	

Intersection Summary			
HCM 2000 Control Delay	21.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	61.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	SBL
Lane Group Flow (vph)	746	1422	52
v/c Ratio	0.28	0.50	0.22
Control Delay	1.8	2.0	25.6
Queue Delay	0.0	0.1	0.0
Total Delay	1.8	2.1	25.6
Queue Length 50th (ft)	89	64	16
Queue Length 95th (ft)	21	67	30
Internal Link Dist (ft)	470	111	791
Turn Bay Length (ft)			
Base Capacity (vph)	2708	2867	339
Starvation Cap Reductn	0	313	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.28	0.56	0.15

Intersection Summary



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	7	672	1247	32	19	14
Future Volume (vph)	7	672	1247	32	19	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		3.5	
Lane Util. Factor		0.95	0.95		1.00	
Frpb, ped/bikes		1.00	1.00		0.90	
Flpb, ped/bikes		1.00	1.00		1.00	
Frt		1.00	1.00		0.94	
Flt Protected		1.00	1.00		0.97	
Satd. Flow (prot)		3537	3513		1569	
Flt Permitted		0.94	1.00		0.97	
Satd. Flow (perm)		3319	3513		1569	
Peak-hour factor, PHF	0.91	0.91	0.90	0.90	0.63	0.63
Adj. Flow (vph)	8	738	1386	36	30	22
RTOR Reduction (vph)	0	0	1	0	19	0
Lane Group Flow (vph)	0	746	1421	0	33	0
Confl. Peds. (#/hr)	52			52		128
Confl. Bikes (#/hr)				9		
Heavy Vehicles (%)	2%	2%	2%	2%	0%	0%
Turn Type	Perm	NA	NA		Prot	
Protected Phases		6	2		4	
Permitted Phases	6					
Actuated Green, G (s)		78.9	78.9		11.6	
Effective Green, g (s)		79.9	79.9		12.6	
Actuated g/C Ratio		0.80	0.80		0.13	
Clearance Time (s)		5.0	5.0		4.5	
Vehicle Extension (s)		0.2	0.2		1.0	
Lane Grp Cap (vph)		2651	2806		197	
v/s Ratio Prot			c0.40		c0.02	
v/s Ratio Perm		0.22				
v/c Ratio		0.28	0.51		0.17	
Uniform Delay, d1		2.6	3.4		39.0	
Progression Factor		0.48	0.35		1.00	
Incremental Delay, d2		0.3	0.6		0.1	
Delay (s)		1.5	1.8		39.2	
Level of Service		A	A		D	
Approach Delay (s)		1.5	1.8		39.2	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	2.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	56.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	757	1441	190	115	42
v/c Ratio	0.34	0.70	0.77	0.31	0.15
Control Delay	6.9	5.0	56.3	7.8	20.1
Queue Delay	0.0	0.2	0.0	0.0	0.0
Total Delay	6.9	5.2	56.3	7.8	20.1
Queue Length 50th (ft)	40	93	113	0	12
Queue Length 95th (ft)	182	146	149	27	34
Internal Link Dist (ft)	753	470	200		616
Turn Bay Length (ft)					
Base Capacity (vph)	2253	2051	326	452	375
Starvation Cap Reductn	0	114	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.34	0.74	0.58	0.25	0.11

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	609	56	81	1192	38	141	7	90	17	3	15
Future Volume (vph)	9	609	56	81	1192	38	141	7	90	17	3	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0	4.0		4.0	
Lane Util. Factor		0.95			0.95			1.00	1.00		1.00	
Frpb, ped/bikes		0.98			1.00			1.00	0.82		0.91	
Flpb, ped/bikes		1.00			1.00			0.82	1.00		0.95	
Frt		0.99			1.00			1.00	0.85		0.94	
Flt Protected		1.00			1.00			0.95	1.00		0.98	
Satd. Flow (prot)		3413			3478			1475	1319		1511	
Flt Permitted		0.93			0.83			0.76	1.00		0.84	
Satd. Flow (perm)		3178			2896			1168	1319		1296	
Peak-hour factor, PHF	0.89	0.89	0.89	0.91	0.91	0.91	0.78	0.78	0.78	0.83	0.83	0.83
Adj. Flow (vph)	10	684	63	89	1310	42	181	9	115	20	4	18
RTOR Reduction (vph)	0	6	0	0	2	0	0	0	91	0	14	0
Lane Group Flow (vph)	0	751	0	0	1439	0	0	190	24	0	28	0
Confl. Peds. (#/hr)	64		113	113		64	127		102	102		127
Confl. Bikes (#/hr)			3			16			7			1
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		D.Pm	NA	custom	Perm	NA	
Protected Phases		2			2			8			4	
Permitted Phases	2			2			4		4	4		
Actuated Green, G (s)		69.7			69.7			20.3	20.3		20.3	
Effective Green, g (s)		70.7			70.7			21.3	21.3		21.3	
Actuated g/C Ratio		0.71			0.71			0.21	0.21		0.21	
Clearance Time (s)		5.0			5.0			5.0	5.0		5.0	
Vehicle Extension (s)		0.2			0.2			1.0	1.0		1.0	
Lane Grp Cap (vph)		2246			2047			248	280		276	
v/s Ratio Prot												
v/s Ratio Perm		0.24			c0.50			c0.16	0.02		0.02	
v/c Ratio		0.33			0.70			0.77	0.09		0.10	
Uniform Delay, d1		5.6			8.5			37.0	31.6		31.6	
Progression Factor		1.04			0.32			1.00	1.00		1.00	
Incremental Delay, d2		0.4			1.8			12.0	0.0		0.1	
Delay (s)		6.3			4.5			49.0	31.6		31.7	
Level of Service		A			A			D	C		C	
Approach Delay (s)		6.3			4.5			42.4			31.7	
Approach LOS		A			A			D			C	

Intersection Summary			
HCM 2000 Control Delay	10.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	81.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	678	1182	221	28
v/c Ratio	0.38	0.64	0.55	0.06
Control Delay	5.1	11.3	16.9	8.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	5.1	11.3	16.9	8.6
Queue Length 50th (ft)	43	171	48	4
Queue Length 95th (ft)	m92	233	60	10
Internal Link Dist (ft)	356	753	239	284
Turn Bay Length (ft)				
Base Capacity (vph)	1802	1845	581	647
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.38	0.64	0.38	0.04

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	590	35	16	1134	9	105	21	40	6	7	6
Future Volume (vph)	12	590	35	16	1134	9	105	21	40	6	7	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5			4.5			4.5	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.99			0.99	
Flpb, ped/bikes		1.00			1.00			0.99			1.00	
Frt		0.99			1.00			0.97			0.96	
Flt Protected		1.00			1.00			0.97			0.98	
Satd. Flow (prot)		3491			3529			1710			1763	
Flt Permitted		0.93			0.94			0.79			0.90	
Satd. Flow (perm)		3245			3335			1396			1604	
Peak-hour factor, PHF	0.94	0.94	0.94	0.98	0.98	0.98	0.75	0.75	0.75	0.68	0.68	0.68
Adj. Flow (vph)	13	628	37	16	1157	9	140	28	53	9	10	9
RTOR Reduction (vph)	0	6	0	0	1	0	0	28	0	0	7	0
Lane Group Flow (vph)	0	672	0	0	1181	0	0	193	0	0	21	0
Confl. Peds. (#/hr)	51		40	40		51	31		21	21		31
Confl. Bikes (#/hr)			3			1			2			
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Actuated Green, G (s)		27.7			27.7			13.3			13.3	
Effective Green, g (s)		27.7			27.7			13.3			13.3	
Actuated g/C Ratio		0.55			0.55			0.27			0.27	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		1797			1847			371			426	
v/s Ratio Prot												
v/s Ratio Perm		0.21			c0.35			c0.14			0.01	
v/c Ratio		0.37			0.64			0.52			0.05	
Uniform Delay, d1		6.3			7.7			15.6			13.7	
Progression Factor		0.61			1.06			1.00			1.00	
Incremental Delay, d2		0.6			1.2			0.6			0.0	
Delay (s)		4.4			9.4			16.2			13.7	
Level of Service		A			A			B			B	
Approach Delay (s)		4.4			9.4			16.2			13.7	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	8.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	45	621	2	1285	407	672
v/c Ratio	0.15	0.98	0.02	0.92	0.96	0.29
Control Delay	31.3	48.9	52.5	31.9	75.0	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.3	48.9	52.5	31.9	75.0	8.2
Queue Length 50th (ft)	22	181	1	338	257	82
Queue Length 95th (ft)	36	#419	m2	#537	#444	147
Internal Link Dist (ft)	425	513		260		2009
Turn Bay Length (ft)			100		100	
Base Capacity (vph)	304	641	89	1391	424	2330
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.97	0.02	0.92	0.96	0.29

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	22	1	12	0	553	2	1226	8	383	630	2
Future Volume (vph)	6	22	1	12	0	553	2	1226	8	383	630	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			0.96		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.99			0.87		1.00	1.00		1.00	1.00	
Flt Protected		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1746			1557		1787	3569		1770	3537	
Flt Permitted		0.75			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1319			1550		1787	3569		1770	3537	
Peak-hour factor, PHF	0.64	0.64	0.64	0.91	0.91	0.91	0.96	0.96	0.96	0.94	0.94	0.94
Adj. Flow (vph)	9	34	2	13	0	608	2	1277	8	407	670	2
RTOR Reduction (vph)	0	2	0	0	288	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	43	0	0	333	0	2	1284	0	407	672	0
Confl. Peds. (#/hr)	16		8	8		16	16		15	15		16
Confl. Bikes (#/hr)			2			1			2			1
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			4		5	2		1	6	
Permitted Phases	4			4								
Actuated Green, G (s)		22.2			22.2		1.0	38.9		23.9	61.8	
Effective Green, g (s)		22.2			22.2		1.0	38.9		23.9	61.8	
Actuated g/C Ratio		0.22			0.22		0.01	0.39		0.24	0.62	
Clearance Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	0.2		2.0	0.2	
Lane Grp Cap (vph)		292			344		17	1388		423	2185	
v/s Ratio Prot							0.00	c0.36		c0.23	0.19	
v/s Ratio Perm		0.03			c0.21							
v/c Ratio		0.15			0.97		0.12	0.93		0.96	0.31	
Uniform Delay, d1		31.3			38.6		49.1	29.2		37.6	9.0	
Progression Factor		1.00			1.00		1.15	0.71		1.00	1.00	
Incremental Delay, d2		0.1			39.4		0.9	9.9		33.7	0.4	
Delay (s)		31.4			78.0		57.4	30.7		71.3	9.4	
Level of Service		C			E		E	C		E	A	
Approach Delay (s)		31.4			78.0			30.7			32.7	
Approach LOS		C			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	41.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	105.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	600	1141	118	325	125	291
v/c Ratio	0.39	0.64	0.40	0.35	0.43	0.33
Control Delay	7.3	10.4	17.5	11.0	18.5	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.3	10.4	17.5	11.0	18.5	10.7
Queue Length 50th (ft)	35	84	29	31	31	27
Queue Length 95th (ft)	88	#204	54	46	57	42
Internal Link Dist (ft)	500	618		212		186
Turn Bay Length (ft)			140		140	
Base Capacity (vph)	1538	1782	430	1301	417	1261
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.64	0.27	0.25	0.30	0.23

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	416	82	39	808	203	111	228	77	115	160	108
Future Volume (vph)	54	416	82	39	808	203	111	228	77	115	160	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	14	11	14	14	11	14
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		0.95			0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.99		1.00	0.99		1.00	0.98	
Flpb, ped/bikes		1.00			1.00		0.98	1.00		0.99	1.00	
Frt		0.98			0.97		1.00	0.96		1.00	0.94	
Flt Protected		1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3304			3295		1874	3287		1881	3195	
Flt Permitted		0.79			0.92		0.57	1.00		0.56	1.00	
Satd. Flow (perm)		2625			3032		1132	3287		1099	3195	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	59	452	89	42	878	221	118	243	82	125	174	117
RTOR Reduction (vph)	0	22	0	0	33	0	0	61	0	0	55	0
Lane Group Flow (vph)	0	578	0	0	1108	0	118	264	0	125	236	0
Confl. Peds. (#/hr)	23		48	48		23	29		24	24		29
Confl. Bikes (#/hr)			3						14			3
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Actuated Green, G (s)		27.9			27.9		12.1	12.1		12.1	12.1	
Effective Green, g (s)		28.9			28.9		13.1	13.1		13.1	13.1	
Actuated g/C Ratio		0.58			0.58		0.26	0.26		0.26	0.26	
Clearance Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		0.2			0.2		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)		1517			1752		296	861		287	837	
v/s Ratio Prot								0.08			0.07	
v/s Ratio Perm		0.22			c0.37		0.10			c0.11		
v/c Ratio		0.38			0.63		0.40	0.31		0.44	0.28	
Uniform Delay, d1		5.7			7.0		15.2	14.8		15.4	14.7	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.7			1.7		0.3	0.1		0.4	0.1	
Delay (s)		6.4			8.8		15.5	14.9		15.8	14.8	
Level of Service		A			A		B	B		B	B	
Approach Delay (s)		6.4			8.8			15.1			15.1	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	10.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	78.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBT
Lane Group Flow (vph)	497	1059	434	428
v/c Ratio	0.29	0.86	0.77	0.81
Control Delay	2.8	37.2	40.3	42.9
Queue Delay	0.0	5.6	0.0	0.2
Total Delay	2.8	42.8	40.3	43.1
Queue Length 50th (ft)	16	312	254	249
Queue Length 95th (ft)	16	#475	#462	#469
Internal Link Dist (ft)	18	500		709
Turn Bay Length (ft)				
Base Capacity (vph)	2070	1311	577	540
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	200	2	5
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.24	0.95	0.75	0.80

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	442	0	0	895	79	675	54	89	0	0	0
Future Volume (vph)	20	442	0	0	895	79	675	54	89	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	11	12	12	12
Total Lost time (s)		3.5			3.5		3.5	3.5				
Lane Util. Factor		0.95			0.95		0.95	0.95				
Frpb, ped/bikes		1.00			0.98		1.00	0.97				
Flpb, ped/bikes		1.00			1.00		1.00	1.00				
Frt		1.00			0.99		1.00	0.97				
Flt Protected		1.00			1.00		0.95	0.97				
Satd. Flow (prot)		3381			3357		1609	1490				
Flt Permitted		0.89			1.00		0.95	0.97				
Satd. Flow (perm)		3006			3357		1609	1490				
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.95	0.95	0.95	0.92	0.92	0.92
Adj. Flow (vph)	22	475	0	0	973	86	711	57	94	0	0	0
RTOR Reduction (vph)	0	0	0	0	6	0	0	8	0	0	0	0
Lane Group Flow (vph)	0	497	0	0	1053	0	434	420	0	0	0	0
Confl. Peds. (#/hr)	58					58			100	100		
Confl. Bikes (#/hr)			1						3			
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	3%	3%	3%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	7	0	0	0	0
Turn Type	Perm	NA			NA		Split	NA				
Protected Phases		2 13			6		4	4				
Permitted Phases	2 13											
Actuated Green, G (s)		54.9			34.6		33.1	33.1				
Effective Green, g (s)		55.9			35.6		34.1	34.1				
Actuated g/C Ratio		0.58			0.37		0.35	0.35				
Clearance Time (s)					4.5		4.5	4.5				
Vehicle Extension (s)					3.5		2.5	2.5				
Lane Grp Cap (vph)		1732			1232		565	523				
v/s Ratio Prot					c0.31		0.27	c0.28				
v/s Ratio Perm		c0.17										
v/c Ratio		0.29			0.85		0.77	0.80				
Uniform Delay, d1		10.4			28.3		27.9	28.4				
Progression Factor		0.24			1.00		1.00	1.00				
Incremental Delay, d2		0.1			6.1		6.0	8.4				
Delay (s)		2.6			34.5		33.9	36.8				
Level of Service		A			C		C	D				
Approach Delay (s)		2.6			34.5			35.3			0.0	
Approach LOS		A			C			D			A	

Intersection Summary			
HCM 2000 Control Delay	28.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	97.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	57.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	SBL	SBT
Lane Group Flow (vph)	506	1602	175	173
v/c Ratio	0.41	0.81	0.64	0.62
Control Delay	14.0	6.8	48.7	44.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	14.0	6.8	48.7	44.4
Queue Length 50th (ft)	68	47	109	97
Queue Length 95th (ft)	116	#471	175	163
Internal Link Dist (ft)	563	18		1167
Turn Bay Length (ft)				
Base Capacity (vph)	1240	2052	455	448
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.41	0.78	0.38	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	242	198	346	1224	0	0	0	0	220	43	40
Future Volume (vph)	0	242	198	346	1224	0	0	0	0	220	43	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
Total Lost time (s)		-0.5			3.5					3.5	3.5	
Lane Util. Factor		0.95			0.95					0.95	0.95	
Frpb, ped/bikes		0.90			1.00					1.00	0.97	
Flpb, ped/bikes		1.00			0.99					1.00	1.00	
Frt		0.93			1.00					1.00	0.96	
Flt Protected		1.00			0.99					0.95	0.98	
Satd. Flow (prot)		2808			3353					1594	1535	
Flt Permitted		1.00			0.63					0.95	0.98	
Satd. Flow (perm)		2808			2132					1594	1535	
Peak-hour factor, PHF	0.87	0.87	0.87	0.98	0.98	0.98	0.92	0.92	0.92	0.87	0.87	0.87
Adj. Flow (vph)	0	278	228	353	1249	0	0	0	0	253	49	46
RTOR Reduction (vph)	0	111	0	0	0	0	0	0	0	0	13	0
Lane Group Flow (vph)	0	395	0	0	1602	0	0	0	0	175	160	0
Confl. Peds. (#/hr)			65	65			57					57
Confl. Bikes (#/hr)			2			2						3
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	2%	2%	2%	4%	4%	4%
Turn Type		NA		custom	NA					Split	NA	
Protected Phases		2		1 4	4 16					3	3	
Permitted Phases				16								
Actuated Green, G (s)		34.6			67.7					15.8	15.8	
Effective Green, g (s)		39.6			69.7					16.8	16.8	
Actuated g/C Ratio		0.41			0.72					0.17	0.17	
Clearance Time (s)		4.5								4.5	4.5	
Vehicle Extension (s)		3.5								2.5	2.5	
Lane Grp Cap (vph)		1146			1961					276	265	
v/s Ratio Prot		0.14			c0.29					c0.11	0.10	
v/s Ratio Perm					c0.30							
v/c Ratio		0.34			0.82					0.63	0.60	
Uniform Delay, d1		19.8			9.3					37.2	37.0	
Progression Factor		1.00			0.58					1.00	1.00	
Incremental Delay, d2		0.2			1.4					4.1	3.2	
Delay (s)		20.0			6.8					41.4	40.3	
Level of Service		B			A					D	D	
Approach Delay (s)		20.0			6.8			0.0			40.8	
Approach LOS		B			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	97.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	84.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	11	272	13	31	905	13	6	9	18	16	12	36
Future Vol, veh/h	11	272	13	31	905	13	6	9	18	16	12	36
Conflicting Peds, #/hr	11	0	61	61	0	11	23	0	40	40	0	23
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	90	90	90	66	66	66	78	78	78
Heavy Vehicles, %	4	4	4	2	2	2	0	0	0	0	0	0
Mvmt Flow	12	286	14	34	1006	14	9	14	27	21	15	46

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1031	0	0	361	0	0	980	1477	251	1306	1477	544
Stage 1	-	-	-	-	-	-	378	378	-	1092	1092	-
Stage 2	-	-	-	-	-	-	602	1099	-	214	385	-
Critical Hdwy	4.18	-	-	4.14	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.24	-	-	2.22	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	658	-	-	1194	-	-	207	127	755	120	127	488
Stage 1	-	-	-	-	-	-	621	619	-	232	293	-
Stage 2	-	-	-	-	-	-	458	291	-	774	614	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	652	-	-	1133	-	-	145	109	693	93	109	474
Mov Cap-2 Maneuver	-	-	-	-	-	-	145	109	-	93	109	-
Stage 1	-	-	-	-	-	-	576	574	-	225	270	-
Stage 2	-	-	-	-	-	-	356	268	-	686	570	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.6	26.1	41.1
HCM LOS			D	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	220	652	-	-	1133	-	-	179
HCM Lane V/C Ratio	0.227	0.018	-	-	0.03	-	-	0.458
HCM Control Delay (s)	26.1	10.6	0.1	-	8.3	0.3	-	41.1
HCM Lane LOS	D	B	A	-	A	A	-	E
HCM 95th %tile Q(veh)	0.8	0.1	-	-	0.1	-	-	2.2

Intersection	
Intersection Delay, s/veh	24
Intersection LOS	C

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Vol, veh/h	11	9	115	71	33	45	13	123	15	28	493	298
Future Vol, veh/h	11	9	115	71	33	45	13	123	15	28	493	298
Peak Hour Factor	0.73	0.73	0.73	0.78	0.78	0.78	0.89	0.89	0.89	0.94	0.94	0.94
Heavy Vehicles, %	2	2	2	0	0	0	5	5	5	1	1	1
Mvmt Flow	15	12	158	91	42	58	15	138	17	30	524	317
Number of Lanes	0	1	0	0	1	0	0	2	0	0	2	0

Approach	NB	SB	SE	NW
Opposing Approach	SB	NB	NW	SE
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SE	NW	SB	NB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NW	SE	NB	SB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	12.1	13	11.1	31.5
HCM LOS	B	B	B	D

Lane	NBLn1	NWLn1	NWLn2	SELn1	SELn2	SBLn1
Vol Left, %	8%	10%	0%	17%	0%	48%
Vol Thru, %	7%	90%	45%	83%	80%	22%
Vol Right, %	85%	0%	55%	0%	20%	30%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	135	275	545	75	77	149
LT Vol	11	28	0	13	0	71
Through Vol	9	247	247	62	62	33
RT Vol	115	0	298	0	15	45
Lane Flow Rate	185	292	579	84	86	191
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.316	0.493	0.906	0.165	0.164	0.344
Departure Headway (Hd)	6.152	6.073	5.632	7.089	6.859	6.489
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	581	590	643	502	519	552
Service Time	4.23	3.834	3.393	4.882	4.652	4.566
HCM Lane V/C Ratio	0.318	0.495	0.9	0.167	0.166	0.346
HCM Control Delay	12.1	14.7	39.9	11.3	11	13
HCM Lane LOS	B	B	E	B	B	B
HCM 95th-tile Q	1.3	2.7	11.4	0.6	0.6	1.5

Lane Group	EBT	WBT	NBT	SBT	NWL
Lane Group Flow (vph)	441	450	171	123	590
v/c Ratio	0.57	0.53	0.42	0.48	0.63
Control Delay	25.6	33.5	47.8	50.2	37.4
Queue Delay	0.5	0.0	0.0	0.0	0.0
Total Delay	26.0	33.5	47.8	50.2	37.4
Queue Length 50th (ft)	107	143	125	88	194
Queue Length 95th (ft)	134	200	184	140	258
Internal Link Dist (ft)	294	560	193	463	230
Turn Bay Length (ft)					
Base Capacity (vph)	778	843	406	254	941
Starvation Cap Reductn	89	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.64	0.53	0.42	0.48	0.63

Intersection Summary

Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Lane Configurations												
Traffic Volume (vph)	6	247	97	56	3	9	295	116	15	72	37	20
Future Volume (vph)	6	247	97	56	3	9	295	116	15	72	37	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	16	12	12
Total Lost time (s)		6.5					6.5			5.0		
Lane Util. Factor		0.95					0.95			1.00		
Frpb, ped/bikes		0.79					0.82			0.98		
Flpb, ped/bikes		1.00					0.99			0.98		
Frt		0.94					0.96			0.95		
Flt Protected		1.00					1.00			0.99		
Satd. Flow (prot)		2369					2540			1951		
Flt Permitted		0.95					0.93			0.96		
Satd. Flow (perm)		2243					2378			1889		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.94	0.94	0.94	0.94	0.85	0.85	0.85	0.85
Adj. Flow (vph)	7	268	105	61	3	10	314	123	18	85	44	24
RTOR Reduction (vph)	0	10	0	0	0	0	30	0	0	0	0	0
Lane Group Flow (vph)	0	431	0	0	0	0	420	0	0	171	0	0
Confl. Peds. (#/hr)	229		112	111	112	111		229	140			
Confl. Bikes (#/hr)			4	3							14	14
Heavy Vehicles (%)	6%	6%	6%	6%	4%	4%	4%	4%	0%	0%	0%	0%
Parking (#/hr)		5					5					
Turn Type	Perm	NA			Perm	Perm	NA		Perm	NA		
Protected Phases		6					2			4		
Permitted Phases	6				2	2			4			
Actuated Green, G (s)		44.5					44.5			28.0		
Effective Green, g (s)		44.5					44.5			28.0		
Actuated g/C Ratio		0.34					0.34			0.22		
Clearance Time (s)		6.5					6.5			5.0		
Lane Grp Cap (vph)		767					814			406		
v/s Ratio Prot												
v/s Ratio Perm		c0.19					0.18			0.09		
v/c Ratio		0.56					0.52			0.42		
Uniform Delay, d1		34.8					34.2			44.0		
Progression Factor		0.66					1.00			1.00		
Incremental Delay, d2		3.0					2.3			3.2		
Delay (s)		26.0					36.5			47.2		
Level of Service		C					D			D		
Approach Delay (s)		26.0					36.5			47.2		
Approach LOS		C					D			D		

Intersection Summary			
HCM 2000 Control Delay	37.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	81.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lane Configurations								
Traffic Volume (vph)	36	31	22	13	5	348	131	65
Future Volume (vph)	36	31	22	13	5	348	131	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	16	12	12	12	12	12
Total Lost time (s)			5.0			6.5		
Lane Util. Factor			1.00			0.97		
Frpb, ped/bikes			0.96			0.92		
Flpb, ped/bikes			1.00			1.00		
Frt			0.98			0.95		
Flt Protected			0.97			0.97		
Satd. Flow (prot)			1966			2938		
Flt Permitted			0.57			0.97		
Satd. Flow (perm)			1163			2938		
Peak-hour factor, PHF	0.83	0.83	0.83	0.83	0.93	0.93	0.93	0.93
Adj. Flow (vph)	43	37	27	16	5	374	141	70
RTOR Reduction (vph)	0	0	4	0	0	49	0	0
Lane Group Flow (vph)	0	0	119	0	0	541	0	0
Confl. Peds. (#/hr)				140				75
Confl. Bikes (#/hr)				2				1
Heavy Vehicles (%)	0%	0%	0%	0%	6%	6%	6%	6%
Parking (#/hr)								
Turn Type	Perm	Perm	NA		Prot	Prot		
Protected Phases			4		3	3		
Permitted Phases	4	4						
Actuated Green, G (s)			28.0			39.5		
Effective Green, g (s)			28.0			39.5		
Actuated g/C Ratio			0.22			0.30		
Clearance Time (s)			5.0			6.5		
Lane Grp Cap (vph)			250			892		
v/s Ratio Prot						c0.18		
v/s Ratio Perm			c0.10					
v/c Ratio			0.48			0.61		
Uniform Delay, d1			44.6			38.6		
Progression Factor			1.00			1.00		
Incremental Delay, d2			6.4			3.1		
Delay (s)			51.0			41.7		
Level of Service			D			D		
Approach Delay (s)			51.0			41.7		
Approach LOS			D			D		

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	91	220	265	67	472	298	266	297	139	239	63
v/c Ratio	0.71	0.28	0.28	0.57	0.69	0.38	0.78	0.85	0.49	0.80	0.29
Control Delay	87.1	26.2	5.6	72.3	35.4	3.0	66.1	72.4	54.5	71.3	7.3
Queue Delay	0.0	0.0	0.0	0.0	2.9	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay	87.1	26.2	5.6	72.3	38.3	3.1	66.1	72.4	54.5	71.3	7.3
Queue Length 50th (ft)	76	125	39	58	281	43	212	239	106	193	0
Queue Length 95th (ft)	#144	189	77	111	388	5	#314	#375	172	#290	22
Internal Link Dist (ft)		1184			71			53		202	
Turn Bay Length (ft)			100	50					100		
Base Capacity (vph)	141	800	953	142	689	820	364	373	316	332	235
Starvation Cap Reductn	0	0	0	0	125	78	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.28	0.28	0.47	0.84	0.40	0.73	0.80	0.44	0.72	0.27

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	194	233	62	434	274	255	272	13	132	227	60
Future Volume (vph)	80	194	233	62	434	274	255	272	13	132	227	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	12	12	12	12	12	11	11	12
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.88	1.00	1.00	0.81	1.00	0.98		1.00	1.00	0.56
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1752	1783	1386	1752	1614	1266	1787	1824		1678	1766	868
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1752	1783	1386	1752	1614	1266	1787	1824		1678	1766	868
Peak-hour factor, PHF	0.88	0.88	0.88	0.92	0.92	0.92	0.96	0.96	0.96	0.95	0.95	0.95
Adj. Flow (vph)	91	220	265	67	472	298	266	283	14	139	239	63
RTOR Reduction (vph)	0	0	50	0	0	37	0	2	0	0	0	52
Lane Group Flow (vph)	91	220	215	67	472	261	266	295	0	139	239	11
Confl. Peds. (#/hr)	70		39	39		70	119		126	126		119
Confl. Bikes (#/hr)						4			6			
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	1%	1%	1%	4%	4%	4%
Parking (#/hr)					5							
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA		Split	NA	Perm
Protected Phases	1	6	3	5	2	4	3	3		4	4	
Permitted Phases			6			2						4
Actuated Green, G (s)	9.5	57.5	82.3	7.6	55.6	77.7	24.8	24.8		22.1	22.1	22.1
Effective Green, g (s)	9.5	57.5	82.3	7.6	55.6	77.7	24.8	24.8		22.1	22.1	22.1
Actuated g/C Ratio	0.07	0.44	0.63	0.06	0.43	0.60	0.19	0.19		0.17	0.17	0.17
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	2.0	2.5	3.0	2.0	2.5	2.0	3.0	3.0		2.0	2.0	2.0
Lane Grp Cap (vph)	128	788	925	102	690	756	340	347		285	300	147
v/s Ratio Prot	c0.05	0.12	0.04	0.04	c0.29	0.06	0.15	c0.16		0.08	c0.14	
v/s Ratio Perm			0.11			0.15						0.01
v/c Ratio	0.71	0.28	0.23	0.66	0.68	0.34	0.78	0.85		0.49	0.80	0.07
Uniform Delay, d1	58.9	23.1	10.3	59.9	30.1	13.3	50.0	50.8		48.8	51.8	45.3
Progression Factor	1.00	1.00	1.00	0.91	0.92	0.32	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	14.3	0.9	0.1	10.9	5.4	0.1	11.1	17.8		0.5	12.8	0.1
Delay (s)	73.2	23.9	10.4	65.7	33.1	4.4	61.2	68.6		49.3	64.6	45.4
Level of Service	E	C	B	E	C	A	E	E		D	E	D
Approach Delay (s)		25.5			25.5			65.1			57.0	
Approach LOS		C			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	40.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	495	585	98	1649	124	1087	340
v/c Ratio	1.02	1.03	0.88	1.03	0.92	0.91	0.53
Control Delay	99.9	98.5	121.8	71.8	120.8	51.6	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	99.9	98.5	121.8	71.8	120.8	51.6	9.2
Queue Length 50th (ft)	~246	~296	90	~583	114	486	34
Queue Length 95th (ft)	#365	#412	#203	#682	#241	#624	123
Internal Link Dist (ft)	193	252		1280		98	
Turn Bay Length (ft)			240		105		
Base Capacity (vph)	486	568	111	1603	135	1195	645
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	1.03	0.88	1.03	0.92	0.91	0.53

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	243	168	54	187	283	51	91	1397	137	112	978	306
Future Volume (vph)	243	168	54	187	283	51	91	1397	137	112	978	306
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	9	9	12	9	9	12	11	10	12	11	10	11
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor		0.95			0.95		1.00	0.91		1.00	0.95	1.00
Frpb, ped/bikes		0.99			0.98		1.00	0.98		1.00	1.00	0.86
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt		0.98			0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.97			0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		2547			2692		1540	4128		1540	2973	1188
Flt Permitted		0.97			0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		2547			2692		1540	4128		1540	2973	1188
Peak-hour factor, PHF	0.94	0.94	0.94	0.89	0.89	0.89	0.93	0.93	0.93	0.90	0.90	0.90
Adj. Flow (vph)	259	179	57	210	318	57	98	1502	147	124	1087	340
RTOR Reduction (vph)	0	7	0	0	6	0	0	8	0	0	0	168
Lane Group Flow (vph)	0	488	0	0	579	0	98	1641	0	124	1087	172
Confl. Peds. (#/hr)	119		36	36		119	52		90	90		52
Confl. Bikes (#/hr)			2			1						
Heavy Vehicles (%)	9%	9%	9%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)		26.3			29.3		10.1	54.1		12.3	56.3	56.3
Effective Green, g (s)		26.3			29.3		10.1	54.1		12.3	56.3	56.3
Actuated g/C Ratio		0.19			0.21		0.07	0.39		0.09	0.40	0.40
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)		3.0			2.0		5.0	3.5		3.0	3.5	3.5
Lane Grp Cap (vph)		478			563		111	1595		135	1195	477
v/s Ratio Prot		c0.19			c0.22		0.06	c0.40		c0.08	0.37	
v/s Ratio Perm												0.14
v/c Ratio		1.02			1.03		0.88	1.03		0.92	0.91	0.36
Uniform Delay, d1		56.9			55.4		64.4	42.9		63.4	39.5	29.3
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		46.4			45.6		53.3	30.3		52.8	11.8	2.1
Delay (s)		103.2			101.0		117.6	73.2		116.1	51.2	31.4
Level of Service		F			F		F	E		F	D	C
Approach Delay (s)		103.2			101.0			75.7			52.1	
Approach LOS		F			F			E			D	

Intersection Summary			
HCM 2000 Control Delay	73.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	95.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBR2	WBL	WBT	NBL	NBT	SBL	SBT	SBR	NEL	NER
Lane Group Flow (vph)	6	530	522	82	599	69	431	826	1642	739
v/c Ratio	0.00	1.58	1.38	2.34	0.49	0.27	1.11	0.75	1.61	1.69
Control Delay	0.0	321.1	242.5	714.2	55.1	41.5	151.3	56.9	321.1	355.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.0	321.1	242.5	714.2	55.1	41.5	151.3	56.9	321.1	355.2
Queue Length 50th (ft)	0	~1115	~1027	~189	347	60	~692	530	~1708	~1558
Queue Length 95th (ft)	0	#1384	#1294	#327	412	101	#935	623	#1050	#1043
Internal Link Dist (ft)			579		160		579		531	
Turn Bay Length (ft)				100		250		200		
Base Capacity (vph)	1627	336	378	35	1227	256	389	1102	1022	437
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.00	1.58	1.38	2.34	0.49	0.27	1.11	0.75	1.61	1.69

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBR2	WBL2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	104	757	36	60	61	20	522	71	66	409	783
Future Volume (vph)	6	104	757	36	60	61	20	522	71	66	409	783
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.5	4.5			5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	1.00		0.95	0.95			1.00	0.95		1.00	1.00	0.88
Frpb, ped/bikes	1.00		1.00	0.99			1.00	0.98		1.00	1.00	1.00
Flpb, ped/bikes	1.00		0.88	1.00			1.00	1.00		1.00	1.00	1.00
Frt	0.86		1.00	0.98			1.00	0.98		1.00	1.00	0.85
Flt Protected	1.00		0.95	0.96			0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1627		1492	1667			1787	3448		1770	1863	2787
Flt Permitted	1.00		0.95	0.96			0.10	1.00		0.29	1.00	1.00
Satd. Flow (perm)	1627		1492	1667			193	3448		538	1863	2787
Peak-hour factor, PHF	0.96	0.91	0.91	0.91	0.91	0.99	0.99	0.99	0.99	0.95	0.95	0.95
Adj. Flow (vph)	6	114	832	40	66	62	20	527	72	69	431	824
RTOR Reduction (vph)	0	0	0	2	0	0	0	5	0	0	0	52
Lane Group Flow (vph)	6	0	530	520	0	0	82	594	0	69	431	774
Confl. Peds. (#/hr)		27			30	23	23		34	34		23
Confl. Bikes (#/hr)									1			1
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	2%	2%	2%
Turn Type	Free	Perm	Split	NA		custom	Prot	NA		D.P+P	NA	custom
Protected Phases			4	4			5	2		1	6 7	3 7
Permitted Phases	Free	4				5				2		
Actuated Green, G (s)	215.0		48.5	48.5			39.0	76.2		84.0	45.0	81.0
Effective Green, g (s)	215.0		48.5	48.5			39.0	76.2		84.0	45.0	81.0
Actuated g/C Ratio	1.00		0.23	0.23			0.18	0.35		0.39	0.21	0.38
Clearance Time (s)			4.5	4.5			5.0	5.0		5.0		
Vehicle Extension (s)			2.0	2.0			2.0	2.0		2.0		
Lane Grp Cap (vph)	1627		336	376			35	1222		254	389	1049
v/s Ratio Prot				0.31				0.17		0.01	c0.23	0.28
v/s Ratio Perm	0.00		0.36				c0.42			0.10		
v/c Ratio	0.00		1.58	1.38			2.34	0.49		0.27	1.11	0.74
Uniform Delay, d1	0.0		83.2	83.2			88.0	54.1		43.1	85.0	57.8
Progression Factor	1.00		1.00	1.00			1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.0		273.7	187.8			683.6	0.1		0.2	78.1	2.4
Delay (s)	0.0		357.0	271.1			771.6	54.2		43.3	163.1	60.2
Level of Service	A		F	F			F	D		D	F	E
Approach Delay (s)				314.3				140.6			92.8	
Approach LOS				F				F			F	

Intersection Summary			
HCM 2000 Control Delay	270.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.75		
Actuated Cycle Length (s)	215.0	Sum of lost time (s)	24.5
Intersection Capacity Utilization	104.1%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

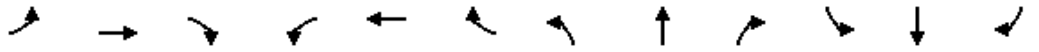
Movement	SBR2	NEL	NER	NER2
Lane Configurations				
Traffic Volume (vph)	2	974	502	24
Future Volume (vph)	2	974	502	24
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	
Lane Util. Factor		0.97	0.91	
Frpb, ped/bikes		1.00	0.84	
Flpb, ped/bikes		1.00	1.00	
Frt		0.99	0.85	
Flt Protected		0.96	1.00	
Satd. Flow (prot)		3489	1231	
Flt Permitted		0.96	1.00	
Satd. Flow (perm)		3489	1231	
Peak-hour factor, PHF	0.95	0.63	0.63	0.63
Adj. Flow (vph)	2	1546	797	38
RTOR Reduction (vph)	0	0	77	0
Lane Group Flow (vph)	0	1642	662	0
Confl. Peds. (#/hr)	23	30		27
Confl. Bikes (#/hr)	1			
Heavy Vehicles (%)	2%	0%	0%	0%
Turn Type		Prot	Perm	
Protected Phases		3		
Permitted Phases			3	
Actuated Green, G (s)		63.0	63.0	
Effective Green, g (s)		63.0	63.0	
Actuated g/C Ratio		0.29	0.29	
Clearance Time (s)		5.0	5.0	
Vehicle Extension (s)		2.0	2.0	
Lane Grp Cap (vph)		1022	360	
v/s Ratio Prot		0.47		
v/s Ratio Perm			c0.54	
v/c Ratio		1.61	1.84	
Uniform Delay, d1		76.0	76.0	
Progression Factor		1.00	1.00	
Incremental Delay, d2		277.6	388.1	
Delay (s)		353.6	464.1	
Level of Service		F	F	
Approach Delay (s)		387.9		
Approach LOS		F		

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	162	552	303	825	189	1411	170	88	975	172
v/c Ratio	0.89	0.92	0.93	0.94	0.88	0.87	0.24	0.94	0.71	0.28
Control Delay	104.2	77.7	91.1	69.6	96.8	41.9	7.6	141.4	40.3	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	104.2	77.7	91.1	69.6	96.8	41.9	7.6	141.4	40.3	6.1
Queue Length 50th (ft)	147	261	271	383	170	613	21	81	405	5
Queue Length 95th (ft)	#276	#368	#436	#503	#297	723	67	#192	488	55
Internal Link Dist (ft)		1244		672		622			665	
Turn Bay Length (ft)	180		350		450		150	230		150
Base Capacity (vph)	189	605	344	902	233	1617	710	94	1375	619
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.91	0.88	0.91	0.81	0.87	0.24	0.94	0.71	0.28

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	152	475	44	288	718	66	170	1270	153	82	907	160
Future Volume (veh/h)	152	475	44	288	718	66	170	1270	153	82	907	160
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.89	1.00		0.91	1.00		0.95	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	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			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1885	1885	1885	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	162	505	47	303	756	69	189	1411	170	88	975	172
Peak Hour Factor	0.94	0.94	0.94	0.95	0.95	0.95	0.90	0.90	0.90	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	1	1	1	2	2	2	2	2	2
Cap, veh/h	185	556	51	325	817	75	212	1629	690	95	1396	594
Arrive On Green	0.10	0.17	0.17	0.18	0.25	0.25	0.12	0.46	0.46	0.05	0.39	0.39
Sat Flow, veh/h	1781	3247	301	1795	3287	300	1781	3554	1504	1781	3554	1512
Grp Volume(v), veh/h	162	275	277	303	412	413	189	1411	170	88	975	172
Grp Sat Flow(s),veh/h/ln	1781	1777	1771	1795	1791	1796	1781	1777	1504	1781	1777	1512
Q Serve(g_s), s	12.6	21.3	21.5	23.3	31.4	31.4	14.6	49.9	9.7	6.9	32.1	10.9
Cycle Q Clear(g_c), s	12.6	21.3	21.5	23.3	31.4	31.4	14.6	49.9	9.7	6.9	32.1	10.9
Prop In Lane	1.00		0.17	1.00		0.17	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	185	304	303	325	445	446	212	1629	690	95	1396	594
V/C Ratio(X)	0.88	0.90	0.91	0.93	0.93	0.93	0.89	0.87	0.25	0.92	0.70	0.29
Avail Cap(c_a), veh/h	191	305	304	346	461	462	235	1629	690	95	1396	594
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	61.8	56.9	57.0	56.5	51.3	51.4	60.8	34.1	23.1	66.0	35.6	29.1
Incr Delay (d2), s/veh	31.7	27.9	29.7	29.7	23.6	23.8	28.1	6.5	0.9	66.2	2.9	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.4	12.0	12.2	13.3	17.1	17.2	8.3	23.0	3.7	4.9	14.6	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	93.5	84.7	86.7	86.2	75.0	75.1	88.9	40.5	24.0	132.2	38.5	30.3
LnGrp LOS	F	F	F	F	E	E	F	D	C	F	D	C
Approach Vol, veh/h		714			1128			1770			1235	
Approach Delay, s/veh		87.5			78.0			44.1			44.0	
Approach LOS		F			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	68.7	30.3	29.0	21.2	59.5	19.5	39.8
Change Period (Y+Rc), s	4.5	4.5	5.0	5.0	4.5	4.5	5.0	5.0
Max Green Setting (Gmax), s	7.5	62.5	27.0	24.0	18.5	51.5	15.0	36.0
Max Q Clear Time (g_c+I1), s	8.9	51.9	25.3	23.5	16.6	34.1	14.6	33.4
Green Ext Time (p_c), s	0.0	9.3	0.1	0.1	0.0	11.5	0.0	0.9

Intersection Summary	
HCM 6th Ctrl Delay	58.4
HCM 6th LOS	E

Route 40 Synchro Report for 2040 Build Intersections

- Westlake Ave & Republican St
- Westlake Ave & Mercer St
- Westlake Ave & Broad St/Valley St
- 9th Ave & Westlake Ave
- Dexter Ave/4th Ave & Nickerson St/Westlake Ave
- Fremont Ave & N 34th St
- Fremont Ave & Fremont Place/N 35th St
- Evanston Ave & N 36th St & Fremont Place
- N 36th St & Dayton Ave N
- Phinney Avenue N & N 36th St
- 1st Ave NW & NW 36th St/N 36th St
- NW Leary Way & NW 39th St
- 14th Ave NW & NW Leary Way
- 15th Ave NW NB & NW Leary Way
- 15th Ave NW SB & NW Leary Way
- NW Dock Pl & Leary Ave NW
- NW Vernon Pl/20th Ave NW & Leary Ave NW
- 22nd Ave NW & Leary Ave NW & NW Market St
- 24th Ave NW & NW Market St
- 15th Ave NW & NW 85th St
- Holman Rd NW & Greenwood Ave N & N 105th St
- Aurora Ave N & N 105th St

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	296	168	352	522
v/c Ratio	0.84	0.48	0.22	0.59
Control Delay	43.2	23.6	7.3	14.6
Queue Delay	0.0	0.0	0.0	0.2
Total Delay	43.2	23.6	7.3	14.8
Queue Length 50th (ft)	114	57	30	137
Queue Length 95th (ft)	#215	110	61	286
Internal Link Dist (ft)	220	255	281	406
Turn Bay Length (ft)				
Base Capacity (vph)	477	477	1586	878
Starvation Cap Reductn	0	0	0	42
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.62	0.35	0.22	0.62

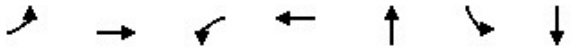
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	200	59	29	110	18	0	253	67	3	429	44
Future Volume (vph)	19	200	59	29	110	18	0	253	67	3	429	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			0.95			1.00	
Frpb, ped/bikes		0.89			0.97			0.93			0.95	
Flpb, ped/bikes		0.99			0.95			1.00			1.00	
Frt		0.97			0.98			0.97			0.99	
Flt Protected		1.00			0.99			1.00			1.00	
Satd. Flow (prot)		1145			1225			2689			1498	
Flt Permitted		0.98			0.92			1.00			1.00	
Satd. Flow (perm)		1121			1138			2689			1496	
Peak-hour factor, PHF	0.94	0.94	0.94	0.93	0.93	0.93	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	20	213	63	31	118	19	0	278	74	3	471	48
RTOR Reduction (vph)	0	13	0	0	6	0	0	26	0	0	4	0
Lane Group Flow (vph)	0	283	0	0	162	0	0	326	0	0	518	0
Confl. Peds. (#/hr)	226		274	274		226	265		128	128		265
Confl. Bikes (#/hr)			11			11			6			7
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	9%	9%	9%	7%	7%	7%
Parking (#/hr)		15			15							
Turn Type	Perm	NA		Perm	NA			NA		Perm	NA	
Protected Phases		4			4			2			6	
Permitted Phases	4			4						6		
Actuated Green, G (s)		21.5			21.5			41.9			41.9	
Effective Green, g (s)		22.0			22.0			42.4			42.4	
Actuated g/C Ratio		0.30			0.30			0.59			0.59	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		2.0			2.0			0.2			0.2	
Lane Grp Cap (vph)		340			345			1574			876	
v/s Ratio Prot								0.12				
v/s Ratio Perm		c0.25			0.14						c0.35	
v/c Ratio		0.83			0.47			0.21			0.59	
Uniform Delay, d1		23.5			20.5			7.1			9.5	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		15.1			0.4			0.3			0.7	
Delay (s)		38.6			20.8			7.4			10.2	
Level of Service		D			C			A			B	
Approach Delay (s)		38.6			20.8			7.4			10.2	
Approach LOS		D			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	17.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	72.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	58.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	10	1489	267	1350	305	164	264
v/c Ratio	0.11	1.59	5.68	0.56	0.68	1.53	0.64
Control Delay	65.0	304.2	2150.9	16.5	52.6	322.3	51.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	65.0	304.2	2150.9	16.5	52.6	322.3	51.5
Queue Length 50th (ft)	8	~659	~394	192	112	~193	205
Queue Length 95th (ft)	28	#787	#626	393	163	#358	287
Internal Link Dist (ft)		218		252	406		356
Turn Bay Length (ft)	90					155	
Base Capacity (vph)	124	937	47	2423	629	107	719
Starvation Cap Reductn	0	0	0	0	0	0	39
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	1.59	5.68	0.56	0.48	1.53	0.39

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	1	8	1215	51	27	221	1031	224	0	192	98	143
Future Volume (vph)	1	8	1215	51	27	221	1031	224	0	192	98	143
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	11	12	12	12	11	12	12	12	12	12
Total Lost time (s)		4.5	5.5			4.5	5.5			6.0		4.5
Lane Util. Factor		1.00	0.91			1.00	0.91			0.95		1.00
Frpb, ped/bikes		1.00	0.97			1.00	0.96			0.95		1.00
Flpb, ped/bikes		0.97	1.00			1.00	1.00			1.00		1.00
Frt		1.00	0.99			1.00	0.97			0.95		1.00
Flt Protected		0.95	1.00			0.95	1.00			1.00		0.95
Satd. Flow (prot)		1484	3933			1547	3825			2624		1518
Flt Permitted		1.00	1.00			0.08	1.00			1.00		0.95
Satd. Flow (perm)		1562	3933			126	3825			2624		1518
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.93	0.93	0.93	0.93	0.95	0.95	0.95	0.87
Adj. Flow (vph)	1	9	1429	60	29	238	1109	241	0	202	103	164
RTOR Reduction (vph)	0	0	2	0	0	0	15	0	0	42	0	0
Lane Group Flow (vph)	0	10	1487	0	0	267	1335	0	0	263	0	164
Confl. Peds. (#/hr)		111		323		323		111	160		91	91
Confl. Bikes (#/hr)				3							3	
Heavy Vehicles (%)	6%	6%	6%	6%	5%	5%	5%	5%	12%	12%	12%	7%
Parking (#/hr)			8	8			8	8				
Turn Type	custom	Prot	NA		custom	Prot	NA			NA		Prot
Protected Phases		7	4			3	8			2		1
Permitted Phases	7				3							
Actuated Green, G (s)		1.9	35.6			51.2	84.9			20.5		9.0
Effective Green, g (s)		2.4	36.1			51.7	85.4			21.0		9.5
Actuated g/C Ratio		0.02	0.26			0.37	0.62			0.15		0.07
Clearance Time (s)		5.0	6.0			5.0	6.0			6.5		5.0
Vehicle Extension (s)		2.0	2.0			2.0	2.0			2.0		2.0
Lane Grp Cap (vph)		27	1022			46	2353			397		103
v/s Ratio Prot			c0.38				0.35			0.10		c0.11
v/s Ratio Perm		0.01				c2.12						
v/c Ratio		0.37	1.45			5.80	0.57			0.66		1.59
Uniform Delay, d1		67.5	51.4			43.6	15.8			55.6		64.7
Progression Factor		1.00	1.00			1.00	1.00			1.00		1.00
Incremental Delay, d2		3.1	210.1			2208.2	0.2			3.2		307.3
Delay (s)		70.6	261.5			2251.8	16.0			58.8		371.9
Level of Service		E	F			F	B			E		F
Approach Delay (s)			260.2				385.1			58.8		
Approach LOS			F				F			E		

Intersection Summary			
HCM 2000 Control Delay	287.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	3.33		
Actuated Cycle Length (s)	138.8	Sum of lost time (s)	25.5
Intersection Capacity Utilization	93.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	230	0
Future Volume (vph)	230	0
Ideal Flow (vphpl)	1900	1900
Lane Width	12	12
Total Lost time (s)	6.0	
Lane Util. Factor	1.00	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	1598	
Flt Permitted	1.00	
Satd. Flow (perm)	1598	
Peak-hour factor, PHF	0.87	0.87
Adj. Flow (vph)	264	0
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	264	0
Confl. Peds. (#/hr)		160
Confl. Bikes (#/hr)		5
Heavy Vehicles (%)	7%	7%
Parking (#/hr)		
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	34.5	
Effective Green, g (s)	35.0	
Actuated g/C Ratio	0.25	
Clearance Time (s)	6.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	402	
v/s Ratio Prot	c0.17	
v/s Ratio Perm		
v/c Ratio	0.66	
Uniform Delay, d1	46.5	
Progression Factor	1.00	
Incremental Delay, d2	2.9	
Delay (s)	49.5	
Level of Service	D	
Approach Delay (s)	173.0	
Approach LOS	F	

Intersection Summary

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	374	84	209	31	445	350	343	6
v/c Ratio	0.69	0.14	0.54	0.13	0.63	0.72	0.46	0.01
Control Delay	38.1	24.2	11.1	20.3	47.2	29.8	27.8	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.5	0.7	0.0
Total Delay	38.1	24.2	11.1	20.3	47.2	30.3	28.6	0.0
Queue Length 50th (ft)	262	45	0	13	172	184	209	0
Queue Length 95th (ft)	356	82	70	30	247	248	281	0
Internal Link Dist (ft)	177	254			356		489	
Turn Bay Length (ft)			300	80		125		
Base Capacity (vph)	542	589	441	242	710	546	752	405
Starvation Cap Reductn	0	0	0	0	0	35	171	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.14	0.47	0.13	0.63	0.68	0.59	0.01

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	254	60	18	58	190	28	352	44	301	295	5
Future Volume (vph)	3	254	60	18	58	190	28	352	44	301	295	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	11	12	11	11	10	12	12	12
Total Lost time (s)		5.0			5.0	5.0	3.0	5.0		3.0	4.0	4.5
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	1.00	1.00
Frpb, ped/bikes		0.96			1.00	0.86	1.00	0.94		1.00	1.00	0.61
Flpb, ped/bikes		1.00			0.98	1.00	0.88	1.00		0.95	1.00	1.00
Frt		0.97			1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected		1.00			0.99	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1248			1487	1156	1253	2646		1498	1660	866
Flt Permitted		1.00			0.88	1.00	0.55	1.00		0.34	1.00	1.00
Satd. Flow (perm)		1247			1330	1156	731	2646		542	1660	866
Peak-hour factor, PHF	0.85	0.85	0.85	0.91	0.91	0.91	0.89	0.89	0.89	0.86	0.86	0.86
Adj. Flow (vph)	4	299	71	20	64	209	31	396	49	350	343	6
RTOR Reduction (vph)	0	5	0	0	0	171	0	5	0	0	0	3
Lane Group Flow (vph)	0	369	0	0	84	38	31	440	0	350	343	3
Confl. Peds. (#/hr)	63		56	56		63	84		130	130		84
Confl. Bikes (#/hr)			8			26			1			4
Heavy Vehicles (%)	6%	6%	6%	8%	8%	8%	10%	10%	10%	3%	3%	3%
Parking (#/hr)		8										
Turn Type	Perm	NA		Perm	NA	custom	pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		1	2			6		6
Actuated Green, G (s)		57.6			57.6	25.5	40.7	37.1		66.1	59.0	59.0
Effective Green, g (s)		57.1			57.1	24.0	41.7	36.6		66.6	59.5	59.0
Actuated g/C Ratio		0.43			0.43	0.18	0.31	0.28		0.50	0.45	0.44
Clearance Time (s)		4.5			4.5	3.5	3.5	4.5		3.5	4.5	4.5
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		536			572	209	245	729		459	744	385
v/s Ratio Prot							0.00	0.17		c0.15	0.21	
v/s Ratio Perm		c0.30			0.06	0.03	0.04			c0.23		0.00
v/c Ratio		0.69			0.15	0.18	0.13	0.60		0.76	0.46	0.01
Uniform Delay, d1		30.6			23.0	46.0	32.0	41.7		22.5	25.5	20.5
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		3.7			0.5	0.4	0.2	3.7		7.4	2.1	0.0
Delay (s)		34.3			23.5	46.4	32.2	45.4		29.9	27.5	20.6
Level of Service		C			C	D	C	D		C	C	C
Approach Delay (s)		34.3			39.9			44.6			28.6	
Approach LOS		C			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	35.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	132.7	Sum of lost time (s)	25.0
Intersection Capacity Utilization	65.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBR	NBT	SBL2	SBL	SBT
Lane Group Flow (vph)	656	88	10	553	736
v/c Ratio	0.43	0.27	0.02	0.76	0.49
Control Delay	10.8	11.6	6.0	27.5	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.9	11.6	6.0	27.5	3.5
Queue Length 50th (ft)	34	0	1	128	0
Queue Length 95th (ft)	281	35	7	620	374
Internal Link Dist (ft)		473			269
Turn Bay Length (ft)			160	160	
Base Capacity (vph)	2109	608	740	1344	1525
Starvation Cap Reductn	83	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.32	0.14	0.01	0.41	0.48

Intersection Summary

Movement	WBL	WBR	NBT	NBR	NBR2	SBL2	SBL	SBT	SWL	SWR
Lane Configurations										
Traffic Volume (vph)	0	571	67	0	4	10	520	692	0	0
Future Volume (vph)	0	571	67	0	4	10	520	692	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	12	12	12	11	12	12
Total Lost time (s)		4.0	4.0			4.5	4.0	4.0		
Lane Util. Factor		0.88	1.00			1.00	1.00	1.00		
Frpb, ped/bikes		1.00	1.00			1.00	1.00	1.00		
Flpb, ped/bikes		1.00	1.00			1.00	1.00	1.00		
Frt		0.85	0.99			1.00	1.00	1.00		
Flt Protected		1.00	1.00			0.95	0.95	1.00		
Satd. Flow (prot)		2333	1469			812	1562	1589		
Flt Permitted		1.00	1.00			0.95	0.95	1.00		
Satd. Flow (perm)		2333	1469			812	1562	1589		
Peak-hour factor, PHF	0.87	0.87	0.81	0.95	0.81	1.00	0.94	0.94	0.95	0.95
Adj. Flow (vph)	0	656	83	0	5	10	553	736	0	0
RTOR Reduction (vph)	0	0	74	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	656	14	0	0	10	553	736	0	0
Confl. Peds. (#/hr)		5			57		57			
Confl. Bikes (#/hr)					1					
Heavy Vehicles (%)	6%	6%	15%	2%	15%	100%	4%	4%	2%	2%
Turn Type		pt+ov	NA			Prot	Prot	NA		
Protected Phases		1 3!	2			1 3 9!	3	6		
Permitted Phases										
Actuated Green, G (s)		49.4	12.9			49.9	35.9	71.8		
Effective Green, g (s)		49.9	13.4			49.9	36.4	72.3		
Actuated g/C Ratio		0.61	0.16			0.61	0.44	0.88		
Clearance Time (s)			4.5				4.5	4.5		
Vehicle Extension (s)			0.2				2.0	0.2		
Lane Grp Cap (vph)		1417	239			493	692	1399		
v/s Ratio Prot		0.28	0.01			0.01	c0.35	c0.46		
v/s Ratio Perm										
v/c Ratio		0.46	0.06			0.02	0.80	0.53		
Uniform Delay, d1		8.8	29.0			6.4	19.7	1.1		
Progression Factor		1.00	1.00			1.00	1.00	1.00		
Incremental Delay, d2		0.1	0.0			0.0	6.0	0.2		
Delay (s)		8.9	29.1			6.4	25.7	1.3		
Level of Service		A	C			A	C	A		
Approach Delay (s)	8.9		29.1					11.7	0.0	
Approach LOS	A		C					B	A	

Intersection Summary			
HCM 2000 Control Delay	11.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	82.1	Sum of lost time (s)	20.5
Intersection Capacity Utilization	53.8%	ICU Level of Service	A
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Lane Group	EBL2	EBT	WBT	WBR	WBR2	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	518	642	218	228	11	203	117	813	243
v/c Ratio	0.88	0.80	0.52	0.28	0.02	0.74	0.19	0.91	0.59
Control Delay	69.8	40.5	49.6	17.9	15.7	68.0	12.8	61.5	44.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.8	40.5	49.6	17.9	15.7	68.0	12.8	61.5	44.7
Queue Length 50th (ft)	222	480	168	107	4	159	7	343	165
Queue Length 95th (ft)	#315	#698	255	163	15	237	33	#457	256
Internal Link Dist (ft)		426	306				751		183
Turn Bay Length (ft)				100	100				
Base Capacity (vph)	588	806	421	817	442	327	715	893	413
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.80	0.52	0.28	0.02	0.62	0.16	0.91	0.59

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL2	EBT	EBR	WBT	WBR	WBR2	NBL	NBT	NBR2	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	502	546	77	196	205	11	179	90	13	772	152	79
Future Volume (vph)	502	546	77	196	205	11	179	90	13	772	152	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	6.5	6.5		5.5	5.5	
Lane Util. Factor	0.97	1.00		1.00	1.00	1.00	1.00	0.95		0.97	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	0.99		1.00	0.89	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.85	0.85	1.00	0.98		1.00	0.95	
Flt Protected	0.95	1.00		1.00	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3400	1794		1759	1495	808	1703	3308		3367	1502	
Flt Permitted	0.95	1.00		1.00	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3400	1794		1759	1495	808	1703	3308		3367	1502	
Peak-hour factor, PHF	0.97	0.97	0.97	0.90	0.90	1.00	0.88	0.88	0.88	0.95	0.95	0.95
Adj. Flow (vph)	518	563	79	218	228	11	203	102	15	813	160	83
RTOR Reduction (vph)	0	4	0	0	0	0	0	81	0	0	15	0
Lane Group Flow (vph)	518	638	0	218	228	11	203	36	0	813	228	0
Confl. Peds. (#/hr)	47		30		47		21		21	21		21
Confl. Bikes (#/hr)			10		9				23			189
Heavy Vehicles (%)	3%	3%	3%	8%	8%	100%	6%	6%	6%	4%	4%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	6	2
Turn Type	Prot	NA		NA	custom	custom	Split	NA		Split	NA	
Protected Phases	4	1 4		1	5	5	3	3		2	2	
Permitted Phases												
Actuated Green, G (s)	22.5	58.1		31.1	71.1	71.1	20.9	20.9		34.5	34.5	
Effective Green, g (s)	22.5	58.1		31.1	71.1	71.1	20.9	20.9		34.5	34.5	
Actuated g/C Ratio	0.17	0.45		0.24	0.55	0.55	0.16	0.16		0.27	0.27	
Clearance Time (s)	4.5			4.5	4.5	4.5	6.5	6.5		5.5	5.5	
Vehicle Extension (s)	3.0			2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	588	801		420	817	441	273	531		893	398	
v/s Ratio Prot	c0.15	c0.36		0.12	0.15	0.01	c0.12	0.01		c0.24	0.15	
v/s Ratio Perm												
v/c Ratio	0.88	0.80		0.52	0.28	0.02	0.74	0.07		0.91	0.57	
Uniform Delay, d1	52.4	30.9		43.0	15.7	13.5	52.0	46.3		46.3	41.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	14.4	5.5		4.5	0.9	0.1	9.2	0.0		13.0	1.2	
Delay (s)	66.9	36.4		47.5	16.6	13.6	61.2	46.3		59.2	42.6	
Level of Service	E	D		D	B	B	E	D		E	D	
Approach Delay (s)		50.0		31.3				55.8			55.4	
Approach LOS		D		C				E			E	

Intersection Summary			
HCM 2000 Control Delay	49.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	83.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	433	155	385	493	877	53
v/c Ratio	0.84	0.53	0.20	0.94	0.82	0.15
Control Delay	54.1	25.7	9.5	32.4	19.4	1.8
Queue Delay	0.0	0.0	0.0	0.0	1.0	0.0
Total Delay	54.1	25.7	9.5	32.4	20.4	1.8
Queue Length 50th (ft)	126	40	57	9	229	0
Queue Length 95th (ft)	#203	97	83	#165	#714	m2
Internal Link Dist (ft)		551	946		251	
Turn Bay Length (ft)	120			350		
Base Capacity (vph)	513	292	1945	526	1064	363
Starvation Cap Reductn	0	0	0	0	53	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.53	0.20	0.94	0.87	0.15

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBT	WBL	WBT	WBR2	NBT	NBR	SBT	SBR	SBR2
Lane Configurations									
Traffic Volume (vph)	0	377	54	81	354	454	842	41	10
Future Volume (vph)	0	377	54	81	354	454	842	41	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1300	1900	1900	1900
Lane Width	12	11	11	12	11	9	12	12	12
Total Lost time (s)		4.0	4.0		4.0	4.5	4.0	4.5	
Lane Util. Factor		0.97	1.00		0.95	1.00	1.00	1.00	
Frpb, ped/bikes		1.00	0.90		1.00	0.63	1.00	0.42	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	
Frt		1.00	0.91		1.00	0.85	1.00	0.85	
Flt Protected		0.95	1.00		1.00	1.00	1.00	1.00	
Satd. Flow (prot)		3255	1444		3172	570	1735	550	
Flt Permitted		0.95	1.00		1.00	1.00	1.00	1.00	
Satd. Flow (perm)		3255	1444		3172	570	1735	550	
Peak-hour factor, PHF	0.25	0.87	0.87	0.87	0.92	0.92	0.96	0.96	1.00
Adj. Flow (vph)	0	433	62	93	385	493	877	43	10
RTOR Reduction (vph)	0	0	67	0	0	191	0	22	0
Lane Group Flow (vph)	0	433	88	0	385	302	877	31	0
Confl. Peds. (#/hr)		151		79		102		218	
Confl. Bikes (#/hr)				9		9		67	
Heavy Vehicles (%)	0%	4%	4%	4%	10%	10%	6%	6%	100%
Bus Blockages (#/hr)	0	0	0	0	0	0	8	0	0
Turn Type		Split	NA		NA	Perm	NA	Perm	
Protected Phases	4	3	3		2		6		
Permitted Phases						2		6	
Actuated Green, G (s)		13.7	13.7		52.7	52.7	52.7	52.7	
Effective Green, g (s)		14.2	14.2		53.2	52.7	53.2	52.7	
Actuated g/C Ratio		0.16	0.16		0.59	0.59	0.59	0.59	
Clearance Time (s)		4.5	4.5		4.5	4.5	4.5	4.5	
Vehicle Extension (s)		0.2	0.2		0.2	0.2	0.2	0.2	
Lane Grp Cap (vph)		513	227		1875	333	1025	322	
v/s Ratio Prot		c0.13	0.06		0.12		0.51		
v/s Ratio Perm						c0.53		0.06	
v/c Ratio		0.84	0.39		0.21	0.91	0.86	0.10	
Uniform Delay, d1		36.8	34.0		8.6	16.5	15.2	8.2	
Progression Factor		1.00	1.00		1.00	1.00	0.72	0.89	
Incremental Delay, d2		15.5	5.0		0.2	30.5	7.1	0.4	
Delay (s)		52.4	39.0		8.8	46.9	18.1	7.7	
Level of Service		D	D		A	D	B	A	
Approach Delay (s)	0.0		48.8		30.2		17.5		
Approach LOS	A		D		C		B		

Intersection Summary			
HCM 2000 Control Delay	29.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	68.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	EBR2	WBL2	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	410	703	10	14	170	202	206	76	77	251
v/c Ratio	0.56	0.71	0.02	0.05	0.29	0.69	0.72	0.20	0.21	0.50
Control Delay	10.2	2.4	0.0	14.9	16.7	40.9	42.5	1.3	31.6	15.5
Queue Delay	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Total Delay	10.2	4.2	0.0	14.9	16.7	40.9	42.5	1.3	31.6	15.7
Queue Length 50th (ft)	134	5	0	4	55	70	71	0	37	42
Queue Length 95th (ft)	m134	m15	m0	15	102	#128	#195	m0	75	112
Internal Link Dist (ft)	448				552		251			177
Turn Bay Length (ft)								40	85	
Base Capacity (vph)	732	987	552	297	590	291	288	371	363	501
Starvation Cap Reductn	0	148	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	56	0	0	0	0	0	0	0	34
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.84	0.02	0.05	0.29	0.69	0.72	0.20	0.21	0.54

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	EBR2	WBL2	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	1	380	654	10	13	135	27	293	74	68	73	216
Future Volume (vph)	1	380	654	10	13	135	27	293	74	68	73	216
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.5	3.5	5.0		5.0	5.0	5.0	6.0	6.0
Lane Util. Factor		1.00	1.00	1.00	1.00	1.00		0.95	0.95	1.00	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00	0.96		1.00	1.00	0.86	1.00	0.98
Flpb, ped/bikes		1.00	1.00	1.00	0.98	1.00		1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85	0.85	1.00	0.98		1.00	1.00	0.85	1.00	0.99
Flt Protected		1.00	1.00	1.00	0.95	1.00		0.95	0.97	1.00	0.95	1.00
Satd. Flow (prot)		1791	1524	808	1356	1345		1588	1571	1238	1770	1804
Flt Permitted		1.00	1.00	1.00	0.37	1.00		0.95	0.97	1.00	0.95	1.00
Satd. Flow (perm)		1791	1524	808	528	1345		1588	1571	1238	1770	1804
Peak-hour factor, PHF	0.93	0.93	0.93	1.00	0.95	0.95	0.95	0.90	0.90	0.90	0.95	0.95
Adj. Flow (vph)	1	409	703	10	14	142	28	326	82	76	77	227
RTOR Reduction (vph)	0	0	0	3	0	7	0	0	0	65	0	130
Lane Group Flow (vph)	0	410	703	7	14	163	0	202	206	11	77	121
Confl. Peds. (#/hr)	92		117		117		92	92		38	38	
Confl. Bikes (#/hr)			1							9		
Heavy Vehicles (%)	6%	6%	6%	100%	17%	17%	17%	8%	8%	8%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	8	0	0
Parking (#/hr)					0	3	3					
Turn Type	Perm	NA	pt+ov	custom	D.P+P	NA		Split	NA	Perm	Split	NA
Protected Phases		8	8 2		7	4		2	2		1	1
Permitted Phases	8			4 2	8					2		
Actuated Green, G (s)		36.3	54.6	60.0	37.7	41.7		12.8	12.8	12.8	18.0	18.0
Effective Green, g (s)		36.8	55.1	60.0	38.7	42.2		13.3	13.3	13.3	18.5	18.5
Actuated g/C Ratio		0.41	0.61	0.67	0.43	0.47		0.15	0.15	0.15	0.21	0.21
Clearance Time (s)		5.5			4.0	5.5		5.5	5.5	5.5	6.5	6.5
Vehicle Extension (s)		0.2			0.2	0.2		0.2	0.2	0.2	0.2	0.2
Lane Grp Cap (vph)		732	933	538	244	630		234	232	182	363	370
v/s Ratio Prot			c0.46		0.00	c0.12		0.13	0.13		0.04	c0.07
v/s Ratio Perm		0.23		0.01	0.02					0.01		
v/c Ratio		0.56	0.75	0.01	0.06	0.26		0.86	0.89	0.06	0.21	0.33
Uniform Delay, d1		20.4	12.6	5.0	21.8	14.4		37.5	37.6	33.0	29.7	30.4
Progression Factor		0.44	0.05	1.00	1.00	1.00		0.79	0.79	1.00	1.00	1.00
Incremental Delay, d2		0.3	0.5	0.0	0.0	1.0		31.5	35.4	0.6	1.3	2.3
Delay (s)		9.2	1.2	5.0	21.8	15.4		60.9	64.9	33.6	31.0	32.8
Level of Service		A	A	A	C	B		E	E	C	C	C
Approach Delay (s)		4.1				15.9			58.3			32.4
Approach LOS		A				B			E			C

Intersection Summary			
HCM 2000 Control Delay	21.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	90.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR2
Lane Configurations	
Traffic Volume (vph)	23
Future Volume (vph)	23
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	24
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	48
Confl. Bikes (#/hr)	107
Heavy Vehicles (%)	2%
Bus Blockages (#/hr)	0
Parking (#/hr)	
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Lane Group	EBL	EBT	EBR	WBL2	WBT	NBL	SWR
Lane Group Flow (vph)	94	1072	49	116	385	92	95
v/c Ratio	0.55	1.07	0.07	0.89	0.22	0.25	0.16
Control Delay	53.7	57.2	0.6	91.1	9.5	14.0	0.6
Queue Delay	0.0	13.5	0.0	0.0	0.0	0.0	0.0
Total Delay	53.7	70.7	0.6	91.1	9.5	14.0	0.6
Queue Length 50th (ft)	51	~671	0	71	36	14	0
Queue Length 95th (ft)	m61	#915	m1	m#140	49	43	0
Internal Link Dist (ft)		25			448	332	
Turn Bay Length (ft)	60			50			
Base Capacity (vph)	202	1004	678	131	1766	371	609
Starvation Cap Reductn	0	117	0	0	0	0	0
Spillback Cap Reductn	0	13	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	1.21	0.07	0.89	0.22	0.25	0.16

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

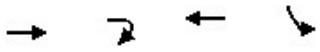
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	EBR2	WBL2	WBT	WBR	NBL	NBR	NBR2	SWR
Lane Configurations											
Traffic Volume (vph)	88	1008	37	10	102	331	8	22	24	27	70
Future Volume (vph)	88	1008	37	10	102	331	8	22	24	27	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.5	4.5		3.5	4.5		4.5			3.5
Lane Util. Factor	1.00	1.00	1.00		1.00	0.95		1.00			1.00
Frpb, ped/bikes	1.00	1.00	0.91		1.00	0.99		0.95			1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00		1.00			1.00
Frt	1.00	1.00	0.85		1.00	1.00		0.91			0.86
Flt Protected	0.95	1.00	1.00		0.95	1.00		0.99			1.00
Satd. Flow (prot)	1736	1827	1184		1687	3342		1390			1536
Flt Permitted	0.95	1.00	1.00		0.95	1.00		0.99			1.00
Satd. Flow (perm)	1736	1827	1184		1687	3342		1390			1536
Peak-hour factor, PHF	0.94	0.94	0.94	1.00	0.88	0.88	0.88	0.79	0.79	0.79	0.74
Adj. Flow (vph)	94	1072	39	10	116	376	9	28	30	34	95
RTOR Reduction (vph)	0	0	22	0	0	2	0	47	0	0	86
Lane Group Flow (vph)	94	1072	27	0	116	383	0	45	0	0	10
Confl. Peds. (#/hr)	78		30		30		78			45	
Confl. Bikes (#/hr)			7							2	1
Heavy Vehicles (%)	4%	4%	4%	100%	7%	7%	7%	16%	16%	16%	7%
Turn Type	Prot	NA	Perm		Prot	NA		Prot			Over
Protected Phases	1	6			5	2		4			1
Permitted Phases			6								
Actuated Green, G (s)	9.0	49.5	49.5		7.0	47.5		21.0			9.0
Effective Green, g (s)	9.0	49.5	49.5		7.0	47.5		21.0			9.0
Actuated g/C Ratio	0.10	0.55	0.55		0.08	0.53		0.23			0.10
Clearance Time (s)	3.5	4.5	4.5		3.5	4.5		4.5			3.5
Vehicle Extension (s)	2.0	0.2	0.2		2.0	0.2		0.2			2.0
Lane Grp Cap (vph)	173	1004	651		131	1763		324			153
v/s Ratio Prot	0.05	c0.59			c0.07	0.11		c0.03			0.01
v/s Ratio Perm			0.02								
v/c Ratio	0.54	1.07	0.04		0.89	0.22		0.14			0.06
Uniform Delay, d1	38.5	20.2	9.3		41.1	11.3		27.3			36.7
Progression Factor	1.22	0.58	0.22		1.02	0.81		1.00			1.00
Incremental Delay, d2	1.0	41.8	0.1		39.4	0.2		0.9			0.1
Delay (s)	48.0	53.5	2.1		81.1	9.4		28.2			36.7
Level of Service	D	D	A		F	A		C			D
Approach Delay (s)		51.0				26.0		28.2			
Approach LOS		D				C		C			

Intersection Summary			
HCM 2000 Control Delay	42.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	87.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBT	EBR	WBT	SBL
Lane Group Flow (vph)	1272	10	399	32
v/c Ratio	0.83	0.01	0.14	0.11
Control Delay	7.1	0.1	2.6	15.9
Queue Delay	1.9	0.0	0.1	0.0
Total Delay	9.0	0.1	2.7	15.9
Queue Length 50th (ft)	53	0	15	4
Queue Length 95th (ft)	m#956	m0	39	17
Internal Link Dist (ft)	470		71	789
Turn Bay Length (ft)				
Base Capacity (vph)	1528	668	2809	371
Starvation Cap Reductn	16	0	1299	0
Spillback Cap Reductn	132	0	0	1
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.91	0.01	0.26	0.09

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	SBR2	NEL	NER
Lane Configurations											
Traffic Volume (vph)	6	1164	10	0	383	12	17	0	4	0	0
Future Volume (vph)	6	1164	10	0	383	12	17	0	4	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	5.0		4.0		3.5				
Lane Util. Factor		1.00	1.00		0.95		1.00				
Frpb, ped/bikes		1.00	1.00		1.00		0.98				
Flpb, ped/bikes		1.00	1.00		1.00		1.00				
Frt		1.00	0.85		1.00		0.97				
Flt Protected		1.00	1.00		1.00		0.96				
Satd. Flow (prot)		1844	808		3385		1749				
Flt Permitted		1.00	1.00		1.00		0.96				
Satd. Flow (perm)		1841	808		3385		1749				
Peak-hour factor, PHF	0.92	0.92	1.00	0.92	0.99	0.99	0.66	0.92	0.66	0.92	0.92
Adj. Flow (vph)	7	1265	10	0	387	12	26	0	6	0	0
RTOR Reduction (vph)	0	0	2	0	2	0	21	0	0	0	0
Lane Group Flow (vph)	0	1272	8	0	397	0	11	0	0	0	0
Confl. Peds. (#/hr)	15					15			51		
Confl. Bikes (#/hr)						2					
Heavy Vehicles (%)	3%	3%	100%	2%	6%	6%	0%	2%	0%	2%	2%
Turn Type	Perm	NA	Perm		NA		Prot				
Protected Phases		6			2		4				
Permitted Phases	6		6								
Actuated Green, G (s)		70.3	70.3		70.3		10.2				
Effective Green, g (s)		71.3	70.3		71.3		11.2				
Actuated g/C Ratio		0.79	0.78		0.79		0.12				
Clearance Time (s)		5.0	5.0		5.0		4.5				
Vehicle Extension (s)		0.2	0.2		0.2		1.0				
Lane Grp Cap (vph)		1458	631		2681		217				
v/s Ratio Prot					0.12		c0.01				
v/s Ratio Perm		c0.69	0.01								
v/c Ratio		0.87	0.01		0.15		0.05				
Uniform Delay, d1		6.3	2.2		2.2		34.7				
Progression Factor		0.15	0.09		0.85		1.00				
Incremental Delay, d2		4.2	0.0		0.1		0.0				
Delay (s)		5.1	0.2		2.0		34.8				
Level of Service		A	A		A		C				
Approach Delay (s)		5.1			2.0		34.8			0.0	
Approach LOS		A			A		C			A	

Intersection Summary			
HCM 2000 Control Delay	4.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	85.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL2	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	1234	96	46	385	38	14	102
v/c Ratio	0.87	0.10	0.41	0.28	0.18	0.05	0.38
Control Delay	9.0	0.3	24.1	5.7	31.2	7.4	27.7
Queue Delay	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.3	0.3	24.1	5.7	31.2	7.4	27.7
Queue Length 50th (ft)	23	1	15	125	17	0	37
Queue Length 95th (ft)	#949	m1	#56	144	40	9	68
Internal Link Dist (ft)	748			470	201		616
Turn Bay Length (ft)							
Base Capacity (vph)	1423	1004	113	1388	271	354	331
Starvation Cap Reductn	1	0	0	0	0	0	0
Spillback Cap Reductn	20	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.10	0.41	0.28	0.14	0.04	0.31

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	EBR2	WBL2	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	0	1160	81	10	45	366	8	31	0	11	53	17
Future Volume (vph)	0	1160	81	10	45	366	8	31	0	11	53	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	5.0		4.0	4.0			4.0	4.0		4.0
Lane Util. Factor		1.00	1.00		1.00	1.00			1.00	1.00		1.00
Frpb, ped/bikes		1.00	0.92		1.00	1.00			1.00	0.94		0.98
Flpb, ped/bikes		1.00	1.00		1.00	1.00			0.92	1.00		0.97
Frt		1.00	0.85		1.00	1.00			1.00	0.85		0.98
Flt Protected		1.00	1.00		0.95	1.00			0.95	1.00		0.97
Satd. Flow (prot)		1845	1310		1719	1800			1609	1473		1710
Flt Permitted		1.00	1.00		0.08	1.00			0.70	1.00		0.78
Satd. Flow (perm)		1845	1310		147	1800			1192	1473		1372
Peak-hour factor, PHF	0.94	0.94	0.94	1.00	0.97	0.97	0.97	0.81	0.81	0.81	0.78	0.78
Adj. Flow (vph)	0	1234	86	10	46	377	8	38	0	14	68	22
RTOR Reduction (vph)	0	0	6	0	0	1	0	0	0	12	0	20
Lane Group Flow (vph)	0	1234	90	0	46	384	0	0	38	2	0	82
Confl. Peds. (#/hr)	46		31		31		46	45		33	33	
Confl. Bikes (#/hr)			1				1			2		
Heavy Vehicles (%)	3%	3%	3%	100%	5%	5%	5%	3%	3%	3%	1%	1%
Turn Type	Perm	NA	Perm		Perm	NA		D.Pm	NA	custom	Perm	NA
Protected Phases		2				2			8			4
Permitted Phases	2		2		2			4		4	4	
Actuated Green, G (s)		66.6	66.6		66.6	66.6			13.4	13.4		13.4
Effective Green, g (s)		67.6	66.6		67.6	67.6			14.4	14.4		14.4
Actuated g/C Ratio		0.75	0.74		0.75	0.75			0.16	0.16		0.16
Clearance Time (s)		5.0	5.0		5.0	5.0			5.0	5.0		5.0
Vehicle Extension (s)		0.2	0.2		0.2	0.2			1.0	1.0		1.0
Lane Grp Cap (vph)		1385	969		110	1352			190	235		219
v/s Ratio Prot		c0.67				0.21						
v/s Ratio Perm			0.07		0.31				0.03	0.00		c0.06
v/c Ratio		0.89	0.09		0.42	0.28			0.20	0.01		0.37
Uniform Delay, d1		8.4	3.3		4.1	3.5			32.8	31.8		33.8
Progression Factor		0.13	0.06		1.40	1.14			1.00	1.00		1.00
Incremental Delay, d2		5.7	0.1		11.2	0.5			0.2	0.0		0.4
Delay (s)		6.8	0.3		16.9	4.6			33.0	31.8		34.2
Level of Service		A	A		B	A			C	C		C
Approach Delay (s)		6.3				5.9			32.7			34.2
Approach LOS		A				A			C			C

Intersection Summary			
HCM 2000 Control Delay	8.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	98.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR2
Lane Configurations	
Traffic Volume (vph)	9
Future Volume (vph)	9
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.78
Adj. Flow (vph)	12
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	45
Confl. Bikes (#/hr)	8
Heavy Vehicles (%)	1%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Lane Group	EBT	EBR	WBL2	WBT	NBT	SBT
Lane Group Flow (vph)	1212	120	19	412	43	33
v/c Ratio	0.85	0.12	0.15	0.30	0.19	0.11
Control Delay	16.8	1.3	6.5	3.6	23.6	18.2
Queue Delay	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	17.2	1.3	6.5	3.6	23.6	18.2
Queue Length 50th (ft)	565	10	2	41	13	7
Queue Length 95th (ft)	#491	m2	10	90	40	22
Internal Link Dist (ft)	303			748	246	294
Turn Bay Length (ft)			100			
Base Capacity (vph)	1422	1004	131	1380	306	385
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	32	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.12	0.15	0.30	0.14	0.09

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBT	EBR	EBR2	WBL2	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR2
Lane Configurations												
Traffic Volume (vph)	1139	103	10	18	385	2	20	5	12	7	11	6
Future Volume (vph)	1139	103	10	18	385	2	20	5	12	7	11	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5			4.5			4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frpb, ped/bikes	1.00	0.89		1.00	1.00			0.99			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.99	
Frt	1.00	0.85		1.00	1.00			0.96			0.97	
Flt Protected	1.00	1.00		0.95	1.00			0.97			0.99	
Satd. Flow (prot)	1845	1297		1703	1790			1514			1782	
Flt Permitted	1.00	1.00		0.09	1.00			0.85			0.92	
Satd. Flow (perm)	1845	1297		169	1790			1327			1674	
Peak-hour factor, PHF	0.94	0.94	1.00	0.94	0.94	0.94	0.88	0.88	0.88	0.72	0.72	0.72
Adj. Flow (vph)	1212	110	10	19	410	2	23	6	14	10	15	8
RTOR Reduction (vph)	0	4	0	0	0	0	0	12	0	0	15	0
Lane Group Flow (vph)	1212	116	0	19	412	0	0	31	0	0	18	0
Confl. Peds. (#/hr)		34		34		28	19		16	16		19
Confl. Bikes (#/hr)						3			1			1
Heavy Vehicles (%)	3%	3%	100%	6%	6%	6%	14%	14%	14%	0%	0%	0%
Turn Type	NA	Perm		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	2				2			4			4	
Permitted Phases		2		2			4			4		
Actuated Green, G (s)	67.6	67.6		67.6	67.6			13.4			13.4	
Effective Green, g (s)	67.6	67.6		67.6	67.6			13.4			13.4	
Actuated g/C Ratio	0.75	0.75		0.75	0.75			0.15			0.15	
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0			2.0	
Lane Grp Cap (vph)	1385	974		126	1344			197			249	
v/s Ratio Prot	c0.66				0.23							
v/s Ratio Perm		0.09		0.11				c0.02			0.01	
v/c Ratio	0.88	0.12		0.15	0.31			0.16			0.07	
Uniform Delay, d1	8.1	3.1		3.1	3.6			33.4			32.9	
Progression Factor	0.85	0.27		0.70	0.62			1.00			1.00	
Incremental Delay, d2	6.9	0.2		2.5	0.6			0.1			0.0	
Delay (s)	13.8	1.1		4.7	2.8			33.5			33.0	
Level of Service	B	A		A	A			C			C	
Approach Delay (s)	12.6				2.9			33.5			33.0	
Approach LOS	B				A			C			C	

Intersection Summary			
HCM 2000 Control Delay	11.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	78.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

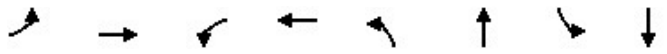
Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	16	492	7	414	334	1348
v/c Ratio	0.12	0.81	0.08	0.27	0.82	0.54
Control Delay	27.8	15.9	40.7	15.5	48.4	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.8	15.9	40.7	15.5	48.4	9.3
Queue Length 50th (ft)	7	21	4	51	179	102
Queue Length 95th (ft)	20	105	m15	117	257	398
Internal Link Dist (ft)	602	497		290		2020
Turn Bay Length (ft)			100		100	
Base Capacity (vph)	236	740	93	1511	520	2489
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	4	0	0	0	32
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.67	0.08	0.27	0.64	0.55

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	3	2	31	4	403	7	397	0	321	1292	2
Future Volume (vph)	8	3	2	31	4	403	7	397	0	321	1292	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			0.97		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.98			0.88		1.00	1.00		1.00	1.00	
Flt Protected		0.97			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1464			1517		1687	3374		1736	3470	
Flt Permitted		0.56			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		848			1484		1687	3374		1736	3470	
Peak-hour factor, PHF	0.81	0.81	0.81	0.89	0.89	0.89	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	10	4	2	35	4	453	7	414	0	334	1346	2
RTOR Reduction (vph)	0	2	0	0	385	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	14	0	0	107	0	7	414	0	334	1348	0
Confl. Peds. (#/hr)	12		6	6		12	4		9	9		4
Confl. Bikes (#/hr)						3			1			
Heavy Vehicles (%)	23%	23%	23%	6%	6%	6%	7%	7%	7%	4%	4%	4%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			4		5	2		1	6	
Permitted Phases	4			4								
Actuated Green, G (s)		13.5			13.5		1.0	40.3		21.2	60.5	
Effective Green, g (s)		13.5			13.5		1.0	40.3		21.2	60.5	
Actuated g/C Ratio		0.15			0.15		0.01	0.45		0.24	0.67	
Clearance Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	0.2		2.0	0.2	
Lane Grp Cap (vph)		127			222		18	1510		408	2332	
v/s Ratio Prot							0.00	0.12		c0.19	c0.39	
v/s Ratio Perm		0.02			c0.07							
v/c Ratio		0.11			0.48		0.39	0.27		0.82	0.58	
Uniform Delay, d1		33.1			35.0		44.2	15.6		32.6	7.9	
Progression Factor		1.00			1.00		0.96	0.79		1.00	1.00	
Incremental Delay, d2		0.1			0.6		4.9	0.4		11.5	1.1	
Delay (s)		33.2			35.6		47.4	12.9		44.1	9.0	
Level of Service		C			D		D	B		D	A	
Approach Delay (s)		33.2			35.6			13.4			15.9	
Approach LOS		C			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	19.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	80.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	40	589	33	630	62	107	176	294
v/c Ratio	0.07	0.28	0.06	0.32	0.32	0.16	0.65	0.40
Control Delay	5.8	9.1	5.7	10.1	29.1	17.8	39.1	15.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.8	9.1	5.7	10.1	29.1	17.8	39.1	15.7
Queue Length 50th (ft)	5	46	4	80	27	16	82	37
Queue Length 95th (ft)	19	138	17	145	52	31	128	62
Internal Link Dist (ft)		500		618		181		179
Turn Bay Length (ft)	60		60		140		140	
Base Capacity (vph)	558	2087	580	1944	320	1074	447	1134
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.28	0.06	0.32	0.19	0.10	0.39	0.26

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	521	33	31	484	102	54	67	26	171	163	122
Future Volume (vph)	38	521	33	31	484	102	54	67	26	171	163	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	14	11	14	14	11	14
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00		0.99	1.00	
Frt	1.00	0.99		1.00	0.97		1.00	0.96		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1660	3288		1641	3194		1794	3125		1842	3104	
Flt Permitted	0.38	1.00		0.41	1.00		0.50	1.00		0.68	1.00	
Satd. Flow (perm)	665	3288		700	3194		951	3125		1327	3104	
Peak-hour factor, PHF	0.94	0.94	0.94	0.93	0.93	0.93	0.87	0.87	0.87	0.97	0.97	0.97
Adj. Flow (vph)	40	554	35	33	520	110	62	77	30	176	168	126
RTOR Reduction (vph)	0	4	0	0	16	0	0	24	0	0	100	0
Lane Group Flow (vph)	40	585	0	33	614	0	62	83	0	176	194	0
Confl. Peds. (#/hr)	7		16	16		7	14		12	12		14
Confl. Bikes (#/hr)			3			1			4			17
Heavy Vehicles (%)	5%	5%	5%	6%	6%	6%	6%	6%	6%	3%	3%	3%
Turn Type	D.P+P	NA		D.P+P	NA		Perm	NA		Perm	NA	
Protected Phases	1	6		5	2			4			4	
Permitted Phases	2			6			4			4		
Actuated Green, G (s)	49.5	46.7		49.5	45.3		15.5	15.5		15.5	15.5	
Effective Green, g (s)	51.5	47.7		51.5	46.3		16.5	16.5		16.5	16.5	
Actuated g/C Ratio	0.64	0.60		0.64	0.58		0.21	0.21		0.21	0.21	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	0.2	0.2		0.2	0.2		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	492	1960		495	1848		196	644		273	640	
v/s Ratio Prot	c0.01	0.18		0.00	c0.19			0.03			0.06	
v/s Ratio Perm	0.05			0.04			0.07			c0.13		
v/c Ratio	0.08	0.30		0.07	0.33		0.32	0.13		0.64	0.30	
Uniform Delay, d1	5.3	7.9		5.2	8.8		27.0	25.9		29.1	26.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.4		0.0	0.5		0.3	0.0		3.9	0.1	
Delay (s)	5.3	8.3		5.2	9.3		27.3	25.9		32.9	27.0	
Level of Service	A	A		A	A		C	C		C	C	
Approach Delay (s)		8.1			9.1			26.4			29.2	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	54.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

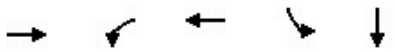
Lane Group	EBT	WBT	WBR	NBL	NBT
Lane Group Flow (vph)	524	677	91	236	233
v/c Ratio	0.52	0.48	0.17	0.61	0.53
Control Delay	5.3	19.2	8.5	36.0	19.9
Queue Delay	0.0	0.2	0.0	0.0	0.2
Total Delay	5.3	19.4	8.5	36.0	20.1
Queue Length 50th (ft)	16	124	8	103	50
Queue Length 95th (ft)	20	184	36	#223	146
Internal Link Dist (ft)	18	500			709
Turn Bay Length (ft)			150		
Base Capacity (vph)	1461	2013	742	414	465
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	517	0	0	21
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.36	0.45	0.12	0.57	0.52

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL2	EBT	WBT	WBR	WBR2	NBL	NBT	NBR2
Lane Configurations								
Traffic Volume (vph)	2	480	569	67	11	304	49	64
Future Volume (vph)	2	480	569	67	11	304	49	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	12	11	11	11
Total Lost time (s)		3.5	3.5	4.5		3.5	3.5	
Lane Util. Factor		0.95	0.95	1.00		0.95	0.95	
Frpb, ped/bikes		1.00	1.00	0.92		1.00	0.98	
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00	
Frt		1.00	1.00	0.85		1.00	0.95	
Flt Protected		1.00	1.00	1.00		0.95	0.98	
Satd. Flow (prot)		3323	3323	1231		1549	1446	
Flt Permitted		0.95	1.00	1.00		0.95	0.98	
Satd. Flow (perm)		3174	3323	1231		1549	1446	
Peak-hour factor, PHF	0.92	0.92	0.84	0.84	1.00	0.89	0.89	0.89
Adj. Flow (vph)	2	522	677	80	11	342	55	72
RTOR Reduction (vph)	0	0	0	37	0	0	82	0
Lane Group Flow (vph)	0	524	677	54	0	236	151	0
Confl. Peds. (#/hr)	21			21				50
Confl. Bikes (#/hr)				8				
Heavy Vehicles (%)	5%	5%	5%	5%	100%	7%	7%	7%
Bus Blockages (#/hr)	0	0	0	0	0	0	7	0
Turn Type	Prot	NA	NA	Perm		Split	NA	
Protected Phases	3	2 3	6			4	4	
Permitted Phases				6				
Actuated Green, G (s)		34.2	32.5	32.5		18.9	18.9	
Effective Green, g (s)		36.2	33.5	32.5		19.9	19.9	
Actuated g/C Ratio		0.46	0.42	0.41		0.25	0.25	
Clearance Time (s)			4.5	4.5		4.5	4.5	
Vehicle Extension (s)			3.5	3.5		2.5	2.5	
Lane Grp Cap (vph)		1476	1402	503		388	362	
v/s Ratio Prot		c0.07	c0.20			c0.15	0.10	
v/s Ratio Perm		0.09		0.04				
v/c Ratio		0.36	0.48	0.11		0.61	0.42	
Uniform Delay, d1		14.0	16.7	14.5		26.3	24.9	
Progression Factor		0.21	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2	0.3	0.1		2.3	0.6	
Delay (s)		3.1	17.0	14.6		28.6	25.5	
Level of Service		A	B	B		C	C	
Approach Delay (s)		3.1	16.7				27.0	
Approach LOS		A	B				C	

Intersection Summary			
HCM 2000 Control Delay	15.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	79.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	655	408	644	153	151
v/c Ratio	0.64	0.60	0.27	0.51	0.50
Control Delay	19.5	30.6	1.0	35.3	32.2
Queue Delay	0.1	0.0	0.0	0.0	0.0
Total Delay	19.5	30.6	1.0	35.3	32.2
Queue Length 50th (ft)	88	138	6	71	64
Queue Length 95th (ft)	182	151	7	140	130
Internal Link Dist (ft)	571		18		1167
Turn Bay Length (ft)					
Base Capacity (vph)	1028	978	2958	509	508
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	17	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.65	0.42	0.22	0.30	0.30

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	285	298	343	541	0	0	0	0	200	41	29
Future Volume (vph)	0	285	298	343	541	0	0	0	0	200	41	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	12	12	12	11	11	11
Total Lost time (s)		-0.5		3.5	3.5					3.5	3.5	
Lane Util. Factor		0.95		1.00	0.95					0.95	0.95	
Frpb, ped/bikes		0.93		1.00	1.00					1.00	0.99	
Flpb, ped/bikes		1.00		1.00	1.00					1.00	1.00	
Frt		0.92		1.00	1.00					1.00	0.97	
Flt Protected		1.00		0.95	1.00					0.95	0.98	
Satd. Flow (prot)		2833		1646	3292					1535	1509	
Flt Permitted		1.00		0.95	1.00					0.95	0.98	
Satd. Flow (perm)		2833		1646	3292					1535	1509	
Peak-hour factor, PHF	0.89	0.89	0.89	0.84	0.84	0.84	0.92	0.92	0.92	0.89	0.89	0.89
Adj. Flow (vph)	0	320	335	408	644	0	0	0	0	225	46	33
RTOR Reduction (vph)	0	161	0	0	0	0	0	0	0	0	10	0
Lane Group Flow (vph)	0	494	0	408	644	0	0	0	0	153	141	0
Confl. Peds. (#/hr)			42	42			30					30
Confl. Bikes (#/hr)			4			1						4
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	2%	2%	2%	8%	8%	8%
Turn Type		NA		Prot	NA					Split	NA	
Protected Phases		2		1 4	4 6					3	3	
Permitted Phases												
Actuated Green, G (s)		19.7		31.7	55.9					14.5	14.5	
Effective Green, g (s)		24.7		32.7	56.9					15.5	15.5	
Actuated g/C Ratio		0.31		0.41	0.72					0.20	0.20	
Clearance Time (s)		4.5								4.5	4.5	
Vehicle Extension (s)		3.5								2.5	2.5	
Lane Grp Cap (vph)		881		677	2359					299	294	
v/s Ratio Prot		c0.17		c0.25	0.20					c0.10	0.09	
v/s Ratio Perm												
v/c Ratio		0.56		0.60	0.27					0.51	0.48	
Uniform Delay, d1		22.8		18.3	4.0					28.6	28.4	
Progression Factor		1.00		1.36	0.15					1.00	1.00	
Incremental Delay, d2		0.9		1.0	0.0					1.1	0.9	
Delay (s)		23.7		25.8	0.6					29.7	29.3	
Level of Service		C		C	A					C	C	
Approach Delay (s)		23.7			10.4			0.0			29.5	
Approach LOS		C			B			A			C	

Intersection Summary			
HCM 2000 Control Delay	17.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	79.4	Sum of lost time (s)	10.5
Intersection Capacity Utilization	61.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	5.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	23	474	4	33	356	10	2	9	69	23	7	28
Future Vol, veh/h	23	474	4	33	356	10	2	9	69	23	7	28
Conflicting Peds, #/hr	4	0	12	12	0	4	6	0	19	19	0	6
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	60	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	79	79	79	91	91	91	42	42	42	92	92	92
Heavy Vehicles, %	5	5	5	6	6	6	1	1	1	0	0	0
Mvmt Flow	29	600	5	36	391	11	5	21	164	25	8	30

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	406	0	0	617	0	0	1167	1151	634	1245	1148	407
Stage 1	-	-	-	-	-	-	673	673	-	473	473	-
Stage 2	-	-	-	-	-	-	494	478	-	772	675	-
Critical Hdwy	4.15	-	-	4.16	-	-	7.11	6.51	6.21	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.1	5.5	-
Follow-up Hdwy	2.245	-	-	2.254	-	-	3.509	4.009	3.309	3.5	4	3.3
Pot Cap-1 Maneuver	1137	-	-	944	-	-	171	199	481	152	200	648
Stage 1	-	-	-	-	-	-	446	456	-	576	562	-
Stage 2	-	-	-	-	-	-	559	557	-	395	456	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1133	-	-	935	-	-	148	184	469	84	185	643
Mov Cap-2 Maneuver	-	-	-	-	-	-	148	184	-	84	185	-
Stage 1	-	-	-	-	-	-	430	440	-	559	538	-
Stage 2	-	-	-	-	-	-	502	534	-	234	440	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.7	23.4	40.4
HCM LOS			C	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	382	1133	-	-	935	-	-	163
HCM Lane V/C Ratio	0.499	0.026	-	-	0.039	-	-	0.387
HCM Control Delay (s)	23.4	8.3	-	-	9	-	-	40.4
HCM Lane LOS	C	A	-	-	A	-	-	E
HCM 95th %tile Q(veh)	2.7	0.1	-	-	0.1	-	-	1.7

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	6	20	6	141	33	27	0	258	3	30	196	158
Future Volume (vph)	6	20	6	141	33	27	0	258	3	30	196	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5			4.5		4.5	4.5	4.5
Lane Util. Factor		1.00			1.00			1.00		1.00	1.00	1.00
Frpb, ped/bikes		0.97			0.99			1.00		1.00	1.00	0.93
Flpb, ped/bikes		0.99			0.90			1.00		0.97	1.00	1.00
Frt		0.97			0.98			1.00		1.00	1.00	0.85
Flt Protected		0.99			0.97			1.00		0.95	1.00	1.00
Satd. Flow (prot)		1763			1583			1738		1618	1759	1392
Flt Permitted		0.95			0.76			1.00		0.52	1.00	1.00
Satd. Flow (perm)		1682			1253			1738		889	1759	1392
Peak-hour factor, PHF	0.75	0.75	0.75	0.88	0.88	0.88	0.78	0.78	0.78	0.76	0.76	0.76
Adj. Flow (vph)	8	27	8	160	38	31	0	331	4	39	258	208
RTOR Reduction (vph)	0	5	0	0	11	0	0	1	0	0	0	104
Lane Group Flow (vph)	0	38	0	0	218	0	0	334	0	39	258	104
Confl. Peds. (#/hr)	41		102	102		41	33		35	35		33
Confl. Bikes (#/hr)						2			3			
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	9%	9%	9%	8%	8%	8%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		2
Actuated Green, G (s)		18.6			18.6			27.4		27.4	27.4	27.4
Effective Green, g (s)		18.6			18.6			27.4		27.4	27.4	27.4
Actuated g/C Ratio		0.34			0.34			0.50		0.50	0.50	0.50
Clearance Time (s)		4.5			4.5			4.5		4.5	4.5	4.5
Vehicle Extension (s)		3.0			3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		568			423			865		442	876	693
v/s Ratio Prot								c0.19			0.15	
v/s Ratio Perm		0.02			c0.17					0.04		0.07
v/c Ratio		0.07			0.51			0.39		0.09	0.29	0.15
Uniform Delay, d1		12.3			14.6			8.6		7.2	8.1	7.5
Progression Factor		1.00			1.00			1.00		1.00	1.00	1.00
Incremental Delay, d2		0.0			1.1			1.3		0.4	0.9	0.5
Delay (s)		12.4			15.6			9.9		7.6	9.0	7.9
Level of Service		B			B			A		A	A	A
Approach Delay (s)		12.4			15.6			9.9			8.4	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	10.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	48.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBT	WBR	NBT	SBT	NWL	NWR
Lane Group Flow (vph)	193	143	157	53	31	244	78	76
v/c Ratio	0.41	0.42	0.31	0.12	0.08	0.57	0.20	0.22
Control Delay	26.9	16.9	29.6	2.6	29.9	40.5	35.8	36.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.9	16.9	29.6	2.6	29.9	40.5	35.8	36.3
Queue Length 50th (ft)	104	46	82	0	16	148	45	44
Queue Length 95th (ft)	128	78	119	6	20	191	80	80
Internal Link Dist (ft)	294		560		193	463	230	
Turn Bay Length (ft)								
Base Capacity (vph)	475	344	501	448	376	427	387	346
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.42	0.31	0.12	0.08	0.57	0.20	0.22

Intersection Summary

Movement	EBT	EBR	EBR2	WBT	WBR	NBL	NBT	NBR	NBR2	SBL2	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	170	111	15	124	42	5	3	6	1	36	117	31
Future Volume (vph)	170	111	15	124	42	5	3	6	1	36	117	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	16	12	12	12	12	16
Total Lost time (s)	6.5	6.5		6.5	6.5		5.0					5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00					1.00
Frpb, ped/bikes	1.00	0.62		1.00	0.81		1.00					0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.92					1.00
Frt	1.00	0.85		1.00	0.85		0.94					1.00
Flt Protected	1.00	1.00		1.00	1.00		0.98					0.96
Satd. Flow (prot)	1433	868		1511	1183		1523					2021
Flt Permitted	1.00	1.00		1.00	1.00		0.89					0.74
Satd. Flow (perm)	1433	868		1511	1183		1376					1565
Peak-hour factor, PHF	0.88	0.88	0.88	0.79	0.79	0.47	0.47	0.47	0.92	0.77	0.77	0.77
Adj. Flow (vph)	193	126	17	157	53	11	6	13	1	47	152	40
RTOR Reduction (vph)	0	56	0	0	35	0	1	0	0	0	0	1
Lane Group Flow (vph)	193	87	0	157	18	0	30	0	0	0	0	243
Confl. Peds. (#/hr)		40	39		64	157						
Confl. Bikes (#/hr)		1	1		2							
Heavy Vehicles (%)	16%	16%	16%	10%	10%	20%	20%	20%	2%	1%	1%	1%
Parking (#/hr)	5			5								
Turn Type	NA	Perm		NA	Perm	Perm	NA			Perm	Perm	NA
Protected Phases	2			6			4					4
Permitted Phases		2			6	4				4	4	
Actuated Green, G (s)	36.5	36.5		36.5	36.5		30.0					30.0
Effective Green, g (s)	36.5	36.5		36.5	36.5		30.0					30.0
Actuated g/C Ratio	0.33	0.33		0.33	0.33		0.27					0.27
Clearance Time (s)	6.5	6.5		6.5	6.5		5.0					5.0
Lane Grp Cap (vph)	475	288		501	392		375					426
v/s Ratio Prot	c0.13			0.10								
v/s Ratio Perm		0.10			0.01		0.02					c0.16
v/c Ratio	0.41	0.30		0.31	0.04		0.08					0.57
Uniform Delay, d1	28.4	27.3		27.4	24.9		29.7					34.5
Progression Factor	0.84	1.04		1.00	1.00		1.00					1.00
Incremental Delay, d2	2.5	2.6		1.6	0.2		0.4					5.5
Delay (s)	26.4	30.9		29.0	25.1		30.2					39.9
Level of Service	C	C		C	C		C					D
Approach Delay (s)	28.3			28.1			30.2					39.9
Approach LOS	C			C			C					D

Intersection Summary			
HCM 2000 Control Delay	32.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	68.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR	NWL2	NWL	NWR
Lane Configurations				
Traffic Volume (vph)	4	1	65	64
Future Volume (vph)	4	1	65	64
Ideal Flow (vphpl)	1900	1900	1900	1900
Lane Width	12	12	12	12
Total Lost time (s)			6.5	6.5
Lane Util. Factor			1.00	1.00
Frpb, ped/bikes			1.00	1.00
Flpb, ped/bikes			1.00	1.00
Frt			1.00	0.85
Flt Protected			0.95	1.00
Satd. Flow (prot)			1671	1495
Flt Permitted			0.95	1.00
Satd. Flow (perm)			1671	1495
Peak-hour factor, PHF	0.77	0.84	0.84	0.84
Adj. Flow (vph)	5	1	77	76
RTOR Reduction (vph)	0	0	0	0
Lane Group Flow (vph)	0	0	78	76
Confl. Peds. (#/hr)	157			
Confl. Bikes (#/hr)	8			
Heavy Vehicles (%)	1%	8%	8%	8%
Parking (#/hr)				
Turn Type		Prot	Prot	Perm
Protected Phases		3	3	
Permitted Phases				3
Actuated Green, G (s)			25.5	25.5
Effective Green, g (s)			25.5	25.5
Actuated g/C Ratio			0.23	0.23
Clearance Time (s)			6.5	6.5
Lane Grp Cap (vph)			387	346
v/s Ratio Prot			0.05	
v/s Ratio Perm				c0.05
v/c Ratio			0.20	0.22
Uniform Delay, d1			34.0	34.2
Progression Factor			1.00	1.00
Incremental Delay, d2			1.2	1.5
Delay (s)			35.2	35.7
Level of Service			D	D
Approach Delay (s)			35.4	
Approach LOS			D	

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	28	242	524	39	207	93	143	105	138	508	52
v/c Ratio	0.35	0.42	0.65	0.48	0.41	0.10	0.46	0.33	0.25	0.89	0.11
Control Delay	63.6	36.0	19.8	67.1	27.5	0.3	44.7	39.4	27.8	53.8	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.6	36.0	19.8	67.1	27.9	0.3	44.7	39.4	27.8	53.8	0.6
Queue Length 50th (ft)	20	140	196	28	113	1	94	64	69	328	0
Queue Length 95th (ft)	49	239	311	62	158	0	135	100	116	#465	2
Internal Link Dist (ft)		1194			73			53		202	
Turn Bay Length (ft)			100	50					100		
Base Capacity (vph)	79	576	863	83	501	965	390	401	608	640	500
Starvation Cap Reductn	0	0	0	0	64	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.42	0.61	0.47	0.47	0.10	0.37	0.26	0.23	0.79	0.10

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	213	461	33	176	79	120	79	9	134	493	50
Future Volume (vph)	25	213	461	33	176	79	120	79	9	134	493	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	12	12	12	12	12	11	11	12
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.93	1.00	1.00	0.93	1.00	0.98		1.00	1.00	0.77
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1752	1783	1463	1671	1539	1397	1752	1785		1694	1783	1205
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1752	1783	1463	1671	1539	1397	1752	1785		1694	1783	1205
Peak-hour factor, PHF	0.88	0.88	0.88	0.85	0.85	0.85	0.84	0.84	0.84	0.97	0.97	0.97
Adj. Flow (vph)	28	242	524	39	207	93	143	94	11	138	508	52
RTOR Reduction (vph)	0	0	70	0	0	34	0	4	0	0	0	35
Lane Group Flow (vph)	28	242	454	39	207	59	143	101	0	138	508	17
Confl. Peds. (#/hr)	38		27	27		38	66		44	44		66
Confl. Bikes (#/hr)			1			1						15
Heavy Vehicles (%)	3%	3%	3%	8%	8%	8%	3%	3%	3%	3%	3%	3%
Parking (#/hr)					5							
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA		Split	NA	Perm
Protected Phases	1	6	3	5	2	4	3	3		4	4	
Permitted Phases			6			2						4
Actuated Green, G (s)	3.0	33.7	53.4	3.3	34.0	69.3	19.7	19.7		35.3	35.3	35.3
Effective Green, g (s)	3.0	33.7	53.4	3.3	34.0	69.3	19.7	19.7		35.3	35.3	35.3
Actuated g/C Ratio	0.03	0.31	0.49	0.03	0.31	0.63	0.18	0.18		0.32	0.32	0.32
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	2.0	2.5	3.0	2.0	2.5	2.0	3.0	3.0		2.0	2.0	2.0
Lane Grp Cap (vph)	47	546	770	50	475	880	313	319		543	572	386
v/s Ratio Prot	0.02	0.14	c0.11	c0.02	0.13	0.02	0.08	0.06		0.08	c0.28	
v/s Ratio Perm			0.20			0.02						0.01
v/c Ratio	0.60	0.44	0.59	0.78	0.44	0.07	0.46	0.32		0.25	0.89	0.04
Uniform Delay, d1	52.9	30.6	20.4	53.0	30.3	7.9	40.4	39.3		27.6	35.5	25.7
Progression Factor	1.00	1.00	1.00	0.94	0.74	0.04	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	12.8	2.6	1.2	50.5	2.9	0.0	1.1	0.6		0.1	15.1	0.0
Delay (s)	65.7	33.2	21.6	100.1	25.4	0.3	41.4	39.9		27.7	50.5	25.7
Level of Service	E	C	C	F	C	A	D	D		C	D	C
Approach Delay (s)		26.7			27.1			40.8			44.2	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	34.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	72.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	515	451	46	821	104	1183	251
v/c Ratio	0.95	0.92	0.79	0.54	0.66	0.90	0.36
Control Delay	78.9	75.6	130.2	33.2	74.6	43.7	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.9	75.6	130.2	33.2	74.6	43.7	6.0
Queue Length 50th (ft)	224	192	39	195	85	494	16
Queue Length 95th (ft)	#336	#230	#115	251	144	#651	72
Internal Link Dist (ft)	193	252		634		98	
Turn Bay Length (ft)			240		150		
Base Capacity (vph)	545	507	58	1528	203	1315	694
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.94	0.89	0.79	0.54	0.51	0.90	0.36

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	263	174	52	170	145	50	42	660	87	100	1136	241
Future Volume (vph)	263	174	52	170	145	50	42	660	87	100	1136	241
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	9	11	12	9	9	12	11	10	12	11	10	11
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor		0.95			0.95		1.00	0.91		1.00	0.95	1.00
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	1.00	0.95
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt		0.98			0.98		1.00	0.98		1.00	1.00	0.85
Flt Protected		0.97			0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		2797			2590		1481	4021		1481	2861	1253
Flt Permitted		0.97			0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		2797			2590		1481	4021		1481	2861	1253
Peak-hour factor, PHF	0.95	0.95	0.95	0.81	0.81	0.81	0.91	0.91	0.91	0.96	0.96	0.96
Adj. Flow (vph)	277	183	55	210	179	62	46	725	96	104	1183	251
RTOR Reduction (vph)	0	7	0	0	10	0	0	12	0	0	0	119
Lane Group Flow (vph)	0	508	0	0	441	0	46	809	0	104	1183	132
Confl. Peds. (#/hr)	39		26	26		39	19		11	11		19
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	6%	6%	6%	6%	6%	6%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)		24.9			24.1		4.1	49.1		13.9	58.9	58.9
Effective Green, g (s)		24.9			24.1		4.1	49.1		13.9	58.9	58.9
Actuated g/C Ratio		0.19			0.19		0.03	0.38		0.11	0.45	0.45
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)		3.0			2.0		5.0	3.5		3.0	3.5	3.5
Lane Grp Cap (vph)		535			480		46	1518		158	1296	567
v/s Ratio Prot		c0.18			c0.17		c0.03	0.20		0.07	c0.41	
v/s Ratio Perm												0.11
v/c Ratio		0.95			0.92		1.00	0.53		0.66	0.91	0.23
Uniform Delay, d1		51.9			52.0		63.0	31.5		55.8	33.2	21.7
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		26.4			22.2		132.7	1.3		9.5	11.3	1.0
Delay (s)		78.3			74.2		195.6	32.9		65.3	44.4	22.7
Level of Service		E			E		F	C		E	D	C
Approach Delay (s)		78.3			74.2			41.5			42.3	
Approach LOS		E			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	51.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	91.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBR2	WBL	WBT	NBL	NBT	SBL	SBT	SBR	NEL	NER
Lane Group Flow (vph)	20	388	390	41	276	112	372	1162	875	408
v/c Ratio	0.03	1.02	0.97	0.67	0.28	0.30	0.74	0.94	0.98	0.86
Control Delay	0.1	103.0	89.6	110.0	33.7	31.8	46.8	50.8	76.5	46.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.1	103.0	89.6	110.0	33.7	31.8	46.8	50.8	76.5	46.3
Queue Length 50th (ft)	0	~393	370	37	87	67	263	548	410	245
Queue Length 95th (ft)	0	#610	#594	#101	127	113	#395	#727	#549	#451
Internal Link Dist (ft)			579		160		579		494	
Turn Bay Length (ft)				100		250		200		434
Base Capacity (vph)	603	380	402	63	972	371	498	1230	891	476
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	1.02	0.97	0.65	0.28	0.30	0.75	0.94	0.98	0.86

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBR2	WBL2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	80	586	29	29	29	8	179	69	104	346	1079
Future Volume (vph)	14	80	586	29	29	29	8	179	69	104	346	1079
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		4.5	4.5			5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	1.00		0.95	0.95			1.00	0.95		1.00	1.00	0.88
Frpb, ped/bikes	1.00		1.00	1.00			1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00		0.94	1.00			0.97	1.00		0.99	1.00	1.00
Frt	0.86		1.00	0.99			1.00	0.96		1.00	1.00	0.85
Flt Protected	1.00		0.95	0.96			0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1536		1543	1626			1687	3284		1718	1827	2733
Flt Permitted	1.00		0.95	0.96			0.62	1.00		0.53	1.00	1.00
Satd. Flow (perm)	1536		1543	1626			1110	3284		958	1827	2733
Peak-hour factor, PHF	0.70	0.93	0.93	0.93	0.93	0.90	0.90	0.90	0.90	0.93	0.93	0.93
Adj. Flow (vph)	20	86	630	31	31	32	9	199	77	112	372	1160
RTOR Reduction (vph)	15	0	0	2	0	0	0	29	0	0	0	75
Lane Group Flow (vph)	5	0	388	388	0	0	41	247	0	112	372	1087
Confl. Peds. (#/hr)		19			11	7	7		13	13		7
Confl. Bikes (#/hr)					2							
Heavy Vehicles (%)	7%	5%	5%	5%	5%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Perm	Perm	Split	NA		custom	Prot	NA		D.P+P	NA	custom
Protected Phases			4	4			5	2		1	6 7	3 7
Permitted Phases	4	4				5				2		
Actuated Green, G (s)	34.5		34.5	34.5			6.4	41.2		49.0	37.6	58.2
Effective Green, g (s)	34.5		34.5	34.5			6.4	41.2		49.0	37.6	58.2
Actuated g/C Ratio	0.25		0.25	0.25			0.05	0.29		0.35	0.27	0.42
Clearance Time (s)	4.5		4.5	4.5			5.0	5.0		5.0		
Vehicle Extension (s)	2.0		2.0	2.0			2.0	2.0		2.0		
Lane Grp Cap (vph)	378		380	400			50	966		377	490	1136
v/s Ratio Prot				0.24				0.08		0.02	c0.20	c0.40
v/s Ratio Perm	0.00		0.25				c0.04			0.09		
v/c Ratio	0.01		1.02	0.97			0.82	0.26		0.30	0.76	0.96
Uniform Delay, d1	39.9		52.8	52.2			66.2	37.7		31.7	47.0	39.7
Progression Factor	1.00		1.00	1.00			1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.0		51.6	36.3			61.4	0.1		0.2	5.9	17.0
Delay (s)	39.9		104.4	88.6			127.6	37.8		31.9	53.0	56.7
Level of Service	D		F	F			F	D		C	D	E
Approach Delay (s)				96.5				49.4			54.1	
Approach LOS				F				D			D	

Intersection Summary			
HCM 2000 Control Delay	69.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	24.5
Intersection Capacity Utilization	88.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR2	NEL	NER	NER2
Lane Configurations				
Traffic Volume (vph)	2	544	673	14
Future Volume (vph)	2	544	673	14
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	
Lane Util. Factor		0.97	0.91	
Frpb, ped/bikes		1.00	0.91	
Flpb, ped/bikes		1.00	1.00	
Frt		0.95	0.85	
Flt Protected		0.97	1.00	
Satd. Flow (prot)		3283	1305	
Flt Permitted		0.97	1.00	
Satd. Flow (perm)		3283	1305	
Peak-hour factor, PHF	0.93	0.96	0.96	0.96
Adj. Flow (vph)	2	567	701	15
RTOR Reduction (vph)	0	0	124	0
Lane Group Flow (vph)	0	875	284	0
Confl. Peds. (#/hr)	7	11		19
Confl. Bikes (#/hr)				
Heavy Vehicles (%)	4%	3%	3%	3%
Turn Type		Prot	Perm	
Protected Phases		3		
Permitted Phases			3	
Actuated Green, G (s)		37.0	37.0	
Effective Green, g (s)		37.0	37.0	
Actuated g/C Ratio		0.26	0.26	
Clearance Time (s)		5.0	5.0	
Vehicle Extension (s)		2.0	2.0	
Lane Grp Cap (vph)		867	344	
v/s Ratio Prot		0.27		
v/s Ratio Perm			0.22	
v/c Ratio		1.01	0.83	
Uniform Delay, d1		51.5	48.5	
Progression Factor		1.00	1.00	
Incremental Delay, d2		32.9	19.9	
Delay (s)		84.4	68.4	
Level of Service		F	E	
Approach Delay (s)		79.3		
Approach LOS		E		

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	132	854	157	499	83	680	152	134	1299	170
v/c Ratio	0.71	0.97	0.90	0.59	0.79	0.51	0.25	0.74	0.87	0.26
Control Delay	76.4	72.2	102.4	45.9	103.6	32.6	7.4	79.3	41.3	11.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.4	72.2	102.4	45.9	103.6	32.6	7.4	79.3	41.3	11.5
Queue Length 50th (ft)	109	374	132	191	70	230	9	111	523	37
Queue Length 95th (ft)	174	#512	#258	261	#158	307	59	176	627	87
Internal Link Dist (ft)		1255		631		1016			609	
Turn Bay Length (ft)	180		350		450		150	230		150
Base Capacity (vph)	242	878	183	843	111	1332	613	244	1493	653
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.97	0.86	0.59	0.75	0.51	0.25	0.55	0.87	0.26

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	124	743	60	154	433	56	75	612	137	130	1260	165
Future Volume (veh/h)	124	743	60	154	433	56	75	612	137	130	1260	165
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.95	1.00		0.95	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	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			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1811	1811	1811	1811	1811	1811	1826	1826	1826
Adj Flow Rate, veh/h	132	790	64	157	442	57	83	680	152	134	1299	170
Peak Hour Factor	0.94	0.94	0.94	0.98	0.98	0.98	0.90	0.90	0.90	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	6	6	6	6	6	6	5	5	5
Cap, veh/h	157	831	67	181	819	105	108	1392	588	159	1504	645
Arrive On Green	0.09	0.25	0.25	0.10	0.27	0.27	0.06	0.40	0.40	0.09	0.43	0.43
Sat Flow, veh/h	1767	3287	266	1725	3048	390	1725	3441	1454	1739	3469	1488
Grp Volume(v), veh/h	132	424	430	157	248	251	83	680	152	134	1299	170
Grp Sat Flow(s),veh/h/ln	1767	1763	1791	1725	1721	1718	1725	1721	1454	1739	1735	1488
Q Serve(g_s), s	9.6	30.7	30.7	11.7	16.0	16.3	6.2	19.1	9.0	9.9	44.1	9.5
Cycle Q Clear(g_c), s	9.6	30.7	30.7	11.7	16.0	16.3	6.2	19.1	9.0	9.9	44.1	9.5
Prop In Lane	1.00		0.15	1.00		0.23	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	157	446	453	181	462	461	108	1392	588	159	1504	645
V/C Ratio(X)	0.84	0.95	0.95	0.87	0.54	0.54	0.77	0.49	0.26	0.84	0.86	0.26
Avail Cap(c_a), veh/h	245	447	455	186	462	461	113	1392	588	247	1504	645
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.3	47.8	47.8	57.3	40.6	40.7	60.0	28.7	25.7	58.1	33.3	23.5
Incr Delay (d2), s/veh	8.3	29.9	29.7	31.0	0.7	0.7	23.0	1.2	1.1	8.3	6.8	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	17.3	17.5	6.7	7.0	7.1	3.4	8.2	3.4	4.7	19.9	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.6	77.6	77.4	88.3	41.3	41.4	83.0	29.9	26.8	66.4	40.2	24.5
LnGrp LOS	E	E	E	F	D	D	F	C	C	E	D	C
Approach Vol, veh/h		986			656			915			1603	
Approach Delay, s/veh		76.1			52.6			34.2			40.7	
Approach LOS		E			D			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.4	57.1	18.6	37.9	12.7	60.9	16.5	39.9
Change Period (Y+Rc), s	4.5	4.5	5.0	5.0	4.5	4.5	5.0	5.0
Max Green Setting (Gmax), s	18.5	45.5	14.0	33.0	8.5	55.5	18.0	29.0
Max Q Clear Time (g_c+I1), s	11.9	21.1	13.7	32.7	8.2	46.1	11.6	18.3
Green Ext Time (p_c), s	0.1	10.4	0.0	0.1	0.0	8.1	0.1	1.3

Intersection Summary	
HCM 6th Ctrl Delay	49.5
HCM 6th LOS	D

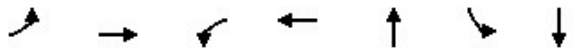
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	238	207	279	255
v/c Ratio	0.76	0.60	0.18	0.32
Control Delay	32.7	21.4	8.3	10.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	32.7	21.4	8.3	10.5
Queue Length 50th (ft)	70	50	21	43
Queue Length 95th (ft)	112	94	51	114
Internal Link Dist (ft)	220	255	335	406
Turn Bay Length (ft)				
Base Capacity (vph)	684	721	1523	790
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.35	0.29	0.18	0.32

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	102	37	34	94	46	1	208	17	0	207	9
Future Volume (vph)	47	102	37	34	94	46	1	208	17	0	207	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			0.95			1.00	
Frpb, ped/bikes		0.90			0.93			0.97			0.97	
Flpb, ped/bikes		0.96			0.94			1.00			1.00	
Frt		0.97			0.96			0.99			0.99	
Flt Protected		0.99			0.99			1.00			1.00	
Satd. Flow (prot)		1119			1152			2915			1438	
Flt Permitted		0.89			0.91			0.95			1.00	
Satd. Flow (perm)		1011			1059			2783			1438	
Peak-hour factor, PHF	0.78	0.78	0.78	0.84	0.84	0.84	0.81	0.81	0.81	0.85	0.85	0.85
Adj. Flow (vph)	60	131	47	40	112	55	1	257	21	0	244	11
RTOR Reduction (vph)	0	7	0	0	23	0	0	5	0	0	1	0
Lane Group Flow (vph)	0	231	0	0	184	0	0	274	0	0	254	0
Confl. Peds. (#/hr)	284		377	377		284	557		175	175		557
Confl. Bikes (#/hr)			8			16			14			4
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	7%	7%	7%	15%	15%	15%
Parking (#/hr)		15			15							
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		4			4			2			6	
Permitted Phases	4			4			2					
Actuated Green, G (s)		17.9			17.9			32.0			32.0	
Effective Green, g (s)		18.4			18.4			32.5			32.5	
Actuated g/C Ratio		0.31			0.31			0.55			0.55	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		2.0			2.0			0.2			0.2	
Lane Grp Cap (vph)		315			330			1535			793	
v/s Ratio Prot											c0.18	
v/s Ratio Perm		c0.23			0.17			0.10				
v/c Ratio		0.73			0.56			0.18			0.32	
Uniform Delay, d1		18.1			16.9			6.6			7.2	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		7.4			1.2			0.3			0.1	
Delay (s)		25.5			18.0			6.8			7.3	
Level of Service		C			B			A			A	
Approach Delay (s)		25.5			18.0			6.8			7.3	
Approach LOS		C			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	13.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	58.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	38.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	11	1438	97	1638	338	205	105
v/c Ratio	0.15	1.27	1.94	0.71	0.73	1.53	0.25
Control Delay	69.5	167.0	521.4	22.2	40.3	309.8	38.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.5	167.0	521.4	22.2	40.3	309.8	38.5
Queue Length 50th (ft)	9	~549	~125	276	86	~238	71
Queue Length 95th (ft)	32	#747	#228	531	138	#414	113
Internal Link Dist (ft)		218		252	406		356
Turn Bay Length (ft)	90					155	
Base Capacity (vph)	83	1136	50	2303	641	134	721
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	1.27	1.94	0.71	0.53	1.53	0.15

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	10	1332	6	8	80	1151	339	0	136	165	174	89
Future Volume (vph)	10	1332	6	8	80	1151	339	0	136	165	174	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	12	11	12	12	12	12	12	12
Total Lost time (s)	4.5	5.5			4.5	5.5			6.0		4.5	6.0
Lane Util. Factor	1.00	0.91			1.00	0.91			0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00			1.00	0.92			0.84		1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00			1.00		1.00	1.00
Frt	1.00	1.00			1.00	0.97			0.92		1.00	1.00
Flt Protected	0.95	1.00			0.95	1.00			1.00		0.95	1.00
Satd. Flow (prot)	1593	4204			1593	3766			2364		1438	1513
Flt Permitted	0.95	1.00			0.09	1.00			1.00		0.95	1.00
Satd. Flow (perm)	1593	4204			150	3766			2364		1438	1513
Peak-hour factor, PHF	0.93	0.93	0.93	0.91	0.91	0.91	0.91	0.89	0.89	0.89	0.85	0.85
Adj. Flow (vph)	11	1432	6	9	88	1265	373	0	153	185	205	105
RTOR Reduction (vph)	0	0	0	0	0	25	0	0	121	0	0	0
Lane Group Flow (vph)	11	1438	0	0	97	1613	0	0	217	0	205	105
Confl. Peds. (#/hr)	219		345		345		219	316		202	202	
Confl. Bikes (#/hr)							1			11		
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	6%	6%	6%	13%	13%
Parking (#/hr)		8	8			8	8					
Turn Type	Prot	NA		custom	Prot	NA			NA		Prot	NA
Protected Phases	7	4			3	8			2		1	6
Permitted Phases				3								
Actuated Green, G (s)	2.3	38.8			44.2	80.7			19.2		12.1	36.3
Effective Green, g (s)	2.8	39.3			44.7	81.2			19.7		12.6	36.8
Actuated g/C Ratio	0.02	0.29			0.33	0.59			0.14		0.09	0.27
Clearance Time (s)	5.0	6.0			5.0	6.0			6.5		5.0	6.5
Vehicle Extension (s)	2.0	2.0			2.0	2.0			2.0		2.0	2.0
Lane Grp Cap (vph)	32	1207			49	2235			340		132	407
v/s Ratio Prot	0.01	c0.34				0.43			c0.09		c0.14	0.07
v/s Ratio Perm					c0.65							
v/c Ratio	0.34	1.19			1.98	0.72			0.64		1.55	0.26
Uniform Delay, d1	66.1	48.8			46.1	19.8			55.2		62.1	39.3
Progression Factor	1.00	1.00			1.00	1.00			1.00		1.00	1.00
Incremental Delay, d2	2.3	94.6			505.5	1.0			2.9		282.6	0.1
Delay (s)	68.4	143.3			551.6	20.8			58.1		344.7	39.4
Level of Service	E	F			F	C			E		F	D
Approach Delay (s)		142.8				50.4			58.1			241.3
Approach LOS		F				D			E			F

Intersection Summary			
HCM 2000 Control Delay	101.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.50		
Actuated Cycle Length (s)	136.8	Sum of lost time (s)	25.5
Intersection Capacity Utilization	91.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	0
Future Volume (vph)	0
Ideal Flow (vphpl)	1900
Lane Width	12
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.85
Adj. Flow (vph)	0
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	316
Confl. Bikes (#/hr)	3
Heavy Vehicles (%)	13%
Parking (#/hr)	
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	403	156	454	15	480	422	302	43
v/c Ratio	0.79	0.26	0.70	0.08	0.80	0.78	0.38	0.16
Control Delay	46.4	27.8	9.7	20.9	61.1	33.5	23.5	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0
Total Delay	46.4	27.8	9.7	20.9	61.1	33.6	24.3	1.2
Queue Length 50th (ft)	300	90	0	6	213	228	148	0
Queue Length 95th (ft)	232	140	79	17	#295	175	145	0
Internal Link Dist (ft)	179	254			356		489	
Turn Bay Length (ft)			300	80		125		
Base Capacity (vph)	509	597	670	188	599	567	801	272
Starvation Cap Reductn	0	0	0	0	0	1	253	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.26	0.68	0.08	0.80	0.75	0.55	0.16

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	164	68	20	116	395	15	436	34	245	175	25
Future Volume (vph)	6	164	68	20	116	395	15	436	34	245	175	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	11	12	11	11	10	12	12	12
Total Lost time (s)		5.0			5.0	5.0	3.0	5.0		3.0	4.0	4.5
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	1.00	1.00
Frpb, ped/bikes		0.92			1.00	0.87	1.00	0.96		1.00	1.00	0.36
Flpb, ped/bikes		1.00			0.99	1.00	0.77	1.00		1.00	1.00	1.00
Frt		0.96			1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected		1.00			0.99	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1243			1561	1218	1162	2858		1547	1629	496
Flt Permitted		0.99			0.91	1.00	0.58	1.00		0.27	1.00	1.00
Satd. Flow (perm)		1236			1436	1218	704	2858		432	1629	496
Peak-hour factor, PHF	0.59	0.59	0.59	0.87	0.87	0.87	0.98	0.98	0.98	0.58	0.58	0.58
Adj. Flow (vph)	10	278	115	23	133	454	15	445	35	422	302	43
RTOR Reduction (vph)	0	8	0	0	0	335	0	3	0	0	0	22
Lane Group Flow (vph)	0	395	0	0	156	119	15	477	0	422	302	21
Confl. Peds. (#/hr)	90		64	64		90	260		202	202		260
Confl. Bikes (#/hr)			22			22			5			5
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	4%	4%	4%	5%	5%	5%
Parking (#/hr)		8										
Turn Type	Perm	NA		Perm	NA	custom	pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		1	2			6		6
Actuated Green, G (s)		55.0			55.0	36.7	32.8	30.4		70.6	64.7	64.7
Effective Green, g (s)		54.5			54.5	35.2	33.8	29.9		71.1	65.2	64.7
Actuated g/C Ratio		0.40			0.40	0.26	0.25	0.22		0.53	0.48	0.48
Clearance Time (s)		4.5			4.5	3.5	3.5	4.5		3.5	4.5	4.5
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		500			581	318	186	634		536	789	238
v/s Ratio Prot							0.00	0.17		c0.22	0.19	
v/s Ratio Perm		c0.32			0.11	0.10	0.02			c0.20		0.04
v/c Ratio		0.79			0.27	0.37	0.08	0.75		0.79	0.38	0.09
Uniform Delay, d1		35.0			26.7	40.7	38.2	48.9		22.4	22.0	18.9
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		8.1			1.1	0.7	0.2	8.0		7.5	1.4	0.7
Delay (s)		43.1			27.9	41.4	38.4	56.9		30.0	23.4	19.7
Level of Service		D			C	D	D	E		C	C	B
Approach Delay (s)		43.1			38.0			56.4			26.8	
Approach LOS		D			D			E			C	

Intersection Summary			
HCM 2000 Control Delay	39.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	134.6	Sum of lost time (s)	25.0
Intersection Capacity Utilization	76.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBR	NBT	SBL2	SBL	SBT
Lane Group Flow (vph)	954	117	6	495	453
v/c Ratio	0.62	0.39	0.01	0.69	0.31
Control Delay	17.5	20.9	6.3	27.9	4.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	17.5	20.9	6.3	27.9	4.0
Queue Length 50th (ft)	59	11	0	108	0
Queue Length 95th (ft)	499	65	5	487	162
Internal Link Dist (ft)		472			268
Turn Bay Length (ft)			150	150	
Base Capacity (vph)	2036	562	697	1270	1538
Starvation Cap Reductn	89	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.49	0.21	0.01	0.39	0.29

Intersection Summary

Movement	WBL	WBR	NBT	NBR	NBR2	SBL2	SBL	SBT	SWL	SWR
Lane Configurations										
Traffic Volume (vph)	0	887	70	0	23	6	426	390	0	0
Future Volume (vph)	0	887	70	0	23	6	426	390	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	12	12	12	11	12	12
Total Lost time (s)		4.0	4.0			4.5	4.0	4.0		
Lane Util. Factor		0.88	1.00			1.00	1.00	1.00		
Frpb, ped/bikes		1.00	0.95			1.00	1.00	1.00		
Flpb, ped/bikes		1.00	1.00			1.00	1.00	1.00		
Frt		0.85	0.97			1.00	1.00	1.00		
Flt Protected		1.00	1.00			0.95	0.95	1.00		
Satd. Flow (prot)		2424	1492			812	1577	1605		
Flt Permitted		1.00	1.00			0.95	0.95	1.00		
Satd. Flow (perm)		2424	1492			812	1577	1605		
Peak-hour factor, PHF	0.93	0.93	0.80	0.95	0.80	1.00	0.86	0.86	0.95	0.95
Adj. Flow (vph)	0	954	88	0	29	6	495	453	0	0
RTOR Reduction (vph)	0	0	79	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	954	38	0	0	6	495	453	0	0
Confl. Peds. (#/hr)		24			143		143			
Confl. Bikes (#/hr)					22					
Heavy Vehicles (%)	2%	2%	5%	2%	5%	100%	3%	3%	2%	2%
Turn Type		pt+ov	NA			Prot	Prot	NA		
Protected Phases		1 3!	2			1 3 9!	3	6		
Permitted Phases										
Actuated Green, G (s)		54.0	12.8			54.6	39.9	76.4		
Effective Green, g (s)		54.5	13.3			54.6	40.4	76.9		
Actuated g/C Ratio		0.60	0.15			0.60	0.44	0.84		
Clearance Time (s)			4.5				4.5	4.5		
Vehicle Extension (s)			0.2				2.0	0.2		
Lane Grp Cap (vph)		1450	217			486	699	1354		
v/s Ratio Prot		c0.39	0.03			0.01	c0.31	c0.28		
v/s Ratio Perm										
v/c Ratio		0.66	0.18			0.01	0.71	0.33		
Uniform Delay, d1		12.1	34.1			7.4	20.6	1.5		
Progression Factor		1.00	1.00			1.00	1.00	1.00		
Incremental Delay, d2		0.8	0.1			0.0	2.7	0.1		
Delay (s)		13.0	34.2			7.4	23.3	1.6		
Level of Service		B	C			A	C	A		
Approach Delay (s)	13.0		34.2					12.9	0.0	
Approach LOS	B		C					B	A	

Intersection Summary			
HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	91.1	Sum of lost time (s)	20.5
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group

Lane Group	EBL2	EBT	WBT	WBR	WBR2	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	753	341	441	751	12	185	306	314	207
v/c Ratio	1.07	0.38	0.87	0.95	0.03	0.63	0.46	0.51	0.67
Control Delay	98.1	18.3	62.3	52.3	18.2	55.3	30.3	47.5	49.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	98.1	18.3	62.3	52.3	18.2	55.3	30.3	47.5	49.1
Queue Length 50th (ft)	~331	150	~367	~626	5	128	69	113	125
Queue Length 95th (ft)	#453	226	#549	#830	17	203	113	160	211
Internal Link Dist (ft)		428	311				772		219
Turn Bay Length (ft)				100	100				
Base Capacity (vph)	707	904	505	792	404	368	814	617	311
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.07	0.38	0.87	0.95	0.03	0.50	0.38	0.51	0.67

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL2	EBT	EBR	WBT	WBR	WBR2	NBL	NBT	NBR2	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	693	192	121	388	661	12	168	272	6	301	102	97
Future Volume (vph)	693	192	121	388	661	12	168	272	6	301	102	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	6.5	6.5		5.5	5.5	
Lane Util. Factor	0.97	1.00		1.00	1.00	1.00	1.00	0.95		0.97	1.00	
Frpb, ped/bikes	1.00	0.98		1.00	1.00	1.00	1.00	0.99		1.00	0.93	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.85	0.85	1.00	1.00		1.00	0.93	
Flt Protected	0.95	1.00		1.00	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3467	1730		1863	1583	808	1770	3506		3367	1545	
Flt Permitted	0.95	1.00		1.00	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3467	1730		1863	1583	808	1770	3506		3367	1545	
Peak-hour factor, PHF	0.92	0.92	0.92	0.88	0.88	1.00	0.91	0.91	0.91	0.96	0.96	0.96
Adj. Flow (vph)	753	209	132	441	751	12	185	299	7	314	106	101
RTOR Reduction (vph)	0	18	0	0	0	0	0	88	0	0	29	0
Lane Group Flow (vph)	753	323	0	441	751	12	185	218	0	314	178	0
Confl. Peds. (#/hr)	57		26		57		24		27	27		24
Confl. Bikes (#/hr)			7						170			26
Heavy Vehicles (%)	1%	1%	1%	2%	2%	100%	2%	2%	2%	4%	4%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	6	2
Turn Type	Prot	NA		NA	custom	custom	Split	NA		Split	NA	
Protected Phases	4	1 4		1	5	5	3	3		2	2	
Permitted Phases												
Actuated Green, G (s)	24.5	61.6		32.6	60.1	60.1	19.9	19.9		22.0	22.0	
Effective Green, g (s)	24.5	61.6		32.6	60.1	60.1	19.9	19.9		22.0	22.0	
Actuated g/C Ratio	0.20	0.51		0.27	0.50	0.50	0.17	0.17		0.18	0.18	
Clearance Time (s)	4.5			4.5	4.5	4.5	6.5	6.5		5.5	5.5	
Vehicle Extension (s)	3.0			2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	707	888		506	792	404	293	581		617	283	
v/s Ratio Prot	c0.22	0.19		0.24	c0.47	0.01	c0.10	0.06		0.09	0.12	
v/s Ratio Perm												
v/c Ratio	1.07	0.36		0.87	0.95	0.03	0.63	0.38		0.51	0.63	
Uniform Delay, d1	47.8	17.5		41.7	28.5	15.2	46.6	44.5		44.1	45.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	52.5	0.3		18.3	21.6	0.1	3.2	0.1		0.2	3.3	
Delay (s)	100.3	17.7		60.0	50.1	15.3	49.9	44.7		44.4	48.6	
Level of Service	F	B		E	D	B	D	D		D	D	
Approach Delay (s)		74.5		53.4				46.6			46.0	
Approach LOS		E		D				D			D	

Intersection Summary			
HCM 2000 Control Delay	58.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	93.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	627	253	1080	626	630	63
v/c Ratio	0.82	0.63	0.59	1.00	0.67	0.23
Control Delay	50.1	29.5	21.4	40.9	23.6	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.9	0.0
Total Delay	50.1	29.5	21.4	40.9	24.5	6.2
Queue Length 50th (ft)	217	91	311	0	310	3
Queue Length 95th (ft)	#288	183	388	#220	427	m18
Internal Link Dist (ft)		538	902		272	
Turn Bay Length (ft)	120			350		
Base Capacity (vph)	769	399	1816	626	938	273
Starvation Cap Reductn	0	0	0	0	115	0
Spillback Cap Reductn	0	1	55	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.64	0.61	1.00	0.77	0.23

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBT	WBL	WBT	WBR2	NBT	NBR	SBT	SBR	SBR2
Lane Configurations									
Traffic Volume (vph)	0	564	64	164	1037	601	580	52	6
Future Volume (vph)	0	564	64	164	1037	601	580	52	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1300	1900	1900	1900
Lane Width	12	11	11	12	11	9	12	12	12
Total Lost time (s)		7.0	7.0		7.0	4.5	7.0	4.5	
Lane Util. Factor		0.97	1.00		0.95	1.00	1.00	1.00	
Frpb, ped/bikes		1.00	0.85		1.00	0.44	1.00	0.31	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	
Frt		1.00	0.89		1.00	0.85	1.00	0.85	
Flt Protected		0.95	1.00		1.00	1.00	1.00	1.00	
Satd. Flow (prot)		3385	1388		3421	429	1768	443	
Flt Permitted		0.95	1.00		1.00	1.00	1.00	1.00	
Satd. Flow (perm)		3385	1388		3421	429	1768	443	
Peak-hour factor, PHF	0.25	0.90	0.90	0.90	0.96	0.96	0.92	0.92	1.00
Adj. Flow (vph)	0	627	71	182	1080	626	630	57	6
RTOR Reduction (vph)	0	0	84	0	0	291	0	29	0
Lane Group Flow (vph)	0	627	169	0	1080	335	630	34	0
Confl. Peds. (#/hr)		153		105		117		331	
Confl. Bikes (#/hr)				86		158		14	
Heavy Vehicles (%)	0%	0%	0%	0%	2%	2%	4%	4%	100%
Bus Blockages (#/hr)	0	0	0	0	0	0	8	0	0
Turn Type		Split	NA		NA	Perm	NA	Perm	
Protected Phases	4	3	3		2		6		
Permitted Phases						2		6	
Actuated Green, G (s)		27.5	27.5		58.9	58.9	58.9	58.9	
Effective Green, g (s)		25.0	25.0		56.4	58.9	56.4	58.9	
Actuated g/C Ratio		0.23	0.23		0.51	0.54	0.51	0.54	
Clearance Time (s)		4.5	4.5		4.5	4.5	4.5	4.5	
Vehicle Extension (s)		0.2	0.2		0.2	0.2	0.2	0.2	
Lane Grp Cap (vph)		769	315		1754	229	906	237	
v/s Ratio Prot		c0.19	0.12		0.32		0.36		
v/s Ratio Perm						c0.78		0.08	
v/c Ratio		0.82	0.54		0.62	1.46	0.70	0.14	
Uniform Delay, d1		40.3	37.4		19.1	25.6	20.3	12.8	
Progression Factor		1.00	1.00		1.00	1.00	0.92	1.02	
Incremental Delay, d2		9.3	6.4		1.6	231.1	3.9	1.1	
Delay (s)		49.6	43.8		20.7	256.6	22.4	14.2	
Level of Service		D	D		C	F	C	B	
Approach Delay (s)	0.0		47.9		107.3		21.7		
Approach LOS	A		D		F		C		

Intersection Summary			
HCM 2000 Control Delay	73.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	64.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	EBR2	WBL2	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	325	548	6	11	278	619	631	115	32	232
v/c Ratio	0.66	0.49	0.01	0.06	0.68	0.93	0.95	0.32	0.11	0.57
Control Delay	37.8	4.2	0.0	29.3	43.4	38.1	42.1	2.2	40.0	23.9
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.8
Total Delay	37.8	4.5	0.0	29.3	43.4	38.6	42.1	2.2	40.0	24.6
Queue Length 50th (ft)	222	46	0	6	167	125	127	0	19	62
Queue Length 95th (ft)	#377	92	m0	19	267	#625	#647	m2	39	97
Internal Link Dist (ft)	420				538		272			170
Turn Bay Length (ft)								40	85	
Base Capacity (vph)	489	1116	597	207	406	667	664	358	294	409
Starvation Cap Reductn	0	161	0	0	0	4	0	0	0	0
Spillback Cap Reductn	0	42	0	0	0	0	0	0	0	42
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.57	0.01	0.05	0.68	0.93	0.95	0.32	0.11	0.63

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBT	EBR	EBR2	WBL2	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR2
Lane Configurations												
Traffic Volume (vph)	276	466	6	10	212	49	801	299	101	24	156	18
Future Volume (vph)	276	466	6	10	212	49	801	299	101	24	156	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.5	3.5	5.0		5.0	5.0	5.0	6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		0.95	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	0.90		1.00	1.00	0.44	1.00	0.98	
Flpb, ped/bikes	1.00	1.00	1.00	0.96	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	0.85	1.00	0.97		1.00	1.00	0.85	1.00	0.98	
Flt Protected	1.00	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	
Satd. Flow (prot)	1845	1568	808	1492	1396		1665	1658	668	1752	1774	
Flt Permitted	1.00	1.00	1.00	0.32	1.00		0.95	0.98	1.00	0.95	1.00	
Satd. Flow (perm)	1845	1568	808	497	1396		1665	1658	668	1752	1774	
Peak-hour factor, PHF	0.85	0.85	1.00	0.94	0.94	0.94	0.88	0.88	0.88	0.75	0.75	0.75
Adj. Flow (vph)	325	548	6	11	226	52	910	340	115	32	208	24
RTOR Reduction (vph)	0	0	2	0	8	0	0	0	72	0	111	0
Lane Group Flow (vph)	325	548	4	11	270	0	619	631	43	32	121	0
Confl. Peds. (#/hr)		193		193		234	114		133	133		114
Confl. Bikes (#/hr)		2							170			11
Heavy Vehicles (%)	3%	3%	100%	5%	5%	5%	3%	3%	3%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	8	8	0	0	0
Parking (#/hr)				0	3	3						
Turn Type	NA	pt+ov	custom	D.P+P	NA		Split	NA	Perm	Split	NA	
Protected Phases	8	2 8		7	4		2	2		1	1	
Permitted Phases			2 8	8					2			
Actuated Green, G (s)	28.7	74.6	74.6	30.1	34.1		40.4	40.4	40.4	18.0	18.0	
Effective Green, g (s)	29.2	75.1	74.6	31.1	34.6		40.9	40.9	40.9	18.5	18.5	
Actuated g/C Ratio	0.27	0.68	0.68	0.28	0.31		0.37	0.37	0.37	0.17	0.17	
Clearance Time (s)	5.5			4.0	5.5		5.5	5.5	5.5	6.5	6.5	
Vehicle Extension (s)	0.2			0.2	0.2		0.2	0.2	0.2	0.2	0.2	
Lane Grp Cap (vph)	489	1070	547	157	439		619	616	248	294	298	
v/s Ratio Prot	0.18	0.35		0.00	c0.19		0.37	c0.38		0.02	c0.07	
v/s Ratio Perm			0.01	0.02					0.06			
v/c Ratio	0.66	0.51	0.01	0.07	0.62		1.00	1.02	0.17	0.11	0.40	
Uniform Delay, d1	36.0	8.5	5.7	38.7	32.1		34.5	34.5	23.2	38.8	40.8	
Progression Factor	0.80	0.35	1.00	1.00	1.00		0.56	0.56	0.13	1.00	1.00	
Incremental Delay, d2	6.5	1.6	0.0	0.1	6.3		33.2	39.6	1.3	0.7	4.0	
Delay (s)	35.5	4.6	5.7	38.8	38.4		52.4	59.0	4.2	39.5	44.9	
Level of Service	D	A	A	D	D		D	E	A	D	D	
Approach Delay (s)	16.0				38.4			51.4			44.2	
Approach LOS	B				D			D			D	

Intersection Summary			
HCM 2000 Control Delay	38.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL2	WBT	NBL	SWR
Lane Group Flow (vph)	121	541	54	126	983	301	280
v/c Ratio	0.63	0.58	0.11	0.66	0.56	0.62	0.68
Control Delay	70.6	15.5	1.2	63.7	10.7	31.2	15.8
Queue Delay	0.1	1.3	0.0	0.0	0.3	0.0	0.0
Total Delay	70.7	16.8	1.2	63.7	11.0	31.2	15.8
Queue Length 50th (ft)	0	193	0	96	89	134	10
Queue Length 95th (ft)	143	312	2	m110	m116	205	82
Internal Link Dist (ft)		2			420	331	
Turn Bay Length (ft)	60			50			
Base Capacity (vph)	334	933	499	252	1750	482	521
Starvation Cap Reductn	11	204	0	0	267	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.74	0.11	0.50	0.66	0.62	0.54

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	EBR2	WBL2	WBT	WBR	NBL	NBR	NBR2	SWR
Lane Configurations											
Traffic Volume (vph)	116	519	46	6	117	893	21	101	101	51	246
Future Volume (vph)	116	519	46	6	117	893	21	101	101	51	246
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.5	4.5		3.5	4.5		4.5			3.5
Lane Util. Factor	1.00	1.00	1.00		1.00	0.95		1.00			1.00
Frpb, ped/bikes	1.00	1.00	0.66		1.00	0.99		0.91			1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00		1.00			1.00
Frt	1.00	1.00	0.85		1.00	1.00		0.92			0.86
Flt Protected	0.95	1.00	1.00		0.95	1.00		0.98			1.00
Satd. Flow (prot)	1770	1863	946		1770	3493		1524			1627
Flt Permitted	0.95	1.00	1.00		0.95	1.00		0.98			1.00
Satd. Flow (perm)	1770	1863	946		1770	3493		1524			1627
Peak-hour factor, PHF	0.96	0.96	0.96	1.00	0.93	0.93	0.93	0.84	0.84	0.84	0.88
Adj. Flow (vph)	121	541	48	6	126	960	23	120	120	61	280
RTOR Reduction (vph)	0	0	25	0	0	1	0	61	0	0	235
Lane Group Flow (vph)	121	541	29	0	126	982	0	240	0	0	45
Confl. Peds. (#/hr)	108		112		112		108			87	
Confl. Bikes (#/hr)			2				9			11	1
Heavy Vehicles (%)	2%	2%	2%	100%	2%	2%	2%	2%	2%	2%	1%
Turn Type	Prot	NA	Perm		Prot	NA		Prot			Over
Protected Phases	1	6			5	2		4			1
Permitted Phases			6								
Actuated Green, G (s)	11.9	55.1	55.1		11.9	55.1		30.5			11.9
Effective Green, g (s)	11.9	55.1	55.1		11.9	55.1		30.5			11.9
Actuated g/C Ratio	0.11	0.50	0.50		0.11	0.50		0.28			0.11
Clearance Time (s)	3.5	4.5	4.5		3.5	4.5		4.5			3.5
Vehicle Extension (s)	2.0	0.2	0.2		2.0	0.2		0.2			2.0
Lane Grp Cap (vph)	191	933	473		191	1749		422			176
v/s Ratio Prot	0.07	c0.29			c0.07	0.28		c0.16			0.03
v/s Ratio Perm			0.03								
v/c Ratio	0.63	0.58	0.06		0.66	0.56		0.57			0.25
Uniform Delay, d1	47.0	19.3	14.1		47.1	19.1		34.1			45.0
Progression Factor	1.24	0.64	0.15		1.20	0.51		1.00			1.00
Incremental Delay, d2	4.5	2.4	0.2		2.8	0.6		5.5			0.3
Delay (s)	62.6	14.7	2.4		59.3	10.3		39.6			45.3
Level of Service	E	B	A		E	B		D			D
Approach Delay (s)		21.9				15.8		39.6			
Approach LOS		C				B		D			

Intersection Summary			
HCM 2000 Control Delay	24.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	62.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBT	SBL
Lane Group Flow (vph)	740	6	1422	52
v/c Ratio	0.49	0.01	0.49	0.24
Control Delay	6.3	2.5	1.8	29.4
Queue Delay	0.0	0.0	0.1	0.0
Total Delay	6.3	2.5	1.9	29.4
Queue Length 50th (ft)	146	0	55	18
Queue Length 95th (ft)	301	m1	63	33
Internal Link Dist (ft)	470		111	791
Turn Bay Length (ft)				
Base Capacity (vph)	1523	669	2924	307
Starvation Cap Reductn	32	0	419	0
Spillback Cap Reductn	69	0	68	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.51	0.01	0.57	0.17

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	SBR2	NEL	NER
Lane Configurations											
Traffic Volume (vph)	7	666	6	0	1247	32	19	0	14	0	0
Future Volume (vph)	7	666	6	0	1247	32	19	0	14	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	5.0		4.0		3.5				
Lane Util. Factor		1.00	1.00		0.95		1.00				
Frpb, ped/bikes		1.00	1.00		1.00		0.89				
Flpb, ped/bikes		1.00	1.00		1.00		1.00				
Frt		1.00	0.85		1.00		0.94				
Flt Protected		1.00	1.00		1.00		0.97				
Satd. Flow (prot)		1861	808		3512		1553				
Flt Permitted		0.98	1.00		1.00		0.97				
Satd. Flow (perm)		1829	808		3512		1553				
Peak-hour factor, PHF	0.91	0.91	1.00	0.92	0.90	0.90	0.63	0.92	0.63	0.92	0.92
Adj. Flow (vph)	8	732	6	0	1386	36	30	0	22	0	0
RTOR Reduction (vph)	0	0	1	0	1	0	19	0	0	0	0
Lane Group Flow (vph)	0	740	5	0	1421	0	33	0	0	0	0
Confl. Peds. (#/hr)	52					52			128		
Confl. Bikes (#/hr)						9					
Heavy Vehicles (%)	2%	2%	100%	2%	2%	2%	0%	2%	0%	2%	2%
Turn Type	Perm	NA	Perm		NA		Prot				
Protected Phases		6			2		4				
Permitted Phases	6		6								
Actuated Green, G (s)		88.9	88.9		88.9		11.6				
Effective Green, g (s)		89.9	88.9		89.9		12.6				
Actuated g/C Ratio		0.82	0.81		0.82		0.11				
Clearance Time (s)		5.0	5.0		5.0		4.5				
Vehicle Extension (s)		0.2	0.2		0.2		1.0				
Lane Grp Cap (vph)		1494	653		2870		177				
v/s Ratio Prot					0.40		c0.02				
v/s Ratio Perm		c0.40	0.01								
v/c Ratio		0.50	0.01		0.50		0.18				
Uniform Delay, d1		3.1	2.0		3.1		44.0				
Progression Factor		1.31	3.69		0.35		1.00				
Incremental Delay, d2		1.1	0.0		0.5		0.2				
Delay (s)		5.1	7.5		1.6		44.2				
Level of Service		A	A		A		D				
Approach Delay (s)		5.1			1.6		44.2			0.0	
Approach LOS		A			A		D			A	

Intersection Summary			
HCM 2000 Control Delay	3.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	61.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL2	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	10	678	69	89	1352	190	115	42
v/c Ratio	0.15	0.50	0.09	0.21	1.01	0.99	0.33	0.17
Control Delay	8.2	8.1	2.6	2.0	33.7	109.2	9.7	24.6
Queue Delay	0.0	0.0	0.0	0.0	11.0	0.0	0.0	0.0
Total Delay	8.2	8.1	2.6	2.0	44.7	109.2	9.7	24.6
Queue Length 50th (ft)	3	284	14	1	~993	135	0	13
Queue Length 95th (ft)	m1	248	m2	2	#1289	#227	32	39
Internal Link Dist (ft)		753			470	200		616
Turn Bay Length (ft)	60							
Base Capacity (vph)	67	1354	742	419	1341	191	350	252
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	44	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.50	0.09	0.21	1.04	0.99	0.33	0.17

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	EBR2	WBL2	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	9	603	56	6	81	1192	38	141	7	90	17	3
Future Volume (vph)	9	603	56	6	81	1192	38	141	7	90	17	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	5.0		4.0	4.0			4.0	4.0		4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00			1.00	1.00		1.00
Frpb, ped/bikes	1.00	1.00	0.70		1.00	0.99			1.00	0.81		0.84
Flpb, ped/bikes	1.00	1.00	1.00		0.93	1.00			0.68	1.00		0.95
Frt	1.00	1.00	0.85		1.00	1.00			1.00	0.85		0.94
Flt Protected	0.95	1.00	1.00		0.95	1.00			0.95	1.00		0.98
Satd. Flow (prot)	1770	1863	1026		1637	1843			1214	1293		1384
Flt Permitted	0.05	1.00	1.00		0.34	1.00			0.75	1.00		0.84
Satd. Flow (perm)	93	1863	1026		578	1843			957	1293		1183
Peak-hour factor, PHF	0.89	0.89	0.89	1.00	0.91	0.91	0.91	0.78	0.78	0.78	0.83	0.83
Adj. Flow (vph)	10	678	63	6	89	1310	42	181	9	115	20	4
RTOR Reduction (vph)	0	0	6	0	0	1	0	0	0	92	0	16
Lane Group Flow (vph)	10	678	63	0	89	1351	0	0	190	23	0	26
Confl. Peds. (#/hr)	64		113		113		64	127		102	102	
Confl. Bikes (#/hr)			3				16			7		
Heavy Vehicles (%)	2%	2%	2%	100%	2%	2%	2%	1%	1%	1%	0%	0%
Turn Type	Perm	NA	Perm		Perm	NA		D.Pm	NA	custom	Perm	NA
Protected Phases		2				2			8			4
Permitted Phases	2		2		2			4		4	4	
Actuated Green, G (s)	79.0	79.0	79.0		79.0	79.0			21.0	21.0		21.0
Effective Green, g (s)	80.0	80.0	79.0		80.0	80.0			22.0	22.0		22.0
Actuated g/C Ratio	0.73	0.73	0.72		0.73	0.73			0.20	0.20		0.20
Clearance Time (s)	5.0	5.0	5.0		5.0	5.0			5.0	5.0		5.0
Vehicle Extension (s)	0.2	0.2	0.2		0.2	0.2			1.0	1.0		1.0
Lane Grp Cap (vph)	67	1354	736		420	1340			191	258		236
v/s Ratio Prot		0.36				c0.73						
v/s Ratio Perm	0.11		0.06		0.15				c0.20	0.02		0.02
v/c Ratio	0.15	0.50	0.09		0.21	1.01			0.99	0.09		0.11
Uniform Delay, d1	4.6	6.4	4.7		4.8	15.0			43.9	35.8		36.0
Progression Factor	0.69	1.03	0.67		0.18	0.38			1.00	1.00		1.00
Incremental Delay, d2	4.3	1.2	0.2		1.0	25.3			63.2	0.1		0.1
Delay (s)	7.5	7.9	3.3		1.9	31.0			107.1	35.9		36.1
Level of Service	A	A	A		A	C			F	D		D
Approach Delay (s)		7.4				29.2			80.3			36.1
Approach LOS		A				C			F			D

Intersection Summary			
HCM 2000 Control Delay	28.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	89.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR2
Lane Configurations	
Traffic Volume (vph)	15
Future Volume (vph)	15
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.83
Adj. Flow (vph)	18
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	127
Confl. Bikes (#/hr)	1
Heavy Vehicles (%)	0%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Lane Group	EBT	EBR	WBL2	WBT	NBT	SBT
Lane Group Flow (vph)	621	43	16	1166	221	28
v/c Ratio	0.45	0.05	0.03	0.85	0.85	0.09
Control Delay	10.9	3.5	2.5	9.3	69.2	22.8
Queue Delay	0.0	0.0	0.0	1.7	0.0	0.0
Total Delay	10.9	3.5	2.5	11.0	69.2	22.8
Queue Length 50th (ft)	161	5	2	262	141	8
Queue Length 95th (ft)	m293	m15	m2	m293	181	22
Internal Link Dist (ft)	356			753	239	284
Turn Bay Length (ft)			100			
Base Capacity (vph)	1370	878	492	1367	290	344
Starvation Cap Reductn	0	0	0	88	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.05	0.03	0.91	0.76	0.08

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBT	EBR	EBR2	WBL2	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR2
Lane Configurations												
Traffic Volume (vph)	584	35	6	16	1134	9	105	21	40	6	7	6
Future Volume (vph)	584	35	6	16	1134	9	105	21	40	6	7	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5			4.5			4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frpb, ped/bikes	1.00	0.85		1.00	1.00			0.99			0.98	
Flpb, ped/bikes	1.00	1.00		0.96	1.00			0.97			0.99	
Frt	1.00	0.85		1.00	1.00			0.97			0.96	
Flt Protected	1.00	1.00		0.95	1.00			0.97			0.98	
Satd. Flow (prot)	1863	1189		1704	1858			1673			1743	
Flt Permitted	1.00	1.00		0.37	1.00			0.79			0.91	
Satd. Flow (perm)	1863	1189		667	1858			1365			1620	
Peak-hour factor, PHF	0.94	0.94	1.00	0.98	0.98	0.98	0.75	0.75	0.75	0.68	0.68	0.68
Adj. Flow (vph)	621	37	6	16	1157	9	140	28	53	9	10	9
RTOR Reduction (vph)	0	4	0	0	0	0	0	11	0	0	12	0
Lane Group Flow (vph)	621	39	0	16	1166	0	0	210	0	0	16	0
Confl. Peds. (#/hr)		40		40		51	31		21	21		31
Confl. Bikes (#/hr)		3				1			2			
Heavy Vehicles (%)	2%	2%	100%	2%	2%	2%	2%	2%	2%	0%	0%	0%
Turn Type	NA	Perm		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	2				2			4			4	
Permitted Phases		2		2			4			4		
Actuated Green, G (s)	80.9	80.9		80.9	80.9			20.1			20.1	
Effective Green, g (s)	80.9	80.9		80.9	80.9			20.1			20.1	
Actuated g/C Ratio	0.74	0.74		0.74	0.74			0.18			0.18	
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0			2.0	
Lane Grp Cap (vph)	1370	874		490	1366			249			296	
v/s Ratio Prot	0.33				c0.63							
v/s Ratio Perm		0.03		0.02				c0.15			0.01	
v/c Ratio	0.45	0.04		0.03	0.85			0.84			0.05	
Uniform Delay, d1	5.8	4.0		3.9	10.3			43.4			37.1	
Progression Factor	1.54	1.00		0.53	0.59			1.00			1.00	
Incremental Delay, d2	1.1	0.1		0.0	1.7			21.4			0.0	
Delay (s)	10.0	4.1		2.1	7.8			64.9			37.1	
Level of Service	A	A		A	A			E			D	
Approach Delay (s)	9.6				7.7			64.9			37.1	
Approach LOS	A				A			E			D	

Intersection Summary			
HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	84.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

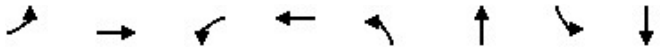
Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	45	621	2	1285	420	672
v/c Ratio	0.16	0.97	0.02	0.90	0.95	0.28
Control Delay	34.0	44.4	69.0	32.4	72.4	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.0	44.4	69.0	32.4	72.4	8.3
Queue Length 50th (ft)	24	174	1	455	291	91
Queue Length 95th (ft)	38	#412	m1	#612	#481	156
Internal Link Dist (ft)	425	513		260		2009
Turn Bay Length (ft)			100		100	
Base Capacity (vph)	309	669	81	1431	454	2403
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.93	0.02	0.90	0.93	0.28

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	22	1	12	0	553	2	1226	8	395	630	2
Future Volume (vph)	6	22	1	12	0	553	2	1226	8	395	630	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			0.96		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.99			0.87		1.00	1.00		1.00	1.00	
Flt Protected		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1745			1553		1787	3569		1770	3537	
Flt Permitted		0.74			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1300			1546		1787	3569		1770	3537	
Peak-hour factor, PHF	0.64	0.64	0.64	0.91	0.91	0.91	0.96	0.96	0.96	0.94	0.94	0.94
Adj. Flow (vph)	9	34	2	13	0	608	2	1277	8	420	670	2
RTOR Reduction (vph)	0	2	0	0	314	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	43	0	0	307	0	2	1284	0	420	672	0
Confl. Peds. (#/hr)	16		8	8		16	16		15	15		16
Confl. Bikes (#/hr)			2			1			2			1
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			4		5	2		1	6	
Permitted Phases	4			4								
Actuated Green, G (s)		23.3			23.3		1.0	44.1		27.6	70.7	
Effective Green, g (s)		23.3			23.3		1.0	44.1		27.6	70.7	
Actuated g/C Ratio		0.21			0.21		0.01	0.40		0.25	0.64	
Clearance Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	0.2		2.0	0.2	
Lane Grp Cap (vph)		275			327		16	1430		444	2273	
v/s Ratio Prot							0.00	c0.36		c0.24	0.19	
v/s Ratio Perm		0.03			c0.20							
v/c Ratio		0.16			0.94		0.12	0.90		0.95	0.30	
Uniform Delay, d1		35.4			42.7		54.1	30.8		40.5	8.7	
Progression Factor		1.00			1.00		1.36	0.83		1.00	1.00	
Incremental Delay, d2		0.1			33.5		0.7	5.2		28.9	0.3	
Delay (s)		35.4			76.2		74.3	30.7		69.4	9.0	
Level of Service		D			E		E	C		E	A	
Approach Delay (s)		35.4			76.2			30.7			32.2	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	40.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	105.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	71	541	42	1099	118	325	125	291
v/c Ratio	0.20	0.27	0.07	0.57	0.60	0.46	0.68	0.40
Control Delay	6.5	9.3	5.5	13.5	40.2	24.0	47.2	16.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.5	9.3	5.5	13.5	40.2	24.0	47.2	16.6
Queue Length 50th (ft)	10	69	6	182	52	60	56	37
Queue Length 95th (ft)	27	113	18	276	99	90	107	66
Internal Link Dist (ft)		500		618		212		186
Turn Bay Length (ft)	100		100		140		140	
Base Capacity (vph)	359	2020	599	1926	270	942	249	958
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.27	0.07	0.57	0.44	0.35	0.50	0.30

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	416	82	39	808	203	111	228	77	115	160	108
Future Volume (vph)	65	416	82	39	808	203	111	228	77	115	160	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	14	11	14	14	11	14
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		0.97	1.00		0.98	1.00	
Frt	1.00	0.98		1.00	0.97		1.00	0.96		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1710	3299		1693	3292		1857	3274		1868	3175	
Flt Permitted	0.19	1.00		0.43	1.00		0.50	1.00		0.46	1.00	
Satd. Flow (perm)	339	3299		764	3292		986	3274		908	3175	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	71	452	89	42	878	221	118	243	82	125	174	117
RTOR Reduction (vph)	0	16	0	0	23	0	0	46	0	0	93	0
Lane Group Flow (vph)	71	525	0	42	1076	0	118	279	0	125	198	0
Confl. Peds. (#/hr)	23		48	48		23	29		24	24		29
Confl. Bikes (#/hr)			3						14			3
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	D.P+P	NA		D.P+P	NA		Perm	NA		Perm	NA	
Protected Phases	1	6		5	2			4			4	
Permitted Phases	2			6			4			4		
Actuated Green, G (s)	49.9	45.7		49.9	44.3		15.1	15.1		15.1	15.1	
Effective Green, g (s)	51.9	46.7		51.9	45.3		16.1	16.1		16.1	16.1	
Actuated g/C Ratio	0.65	0.58		0.65	0.57		0.20	0.20		0.20	0.20	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	0.2	0.2		0.2	0.2		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	333	1925		556	1864		198	658		182	638	
v/s Ratio Prot	c0.02	0.16		0.00	c0.33			0.09			0.06	
v/s Ratio Perm	0.12			0.04			0.12			c0.14		
v/c Ratio	0.21	0.27		0.08	0.58		0.60	0.42		0.69	0.31	
Uniform Delay, d1	6.3	8.2		5.1	11.2		29.0	27.9		29.6	27.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.4		0.0	1.3		3.2	0.2		8.3	0.1	
Delay (s)	6.4	8.6		5.1	12.5		32.2	28.1		37.9	27.3	
Level of Service	A	A		A	B		C	C		D	C	
Approach Delay (s)		8.3			12.2			29.2			30.5	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	17.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

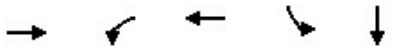
Lane Group	EBT	WBT	WBR	NBL	NBT
Lane Group Flow (vph)	497	960	98	434	428
v/c Ratio	0.51	0.75	0.23	0.79	0.75
Control Delay	5.8	32.5	12.9	42.8	31.9
Queue Delay	0.0	6.6	0.0	0.0	0.3
Total Delay	5.8	39.2	12.9	42.8	32.3
Queue Length 50th (ft)	18	274	16	258	192
Queue Length 95th (ft)	18	401	59	#482	#390
Internal Link Dist (ft)	18	500			709
Turn Bay Length (ft)			150		
Base Capacity (vph)	1318	1336	438	572	594
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	326	0	0	18
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.38	0.95	0.22	0.76	0.74

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL2	EBT	WBT	WBR	WBR2	NBL	NBT	NBR2
Lane Configurations								
Traffic Volume (vph)	9	453	883	79	12	675	54	89
Future Volume (vph)	9	453	883	79	12	675	54	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	12	11	11	11
Total Lost time (s)		3.5	3.5	4.5		3.5	3.5	
Lane Util. Factor		0.95	0.95	1.00		0.95	0.95	
Frpb, ped/bikes		1.00	1.00	0.79		1.00	0.97	
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00	
Frt		1.00	1.00	0.85		1.00	0.97	
Flt Protected		1.00	1.00	1.00		0.95	0.97	
Satd. Flow (prot)		3382	3455	1096		1609	1489	
Flt Permitted		0.95	1.00	1.00		0.95	0.97	
Satd. Flow (perm)		3233	3455	1096		1609	1489	
Peak-hour factor, PHF	0.93	0.93	0.92	0.92	1.00	0.95	0.95	0.95
Adj. Flow (vph)	10	487	960	86	12	711	57	94
RTOR Reduction (vph)	0	0	0	38	0	0	68	0
Lane Group Flow (vph)	0	497	960	60	0	434	360	0
Confl. Peds. (#/hr)	58			58				100
Confl. Bikes (#/hr)								3
Heavy Vehicles (%)	3%	3%	1%	1%	100%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	7	0
Turn Type	Prot	NA	NA	Perm		Split	NA	
Protected Phases	3	2 3	6			4	4	
Permitted Phases				6				
Actuated Green, G (s)		40.4	35.2	35.2		32.5	32.5	
Effective Green, g (s)		42.4	36.2	35.2		33.5	33.5	
Actuated g/C Ratio		0.43	0.37	0.36		0.34	0.34	
Clearance Time (s)			4.5	4.5		4.5	4.5	
Vehicle Extension (s)			3.5	3.5		2.5	2.5	
Lane Grp Cap (vph)		1425	1276	393		550	508	
v/s Ratio Prot		c0.06	c0.28			c0.27	0.24	
v/s Ratio Perm		0.09		0.05				
v/c Ratio		0.35	0.75	0.15		0.79	0.71	
Uniform Delay, d1		18.6	27.0	21.3		29.1	28.0	
Progression Factor		0.19	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2	2.6	0.2		7.2	4.2	
Delay (s)		3.7	29.6	21.5		36.2	32.2	
Level of Service		A	C	C		D	C	
Approach Delay (s)		3.7	28.9				34.2	
Approach LOS		A	C				C	

Intersection Summary			
HCM 2000 Control Delay	25.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	98.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	506	353	1249	175	173
v/c Ratio	0.55	0.45	0.49	0.61	0.60
Control Delay	22.5	38.1	1.1	46.6	42.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	22.5	38.1	1.1	46.6	42.5
Queue Length 50th (ft)	92	190	11	109	97
Queue Length 95th (ft)	153	m321	28	174	162
Internal Link Dist (ft)	563		18		1167
Turn Bay Length (ft)					
Base Capacity (vph)	925	954	2613	451	445
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.55	0.37	0.48	0.39	0.39

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	242	198	346	1224	0	0	0	0	220	43	40
Future Volume (vph)	0	242	198	346	1224	0	0	0	0	220	43	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
Total Lost time (s)		-0.5		3.5	3.5					3.5	3.5	
Lane Util. Factor		0.95		1.00	0.95					0.95	0.95	
Frpb, ped/bikes		0.90		1.00	1.00					1.00	0.97	
Flpb, ped/bikes		1.00		1.00	1.00					1.00	1.00	
Frt		0.93		1.00	1.00					1.00	0.96	
Flt Protected		1.00		0.95	1.00					0.95	0.98	
Satd. Flow (prot)		2804		1711	3421					1594	1535	
Flt Permitted		1.00		0.95	1.00					0.95	0.98	
Satd. Flow (perm)		2804		1711	3421					1594	1535	
Peak-hour factor, PHF	0.87	0.87	0.87	0.98	0.98	0.98	0.92	0.92	0.92	0.87	0.87	0.87
Adj. Flow (vph)	0	278	228	353	1249	0	0	0	0	253	49	46
RTOR Reduction (vph)	0	118	0	0	0	0	0	0	0	0	13	0
Lane Group Flow (vph)	0	388	0	353	1249	0	0	0	0	175	160	0
Confl. Peds. (#/hr)			65	65			57					57
Confl. Bikes (#/hr)			2			2						3
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	2%	2%	2%	4%	4%	4%
Turn Type		NA		Prot	NA					Split	NA	
Protected Phases		2		1 4	4 6					3	3	
Permitted Phases												
Actuated Green, G (s)		23.6		44.1	72.2					16.8	16.8	
Effective Green, g (s)		28.6		45.1	73.2					17.8	17.8	
Actuated g/C Ratio		0.29		0.46	0.75					0.18	0.18	
Clearance Time (s)		4.5								4.5	4.5	
Vehicle Extension (s)		3.5								2.5	2.5	
Lane Grp Cap (vph)		818		787	2555					289	278	
v/s Ratio Prot		0.14		0.21	c0.37					c0.11	0.10	
v/s Ratio Perm												
v/c Ratio		0.47		0.45	0.49					0.61	0.58	
Uniform Delay, d1		28.5		18.0	4.9					36.9	36.6	
Progression Factor		1.00		1.85	0.12					1.00	1.00	
Incremental Delay, d2		0.5		0.1	0.1					3.0	2.4	
Delay (s)		29.0		33.4	0.7					39.9	39.0	
Level of Service		C		C	A					D	D	
Approach Delay (s)		29.0			7.9			0.0			39.4	
Approach LOS		C			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	16.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	98.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	59.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	272	13	31	905	13	6	9	18	16	12	36
Future Vol, veh/h	11	272	13	31	905	13	6	9	18	16	12	36
Conflicting Peds, #/hr	11	0	61	61	0	11	23	0	40	40	0	23
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	60	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	90	90	90	66	66	66	78	78	78
Heavy Vehicles, %	4	4	4	2	2	2	0	0	0	0	0	0
Mvmt Flow	12	286	14	34	1006	14	9	14	27	21	15	46

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1031	0	0	361	0	0	1513	1477	394	1470	1477	1047
Stage 1	-	-	-	-	-	-	378	378	-	1092	1092	-
Stage 2	-	-	-	-	-	-	1135	1099	-	378	385	-
Critical Hdwy	4.14	-	-	4.12	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.236	-	-	2.218	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	666	-	-	1198	-	-	99	127	659	106	127	280
Stage 1	-	-	-	-	-	-	648	619	-	262	293	-
Stage 2	-	-	-	-	-	-	248	291	-	648	614	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	660	-	-	1137	-	-	66	114	605	85	114	272
Mov Cap-2 Maneuver	-	-	-	-	-	-	66	114	-	85	114	-
Stage 1	-	-	-	-	-	-	604	577	-	255	282	-
Stage 2	-	-	-	-	-	-	185	280	-	573	572	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.3	36	54.7
HCM LOS			E	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	165	660	-	-	1137	-	-	150
HCM Lane V/C Ratio	0.303	0.018	-	-	0.03	-	-	0.547
HCM Control Delay (s)	36	10.6	-	-	8.3	-	-	54.7
HCM Lane LOS	E	B	-	-	A	-	-	F
HCM 95th %tile Q(veh)	1.2	0.1	-	-	0.1	-	-	2.7

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	11	77	23	123	55	53	16	150	32	71	584	411
Future Volume (vph)	11	77	23	123	55	53	16	150	32	71	584	411
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes		0.95			0.95		1.00	0.96		1.00	1.00	0.91
Flpb, ped/bikes		0.99			0.91		0.98	1.00		0.86	1.00	1.00
Frt		0.97			0.97		1.00	0.97		1.00	1.00	0.85
Flt Protected		1.00			0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1724			1543		1698	1716		1519	1863	1440
Flt Permitted		0.96			0.78		0.31	1.00		0.64	1.00	1.00
Satd. Flow (perm)		1666			1228		553	1716		1022	1863	1440
Peak-hour factor, PHF	0.78	0.78	0.78	0.96	0.96	0.96	0.97	0.97	0.97	0.94	0.94	0.94
Adj. Flow (vph)	14	99	29	128	57	55	16	155	33	76	621	437
RTOR Reduction (vph)	0	15	0	0	18	0	0	11	0	0	0	120
Lane Group Flow (vph)	0	127	0	0	222	0	16	177	0	76	621	317
Confl. Peds. (#/hr)	110		129	129		110	40		102	102		40
Confl. Bikes (#/hr)			3			1			2			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		2
Actuated Green, G (s)		19.1			19.1		36.9	36.9		36.9	36.9	36.9
Effective Green, g (s)		19.1			19.1		36.9	36.9		36.9	36.9	36.9
Actuated g/C Ratio		0.29			0.29		0.57	0.57		0.57	0.57	0.57
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		489			360		313	974		580	1057	817
v/s Ratio Prot								0.10			c0.33	
v/s Ratio Perm		0.08			c0.18		0.03			0.07		0.22
v/c Ratio		0.26			0.62		0.05	0.18		0.13	0.59	0.39
Uniform Delay, d1		17.5			19.8		6.3	6.8		6.6	9.1	7.8
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		0.3			3.1		0.3	0.4		0.5	2.4	1.4
Delay (s)		17.8			22.9		6.6	7.2		7.0	11.5	9.2
Level of Service		B			C		A	A		A	B	A
Approach Delay (s)		17.8			22.9			7.1			10.3	
Approach LOS		B			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	67.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBT	WBR	NBT	SBT	NWL	NWR
Lane Group Flow (vph)	268	166	314	123	171	123	366	154
v/c Ratio	0.47	0.57	0.54	0.45	0.51	0.63	0.69	0.32
Control Delay	22.6	16.8	36.8	10.6	53.6	62.5	47.2	36.7
Queue Delay	1.6	0.0	0.0	0.0	0.0	0.0	0.5	0.0
Total Delay	24.2	16.8	36.8	10.6	53.6	62.5	47.7	36.7
Queue Length 50th (ft)	129	41	208	0	131	93	271	99
Queue Length 95th (ft)	147	66	303	54	193	149	387	161
Internal Link Dist (ft)	294		560		193	463	230	
Turn Bay Length (ft)								
Base Capacity (vph)	572	291	584	273	338	195	530	474
Starvation Cap Reductn	162	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	24	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.57	0.54	0.45	0.51	0.63	0.72	0.32

Intersection Summary

Movement	EBT	EBR	EBR2	WBT	WBR	NBL	NBT	NBR	NBR2	SBL2	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	247	97	56	295	116	15	72	37	20	36	31	22
Future Volume (vph)	247	97	56	295	116	15	72	37	20	36	31	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	16	12	12	12	12	16
Total Lost time (s)	6.5	6.5		6.5	6.5		5.0					5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00					1.00
Frpb, ped/bikes	1.00	0.44		1.00	0.34		0.97					0.93
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.96					1.00
Frt	1.00	0.85		1.00	0.85		0.95					0.98
Flt Protected	1.00	1.00		1.00	1.00		0.99					0.97
Satd. Flow (prot)	1568	675		1599	536		1896					1911
Flt Permitted	1.00	1.00		1.00	1.00		0.96					0.53
Satd. Flow (perm)	1568	675		1599	536		1832					1039
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.94	0.85	0.85	0.85	0.85	0.83	0.83	0.83
Adj. Flow (vph)	268	105	61	314	123	18	85	44	24	43	37	27
RTOR Reduction (vph)	0	45	0	0	78	0	0	0	0	0	0	4
Lane Group Flow (vph)	268	121	0	314	45	0	171	0	0	0	0	119
Confl. Peds. (#/hr)		112	111		229	140						
Confl. Bikes (#/hr)		4	3					14	14			
Heavy Vehicles (%)	6%	6%	6%	4%	4%	0%	0%	0%	0%	0%	0%	0%
Parking (#/hr)	5			5								
Turn Type	NA	Perm		NA	Perm	Perm	NA			Perm	Perm	NA
Protected Phases	6			2			4					4
Permitted Phases		6			2	4				4	4	
Actuated Green, G (s)	47.5	47.5		47.5	47.5		24.0					24.0
Effective Green, g (s)	47.5	47.5		47.5	47.5		24.0					24.0
Actuated g/C Ratio	0.37	0.37		0.37	0.37		0.18					0.18
Clearance Time (s)	6.5	6.5		6.5	6.5		5.0					5.0
Lane Grp Cap (vph)	572	246		584	195		338					191
v/s Ratio Prot	0.17			c0.20								
v/s Ratio Perm		0.18			0.08		0.09					c0.11
v/c Ratio	0.47	0.49		0.54	0.23		0.51					0.62
Uniform Delay, d1	31.6	31.9		32.6	28.6		47.7					48.8
Progression Factor	0.62	0.46		1.00	1.00		1.00					1.00
Incremental Delay, d2	2.7	6.8		3.5	2.7		5.3					14.3
Delay (s)	22.2	21.6		36.1	31.3		53.0					63.2
Level of Service	C	C		D	C		D					E
Approach Delay (s)	22.0			34.8			53.0					63.2
Approach LOS	C			C			D					E

Intersection Summary			
HCM 2000 Control Delay	38.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	75.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR	NWL2	NWL	NWR
Lane Configurations				
Traffic Volume (vph)	13	5	336	143
Future Volume (vph)	13	5	336	143
Ideal Flow (vphpl)	1900	1900	1900	1900
Lane Width	12	12	12	12
Total Lost time (s)			6.5	6.5
Lane Util. Factor			1.00	1.00
Frpb, ped/bikes			1.00	1.00
Flpb, ped/bikes			1.00	1.00
Frt			1.00	0.85
Flt Protected			0.95	1.00
Satd. Flow (prot)			1703	1524
Flt Permitted			0.95	1.00
Satd. Flow (perm)			1703	1524
Peak-hour factor, PHF	0.83	0.93	0.93	0.93
Adj. Flow (vph)	16	5	361	154
RTOR Reduction (vph)	0	0	0	0
Lane Group Flow (vph)	0	0	366	154
Confl. Peds. (#/hr)	140			
Confl. Bikes (#/hr)	2			
Heavy Vehicles (%)	0%	6%	6%	6%
Parking (#/hr)				
Turn Type		Prot	Prot	Perm
Protected Phases		3	3	
Permitted Phases				3
Actuated Green, G (s)			40.5	40.5
Effective Green, g (s)			40.5	40.5
Actuated g/C Ratio			0.31	0.31
Clearance Time (s)			6.5	6.5
Lane Grp Cap (vph)			530	474
v/s Ratio Prot			c0.21	
v/s Ratio Perm				0.10
v/c Ratio			0.69	0.32
Uniform Delay, d1			39.3	34.3
Progression Factor			1.00	1.00
Incremental Delay, d2			7.2	1.8
Delay (s)			46.5	36.1
Level of Service			D	D
Approach Delay (s)			43.4	
Approach LOS			D	

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	98	220	265	67	472	298	266	297	139	239	63
v/c Ratio	0.72	0.27	0.28	0.57	0.69	0.35	0.78	0.85	0.50	0.81	0.29
Control Delay	85.5	25.8	5.4	71.1	34.1	2.9	66.1	72.4	55.3	73.3	7.5
Queue Delay	0.0	0.0	0.0	0.0	5.1	0.2	0.0	0.0	0.0	0.0	0.0
Total Delay	85.5	25.8	5.4	71.1	39.1	3.0	66.1	72.4	55.3	73.3	7.5
Queue Length 50th (ft)	81	124	39	59	274	36	212	239	106	193	0
Queue Length 95th (ft)	#148	186	75	111	414	14	#314	#375	174	#309	22
Internal Link Dist (ft)		1184			71			53		202	
Turn Bay Length (ft)			100	50					100		
Base Capacity (vph)	154	805	957	142	685	878	364	373	303	319	229
Starvation Cap Reductn	0	0	0	0	151	133	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.27	0.28	0.47	0.88	0.40	0.73	0.80	0.46	0.75	0.28

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	86	194	233	62	434	274	255	272	13	132	227	60
Future Volume (vph)	86	194	233	62	434	274	255	272	13	132	227	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	12	12	12	12	12	11	11	12
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.88	1.00	1.00	0.88	1.00	0.98		1.00	1.00	0.56
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1752	1783	1386	1752	1614	1386	1787	1824		1678	1766	868
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1752	1783	1386	1752	1614	1386	1787	1824		1678	1766	868
Peak-hour factor, PHF	0.88	0.88	0.88	0.92	0.92	0.92	0.96	0.96	0.96	0.95	0.95	0.95
Adj. Flow (vph)	98	220	265	67	472	298	266	283	14	139	239	63
RTOR Reduction (vph)	0	0	50	0	0	39	0	2	0	0	0	52
Lane Group Flow (vph)	98	220	215	67	472	259	266	295	0	139	239	11
Confl. Peds. (#/hr)	70		39	39		70	119		126	126		119
Confl. Bikes (#/hr)						4			6			
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	1%	1%	1%	4%	4%	4%
Parking (#/hr)					5							
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA		Split	NA	Perm
Protected Phases	1	6	3	5	2	4	3	3		4	4	
Permitted Phases			6			2						4
Actuated Green, G (s)	10.2	57.9	82.7	7.6	55.3	77.0	24.8	24.8		21.7	21.7	21.7
Effective Green, g (s)	10.2	57.9	82.7	7.6	55.3	77.0	24.8	24.8		21.7	21.7	21.7
Actuated g/C Ratio	0.08	0.45	0.64	0.06	0.43	0.59	0.19	0.19		0.17	0.17	0.17
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	2.0	2.5	3.0	2.0	2.5	2.0	3.0	3.0		2.0	2.0	2.0
Lane Grp Cap (vph)	137	794	929	102	686	820	340	347		280	294	144
v/s Ratio Prot	c0.06	c0.12	0.04	0.04	c0.29	0.05	0.15	c0.16		0.08	c0.14	
v/s Ratio Perm			0.11			0.13						0.01
v/c Ratio	0.72	0.28	0.23	0.66	0.69	0.32	0.78	0.85		0.50	0.81	0.07
Uniform Delay, d1	58.5	22.8	10.1	59.9	30.3	13.3	50.0	50.8		49.2	52.2	45.7
Progression Factor	1.00	1.00	1.00	0.91	0.88	0.36	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	13.7	0.9	0.1	10.3	5.2	0.1	11.1	17.8		0.5	14.9	0.1
Delay (s)	72.2	23.7	10.2	65.0	31.9	4.9	61.2	68.6		49.7	67.1	45.7
Level of Service	E	C	B	E	C	A	E	E		D	E	D
Approach Delay (s)		25.7			24.9			65.1			58.5	
Approach LOS		C			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	40.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	NBL	NBT	SBL	SBR
Lane Group Flow (vph)	495	585	98	1649	124	1087	340
v/c Ratio	1.00	1.02	0.88	1.01	0.92	0.89	0.52
Control Delay	95.8	96.5	121.8	65.8	120.8	49.0	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	95.8	96.5	121.8	65.8	120.8	49.0	8.6
Queue Length 50th (ft)	236	~294	90	~552	114	480	31
Queue Length 95th (ft)	#360	#410	#203	#670	#241	#590	117
Internal Link Dist (ft)	193	252		1280		98	
Turn Bay Length (ft)			240		105		
Base Capacity (vph)	496	572	111	1636	135	1218	655
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.00	1.02	0.88	1.01	0.92	0.89	0.52

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	243	168	54	187	283	51	91	1397	137	112	978	306
Future Volume (vph)	243	168	54	187	283	51	91	1397	137	112	978	306
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	9	11	12	9	9	12	11	10	12	11	10	11
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor		0.95			0.95		1.00	0.91		1.00	0.95	1.00
Frpb, ped/bikes		0.99			0.98		1.00	0.98		1.00	1.00	0.86
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt		0.98			0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.97			0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		2736			2692		1540	4128		1540	2973	1188
Flt Permitted		0.97			0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		2736			2692		1540	4128		1540	2973	1188
Peak-hour factor, PHF	0.94	0.94	0.94	0.89	0.89	0.89	0.93	0.93	0.93	0.90	0.90	0.90
Adj. Flow (vph)	259	179	57	210	318	57	98	1502	147	124	1087	340
RTOR Reduction (vph)	0	7	0	0	6	0	0	8	0	0	0	168
Lane Group Flow (vph)	0	488	0	0	579	0	98	1641	0	124	1087	172
Confl. Peds. (#/hr)	119		36	36		119	52		90	90		52
Confl. Bikes (#/hr)			2			1						
Heavy Vehicles (%)	9%	9%	9%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)		25.0			29.5		10.1	55.2		12.3	57.4	57.4
Effective Green, g (s)		25.0			29.5		10.1	55.2		12.3	57.4	57.4
Actuated g/C Ratio		0.18			0.21		0.07	0.39		0.09	0.41	0.41
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)		3.0			2.0		5.0	3.5		3.0	3.5	3.5
Lane Grp Cap (vph)		488			567		111	1627		135	1218	487
v/s Ratio Prot		c0.18			c0.22		0.06	c0.40		c0.08	0.37	
v/s Ratio Perm												0.14
v/c Ratio		1.00			1.02		0.88	1.01		0.92	0.89	0.35
Uniform Delay, d1		57.5			55.2		64.4	42.4		63.4	38.4	28.5
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		40.2			43.5		53.3	24.4		52.8	10.1	2.0
Delay (s)		97.7			98.7		117.6	66.8		116.1	48.6	30.5
Level of Service		F			F		F	E		F	D	C
Approach Delay (s)		97.7			98.7			69.6			50.0	
Approach LOS		F			F			E			D	

Intersection Summary			
HCM 2000 Control Delay	69.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	95.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBR2	WBL	WBT	NBL	NBT	SBL	SBT	SBR	NEL	NER
Lane Group Flow (vph)	6	530	522	82	599	69	431	826	1642	739
v/c Ratio	0.00	1.58	1.38	2.34	0.49	0.27	1.11	0.75	1.61	1.69
Control Delay	0.0	321.1	242.5	714.2	55.1	41.5	151.3	56.9	321.1	355.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.0	321.1	242.5	714.2	55.1	41.5	151.3	56.9	321.1	355.2
Queue Length 50th (ft)	0	~1115	~1027	~189	347	60	~692	530	~1708	~1558
Queue Length 95th (ft)	0	#1384	#1294	#327	412	101	#935	623	#1050	#1043
Internal Link Dist (ft)			579		160		579		531	
Turn Bay Length (ft)				100		250		200		434
Base Capacity (vph)	1627	336	378	35	1227	256	389	1102	1022	437
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.00	1.58	1.38	2.34	0.49	0.27	1.11	0.75	1.61	1.69

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBR2	WBL2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	104	757	36	60	61	20	522	71	66	409	783
Future Volume (vph)	6	104	757	36	60	61	20	522	71	66	409	783
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.5	4.5			5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	1.00		0.95	0.95			1.00	0.95		1.00	1.00	0.88
Frpb, ped/bikes	1.00		1.00	0.99			1.00	0.98		1.00	1.00	1.00
Flpb, ped/bikes	1.00		0.88	1.00			1.00	1.00		1.00	1.00	1.00
Frt	0.86		1.00	0.98			1.00	0.98		1.00	1.00	0.85
Flt Protected	1.00		0.95	0.96			0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1627		1492	1667			1787	3448		1770	1863	2787
Flt Permitted	1.00		0.95	0.96			0.10	1.00		0.29	1.00	1.00
Satd. Flow (perm)	1627		1492	1667			193	3448		538	1863	2787
Peak-hour factor, PHF	0.96	0.91	0.91	0.91	0.91	0.99	0.99	0.99	0.99	0.95	0.95	0.95
Adj. Flow (vph)	6	114	832	40	66	62	20	527	72	69	431	824
RTOR Reduction (vph)	0	0	0	2	0	0	0	5	0	0	0	52
Lane Group Flow (vph)	6	0	530	520	0	0	82	594	0	69	431	774
Confl. Peds. (#/hr)		27			30	23	23		34	34		23
Confl. Bikes (#/hr)									1			1
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	2%	2%	2%
Turn Type	Free	Perm	Split	NA		custom	Prot	NA		D.P+P	NA	custom
Protected Phases			4	4			5	2		1	6 7	3 7
Permitted Phases	Free	4				5				2		
Actuated Green, G (s)	215.0		48.5	48.5			39.0	76.2		84.0	45.0	81.0
Effective Green, g (s)	215.0		48.5	48.5			39.0	76.2		84.0	45.0	81.0
Actuated g/C Ratio	1.00		0.23	0.23			0.18	0.35		0.39	0.21	0.38
Clearance Time (s)			4.5	4.5			5.0	5.0		5.0		
Vehicle Extension (s)			2.0	2.0			2.0	2.0		2.0		
Lane Grp Cap (vph)	1627		336	376			35	1222		254	389	1049
v/s Ratio Prot				0.31				0.17		0.01	c0.23	0.28
v/s Ratio Perm	0.00		0.36				c0.42			0.10		
v/c Ratio	0.00		1.58	1.38			2.34	0.49		0.27	1.11	0.74
Uniform Delay, d1	0.0		83.2	83.2			88.0	54.1		43.1	85.0	57.8
Progression Factor	1.00		1.00	1.00			1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.0		273.7	187.8			683.6	0.1		0.2	78.1	2.4
Delay (s)	0.0		357.0	271.1			771.6	54.2		43.3	163.1	60.2
Level of Service	A		F	F			F	D		D	F	E
Approach Delay (s)				314.3				140.6			92.8	
Approach LOS				F				F			F	

Intersection Summary			
HCM 2000 Control Delay	270.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.75		
Actuated Cycle Length (s)	215.0	Sum of lost time (s)	24.5
Intersection Capacity Utilization	104.1%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR2	NEL	NER	NER2
Lane Configurations				
Traffic Volume (vph)	2	974	502	24
Future Volume (vph)	2	974	502	24
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	
Lane Util. Factor		0.97	0.91	
Frpb, ped/bikes		1.00	0.84	
Flpb, ped/bikes		1.00	1.00	
Frt		0.99	0.85	
Flt Protected		0.96	1.00	
Satd. Flow (prot)		3489	1231	
Flt Permitted		0.96	1.00	
Satd. Flow (perm)		3489	1231	
Peak-hour factor, PHF	0.95	0.63	0.63	0.63
Adj. Flow (vph)	2	1546	797	38
RTOR Reduction (vph)	0	0	77	0
Lane Group Flow (vph)	0	1642	662	0
Confl. Peds. (#/hr)	23	30		27
Confl. Bikes (#/hr)	1			
Heavy Vehicles (%)	2%	0%	0%	0%
Turn Type		Prot	Perm	
Protected Phases		3		
Permitted Phases			3	
Actuated Green, G (s)		63.0	63.0	
Effective Green, g (s)		63.0	63.0	
Actuated g/C Ratio		0.29	0.29	
Clearance Time (s)		5.0	5.0	
Vehicle Extension (s)		2.0	2.0	
Lane Grp Cap (vph)		1022	360	
v/s Ratio Prot		0.47		
v/s Ratio Perm			c0.54	
v/c Ratio		1.61	1.84	
Uniform Delay, d1		76.0	76.0	
Progression Factor		1.00	1.00	
Incremental Delay, d2		277.6	388.1	
Delay (s)		353.6	464.1	
Level of Service		F	F	
Approach Delay (s)		387.9		
Approach LOS		F		

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	162	552	303	825	189	1411	170	88	975	172
v/c Ratio	0.89	0.92	0.93	0.94	0.88	0.87	0.24	0.94	0.71	0.28
Control Delay	104.2	77.7	91.1	69.6	96.8	41.9	7.6	141.4	40.3	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	104.2	77.7	91.1	69.6	96.8	41.9	7.6	141.4	40.3	6.1
Queue Length 50th (ft)	147	261	271	383	170	613	21	81	405	5
Queue Length 95th (ft)	#276	#368	#436	#503	#297	723	67	#192	488	55
Internal Link Dist (ft)		1244		672		622			665	
Turn Bay Length (ft)	180		350		450		150	230		150
Base Capacity (vph)	189	605	344	902	233	1617	710	94	1375	619
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.91	0.88	0.91	0.81	0.87	0.24	0.94	0.71	0.28

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	152	475	44	288	718	66	170	1270	153	82	907	160
Future Volume (veh/h)	152	475	44	288	718	66	170	1270	153	82	907	160
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.89	1.00		0.91	1.00		0.95	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	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			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1885	1885	1885	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	162	505	47	303	756	69	189	1411	170	88	975	172
Peak Hour Factor	0.94	0.94	0.94	0.95	0.95	0.95	0.90	0.90	0.90	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	1	1	1	2	2	2	2	2	2
Cap, veh/h	185	556	51	325	817	75	212	1629	690	95	1396	594
Arrive On Green	0.10	0.17	0.17	0.18	0.25	0.25	0.12	0.46	0.46	0.05	0.39	0.39
Sat Flow, veh/h	1781	3247	301	1795	3287	300	1781	3554	1504	1781	3554	1512
Grp Volume(v), veh/h	162	275	277	303	412	413	189	1411	170	88	975	172
Grp Sat Flow(s),veh/h/ln	1781	1777	1771	1795	1791	1796	1781	1777	1504	1781	1777	1512
Q Serve(g_s), s	12.6	21.3	21.5	23.3	31.4	31.4	14.6	49.9	9.7	6.9	32.1	10.9
Cycle Q Clear(g_c), s	12.6	21.3	21.5	23.3	31.4	31.4	14.6	49.9	9.7	6.9	32.1	10.9
Prop In Lane	1.00		0.17	1.00		0.17	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	185	304	303	325	445	446	212	1629	690	95	1396	594
V/C Ratio(X)	0.88	0.90	0.91	0.93	0.93	0.93	0.89	0.87	0.25	0.92	0.70	0.29
Avail Cap(c_a), veh/h	191	305	304	346	461	462	235	1629	690	95	1396	594
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	61.8	56.9	57.0	56.5	51.3	51.4	60.8	34.1	23.1	66.0	35.6	29.1
Incr Delay (d2), s/veh	31.7	27.9	29.7	29.7	23.6	23.8	28.1	6.5	0.9	66.2	2.9	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.4	12.0	12.2	13.3	17.1	17.2	8.3	23.0	3.7	4.9	14.6	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	93.5	84.7	86.7	86.2	75.0	75.1	88.9	40.5	24.0	132.2	38.5	30.3
LnGrp LOS	F	F	F	F	E	E	F	D	C	F	D	C
Approach Vol, veh/h		714			1128			1770			1235	
Approach Delay, s/veh		87.5			78.0			44.1			44.0	
Approach LOS		F			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	68.7	30.3	29.0	21.2	59.5	19.5	39.8
Change Period (Y+Rc), s	4.5	4.5	5.0	5.0	4.5	4.5	5.0	5.0
Max Green Setting (Gmax), s	7.5	62.5	27.0	24.0	18.5	51.5	15.0	36.0
Max Q Clear Time (g_c+I1), s	8.9	51.9	25.3	23.5	16.6	34.1	14.6	33.4
Green Ext Time (p_c), s	0.0	9.3	0.1	0.1	0.0	11.5	0.0	0.9

Intersection Summary	
HCM 6th Ctrl Delay	58.4
HCM 6th LOS	E

Seattle Department of Transportation

Attachment B

Transit Travel Time Calculations

Route 40 Transit Plus Multimodal Corridor
Traffic Analysis Addendum for 30% Design (Refined Alternative)
July 16, 2021

Estimated Transit Travel Time by Concept

Summary Table

Zone	Location	Concept Type	Refined Alternative Scope	Travel Time Savings Method	AM Peak Estimated Transit Travel Time Savings (sec) *Average of both directions*	PM Peak Estimated Transit Travel Time Savings (sec) *Average of both directions*	Average Estimated Transit Travel Time Savings (sec) *Average of both directions*
Zone 1 (North Seattle)	85th St between 16th Ave and 15th Ave	Corridor Markings	- Channelization modification on EB approach, shift center line slightly north to improve lane utilization	Synchro	2.15	3.2	2.7
Zone 1 (North Seattle)	Holman Rd btwn 3rd Ave and 104th St	Bus Lanes	- NB bus lane in curbside lane between bus zone north of 3rd Ave and 104th St - Remove two-way center turn lane in this segment - Install signs to enforce a full-time left-turn restriction	Comparison to Off-Peak	19.3	45.7	32.5
Zone 1 (North Seattle)	105th St at Aurora Ave (SR 99)	Bus Zone Modification	- Relocate EB bus stop flag to driveway (approximately an additional 75') - Install shelter footing - Construct landing area at door locations - Install pedestrian light at head of zone - Install tech plyon foundation and conduit	Industry Standard	2.0	2.0	2.0
Zone 2 (Ballard)	Leary Way btwn 17th Ave and 14th Ave	Intersection Modification	- Channelization modifications on EB approach (4-lane profile) - Install curbside right-turn, except buses, pocket on WB approach - Prohibit EB left at 15th Ave - Install left turn pockets at 14th Ave - Install signs - Signal timing modifications, signal head modifications, and new loops at 15th Ave (major modification) - Signal head modifications at 14th Ave (minor modification) - Install APS (assumed upgrades of SW and SE curb	Synchro	-0.35	4.5	2.1
Zone 2 (Ballard)	Leary Way at 15th Ave	Sidewalk Repair	- Curb ramps and sidewalk repair on NW and NE corners	No travel time improvement	N/A	N/A	N/A
Zone 2 (Ballard)	Leary Ave at 17th Ave	Paving	- Reconstruct concrete paving around the curve	No travel time improvement	N/A	N/A	N/A
Zone 2 (Ballard)	Leary Way btwn 17th Ave and 20th Ave	Corridor Markings	- Modify lane configuration (standard 4 to 3 road diet with center turn lane) - Install right-turn pocket (except buses) on NB approach to 20th Ave	No travel time improvement	N/A	N/A	N/A
Zone 2 (Ballard)	Leary Ave btwn Ione Pl and Dock Pl	Bus Bulb	- Relocate Ione Pl bus stops to far side stops at Dock Pl - Update parking regs - Construct bus bulbs in both directions - Concrete bus pads in both directions - Construct shorth median islands at both stop locations - Install shelter footing (2) - Furnish and install pedestrian light at head of zone (1) - Install tech plyon foundation, conduit, and	Industry Standard	4.0	4.0	4.0
Zone 2 (Ballard)	Leary Ave btwn 20th Ave and Market St	Bus Lanes	- NB bus only lane and center turn lane on Leary Ave btwn 20th Ave and Market St - Sign restriction of NB right turn from Leary Ave to Market St	Comparison to Off-Peak	4.8	48.0	26.4
Zone 2 (Ballard)	Leary Ave at Vernon Pl and 20th Ave	Intersection Modification	- New traffic signal (includes APS) - Small curb bulbs on three corners (NW, SW, and SE) - Large curb bulb on NE corner with driveway access - Relocate southern crosswalk and add crossbike markings - Bike lane markings on minor-leg approaches with bike detection	Synchro	0.9	17.25	9.1
Zone 2 (Ballard)	Leary Ave at 20th Ave	Turn Restriction	- Median refuge island on Leary Ave and diverter island on 20th Ave to restrict NB 20th Ave to right-turn only movements	No travel time improvement	N/A	N/A	N/A
Zone 2 (Ballard)	Leary Ave btwn 20th Ave and Market St (existing midblock crosswalk)	Crossing Improvement	- Median pedestrian refuge island - Curb bulbs on west side of crosswalk - RRFB	No travel time improvement	N/A	N/A	N/A

Estimated Transit Travel Time by Concept

Summary Table

Zone	Location	Concept Type	Refined Alternative Scope	Travel Time Savings Method	AM Peak Estimated Transit Travel Time Savings (sec) *Average of both directions*	PM Peak Estimated Transit Travel Time Savings (sec) *Average of both directions*	Average Estimated Transit Travel Time Savings (sec) *Average of both directions*
Zone 2 (Ballard)	Market St btwn Ballard Ave and 22nd Ave	Bus Zone Modification	- Extension of bus zones and bus bulbs in both directions to accommodate three coaches with clear landings at door areas - Relocation of utilities - Install shelter footing (1) - Furnish and install pedestrian light at head of zone (1) - Install tech plyon foundation and conduit (1) - Install RTIS displays (2)	Industry Standard	4.0	4.0	4.0
Zone 2 (Ballard)	Market St btwn 24th Ave and 22nd Ave	Bus Lanes	- Bus lane markings and channelization modifications on Market St between 24th Ave and 22 Ave NW (no red paint prior to AAC project) - Install right-turn expect buses EB at 24th Ave and WB at 22nd Ave	Comparison to Off-Peak	14.1	16.5	15.3
Zone 2 (Ballard)	Market St btwn 24th Ave and 22nd Ave	Paving	- Extend concrete bus pads to match extended bus zones in curbside lanes - Asphalt overlay in center lanes	No travel time improvement	N/A	N/A	N/A
Zone 2 (Ballard)	24th Ave between Market St and 56th Ave	Corridor Markings	- Marking adjustments (center line, stop bar, and symbols) on 24th Ave NW to improve EB to NB right-turns for bus and other heavy vehicle movements - Adjust signal (video) detection location in SB left-turn lane on 24th Avenue NW approaching Market St NW	No travel time improvement	N/A	N/A	N/A
Zone 3 (Fremont)	Fremont Ave at 34th St	Turn Restriction	- Sign and signal head modification to restrict NB left-turns from Fremont Ave to 34th St all day (minor modification)	Synchro	0	0	0.0
Zone 3 (Fremont)	Fremont Ave btwn 34th Ave & 35th Ave	Bus Lanes	- Bus lanes in both directions on Fremont Ave N between N 34th St and N 35th St (use red paint marking if repaved)	Comparison to Off-Peak	22.0	49.6	35.8
Zone 3 (Fremont)	Fremont Ave btwn 34th Ave & 35th Ave	Bus Zone Modification	- Extend and split NB bus zone - Furnish and install pedestrian light at head of zone (2) - Install tech plyon foundation, conduit, and displays (2)	Industry Standard	2.0	2.0	2.0
Zone 3 (Fremont)	Fremont Ave btwn 34th Ave & 35th Ave	Paving	- Curb to curb pavement restoration in concrete - Corner drainage	No travel time improvement			N/A
Zone 3 (Fremont)	Fremont Ave btwn 34th Ave & 35th Ave	Sidewalk Repair	- Sidewalk spot repair - Reconstruct curb ramps on NW and NE corners at 34th St - New curb, full length - Flexipave in tree pits	No travel time improvement			N/A
Zone 3 (Fremont)	35th St at Fremont Ave	Intersection Modification	- Install WB transit only left-turn pocket on 35th Ave - Remove parking on north curb - Signal timing and signal head modification (major) - Install APS (may require rebuilding curb ramps, up to three corners)	Synchro	-17.45	-15.7	-16.6
Zone 3 (Fremont)	Fremont Pl at 35th St	Pedestrian Bulb	- Curb bulb and crosswalk realignment (western segment of 35th St)	No travel time improvement	N/A	N/A	N/A
Zone 3 (Fremont)	Fremont Ave btwn 35th St & 36th St	Bicycle Facility	- NB protected bike lane on Fremont Ave N between N 35th St and N 36th St - Parking removal on east curb	No travel time improvement	N/A	N/A	N/A
Zone 3 (Fremont)	36th St & Fremont Pl btwn 2nd Ave & Fremont Ave	Bus Lanes	- SB bus only lane and center turn lane on N 36th St between 1st Ave N and Evanston Ave N - SB bus only lane on Fremont Pl between Evanston Ave N and Fremont Ave N - Install right-turn only (except buses) lane on N 36th St EB approaching 1st Ave - Signal head location modifications WB at Phinney Ave, Dayton Ave, 1st Ave (minor modifications)	Comparison to Off-Peak	35.6	43.1	39.3
Zone 3 (Fremont)	36th St at Dayton Ave	Bus Bulb	- Bus bulb on NW corner for WB bus zone - Concrete bus pad - Install shelter footing (1) - Furnish and install pedestrian light at head of zone (1)	Industry Standard	2.0	2.0	2.0
Zone 3 (Fremont)	36th St at Dayton Ave	Pedestrian Bulb	- Pedestrian bulb on south side of intersection, connecting across the top of the "T" - Bike racks	No travel time improvement	N/A	N/A	N/A

Estimated Transit Travel Time by Concept

Summary Table

Zone	Location	Concept Type	Refined Alternative Scope	Travel Time Savings Method	AM Peak Estimated Transit Travel Time Savings (sec) *Average of both directions*	PM Peak Estimated Transit Travel Time Savings (sec) *Average of both directions*	Average Estimated Transit Travel Time Savings (sec) *Average of both directions*
Zone 3 (Fremont)	36th St at Phinney Ave	Pedestrian Bulb	- Pedestrian bulbs on NW, NE, and SW corners	No travel time improvement	N/A	N/A	N/A
Zone 3 (Fremont)	36th St at 1st Ave	Bus Bulb	- Bus bulbs at eastbound bus bulb - Install shelter footing (1) - Furnish and install pedestrian light at head of zone (1)	Industry Standard	2.0	2.0	2.0
Zone 4 (Westlake)	Westlake Ave btwn Mercer St & Valley St	Intersection Modification	- Shorten NB left-turn lane and lengthen SB left-turn lane	Synchro	0	0	0.0
Zone 4 (Westlake)	Westlake Ave at 9th Ave	Intersection Modification	- Center lane converted to transit only left turn lane (SB Westlake to Westlake) with one left-turn lane for GP and one thru lane for GP - Modify markings on south leg of 9th Ave to extend bike lane buffer to crosswalk - Signal head modifications and signal phasing changes (minor modification)	Synchro	4.25	5.45	4.9
Zone 4 (Westlake)	Westlake Ave btwn 9th Ave & Dexter Ave	Bus Lanes	- Bus only lanes in both directions on Westlake Avenue between 9th Ave (South Lake Union) and Dexter Ave N (Fremont Bridge) - Queue jump SB at Highland Drive (minor modification) - Signal timing and signal head modification at Galer St (minor modification)	Comparison to Off-Peak	89.5	170.6	130.0
Zone 4 (Westlake)	Westlake Ave btwn 9th Ave & Dexter Ave	Bus Pads	- Concrete bus pads at SB bus zones on Westlake Ave (Dexter, Crockett, Blaine, and 8th Ave bus stop locations)	No travel time improvement	N/A	N/A	N/A
Zone 4 (Westlake)	Westlake Ave at Dexter Ave/Nickerson St/4th Ave	Bicycle Facility	- Bicycle facility improvements in the SB direction between Fremont Bridge and Nickerson St with bike box (more triangle in shape) - Bike dots in NB lanes directing cyclists toward bike ramp approaching bridge	No travel time improvement	N/A	N/A	N/A
Zone 4 (Westlake)	Westlake Ave btwn SR 99 overpass and 4th Ave	Paving	- Replace asphalt in curb-side northbound lane with concrete	No travel time improvement	N/A	N/A	N/A
Zone 1 (North Seattle)	Meridian Ave N at N Northgate Way	TSP Upgrade	- New controller	Industry Standard	3.0	3.0	3.0
Zone 1 (North Seattle)	Aurora Ave N at N 105th St/N Northgate Way	TSP Upgrade	- New controller	Industry Standard	3.0	3.0	3.0
Zone 1 (North Seattle)	Fremont Ave N at N 105th St	TSP Upgrade	- New controller	Industry Standard	3.0	3.0	3.0
Zone 1 (North Seattle)	Dayton Ave N at N 105th St	TSP Upgrade	- New controller	Industry Standard	3.0	3.0	3.0
Zone 1 (North Seattle)	13th Ave NW at Holman Rd NW/NW 92nd St	TSP Upgrade	- New controller	Industry Standard	3.0	3.0	3.0
Zone 1 (North Seattle)	15th Ave NW at Holman Rd NW	TSP Upgrade	- New controller	Industry Standard	3.0	3.0	3.0
Zone 1 (North Seattle)	15th Ave NW at NW 85th St	TSP Upgrade	- New controller	Industry Standard	3.0	3.0	3.0
Zone 2 (Ballard)	Leary Ave NW at NW Dock Pl (half)	TSP Upgrade	- New controller, fiber	Industry Standard	3.0	3.0	3.0
Zone 2 (Ballard)	15th Ave NW at NW Leary Way	TSP Upgrade	- New controller	Industry Standard	3.0	3.0	3.0
Zone 2 (Ballard)	14th Ave NW at NW Leary Way	TSP Upgrade	- New controller	Industry Standard	3.0	3.0	3.0
Zone 2 (Ballard)	11th Ave NW at NW Leary Way	TSP Upgrade	- New controller	Industry Standard	3.0	3.0	3.0
Zone 3 (Fremont)	8th Ave NW at Leary Way NW	TSP Upgrade	- New controller	Industry Standard	3.0	3.0	3.0
Zone 3 (Fremont)	1st Ave NW at NW 36th St	TSP Upgrade	- New controller	Industry Standard	3.0	3.0	3.0
Zone 4 (Westlake)	Westlake Ave N at Dexter Ave N & 4th Ave N & Nickerson St	TSP Upgrade	- New controller	Industry Standard	3.0	3.0	3.0
Zone 4 (Westlake)	Westlake Ave N at Galer St (8th Ave N)	TSP Upgrade	- New cabinet and new controller - Install APS - Reconstruct curb ramps on NW corner	No travel time improvement	N/A	N/A	N/A
			Total Estimated Transit Travel Time Savings (sec)		**233.0**	**446.0**	**339.5**
			Total Estimated Transit Travel Time Savings (min)		**3.9**	**7.4**	**5.7**

Estimated Transit Travel Time Savings - Proposed Bus Lanes

Method: Comparison to Off-Peak

Location	Proposed Improvement	Existing Travel Time (sec)				Estimated Transit Travel Time Savings (sec)		
		AM 5am to 9am	PM 3pm to 7pm	Average Peak	Late Night 10pm to 12am	AM Peak	PM Peak	Average Peak
Westlake Ave btwn 9th Ave & Dexter Ave	Bus lanes both directions	477.1	558.3	517.7	387.7	89.5	170.6	130.0
Fremont Ave btwn 34th Ave & 35th Ave	Bus lanes both directions	186.1	213.6	199.9	164.1	22.0	49.6	35.8
36th St & Fremont Pl btwn 2nd Ave & Fremont Ave	Southeastbound bus lane with center turn lane	361.1	401.7	381.4	275.7	35.6	43.1	39.3
Leary Ave btwn 20th Ave and Market St	Northbound bus lane with center turn lane	186.6	272.9	229.7	177.0	4.8	48.0	52.8
Market St btwn 24th Ave and 22nd Ave	Bus lanes both directions	74.3	76.6	75.4	60.1	14.1	16.5	15.3
Holman Rd btwn 3rd Ave and 104th St	Northbound bus lane	160.5	213.2	186.8	121.9	19.3	45.7	65.0

Estimated Transit Travel Time Savings - Intersection Operations Modifications

Method: Synchro Analysis

Intersection Name	Int/ Ln Grp	Peak Hour	Delay by Affected Approach (sec)		Change in Transit Travel Time by Affected Approach (sec)	
			2040 No Build	2040 Build	By Approach	Cumulative
Westlake Ave at 9th Ave	SBL	AM	14.9	6.4	8.5	**8.5**
		PM	18.3	7.4	10.9	**10.9**
Leary Ave at Vernon Pl and 20th Ave	NWBT/NWBR	AM	9.7	7.9	1.8	**1.8**
	SEBT		9.9	9.9	0	
	NWBT/NWBR	PM	39.9	9.2	30.7	**34.5**
	SEBT		11.0	7.2	3.8	
Leary Way at 15th Ave NW	WBT/WBR	AM	21.1	14.6	6.5	**-0.7**
	EBT		1.9	3.1	-1.2	
	WBT		2.9	0.6	2.3	
	EBT		15.4	23.7	-8.3	
	WBT/WBR	PM	34.5	21.5	13.0	**9.0**
	EBT		2.6	3.7	-1.1	
	WBT		6.8	0.7	6.1	
	EBT		20.0	29	-9.0	
Leary Ave at Vernon Pl and 20th Ave	NWBT/NWBR	AM	9.7	7.9	1.8	**1.8**
	SEBT		9.9	9.9	0	
	NWBT/NWBR	PM	39.9	9.2	30.7	**34.5**
	SEBT		11.0	7.2	3.8	
85th St between 16th Ave and 15th Ave	EBL	AM	81.7	78.3	3.4	**4.3**
	SBR		23.6	22.7	0.9	
	EBL	PM	103.2	97.7	5.5	**6.4**
	SBR		31.4	30.5	0.9	
35th St at Fremont Ave	NBL	AM	31.4	64.9	-33.5	**-34.9**
	EBR		3.6	5.0	-1.4	
	NBL	PM	30.4	59.0	-28.6	**-31.4**
	EBR		2.9	5.7	-2.8	

Seattle Department of Transportation

Attachment C

Turning Movement Classification (TMC) Counts

Route 40 Transit Plus Multimodal Corridor
Traffic Analysis Addendum for 30% Design (Refined Alternative)
July 16, 2021

	HV %:	PHF
EB	15.2%	0.85
WB	11.4%	0.89
NB	2.9%	0.85
SB	1.3%	0.75
NWB	9.9%	0.94
TOTAL	10.0%	0.92

Two-Hour Count Summaries

Interval Start		NW MARKET ST Eastbound					NW MARKET ST Westbound					22ND AVE NW Northbound					22ND AVE NW Southbound					LEARY AVE NW Northwestbound					15-min Total	Rolling One Hour
		UT	LT	TH	BR	RT	UT	HL	LT	TH	RT	UT	LT	TH	RT	HR	UT	LT	BL	TH	RT	UT	HL	BL	BR	HR		
7:00 AM		0	0	40	14	2	0	2	0	19	7	0	0	1	0	0	0	7	21	1	2	0	0	15	5	4	140	0
7:15 AM		0	0	33	20	3	0	0	2	40	9	0	1	0	1	0	0	5	21	6	0	0	0	18	6	2	167	0
7:30 AM		0	0	31	23	1	0	1	5	20	14	0	0	5	1	0	0	9	25	5	3	0	0	20	10	5	178	0
7:45 AM		0	0	27	23	3	0	2	1	29	9	0	3	2	1	0	0	9	19	7	4	0	0	17	5	1	162	647
8:00 AM		**0**	**1**	**33**	**20**	**1**	**0**	**0**	**2**	**38**	**11**	**0**	**1**	**4**	**3**	**0**	**0**	**2**	**34**	**7**	**2**	**0**	**0**	**28**	**8**	**7**	**202**	709
8:15 AM		**0**	**1**	**43**	**27**	**5**	**0**	**2**	**1**	**35**	**9**	**0**	**0**	**3**	**5**	**0**	**0**	**6**	**40**	**5**	**1**	**0**	**0**	**28**	**6**	**6**	**223**	765
8:30 AM		**0**	**1**	**34**	**24**	**5**	**0**	**2**	**0**	**43**	**9**	**0**	**0**	**4**	**3**	**1**	**0**	**4**	**14**	**5**	**2**	**0**	**0**	**25**	**10**	**6**	**192**	779
8:45 AM		**0**	**0**	**43**	**15**	**4**	**0**	**1**	**3**	**43**	**12**	**0**	**0**	**5**	**4**	**1**	**0**	**6**	**20**	**7**	**2**	**0**	**0**	**20**	**13**	**5**	**204**	**821**
Count Total		0	3	284	166	24	0	10	14	267	80	0	5	24	18	2	0	48	194	43	16	0	0	171	63	36	1,468	0
Peak Hour	**All**	**0**	**3**	**153**	**86**	**15**	**0**	**5**	**6**	**159**	**41**	**0**	**1**	**16**	**15**	**2**	**0**	**18**	**108**	**24**	**7**	**0**	**0**	**101**	**37**	**24**	**821**	**0**
	HV	**0**	**0**	**16**	**21**	**2**	**0**	**0**	**0**	**20**	**4**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**13**	**2**	**1**	**82**	**0**
	HV%	**-**	**0%**	**10%**	**24%**	**13%**	**-**	**0%**	**0%**	**13%**	**10%**	**-**	**0%**	**6%**	**0%**	**0%**	**-**	**6%**	**0%**	**4%**	**0%**	**-**	**-**	**13%**	**5%**	**4%**	**10%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals						Bicycles						Pedestrians (Crossing Leg)					
	EB	WB	NB	SB	NWB	Total	EB	WB	NB	SB	NWB	Total	East	West	North	South	Southeast	Total
7:00 AM	11	3	0	1	2	*17*	0	0	0	7	0	*7*	11	31	19	21	15	*97*
7:15 AM	11	10	0	2	7	*30*	0	0	0	6	1	*7*	2	25	12	19	16	*74*
7:30 AM	8	7	1	1	5	*22*	0	1	0	5	0	*6*	4	28	15	24	10	*81*
7:45 AM	10	4	1	0	4	*19*	0	0	1	13	0	*14*	2	37	21	23	15	*98*
8:00 AM	**9**	**5**	**0**	**1**	**3**	***18***	**0**	**1**	**1**	**14**	**0**	***16***	**2**	**48**	**12**	**27**	**15**	***104***
8:15 AM	**14**	**7**	**1**	**0**	**7**	***29***	**1**	**1**	**0**	**8**	**0**	***10***	**3**	**34**	**24**	**29**	**26**	***116***
8:30 AM	**8**	**6**	**0**	**0**	**3**	***17***	**0**	**0**	**3**	**8**	**0**	***11***	**3**	**41**	**29**	**24**	**16**	***113***
8:45 AM	**8**	**6**	**0**	**1**	**3**	***18***	**0**	**1**	**0**	**7**	**0**	***8***	**1**	**36**	**28**	**17**	**9**	***91***
Count Total	79	48	3	6	34	*170*	1	4	5	68	1	*79*	28	280	160	184	122	*774*
Peak Hr	**39**	**24**	**1**	**2**	**16**	***82***	**1**	**3**	**4**	**37**	**0**	***45***	**9**	**159**	**93**	**97**	**66**	*424*

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	NW MARKET ST Eastbound					NW MARKET ST Westbound					22ND AVE NW Northbound					22ND AVE NW Southbound					LEARY AVE NW Northwestbound					15-min Total	Rolling One Hour
	UT	LT	TH	BR	RT	UT	HL	LT	TH	RT	UT	LT	TH	RT	HR	UT	LT	BL	TH	RT	UT	HL	BL	BR	HR		
7:00 AM	0	0	6	4	1	0	0	0	3	0	0	0	0	0	0	0	0	0	0	1	0	0	2	0	0	17	0
7:15 AM	0	0	3	8	0	0	0	0	9	1	0	0	0	0	0	0	1	1	0	0	0	0	7	0	0	30	0
7:30 AM	0	0	2	6	0	0	0	1	4	2	0	0	1	0	0	0	0	0	0	1	0	0	5	0	0	22	0
7:45 AM	0	0	5	5	0	0	1	0	3	0	0	1	0	0	0	0	0	0	0	0	0	0	4	0	0	19	88
8:00 AM	**0**	**0**	**4**	**5**	**0**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**2**	**0**	**1**	**18**	89
8:15 AM	**0**	**0**	**5**	**7**	**2**	**0**	**0**	**0**	**6**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**7**	**0**	**0**	**29**	88
8:30 AM	**0**	**0**	**3**	**5**	**0**	**0**	**0**	**0**	**5**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**1**	**0**	**17**	83
8:45 AM	**0**	**0**	**4**	**4**	**0**	**0**	**0**	**0**	**4**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**2**	**1**	**0**	**18**	**82**
Count Total	0	0	32	44	3	0	1	1	39	7	0	1	2	0	0	0	2	1	1	2	0	0	31	2	1	170	0
Peak Hour	**0**	**0**	**16**	**21**	**2**	**0**	**0**	**0**	**20**	**4**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**13**	**2**	**1**	82	**0**

Two-Hour Count Summaries - Bikes

Interval Start	NW MARKET ST Eastbound					NW MARKET ST Westbound					22ND AVE NW Northbound					22ND AVE NW Southbound					LEARY AVE NW Northwestbound					15-min Total	Rolling One Hour
	UT	LT	TH	BR	RT	UT	HL	LT	TH	RT	UT	LT	TH	RT	HR	UT	LT	BL	TH	RT	UT	HL	BL	BR	HR		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	7	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	1	0	7	0
7:30 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	6	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	12	0	0	0	0	0	0	14	34
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**13**	**1**	**0**	**0**	**0**	**0**	**0**	**16**	43
8:15 AM	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**10**	46
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**1**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**11**	51
8:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	**45**
Count Total	0	0	0	0	1	0	0	0	4	0	0	0	4	1	0	0	0	3	64	1	0	0	0	1	0	79	0
Peak Hour	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**2**	**34**	**1**	**0**	**0**	**0**	**0**	**0**	45	**0**

Study Name #21007 LEARY AVE NW & NW VERNON PL & 20TH AVE NW
Start Date Wednesday, February 10, 2021 7:00 AM
End Date Wednesday, February 10, 2021 7:00 PM
Site Code 25163 & 25164

Report Summary

		Southbound							Northwestbound							Northbound							Northeastbound							Southeastbound							
Time Period	**Class.**	**HR**	**BR**	**T**	**BL**	**U**	**I**	**O**	**BR**	**T**	**L**	**HL**	**U**	**I**	**O**	**HR**	**T**	**BL**	**HL**	**U**	**I**	**O**	**HR**	**R**	**BL**	**L**	**U**	**I**	**O**	**R**	**BR**	**T**	**HL**	**U**	**I**	**O**	**Total**
Peak 1	Motorcycles	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%
7:00 AM - 12:00 PM	rs & Light Goc	29	22	7	57	3	118	121	93	185	17	9	0	304	218	13	14	5	2	3	37	27	4	39	4	1	0	48	48	7	4	109	7	0	127	220	634
One Hour Peak	%	97%	92%	78%	97%	100%	94%	97%	96%	96%	94%	90%	0%	96%	93%	93%	100%	100%	67%	100%	95%	84%	100%	93%	100%	100%	0%	94%	92%	100%	67%	91%	100%	0%	91%	96%	94%
11:00 AM - 12:00 PM	Buses	0	0	0	0	0	0	1	1	4	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	5	4	10
	%	0%	0%	0%	0%	0%	0%	1%	1%	2%	0%	0%	0%	2%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%	0%	4%	2%	1%
	ıgle-Unit Truc	1	1	1	2	0	5	3	3	2	0	1	0	6	10	1	0	0	1	0	2	4	0	2	0	0	0	2	2	0	2	5	0	0	7	3	22
	%	3%	4%	11%	3%	0%	4%	2%	3%	1%	0%	10%	0%	2%	4%	7%	0%	0%	33%	0%	5%	13%	0%	5%	0%	0%	0%	4%	4%	0%	33%	4%	0%	0%	5%	1%	3%
	ticulated Truc	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%	0%
	icycles on Roa	0	1	1	0	0	2	0	0	1	0	0	0	1	1	0	0	0	0	0	0	1	0	1	0	0	0	1	1	0	0	0	0	0	0	1	4
	%	0%	4%	11%	0%	0%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%	2%	0%	0%	0%	2%	2%	0%	0%	0%	0%	0%	0%	0%	1%
	Total	**30**	**24**	**9**	**59**	**3**	**125**	**125**	**97**	**192**	**18**	**10**	**0**	**317**	**235**	**14**	**14**	**5**	**3**	**3**	**39**	**32**	**4**	**42**	**4**	**1**	**0**	**51**	**52**	**7**	**6**	**120**	**7**	**0**	**140**	**228**	**672**
	PHF	0.68	0.75	0.56	0.67	0.75	0.74	0.87	0.84	0.92	0.75	0.5	0	0.92	0.79	0.5	0.58	0.31	0.38	0.38	0.75	0.62	0.5	0.95	0.5	0.25	0	0.91	0.72	0.44	0.38	0.77	0.58	0	0.74	0.88	0.9
	Approach %						19%	19%						47%	35%						6%	5%						8%	8%						21%	34%	
Peak 2	Motorcycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:00 PM - 7:00 PM	rs & Light Goc	47	44	8	108	0	207	172	134	235	35	12	2	418	225	12	5	1	0	0	18	34	6	5	21	4	0	36	103	24	8	98	12	0	142	287	821
One Hour Peak	%	100%	98%	89%	99%	0%	99%	99%	100%	97%	100%	100%	100%	98%	96%	92%	100%	100%	0%	0%	95%	97%	100%	100%	95%	80%	0%	95%	99%	100%	100%	92%	100%	0%	95%	97%	98%
5:00 PM - 6:00 PM	Buses	0	0	0	0	0	0	0	0	7	0	0	0	7	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	6	7	13
	%	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	0%	2%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	0%	0%	4%	2%	2%
	ıgle-Unit Truc	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	ticulated Truc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	icycles on Roa	0	1	1	0	0	2	1	0	0	0	0	0	0	3	1	0	0	0	0	1	1	0	0	1	1	0	2	1	0	0	2	0	0	2	1	7
	%	0%	2%	11%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	1%	8%	0%	0%	0%	0%	5%	3%	0%	0%	5%	20%	0%	5%	1%	0%	0%	2%	0%	0%	1%	0%	1%
	Total	**47**	**45**	**9**	**109**	**0**	**210**	**173**	**134**	**242**	**35**	**12**	**2**	**425**	**235**	**13**	**5**	**1**	**0**	**0**	**19**	**35**	**6**	**5**	**22**	**5**	**0**	**38**	**104**	**24**	**8**	**106**	**12**	**0**	**150**	**295**	**842**
	PHF	0.73	0.8	0.32	0.85	0	0.97	0.9	0.86	0.96	0.67	0.75	0.5	0.94	0.89	0.65	0.42	0.25	0	0	0.79	0.62	0.5	0.42	0.61	0.62	0	0.79	0.87	0.67	0.67	0.91	0.75	0	0.96	1	0.96
	Approach %						25%	21%						50%	28%						2%	4%						5%	12%						18%	35%	

Study Name #19028 15TH SB AVE NW & NW LEARY WAY
Start Date Thursday, April 25, 2019 7:00 AM
End Date Thursday, April 25, 2019 7:00 PM
Site Code 25187

Report Summary

		Southbound						Westbound						Northbound						Eastbound								Crosswalk		
Time Period	Class.	R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	Total		s on Cr	odestria	Total
Peak 1	Motorcycles	0	0	1	0	1	0	0	0	1	0	1	3	0	0	0	0	0	3	2	2	0	0	4	0	6	SB	2	25	27
Specified Period	%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	1%	1%	0%	0%	1%	0%	0%		7%	93%	
7:00 AM - 12:00 PM	rs & Light Goc	23	24	175	0	222	0	0	452	293	0	745	414	0	0	0	0	0	568	251	239	0	0	490	475	1457	WB	0	0	0
One Hour Peak	%	88%	59%	97%	0%	90%	0%	0%	93%	92%	0%	93%	94%	0%	0%	0%	0%	0%	90%	93%	92%	0%	0%	92%	92%	92%		0%	0%	
8:00 AM - 9:00 AM	Buses	0	9	1	0	10	0	0	10	0	0	10	12	0	0	0	0	0	19	10	11	0	0	21	10	41	NB	3	38	41
	%	0%	22%	1%	0%	4%	0%	0%	2%	0%	0%	1%	3%	0%	0%	0%	0%	0%	3%	4%	4%	0%	0%	4%	2%	3%		7%	93%	
	ıgle-Unit Truc	3	4	1	0	8	0	0	22	14	0	36	5	0	0	0	0	0	23	5	4	0	0	9	25	53	EB	2	36	38
	%	12%	10%	1%	0%	3%	0%	0%	5%	4%	0%	4%	1%	0%	0%	0%	0%	0%	4%	2%	2%	0%	0%	2%	5%	3%		5%	95%	
	ticulated Truc	0	0	2	0	2	0	0	3	1	0	4	3	0	0	0	0	0	1	0	1	0	0	1	3	7		**7**	**99**	**106**
	%	0%	0%	1%	0%	1%	0%	0%	1%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%				
	icycles on Roa	0	4	1	0	5	0	0	1	8	0	9	5	0	0	0	0	0	14	2	4	0	0	6	1	20				
	%	0%	10%	1%	0%	2%	0%	0%	0%	3%	0%	1%	1%	0%	0%	0%	0%	0%	2%	1%	2%	0%	0%	1%	0%	1%				
	Total	**26**	**41**	**181**	**0**	**248**	**0**	**0**	**488**	**317**	**0**	**805**	**442**	**0**	**0**	**0**	**0**	**0**	**628**	**270**	**261**	**0**	**0**	**531**	**514**	**1584**				
	PHF	0.72	0.73	0.84	0	0.89	0	0	0.84	0.84	0	0.84	0.89	0	0	0	0	0	0.9	0.85	0.93	0	0	0.89	0.83	0.92				
	Approach %					16%	0%					51%	28%					0%	40%					34%	32%					
Peak 2	Motorcycles	0	2	0	0	2	0	0	10	2	0	12	1	0	0	0	0	0	6	2	1	0	0	3	10	17	SB	8	43	51
Specified Period	%	0%	5%	0%	0%	1%	0%	0%	1%	1%	0%	1%	0%	0%	0%	0%	0%	0%	1%	1%	0%	0%	0%	1%	1%	1%		16%	84%	
12:00 PM - 7:00 PM	rs & Light Goc	36	29	195	0	260	0	0	1067	310	0	1377	402	0	0	0	0	0	511	172	207	0	0	379	1103	2016	WB	0	0	0
One Hour Peak	%	92%	74%	98%	0%	94%	0%	0%	95%	99%	0%	96%	96%	0%	0%	0%	0%	0%	96%	95%	94%	0%	0%	94%	95%	95%		0%	0%	
5:00 PM - 6:00 PM	Buses	0	8	0	0	8	0	0	21	0	0	21	7	0	0	0	0	0	12	4	7	0	0	11	21	40	NB	3	82	85
	%	0%	21%	0%	0%	3%	0%	0%	2%	0%	0%	1%	2%	0%	0%	0%	0%	0%	2%	2%	3%	0%	0%	3%	2%	2%		4%	96%	
	ıgle-Unit Truc	0	0	3	0	3	0	0	2	0	0	2	6	0	0	0	0	0	0	0	3	0	0	3	2	8	EB	1	58	59
	%	0%	0%	2%	0%	1%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%	0%		2%	98%	
	ticulated Truc	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	2		**12**	**183**	**195**
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%				
	icycles on Roa	3	0	0	0	3	2	2	16	2	0	20	2	0	0	1	0	1	6	4	2	0	0	6	20	30				
	%	8%	0%	0%	0%	1%	100%	100%	1%	1%	0%	1%	0%	0%	0%	100%	0%	100%	1%	2%	1%	0%	0%	1%	2%	1%				
	Total	**39**	**39**	**198**	**0**	**276**	**2**	**2**	**1118**	**314**	**0**	**1434**	**418**	**0**	**0**	**1**	**0**	**1**	**535**	**182**	**220**	**0**	**0**	**402**	**1158**	**2113**				
	PHF	0.65	0.89	0.88	0	0.87	0.5	0.5	0.98	0.95	0	0.98	0.9	0	0	0.25	0	0.25	0.9	0.78	0.92	0	0	0.87	0.97	0.96				
	Approach %					13%	0%					68%	20%					0%	25%					19%	55%					

Study Name	#19028 15TH NB AVE NW & NW LEARY WAY
Start Date	Thursday, April 25, 2019 7:00 AM
End Date	Thursday, April 25, 2019 7:15 PM
Site Code	25468

Report Summary

		Southbound						Westbound						Northbound						Eastbound								Crosswalk	
Time Period	**Class.**	**R**	**T**	**L**	**U**	**I**	**O**	**R**	**T**	**L**	**U**	**I**	**O**	**R**	**T**	**L**	**U**	**I**	**O**	**R**	**T**	**L**	**U**	**I**	**O**	**Total**		**s on Cr**	**odestria**	**Total**
Peak 1	Motorcycles	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3	3	SB	4	25	29
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		14%	86%	
7:00 AM - 12:00 PM	rs & Light Goc	0	0	0	0	0	163	87	510	0	0	597	374	59	49	400	0	508	0	0	315	27	0	342	910	1447	WB	3	16	19
One Hour Peak	%	0%	0%	0%	0%	0%	93%	96%	93%	0%	0%	94%	92%	88%	89%	94%	0%	93%	0%	0%	93%	90%	0%	93%	94%	93%		16%	84%	
10:30 AM - 11:30 AM	Buses	0	0	0	0	0	5	0	5	0	0	5	10	2	5	3	0	10	0	0	8	0	0	8	8	23	NB	3	36	39
	%	0%	0%	0%	0%	0%	3%	0%	1%	0%	0%	1%	2%	3%	9%	1%	0%	2%	0%	0%	2%	0%	0%	2%	1%	1%		8%	92%	
	ıgle-Unit Truc	0	0	0	0	0	5	3	22	0	0	25	16	4	1	22	0	27	0	0	12	1	0	13	44	65	EB	0	0	0
	%	0%	0%	0%	0%	0%	3%	3%	4%	0%	0%	4%	4%	6%	2%	5%	0%	5%	0%	0%	4%	3%	0%	4%	5%	4%		0%	0%	
	ticulated Truc	0	0	0	0	0	3	1	7	0	0	8	4	2	0	1	0	3	0	0	2	2	0	4	8	15		**10**	**77**	**87**
	%	0%	0%	0%	0%	0%	2%	1%	1%	0%	0%	1%	1%	3%	0%	0%	0%	1%	0%	0%	1%	7%	0%	1%	1%	1%				
	icycles on Roa	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0	0	2	0	2				
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%	0%				
	Total	**0**	**0**	**0**	**0**	**0**	**176**	**91**	**547**	**0**	**0**	**638**	**406**	**67**	**55**	**426**	**0**	**548**	**0**	**0**	**339**	**30**	**0**	**369**	**973**	**1555**				
	PHF	0	0	0	0	0	0.9	0.78	0.91	0	0	0.91	0.93	0.88	0.72	0.95	0	0.94	0	0	0.94	0.75	0	0.93	0.94	0.94				
	Approach %					0%	11%					41%	26%					35%	0%					24%	63%					
Peak 2	Motorcycles	0	0	0	0	0	0	0	2	0	0	2	2	1	0	3	0	4	0	0	1	0	0	1	5	7	SB	0	0	0
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%		0%	0%	
12:00 PM - 7:15 PM	rs & Light Goc	0	0	0	0	0	122	73	743	0	0	816	455	77	33	534	0	644	0	0	378	16	0	394	1277	1854	WB	3	60	63
One Hour Peak	%	0%	0%	0%	0%	0%	92%	100%	98%	0%	0%	98%	97%	96%	75%	97%	0%	95%	0%	0%	97%	100%	0%	98%	97%	97%		5%	95%	
5:15 PM - 6:15 PM	Buses	0	0	0	0	0	9	0	11	0	0	11	6	0	9	13	0	22	0	0	6	0	0	6	24	39	NB	6	78	84
	%	0%	0%	0%	0%	0%	7%	0%	1%	0%	0%	1%	1%	0%	20%	2%	0%	3%	0%	0%	2%	0%	0%	1%	2%	2%		7%	93%	
	ıgle-Unit Truc	0	0	0	0	0	0	0	3	0	0	3	3	1	0	1	0	2	0	0	2	0	0	2	4	7	EB	0	0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%		0%	0%	
	ticulated Truc	0	0	0	0	0	0	0	2	0	0	2	1	0	0	2	0	2	0	0	1	0	0	1	4	5		**9**	**138**	**147**
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%				
	icycles on Roa	0	0	0	0	0	2	0	0	0	0	0	1	1	2	0	0	3	0	0	0	0	0	0	0	3				
	%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	1%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%				
	Total	**0**	**0**	**0**	**0**	**0**	**133**	**73**	**761**	**0**	**0**	**834**	**468**	**80**	**44**	**553**	**0**	**677**	**0**	**0**	**388**	**16**	**0**	**404**	**1314**	**1915**				
	PHF	0	0	0	0	0	0.85	0.83	0.95	0	0	0.95	0.93	0.87	0.65	0.92	0	0.94	0	0	0.93	0.67	0	0.92	0.94	0.97				
	Approach %					0%	7%					44%	24%					35%	0%					21%	69%					

CITY OF SEATTLE

DEPARTMENT OF TRANSPORTATION

Counted by : JR
Counter No : 1024
Weather : CLEAR
Comments :

File Name : NW_078a14
Site Code : 00041502
Start Date : 4/15/2014
Page No : 1

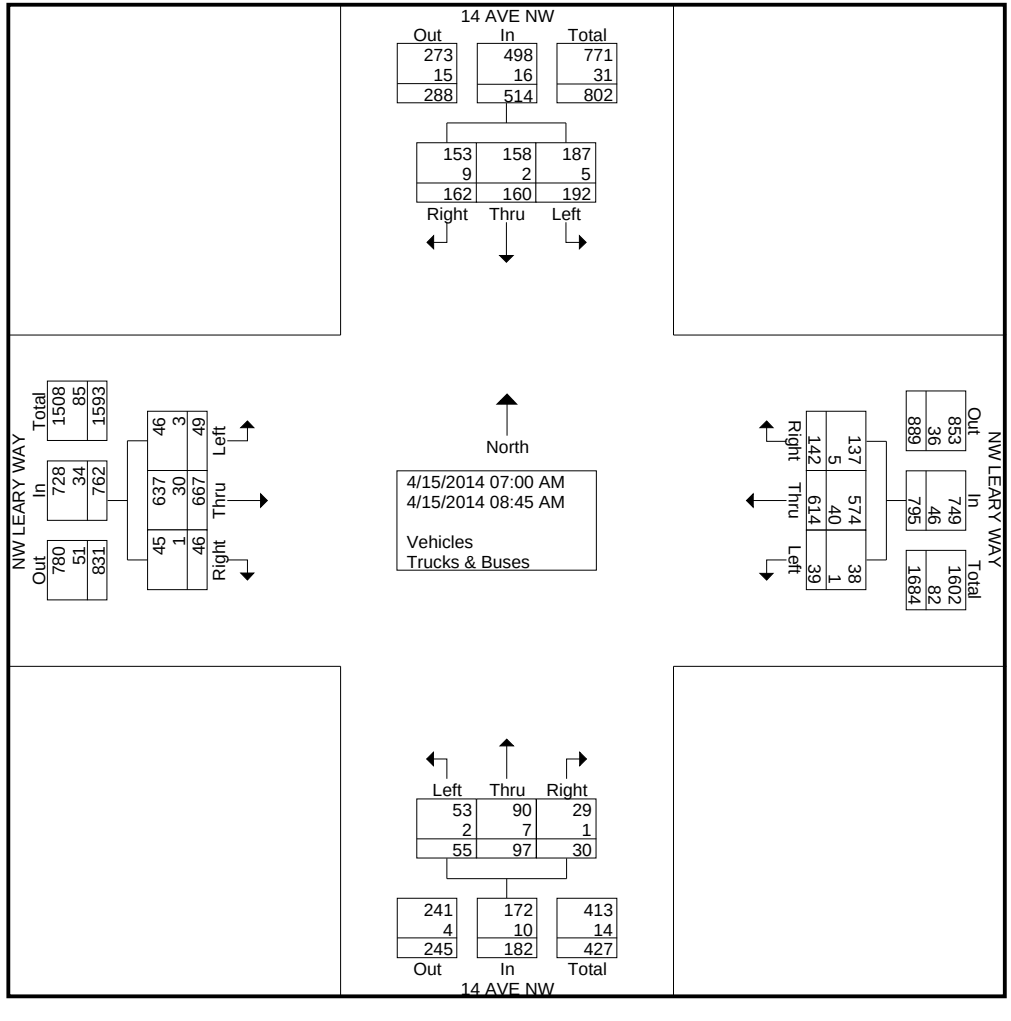
Groups Printed- Vehicles - Trucks & Buses

	14 AVE NW From North				NW LEARY WAY From East				14 AVE NW From South				NW LEARY WAY From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	20	22	18	60	5	49	13	67	4	7	3	14	9	64	4	77	218
07:15 AM	29	16	14	59	5	65	16	86	6	12	1	19	6	69	4	79	243
07:30 AM	23	14	18	55	3	68	21	92	3	14	2	19	4	87	9	100	266
07:45 AM	21	20	20	61	2	100	14	116	5	12	7	24	4	89	8	101	302
Total	93	72	70	235	15	282	64	361	18	45	13	76	23	309	25	357	1029
08:00 AM	23	22	23	68	7	72	18	97	6	8	2	16	6	88	5	99	280
08:15 AM	26	24	27	77	5	100	23	128	11	11	3	25	8	98	6	112	342
08:30 AM	29	27	20	76	9	83	21	113	8	15	6	29	9	115	5	129	347
08:45 AM	21	15	22	58	3	77	16	96	12	18	6	36	3	57	5	65	255
Total	99	88	92	279	24	332	78	434	37	52	17	106	26	358	21	405	1224
Grand Total	192	160	162	514	39	614	142	795	55	97	30	182	49	667	46	762	2253
Apprch %	37.4	31.1	31.5		4.9	77.2	17.9		30.2	53.3	16.5		6.4	87.5	6		
Total %	8.5	7.1	7.2	22.8	1.7	27.3	6.3	35.3	2.4	4.3	1.3	8.1	2.2	29.6	2	33.8	
Vehicles	187	158	153	498	38	574	137	749	53	90	29	172	46	637	45	728	2147
% Vehicles	97.4	98.8	94.4	96.9	97.4	93.5	96.5	94.2	96.4	92.8	96.7	94.5	93.9	95.5	97.8	95.5	95.3
Trucks & Buses	5	2	9	16	1	40	5	46	2	7	1	10	3	30	1	34	106
% Trucks & Buses	2.6	1.2	5.6	3.1	2.6	6.5	3.5	5.8	3.6	7.2	3.3	5.5	6.1	4.5	2.2	4.5	4.7

CITY OF SEATTLE
DEPARTMENT OF TRANSPORTATION

Counted by : JR
Counter No : 1024
Weather : CLEAR
Comments :

File Name : NW_078a14
Site Code : 00041502
Start Date : 4/15/2014
Page No : 2



CITY OF SEATTLE

DEPARTMENT OF TRANSPORTATION

Counted by : JR
Counter No : 1024
Weather : CLEAR
Comments :

File Name : NW_078a14
Site Code : 00041502
Start Date : 4/15/2014

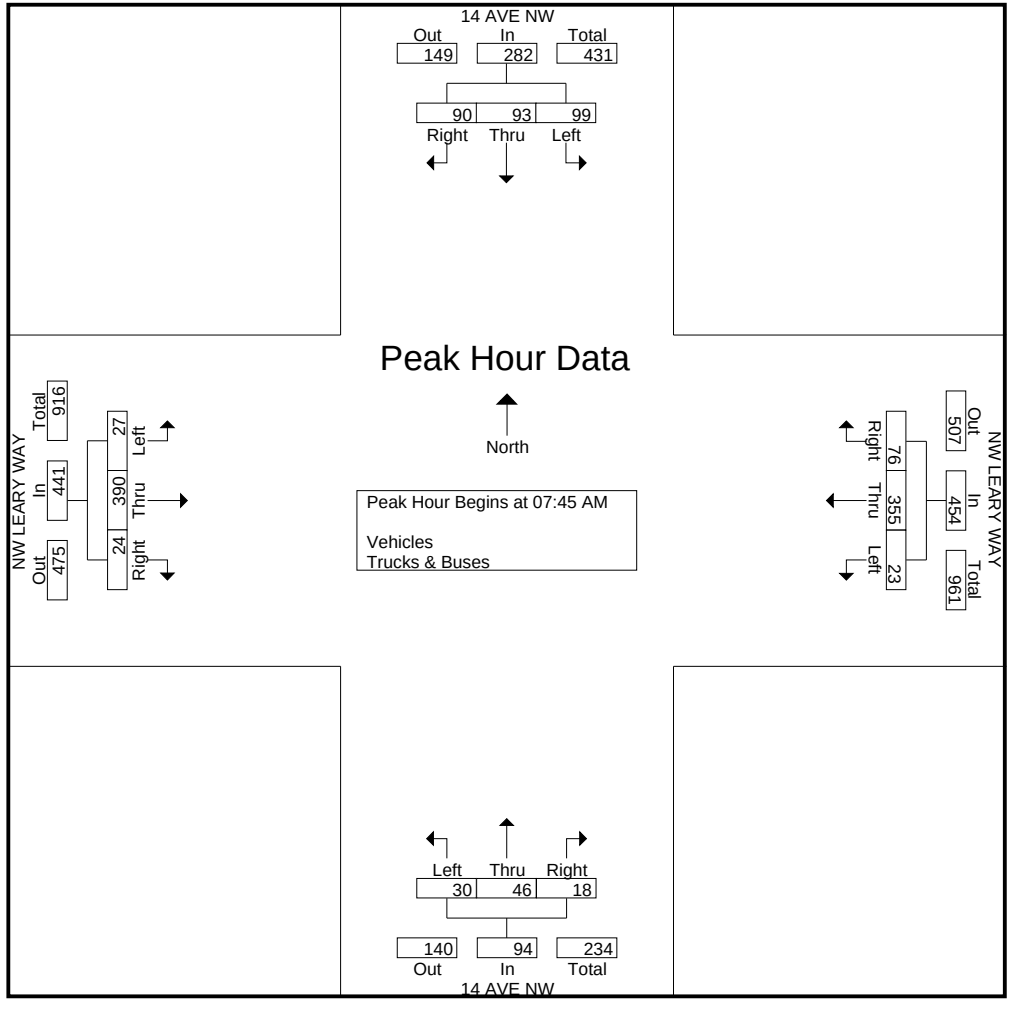
	14 AVE NW From North				NW LEARY WAY From East				14 AVE NW From South				NW LEARY WAY From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	21	20	20	61	2	**100**	14	116	5	12	**7**	24	4	89	**8**	101	302
08:00 AM	23	22	23	68	7	72	18	97	6	8	2	16	6	88	5	99	280
08:15 AM	26	24	**27**	**77**	5	100	**23**	**128**	**11**	11	3	25	8	98	6	112	342
08:30 AM	**29**	**27**	20	76	**9**	83	21	113	8	**15**	6	**29**	**9**	**115**	5	**129**	**347**
Total Volume	99	93	90	282	23	355	76	454	30	46	18	94	27	390	24	441	1271
% App. Total	35.1	33	31.9		5.1	78.2	16.7		31.9	48.9	19.1		6.1	88.4	5.4		
PHF	.853	.861	.833	.916	.639	.888	.826	.887	.682	.767	.643	.810	.750	.848	.750	.855	.916

CITY OF SEATTLE

DEPARTMENT OF TRANSPORTATION

Counted by : JR
Counter No : 1024
Weather : CLEAR
Comments :

File Name : NW_078a14
Site Code : 00041502
Start Date : 4/15/2014
Page No : 4



Study Name	#17074 PHINNEY AVE N & N 36TH ST
Start Date	Tuesday, May 16, 2017 7:00 AM
End Date	Tuesday, May 16, 2017 6:00 PM
Site Code	27024

Report Summary

		Southbound						Westbound						Northbound						Eastbound								Crosswalk	
Time Period	**Class.**	**R**	**T**	**L**	**U**	**I**	**O**	**R**	**T**	**L**	**U**	**I**	**O**	**R**	**T**	**L**	**U**	**I**	**O**	**R**	**T**	**L**	**U**	**I**	**O**	**Total**		**s on Cr**	**odestria**	**Total**
Peak 2	Motorcycles	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	1	0	0	2	0	2	SB	1	40	41
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%	0%	0%	0%	0%	0%	0%		2%	98%	
11:00 AM - 12:00 PM	Cars	10	2	9	0	21	21	16	356	37	1	410	408	47	1	47	0	95	74	35	351	4	0	390	413	916	WB	0	27	27
One Hour Peak	%	83%	50%	82%	0%	78%	78%	80%	76%	76%	100%	76%	75%	80%	100%	90%	0%	85%	74%	74%	74%	67%	0%	74%	77%	76%		0%	100%	
11:00 AM - 12:00 PM	ıt Goods Vehi	1	0	1	0	2	3	2	71	3	0	76	90	7	0	3	0	10	12	9	82	1	0	92	75	180	NB	1	28	29
	%	8%	0%	9%	0%	7%	11%	10%	15%	6%	0%	14%	17%	12%	0%	6%	0%	9%	12%	19%	17%	17%	0%	17%	14%	15%		3%	97%	
	Buses	0	0	0	0	0	0	0	5	2	0	7	6	0	0	1	0	1	2	0	6	0	0	6	6	14	EB	0	20	20
	%	0%	0%	0%	0%	0%	0%	0%	1%	4%	0%	1%	1%	0%	0%	2%	0%	1%	2%	0%	1%	0%	0%	1%	1%	1%		0%	100%	
	ıgle-Unit Truc	1	0	1	0	2	3	2	34	7	0	43	35	5	0	1	0	6	9	2	29	1	0	32	36	83		**2**	**115**	**117**
	%	8%	0%	9%	0%	7%	11%	10%	7%	14%	0%	8%	6%	8%	0%	2%	0%	5%	9%	4%	6%	17%	0%	6%	7%	7%				
	ticulated Truc	0	0	0	0	0	0	0	5	0	0	5	5	0	0	0	0	0	0	0	5	0	0	5	5	10				
	%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%	1%				
	icycles on Roa	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2				
	%	0%	50%	0%	0%	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%				
	Total	**12**	**4**	**11**	**0**	**27**	**27**	**20**	**471**	**49**	**1**	**541**	**545**	**59**	**1**	**52**	**0**	**112**	**100**	**47**	**474**	**6**	**0**	**527**	**535**	**1207**				
	PHF	0.6	1	0.55	0	0.75	0.56	0.56	0.84	0.72	0.25	0.82	0.85	0.64	0.25	0.65	0	0.64	0.74	0.73	0.87	0.75	0	0.86	0.9	0.87				
	Approach %					2%	2%					45%	45%					9%	8%					44%	44%					
Peak 3	Motorcycles	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	2	SB	0	82	82
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%	100%	
12:00 PM - 2:00 PM	Cars	6	5	11	0	22	29	16	367	73	2	458	465	50	6	34	0	90	124	46	402	7	0	455	407	1025	WB	0	46	46
One Hour Peak	%	55%	71%	92%	0%	73%	83%	89%	77%	89%	100%	79%	79%	74%	67%	79%	0%	75%	86%	82%	79%	88%	0%	80%	77%	79%		0%	100%	
12:00 PM - 1:00 PM	ıt Goods Vehi	5	1	0	0	6	4	2	78	7	0	87	97	12	1	6	0	19	12	4	85	1	0	90	89	202	NB	0	35	35
	%	45%	14%	0%	0%	20%	11%	11%	16%	9%	0%	15%	16%	18%	11%	14%	0%	16%	8%	7%	17%	13%	0%	16%	17%	16%		0%	100%	
	Buses	0	0	0	0	0	0	0	5	1	0	6	5	1	0	0	0	1	1	0	4	0	0	4	5	11	EB	0	32	32
	%	0%	0%	0%	0%	0%	0%	0%	1%	1%	0%	1%	1%	1%	0%	0%	0%	1%	1%	0%	1%	0%	0%	1%	1%	1%		0%	100%	
	ıgle-Unit Truc	0	1	1	0	2	0	0	16	1	0	17	16	4	0	3	0	7	8	6	11	0	0	17	19	43		**0**	**195**	**195**
	%	0%	14%	8%	0%	7%	0%	0%	3%	1%	0%	3%	3%	6%	0%	7%	0%	6%	6%	11%	2%	0%	0%	3%	4%	3%				
	ticulated Truc	0	0	0	0	0	0	0	8	0	0	8	6	1	0	0	0	1	0	0	5	0	0	5	8	14				
	%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	1%	1%	1%	0%	0%	0%	1%	0%	0%	1%	0%	0%	1%	2%	1%				
	icycles on Roa	0	0	0	0	0	2	0	1	0	0	1	0	0	2	0	0	2	0	0	0	0	0	0	1	3				
	%	0%	0%	0%	0%	0%	6%	0%	0%	0%	0%	0%	0%	0%	22%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%				
	Total	**11**	**7**	**12**	**0**	**30**	**35**	**18**	**477**	**82**	**2**	**579**	**589**	**68**	**9**	**43**	**0**	**120**	**145**	**56**	**507**	**8**	**0**	**571**	**531**	**1300**				
	PHF	0.69	0.58	0.75	0	0.83	0.73	0.75	0.85	0.79	0.5	0.87	0.95	0.85	0.45	0.63	0	0.83	0.76	0.74	0.95	0.5	0	0.96	0.82	0.9				
	Approach %					2%	3%					45%	45%					9%	11%					44%	41%					

Study Name	#17074 DAYTON AVE N & N 36TH ST
Start Date	Tuesday, May 16, 2017 7:00 AM
End Date	Tuesday, May 16, 2017 6:00 PM
Site Code	27022

Report Summary

		Southbound					Westbound					Eastbound							Crosswalk		
Time Period	**Class.**	**R**	**L**	**U**	**I**	**O**	**R**	**T**	**U**	**I**	**O**	**T**	**L**	**U**	**I**	**O**	**Total**		**s on Cr**	**odestria**	**Total**
Peak 1	Motorcycles	0	0	0	0	0	0	2	0	2	7	7	0	0	7	2	9	SB	2	43	45
Specified Period	%	0%	0%	0%	0%	0%	0%	1%	0%	1%	1%	1%	0%	0%	1%	1%	1%		4%	96%	
7:00 AM - 9:00 AM	Cars	4	15	0	19	18	13	297	0	310	1065	1050	5	1	1056	302	1385	WB	1	10	11
One Hour Peak	%	100%	88%	0%	90%	90%	93%	79%	0%	79%	88%	88%	83%	100%	88%	79%	86%		9%	91%	
7:45 AM - 8:45 AM	ıt Goods Vehi	0	0	0	0	2	1	53	0	54	90	90	1	0	91	53	145	EB	0	13	13
	%	0%	0%	0%	0%	10%	7%	14%	0%	14%	7%	8%	17%	0%	8%	14%	9%		0%	100%	
	Buses	0	0	0	0	0	0	6	0	6	14	14	0	0	14	6	20		**3**	**66**	**69**
	%	0%	0%	0%	0%	0%	0%	2%	0%	2%	1%	1%	0%	0%	1%	2%	1%				
	ıgle-Unit Truc	0	0	0	0	0	0	13	0	13	26	26	0	0	26	13	39				
	%	0%	0%	0%	0%	0%	0%	3%	0%	3%	2%	2%	0%	0%	2%	3%	2%				
	ticulated Truc	0	0	0	0	0	0	3	0	3	1	1	0	0	1	3	4				
	%	0%	0%	0%	0%	0%	0%	1%	0%	1%	0%	0%	0%	0%	0%	1%	0%				
	icycles on Roa	0	2	0	2	0	0	2	0	2	3	1	0	0	1	2	5				
	%	0%	12%	0%	10%	0%	0%	1%	0%	1%	0%	0%	0%	0%	0%	1%	0%				
	Total	**4**	**17**	**0**	**21**	**20**	**14**	**376**	**0**	**390**	**1206**	**1189**	**6**	**1**	**1196**	**381**	**1607**				
	PHF	1	0.71	0	0.75	0.56	0.5	0.96	0	0.97	0.93	0.93	0.75	0.25	0.93	0.96	0.95				
	Approach %				1%	1%				24%	75%				74%	24%					

Study Name	#17074 FREMONT PL N & N 36TH ST
Start Date	Tuesday, May 16, 2017 7:00 AM
End Date	Tuesday, May 16, 2017 6:00 PM
Site Code	27026

Report Summary

		Southbound						Westbound						Northbound						Eastbound								Crosswalk		
Time Period	**Class.**	**R**	**T**	**L**	**U**	**I**	**O**	**R**	**T**	**L**	**U**	**I**	**O**	**R**	**T**	**L**	**U**	**I**	**O**	**R**	**T**	**L**	**U**	**I**	**O**	**Total**		**s on Cr**	**destria**	**Total**
Peak 1	Motorcycles	0	0	0	0	0	1	0	0	0	0	0	5	1	0	0	0	1	0	0	4	1	0	5	0	6	SB	1	51	52
Specified Period	%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	1%	0%	0%	0%	1%	0%	0%	0%	0%		2%	98%	
7:00 AM - 9:00 AM	Cars	71	0	0	0	71	98	3	241	59	0	303	968	34	26	16	0	76	105	46	934	69	0	1049	328	1499	WB	0	32	32
One Hour Peak	%	90%	0%	0%	0%	90%	84%	75%	80%	89%	0%	82%	88%	79%	79%	84%	0%	80%	87%	84%	89%	86%	0%	88%	82%	87%		0%	100%	
8:00 AM - 9:00 AM	ıt Goods Vehi	5	0	0	0	5	10	1	42	6	0	49	82	3	1	2	0	6	14	8	79	8	0	95	49	155	NB	0	25	25
	%	6%	0%	0%	0%	6%	9%	25%	14%	9%	0%	13%	7%	7%	3%	11%	0%	6%	12%	15%	8%	10%	0%	8%	12%	9%		0%	100%	
	Buses	0	0	0	0	0	2	0	4	0	0	4	16	4	2	0	0	6	0	0	12	0	0	12	4	22	EB	0	1	1
	%	0%	0%	0%	0%	0%	2%	0%	1%	0%	0%	1%	1%	9%	6%	0%	0%	6%	0%	0%	1%	0%	0%	1%	1%	1%		0%	100%	
	ıgle-Unit Truc	3	0	0	0	3	6	0	10	0	0	10	22	1	4	1	0	6	0	0	21	2	0	23	14	42		**1**	**109**	**110**
	%	4%	0%	0%	0%	4%	5%	0%	3%	0%	0%	3%	2%	2%	12%	5%	0%	6%	0%	0%	2%	3%	0%	2%	4%	2%				
	ticulated Truc	0	0	0	0	0	0	0	3	1	0	4	2	0	0	0	0	0	1	0	2	0	0	2	3	6				
	%	0%	0%	0%	0%	0%	0%	0%	1%	2%	0%	1%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	1%	0%				
	icycles on Roa	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	1	0	0	0	1	1	2				
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%	0%	0%	0%	0%	0%	0%				
	Total	**79**	**0**	**0**	**0**	**79**	**117**	**4**	**301**	**66**	**0**	**371**	**1095**	**43**	**33**	**19**	**0**	**95**	**121**	**55**	**1052**	**80**	**0**	**1187**	**399**	**1732**				
	PHF	0.82	0	0	0	0.82	0.84	0.5	0.92	0.79	0	0.89	0.89	0.6	0.82	0.68	0	0.79	0.67	0.57	0.88	0.83	0	0.91	0.9	0.97				
	Approach %					5%	7%					21%	63%					5%	7%					69%	23%					
Peak 2	Motorcycles	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	1	0	1	SB	0	60	60
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%	100%	
11:00 AM - 12:00 PM	Cars	96	0	0	0	96	120	14	307	33	0	354	353	34	36	43	0	113	78	45	319	70	0	434	446	997	WB	0	59	59
One Hour Peak	%	84%	0%	0%	0%	84%	85%	64%	77%	73%	0%	76%	74%	79%	86%	81%	0%	82%	82%	90%	74%	91%	0%	78%	79%	78%		0%	100%	
11:00 AM - 12:00 PM	ıt Goods Vehi	9	0	0	0	9	13	6	61	8	0	75	68	3	2	4	0	9	11	3	65	5	0	73	74	166	NB	1	46	47
	%	8%	0%	0%	0%	8%	9%	27%	15%	18%	0%	16%	14%	7%	5%	8%	0%	7%	12%	6%	15%	6%	0%	13%	13%	13%		2%	98%	
	Buses	2	0	0	0	2	0	0	5	0	0	5	7	1	0	0	0	1	0	0	6	0	0	6	7	14	EB	0	0	0
	%	2%	0%	0%	0%	2%	0%	0%	1%	0%	0%	1%	1%	2%	0%	0%	0%	1%	0%	0%	1%	0%	0%	1%	1%	1%		0%	0%	
	ıgle-Unit Truc	7	0	0	0	7	8	2	24	4	0	30	39	4	4	6	0	14	6	2	35	2	0	39	37	90		**1**	**165**	**166**
	%	6%	0%	0%	0%	6%	6%	9%	6%	9%	0%	6%	8%	9%	10%	11%	0%	10%	6%	4%	8%	3%	0%	7%	7%	7%				
	ticulated Truc	0	0	0	0	0	0	0	3	0	0	3	5	0	0	0	0	0	0	0	5	0	0	5	3	8				
	%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%	1%				
	icycles on Roa	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0	1				
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%				
	Total	**114**	**0**	**0**	**0**	**114**	**141**	**22**	**400**	**45**	**0**	**467**	**474**	**43**	**42**	**53**	**0**	**138**	**95**	**50**	**431**	**77**	**0**	**558**	**567**	**1277**				
	PHF	0.68	0	0	0	0.68	0.9	0.79	0.76	0.7	0	0.79	0.83	0.98	0.81	0.78	0	0.88	0.82	0.74	0.82	0.88	0	0.86	0.78	0.88				
	Approach %					9%	11%					37%	37%					11%	7%					44%	44%					

Study Name #19113 FREMONT AVE N & FREMONT PL N-N 35TH ST
Start Date Thursday, September 19, 2019 7:00 AM
End Date Thursday, September 19, 2019 7:00 PM
Site Code 27035

Report Summary

		Southbound						Westbound						Northbound						Southeastbound							Crosswalk		
Time Period	Class.	HR	T	L	U	I	O	R	BR	L	U	I	O	R	T	BL	U	I	O	BR	BL	HL	U	I	O	Total		s on Cr	ossestria	Total
Peak 1	Motorcycles	0	3	0	0	3	0	0	0	0	0	0	4	0	0	2	0	2	11	8	4	0	0	12	2	17	SB	1	41	42
Specified Period	%	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%	1%	1%	1%	1%	0%	0%	1%	0%	1%		2%	98%	
7:00 AM - 12:00 PM	rs & Light Goc	25	221	69	0	315	79	17	113	0	0	130	452	60	60	232	0	352	798	577	323	2	0	902	370	1699	WB	8	86	94
One Hour Peak	%	100%	65%	97%	0%	72%	88%	85%	90%	0%	0%	82%	91%	82%	88%	92%	0%	90%	82%	93%	92%	100%	0%	93%	92%	87%		9%	91%	
7:45 AM - 8:45 AM	Buses	0	0	0	0	0	0	0	2	14	0	16	16	11	0	9	0	20	33	19	5	0	0	24	11	60	NB	0	31	31
	%	0%	0%	0%	0%	0%	0%	0%	2%	100%	0%	10%	3%	15%	0%	4%	0%	5%	3%	3%	1%	0%	0%	2%	3%	3%		0%	100%	
	ıgle-Unit Truc	0	2	1	0	3	5	3	8	0	0	11	21	1	2	4	0	7	17	15	19	0	0	34	12	55	SEB	41	71	112
	%	0%	1%	1%	0%	1%	6%	15%	6%	0%	0%	7%	4%	1%	3%	2%	0%	2%	2%	2%	5%	0%	0%	3%	3%	3%		37%	63%	
	ticulated Truc	0	6	0	0	6	0	0	2	0	0	2	1	0	0	3	0	3	6	0	1	0	0	1	5	12		**50**	**229**	**279**
	%	0%	2%	0%	0%	1%	0%	0%	2%	0%	0%	1%	0%	0%	0%	1%	0%	1%	1%	0%	0%	0%	0%	0%	1%	1%				
	icycles on Roa	0	107	1	0	108	6	0	0	0	0	0	3	1	6	1	0	8	107	0	1	0	0	1	1	117				
	%	0%	32%	1%	0%	25%	7%	0%	0%	0%	0%	0%	1%	1%	9%	0%	0%	2%	11%	0%	0%	0%	0%	0%	0%	6%				
	Total	**25**	**339**	**71**	**0**	**435**	**90**	**20**	**125**	**14**	**0**	**159**	**497**	**73**	**68**	**251**	**0**	**392**	**972**	**619**	**353**	**2**	**0**	**974**	**401**	**1960**				
	PHF	0.62	0.82	0.85	0	0.82	0.83	0.62	0.84	0.7	0	0.86	0.93	0.83	0.81	0.91	0	0.89	0.93	0.88	0.93	0.5	0	0.94	0.9	0.96				
	Approach %					22%	5%					8%	25%					20%	50%					50%	20%					
Peak 2	Motorcycles	0	1	0	0	1	5	0	4	0	0	4	1	0	5	8	0	13	1	0	1	0	0	1	12	19	SB	0	107	107
Specified Period	%	0%	1%	0%	0%	0%	1%	0%	2%	0%	0%	1%	0%	0%	2%	1%	0%	1%	0%	0%	0%	0%	0%	0%	1%	1%		0%	100%	
12:00 PM - 7:00 PM	rs & Light Goc	18	164	37	0	219	240	48	201	0	0	249	355	51	192	789	0	1032	699	535	267	0	0	802	1008	2302	WB	2	219	221
One Hour Peak	%	95%	93%	95%	0%	94%	65%	94%	96%	0%	0%	92%	94%	80%	60%	96%	0%	86%	95%	97%	97%	0%	0%	97%	96%	91%		1%	99%	
4:45 PM - 5:45 PM	Buses	0	0	0	0	0	0	0	4	9	0	13	18	13	0	12	0	25	21	12	5	0	0	17	16	55	NB	2	114	116
	%	0%	0%	0%	0%	0%	0%	0%	2%	100%	0%	5%	5%	20%	0%	1%	0%	2%	3%	2%	2%	0%	0%	2%	2%	2%		2%	98%	
	ıgle-Unit Truc	1	2	1	0	4	1	1	1	0	0	2	3	0	0	8	0	8	8	6	2	0	0	8	10	22	SEB	4	179	183
	%	5%	1%	3%	0%	2%	0%	2%	0%	0%	0%	1%	1%	0%	0%	1%	0%	1%	1%	1%	1%	0%	0%	1%	1%	1%		2%	98%	
	ticulated Truc	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0	1	1	2		**8**	**619**	**627**
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%				
	icycles on Roa	0	9	1	0	10	123	2	0	0	0	2	1	0	121	6	0	127	9	0	0	0	0	0	6	139				
	%	0%	5%	3%	0%	4%	33%	4%	0%	0%	0%	1%	0%	0%	38%	1%	0%	11%	1%	0%	0%	0%	0%	0%	1%	5%				
	Total	**19**	**176**	**39**	**0**	**234**	**370**	**51**	**210**	**9**	**0**	**270**	**378**	**64**	**318**	**824**	**0**	**1206**	**738**	**553**	**275**	**1**	**0**	**829**	**1053**	**2539**				
	PHF	0.59	0.86	0.54	0	0.85	0.87	0.8	0.91	0.75	0	0.94	0.93	0.89	0.85	0.96	0	0.93	0.87	0.76	0.9	0.25	0	0.82	0.95	0.96				
	Approach %					9%	15%					11%	15%					47%	29%					33%	41%					

Study Name	#19113 FREMONT AVE N & N 34TH ST
Start Date	Tuesday, September 17, 2019 7:00 AM
End Date	Tuesday, September 17, 2019 7:00 PM
Site Code	27039

Report Summary

		Southbound						Westbound						Northwestboun			Northbound						Eastbound							Crosswalk		
Time Period	**Class.**	**R**	**T**	**L**	**U**	**I**	**O**	**R**	**T**	**L**	**U**	**I**	**O**	**I**	**O**	**HR**	**R**	**T**	**L**	**U**	**I**	**O**	**R**	**T**	**L**	**U**	**I**	**O**	**Total**		**s on Cr**	**destria**	**Total**
Peak 1	Motorcycles	1	5	0	0	6	0	0	1	1	0	2	0	0	2	2	0	0	0	0	2	6	0	0	0	0	0	2	10	SB	1	196	197
Specified Period	%	2%	1%	0%	0%	1%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%		1%	99%	
7:00 AM - 12:00 PM	rs & Light Goc	44	742	0	1	787	305	65	48	363	1	477	1	0	557	557	0	239	37	0	833	1105	0	0	0	0	0	129	2097	WB	10	69	79
One Hour Peak	%	92%	86%	0%	100%	86%	88%	90%	77%	85%	100%	85%	3%	0%	92%	92%	0%	87%	84%	0%	90%	78%	0%	0%	0%	0%	0%	84%	82%		13%	87%	
7:45 AM - 8:45 AM	Buses	1	29	0	0	30	18	1	1	5	0	7	0	0	9	9	0	17	0	0	26	34	0	0	0	0	0	2	63	NWB	0	0	0
	%	2%	3%	0%	0%	3%	5%	1%	2%	1%	0%	1%	0%	0%	1%	1%	0%	6%	0%	0%	3%	2%	0%	0%	0%	0%	0%	1%	2%		0%	0%	
	ngle-Unit Truc	0	15	0	0	15	17	6	2	5	0	13	0	0	15	15	0	11	0	0	26	20	0	0	0	0	0	2	54	NB	74	53	127
	%	0%	2%	0%	0%	2%	5%	8%	3%	1%	0%	2%	0%	0%	2%	2%	0%	4%	0%	0%	3%	1%	0%	0%	0%	0%	0%	1%	2%		58%	42%	
	ticulated Truc	0	7	0	0	7	3	0	0	0	0	0	0	0	3	3	0	3	0	0	6	7	0	0	0	0	0	0	13	EB	1	143	144
	%	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%		1%	99%	
	icycles on Roa	2	65	0	0	67	5	0	10	51	0	61	33	0	20	20	4	5	7	0	36	244	128	29	0	0	157	19	321		**86**	**461**	**547**
	%	4%	8%	0%	0%	7%	1%	0%	16%	12%	0%	11%	97%	0%	3%	3%	100%	2%	16%	0%	4%	17%	100%	100%	0%	0%	100%	12%	13%				
	Total	**48**	**863**	**0**	**1**	**912**	**348**	**72**	**62**	**425**	**1**	**560**	**34**	**0**	**606**	**606**	**4**	**275**	**44**	**0**	**929**	**1416**	**128**	**29**	**0**	**0**	**157**	**154**	**2558**				
	PHF	0.75	0.95	0	0.25	0.95	0.97	0.67	0.86	0.91	0.25	0.91	0.77	0	0.96	0.96	0.5	0.92	0.73	0	0.94	0.98	0.89	0.81	0	0	0.87	0.86	0.97				
	Approach %					36%	14%					22%	1%	0%	24%						36%	55%					6%	6%					
Peak 2	Motorcycles	0	1	0	0	1	3	2	1	2	0	5	0	0	1	1	0	1	0	0	2	3	0	0	0	0	0	1	8	SB	3	328	331
Specified Period	%	0%	0%	0%	0%	0%	0%	1%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		1%	99%	
12:00 PM - 7:00 PM	rs & Light Goc	52	516	0	0	568	1170	161	63	561	0	785	0	0	581	581	0	1009	3	0	1593	1077	0	0	0	0	0	118	2946	WB	9	96	105
One Hour Peak	%	100%	95%	0%	0%	95%	87%	89%	47%	95%	0%	87%	0%	0%	81%	81%	0%	87%	4%	0%	81%	94%	0%	0%	0%	0%	0%	45%	85%		9%	91%	
5:00 PM - 6:00 PM	Buses	0	20	0	0	20	22	0	0	1	0	1	0	0	3	3	0	22	0	0	25	21	0	0	0	0	0	0	46	NWB	0	0	0
	%	0%	4%	0%	0%	3%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	1%	2%	0%	0%	0%	0%	0%	0%	1%		0%	0%	
	ngle-Unit Truc	0	2	0	0	2	3	1	0	0	0	1	0	0	0	0	0	2	0	0	2	2	0	0	0	0	0	0	5	NB	28	89	117
	%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		24%	76%	
	ticulated Truc	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	2	0	0	0	0	0	0	0	2	EB	4	149	153
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		3%	97%	
	icycles on Roa	0	7	0	0	7	146	16	71	26	0	113	15	0	134	134	2	130	70	0	336	40	7	13	0	0	20	141	476		**44**	**662**	**706**
	%	0%	1%	0%	0%	1%	11%	9%	53%	4%	0%	12%	100%	0%	19%	19%	100%	11%	96%	0%	17%	3%	100%	100%	0%	0%	100%	54%	14%				
	Total	**52**	**546**	**0**	**0**	**598**	**1344**	**180**	**135**	**590**	**0**	**905**	**15**	**0**	**721**	**721**	**2**	**1164**	**73**	**0**	**1960**	**1143**	**7**	**13**	**0**	**0**	**20**	**260**	**3483**				
	PHF	0.65	0.92	0	0	0.93	0.96	0.9	0.78	0.84	0	0.92	0.54	0	0.96	0.96	0.5	0.94	0.76	0	0.96	0.9	0.58	0.54	0	0	0.62	0.82	0.95				
	Approach %					17%	39%					26%	0%	0%	21%						56%	33%					1%	7%					

Study Name	#19110 9TH AVE N & WESTLAKE AVE N
Start Date	Thursday, September 19, 2019 7:00 AM
End Date	Thursday, September 19, 2019 7:00 PM
Site Code	28734

Report Summary

		Southbound					Northwestbound					Northbound						Crosswalk		
Time Period	**Class.**	**T**	**BL**	**U**	**I**	**O**	**BR**	**HL**	**U**	**I**	**O**	**HR**	**T**	**U**	**I**	**O**	**Total**		**s on Cr**	**odestria**	**Total**
Peak 1	Motorcycles	10	5	0	15	5	5	0	0	5	5	0	0	0	0	10	20	SB	4	73	77
Specified Period	%	1%	1%	0%	1%	1%	1%	0%	0%	1%	1%	0%	0%	0%	0%	1%	1%		5%	95%	
7:00 AM - 12:00 PM	rs & Light Goc	678	533	0	1211	610	560	0	0	560	535	2	50	1	53	679	1824	NWB	0	4	4
One Hour Peak	%	74%	94%	0%	82%	92%	93%	0%	0%	93%	89%	6%	81%	100%	56%	74%	84%		0%	100%	
7:45 AM - 8:45 AM	Buses	6	17	0	23	21	17	0	0	17	17	0	4	0	4	6	44	NB	1	52	53
	%	1%	3%	0%	2%	3%	3%	0%	0%	3%	3%	0%	6%	0%	4%	1%	2%		2%	98%	
	ıgle-Unit Truc	10	14	0	24	21	16	0	0	16	14	0	5	0	5	10	45		**5**	**129**	**134**
	%	1%	2%	0%	2%	3%	3%	0%	0%	3%	2%	0%	8%	0%	5%	1%	2%				
	ticulated Truc	3	0	0	3	3	1	0	0	1	0	0	2	0	2	3	6				
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%	2%	0%	0%				
	icycles on Roa	208	0	0	208	1	0	6	0	6	30	30	1	0	31	214	245				
	%	23%	0%	0%	14%	0%	0%	100%	0%	1%	5%	94%	2%	0%	33%	23%	11%				
	Total	**915**	**569**	**0**	**1484**	**661**	**599**	**6**	**0**	**605**	**601**	**32**	**62**	**1**	**95**	**922**	**2184**				
	PHF	0.9	0.8	0	0.95	0.93	0.91	0.3	0	0.89	0.81	0.8	0.74	0.25	0.82	0.91	0.97				
	Approach %				68%	30%				28%	28%				4%	42%					
Peak 2	Motorcycles	2	1	0	3	7	7	1	0	8	11	10	0	0	10	3	21	SB	11	153	164
Specified Period	%	0%	0%	0%	0%	1%	1%	100%	0%	1%	2%	4%	0%	0%	3%	1%	1%		7%	93%	
12:00 PM - 7:00 PM	rs & Light Goc	385	431	0	816	958	902	0	0	902	448	17	56	0	73	385	1791	NWB	0	27	27
One Hour Peak	%	88%	96%	0%	92%	94%	96%	0%	0%	96%	66%	8%	71%	0%	24%	87%	84%		0%	100%	
5:15 PM - 6:15 PM	Buses	2	12	0	14	21	19	0	0	19	12	0	2	0	2	2	35	NB	4	167	171
	%	0%	3%	0%	2%	2%	2%	0%	0%	2%	2%	0%	3%	0%	1%	0%	2%		2%	98%	
	ıgle-Unit Truc	9	6	0	15	6	4	0	0	4	6	0	2	0	2	9	21		**15**	**347**	**362**
	%	2%	1%	0%	2%	1%	0%	0%	0%	0%	1%	0%	3%	0%	1%	2%	1%				
	ticulated Truc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%				
	icycles on Roa	42	0	0	42	23	4	0	0	4	199	199	19	0	218	42	264				
	%	10%	0%	0%	5%	2%	0%	0%	0%	0%	29%	88%	24%	0%	71%	10%	12%				
	Total	**440**	**450**	**0**	**890**	**1015**	**936**	**1**	**0**	**937**	**676**	**226**	**79**	**0**	**305**	**441**	**2132**				
	PHF	0.81	0.82	0	0.87	0.95	0.94	0.25	0	0.94	0.88	0.9	0.79	0	0.88	0.82	0.91				
	Approach %				42%	48%				44%	32%				14%	21%					

Seattle Department of Transportation

Attachment D

Average Daily Traffic (ADT) Counts

Route 40 Transit Plus Multimodal Corridor
Traffic Analysis Addendum for 30% Design (Refined Alternative)
July 16, 2021

Seattle Department of Transportation

AUTOMATIC TRAFFIC COUNT- 1 Hour Detail Report

STUDY **208347**	**HOLMAN RD N, SW/O GREENWOOD AVE N; NE FLOW; CH1; 17NOV2005 11:15** 11/17/2005 11:15:00 AM THRU 11/24/2005 11:15:00 AM

COUNTER: 174	CHAN: **1**	FLOW: **NE**	LANE CODE: **STANDARD**

Interval	20 Nov 2005 **SUN**	21 Nov 2005 **MON**	22 Nov 2005 **TUE**	23 Nov 2005 **WED**	17 Nov 2005 **THURS**	18 Nov 2005 **FRI**	19 Nov 2005 **SAT**
1:00	253	90	110	110	113	137	263
2:00	178	64	73	94	80	93	165
3:00	145	57	56	58	59	68	130
4:00	76	41	44	49	46	50	81
5:00	46	82	72	75	79	83	56
6:00	59	178	202	178	181	164	78
7:00	108	428	465	413	432	423	203
8:00	191	882	880	861	888	928	353
9:00	345	878	925	918	892	844	599
10:00	545	840	860	865	855	854	809
11:00	773	864	815	958	868	841	1,060
12:00	957	897	839	1,005	927	963	1,057
13:00	1,111	955	972	1,088	936	1,002	1,070
14:00	1,145	993	1,000	1,132	912	1,086	1,143
15:00	1,048	1,069	1,114	1,239	1,092	1,149	1,120
16:00	1,012	1,302	1,342	1,430	1,248	1,327	1,081
17:00	924	1,410	1,479	1,466	1,369	1,435	1,095
18:00	829	1,471	1,389	1,369	1,524	1,416	1,052
19:00	682	1,166	1,228	1,077	1,168	1,272	871
20:00	545	721	842	797	809	829	676
21:00	507	498	540	595	570	615	515
22:00	416	453	521	519	507	624	506
23:00	233	324	375	344	414	502	482
24:00	164	231	240	304	233	376	371
Daily Total	**12,292**	**15,894**	**16,383**	**16,944**	**16,202**	**17,081**	**14,836**
AM Peak Vol	967	942	999	1,007	951	974	1,074
AM Peak Hr	10:45-11:45	07:30-8:30	07:45-8:45	10:15-11:15	07:30-8:30	07:15-8:15	10:45-11:45
AM Peak Fac	0.959	0.885	0.816	0.936	0.861	0.899	0.966
AM 15min Hi	11:30	08:00	08:00	10:30	08:00	08:00	11:00
PM Peak Vol	1,181	1,514	1,480	1,481	1,531	1,469	1,165
PM Peak Hr	12:15-13:15	16:30-17:30	16:30-17:30	15:30-16:30	16:45-17:45	16:30-17:30	13:30-14:30
PM Peak Fac	0.965	0.963	0.959	0.928	0.979	0.964	0.936
PM 15min Hi	13:00	17:15	17:00	15:45	17:15	17:30	14:30
Max8 Vol	7,819	9,263	9,399	9,806	9,176	9,650	8,678
Max8 %/DT	0.636	0.583	0.574	0.579	0.566	0.565	0.585
Max8 Time	10:15-18:15	11:15-19:15	11:15-19:15	11:00-19:00	11:15-19:15	11:00-19:00	10:00-18:00

Average Daily Traffic (ADT) =	**15,662**	**based on 7 days**
Average Weekday Traffic (AWDT) =	**16,501**	**based on 5 weekday**
AWDT Max8 Volume =	**9,459**	**57.3% of AWDT**
AWDT AM Peak Hour Volume =	**975**	**based on 5 weekday**
AWDT PM Peak Hour Volume =	**1,495**	**based on 5 weekday**

Print Date: 5/18/2021
5:14:19 PM

END OF REPORT

Seattle Department of Transportation

Attachment E

3-Year Crash History

Route 40 Transit Plus Multimodal Corridor
Traffic Analysis Addendum for 30% Design (Refined Alternative)
July 16, 2021

Study ID: 2961

Collision Records

Study Segment 1 - Westlake

01/01/2016 thru 08/31/2019

LOCATION	TOT ACC	PDO ACC	INJ ACC	FTL ACC	# INJ	# FTL	Accident Type									
							OTH	HDO	ANG	RE	SS	PCY	PED	RGT TRN	LFT TRN	PRK CAR
9TH AVE N AND WESTLAKE AVE N	5	2	2	0	2	0	1	0	0	0	0	1	1	0	0	0
9TH AVE N BETWEEN BROAD E ST AND WESTLAKE AVE N	3	2	1	0	4	0	1	0	0	0	1	0	0	0	0	0
MERCER NR ST AND WESTLAKE AVE N	12	7	4	0	6	0	1	0	5	1	0	0	1	1	1	0
MERCER NR ST BETWEEN 9TH AVE N AND WESTLAKE AVE N	6	4	1	0	1	0	0	0	0	4	1	0	0	0	0	0
MERCER NR ST BETWEEN WESTLAKE AVE N AND TERRY AVE N	9	8	1	0	2	0	1	0	0	3	2	0	0	1	0	0
MERCER SR ST AND WESTLAKE AVE N	3	0	3	0	5	0	0	0	3	0	0	0	0	0	0	0
MERCER SR ST BETWEEN 9TH AVE N AND WESTLAKE AVE N	9	6	3	0	4	0	2	0	0	4	2	0	0	0	0	1
MERCER SR ST BETWEEN WESTLAKE AVE N AND TERRY AVE N	8	5	2	0	4	0	0	0	0	2	2	0	1	0	0	0
REPUBLICAN ST AND WESTLAKE AVE N	8	5	3	0	8	0	1	0	1	0	1	1	0	2	1	1
REPUBLICAN ST BETWEEN 9TH AVE N AND WESTLAKE AVE N	3	2	1	0	1	0	0	0	1	1	0	0	1	0	0	0
REPUBLICAN ST BETWEEN WESTLAKE AVE N AND TERRY AVE N	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
ROY ST BETWEEN 9TH AVE N AND VALLEY ST	3	1	1	0	1	0	1	0	0	0	1	0	0	0	0	0
VALLEY ST BETWEEN WESTLAKE AVE N AND TERRY AVE N	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
WESTLAKE AVE N AND VALLEY ST	8	5	3	0	3	0	1	0	0	0	0	3	0	1	3	0
WESTLAKE AVE N BETWEEN 9TH AVE N AND ALOHA N ST	2	1	1	0	1	0	1	0	0	0	0	0	0	0	0	0
WESTLAKE AVE N BETWEEN HARRISON ST AND REPUBLICAN ST	3	2	1	0	1	0	2	0	0	0	0	0	0	0	0	1
WESTLAKE AVE N BETWEEN MERCER NR ST AND VALLEY ST	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0

Study ID: 2961

Collision Records

Study Segment 1 - Westlake

01/01/2016 thru 08/31/2019

WESTLAKE AVE N BETWEEN REPUBLICAN ST AND MERCER SR ST	10	6	3	0	4	0	0	0	0	3	3	1	0	0	1	0
WESTLAKE AVE N BETWEEN VALLEY ST AND 9TH AVE N	9	8	0	0	0	0	0	0	0	3	2	0	0	0	0	1
Totals:	**105**	**67**	**30**	**0**	**47**	**0**	**12**	**0**	**10**	**21**	**16**	**6**	**4**	**5**	**6**	**6**

TOTAL RECORDS SUMMARIZED = 105

Note:

1. "Not Enough Damage" and "Non-State Matched" numbers are only included in the TOT/ACC aggregations.

2. Collision Types compiled using the Washington State Collision Code

3. Under 23 United States Code Section 409, this data or record is not subject to discovery, and shall not be used as evidence in any for damages. This data or record also may be exempt from public disclosure under RCW 42.56.290

DEFINITION OF ABBREVIATIONS

TOT/ACC	= Total # of Collisions
PDO/ACC	= Total # of Property Damage Only
INJ/ACC	= Total # of Injury Collisions
FTL/ACC	= Total # of Fatal Collisions
#/INJ	= Total # of Injured
#/FTL	= Total # of Fatalities
OTH	= Other Collision Type
HDO	= Head-on Collision
ANG	= Right Angle
RE	= Rear End
SS	= Sideswipe
PCY	= Pedalcyclist
PED	= Pedestrian
RGT/TRN	= Right Turn
LFT/TRN	= Left Turn
PRK/CAR	= Parked Car

END OF REPORT

Study ID: 2962

Study Segment 2 - Fremont

Collision Records

01/01/2016 thru 08/31/2019

LOCATION	TOT ACC	PDO ACC	INJ ACC	FTL ACC	# INJ	# FTL	Accident Type									
							OTH	HDO	ANG	RE	SS	PCY	PED	RGT TRN	LFT TRN	PRK CAR
1ST AVE NW AND NW 36TH ST	4	2	2	0	2	0	0	0	3	0	0	0	0	0	1	0
1ST AVE NW BETWEEN NW 35TH ST AND NW 36TH ST	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1ST AVE NW BETWEEN NW 36TH ST AND NW 39TH W ST	3	1	1	0	4	0	0	0	0	0	0	0	0	1	0	1
4TH AVE N BETWEEN NICKERSON ST AND FREMONT BR	8	6	2	0	2	0	0	1	0	2	3	0	0	0	1	0
DAYTON AVE N AND N 36TH ST	3	1	2	0	2	0	0	0	0	0	1	0	1	0	1	0
DAYTON AVE N BETWEEN N 36TH ST AND N 39TH E ST	8	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4
DEXTER AVE N BETWEEN 4TH S AVE N AND WESTLAKE AVE N	6	4	2	0	2	0	0	0	0	2	3	1	0	0	0	0
EVANSTON AVE N BETWEEN N 36TH ST AND N 39TH ST	12	7	0	0	0	0	0	0	0	0	0	0	0	0	0	7
FREMONT AVE N AND FREMONT PL N	9	7	1	0	1	0	0	0	0	2	3	0	0	0	1	1
FREMONT AVE N AND N 34TH ST	11	4	6	0	6	0	0	0	0	0	3	4	0	0	1	0
FREMONT AVE N BETWEEN FREMONT BR AND N 34TH ST	6	6	0	0	0	0	0	0	0	2	2	0	0	0	0	0
FREMONT AVE N BETWEEN N 34TH ST AND FREMONT PL N	5	3	2	0	2	0	1	1	0	1	0	0	0	0	0	0
FREMONT BR BETWEEN 4TH AVE N AND POINT A	7	3	3	0	6	0	1	0	0	2	1	1	0	0	0	0
FREMONT BR BETWEEN POINT A AND FREMONT AVE N	3	2	1	0	1	0	1	0	0	0	1	0	0	0	0	0
FREMONT PL N AND N 36TH ST	3	0	3	0	5	0	0	0	2	0	0	0	1	0	0	0
FREMONT PL N BETWEEN FREMONT AVE N AND N 36TH ST	5	3	0	0	0	0	2	0	0	1	0	0	0	0	0	0
LEARY WAY NW AND NW 39TH ST	3	2	1	0	1	0	0	0	0	1	0	1	0	0	1	0
LEARY WAY NW BETWEEN NW 36TH ST AND NW 39TH ST	4	4	0	0	0	0	0	0	0	1	1	0	0	0	0	2
LEARY WAY NW BETWEEN NW 39TH ST AND 3RD AVE NW	5	3	2	0	2	0	0	0	0	2	2	0	0	0	0	0
N 34TH ST BETWEEN EVANSTON AVE N AND FREMONT AVE N	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1

Study ID: 2962

Collision Records

Study Segment 2 - Fremont

01/01/2016 thru 08/31/2019

N 34TH ST BETWEEN FREMONT AVE N AND TROLL AVE N	10	5	2	0	2	0	1	1	2	0	1	0	0	0	0	1
N 36TH ST BETWEEN 1ST AVE NW AND PALATINE AVE N	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
N 36TH ST BETWEEN DAYTON AVE N AND FREMONT PL N	8	3	1	0	1	0	0	0	0	1	1	0	1	0	0	1
N 36TH ST BETWEEN FRANCIS AVE N AND DAYTON AVE N	6	5	1	0	1	0	0	0	0	0	1	0	0	0	0	3
N 36TH ST BETWEEN GREENWOOD AVE N AND PHINNEY AVE N	9	2	7	0	9	0	0	0	4	0	0	0	1	0	0	4
N 36TH ST BETWEEN PALATINE AVE N AND GREENWOOD AVE N	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
N 36TH ST BETWEEN PHINNEY AVE N AND FRANCIS AVE N	9	5	3	0	4	0	2	0	0	0	2	0	1	0	1	2
NICKERSON ST AND WESTLAKE AVE N	13	8	5	0	5	0	2	0	0	1	2	1	2	1	1	0
NICKERSON ST BETWEEN FLORENTIA ST AND WESTLAKE AVE N	9	7	1	0	1	0	0	0	1	2	3	0	0	0	0	1
NW 36TH ST BETWEEN 1ST AVE NW AND LEARY WAY NW	7	3	4	0	4	0	2	0	1	0	1	1	0	0	0	2
NW 39TH ST BETWEEN 2ND AVE NW AND LEARY WAY NW	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
NW 39TH ST BETWEEN LEARY WAY NW AND 3RD AVE NW	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
PHINNEY AVE N AND N 36TH ST	4	0	4	0	5	0	0	0	0	0	0	0	3	0	1	0
PHINNEY AVE N BETWEEN N 35TH ST AND N 36TH ST	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PHINNEY AVE N BETWEEN N 36TH ST AND N 39TH ST	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3
WESTLAKE AVE N BETWEEN NEWELL ST AND NICKERSON ST	18	9	7	0	11	0	7	3	0	1	3	0	0	0	1	1
Totals:	**211**	**115**	**63**	**0**	**79**	**0**	**19**	**6**	**13**	**23**	**34**	**9**	**10**	**2**	**10**	**34**

TOTAL RECORDS SUMMARIZED = 211

Note:

1. *"Not Enough Damage" and "Non-State Matched" numbers are only included in the TOT/ACC aggregations.*
2. *Collision Types compiled using the Washington State Collision Code*

Study ID: 2962

Collision Records

Study Segment 2 - Fremont

01/01/2016 thru 08/31/2019

3. Under 23 United States Code Section 409, this data or record is not subject to discovery, and shall not be used as evidence in any for damages. This data or record also may be exempt from public disclosure under RCW 42.56.290

DEFINITION OF ABBREVIATIONS

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PDO/ACC	= Total # of Property Damage Only
INJ/ACC	= Total # of Injury Collisions
FTL/ACC	= Total # of Fatal Collisions
#/INJ	= Total # of Injured
#/FTL	= Total # of Fatalities
OTH	= Other Collision Type
HDO	= Head-on Collision
ANG	= Right Angle
RE	= Rear End
SS	= Sideswipe
PCY	= Pedalcyclist
PED	= Pedestrian
RGT/TRN	= Right Turn
LFT/TRN	= Left Turn
PRK/CAR	= Parked Car

END OF REPORT

Study ID: 2963

Collision Records

Study Segment 3 - Ballard Bridge

01/01/2016 thru 08/31/2019

LOCATION	TOT ACC	PDO ACC	INJ ACC	FTL ACC	# INJ	# FTL	Accident Type									
							OTH	HDO	ANG	RE	SS	PCY	PED	RGT TRN	LFT TRN	PRK CAR
14TH AVE NW AND NW LEARY WAY	6	4	2	0	3	0	0	0	1	1	1	0	0	0	2	1
14TH AVE NW BETWEEN NW BALLARD WAY AND NW LEARY WAY	5	2	1	0	1	0	0	0	0	0	0	0	1	0	0	1
14TH AVE NW BETWEEN NW LEARY WAY AND NW 49TH ST	3	3	0	0	0	0	0	0	0	1	1	0	0	0	0	0
15TH NB AVE NW AND NW LEARY WAY	19	13	3	0	3	0	2	1	0	0	2	0	0	0	10	0
15TH NB AVE NW BETWEEN NW BALLARD WAY AND NW LEARY WAY	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15TH SB AVE NW AND NW LEARY WAY	7	7	0	0	0	0	4	0	0	0	1	0	0	0	2	0
15TH SB AVE NW BETWEEN NW BALLARD WAY AND NW LEARY WAY	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
BALLARD BR BETWEEN BALLARD BR OFF RP AND 15TH AVE NW	3	2	1	0	2	0	0	0	0	2	1	0	0	0	0	0
LEARY AVE NW AND NW DOCK PL	5	3	2	0	2	0	0	0	2	0	0	0	0	0	2	0
LEARY AVE NW BETWEEN NW DOCK PL AND NW IONE PL	5	2	1	0	1	0	1	0	0	0	0	0	0	0	0	2
LEARY AVE NW BETWEEN NW LEARY WAY AND NW DOCK PL	6	3	2	0	2	0	1	0	0	1	1	0	0	0	0	2
NW DOCK PL BETWEEN RUSSELL AVE NW AND LEARY AVE NW	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
NW LEARY WAY BETWEEN 11TH AVE NW AND 14TH AVE NW	7	5	2	0	3	0	1	0	0	3	1	0	0	0	0	2
NW LEARY WAY BETWEEN 14TH AVE NW AND 15TH NB AVE NW	17	9	5	0	5	0	1	0	3	4	3	0	0	1	1	1
NW LEARY WAY BETWEEN 15TH NB AVE NW AND 15TH SB AVE NW	6	2	4	0	5	0	1	0	0	2	2	0	0	0	0	1
NW LEARY WAY BETWEEN 15TH SB AVE NW AND LEARY AVE NW	9	5	3	0	3	0	0	0	2	1	1	0	0	0	0	3
Totals:	**101**	**63**	**26**	**0**	**30**	**0**	**11**	**1**	**8**	**15**	**14**	**0**	**1**	**1**	**18**	**14**

Study ID: 2963

Study Segment 3 - Ballard Bridge

Collision Records

01/01/2016 thru 08/31/2019

TOTAL RECORDS SUMMARIZED = 101

Note:

1. *"Not Enough Damage" and "Non-State Matched" numbers are only included in the TOT/ACC aggregations.*
2. *Collision Types compiled using the Washington State Collision Code*
3. *Under 23 United States Code Section 409, this data or record is not subject to discovery, and shall not be used as evidence in any for damages. This data or record also may be exempt from public disclosure under RCW 42.56.290*

DEFINITION OF ABBREVIATIONS

TOT/ACC	= Total # of Collisions
PDO/ACC	= Total # of Property Damage Only
INJ/ACC	= Total # of Injury Collisions
FTL/ACC	= Total # of Fatal Collisions
#/INJ	= Total # of Injured
#/FTL	= Total # of Fatalities
OTH	= Other Collision Type
HDO	= Head-on Collision
ANG	= Right Angle
RE	= Rear End
SS	= Sideswipe
PCY	= Pedalcyclist
PED	= Pedestrian
RGT/TRN	= Right Turn
LFT/TRN	= Left Turn
PRK/CAR	= Parked Car

END OF REPORT

Study ID: 2964

Collision Records

Study Segment 4 - Ballard Market

01/01/2016 thru 08/31/2019

LOCATION	TOT ACC	PDO ACC	INJ ACC	FTL ACC	# INJ	# FTL	Accident Type									
							OTH	HDO	ANG	RE	SS	PCY	PED	RGT TRN	LFT TRN	PRK CAR
22ND AVE NW BETWEEN NW MARKET ST AND NW 56TH ST	4	3	1	0	1	0	0	1	0	0	1	1	0	0	0	1
24TH AVE NW AND NW MARKET ST	6	3	3	0	3	0	0	0	1	1	1	0	1	0	0	0
24TH AVE NW BETWEEN NW MARKET ST AND NW 56TH ST	8	7	1	0	1	0	1	0	2	0	4	0	0	0	0	0
LEARY AVE NW AND NW MARKET ST	9	5	3	0	3	0	0	1	1	1	0	0	1	0	4	0
LEARY AVE NW BETWEEN NW VERNON PL AND NW MARKET ST	8	3	1	0	1	0	1	0	1	1	0	0	0	0	0	0
NW MARKET ST BETWEEN 24TH AVE NW AND 26TH AVE NW	14	7	3	1	3	1	0	1	1	4	1	0	0	0	0	3
NW MARKET ST BETWEEN BALLARD AVE NW AND 24TH AVE NW	5	3	2	0	2	0	1	0	0	1	2	0	0	0	0	1
NW MARKET ST BETWEEN LEARY AVE NW AND BALLARD AVE NW	8	5	1	0	1	0	1	0	0	0	2	1	1	0	0	1
NW MARKET ST BETWEEN RUSSELL AVE NW AND LEARY AVE NW	6	3	2	0	2	0	0	0	0	0	0	1	1	0	0	3
Totals:	**68**	**39**	**17**	**1**	**17**	**1**	**4**	**3**	**6**	**8**	**11**	**3**	**4**	**0**	**4**	**9**

TOTAL RECORDS SUMMARIZED = 68

Note:

1. *"Not Enough Damage" and "Non-State Matched" numbers are only included in the TOT/ACC aggregations.*
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FTL/ACC	= Total # of Fatal Collisions

Study ID: 2964

Collision Records

Study Segment 4 - Ballard Market

01/01/2016 thru 08/31/2019

#/INJ	= Total # of Injured
#/FTL	= Total # of Fatalities
OTH	= Other Collision Type
HDO	= Head-on Collision
ANG	= Right Angle
RE	= Rear End
SS	= Sideswipe
PCY	= Pedalcyclist
PED	= Pedestrian
RGT/TRN	= Right Turn
LFT/TRN	= Left Turn
PRK/CAR	= Parked Car

END OF REPORT

Study ID: 2965

Collision Records

Study Segment 5 - Ballard/Crown Hill

01/01/2016 thru 08/31/2019

LOCATION	TOT ACC	PDO ACC	INJ ACC	FTL ACC	# INJ	# FTL	Accident Type									
							OTH	HDO	ANG	RE	SS	PCY	PED	RGT TRN	LFT TRN	PRK CAR
15TH AVE NW AND NW 85TH ST	12	7	4	0	4	0	2	0	2	2	0	0	1	2	1	0
15TH AVE NW BETWEEN HOLMAN RD NW AND NW 90TH S ST	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
15TH AVE NW BETWEEN NW 83RD ST AND NW 85TH ST	17	12	4	0	4	0	1	0	0	6	3	0	1	2	0	2
15TH AVE NW BETWEEN NW 85TH ST AND NW 87TH ST	21	11	7	0	10	0	1	0	1	6	0	0	1	0	3	1
15TH AVE NW BETWEEN NW 87TH ST AND HOLMAN RD NW	6	4	2	0	2	0	1	0	0	1	1	0	1	0	0	0
HOLMAN RD NW BETWEEN 15TH AVE NW AND NW 90TH ST	3	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0
NW 85TH ST BETWEEN 15TH AVE NW AND 16TH AVE NW	3	1	1	0	2	0	0	1	0	0	0	0	0	0	0	0
NW 85TH ST BETWEEN MARY AVE NW AND 15TH AVE NW	2	1	1	0	1	0	1	0	0	0	1	0	0	0	0	0
Totals:	**67**	**39**	**19**	**0**	**23**	**0**	**6**	**1**	**3**	**15**	**5**	**0**	**4**	**4**	**5**	**4**

TOTAL RECORDS SUMMARIZED = 67

Note:

1. *"Not Enough Damage" and "Non-State Matched" numbers are only included in the TOT/ACC aggregations.*
2. *Collision Types compiled using the Washington State Collision Code*
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#/INJ	= Total # of Injured
#/FTL	= Total # of Fatalities
OTH	= Other Collision Type

Study ID: 2965

Collision Records

Study Segment 5 - Ballard/Crown Hill

01/01/2016 thru 08/31/2019

HDO	=	Head-on Collision
ANG	=	Right Angle
RE	=	Rear End
SS	=	Sideswipe
PCY	=	Pedalcyclist
PED	=	Pedestrian
RGT/TRN	=	Right Turn
LFT/TRN	=	Left Turn
PRK/CAR	=	Parked Car

END OF REPORT

Study ID: 2966

Collision Records

Study Segment 6 - Greenwood

01/01/2016 thru 08/31/2019

LOCATION	TOT ACC	PDO ACC	INJ ACC	FTL ACC	# INJ	# FTL	Accident Type									
							OTH	HDO	ANG	RE	SS	PCY	PED	RGT TRN	LFT TRN	PRK CAR
GREENWOOD AVE N AND HOLMAN RD N	24	13	9	0	9	0	1	0	12	1	2	1	0	2	3	0
GREENWOOD AVE N BETWEEN HOLMAN RD N AND N 107TH ST	21	12	8	0	18	0	3	0	0	6	4	1	0	0	0	1
GREENWOOD AVE N BETWEEN N 104TH ST AND HOLMAN RD N	9	7	2	0	4	0	0	0	1	4	0	0	1	0	1	1
HOLMAN RD N BETWEEN N 104TH ST AND GREENWOOD AVE N	9	7	1	0	1	0	2	0	1	3	1	0	0	0	1	0
N 105TH ST BETWEEN GREENWOOD AVE N AND PHINNEY AVE N	12	5	6	0	6	0	0	0	1	4	1	0	0	0	3	1
N 105TH ST BETWEEN PALATINE AVE N AND GREENWOOD AVE N	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Totals:	**76**	**45**	**26**	**0**	**38**	**0**	**7**	**0**	**15**	**18**	**8**	**2**	**1**	**2**	**8**	**3**

TOTAL RECORDS SUMMARIZED = 76

Note:

1. *"Not Enough Damage" and "Non-State Matched" numbers are only included in the TOT/ACC aggregations.*
2. *Collision Types compiled using the Washington State Collision Code*
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INJ/ACC	= Total # of Injury Collisions
FTL/ACC	= Total # of Fatal Collisions
#/INJ	= Total # of Injured
#/FTL	= Total # of Fatalities
OTH	= Other Collision Type
HDO	= Head-on Collision

Study ID: 2966

Collision Records

Study Segment 6 - Greenwood

01/01/2016 thru 08/31/2019

ANG	= Right Angle
RE	= Rear End
SS	= Sideswipe
PCY	= Pedalcyclist
PED	= Pedestrian
RGT/TRN	= Right Turn
LFT/TRN	= Left Turn
PRK/CAR	= Parked Car

END OF REPORT

Seattle Department of Transportation

Study ID: 2967

Collision Records

Study Segment 7 - Aurora

01/01/2016 thru 08/31/2019

LOCATION	TOT ACC	PDO ACC	INJ ACC	FTL ACC	# INJ	# FTL	Accident Type									
							OTH	HDO	ANG	RE	SS	PCY	PED	RGT TRN	LFT TRN	PRK CAR
AURORA AVE N AND N NORTHGATE WAY	25	13	11	0	16	0	3	0	5	3	1	0	2	3	5	0
AURORA AVE N BETWEEN N 104TH ST AND N NORTHGATE WAY	10	6	3	1	6	1	0	0	0	4	2	0	1	0	0	0
AURORA AVE N BETWEEN N NORTHGATE WAY AND N 107TH S ST	24	13	10	0	13	0	0	1	2	10	1	1	3	0	0	2
N 105TH ST BETWEEN WHITMAN AVE N AND AURORA AVE N	18	13	4	0	5	0	0	0	2	7	4	0	0	2	1	0
N NORTHGATE WAY BETWEEN AURORA AVE N AND MIDVALE AVE N	17	9	8	0	10	0	1	0	5	3	2	1	2	0	1	0
Totals:	**94**	**54**	**36**	**1**	**50**	**1**	**4**	**1**	**14**	**27**	**10**	**2**	**8**	**5**	**7**	**2**

TOTAL RECORDS SUMMARIZED = 94

Note:

1. *"Not Enough Damage" and "Non-State Matched" numbers are only included in the TOT/ACC aggregations.*
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SS	= Sideswipe
PCY	= Pedalcyclist
PED	= Pedestrian
RGT/TRN	= Right Turn
LFT/TRN	= Left Turn
PRK/CAR	= Parked Car

END OF REPORT