

## APPENDIX B9

### Segment A – PM No-Build Vissim Report





Metro SW Corridor FEIS

PM No-Build Vissim Model Results Memorandum

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## MEMORANDUM

DATE: April 14, 2020

TO: TriMet, Metro  
Portland, Oregon

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SUBJECT: TriMet SW Corridor FEIS- Segment A – PM Model  
PM Future No-Build Vissim Model Results Memorandum

P# 17158-003

This memorandum documents the development of the future No-Build year 2035 weekday PM peak period Vissim microsimulation model for the Metro SW Corridor DEIS project- Segment A. This memorandum also documents the performance measures reported for the future No-Build year Vissim model. The Future No-Build performance measures reported in this memo includes refinements based on comments on the Draft Environmental Impact Statement (DEIS) received from partner agencies.

The Methods and Assumptions memorandum<sup>1</sup> documented the details of model development that were assumed going into this task. This memorandum documents additional assumptions made and parameters that were changed during modeling.

### Project Description

The project evaluates the transportation impacts (and other environmental issues) associated with the Future No-Build and Future Build Light Rail alternatives for 2035. Because the study area is so large and sometimes spans between different jurisdictions, this project was divided into the following three segments for evaluation of alignment alternatives, station access projects, and other segment-related options:

- Segment A: Inner Portland
- Segment B: Outer Portland
- Segment C: Tigard and Tualatin

The transit alternatives address the impacts of various options for track alignment and station locations as well as related station access projects, bridgehead reconfigurations, and O&M facility sites within each of these three segments. This memo is focusing on the No-Build year 2035 of Segment A - the PM peak period.

The No-Build model assumes that the project will not be built in any capacity. The purpose of this alternative is to have a direct comparison between future scenarios, instead of comparing a future LRT Alternative with the existing conditions.

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<sup>1</sup> SWC Transportation Analysis Methods, June 2017, DKS Associates.

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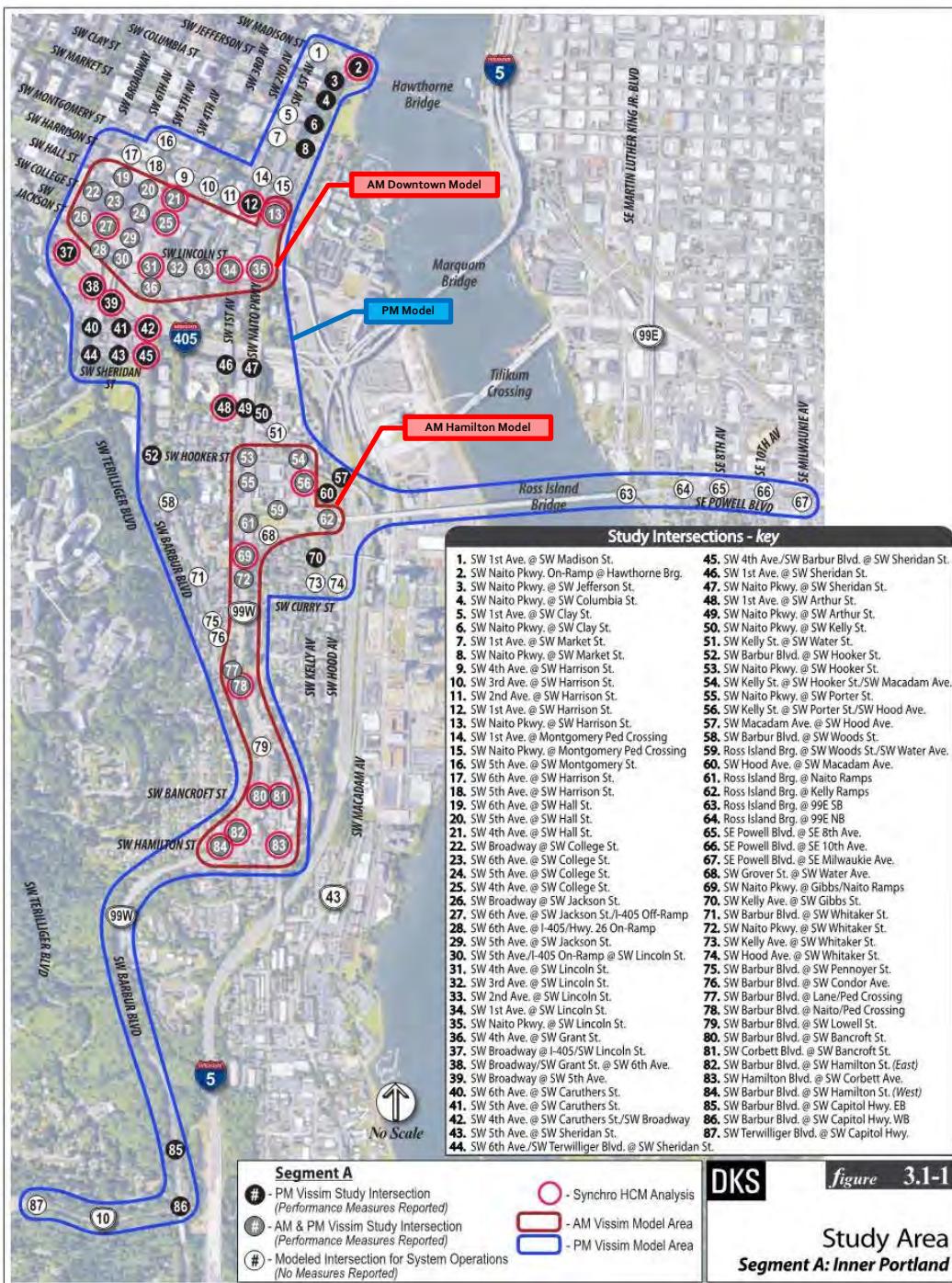


Figure 1: Segment A Study Area

## Segment A Study Area and Model Area

Segment A includes a total of 87 signalized and unsignalized intersections. Performance measures were reported for major signalized and un-signalized intersections. Intersections with no reported performance measures were included in the model due to their influence on arrival patters, lane utilization, and queuing at study intersections with reported performance measures. PM No-Build Study intersections are shown in Figure 1.

## Model Development Summary

The Vissim model development process used the following two documents as guidelines - The Federal Highway Administration's (FHWA's) Traffic Analysis Toolbox Volume III: Guidelines for Applying Traffic Microsimulation Modeling Software<sup>2</sup> and the Oregon Department of Transportation (ODOT), Protocol for Vissim Simulation<sup>3</sup>. This section describes the steps completed in the future no-build year 2035 PM peak period model development process.

### Network Coding

The PM Existing Conditions model was used as the base network for the PM Future No Build model. Five future projects were added to the model, per Metro's directions:

- Green Loop on SW 4<sup>th</sup> Avenue – This project added a new mixed-use path along the east side of SW 4<sup>th</sup> Avenue from SW Lincoln Street to SW College Street. The project also included a new signal at SW 4<sup>th</sup> Avenue and SW College Street, with signalized bicycle crossings.
- 4<sup>th</sup> Avenue Central City in Motion (CCIM) project – This project re-allocated lanes on 4<sup>th</sup> Avenue to provide additional space for directional bike lanes / Green Loop and BAT lanes. While the design for this project is on-going, the following changes to the existing network were considered likely enough to be included in the No-Build model:
  - SW 4<sup>th</sup> Avenue / I-405 Northbound Off-Ramp and SW Lincoln Street: The I-405 northbound off-ramp approach was re-configured from a northbound through and shared through/right to a single northbound through and exclusive northbound right. This allows for a protected bike phase for the Green loop crossing over the east leg of the intersection. This also eliminates the merge from four to three lanes on SW 4<sup>th</sup> Avenue between SW Lincoln Street and SW College Street
  - SW 4<sup>th</sup> Avenue and SW College Street: This intersection was signalized with a bike crossing phase for the Green Loop. The northbound inside shared through/left lane was re-configured to a left turn only for passenger vehicles, and a through lane for bus only.
  - SW 4<sup>th</sup> Avenue and SW Hall Street: This intersection was re-configured, with northbound inside lane converted from a shared through/left to a left turn BAT trap lane to Hall Street.

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<sup>2</sup> Traffic Analysis Toolbox Volume III: Guidelines for Applying Traffic Microsimulation Modeling Software, Federal Highway Administration, June 2004.

<sup>3</sup> Protocol for Vissim Simulation, ODOT, June 2011

- SW 4<sup>th</sup> Avenue and SW Harrison Street: One of the northbound through lanes at this intersection was removed, modifying the northbound approach from a shared through/left, exclusive through, and shared through/right to a shared through/left and shared through/right.
- Division Transit Project – The yet to be constructed Division Transit Line was added to the model. This line used longer buses and shorter dwell times consistent with operations assumptions used on the Division Transit project.
- Signal at the eastbound Hawthorne Bridge and the SW Naito Parkway northbound on-ramp.
- Better Naito Project – this project converts the outside northbound lane on SW Naito Parkway to a bikeway and walk area. This project was included in the No-Build model by coding the northbound SW Naito Parkway to eastbound Hawthorne Bridge ramp as a trap lane for the outside northbound lane on SW Naito Parkway, rather than a thru/ramp option lane. SW Naito Parkway was then modeled with a single northbound lane north of the Hawthorne Bridge ramp.

Some signal timings were updated to accommodate changes in turn volumes. The remainder of the model retained existing conditions coding.

### Traffic Demand and Routing

Vissim's Dynamic Traffic Assignment (DTA) feature was used in combination with the O-D matrix (based on Metro's Financially Constrained 2035 travel demand model and post-processed future turn movement forecasts) to generate motor vehicle inputs and routing through the network. These post-processed turn volumes were reviewed and approved by the project stakeholders and are included in Attachment G of this report. The DTA assignment was then converted to static vehicle inputs and complete O-D routes. The roadway network extents in the Vissim model were such that there was only one possible route for each O-D pair.

Based on the Financially Constrained 2035 Metro model, vehicle trip growth within the model area projects to be about 14% higher than under existing conditions by the year 2035. In the absence of more mode specific growth projections, pedestrian and bicycle volumes within the model were also grown by 15%, representing the additional trip activity for all modes within the model area.

### Traffic Volume Peaking Profile

As most peaking profiles within the existing model did not show substantial peaking behavior under existing conditions, these profiles were also applied to the future No-Build model.

### Vehicle Compositions

Heavy vehicle percentage from the existing model were also applied to the future No-Build model.

### Transit

The future No-Build transit conditions were assumed to be identical to the existing transit conditions, except for the added Division Transit. The Division Transit Line was assumed to use 60-foot articulated buses (similar to the EMX buses in Eugene), 6-minute headways, and average dwell times of 20 seconds due to off-board fare collection and platform level boarding.

### Simulation Period and Seeding Period

The future No-Build model used the same simulation period (4-6 PM) and same seeding period (30 minutes) as the existing conditions model.

### Error Checking

A review of the animation was conducted to determine locations where additional vehicle yielding behavior (conflict areas or priority rules) were needed to accommodate increased queue spillback and locations where signal timing could be optimized to operate more efficiently under future conditions.

### Validation

Upon the completion of the error checking, the model results were validated. The model validation was based on 15 simulation runs to account for daily variation.

The following validation tools were used for the future year No-Build Vissim model:

- A quantitative comparison between forecasted two-hour balanced volumes and model output results for traffic volumes.
- Review of speed plots showing key bottleneck locations (see Attachment A)
- Comparison of travel time segments against results from the existing conditions model for reasonableness

The GEH statistic was calculated for all study intersections, entries, and exits. Note that the GEH statistic at entries and exits was measured at the entry intersection, not the beginning (entry) or ending (exit) of a model link, as the theoretical measured locations are at the intersections. The GEH results are documented in Attachment B.

HCM intersection analysis performed during the DEIS indicated over capacity conditions at the following locations in the modeled network:

- Northbound SW Naito Parkway Ramp and Eastbound Ross Island Bridge
- SW Kelly Avenue Ramp and Eastbound Ross Island Bridge
- SW Corbett Avenue and SW Bancroft Street
- SW Corbett Avenue and SW Hamilton Street

With the amount of traffic forecasted on I-5 and Terwilliger Boulevard under 2035 demand conditions, there are no readily available alternate routes to avoid the SW Barbur Boulevard/SW Corbett Avenue/SW Hamilton Street/SW Bancroft Street area. Initial review of the simulation showed that under existing timing and modeled geometry the southbound left turn at SW Barbur Boulevard and SW Hamilton Street would queue all the way up SW Barbur Boulevard and impact operations at the I-405 southbound off-ramp at SW Broadway. The two following edits were made to the model to provide more reasonable operations for this movement:

1. Review of field observations noted that drivers traveling southbound on SW Barbur Boulevard occasionally cut across the striped gore between the southbound SW Naito Parkway and southbound SW north of SW Bancroft Street when the queues from the southbound left turn at SW Barbur Boulevard and SW Hamilton Street extend to the striped gore (see Figure 2). While this behavior only occurs occasionally under existing conditions, the increased demand for the southbound left turn at SW Barbur Boulevard and SW Hamilton Street under future

conditions would likely cause the behavior to become much more prevalent. Therefore, the coded southbound section of SW Barbur Boulevard was extended approximately 125 feet to the north, allowing vehicles to merge from SW Barbur Boulevard into the middle lane just south of the physical gore point, rather than after the striped gore.

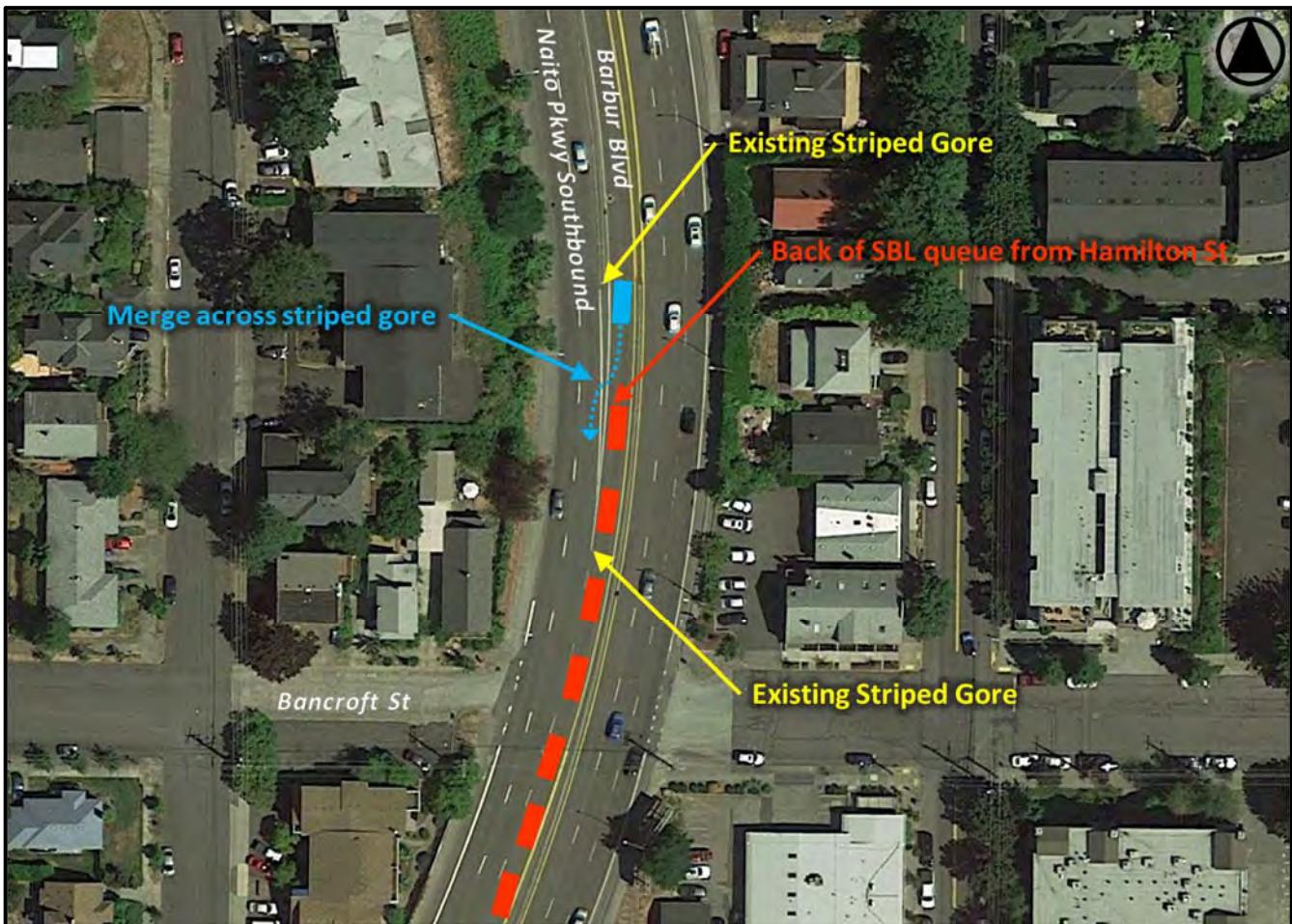


Figure 2: Southbound Naito/Barbur Merge

Under future demand conditions, growth on the South Waterfront would lead to a 10% increase in northbound SW Macadam Avenue traffic. A portion of this growth would go to the SW Kelly Avenue northbound ramp onto the eastbound Ross Island Bridge, resulting in a 5% demand increase at this already over-capacity location. The westbound Ross Island Bridge to southbound SW Hood Avenue/Southbound I-5 movement would increase by 15%. These combined increases in demand would result in longer queue spillback from the SW Kelly Ave northbound ramp to eastbound Ross Island Bridge extending north of the gore between the westbound Ross Island Bridge to SW Hood Avenue and SW Macadam Avenue to SW Hood Avenue merge. Once the queues extend beyond this gore, the queue quickly bottlenecks the westbound Ross Island Bridge, and maintains this bottleneck throughout the remainder of the simulation, reducing westbound throughput to the I-405 northbound on-ramp at SW 6<sup>th</sup> Avenue. Drivers attempting to access the eastbound Ross Island Bridge from

northbound SW Macadam Avenue also queue back and prevent some of the SW Macadam demand from reaching SW Kelly Avenue north of SW Porter Street.

A reasonable secondary route does exist for traffic traveling from northbound SW Macadam Avenue to the eastbound Ross Island Bridge, as follows: Macadam – Kelly/Arthur – 1<sup>st</sup> – Sheridan – Naito – eastbound Ross Island Bridge. Under lower traffic demand conditions this secondary route takes more time than the Macadam – Hood – Whitaker – Kelly – eastbound Ross Island Bridge route. But as congestion builds, this secondary route becomes a more viable option based on travel time. Drivers that are either familiar with the area or using a routing app will likely shift to this secondary route when it becomes the quicker option. Initially, shifting a portion of the static volume to the secondary route was tested to see if the results would ease the bottleneck without generating unreasonable results on the primary and secondary routes. However, the travel time varied widely between the primary and secondary route at different times in the simulation, making the resulting routing decisions unreasonable. To better capture the dynamic nature of the two routing options, the following method was applied:

1. Travel time segments were set up for the two routes shown in Figure 3, i.e. the “primary” route and “secondary” route. A third “Kelly” travel time segment was added as well (also included in Figure 4). Travel time measurements were recorded by five minutes interval for all three routes.
2. A partial routing decision was coded into the network, covering the primary and secondary route options (see Figure 4). This routing decision was initially set to send 100% of the demand on the primary route, and 0% on the secondary route.

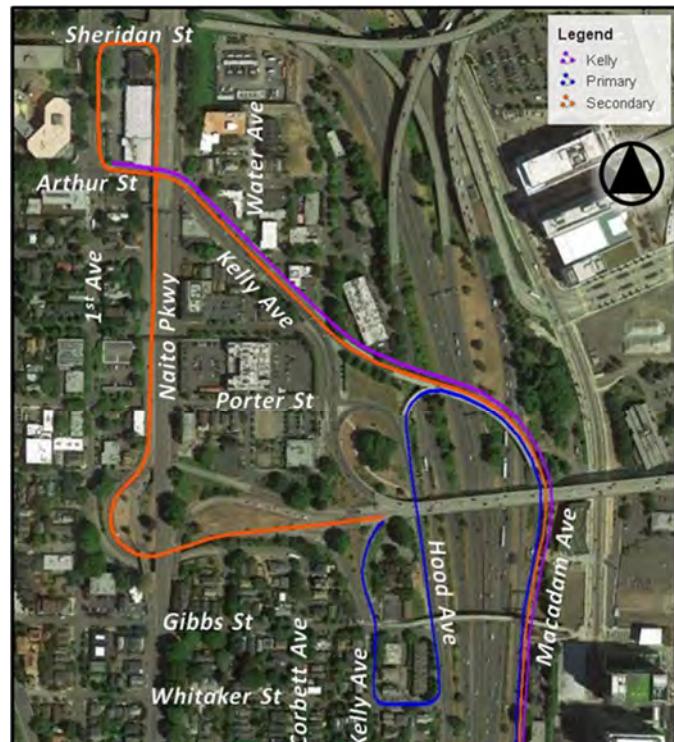


Figure 3: Primary/Secondary/Kelly Travel Time Segments

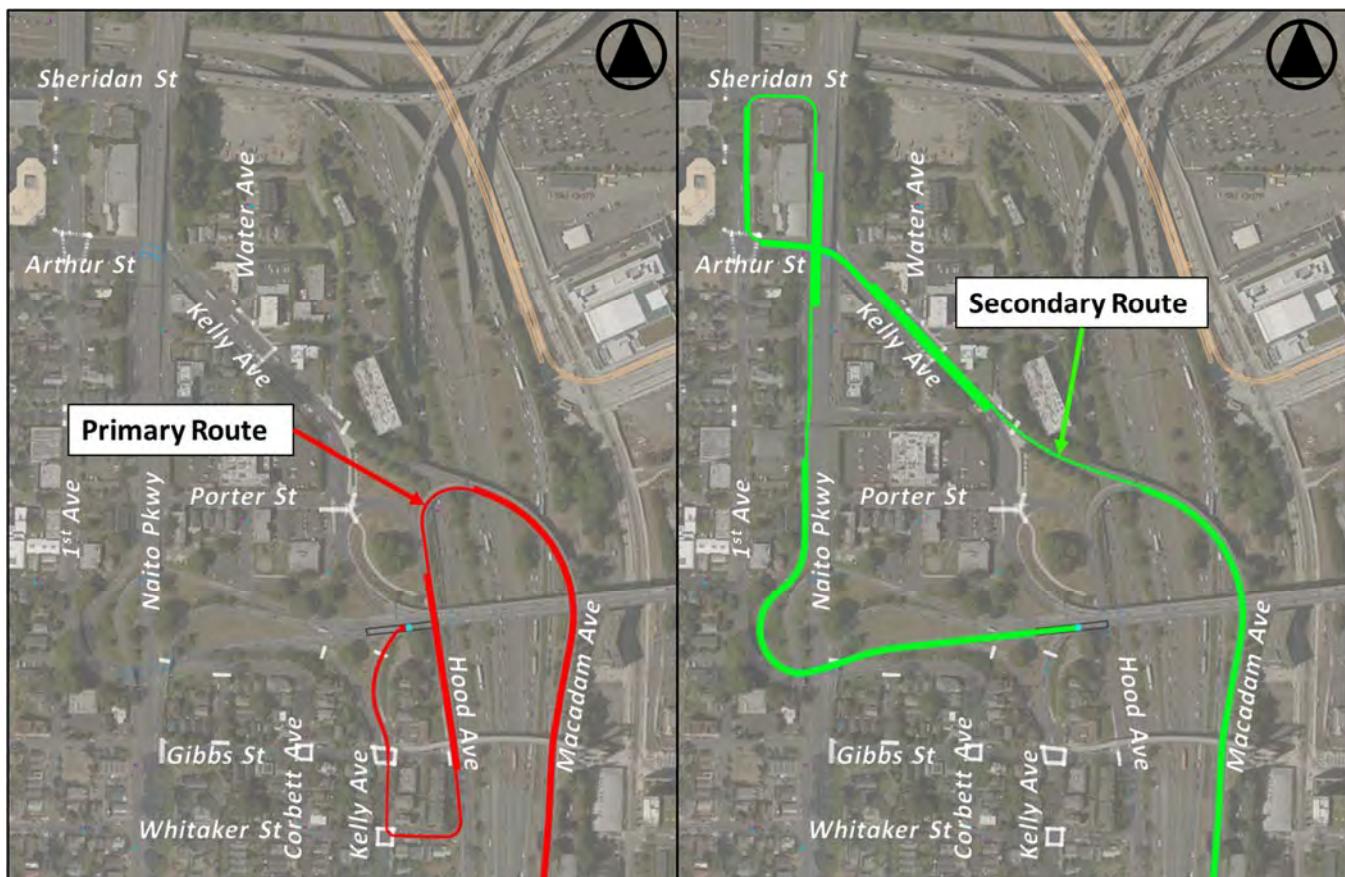


Figure 4: Macadam Partial Routing Decisions

3. A COM script was used to dynamically change the partial routing decision weighting based on the following criteria:
  - a. If the Kelly travel time segment travel time was >250 seconds over the last five minutes, the partial route would remain 100% on primary and 0% on secondary
  - b. If the primary travel time segment was > 300 seconds and the Kelly travel time segment was < 250 seconds over the last five minutes, the partial routing decision would switch to 30% on the primary route and 70% on the secondary route. The 30/70 partial route split would remain until either the Kelly travel time segment reached > 250 seconds or the travel time on the secondary route exceeded the travel time on the primary route over the last five minutes, whereby the COM script would revert all demand back to the primary route.

Some key assumptions in this methodology include the following:

- By the year 2035, 70% of drivers on this route are assumed to be either using a routing app that is sensitive to real time travel time or are very familiar with the congestion patterns in the area.
- There is an inherent lag of five minutes between travel time measurements and feedback to drivers making travel time-based routing decisions. This assumption seems reasonable given the general lag in feedback for travel time

measurements under congested conditions. For example, the travel time is typically known based on vehicles that have completed the route. If the route takes five minutes to complete, the data for a driver at the start of the route has data that is already five minutes old.

The model was run for 15 simulations with the COM script and the travel times and volumes on the primary and secondary routes were recorded and are provided by simulation in Attachment C. Figure 5 shows results for a single simulation run (random seed 5) as a sample of the resulting trends.

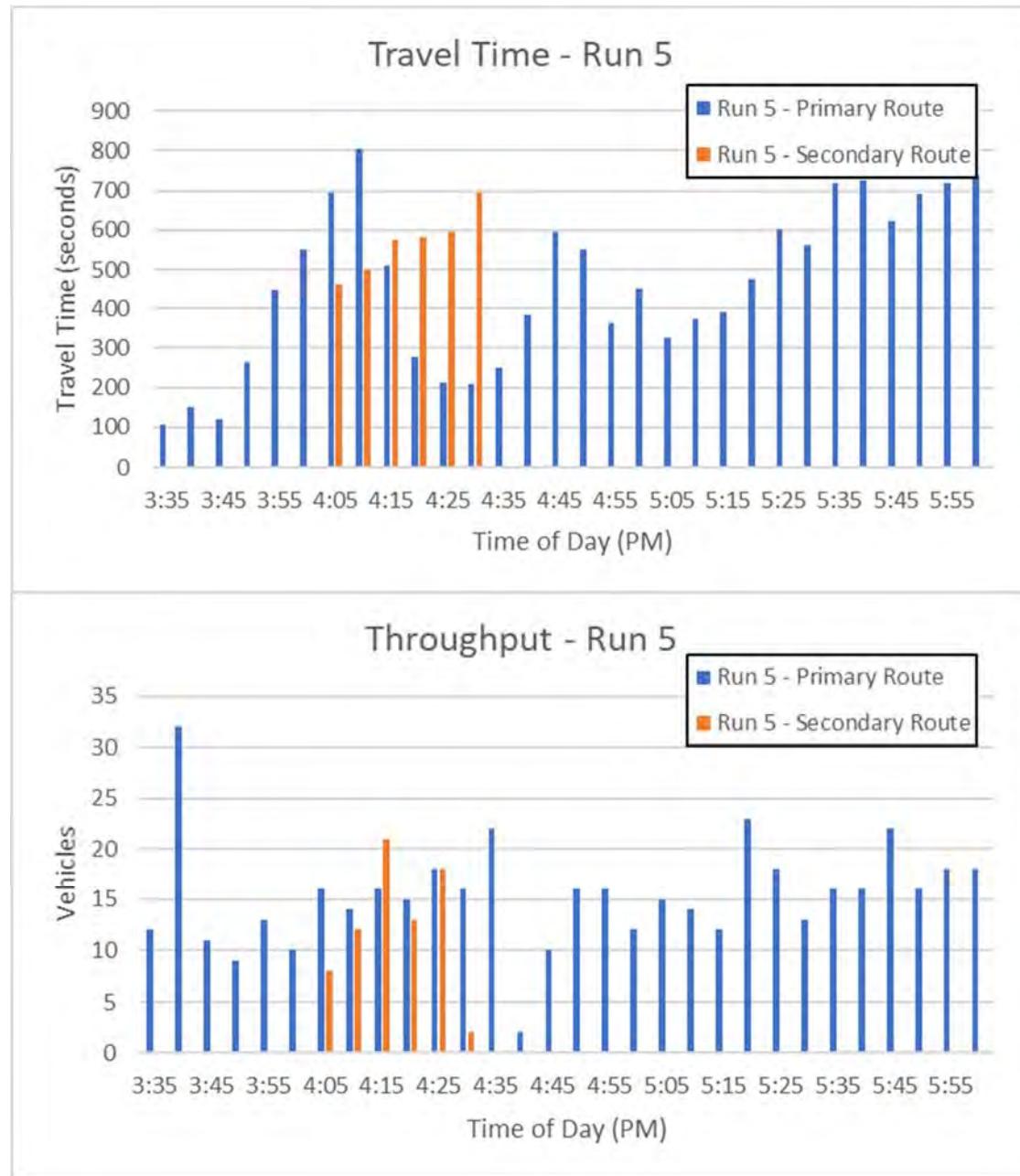


Figure 5: Primary/Secondary Route Travel Time and Usage

As shown for simulation random seed 5 in Figure 5, the secondary route helps to reduce the travel time on the primary route as congestion grows. Note that while the partial routes will revert back to 100% on the primary route, vehicles that already started onto the secondary network still need to clear the travel time segment, resulting in multiple five-minute intervals where the secondary route measured travel time is higher than the primary route.

Averaged overall the 15 simulation runs, from 4-6 PM approximately 21% of the traffic traveling from northbound SW Macadam Avenue to eastbound Ross Island Bridge uses the secondary route identified in Figure 4. The dynamic route reduces the queuing issues onto the eastbound Ross Island Bridge caused by the westbound Ross Island Bridge to SW Hood Avenue and SW Macadam Avenue to SW Hood Avenue weave.

Under existing conditions, the northbound SW Kelly Avenue ramp onto the eastbound Ross Island Bridge queues back into the neighborhood over the entire 4-6 PM analysis period. With the application of the alternate routing from the SW Macadam Avenue ramp, combined with the impacts caused by queue spillback from the I-405 northbound on-ramp at SW 6<sup>th</sup> Avenue, which typically reach the SW Macadam Avenue ramp around 5:15 PM, the impacts of the additional No-Build demand and the extent of queuing on the SW Kelly Avenue ramp are reduced. In reality, this change would be offset by other drivers coming through the neighborhoods south of the bridge. To account for this, 75 vehicles/per hour of demand was added back on to the SW Kelly Avenue ramp, using the route shown in Figure 6. Note that the route using Gibbs Avenue is actually not a legal left turn onto the ramp. Under existing conditions this “illegal” movement served significant demand but had been eliminated as part of the No-Build volume development. This added demand reverts this “illegal” turn movement to existing condition volumes.

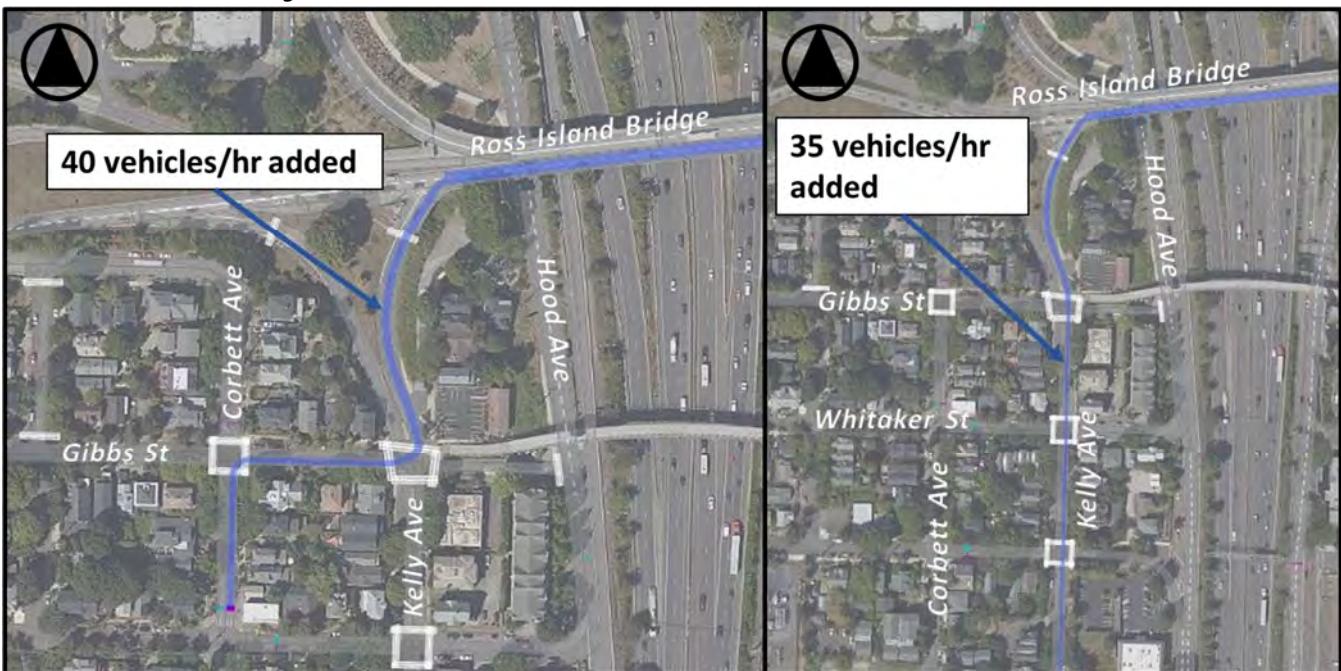


Figure 6: Additional Kelly Ramp Demand

During initial simulations, excessive queuing conditions were observed in the northbound outside lane on SW Barbur Boulevard at SW Hamilton Street due to a combination of eastbound queue spillback on SW Bancroft Street from SW

Corbett Avenue, and vehicles failing to change lanes when buses dwell at the far-side stop. To properly capture expected driver behavior at this location, the following dynamic routing decisions were implemented:

- *Northbound SW Barbur Boulevard to northbound SW Corbett Avenue:* As shown in Figure 7, there are two potential routes for vehicles traveling northbound on SW Barbur Boulevard and destined for northbound SW Corbett Avenue. The primary route is to use SW Bancroft Street to access northbound SW Corbett Avenue. Under most conditions, 90% of the demand uses this primary route. However, this route can become excessively delayed under some queuing conditions. The secondary route uses SW Hamilton Street instead of SW Bancroft Street, with 10% of the demand using this route under most conditions. Therefore, a VAP script was used to flip the demand from 90/10 on the primary/secondary routes to 10/90 whenever the northbound queue spillback in the outside lane on SW Barbur Boulevard extends 250' south of SW Bancroft Street. This routing would remain in effect until the SW Barbur Boulevard queuing was reduced.
- *Far-side northbound bus stop at SW Barbur Boulevard and SW Hamilton Street:* When buses dwell at the far-side northbound bus stop at SW Barbur Boulevard and SW Hamilton Street, vehicles in the model attempting to go through the intersection that were already in the right lane due to an downstream lane change decision would simply wait rather than change lanes to pass the bus if a gap was available in the adjacent lane. To make this behavior more realistic, a partial routing decision was applied at this bus stop, as shown in Figure 8. This partial routing decision was only applied while a bus was dwelling in the stop and resulted in much more realistic driver behavior at this location.

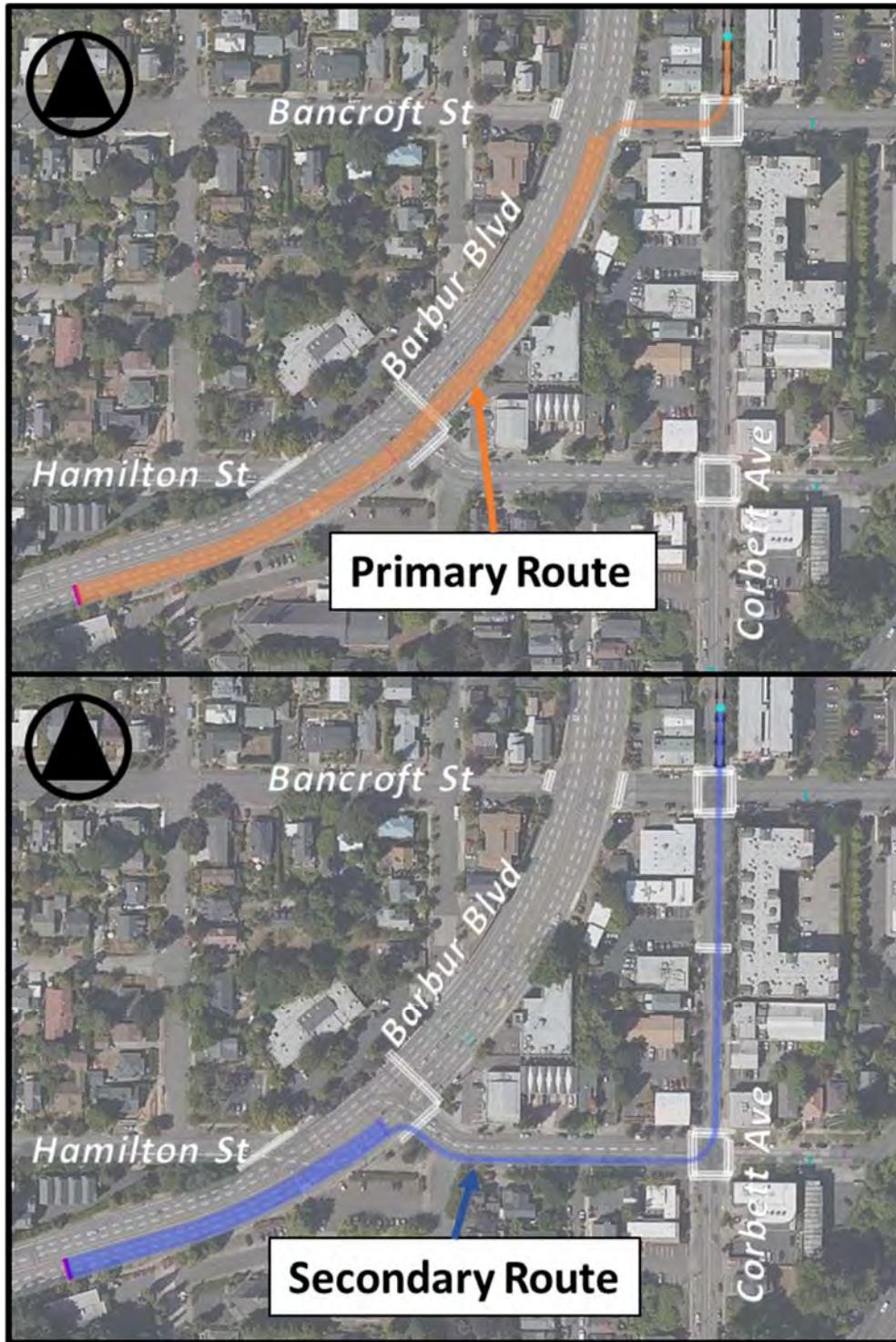


Figure 7: Barbur to Corbett Dynamic Routing

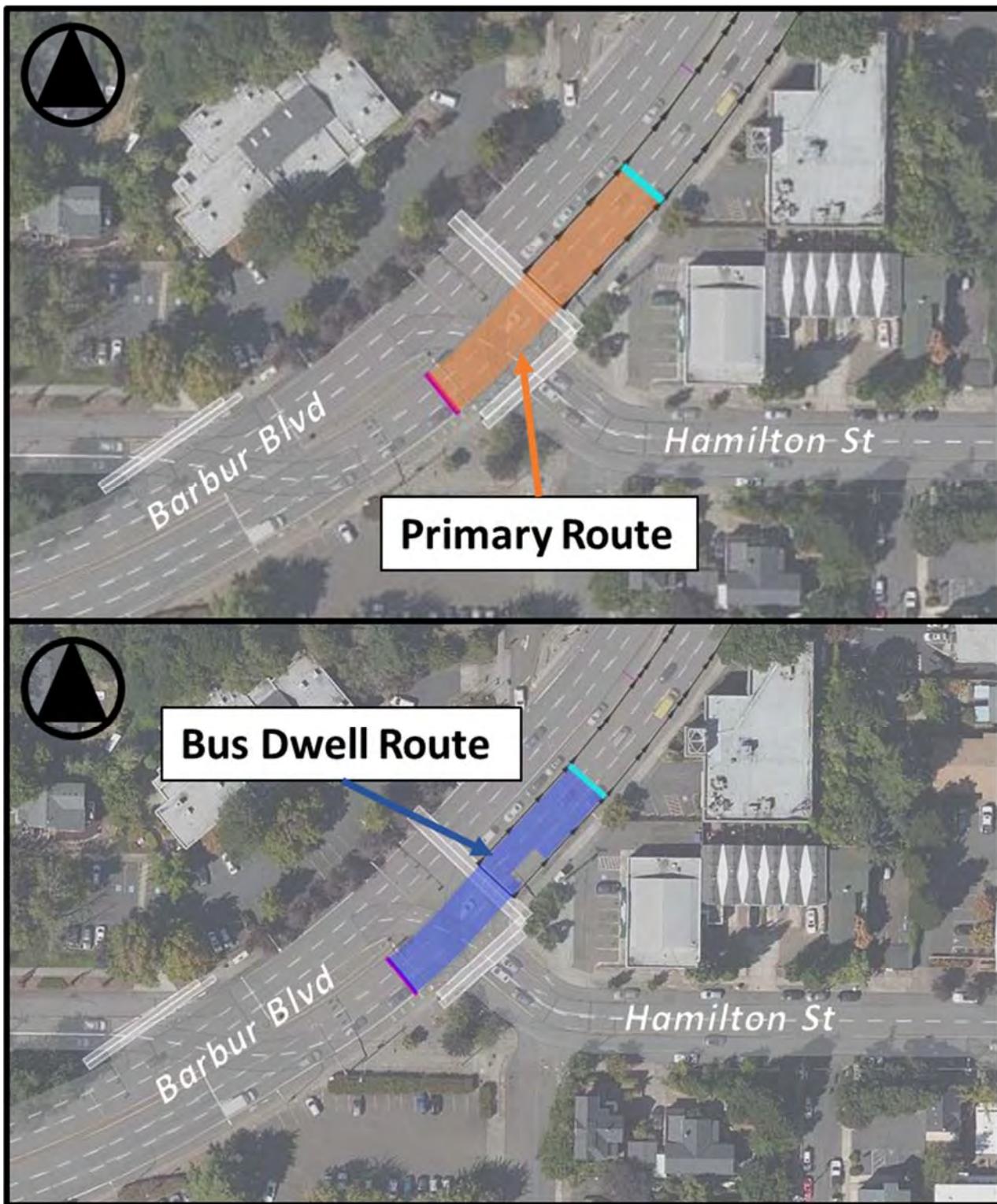


Figure 8: Barbur/Hamilton Northbound Bus Stop Dynamic Routing

These dynamic routing adjustments were visually reviewed over multiple simulation animations to ensure the logic was operating properly. Overall, these adjustments reduced some of the unreasonable queueing conditions in the Barbur/Corbett/Hamilton area.

In addition, the eastbound queue spillback from the Hamilton/Corbett intersection increases due to increased conflicts from the eastbound left turns and the northbound movements at this intersection. The queue spillback impacted the southbound left turn movement at Hamilton/Barbur unrealistically, causing queues to spill all the way back up SW Barbur Boulevard into the I-405 interchange area. Under existing conditions, if vehicles are not parked too close to the Hamilton/Corbett intersection in the southwest quadrant, a de-facto eastbound right turn lane occasionally forms. Under No-Build conditions, this condition was assumed to occur throughout the 4-6 PM time period with the application of some sort of parking restriction, allowing two to three vehicles to queue up in a de-facto right turn lane. This adjustment to the model allowed the southbound left turn at Hamilton/Barbur serve the demand without excessive queueing.

After the validation adjustments were completed, the model was run for 15 different random seed simulations and measures of effectiveness were extracted from the simulation results.

## Future No-Build Model Measures of Effectiveness

The following measures of effectiveness were collected from the future No-Build model, average over 15 simulation runs:

- System Measures:
  - Unserved Demand – total and at key gateways
  - Total Network delay (including delay for unserved demand)
- Individual turn movement and total intersection delay at all study intersections for motor vehicles (Attachment D)
- Average and 95<sup>th</sup> percentile motor vehicle queue lengths (Attachment E)
- Throughput at Key Locations:
  - I-405 Northbound On-Ramp from SW 6<sup>th</sup> Avenue throughput
  - Ross Island Bridge throughput by direction
  - Northbound/Southbound SW Barbur Boulevard at SW Hamilton Street
- Corridor travel times for motor vehicles (Attachment F)

### System Measures

Table 1 shows the network performance measures generated by Vissim. The key measure is unserved demand; vehicles unable to enter the network due to queue spillback during the analysis period (4-6 PM). As shown in Table 1, the roadway network modeled for No-Build conditions does not have sufficient capacity to serve all the future two-hour demand. However, most of the unserved demand would likely shift to other regional routes or to a different time of day (i.e. shoulder hours). Note that the total delay also includes estimated delay for unserved demand (i.e. vehicles waiting to enter the network).

*Table 1: Future (2035) No-Build Model System Performance (4-6 PM)*

| System Measure              | Existing (2017) | Future No-Build (2035) |
|-----------------------------|-----------------|------------------------|
| Total Vehicles Served       | 47,150          | 51,930                 |
| Unserved Demand             | 135             | 720                    |
| Percent Unserved Demand     | 0.3%            | 1.4%                   |
| Total Delay (vehicle-hours) | 2,860           | 4,660                  |

The unserved demand is summarized in Table 2 by model gateways where queue spillback prevented the full demand from entering the network. Note that the unserved demand shown in Table 2 does not match the Vissim volume difference (i.e. Vissim output vs demand) reported in Attachment B, as the unserved volume reported in Table 2 were collected at the beginning of the model entrance links and the volume in Attachment B was generated at intersections. Therefore, the unserved demand in Table 2 is generally lower than the volume differences reported at the entry intersections in Attachment B (i.e. the difference between volume that did not get to the intersection but is still in the model versus the volume that did not get into the model).

*Table 2: Future (2035) No-Build Model Unserved Demand at Key Gateways (4-6 PM)*

| Model Gateway                  | Gateway Demand | Unserved Demand | % Unserved Demand |
|--------------------------------|----------------|-----------------|-------------------|
| I-405 SB Off-Ramp to Broadway  | 2,538          | 17              | 0.7%              |
| Northbound Broadway at Grant   | 670            | 82              | 12%               |
| Southbound Water at Kelly      | 428            | 89              | 21%               |
| Northbound Macadam at Curry    | 2,655          | 191             | 7%                |
| Hwy 99E Northbound ramp to 8th | 1,811          | 119             | 7%                |
| Northbound Corbett at Hamilton | 1,378          | 169             | 31%               |

The capacity constraints resulting in the unserved demand are summarized by key gateway as follows:

- I-405 Southbound Off-Ramp at Broadway – Demand on this approach increases over existing count (likely a light demand day) conditions by 25%, leading to increases queue spillback over the 2-hour analysis period.
- Northbound Broadway at Grant – Demand on this approach increase by about 18% over existing conditions as increased congestion in the Hwy 26 tunnel causes drivers to seek other routes. With heavy conflicting volume on SW Broadway and stop control this approach is unable to serve the full demand from 4-6 PM.
- Southbound Water at Kelly – Caused by growth in demand on southbound Water Street (nearly 50%) due to new development on the South Waterfront and direct routing from Moody Avenue via Sheridan Street.

- Northbound Macadam at Curry – Caused by increased demand (about 28%) and corresponding queue spillback from the I-405 northbound on-ramp at SW 6<sup>th</sup> Avenue.
- Hwy 99E Northbound ramp to 8th – Caused by increased demand for both southbound SE 8<sup>th</sup> Avenue (about 11%) and westbound SE Powell Boulevard (about 6%), leading to increased queue spillback from the I-405 northbound on-ramp at SW 6<sup>th</sup> Avenue.
- Northbound Corbett at Hamilton – Caused by increased demand for this approach (20%) at the already over-capacity intersection of SW Corbett Avenue and SW Hamilton Street, combined with increases queue spillback from both SW Corbett Avenue and SW Bancroft Street and SW Barbur Boulevard and SW Hamilton Street. Note that the I-5 northbound off-ramp to SW Corbett Avenue was not including in the DEIS PM model study area, so the impacts of queuing to this ramp are unknown.

### Delay

The delay measurements were calculated over the system peak hour interval (4:30-5:30 PM) for each simulation run. Delay reported for a study intersection is measured upstream to the next intersection and not through. The full delay results by turning movement and intersection are provided in Attachment D.

### Queuing

To calculate 95<sup>th</sup> percentile queues, queue length data was collected from Vissim using queue counters on critical approaches and a 120-second interval to reflect queues that form while traffic flow is impeded. The queues were measured over the entire 4-6 PM time interval, to capture the future worst case, which likely occurred after the existing system peak hour (4:30 to 5:30 PM). The 95th percentile queue was then calculated using a percentile function. The queue results are included in Attachment E. In addition, the congestion plots provided in Attachment A graphically display the queuing in the entire model. The results of the queuing analysis combined with a visual review of the simulation animations lead to the following findings:

- Increased demand on northbound Corbett Avenue leads to increased queuing on northbound Corbett Avenue
- Increased demand on the I-405 southbound off-ramp to Broadway lead to increased queuing along the eastbound US-26 to US-26 route, particularly between 4:00 and 5:00 PM.
- Increased queue spillback from the northbound SW Naito Parkway ramp onto the eastbound Ross Island Bridge would impact the SW Barbur Boulevard and SW Hamilton Street intersection by about 5:30 PM, and cause northbound queue to extend back nearly to the SW Capitol Highway merge with northbound SW Barbur Boulevard by 6:00 PM.
- The increased demand on the I-405 northbound on-ramp from SW 6<sup>th</sup> Avenue leads to increased queuing for all movements feeding into the westbound US-26 to US-26 movement. The westbound queue would propagate throughout the network, peaking around between 5:15 and 5:45 PM on average. The impacts of this westbound queue include increased queues on northbound SW Macadam Avenue, the westbound Ross Island Bridge, and the Hwy 99E northbound off-ramp (SE 8<sup>th</sup> Avenue) to westbound SE Powell Boulevard.

### Throughput at Key Locations

The throughput for each direction of travel at the west end of the Ross Island Bridge was measured during the 15 No-Build model simulation runs and compared against existing conditions, both over the entire 4-6 PM interval and by 15-minute time bin. The two-hour results are summarized in Table 3, while the 15-minute results are shown in Figure 9.

Table 3: Ross Island Bridge Vehicle Throughput Comparison (4-6 PM)

| Measure    | Ross Island Bridge Westbound |               | Ross Island Bridge Eastbound |               |
|------------|------------------------------|---------------|------------------------------|---------------|
|            | Existing                     | 2035 No-Build | Existing                     | 2035 No-Build |
| Throughput | 4,600                        | 4,738         | 6,216                        | 6,368         |
| Demand     | 4,591                        | 4,965         | 6,191                        | 6,520         |
| % Unserved | 0%                           | 4.6%          | 0%                           | 2.3%          |

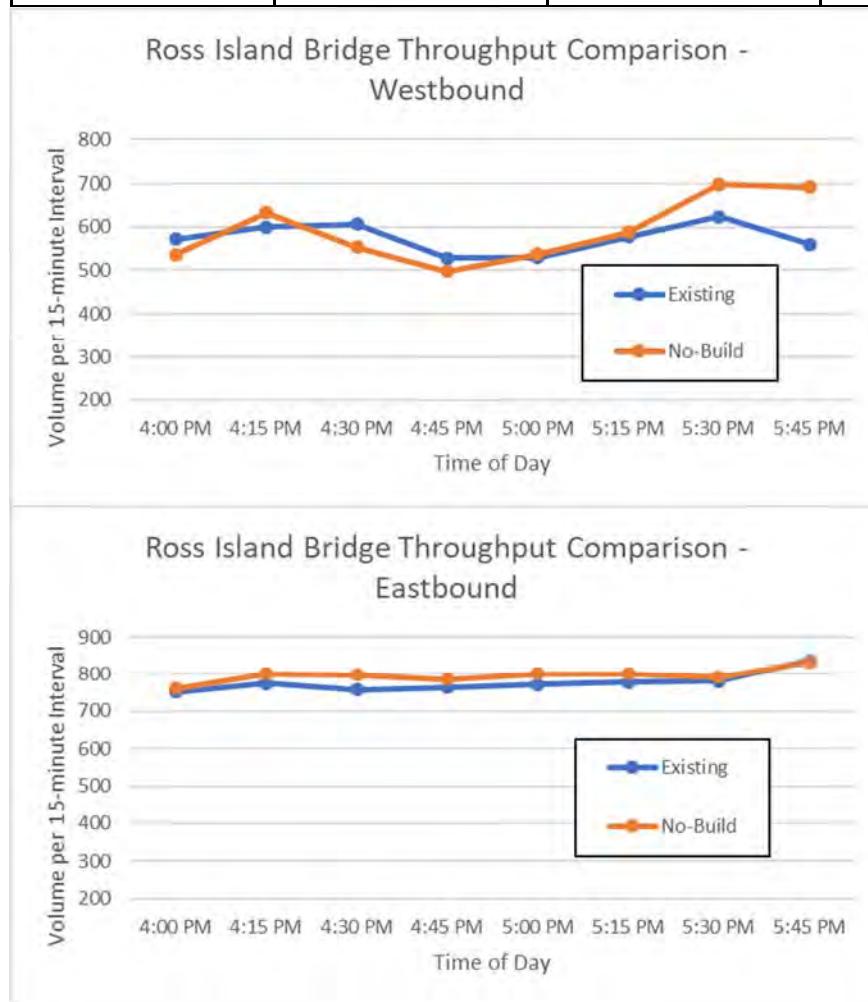


Figure 9: Ross Island Bridge Throughput Profile

Key findings from the throughput at key locations are summarized as follows:

- The 4.6% unserved westbound demand is due to the increased westbound demand on the bridge coupled with the capacity constraints of the I-405 northbound on-ramp at SW 6<sup>th</sup> Avenue, all leading to increased westbound queuing on the Ross Island Bridge. The volume profile for this movement closely match the existing model.
- The 2.3% unserved eastbound demand is mainly due to the capacity constraints on the east side of the Ross Island Bridge (i.e. the combination of Milwaukie Avenue, 20<sup>th</sup> Avenue, and 26<sup>th</sup> Avenue) which are captured in the model with time varying reduced speed areas.

### Travel Time

Travel times were measured over segments within the study area based on the entering and exiting time stamp of each vehicle traversing the selected segment. The detailed travel time results broken down by simulation run and 15-minute time interval are included in Attachment F. The final travel times are summarized and compared against the existing conditions travel times in Table 4.

*Table 4: Future No-Build Travel Time Results*

| # | From/To  | Direction | Average Travel Time<br>(4:00-6:00, min:ss) |                     | Segment Throughput (vph) |                    |
|---|--|-----------|--|---------------------|--------------------------|--------------------|
|   |  |           | Existing<br>Vissim                         | Future No-<br>Build | Future No-Build          | % Demand<br>Served |
| 1 | I-405 SB Off-ramp/Broadway to Hwy 99E                                  | EB        | 14:43                                      | 15:40               | 325                      | 100%               |
| 2 | Milwaukie Ave/Powell Boulevard to I-405 NB on-ramp/6 <sup>th</sup> Ave | WB        | 12:33                                      | 16:53               | 275                      | 95%                |
| 3 | Barbur Blvd/Hamilton St to Hwy 99E                                     | EB        | 10:25                                      | 10:53               | 755                      | 90%                |
| 4 | Milwaukie Ave/Powell Boulevard to Barbur Blvd/Hamilton St              | WB        | 4:23                                       | 5:20                | 996                      | 96%                |
| 5 | Macadam Ave/Curry St to Hwy 99E  | EB        | 10:32                                      | 11:46               | 350                      | 95%                |
| 6 | Naito Pkwy/Harrison St to Hwy 99E                                      | EB        | 8:43                                       | 7:59                | 687                      | 100%               |

In addition, the travel times on the key 26-26 eastbound and westbound routes are shown averaged over 15-minute intervals from 4:00 to 6:00 PM and compared against the Existing Conditions model in Figure 10.

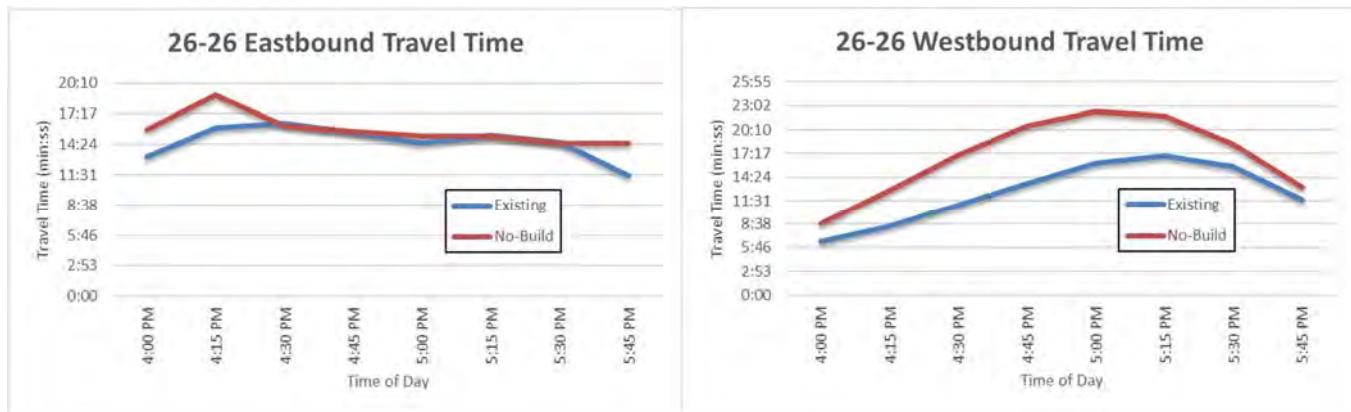


Figure 10: 26-26 Travel Time Comparison

Key findings from the travel time results are summarized as follows:

- Travel times increase on both the westbound and eastbound 26-26 routes due to increased demand on the Ross Island Bridge. The same demand increases also increase the travel time for the SE Powell Boulevard at SE Milwaukie Avenue to SW Barbur Boulevard at SW Hamilton Street route.
- The modeled travel times decrease on Naito at Harrison to Hwy 99E, although in reality these would likely increase.
- The travel times for the remaining segments increase over the existing conditions model, an expected outcome from the increased demand and congestion in the network.

## Key Future No-Build Findings

The future No-Build analysis key findings are summarized as follows:

1. Increased demand westbound on the Ross Island Bridge and northbound on SW Macadam Avenue lead to increased queuing both on SE Powell Boulevard and SW Macadam Avenue.
2. SW Water Avenue at SW Kelly Avenue does not have the capacity to serve the forecasted demand.
3. SW Corbett Avenue at SW Hamilton Street does not have the capacity to serve the forecasted demand.

While the No-Build model shows increased congestion under future conditions, the results are reasonable, given the congestion observed under existing conditions and the traffic growth forecasted throughout the study area.

## ATTACHMENTS

Attachment A: Queue Plots

Attachment B: GEH Results

Attachment C: Dynamic Routing Results

Attachment D: Intersection Delay

Attachment E: 95<sup>th</sup> Percentile Queues

Attachment F: Travel Time Results

Attachment G: Future No-Build Volumes

# **Attachment**

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**Attachment A: Queue Plots**

**Attachment B: GEH Results**

**Attachment C: Dynamic Routing Results**

**Attachment D: Intersection Delay**

**Attachment E: 95th Percentile Queues**

**Attachment F: Travel Time Results**

**Attachment G: Future No-Build Volumes**

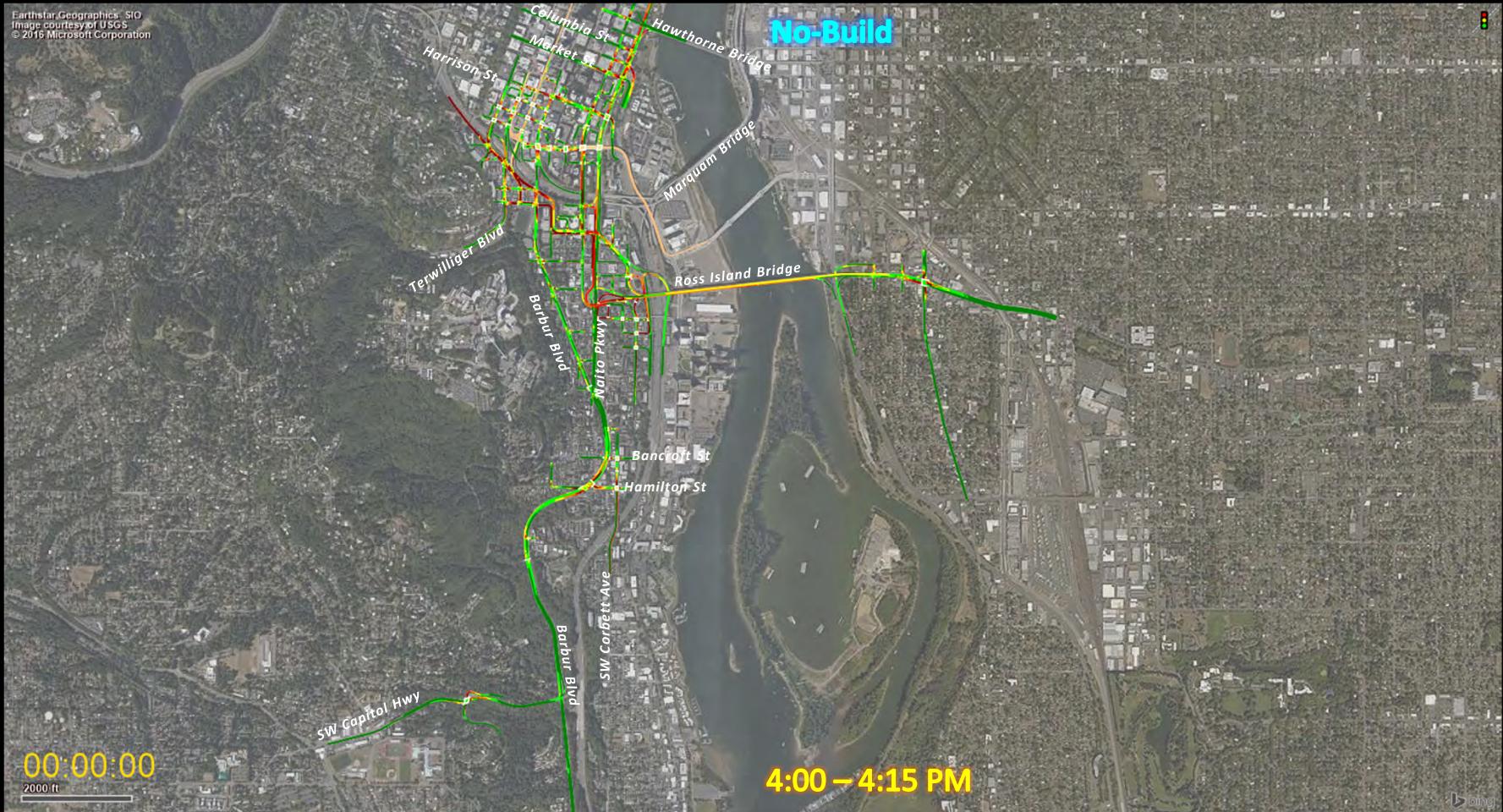
## **Attachment A: Queue Plots**

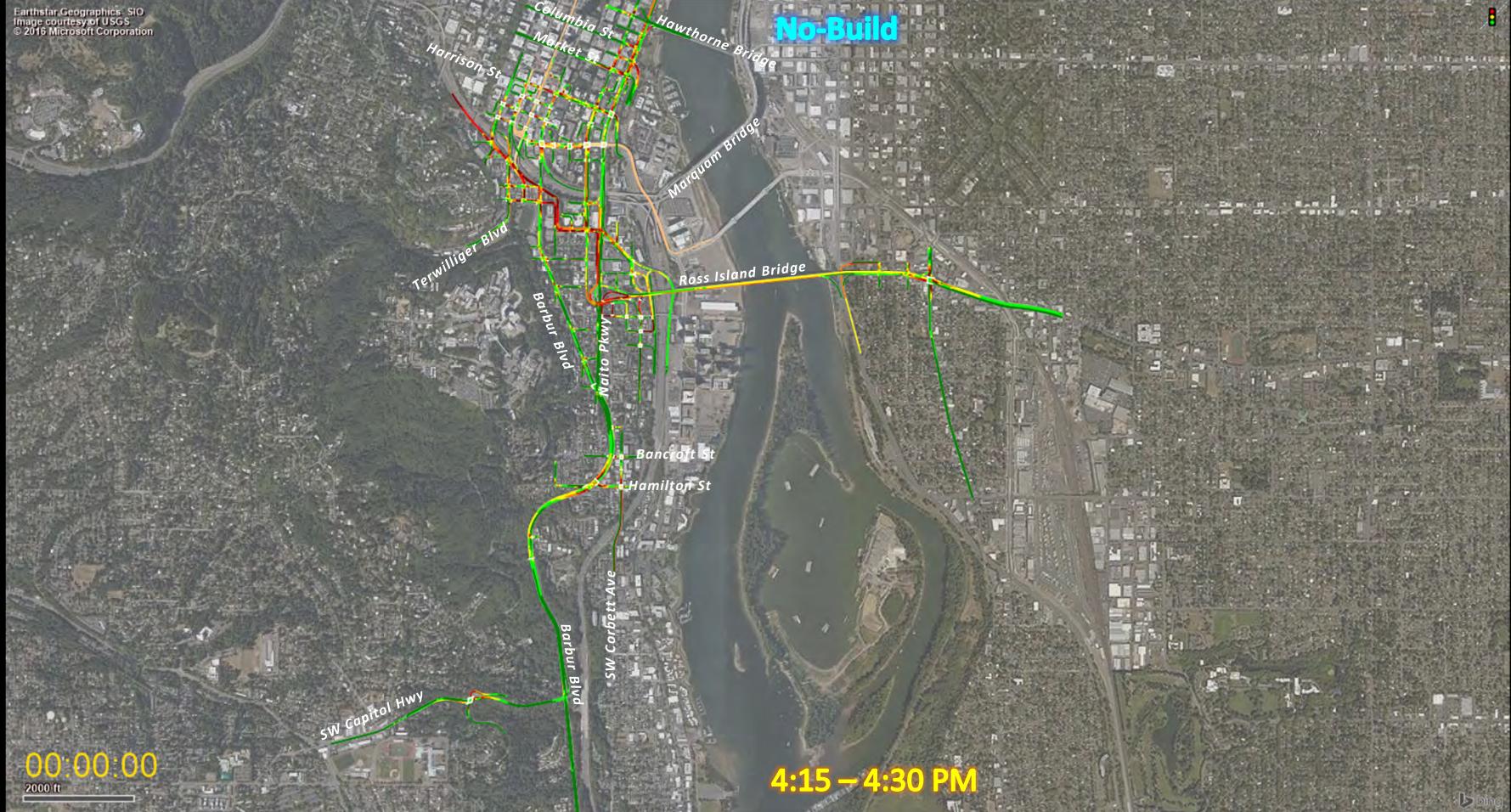
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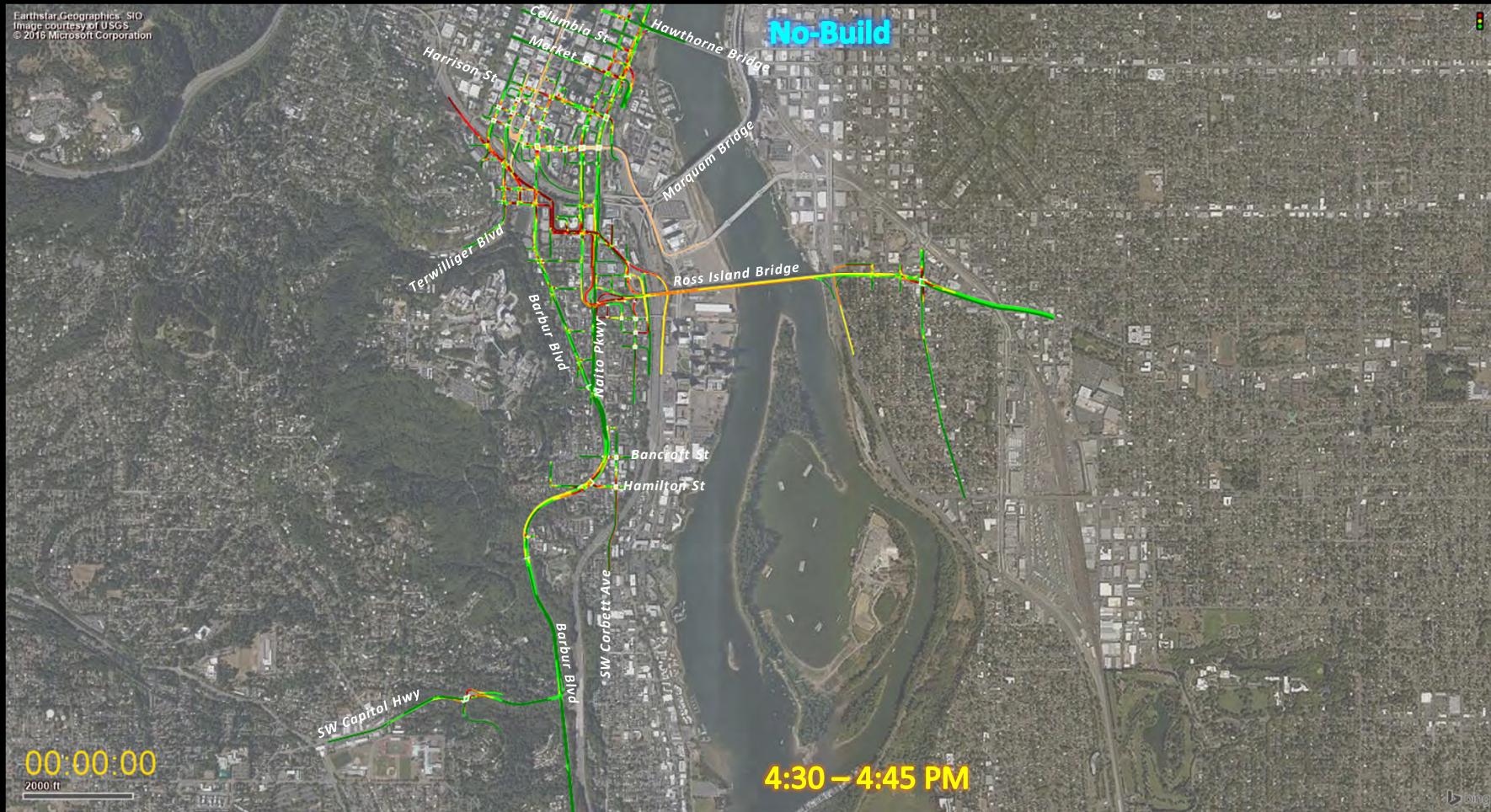
# No-Build: Full Study Area

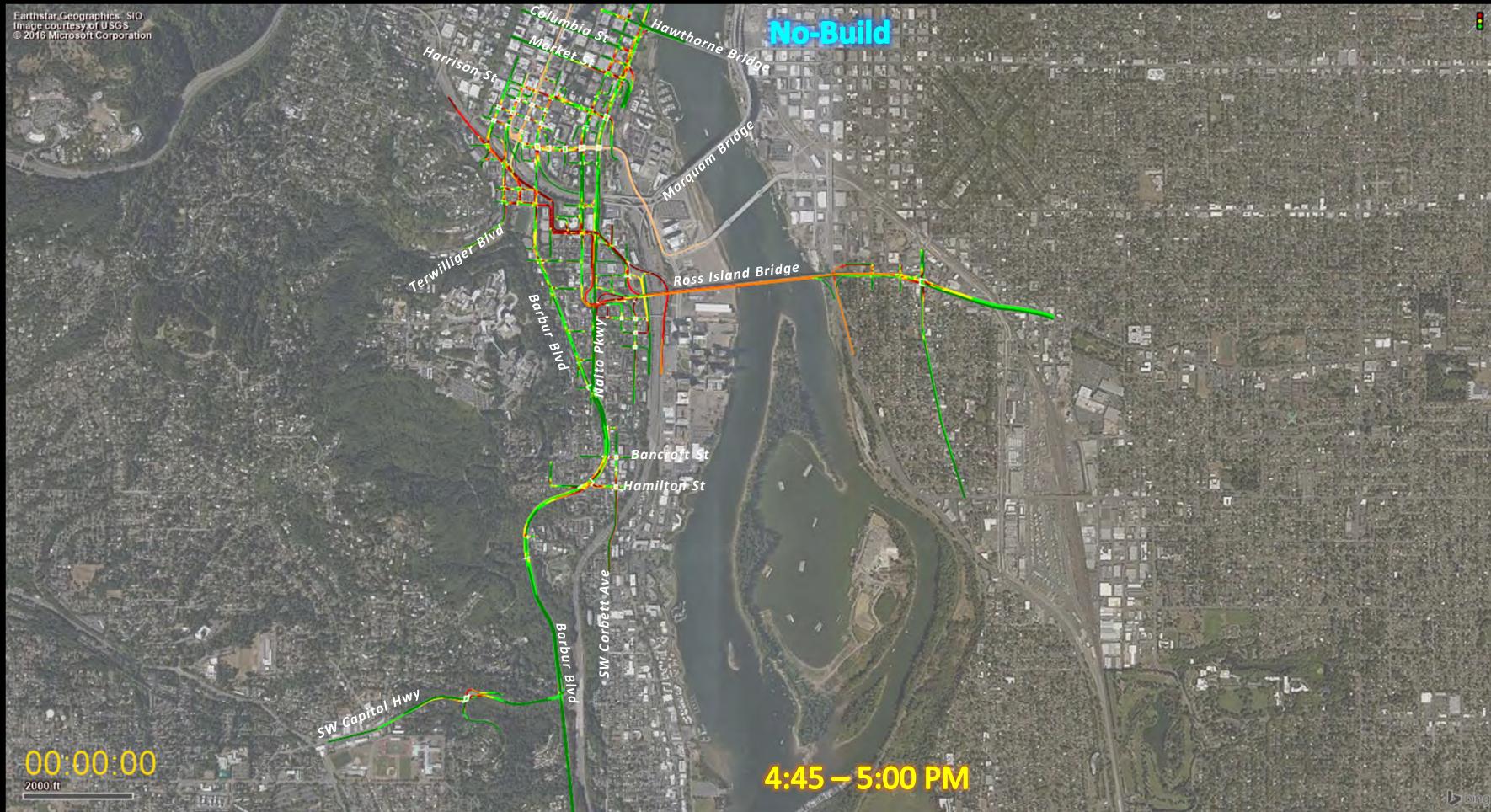
No LRT Alignment

Earthstar Geographics SIO  
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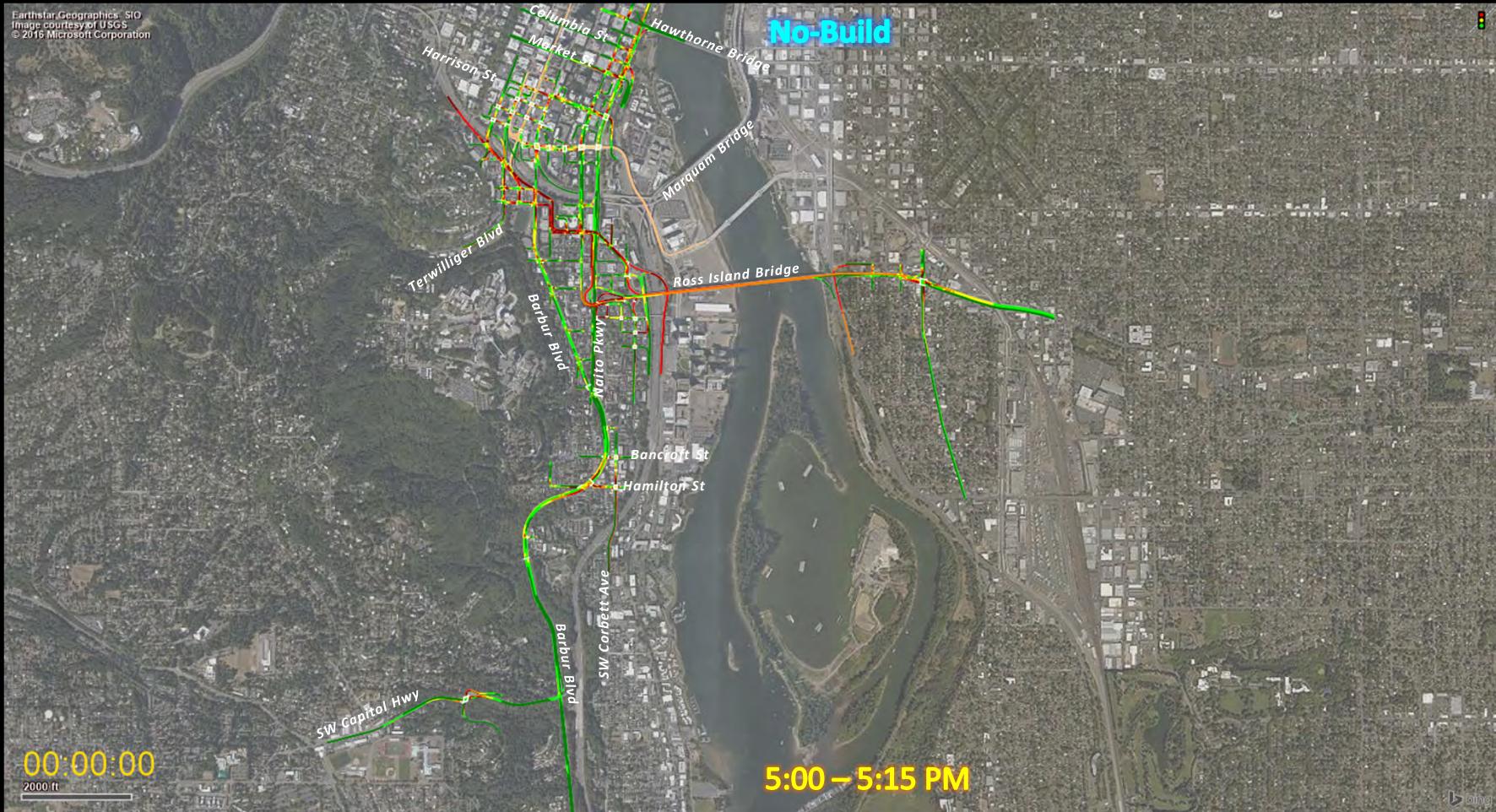


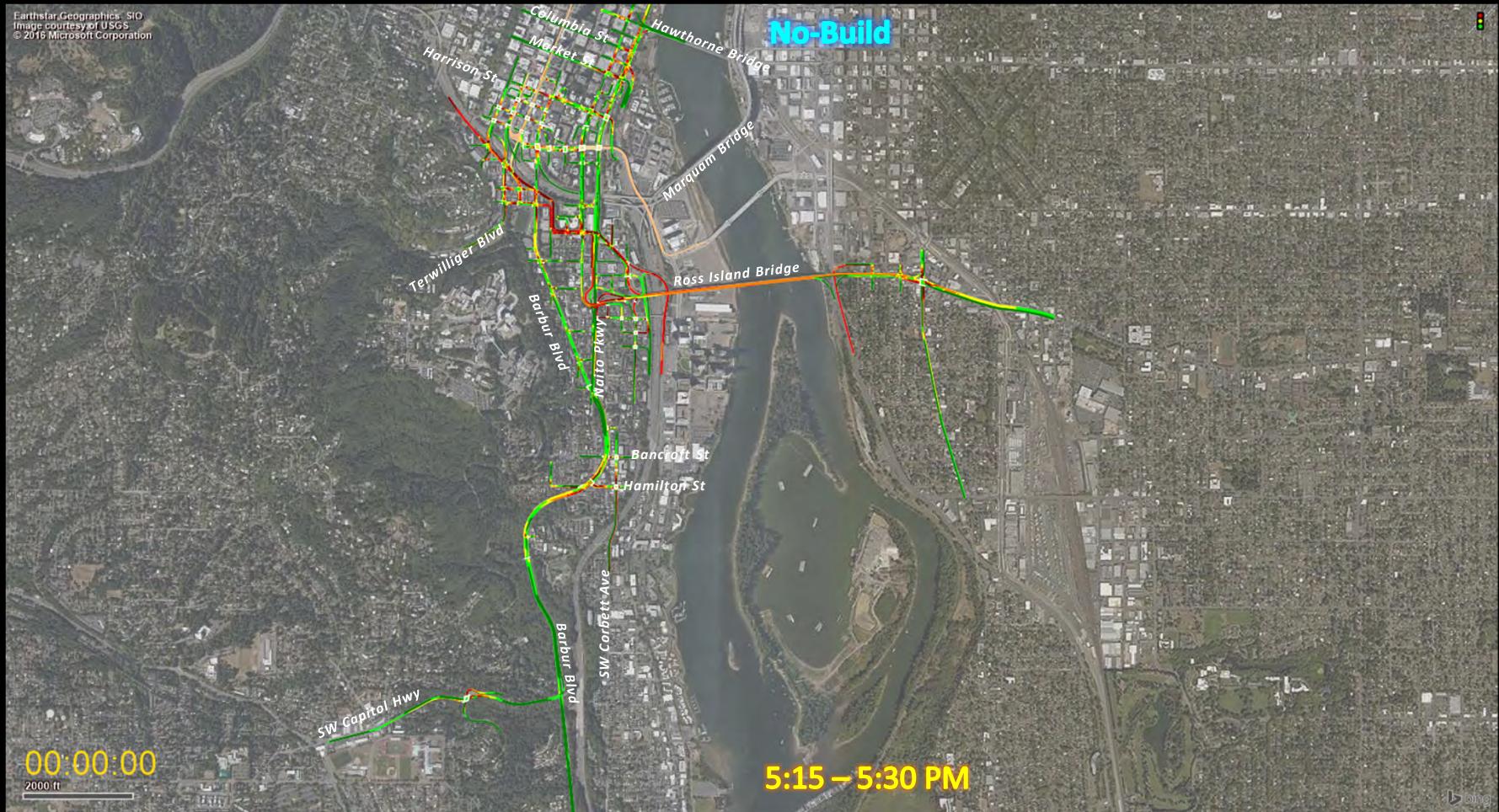




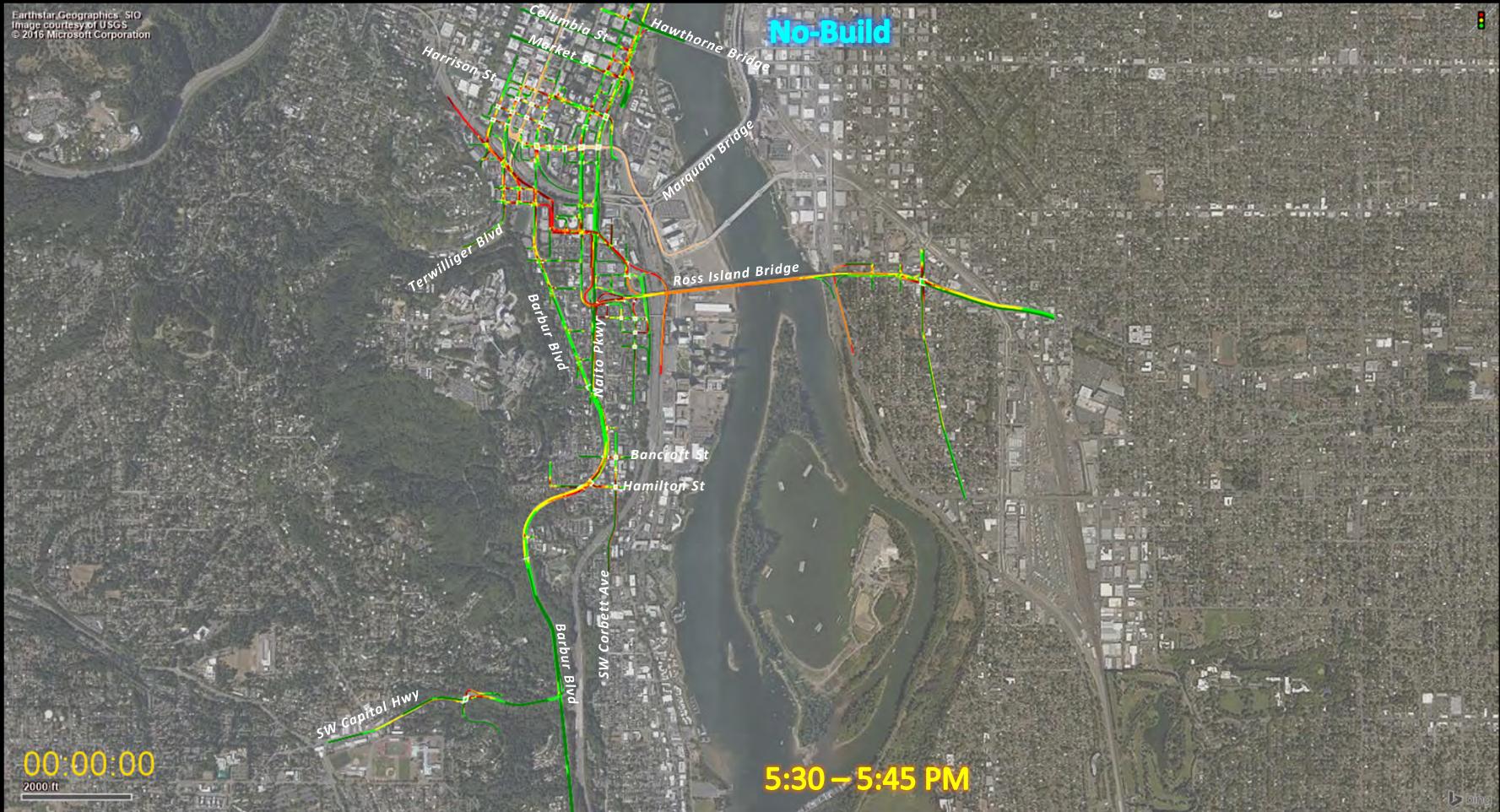


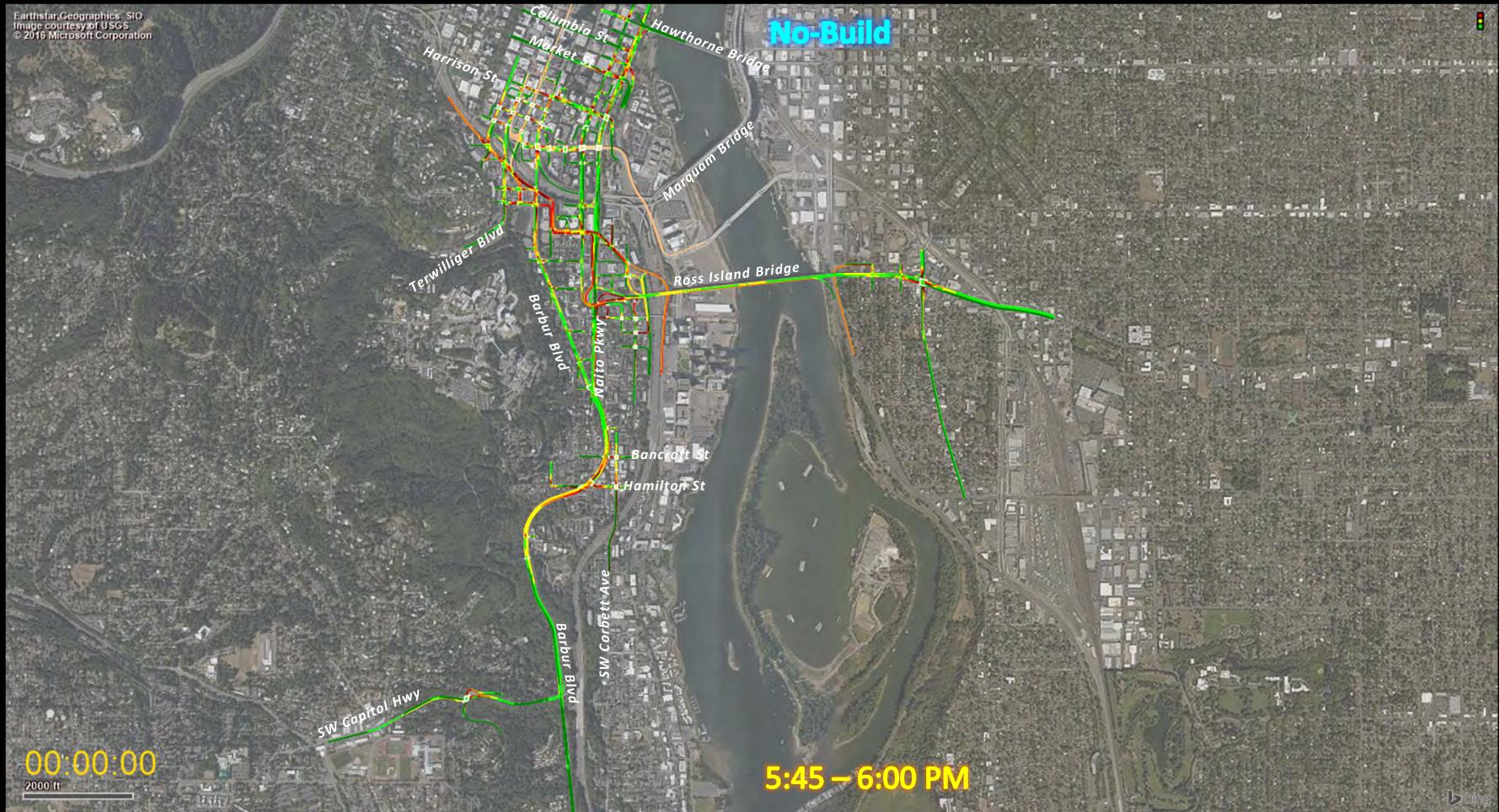
Earthstar Geographics SIO  
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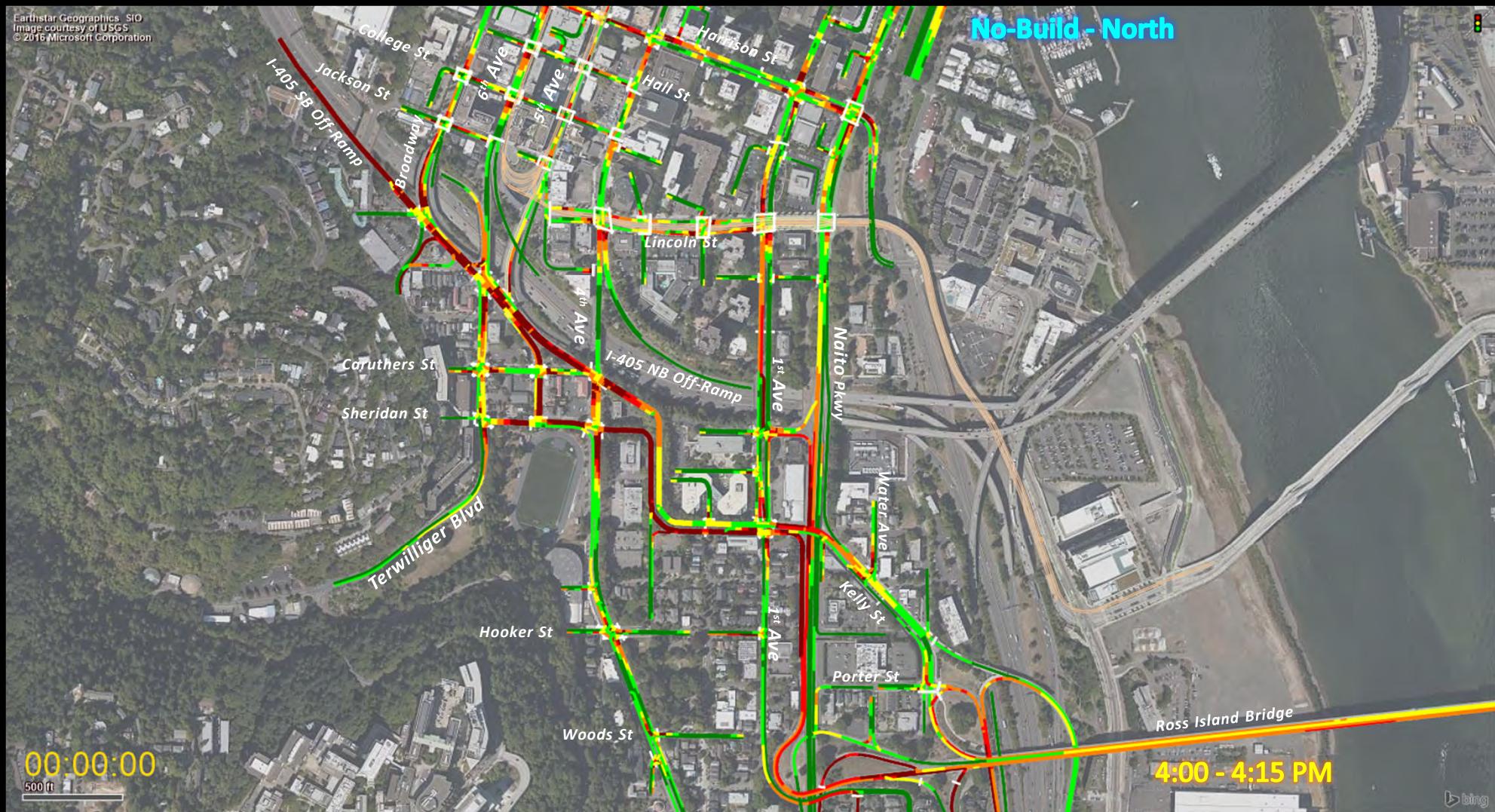
Earthstar Geographics SIO  
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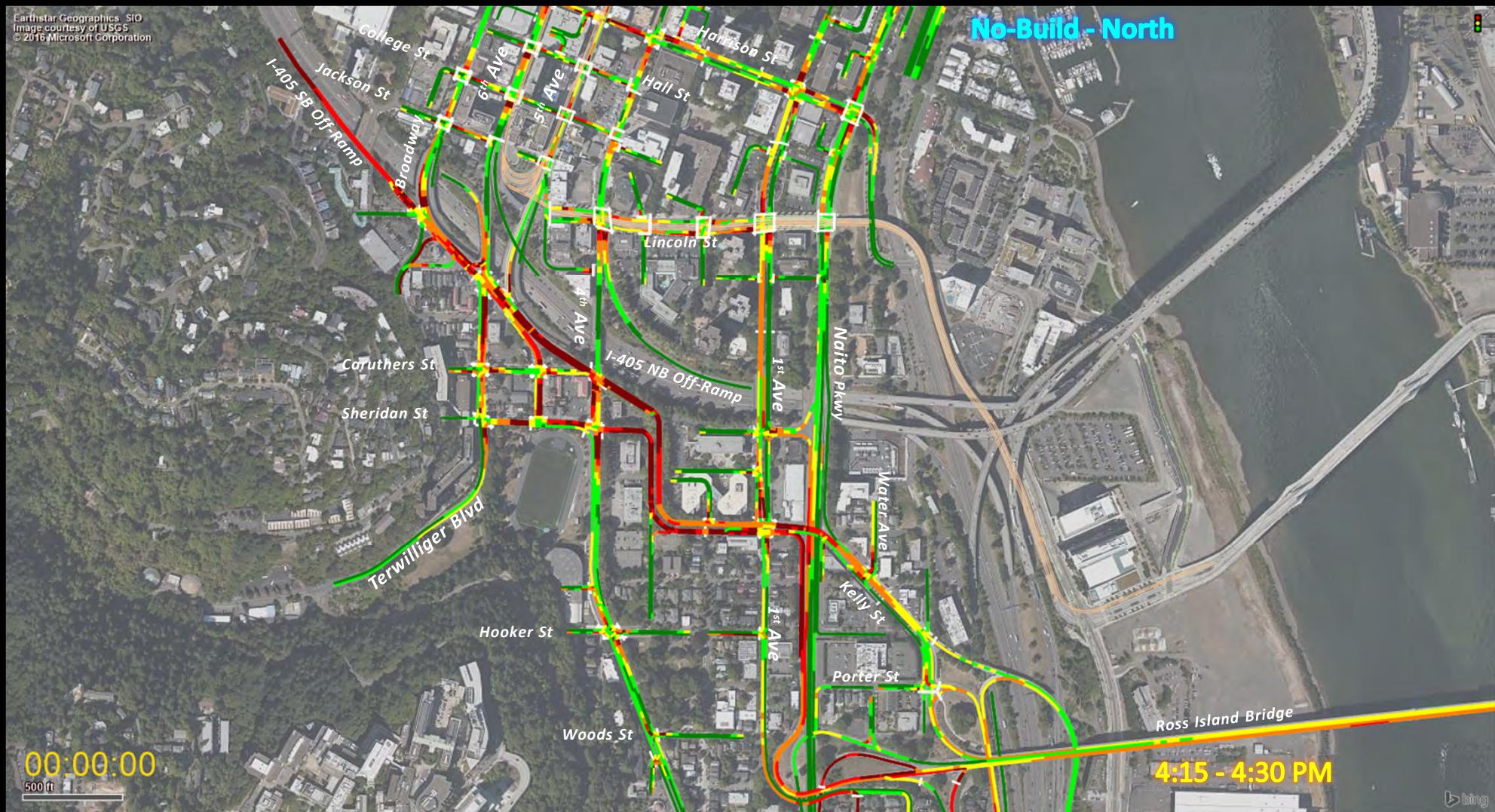


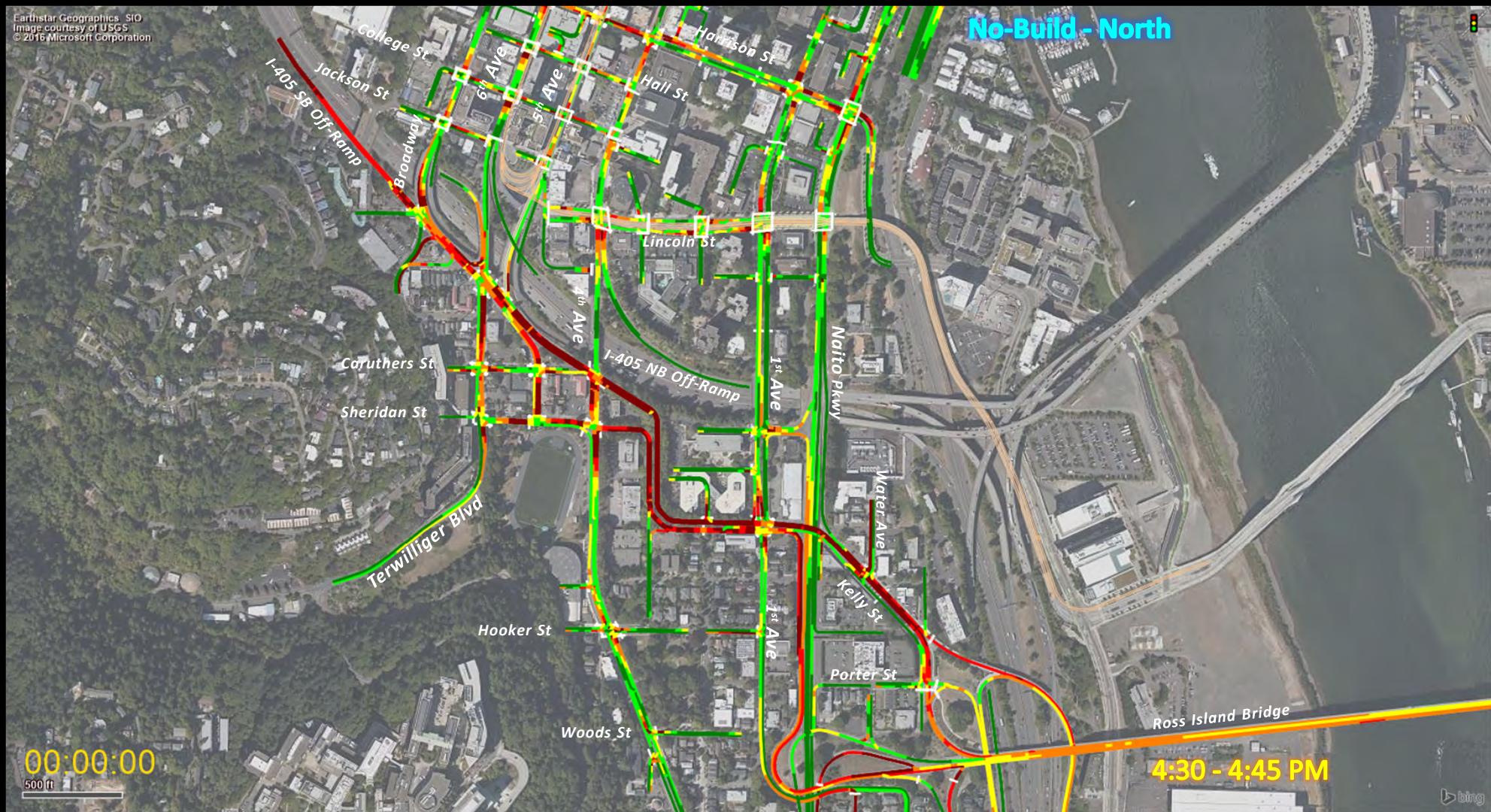


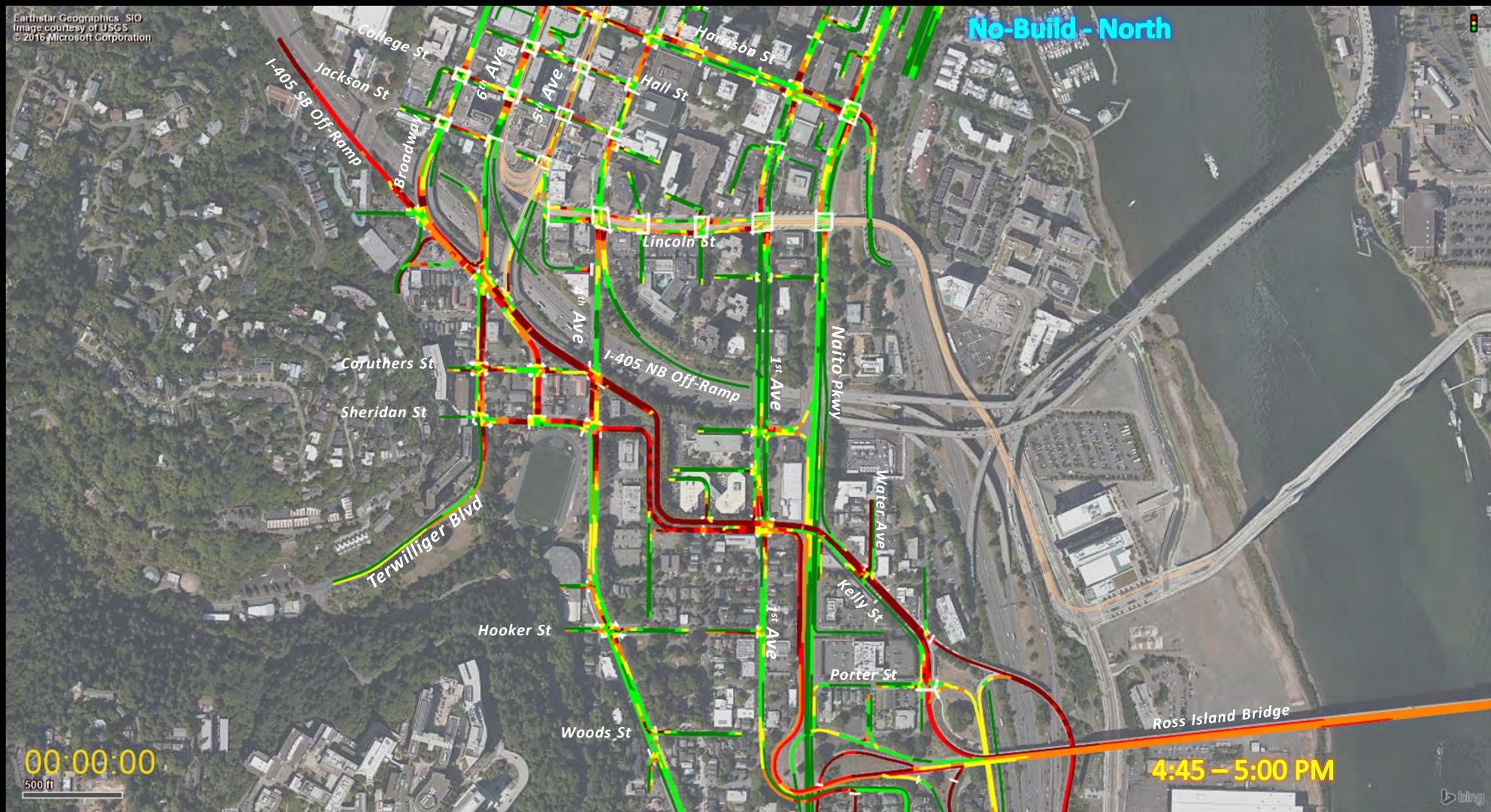
# No – Build: North

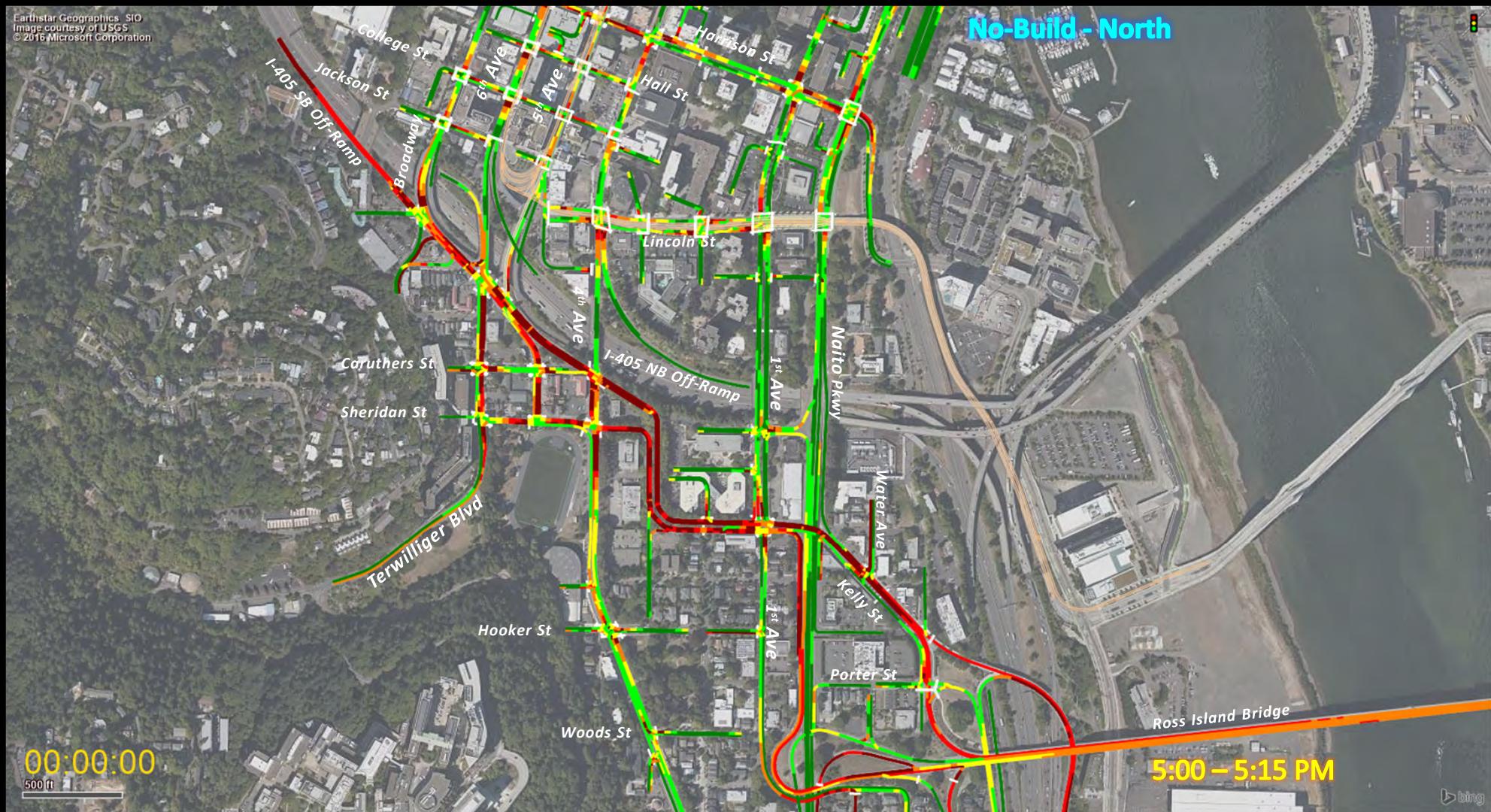
No LRT Alignment

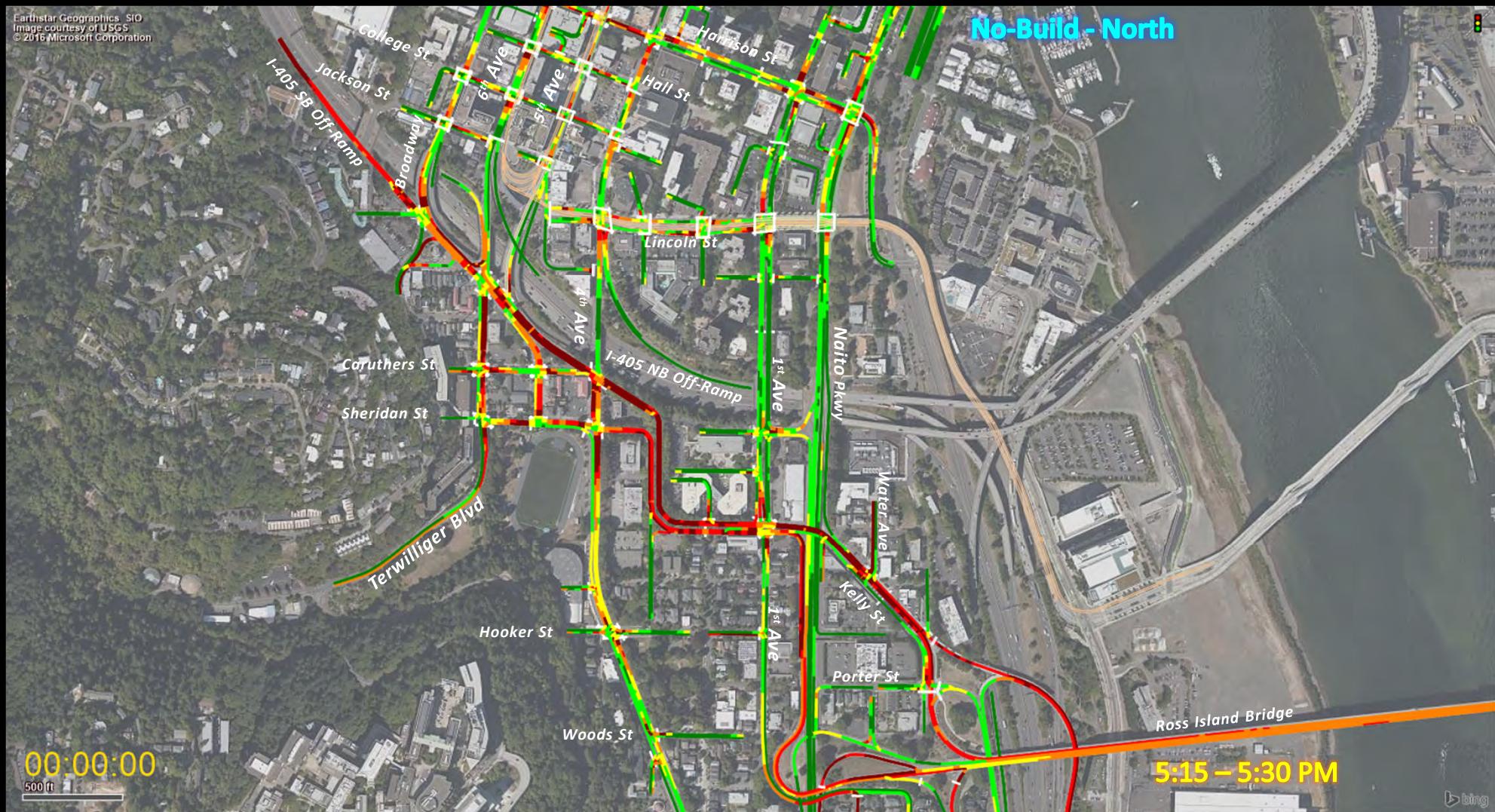


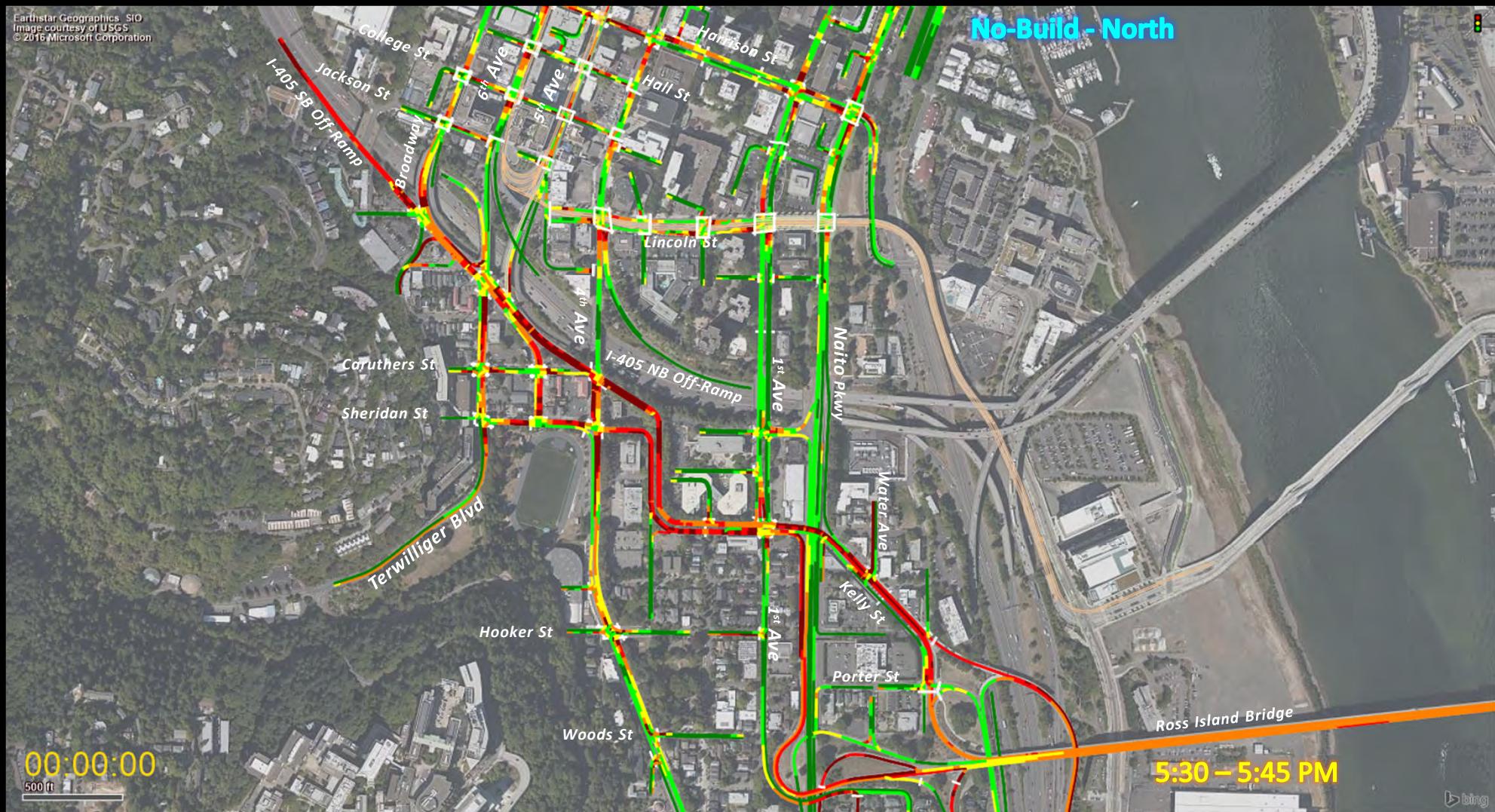


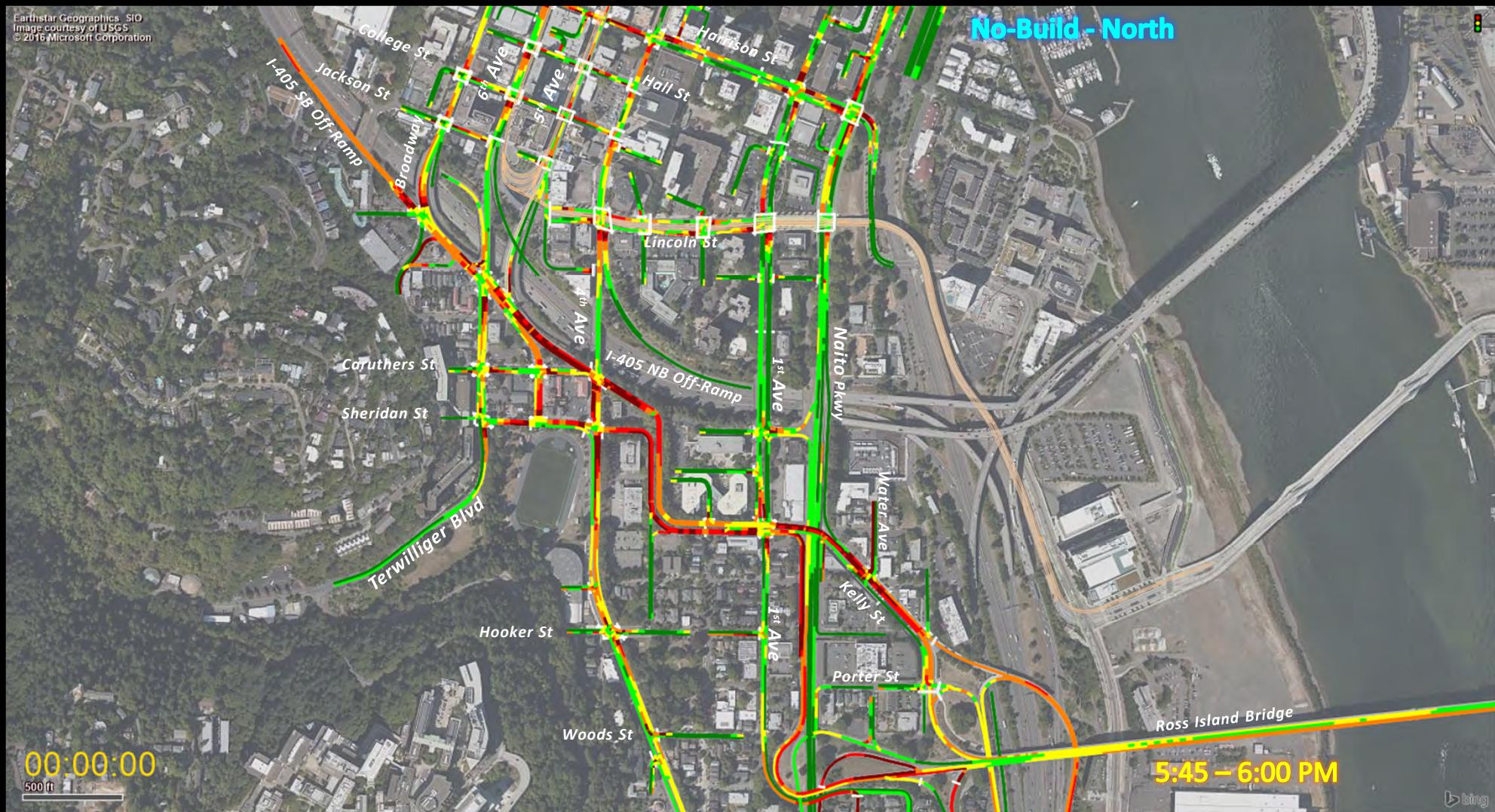










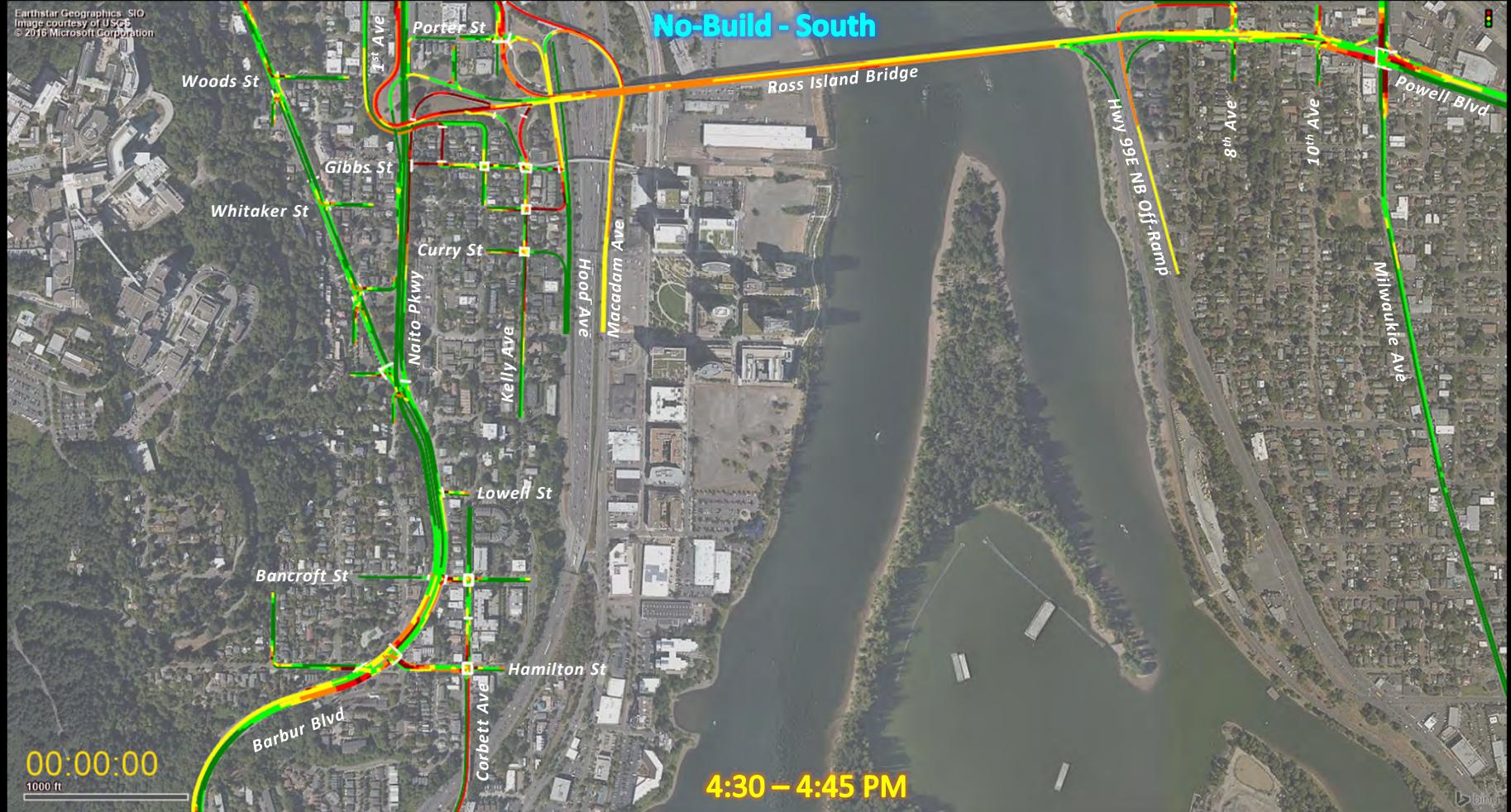


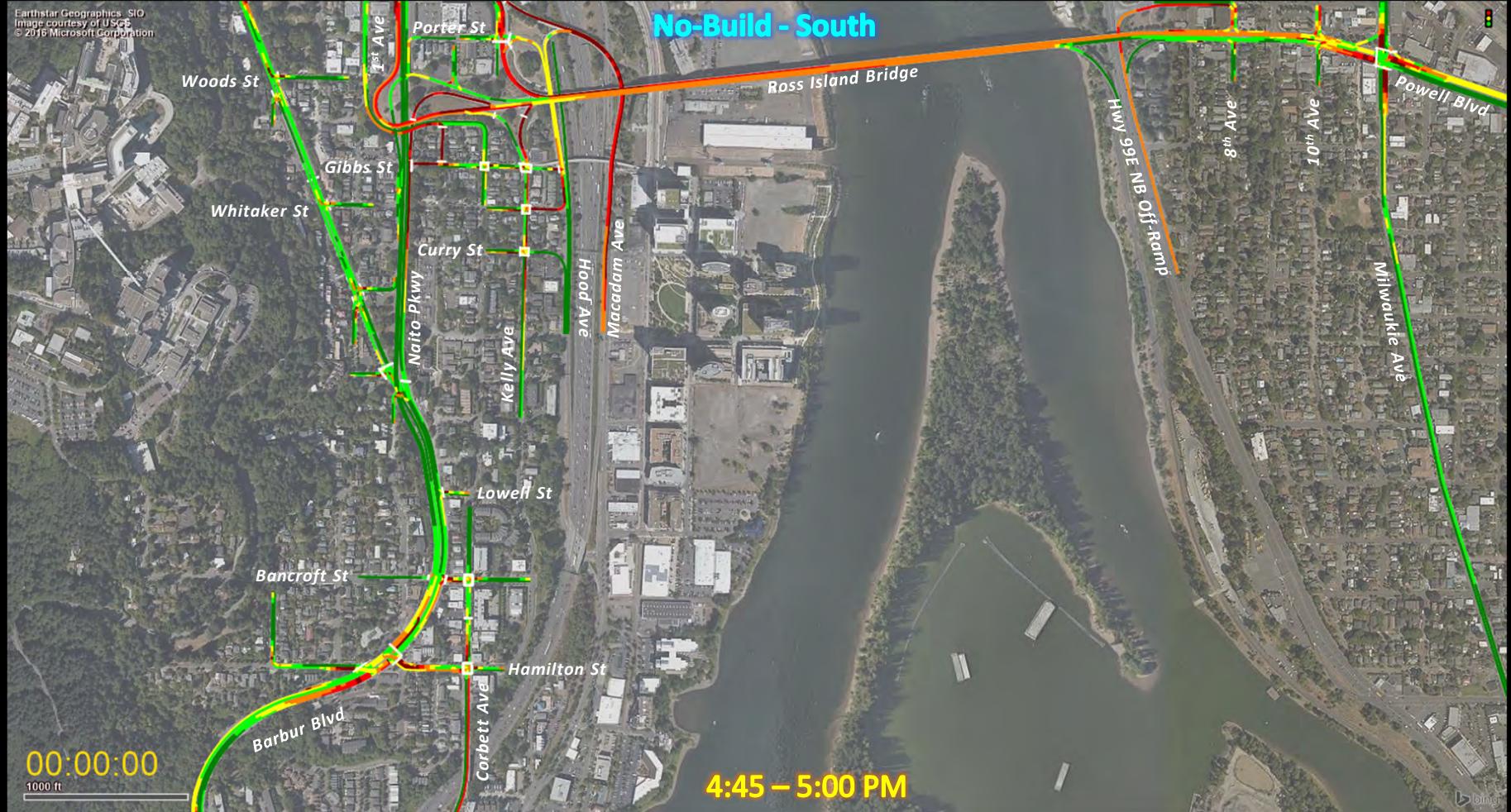
# No – Build: South

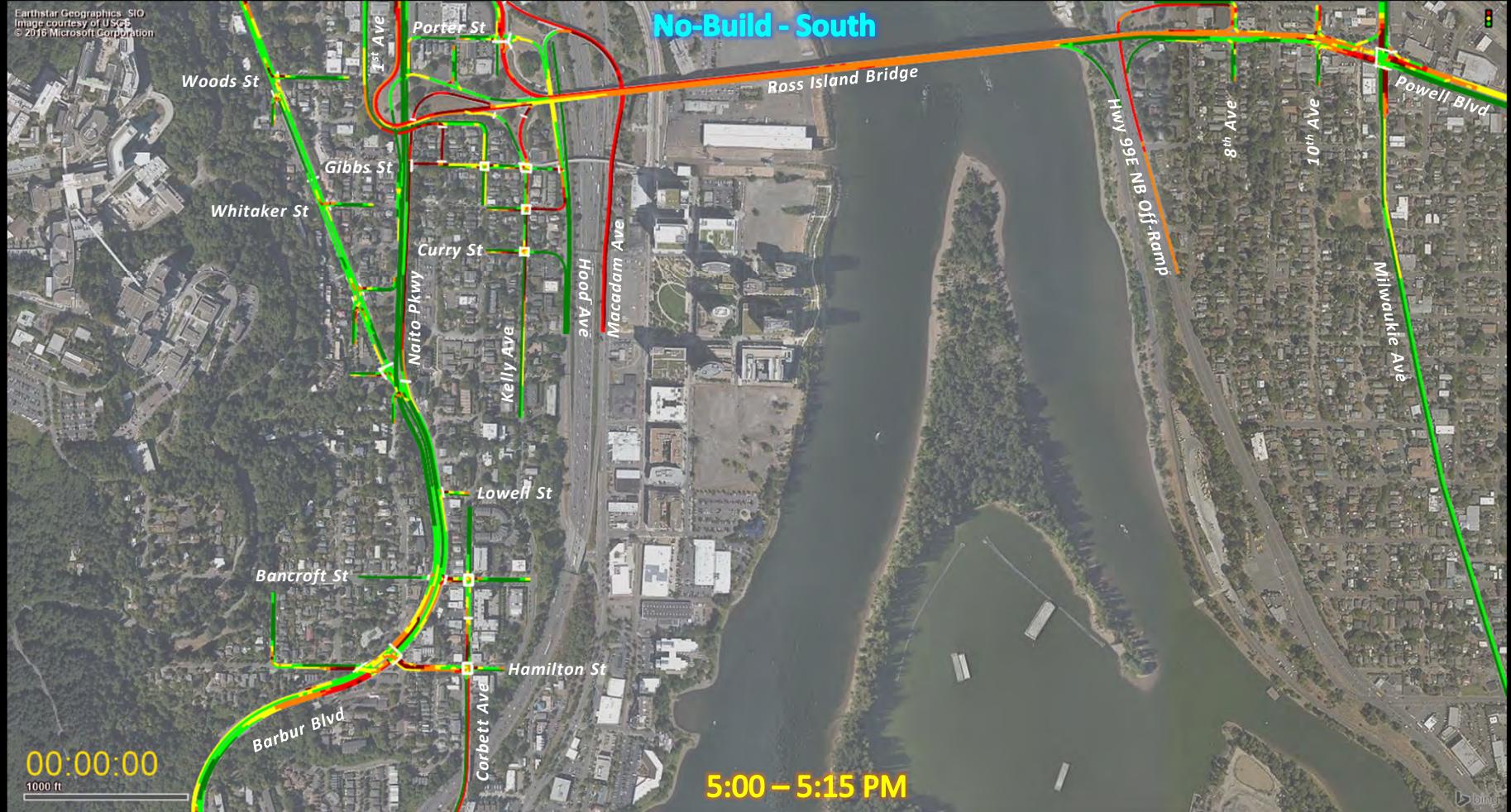
No LRT Alignment

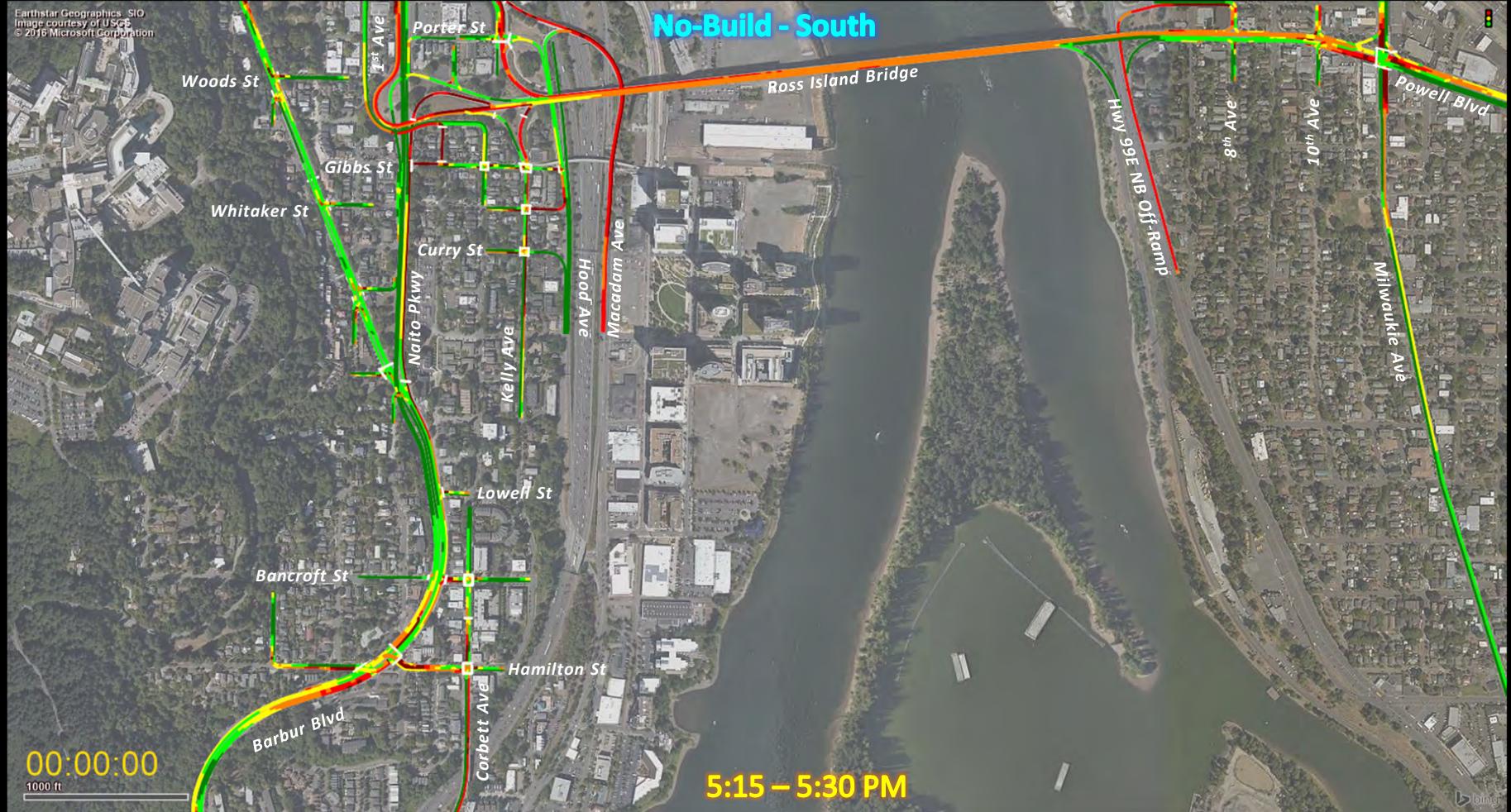


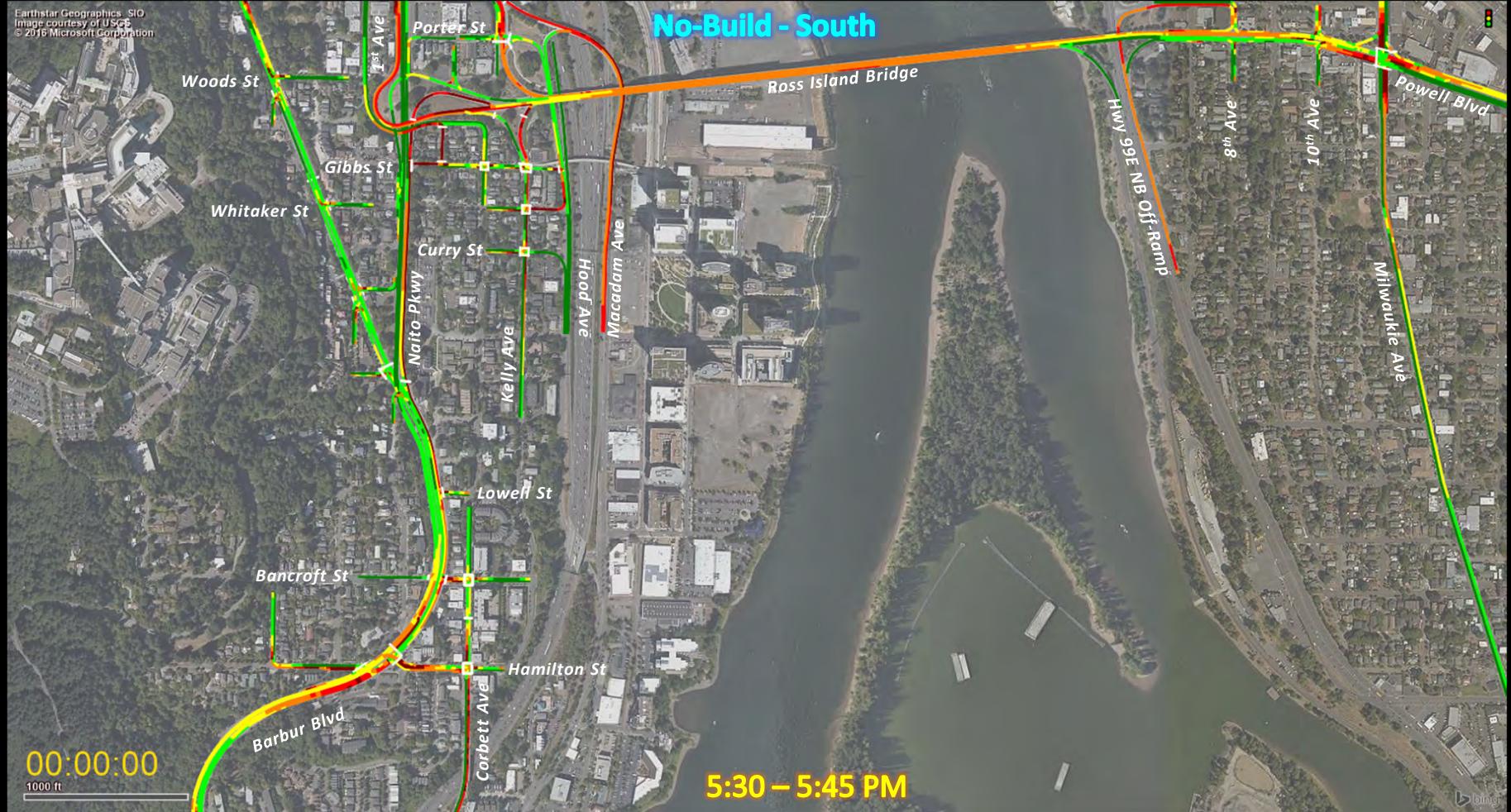


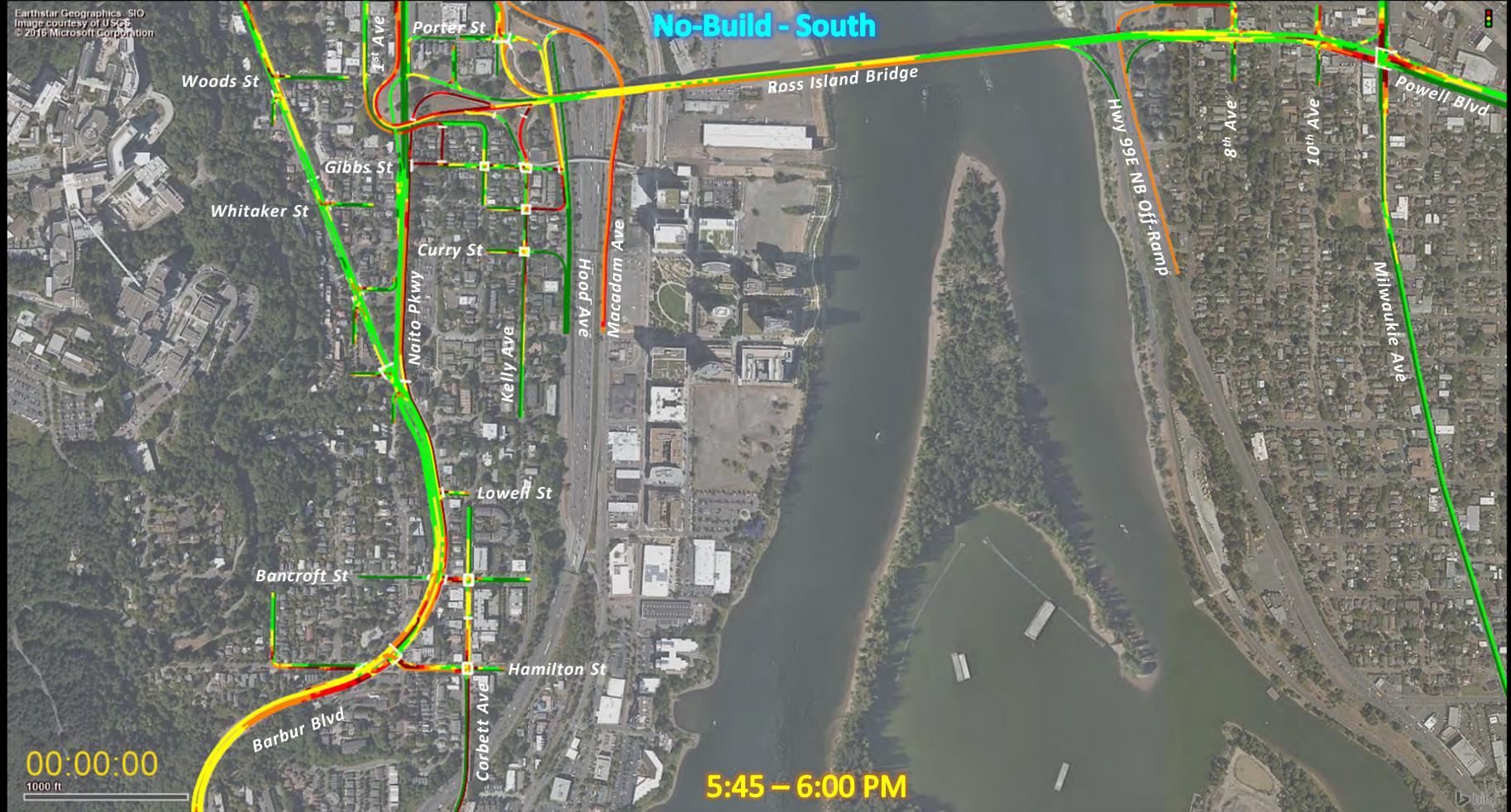












## **Attachment B: GEH Results**

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| 2035 No-Build PM Intersection GEH (4-6 p.m.) |  |          |               |                      |      |       |                    |     |
|--|--|----------|---------------|----------------------|------|-------|--------------------|-----|
| Intersection Number                          | Intersection Name                        | Movement | Input Volume* | VISSIM Output Volume | Diff | %Diff | Standard Deviation | GEH |
| 1  | SW 1st Ave @ SW Madison St               | SBL      | 345           | 338                  | -7   | -2%   | 21                 | 0.4 |
|  |  | SBT      | 1235          | 1235                 | 0    | 0%    | 21                 | 0.0 |
|  |  | EBT      | 3035          | 2981                 | -54  | -2%   | 14                 | 1.0 |
|  |  | EBR      | 100           | 100                  | 0    | 0%    | 13                 | 0.0 |
|  |  | Total    | 4715          | 4654                 | -61  | -1%   | 9                  | 0.9 |
| 2  | SW Naito Pkwy On-Ramp @ Hawthorne Bridge | NBR      | 635           | 607                  | -28  | -4%   | 22                 | 1.1 |
|  |  | EBT      | 3535          | 3374                 | -161 | -5%   | 20                 | 2.7 |
|  |  | Total    | 4170          | 3981                 | -189 | -5%   | 32                 | 3.0 |
| 3  | SW Naito Pkwy @ SW Jefferson St          | NBL      | 160           | 155                  | -5   | -3%   | 11                 | 0.4 |
|  |  | NBT      | 2230          | 2195                 | -35  | -2%   | 38                 | 0.7 |
|  |  | SBT      | 2685          | 2700                 | 15   | 1%    | 44                 | 0.3 |
|  |  | SBR      | 230           | 226                  | -4   | -2%   | 16                 | 0.3 |
|  |  | Total    | 5305          | 5276                 | -29  | -1%   | 53                 | 0.4 |
| 4  | SW Naito Pkwy @ SW Columbia St           | NBT      | 2610          | 2551                 | -59  | -2%   | 47                 | 1.2 |
|  |  | SBT      | 2685          | 2710                 | 25   | 1%    | 44                 | 0.5 |
|  |  | EBL      | 415           | 405                  | -10  | -2%   | 10                 | 0.5 |
|  |  | EBR      | 580           | 587                  | 7    | 1%    | 12                 | 0.3 |
|  |  | Total    | 6290          | 6253                 | -37  | -1%   | 50                 | 0.5 |
| 5  | SW 1st Ave @ SW Clay St                  | SBT      | 1245          | 1253                 | 8    | 1%    | 15                 | 0.2 |
|  |  | SBR      | 225           | 215                  | -10  | -4%   | 14                 | 0.7 |
|  |  | WBL      | 110           | 75                   | -35  | -32%  | 7                  | 3.6 |
|  |  | WBT      | 865           | 899                  | 34   | 4%    | 25                 | 1.1 |
|  |  | Total    | 2445          | 2442                 | -3   | 0%    | 26                 | 0.1 |
| 6  | SW Naito Pkwy @ SW Clay St               | NBL      | 90            | 73                   | -17  | -19%  | 8                  | 1.9 |
|  |  | NBT      | 1680          | 1587                 | -93  | -6%   | 38                 | 2.3 |
|  |  | SBT      | 3125          | 3154                 | 29   | 1%    | 32                 | 0.5 |
|  |  | SBR      | 140           | 141                  | 1    | 1%    | 12                 | 0.1 |
|  |  | WBL      | 90            | 93                   | 3    | 3%    | 6                  | 0.3 |
|  |  | WBT      | 745           | 759                  | 14   | 2%    | 22                 | 0.5 |
|  |  | WBR      | 930           | 964                  | 34   | 4%    | 20                 | 1.1 |
|  |  | Total    | 6800          | 6912                 | 112  | 2%    | 40                 | 1.4 |
| 7  | SW 1st Ave @ SW Market St                | SBL      | 610           | 622                  | 12   | 2%    | 18                 | 0.5 |
|  |  | SBT      | 745           | 706                  | -39  | -5%   | 14                 | 1.4 |
|  |  | EBT      | 1870          | 1841                 | -29  | -2%   | 26                 | 0.7 |
|  |  | EBR      | 675           | 668                  | -7   | -1%   | 26                 | 0.3 |
|  |  | Total    | 3900          | 3837                 | -63  | -2%   | 25                 | 1.0 |
| 8  | SW Naito Pkwy @ SW Market St             | NBT      | 1050          | 951                  | -99  | -9%   | 26                 | 3.1 |
|  |  | NBR      | 30            | 37                   | 7    | 23%   | 7                  | 1.2 |
|  |  | SBL      | 1600          | 1621                 | 21   | 1%    | 32                 | 0.5 |
|  |  | SBT      | 1615          | 1626                 | 11   | 1%    | 34                 | 0.3 |
|  |  | EBL      | 720           | 707                  | -13  | -2%   | 17                 | 0.5 |
|  |  | EBT      | 1265          | 1261                 | -4   | 0%    | 30                 | 0.1 |
|  |  | EBR      | 495           | 497                  | 2    | 0%    | 20                 | 0.1 |
|  |  | Total    | 6775          | 6700                 | -75  | -1%   | 42                 | 0.9 |
| 9  | SW 4th Ave @ SW Harrison St              | NBL      | 80            | 74                   | -6   | -8%   | 7                  | 0.7 |
|  |  | NBT      | 1295          | 1221                 | -74  | -6%   | 38                 | 2.1 |
|  |  | NBR      | 240           | 208                  | -32  | -13%  | 9                  | 2.1 |
|  |  | EBL      | 145           | 142                  | -3   | -2%   | 9                  | 0.3 |
|  |  | EBT      | 340           | 346                  | 6    | 2%    | 21                 | 0.3 |
|  |  | EBR      | 390           | 386                  | -4   | -1%   | 12                 | 0.2 |
|  |  | WBR      | 630           | 591                  | -39  | -6%   | 31                 | 1.6 |
|  |  | Total    | 3120          | 2969                 | -151 | -5%   | 41                 | 2.7 |
| 12   | SW 1st Ave @ SW Harrison St              | NBL      | 265           | 247                  | -18  | -7%   | 22                 | 1.1 |
|  |  | NBR      | 200           | 148                  | -52  | -26%  | 6                  | 3.9 |
|  |  | SBL      | 405           | 413                  | 8    | 2%    | 18                 | 0.4 |
|  |  | SBT      | 1040          | 971                  | -69  | -7%   | 31                 | 2.2 |
|  |  | SBR      | 195           | 216                  | 21   | 11%   | 13                 | 1.5 |
|  |  | EBT      | 460           | 433                  | -27  | -6%   | 19                 | 1.3 |
|  |  | EBR      | 175           | 171                  | -4   | -2%   | 13                 | 0.3 |
|  |  | WBL      | 80            | 66                   | -14  | -18%  | 10                 | 1.6 |
|  |  | WBT      | 555           | 513                  | -42  | -8%   | 30                 | 1.8 |
|  |  | Total    | 3375          | 3179                 | -196 | -6%   | 44                 | 3.4 |

| 2035 No-Build PM Intersection GEH (4-6 p.m.) |                                |          |               |                      |      |       |                    |      |
|--|--------------------------------|----------|---------------|----------------------|------|-------|--------------------|------|
| Intersection Number                          | Intersection Name              | Movement | Input Volume* | VISSIM Output Volume | Diff | %Diff | Standard Deviation | GEH  |
| 13   | SW Naito Pkwy @ SW Harrison St | NBL      | 390           | 325                  | -65  | -17%  | 18                 | 3.4  |
|  |                                | NBT      | 565           | 553                  | -12  | -2%   | 22                 | 0.5  |
|  |                                | NBR      | 200           | 166                  | -34  | -17%  | 14                 | 2.5  |
|  |                                | SBT      | 2045          | 2056                 | 11   | 1%    | 37                 | 0.2  |
|  |                                | SBR      | 100           | 104                  | 4    | 4%    | 10                 | 0.4  |
|  |                                | EBL      | 280           | 251                  | -29  | -10%  | 12                 | 1.8  |
|  |                                | EBT      | 220           | 200                  | -20  | -9%   | 12                 | 1.4  |
|  |                                | EBR      | 565           | 544                  | -21  | -4%   | 27                 | 0.9  |
|  |                                | WBL      | 305           | 296                  | -9   | -3%   | 12                 | 0.5  |
|  |                                | WBT      | 145           | 150                  | 5    | 3%    | 10                 | 0.4  |
|  |                                | WBR      | 20            | 20                   | 0    | 0%    | 5                  | 0.0  |
|  |                                | Total    | 4835          | 4665                 | -170 | -4%   | 56                 | 2.5  |
| 16   | SW 5th Ave @ SW Montgomery St  | SBT      | 620           | 611                  | -9   | -1%   | 2                  | 0.4  |
|  |                                | WBL      | 75            | 70                   | -5   | -7%   | 1                  | 0.6  |
|  |                                | Total    | 695           | 681                  | -14  | -2%   | 3                  | 0.5  |
| 17   | SW 6th Ave @ SW Harrison St    | NBL      | 35            | 33                   | -2   | -6%   | 5                  | 0.3  |
|  |                                | NBT      | 1015          | 934                  | -81  | -8%   | 31                 | 2.6  |
|  |                                | NBR      | 235           | 255                  | 20   | 9%    | 12                 | 1.3  |
|  |                                | EBL      | 85            | 88                   | 3    | 4%    | 6                  | 0.3  |
|  |                                | EBT      | 210           | 195                  | -15  | -7%   | 6                  | 1.1  |
|  |                                | WBT      | 175           | 171                  | -4   | -2%   | 13                 | 0.3  |
|  |                                | WBR      | 225           | 212                  | -13  | -6%   | 13                 | 0.9  |
|  |                                | Total    | 1980          | 1889                 | -91  | -5%   | 31                 | 2.1  |
| 18   | SW 5th Ave @ SW Harrison St    | SBL      | 210           | 206                  | -4   | -2%   | 13                 | 0.3  |
|  |                                | SBT      | 485           | 475                  | -10  | -2%   | 12                 | 0.5  |
|  |                                | EBT      | 275           | 282                  | 7    | 3%    | 13                 | 0.4  |
|  |                                | EBR      | 150           | 144                  | -6   | -4%   | 10                 | 0.5  |
|  |                                | WBL      | 70            | 66                   | -4   | -6%   | 6                  | 0.5  |
|  |                                | WBT      | 400           | 394                  | -6   | -2%   | 14                 | 0.3  |
|  |                                | Total    | 1590          | 1566                 | -24  | -2%   | 24                 | 0.6  |
| 19   | SW 6th Ave @ SW Hall St        | NBL      | 70            | 64                   | -6   | -9%   | 9                  | 0.7  |
|  |                                | NBT      | 1240          | 1159                 | -81  | -7%   | 26                 | 2.3  |
|  |                                | EBL      | 80            | 81                   | 1    | 1%    | 6                  | 0.1  |
|  |                                | EBT      | 145           | 126                  | -19  | -13%  | 7                  | 1.6  |
|  |                                | WBT      | 55            | 53                   | -2   | -4%   | 8                  | 0.3  |
|  |                                | WBR      | 75            | 82                   | 7    | 9%    | 10                 | 0.8  |
|  |                                | Total    | 1665          | 1565                 | -100 | -6%   | 31                 | 2.5  |
| 20   | SW 5th Ave @ SW Hall St        | SBL      | 70            | 74                   | 4    | 6%    | 7                  | 0.5  |
|  |                                | SBT      | 635           | 613                  | -22  | -3%   | 20                 | 0.9  |
|  |                                | EBT      | 70            | 31                   | -39  | -56%  | 3                  | 5.5  |
|  |                                | EBR      | 70            | 105                  | 35   | 50%   | 6                  | 3.7  |
|  |                                | WBL      | 60            | 0                    | -60  | -100% | 0                  | 11.0 |
|  |                                | WBT      | 205           | 153                  | -52  | -25%  | 13                 | 3.9  |
|  |                                | Total    | 1110          | 976                  | -134 | -12%  | 26                 | 4.1  |
| 21   | SW 4th Ave @ SW Hall St        | NBL      | 190           | 154                  | -36  | -19%  | 13                 | 2.7  |
|  |                                | NBT      | 1475          | 1398                 | -77  | -5%   | 36                 | 2.0  |
|  |                                | EBL      | 140           | 105                  | -35  | -25%  | 8                  | 3.2  |
|  |                                | Total    | 1805          | 1657                 | -148 | -8%   | 35                 | 3.6  |
|  |                                | SBL      | 145           | 138                  | -7   | -5%   | 13                 | 0.6  |
| 22   | SW Broadway @ SW College St    | SBT      | 1430          | 1438                 | 8    | 1%    | 25                 | 0.2  |
|  |                                | SBR      | 15            | 12                   | -3   | -20%  | 4                  | 0.8  |
|  |                                | EBT      | 25            | 23                   | -2   | -8%   | 3                  | 0.4  |
|  |                                | EBR      | 25            | 25                   | 0    | 0%    | 3                  | 0.0  |
|  |                                | WBL      | 370           | 286                  | -84  | -23%  | 20                 | 4.6  |
|  |                                | WBT      | 25            | 28                   | 3    | 12%   | 5                  | 0.6  |
|  |                                | Total    | 2035          | 1950                 | -85  | -4%   | 35                 | 1.9  |
| 23   | SW 6th Ave @ SW College St     | NBL      | 230           | 116                  | -114 | -50%  | 9                  | 8.7  |
|  |                                | NBT      | 1155          | 1142                 | -13  | -1%   | 30                 | 0.4  |
|  |                                | EBL      | 85            | 79                   | -6   | -7%   | 8                  | 0.7  |
|  |                                | EBT      | 85            | 82                   | -3   | -4%   | 12                 | 0.3  |
|  |                                | WBT      | 165           | 200                  | 35   | 21%   | 17                 | 2.6  |
|  |                                | WBR      | 70            | 3                    | -67  | -96%  | 2                  | 11.1 |

| 2035 No-Build PM Intersection GEH (4-6 p.m.) |                                   |          |               |                      |      |       |                    |     |
|--|-----------------------------------|----------|---------------|----------------------|------|-------|--------------------|-----|
| Intersection Number                          | Intersection Name                 | Movement | Input Volume* | VISSIM Output Volume | Diff | %Diff | Standard Deviation | GEH |
|  |                                   | Total    | 1790          | 1621                 | -169 | -9%   | 43                 | 4.1 |
| 24   | SW 5th Ave @ SW College St        | SBL      | 45            | 39                   | -6   | -13%  | 6                  | 0.9 |
|  |                                   | SBT      | 710           | 680                  | -30  | -4%   | 22                 | 1.1 |
|  |                                   | EBT      | 25            | 20                   | -5   | -20%  | 6                  | 1.1 |
|  |                                   | EBC      | 60            | 61                   | 1    | 2%    | 7                  | 0.1 |
|  |                                   | WBL      | 220           | 233                  | 13   | 6%    | 12                 | 0.9 |
|  |                                   | WBT      | 230           | 202                  | -28  | -12%  | 17                 | 1.9 |
|  |                                   | Total    | 1290          | 1236                 | -54  | -4%   | 47                 | 1.5 |
| 25   | SW 4th Ave @ SW College St        | NBL      | 450           | 439                  | -11  | -2%   | 27                 | 0.5 |
|  |                                   | NBT      | 1595          | 1492                 | -103 | -6%   | 39                 | 2.6 |
|  |                                   | EBL      | 70            | 59                   | -11  | -16%  | 9                  | 1.4 |
|  |                                   | Total    | 2115          | 1990                 | -125 | -6%   | 45                 | 2.8 |
| 26   | SW Broadway @ SW Jackson St       | SBL      | 95            | 85                   | -10  | -11%  | 6                  | 1.1 |
|  |                                   | SBT      | 1640          | 1575                 | -65  | -4%   | 26                 | 1.6 |
|  |                                   | SBR      | 90            | 92                   | 2    | 2%    | 10                 | 0.2 |
|  |                                   | EBT      | 75            | 71                   | -4   | -5%   | 7                  | 0.5 |
|  |                                   | EBC      | 100           | 101                  | 1    | 1%    | 7                  | 0.1 |
|  |                                   | WBL      | 365           | 391                  | 26   | 7%    | 14                 | 1.3 |
|  |                                   | WBT      | 20            | 20                   | 0    | 0%    | 5                  | 0.0 |
| 27   | SW 6th Ave @ SW Jackson St        | Total    | 2385          | 2335                 | -50  | -2%   | 41                 | 1.0 |
|  |                                   | NBL      | 385           | 410                  | 25   | 6%    | 14                 | 1.3 |
|  |                                   | NBT      | 825           | 737                  | -88  | -11%  | 28                 | 3.1 |
|  |                                   | EBL      | 165           | 156                  | -9   | -5%   | 11                 | 0.7 |
|  |                                   | WBR      | 390           | 369                  | -21  | -5%   | 1                  | 1.1 |
| 28   | SW 6th Ave @ I-405/Hwy 26 On-Ramp | Total    | 1765          | 1673                 | -92  | -5%   | 37                 | 2.2 |
|  |                                   | NBL      | 2735          | 2536                 | -199 | -7%   | 10                 | 3.9 |
| 29   | SW 5th Ave @ SW Jackson St        | Total    | 2735          | 2536                 | -199 | -7%   | 10                 | 3.9 |
|  |                                   | SBL      | 415           | 408                  | -7   | -2%   | 12                 | 0.3 |
|  |                                   | SBT      | 575           | 547                  | -28  | -5%   | 18                 | 1.2 |
|  |                                   | SBR      | 20            | 19                   | -1   | -5%   | 5                  | 0.2 |
|  |                                   | EBR      | 20            | 15                   | -5   | -25%  | 2                  | 1.2 |
| 30   | SW 5th Ave @ SW Lincoln St        | Total    | 1030          | 990                  | -40  | -4%   | 31                 | 1.3 |
|  |                                   | SBL      | 100           | 82                   | -18  | -18%  | 10                 | 1.9 |
|  |                                   | SBT      | 55            | 74                   | 19   | 35%   | 8                  | 2.4 |
|  |                                   | WBL      | 15            | 0                    | -15  | -100% | 0                  | 5.5 |
|  |                                   | WBU      | 120           | 113                  | -7   | -6%   | 12                 | 0.6 |
| 31   | SW 4th Ave @ SW Lincoln St        | Total    | 290           | 269                  | -21  | -7%   | 18                 | 1.3 |
|  |                                   | NBL      | 90            | 77                   | -13  | -14%  | 10                 | 1.4 |
|  |                                   | NBT      | 1290          | 1231                 | -59  | -5%   | 48                 | 1.7 |
|  |                                   | NWBT     | 240           | 239                  | -1   | 0%    | 15                 | 0.1 |
|  |                                   | NWBR     | 380           | 388                  | 8    | 2%    | 15                 | 0.4 |
|  |                                   | EBL      | 45            | 39                   | -6   | -13%  | 7                  | 0.9 |
|  |                                   | EBT      | 180           | 156                  | -24  | -13%  | 15                 | 1.9 |
|  |                                   | WBT      | 35            | 36                   | 1    | 3%    | 4                  | 0.2 |
| 32   | SW 3rd Ave @ SW Lincoln St        | WBR      | 360           | 303                  | -57  | -16%  | 17                 | 3.1 |
|  |                                   | Total    | 2620          | 2470                 | -150 | -6%   | 52                 | 3.0 |
|  |                                   | NBR      | 35            | 33                   | -2   | -6%   | 0                  | 0.3 |
|  |                                   | SBR      | 80            | 80                   | 0    | 0%    | 1                  | 0.0 |
|  |                                   | EBT      | 475           | 470                  | -5   | -1%   | 17                 | 0.2 |
|  |                                   | EBC      | 70            | 74                   | 4    | 6%    | 9                  | 0.5 |
|  |                                   | WBT      | 300           | 260                  | -40  | -13%  | 19                 | 2.4 |
| 33   | SW 2nd Ave @ SW Lincoln St        | WBR      | 15            | 14                   | -1   | -7%   | 3                  | 0.3 |
|  |                                   | Total    | 975           | 932                  | -43  | -4%   | 31                 | 1.4 |
|  |                                   | NBL      | 15            | 15                   | 0    | 0%    | 3                  | 0.0 |
|  |                                   | NBR      | 20            | 18                   | -2   | -10%  | 3                  | 0.5 |
|  |                                   | SBL      | 20            | 20                   | 0    | 0%    | 3                  | 0.0 |
|  |                                   | SBR      | 10            | 8                    | -2   | -20%  | 3                  | 0.7 |
|  |                                   | EBL      | 35            | 30                   | -5   | -14%  | 7                  | 0.9 |
|  |                                   | EBT      | 445           | 444                  | -1   | 0%    | 16                 | 0.0 |
|  |                                   | EBC      | 30            | 30                   | 0    | 0%    | 5                  | 0.0 |
|  |                                   | WBL      | 25            | 29                   | 4    | 16%   | 5                  | 0.8 |
|  |                                   | WBT      | 290           | 251                  | -39  | -13%  | 19                 | 2.4 |

| 2035 No-Build PM Intersection GEH (4-6 p.m.) |   |          |               |                      |      |       |                    |     |
|--|---|----------|---------------|----------------------|------|-------|--------------------|-----|
| Intersection Number                          | Intersection Name                               | Movement | Input Volume* | VISSIM Output Volume | Diff | %Diff | Standard Deviation | GEH |
|  |   | WBR      | 30            | 35                   | 5    | 17%   | 7                  | 0.9 |
| 34   | SW 1st Ave @ SW Lincoln St                      | Total    | 920           | 880                  | -40  | -4%   | 28                 | 1.3 |
|  |   | NBL      | 195           | 138                  | -57  | -29%  | 10                 | 4.4 |
|  |   | NBT      | 465           | 424                  | -41  | -9%   | 23                 | 1.9 |
|  |   | SBT      | 1220          | 1114                 | -106 | -9%   | 32                 | 3.1 |
|  |   | SBR      | 150           | 176                  | 26   | 17%   | 16                 | 2.0 |
|  |   | EBL      | 145           | 127                  | -18  | -12%  | 7                  | 1.5 |
|  |   | EBR      | 340           | 353                  | 13   | 4%    | 15                 | 0.7 |
| 35   | SW Naito Pkwy @ SW Lincoln St                   | Total    | 2515          | 2334                 | -181 | -7%   | 50                 | 3.7 |
|  |   | NBT      | 1175          | 1070                 | -105 | -9%   | 29                 | 3.1 |
|  |   | SBT      | 2920          | 2910                 | -10  | 0%    | 45                 | 0.2 |
| 36   | SW 4th Ave @ SW Grant St                        | Total    | 4095          | 3980                 | -115 | -3%   | 56                 | 1.8 |
|  |   | SBU      | 70            | 75                   | 5    | 7%    | 8                  | 0.6 |
| 37   | SW Broadway @ I-405 SB Off-Ramp/SW Lincoln St   | Total    | 70            | 75                   | 5    | 7%    | 8                  | 0.6 |
|  |   | NBR      | 675           | 577                  | -98  | -15%  | 33                 | 3.9 |
|  |   | SBL      | 1035          | 1010                 | -25  | -2%   | 26                 | 0.8 |
|  |   | SBT      | 370           | 371                  | 1    | 0%    | 19                 | 0.1 |
|  |   | SBR      | 10            | 10                   | 0    | 0%    | 3                  | 0.0 |
|  |   | EBT      | 2489          | 2244                 | -245 | -10%  | 43                 | 5.0 |
|  |   | EBR      | 255           | 241                  | -14  | -5%   | 14                 | 0.9 |
| 38   | SW Broadway @ SW Grant St/SW 6th Ave            | EBU      | 20            | 18                   | -2   | -10%  | 4                  | 0.5 |
|  |   | Total    | 4854          | 4472                 | -382 | -8%   | 97                 | 5.6 |
|  |   | NBT      | 985           | 1004                 | 19   | 2%    | 26                 | 0.6 |
|  |   | EBL      | 390           | 407                  | 17   | 4%    | 16                 | 0.9 |
|  |   | EBT      | 2799          | 2510                 | -289 | -10%  | 67                 | 5.6 |
|  |   | EBR      | 995           | 984                  | -11  | -1%   | 36                 | 0.3 |
| 39   | SW Broadway @ SW 5th Ave                        | WBR      | 2570          | 2275                 | -295 | -11%  | 49                 | 6.0 |
|  |   | Total    | 7739          | 7179                 | -560 | -7%   | 96                 | 6.5 |
|  |   | SBT      | 420           | 403                  | -17  | -4%   | 18                 | 0.8 |
|  |   | EBR      | 2550          | 2511                 | -39  | -2%   | 69                 | 0.8 |
| 40   | SW 4th Ave @ SW Caruthers St                    | WBT      | 2570          | 2277                 | -293 | -11%  | 50                 | 6.0 |
|  |   | Total    | 5540          | 5190                 | -350 | -6%   | 100                | 4.8 |
|  |   | NBL      | 5             | 5                    | 0    | 0%    | 2                  | 0.0 |
|  |   | NBT      | 875           | 891                  | 16   | 2%    | 14                 | 0.5 |
|  |   | SBT      | 970           | 957                  | -13  | -1%   | 35                 | 0.4 |
|  |   | SBR      | 25            | 28                   | 3    | 12%   | 6                  | 0.6 |
|  |   | EBL      | 45            | 40                   | -5   | -11%  | 4                  | 0.8 |
|  |   | EBR      | 15            | 17                   | 2    | 13%   | 4                  | 0.5 |
| 41   | SW 5th Ave @ SW Caruthers St                    | WBL      | 165           | 145                  | -20  | -12%  | 13                 | 1.6 |
|  |   | WBT      | 10            | 9                    | -1   | -10%  | 3                  | 0.3 |
|  |   | WBR      | 70            | 63                   | -7   | -10%  | 6                  | 0.9 |
|  |   | Total    | 2180          | 2157                 | -23  | -1%   | 39                 | 0.5 |
|  |   | SBT      | 3124          | 2835                 | -289 | -9%   | 83                 | 5.3 |
| 42   | SW 4th Ave @ SW Caruthers St/SW Broadway        | SBR      | 100           | 82                   | -18  | -18%  | 8                  | 1.9 |
|  |   | WBL      | 25            | 16                   | -9   | -36%  | 4                  | 2.0 |
|  |   | WBT      | 145           | 136                  | -9   | -6%   | 15                 | 0.8 |
|  |   | Total    | 3394          | 3070                 | -324 | -10%  | 88                 | 5.7 |
|  |   | NBL      | 525           | 454                  | -71  | -14%  | 13                 | 3.2 |
| 43   | SW 5th Ave @ SW Sheridan St                     | NBT      | 1135          | 1058                 | -77  | -7%   | 40                 | 2.3 |
|  |   | WBT      | 2255          | 1986                 | -269 | -12%  | 43                 | 5.8 |
|  |   | WBR      | 175           | 185                  | 10   | 6%    | 9                  | 0.7 |
|  |   | Total    | 4090          | 3683                 | -407 | -10%  | 95                 | 6.5 |
|  |   | SBL      | 3149          | 2852                 | -297 | -9%   | 61                 | 5.4 |
| 44   | SW 5th Ave @ SW Sheridan St                     | EBT      | 600           | 542                  | -58  | -10%  | 11                 | 2.4 |
|  |   | Total    | 3749          | 3395                 | -354 | -9%   | 96                 | 5.9 |
|  |   | NBT      | 880           | 882                  | 2    | 0%    | 16                 | 0.1 |
|  |   | NBR      | 395           | 392                  | -3   | -1%   | 14                 | 0.2 |
|  |   | SBL      | 205           | 143                  | -62  | -30%  | 14                 | 4.7 |
|  |   | SBT      | 915           | 945                  | 30   | 3%    | 32                 | 1.0 |
|  | SW 6th Ave/SW Terwilliger Blvd @ SW Sheridan St | SBR      | 30            | 32                   | 2    | 7%    | 6                  | 0.4 |
|  |   | Total    | 2425          | 2394                 | -31  | -1%   | 45                 | 0.6 |
|  |   | NBT      | 1450          | 1344                 | -106 | -7%   | 40                 | 2.8 |

| 2035 No-Build PM Intersection GEH (4-6 p.m.) |  |          |               |                      |      |       |                    |     |
|--|--|----------|---------------|----------------------|------|-------|--------------------|-----|
| Intersection Number                          | Intersection Name                          | Movement | Input Volume* | VISSIM Output Volume | Diff | %Diff | Standard Deviation | GEH |
| 45   | SW 4th Ave/SW Barbur Blvd @ SW Sheridan St | NBR      | 150           | 138                  | -12  | -8%   | 12                 | 1.0 |
|  |  | EBL      | 210           | 176                  | -34  | -16%  | 12                 | 2.4 |
|  |  | EBT      | 1944          | 1745                 | -199 | -10%  | 64                 | 4.6 |
|  |  | EBR      | 1495          | 1478                 | -17  | -1%   | 42                 | 0.4 |
|  |  | Total    | 5249          | 4881                 | -368 | -7%   | 117                | 5.2 |
| 46   | SW 1st Ave @ SW Sheridan St                | NBL      | 5             | 4                    | -1   | -20%  | 2                  | 0.5 |
|  |  | NBT      | 350           | 339                  | -11  | -3%   | 24                 | 0.6 |
|  |  | NBR      | 290           | 364                  | 74   | 26%   | 44                 | 4.1 |
|  |  | SBL      | 765           | 692                  | -73  | -10%  | 19                 | 2.7 |
|  |  | SBT      | 800           | 776                  | -24  | -3%   | 22                 | 0.9 |
|  |  | SBR      | 5             | 6                    | 1    | 20%   | 2                  | 0.4 |
|  |  | EBL      | 10            | 10                   | 0    | 0%    | 2                  | 0.0 |
|  |  | EBT      | 10            | 10                   | 0    | 0%    | 3                  | 0.0 |
|  |  | EBR      | 20            | 20                   | 0    | 0%    | 3                  | 0.0 |
|  |  | WBL      | 50            | 49                   | -1   | -2%   | 4                  | 0.1 |
|  |  | WBR      | 60            | 47                   | -13  | -22%  | 6                  | 1.8 |
|  |  | Total    | 2365          | 2315                 | -50  | -2%   | 40                 | 1.0 |
| 47   | SW Naito Pkwy @ SW Sheridan St             | EBT      | 1065          | 1067                 | 2    | 0%    | 45                 | 0.1 |
|  |  | WBT      | 110           | 97                   | -13  | -12%  | 9                  | 1.3 |
|  |  | Total    | 1175          | 1163                 | -12  | -1%   | 46                 | 0.4 |
| 48   | SW 1st Ave @ SW Arthur St                  | NBL      | 60            | 77                   | 17   | 28%   | 8                  | 2.1 |
|  |  | NBT      | 125           | 159                  | 34   | 27%   | 10                 | 2.9 |
|  |  | NBR      | 245           | 215                  | -30  | -12%  | 12                 | 2.0 |
|  |  | SBL      | 235           | 230                  | -5   | -2%   | 16                 | 0.3 |
|  |  | SBT      | 635           | 606                  | -29  | -5%   | 19                 | 1.2 |
|  |  | SBR      | 145           | 148                  | 3    | 2%    | 11                 | 0.2 |
|  |  | EBL      | 65            | 97                   | 32   | 49%   | 7                  | 3.6 |
|  |  | EBT      | 2249          | 1956                 | -293 | -13%  | 64                 | 6.4 |
|  |  | EBR      | 145           | 112                  | -33  | -23%  | 13                 | 2.9 |
|  |  | WBT      | 2035          | 1841                 | -194 | -10%  | 56                 | 4.4 |
|  |  | WBR      | 455           | 448                  | -7   | -2%   | 44                 | 0.3 |
|  |  | Total    | 6394          | 5889                 | -505 | -8%   | 92                 | 6.4 |
| 49   | SW Naito Pkwy @ SW Arthur St               | EBT      | 355           | 323                  | -32  | -9%   | 23                 | 1.7 |
|  |  | EBR      | 2374          | 2082                 | -292 | -12%  | 66                 | 6.2 |
|  |  | Total    | 2729          | 2405                 | -324 | -12%  | 77                 | 6.4 |
| 50   | SW Naito Pkwy @ SW Kelly St                | NBL      | 2455          | 2294                 | -161 | -7%   | 72                 | 3.3 |
|  |  | NBT      | 710           | 598                  | -112 | -16%  | 32                 | 4.4 |
|  |  | Total    | 3165          | 2892                 | -273 | -9%   | 87                 | 5.0 |
| 51   | SW Water St @ SW Kelly St                  | NBT      | 2895          | 2697                 | -198 | -7%   | 92                 | 3.7 |
|  |  | NBR      | 320           | 302                  | -18  | -6%   | 31                 | 1.0 |
|  |  | SBL      | 115           | 124                  | 9    | 8%    | 13                 | 0.8 |
|  |  | SBT      | 305           | 268                  | -37  | -12%  | 21                 | 2.2 |
|  |  | WBL      | 125           | 100                  | -25  | -20%  | 21                 | 2.4 |
|  |  | WBR      | 270           | 166                  | -104 | -39%  | 22                 | 7.0 |
|  |  | Total    | 4030          | 3657                 | -373 | -9%   | 96                 | 6.0 |
| 52   | SW Barbur Blvd @ SW Hooker St              | NBL      | 15            | 16                   | 1    | 7%    | 4                  | 0.3 |
|  |  | NBT      | 1515          | 1426                 | -89  | -6%   | 38                 | 2.3 |
|  |  | NBR      | 90            | 89                   | -1   | -1%   | 8                  | 0.1 |
|  |  | SBL      | 165           | 162                  | -3   | -2%   | 11                 | 0.2 |
|  |  | SBT      | 1320          | 1305                 | -15  | -1%   | 36                 | 0.4 |
|  |  | SBR      | 10            | 9                    | -1   | -10%  | 2                  | 0.3 |
|  |  | EBL      | 5             | 3                    | -2   | -40%  | 1                  | 1.0 |
|  |  | EBT      | 5             | 4                    | -1   | -20%  | 2                  | 0.5 |
|  |  | EBR      | 5             | 3                    | -2   | -40%  | 1                  | 1.0 |
|  |  | WBL      | 60            | 59                   | -1   | -2%   | 6                  | 0.1 |
|  |  | WBT      | 5             | 0                    | -5   | -100% | 0                  | 3.2 |
|  |  | WBR      | 90            | 89                   | -1   | -1%   | 6                  | 0.1 |
|  |  | Total    | 3285          | 3164                 | -121 | -4%   | 67                 | 2.1 |
| 53   | SW Naito Pkwy @ SW Hooker St               | NBT      | 635           | 571                  | -64  | -10%  | 22                 | 2.6 |
|  |  | SBT      | 2130          | 2068                 | -62  | -3%   | 44                 | 1.4 |
|  |  | SBR      | 1735          | 1833                 | 98   | 6%    | 42                 | 2.3 |
|  |  | EBR      | 2120          | 2093                 | -27  | -1%   | 63                 | 0.6 |

| 2035 No-Build PM Intersection GEH (4-6 p.m.) |  |   |  |  |  |  |   |   |
|--|--|---|--|--|--|--|---|---|
| Intersection Number                          | Intersection Name                              | Movement  | Input Volume*  | VISSIM Output Volume                                       | Diff   | %Diff  | Standard Deviation                              | GEH   |
|  |  | WBR<br>Total  | 60<br>6680   | 57<br>6621   | -3<br>-59  | -5%<br>-1%   | 0<br>64   | 0.4<br>0.7  |
| 54   | SW Corbett Ave/SW Kelly St @ SW Macadam Ave    | NBT   | 1810   | 1686   | -124   | -7%  | 136   | 3.0   |
|  |  | WBT   | 1405   | 1329   | -76  | -5%  | 99  | 2.1   |
|  |  | WBR   | 165  | 146  | -19  | -12%   | 21  | 1.5   |
|  |  | Total   | 3380   | 3161   | -219   | -6%  | 107   | 3.8   |
| 55   | SW Naito Pkwy @ SW Porter St                   | NBR<br>Total  | 30<br>30   | 5<br>5   | -25<br>-25   | -83%<br>-83%   | 3<br>3  | 6.0<br>6.0  |
| 56   | Kelly St/SW Corbett Ave @ SW Porter St/SW Hood | NBT   | 1810   | 1690   | -120   | -7%  | 137   | 2.9   |
|  |  | NBR   | 1460   | 1431   | -29  | -2%  | 115   | 0.8   |
|  |  | SBL   | 305  | 220  | -85  | -28%   | 23  | 5.2   |
|  |  | SBT   | 65   | 93   | 28   | 43%  | 12  | 3.2   |
|  |  | SBR   | 60   | 77   | 17   | 28%  | 11  | 2.1   |
|  |  | EBR   | 25   | 17   | -8   | -32%   | 0   | 1.7   |
|  |  | Total   | 3725   | 3527   | -198   | -5%  | 225   | 3.3   |
| 58   | SW Barbur Blvd @ SW Woods St                   | NBL   | 5  | 5  | 0  | 0%   | 3   | 0.0   |
|  |  | NBT   | 1585   | 1505   | -80  | -5%  | 38  | 2.0   |
|  |  | NBR   | 395  | 392  | -3   | -1%  | 17  | 0.2   |
|  |  | SBL   | 255  | 251  | -4   | -2%  | 21  | 0.3   |
|  |  | SBT   | 1150   | 1110   | -40  | -3%  | 28  | 1.2   |
|  |  | SBR   | 10   | 6  | -4   | -40%   | 3   | 1.4   |
|  |  | EBL   | 10   | 8  | -2   | -20%   | 1   | 0.7   |
|  |  | EBR   | 5  | 4  | -1   | -20%   | 1   | 0.5   |
|  |  | WBL   | 25   | 23   | -2   | -8%  | 4   | 0.4   |
|  |  | WBR   | 35   | 33   | -2   | -6%  | 4   | 0.3   |
|  |  | Total   | 3475   | 3337   | -138   | -4%  | 63  | 2.4   |
| 59   | SW Water Ave @ Ross Island Bridge              | SBR<br>WBT<br>WBR<br>Total                                    | 100<br>1665<br>30<br>1795                                  | 97<br>1588<br>30<br>1714                                   | -3<br>-77<br>0<br>-81                                  | -3%<br>-5%<br>0%<br>-5%                                      | 1<br>124<br>6<br>124                            | 0.3<br>1.9<br>0.0<br>1.9                                    |
| 60   | SW Hood Ave @ SW Macadam Ave                   | EBR<br>WBL<br>Total   | 1765<br>1090<br>2855                                       | 1654<br>925<br>2579  | -111<br>-165<br>-276                                   | -6%<br>-15%<br>-10%  | 106<br>63<br>123                                | 2.7<br>5.2<br>5.3   |
| 61   | SW Naito Pkwy @ Ross Island Bridge             | NBR<br>EBT<br>Total   | 1560<br>3709<br>5269                                       | 1450<br>3513<br>4963                                       | -110<br>-196<br>-306                                   | -7%<br>-5%<br>-6%  | 24<br>54<br>52                                  | 2.8<br>3.3<br>4.3   |
| 62   | Kelly Ramps @ Ross Island Bridge               | NBR<br>Total  | 1505<br>1505   | 1383<br>1383   | -122<br>-122   | -8%<br>-8%   | 20<br>20  | 3.2<br>3.2  |
| 63   | Hwy 99E SB @ Ross Island Bridge EB             | EBT<br>EBR<br>Total   | 4281<br>2494<br>6775                                       | 4098<br>2307<br>6405                                       | -183<br>-187<br>-370                                   | -4%<br>-7%<br>-5%  | 58<br>28<br>64                                  | 2.8<br>3.8<br>4.6   |
| 64   | Hwy 99E NB @ Ross Island Bridge EB             | NBR<br>EBT<br>Total   | 70<br>4281<br>4351   | 65<br>4093<br>4158   | -5<br>-188<br>-193                                     | -7%<br>-4%<br>-4%  | 1<br>61<br>61                                   | 0.6<br>2.9<br>3.0   |
| 65   | SE 8th Ave @ SE Powell Blvd                    | NBR<br>SBR<br>EBT<br>EBR<br>WBT<br>WBR<br>Total               | 20<br>1795<br>4170<br>80<br>3170<br>130<br>9365            | 16<br>1640<br>4084<br>69<br>3077<br>144<br>9030            | -4<br>-155<br>-86<br>-11<br>-93<br>14<br>-335          | -20%<br>-9%<br>-2%<br>-14%<br>-3%<br>11%<br>-4%              | 0<br>189<br>59<br>8<br>170<br>8<br>375          | 0.9<br>3.7<br>1.3<br>1.3<br>1.7<br>1.2<br>3.5               |
|  |  | NBR<br>SBR<br>EBL<br>EBT<br>EBR<br>WBL<br>WBT<br>WBR<br>Total | 25<br>180<br>645<br>3525<br>20<br>15<br>3120<br>65<br>7595 | 23<br>177<br>612<br>3463<br>17<br>17<br>3052<br>76<br>7436 | -2<br>-3<br>-33<br>-62<br>-3<br>2<br>-68<br>11<br>-159 | -8%<br>-2%<br>-5%<br>-2%<br>-15%<br>13%<br>-2%<br>17%<br>-2% | 0<br>1<br>21<br>59<br>5<br>5<br>167<br>8<br>204 | 0.4<br>0.2<br>1.3<br>1.0<br>0.7<br>0.5<br>1.2<br>1.3<br>1.8 |
|  |  | NBL<br>NBT  | 370<br>460   | 357<br>447   | -13<br>-13   | -4%<br>-3%   | 17<br>31  | 0.7<br>0.6  |

| 2035 No-Build PM Intersection GEH (4-6 p.m.) |   |          |               |                      |      |       |                    |     |
|--|---|----------|---------------|----------------------|------|-------|--------------------|-----|
| Intersection Number                          | Intersection Name                       | Movement | Input Volume* | VISSIM Output Volume | Diff | %Diff | Standard Deviation | GEH |
| 67   | SE Milwaukie Ave @ SE Powell Blvd       | NBR      | 190           | 189                  | -1   | -1%   | 22                 | 0.1 |
|  |   | SBL      | 815           | 815                  | 0    | 0%    | 28                 | 0.0 |
|  |   | SBT      | 570           | 566                  | -4   | -1%   | 24                 | 0.2 |
|  |   | SBR      | 215           | 211                  | -4   | -2%   | 14                 | 0.3 |
|  |   | EBT      | 3460          | 3307                 | -153 | -4%   | 54                 | 2.6 |
|  |   | EBR      | 190           | 193                  | 3    | 2%    | 15                 | 0.2 |
|  |   | WBL      | 230           | 217                  | -13  | -6%   | 16                 | 0.9 |
|  |   | WBT      | 2615          | 2548                 | -67  | -3%   | 209                | 1.3 |
|  |   | WBR      | 490           | 477                  | -13  | -3%   | 36                 | 0.6 |
|  |   | Total    | 9605          | 9327                 | -278 | -3%   | 350                | 2.9 |
| 68   | SW Water Ave @ SW Grover St             | EBT      | 745           | 672                  | -73  | -10%  | 17                 | 2.7 |
|  |   | EBR      | 385           | 433                  | 48   | 12%   | 12                 | 2.4 |
|  |   | WBT      | 125           | 154                  | 29   | 23%   | 7                  | 2.5 |
|  |   | Total    | 1255          | 1259                 | 4    | 0%    | 20                 | 0.1 |
| 69   | SW Naito Pkwy @ SW Gibbs St/Naito Ramps | NBT      | 1600          | 1455                 | -145 | -9%   | 29                 | 3.7 |
|  |   | NBR      | 10            | 0                    | -10  | -100% | 0                  | 4.5 |
|  |   | WBR      | 625           | 571                  | -54  | -9%   | 18                 | 2.2 |
|  |   | Total    | 2235          | 2026                 | -209 | -9%   | 34                 | 4.5 |
| 70   | SW Kelly Ave @ SW Gibbs St              | NBL      | 5             | 16                   | 11   | 220%  | 4                  | 3.4 |
|  |   | NBT      | 1425          | 1302                 | -123 | -9%   | 20                 | 3.3 |
|  |   | NBR      | 5             | 0                    | -5   | -100% | 0                  | 3.2 |
|  |   | SBL      | 15            | 8                    | -7   | -47%  | 4                  | 2.1 |
|  |   | SBT      | 375           | 418                  | 43   | 11%   | 16                 | 2.2 |
|  |   | SBR      | 10            | 17                   | 7    | 70%   | 5                  | 1.9 |
|  |   | EBR      | 225           | 216                  | -9   | -4%   | 12                 | 0.6 |
| 71   | SW Barbur Blvd @ SW Whitaker St         | Total    | 2140          | 2056                 | -84  | -4%   | 28                 | 1.8 |
|  |   | NBR      | 125           | 119                  | -6   | -5%   | 13                 | 0.5 |
|  |   | SBL      | 30            | 29                   | -1   | -3%   | 4                  | 0.2 |
|  |   | WBL      | 45            | 43                   | -2   | -4%   | 4                  | 0.3 |
|  |   | WBR      | 25            | 22                   | -3   | -12%  | 4                  | 0.6 |
| 72   | SW Naito Pkwy @ SW Whitaker St          | Total    | 225           | 213                  | -12  | -5%   | 12                 | 0.8 |
|  |   | SBT      | 3810          | 3669                 | -141 | -4%   | 136                | 2.3 |
|  |   | SBR      | 85            | 83                   | -2   | -2%   | 8                  | 0.2 |
|  |   | EBR      | 5             | 4                    | -1   | -20%  | 1                  | 0.5 |
|  |   | EBU      | 40            | 37                   | -3   | -8%   | 1                  | 0.5 |
| 73   | SW Kelly Ave @ SW Whitaker St           | Total    | 3940          | 3792                 | -148 | -4%   | 137                | 2.4 |
|  |   | NBL      | 15            | 0                    | -15  | -100% | 0                  | 5.5 |
|  |   | NBT      | 480           | 497                  | 17   | 4%    | 15                 | 0.8 |
|  |   | SBT      | 590           | 624                  | 34   | 6%    | 23                 | 1.4 |
|  |   | SBR      | 10            | 10                   | 0    | 0%    | 3                  | 0.0 |
|  |   | EBL      | 405           | 402                  | -3   | -1%   | 5                  | 0.1 |
|  |   | EBR      | 5             | 4                    | -1   | -20%  | 2                  | 0.5 |
|  |   | WBL      | 45            | 47                   | 2    | 4%    | 6                  | 0.3 |
|  |   | WBT      | 125           | 126                  | 1    | 1%    | 15                 | 0.1 |
|  |   | WBR      | 550           | 415                  | -135 | -25%  | 30                 | 6.1 |
| 74   | SW Hood Ave @ SW Whitaker St            | Total    | 2225          | 2124                 | -101 | -5%   | 33                 | 2.2 |
|  |   | SBT      | 2230          | 2019                 | -211 | -9%   | 117                | 4.6 |
|  |   | SBR      | 720           | 586                  | -134 | -19%  | 33                 | 5.2 |
|  |   | WBL      | 1410          | 1404                 | -6   | 0%    | 3                  | 0.2 |
| 75   | SW Barbur Blvd @ SW Pennoyer St         | Total    | 4360          | 4009                 | -351 | -8%   | 119                | 5.4 |
|  |   | NBR      | 10            | 16                   | 6    | 60%   | 5                  | 1.7 |
|  |   | SBL      | 10            | 12                   | 2    | 20%   | 4                  | 0.6 |
|  |   | WBL      | 30            | 28                   | -2   | -7%   | 3                  | 0.4 |
|  |   | WBR      | 20            | 20                   | 0    | 0%    | 3                  | 0.0 |
| 76   | SW Barbur Blvd @ SW Condor Ave          | Total    | 70            | 75                   | 5    | 7%    | 6                  | 0.6 |
|  |   | NBL      | 5             | 5                    | 0    | 0%    | 2                  | 0.0 |
|  |   | SBR      | 25            | 29                   | 4    | 16%   | 5                  | 0.8 |
|  |   | EBL      | 220           | 218                  | -2   | -1%   | 4                  | 0.1 |
|  |   | EBR      | 10            | 10                   | 0    | 0%    | 2                  | 0.0 |
|  |   | Total    | 260           | 262                  | 2    | 1%    | 7                  | 0.1 |
|  |   | NBL      | 60            | 57                   | -3   | -5%   | 7                  | 0.4 |
|  |   | NBT      | 1810          | 1762                 | -48  | -3%   | 48                 | 1.1 |

| 2035 No-Build PM Intersection GEH (4-6 p.m.) |                                    |          |               |                      |      |       |                    |     |
|--|------------------------------------|----------|---------------|----------------------|------|-------|--------------------|-----|
| Intersection Number                          | Intersection Name                  | Movement | Input Volume* | VISSIM Output Volume | Diff | %Diff | Standard Deviation | GEH |
| 77   | SW Barbur Blvd @ SW Lane St        | SBT      | 1160          | 1138                 | -22  | -2%   | 36                 | 0.6 |
|  |                                    | SBR      | 10            | 10                   | 0    | 0%    | 3                  | 0.0 |
|  |                                    | EBL      | 45            | 43                   | -2   | -4%   | 4                  | 0.3 |
|  |                                    | EBR      | 325           | 321                  | -4   | -1%   | 6                  | 0.2 |
|  |                                    | Total    | 3410          | 3331                 | -79  | -2%   | 77                 | 1.4 |
| 78   | SW Barbur Blvd @ SW Abernathy St   | NBL      | 20            | 18                   | -2   | -10%  | 3                  | 0.5 |
|  |                                    | SBT      | 1460          | 1435                 | -25  | -2%   | 37                 | 0.7 |
|  |                                    | SBR      | 25            | 25                   | 0    | 0%    | 4                  | 0.0 |
|  |                                    | EBL      | 30            | 29                   | -1   | -3%   | 4                  | 0.2 |
|  |                                    | EBR      | 20            | 19                   | -1   | -5%   | 4                  | 0.2 |
| 79   | SW Barbur Blvd @ SW Lowell St      | Total    | 1555          | 1526                 | -29  | -2%   | 149                | 0.7 |
|  |                                    | NBR      | 365           | 339                  | -26  | -7%   | 20                 | 1.4 |
|  |                                    | WBR      | 20            | 15                   | -5   | -25%  | 1                  | 1.2 |
| 80   | SW Barbur Blvd @ SW Bancroft St    | Total    | 385           | 353                  | -32  | -8%   | 20                 | 1.7 |
|  |                                    | NBR      | 600           | 411                  | -189 | -32%  | 23                 | 8.4 |
|  |                                    | WBR      | 225           | 264                  | 39   | 17%   | 19                 | 2.5 |
| 81   | SW Corbett Ave @ SW Bancroft St    | Total    | 825           | 675                  | -150 | -18%  | 37                 | 5.5 |
|  |                                    | NBL      | 195           | 240                  | 45   | 23%   | 19                 | 3.1 |
|  |                                    | NBT      | 635           | 667                  | 32   | 5%    | 26                 | 1.3 |
|  |                                    | NBR      | 35            | 82                   | 47   | 134%  | 12                 | 6.1 |
|  |                                    | SBL      | 20            | 11                   | -9   | -45%  | 3                  | 2.3 |
|  |                                    | SBT      | 675           | 679                  | 4    | 1%    | 6                  | 0.2 |
|  |                                    | SBR      | 15            | 13                   | -2   | -13%  | 3                  | 0.5 |
|  |                                    | EBL      | 490           | 374                  | -116 | -24%  | 21                 | 5.6 |
|  |                                    | EBT      | 75            | 34                   | -41  | -55%  | 6                  | 5.6 |
|  |                                    | EBR      | 35            | 3                    | -32  | -91%  | 2                  | 7.3 |
|  |                                    | WBL      | 50            | 67                   | 17   | 34%   | 2                  | 2.2 |
|  |                                    | WBT      | 15            | 12                   | -3   | -20%  | 3                  | 0.8 |
|  |                                    | WBR      | 25            | 9                    | -16  | -64%  | 2                  | 3.9 |
| 82   | SW Barbur Blvd @ SW Hamilton St    | Total    | 2265          | 2191                 | -74  | -3%   | 56                 | 1.6 |
|  |                                    | NBT      | 3730          | 3523                 | -207 | -6%   | 77                 | 3.4 |
|  |                                    | NBR      | 510           | 507                  | -3   | -1%   | 29                 | 0.1 |
|  |                                    | SBL      | 785           | 710                  | -75  | -10%  | 31                 | 2.7 |
|  |                                    | SBT      | 4400          | 4260                 | -140 | -3%   | 149                | 2.1 |
|  |                                    | SBR      | 95            | 59                   | -36  | -38%  | 6                  | 4.1 |
|  |                                    | EBL      | 175           | 170                  | -5   | -3%   | 15                 | 0.4 |
|  |                                    | EBT      | 135           | 126                  | -9   | -7%   | 15                 | 0.8 |
|  |                                    | EBR      | 25            | 26                   | 1    | 4%    | 5                  | 0.2 |
|  |                                    | WBL      | 660           | 641                  | -19  | -3%   | 30                 | 0.7 |
|  |                                    | WBT      | 105           | 130                  | 25   | 24%   | 8                  | 2.3 |
| 83   | SW Hamilton Blvd @ SW Corbett Ave  | WBR      | 275           | 155                  | -120 | -44%  | 13                 | 8.2 |
|  |                                    | Total    | 10895         | 10307                | -588 | -5%   | 184                | 5.7 |
|  |                                    | NBL      | 645           | 494                  | -151 | -23%  | 34                 | 6.3 |
|  |                                    | NBT      | 575           | 588                  | 13   | 2%    | 34                 | 0.5 |
|  |                                    | NBR      | 75            | 61                   | -14  | -19%  | 7                  | 1.7 |
|  |                                    | SBL      | 5             | 5                    | 0    | 0%    | 2                  | 0.0 |
|  |                                    | SBT      | 420           | 409                  | -11  | -3%   | 16                 | 0.5 |
|  |                                    | SBR      | 280           | 334                  | 54   | 19%   | 12                 | 3.1 |
|  |                                    | EBL      | 280           | 355                  | 75   | 27%   | 24                 | 4.2 |
|  |                                    | EBT      | 85            | 84                   | -1   | -1%   | 7                  | 0.1 |
|  |                                    | EBR      | 870           | 906                  | 36   | 4%    | 45                 | 1.2 |
| 85   | SW Barbur Blvd @ SW Capitol Hwy EB | WBL      | 25            | 25                   | 0    | 0%    | 5                  | 0.0 |
|  |                                    | WBT      | 85            | 76                   | -9   | -11%  | 5                  | 1.0 |
|  |                                    | WBR      | 10            | 15                   | 5    | 50%   | 3                  | 1.4 |
|  |                                    | Total    | 3355          | 3352                 | -3   | 0%    | 101                | 0.1 |
|  |                                    | NBT      | 2755          | 2733                 | -22  | -1%   | 11                 | 0.4 |
| 86   | SW Barbur Blvd @ SW Capitol Hwy WB | WBR      | 1435          | 1431                 | -4   | 0%    | 22                 | 0.1 |
|  |                                    | Total    | 4190          | 4164                 | -26  | -1%   | 25                 | 0.4 |
|  |                                    | SBT      | 2820          | 2729                 | -91  | -3%   | 79                 | 1.7 |
|  |                                    | SBR      | 2225          | 2139                 | -86  | -4%   | 82                 | 1.8 |
|  |                                    | Total    | 5045          | 4868                 | -177 | -4%   | 137                | 2.5 |
|  |                                    | NBL      | 190           | 184                  | -6   | -3%   | 12                 | 0.4 |

| 2035 No-Build PM Intersection GEH (4-6 p.m.) |  |          |               |                      |      |       |                    |     |
|--|--|----------|---------------|----------------------|------|-------|--------------------|-----|
| Intersection Number                          | Intersection Name                              | Movement | Input Volume* | VISSIM Output Volume | Diff | %Diff | Standard Deviation | GEH |
| 87   | SW Terwilliger Blvd @ SW Capitol Hwy           | NBT      | 175           | 173                  | -2   | -1%   | 11                 | 0.2 |
|  |  | NBR      | 15            | 15                   | 0    | 0%    | 2                  | 0.0 |
|  |  | SBL      | 35            | 36                   | 1    | 3%    | 9                  | 0.2 |
|  |  | SBT      | 500           | 488                  | -12  | -2%   | 17                 | 0.5 |
|  |  | SBR      | 540           | 537                  | -3   | -1%   | 20                 | 0.1 |
|  |  | EBL      | 200           | 202                  | 2    | 1%    | 11                 | 0.1 |
|  |  | EBT      | 1383          | 1392                 | 9    | 1%    | 18                 | 0.2 |
|  |  | EBR      | 185           | 179                  | -6   | -3%   | 18                 | 0.4 |
|  |  | WBL      | 30            | 29                   | -1   | -3%   | 7                  | 0.2 |
|  |  | WBT      | 2160          | 2095                 | -65  | -3%   | 79                 | 1.4 |
|  |  | WBR      | 30            | 29                   | -1   | -3%   | 7                  | 0.2 |
|  |  | Total    | 5443          | 5359                 | -84  | -2%   | 90                 | 1.1 |
| 100  | SW Naito Pkwy @ Downtown PNR                   | NBR      | 10            | 14                   | 4    | 40%   | 3                  | 1.2 |
|  |  | WBR      | 110           | 64                   | -46  | -42%  | 5                  | 4.9 |
|  |  | Total    | 120           | 78                   | -42  | -35%  | 3                  | 4.2 |
| 101  | SW 1st Ave @ Harrison Square Driveway          | SBL      | 10            | 9                    | -1   | -10%  | 3                  | 0.3 |
|  |  | WBL      | 230           | 234                  | 4    | 2%    | 1                  | 0.3 |
|  |  | Total    | 240           | 243                  | 3    | 1%    | 4                  | 0.2 |
| 102  | SW Naito Pkwy @ Harrison Square Driveway       | NBL      | 10            | 9                    | -1   | -10%  | 3                  | 0.3 |
|  |  | SBR      | 30            | 29                   | -1   | -3%   | 4                  | 0.2 |
|  |  | EBL      | 125           | 123                  | -2   | -2%   | 5                  | 0.2 |
|  |  | EBR      | 65            | 62                   | -3   | -5%   | 5                  | 0.4 |
|  |  | Total    | 230           | 223                  | -7   | -3%   | 4                  | 0.5 |
| 103  | SW 3rd Ave Parking Lot OB @ SW Harrison St     | SBL      | 55            | 53                   | -2   | -4%   | 5                  | 0.3 |
|  |  | SBR      | 24            | 23                   | -1   | -4%   | 3                  | 0.2 |
|  |  | Total    | 79            | 76                   | -3   | -4%   | 5                  | 0.3 |
| 104  | SW 3rd Ave Parking Lot IB @ SW Harrison St     | WBR      | 20            | 18                   | -2   | -10%  | 4                  | 0.5 |
|  |  | Total    | 20            | 18                   | -2   | -10%  | 4                  | 0.5 |
| 105  | SW Harrison St Parking Garage @ SW Harrison St | NBL      | 60            | 63                   | 3    | 5%    | 6                  | 0.4 |
|  |  | NBR      | 55            | 50                   | -5   | -9%   | 6                  | 0.7 |
|  |  | EBR      | 75            | 74                   | -1   | -1%   | 9                  | 0.1 |
|  |  | WBL      | 60            | 74                   | 14   | 23%   | 7                  | 1.7 |
|  |  | Total    | 250           | 261                  | 11   | 4%    | 12                 | 0.7 |
| 106  | SW 6th Ave @ SW 6th Ave Parking Garage         | NBL      | 110           | 96                   | -14  | -13%  | 8                  | 1.4 |
|  |  | Total    | 110           | 96                   | -14  | -13%  | 8                  | 1.4 |
| 107  | SW Hall St Parking Garage @ SW Hall St         | SBL      | 15            | 31                   | 16   | 107%  | 3                  | 3.3 |
|  |  | SBR      | 20            | 9                    | -11  | -55%  | 3                  | 2.9 |
|  |  | EBL      | 20            | 21                   | 1    | 5%    | 4                  | 0.2 |
|  |  | WBR      | 25            | 28                   | 3    | 12%   | 8                  | 0.6 |
|  |  | Total    | 80            | 88                   | 8    | 10%   | 7                  | 0.9 |
| 108  | SW 1st Ave @ Make-A-Wish Driveway              | NBT      | 460           | 395                  | -65  | -14%  | 22                 | 3.1 |
|  |  | NBR      | 150           | 157                  | 7    | 5%    | 13                 | 0.6 |
|  |  | SBT      | 1280          | 1191                 | -89  | -7%   | 41                 | 2.5 |
|  |  | SBR      | 15            | 16                   | 1    | 7%    | 4                  | 0.3 |
|  |  | EBR      | 90            | 97                   | 7    | 8%    | 1                  | 0.7 |
|  |  | WBR      | 5             | 0                    | -5   | -100% | 0                  | 3.2 |
|  |  | Total    | 2000          | 1856                 | -144 | -7%   | 44                 | 3.3 |
| 109  | SW Naito Pkwy @ Ochin Inc Driveway             | NBL      | 30            | 30                   | 0    | 0%    | 5                  | 0.0 |
|  |  | SBR      | 50            | 49                   | -1   | -2%   | 7                  | 0.1 |
|  |  | EBL      | 10            | 8                    | -2   | -20%  | 4                  | 0.7 |
|  |  | EBR      | 55            | 56                   | 1    | 2%    | 4                  | 0.1 |
|  |  | Total    | 145           | 142                  | -3   | -2%   | 6                  | 0.3 |
| 110  | SW 4th Ave @ PSU Parking Garage                | NBR      | 15            | 17                   | 2    | 13%   | 4                  | 0.5 |
|  |  | WBR      | 140           | 136                  | -4   | -3%   | 2                  | 0.3 |
|  |  | Total    | 155           | 154                  | -1   | -1%   | 5                  | 0.1 |
| 111  | SW Broadway @ I-405 SB On-ramp                 | SBL      | 685           | 677                  | -8   | -1%   | 21                 | 0.3 |
|  |  | Total    | 685           | 677                  | -8   | -1%   | 21                 | 0.3 |
| 112  | SW 1st Ave @ Lincoln Apartments Driveway       | SBR      | 10            | 12                   | 2    | 20%   | 3                  | 0.6 |
|  |  | EBR      | 20            | 17                   | -3   | -15%  | 0                  | 0.7 |
|  |  | Total    | 30            | 29                   | -1   | -3%   | 3                  | 0.2 |
| 113  | SW 1st Ave @ Boy Scouts of America Driveway    | NBR      | 5             | 3                    | -2   | -40%  | 3                  | 1.0 |
|  |  | WBR      | 245           | 171                  | -74  | -30%  | 15                 | 5.1 |

| 2035 No-Build PM Intersection GEH (4-6 p.m.) |  |          |               |                      |      |       |                    |     |
|--|--|----------|---------------|----------------------|------|-------|--------------------|-----|
| Intersection Number                          | Intersection Name                              | Movement | Input Volume* | VISSIM Output Volume | Diff | %Diff | Standard Deviation | GEH |
|  |  | Total    | 250           | 174                  | -76  | -30%  | 15                 | 5.2 |
| 114  | SW Naito Pkwy @ Boy Scouts of America Driveway | NBL      | 230           | 152                  | -78  | -34%  | 15                 | 5.6 |
|  |  | SBR      | 15            | 19                   | 4    | 27%   | 5                  | 1.0 |
|  |  | EBR      | 5             | 3                    | -2   | -40%  | 3                  | 1.0 |
|  |  | Total    | 250           | 174                  | -76  | -30%  | 15                 | 5.2 |
| 115  | SW Broadway Dr @ SW Grant St                   | NBT      | 675           | 526                  | -149 | -22%  | 27                 | 6.1 |
|  |  | SBT      | 630           | 624                  | -6   | -1%   | 28                 | 0.2 |
|  |  | WBL      | 10            | 13                   | 3    | 30%   | 3                  | 0.9 |
|  |  | WBR      | 5             | 0                    | -5   | -100% | 0                  | 3.2 |
|  |  | Total    | 1320          | 1162                 | -158 | -12%  | 45                 | 4.5 |
| 116  | SW 1st Ave @ ADP South East Driveway           | SBR      | 10            | 9                    | -1   | -10%  | 3                  | 0.3 |
|  |  | EBR      | 155           | 145                  | -10  | -6%   | 3                  | 0.8 |
|  |  | Total    | 165           | 154                  | -11  | -7%   | 3                  | 0.9 |
| 117  | ADP South Driveway @ SW Arthur St              | SBR      | 185           | 155                  | -30  | -16%  | 1                  | 2.3 |
|  |  | WBR      | 15            | 10                   | -5   | -33%  | 2                  | 1.4 |
|  |  | Total    | 200           | 165                  | -35  | -18%  | 2                  | 2.6 |
| 118  | SW Arthur St Parking Garage @ SW Arthur St     | NBR      | 275           | 271                  | -4   | -1%   | 3                  | 0.2 |
|  |  | SBT      | 10            | 8                    | -2   | -20%  | 2                  | 0.7 |
|  |  | Total    | 285           | 280                  | -5   | -2%   | 4                  | 0.3 |
| 119  | Frontage Road @ SW Kelly Ave                   | NBL      | 35            | 29                   | -6   | -17%  | 4                  | 1.1 |
|  |  | NBR      | 70            | 78                   | 8    | 11%   | 6                  | 0.9 |
|  |  | EBR      | 5             | 8                    | 3    | 60%   | 3                  | 1.2 |
|  |  | Total    | 110           | 139                  | 29   | 26%   | 10                 | 2.6 |
| 120  | SW Naito Pkwy Diverge to RI Bridge             | SBT      | 2130          | 2069                 | -61  | -3%   | 43                 | 1.3 |
|  |  | SBR      | 1735          | 1826                 | 91   | 5%    | 44                 | 2.2 |
|  |  | Total    | 3865          | 3894                 | 29   | 1%    | 50                 | 0.5 |
| 121  | SW Barbur Blvd @ Under Armour Driveway         | NBL      | 20            | 17                   | -3   | -15%  | 4                  | 0.7 |
|  |  | SBR      | 10            | 8                    | -2   | -20%  | 3                  | 0.7 |
|  |  | EBL      | 10            | 9                    | -1   | -10%  | 2                  | 0.3 |
|  |  | EBR      | 10            | 7                    | -3   | -30%  | 2                  | 1.0 |
|  |  | Total    | 50            | 41                   | -9   | -18%  | 5                  | 1.3 |
| 122  | SW 1st Ave @ SW Hooker St                      | NBL      | 5             | 2                    | -3   | -60%  | 2                  | 1.6 |
|  |  | NBT      | 120           | 152                  | 32   | 27%   | 7                  | 2.7 |
|  |  | SBT      | 720           | 652                  | -68  | -9%   | 16                 | 2.6 |
|  |  | SBR      | 60            | 66                   | 6    | 10%   | 7                  | 0.8 |
|  |  | EBL      | 310           | 269                  | -41  | -13%  | 14                 | 2.4 |
|  |  | EBR      | 410           | 414                  | 4    | 1%    | 23                 | 0.2 |
| 123  | SW Water St @ SW Gibbs St                      | Total    | 1625          | 1555                 | -70  | -4%   | 30                 | 1.8 |
|  |  | SBR      | 395           | 415                  | 20   | 5%    | 15                 | 1.0 |
|  |  | EBT      | 10            | 0                    | -10  | -100% | 0                  | 4.5 |
|  |  | WBT      | 230           | 158                  | -72  | -31%  | 12                 | 5.2 |
| 124  | SW Corbett Ave @ SW Gibbs St                   | Total    | 635           | 587                  | -48  | -8%   | 17                 | 1.9 |
|  |  | NBL      | 115           | 116                  | 1    | 1%    | 13                 | 0.1 |
|  |  | NBT      | 135           | 140                  | 5    | 4%    | 7                  | 0.4 |
|  |  | NBR      | 170           | 161                  | -9   | -5%   | 9                  | 0.7 |
|  |  | SBL      | 135           | 133                  | -2   | -1%   | 9                  | 0.2 |
|  |  | SBT      | 495           | 495                  | 0    | 0%    | 11                 | 0.0 |
|  |  | SBR      | 115           | 41                   | -74  | -64%  | 5                  | 8.4 |
|  |  | EBR      | 10            | 15                   | 5    | 50%   | 5                  | 1.4 |
| 125  | SW Hood Ave @ SW Gibbs St                      | WBL      | 15            | 19                   | 4    | 27%   | 4                  | 1.0 |
|  |  | Total    | 1190          | 1135                 | -55  | -5%   | 22                 | 1.6 |
| 126  | SW Kelly Ave @ SW Curry St                     | EBR      | 20            | 8                    | -12  | -60%  | 4                  | 3.2 |
|  |  | Total    | 20            | 8                    | -12  | -60%  | 4                  | 3.2 |
|  |  | NBL      | 10            | 10                   | 0    | 0%    | 3                  | 0.0 |
|  |  | NBT      | 330           | 326                  | -4   | -1%   | 23                 | 0.2 |
|  |  | NBR      | 15            | 14                   | -1   | -7%   | 3                  | 0.3 |
|  |  | SBL      | 545           | 579                  | 34   | 6%    | 23                 | 1.4 |
|  |  | SBT      | 90            | 88                   | -2   | -2%   | 9                  | 0.2 |
|  |  | SBR      | 5             | 8                    | 3    | 60%   | 3                  | 1.2 |
|  |  | EBL      | 165           | 162                  | -3   | -2%   | 10                 | 0.2 |
|  |  | EBT      | 125           | 123                  | -2   | -2%   | 10                 | 0.2 |
|  |  | EBR      | 10            | 9                    | -1   | -10%  | 3                  | 0.3 |

| 2035 No-Build PM Intersection GEH (4-6 p.m.) |   |          |               |                      |      |       |                    |     |
|--|---|----------|---------------|----------------------|------|-------|--------------------|-----|
| Intersection Number                          | Intersection Name                           | Movement | Input Volume* | VISSIM Output Volume | Diff | %Diff | Standard Deviation | GEH |
|  |   | Total    | 1295          | 1320                 | 25   | 2%    | 38                 | 0.7 |
| 127  | SW Hood Ave @ SW Curry St                   | SBT      | 3565          | 3429                 | -136 | -4%   | 118                | 2.3 |
|  |   | EBR      | 685           | 718                  | 33   | 5%    | 24                 | 1.2 |
|  |   | Total    | 4250          | 4147                 | -103 | -2%   | 112                | 1.6 |
| 128  | Barbur/Naito SB Merge                       | NBT      | 3450          | 3683                 | 233  | 7%    | 83                 | 3.9 |
|  |   | SBT      | 1480          | 1451                 | -29  | -2%   | 49                 | 0.8 |
|  |   | EBR      | 3815          | 3660                 | -155 | -4%   | 134                | 2.5 |
|  |   | Total    | 8745          | 8794                 | 49   | 1%    | 153                | 0.5 |
| 129  | SW Barbur Blvd SB @ SW Bancroft St          | SBR      | 75            | 73                   | -2   | -3%   | 9                  | 0.2 |
|  |   | Total    | 75            | 73                   | -2   | -3%   | 9                  | 0.2 |
| 130  | SW Barbur Blvd @ Barbur Apartments Driveway | NBR      | 100           | 95                   | -5   | -5%   | 11                 | 0.5 |
|  |   | SBL      | 75            | 69                   | -6   | -8%   | 9                  | 0.7 |
|  |   | WBL      | 10            | 8                    | -2   | -20%  | 3                  | 0.7 |
|  |   | WBR      | 10            | 8                    | -2   | -20%  | 3                  | 0.7 |
|  |   | Total    | 195           | 180                  | -15  | -8%   | 17                 | 1.1 |
| 131  | SW Naito Pkwy @ SW Pennoyer St              | NBT      | 1610          | 1483                 | -127 | -8%   | 30                 | 3.2 |
|  |   | SBT      | 3810          | 3671                 | -139 | -4%   | 136                | 2.3 |
|  |   | Total    | 5420          | 5155                 | -265 | -5%   | 127                | 3.6 |

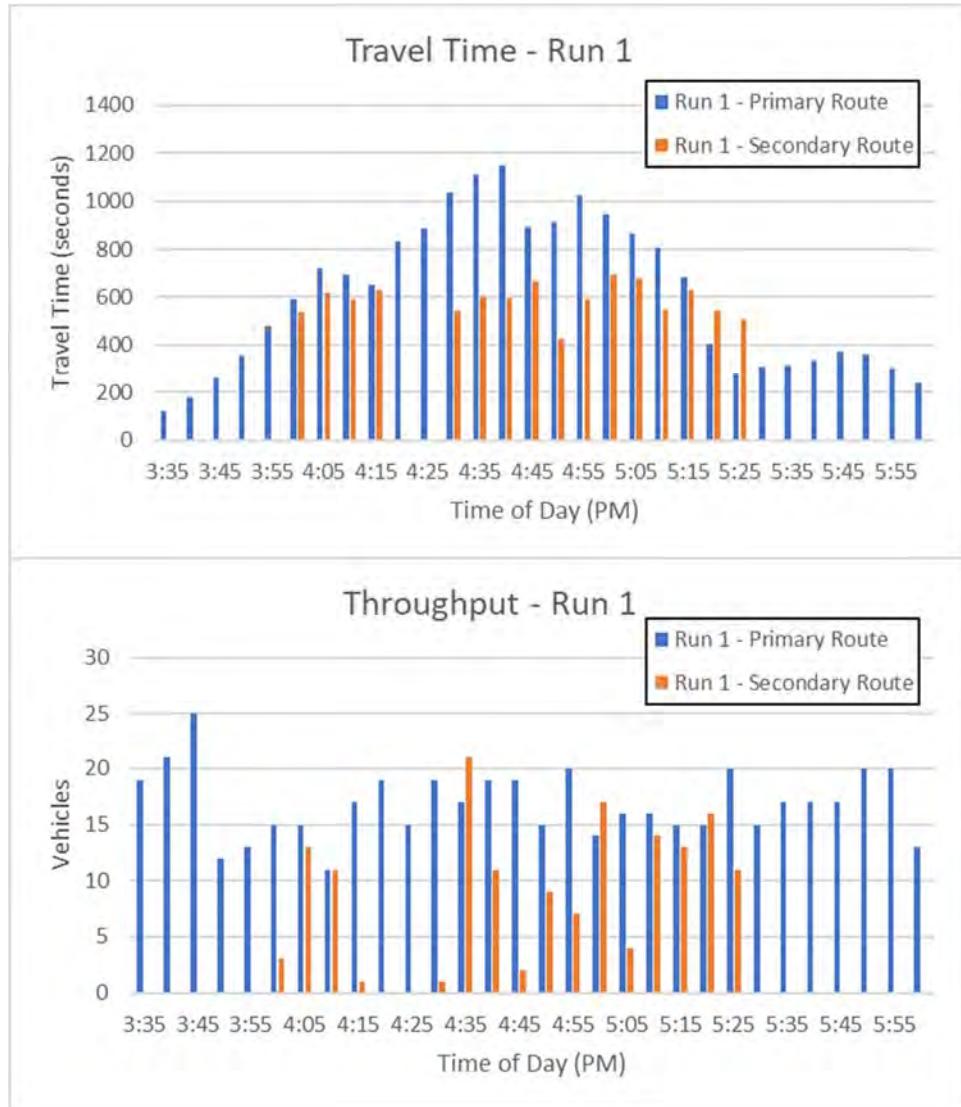
| Entry GEH (4-6 PM)   |          |                   |      |         |     |
|--|----------|-------------------|------|---------|-----|
| Entry Location   | Forecast | Vissim Throughput | Diff | %Diff   | GEH |
| SW 1st Ave @ SW Madison St - North Entrance                      | 1580     | 1573              | -7   | -0.4%   | 0.2 |
| SW Naito Pkwy @ SW Jefferson St - North Entrance                 | 2915     | 2926              | 11   | 0.4%    | 0.2 |
| SW 1st Ave @ SW Clay St - North Entrance                         | 1470     | 1468              | -2   | -0.1%   | 0.1 |
| SW 5th Ave @ SW Montgomery St - North Entrance                   | 620      | 611               | -9   | -1.5%   | 0.4 |
| SW Broadway @ SW College St - North Entrance                     | 1590     | 1588              | -2   | -0.1%   | 0.1 |
| SW 3rd Ave @ SW Lincoln St - North Entrance                      | 80       | 80                | 0    | 0.0%    | 0.0 |
| SW 2nd Ave @ SW Lincoln St - North Entrance                      | 30       | 28                | -2   | -6.7%   | 0.4 |
| SW Water Ave @ Ross Island Bridge - North Entrance               | 100      | 97                | -3   | -3.0%   | 0.3 |
| SW Hood Ave @ SW Macadam Ave - North Entrance                    | 1090     | 991               | -99  | -9.1%   | 3.1 |
| SE 8th Ave @ SE Powell Blvd - North Entrance                     | 1795     | 1640              | -155 | -8.6%   | 3.7 |
| SE 10th Ave @ SE Powell Blvd - North Entrance                    | 180      | 177               | -3   | -1.7%   | 0.2 |
| SE Milwaukie Ave @ SE Powell Blvd - North Entrance               | 1600     | 1592              | -8   | -0.5%   | 0.2 |
| SW Corbett Ave @ SW Bancroft St - North Entrance                 | 710      | 703               | -7   | -1.0%   | 0.3 |
| SW Terwilliger Blvd @ SW Capitol Hwy - North Entrance            | 1075     | 1061              | -14  | -1.3%   | 0.4 |
| SW 3rd Ave Parking Lot OB @ SW Harrison St - North Entrance      | 79       | 76                | -3   | -3.8%   | 0.3 |
| SW Hall St Parking Garage @ SW Hall St - North Entrance          | 35       | 40                | 5    | 14.3%   | 0.8 |
| ADP South Driveway @ SW Arthur St - North Entrance               | 185      | 155               | -30  | -16.2%  | 2.3 |
| SW 4th Ave @ SW Lincoln St - South Entrance                      | 620      | 628               | 8    | 1.3%    | 0.3 |
| SW 3rd Ave @ SW Lincoln St - South Entrance                      | 35       | 33                | -2   | -5.7%   | 0.3 |
| SW 2nd Ave @ SW Lincoln St - South Entrance                      | 35       | 33                | -2   | -5.7%   | 0.3 |
| SW 6th Ave/SW Terwilliger Blvd @ SW Sheridan St - South Entrance | 1275     | 1274              | -1   | -0.1%   | 0.0 |
| Hwy 99E NB @ Ross Island Bridge EB - South Entrance              | 70       | 65                | -5   | -7.1%   | 0.6 |
| SE 8th Ave @ SE Powell Blvd - South Entrance                     | 20       | 16                | -4   | -20.0%  | 0.9 |
| SE 10th Ave @ SE Powell Blvd - South Entrance                    | 25       | 23                | -2   | -8.0%   | 0.4 |
| SE Milwaukie Ave @ SE Powell Blvd - South Entrance               | 1020     | 993               | -27  | -2.6%   | 0.9 |
| SW Hamilton Blvd @ SW Corbett Ave - South Entrance               | 1295     | 1143              | -152 | -11.7%  | 4.4 |
| SW Barbur Blvd @ SW Capitol Hwy EB - South Entrance              | 2755     | 2733              | -22  | -0.8%   | 0.4 |
| SW Terwilliger Blvd @ SW Capitol Hwy - South Entrance            | 380      | 372               | -8   | -2.1%   | 0.4 |
| SW Harrison St Parking Garage @ SW Harrison St - South Entrance  | 115      | 113               | -2   | -1.7%   | 0.2 |
| SW Broadway Dr @ SW Grant St - South Entrance                    | 675      | 526               | -149 | -22.1%  | 6.1 |
| SW Arthur St Parking Garage @ SW Arthur St - South Entrance      | 275      | 271               | -4   | -1.5%   | 0.0 |
| Frontage Road @ SW Kelly Ave - South Entrance                    | 105      | 107               | 2    | 1.9%    | 0.0 |
| SW Corbett Ave @ SW Gibbs St - South Entrance                    | 420      | 417               | -3   | -0.7%   | 4.0 |
| SW Kelly Ave @ SW Curry St - South Entrance                      | 355      | 350               | -5   | -1.4%   | 3.6 |
| SW Naito Pkwy @ SW Clay St - East Entrance                       | 1765     | 1816              | 51   | 2.9%    | 1.2 |
| SW Naito Pkwy @ SW Harrison St - East Entrance                   | 470      | 466               | -4   | -0.9%   | 0.2 |
| SW 5th Ave @ SW Montgomery St - East Entrance                    | 75       | 70                | -5   | -6.7%   | 0.6 |
| SW 6th Ave @ SW Jackson St - East Entrance                       | 390      | 369               | -21  | -5.4%   | 1.1 |
| SW Water St @ SW Kelly St - East Entrance                        | 395      | 266               | -129 | -32.7%  | 7.1 |
| SW Barbur Blvd @ SW Hooker St - East Entrance                    | 155      | 148               | -7   | -4.5%   | 0.6 |
| SW Naito Pkwy @ SW Hooker St - East Entrance                     | 60       | 57                | -3   | -5.0%   | 0.4 |
| SW Corbett Ave/SW Kelly St @ SW Macadam Ave - East Entrance      | 1570     | 1475              | -95  | -6.1%   | 2.4 |
| SW Barbur Blvd @ SW Woods St - East Entrance                     | 60       | 56                | -4   | -6.7%   | 0.5 |
| SE Milwaukie Ave @ SE Powell Blvd - East Entrance                | 3335     | 3242              | -93  | -2.8%   | 1.6 |
| SW Barbur Blvd @ SW Whitaker St - East Entrance                  | 70       | 65                | -5   | -7.1%   | 0.6 |
| SW Hood Ave @ SW Whitaker St - East Entrance                     | 1410     | 1404              | -6   | -0.4%   | 0.2 |
| SW Barbur Blvd @ SW Pennoyer St - East Entrance                  | 50       | 48                | -2   | -4.0%   | 0.3 |
| SW Barbur Blvd @ SW Lowell St - East Entrance                    | 20       | 15                | -5   | -25.0%  | 1.2 |
| SW Corbett Ave @ SW Bancroft St - East Entrance                  | 90       | 88                | -2   | -2.2%   | 0.2 |
| SW Hamilton Blvd @ SW Corbett Ave - East Entrance                | 120      | 116               | -4   | -3.3%   | 0.4 |
| SW Naito Pkwy @ Downtown PNR - East Entrance                     | 110      | 64                | -46  | -41.8%  | 0.0 |
| SW 1st Ave @ Harrison Square Driveway - East Entrance            | 230      | 234               | 4    | 1.7%    | 0.0 |
| SW 1st Ave @ Make-A-Wish Driveway - East Entrance                | 5        | 0                 | -5   | -100.0% | 3.2 |
| SW 4th Ave @ PSU Parking Garage - East Entrance                  | 140      | 136               | -4   | -2.9%   | 0.3 |
| SW Barbur Blvd @ Barbur Apartments Driveway - East Entrance      | 20       | 16                | -4   | -20.0%  | 0.0 |
| SW 1st Ave @ SW Madison St - West Entrance                       | 3135     | 3081              | -54  | -1.7%   | 1.0 |
| SW Naito Pkwy @ SW Columbia St - West Entrance                   | 995      | 992               | -3   | -0.3%   | 0.1 |

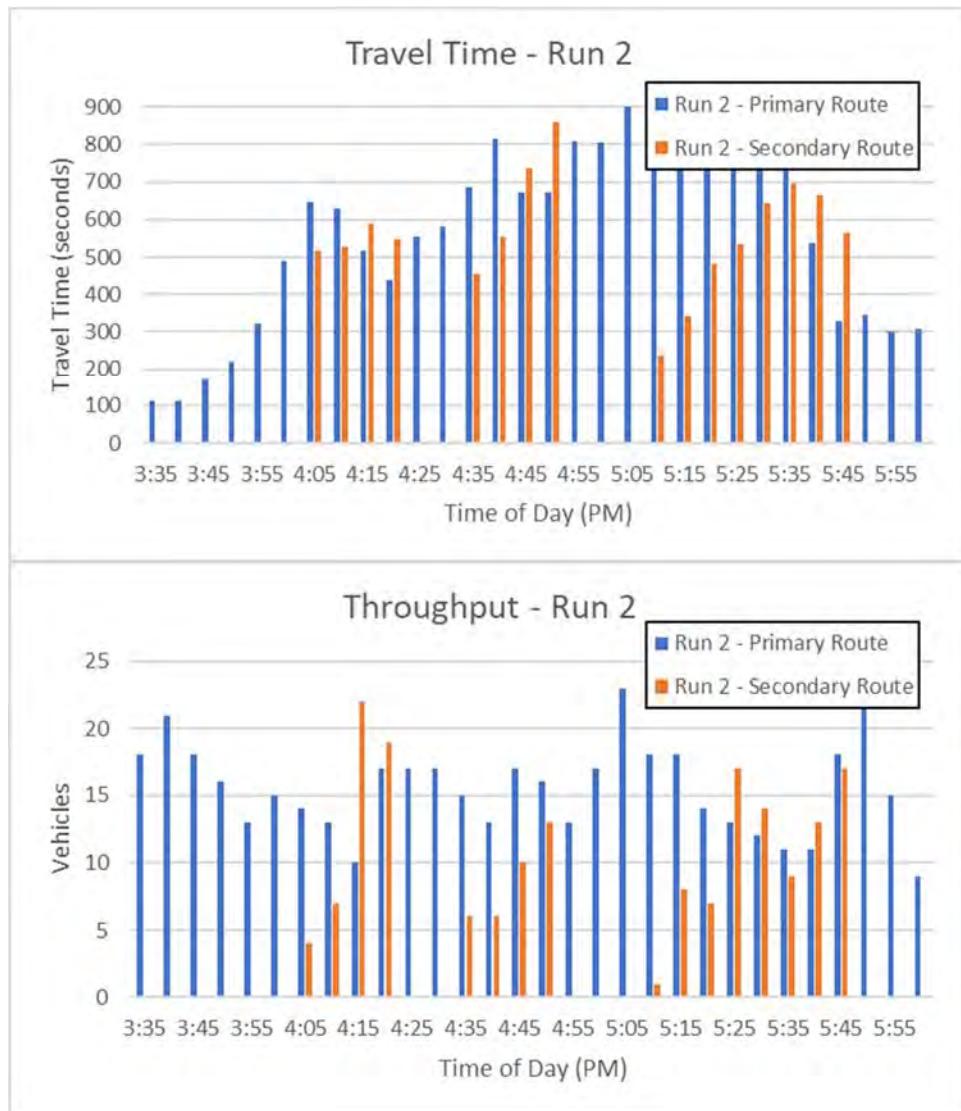
| Entry GEH (4-6 PM)   |              |                   |              |            |            |
|--|--------------|-------------------|--------------|------------|------------|
| Entry Location   | Forecast     | Vissim Throughput | Diff         | %Diff      | GEH        |
| SW 1st Ave @ SW Market St - West Entrance                            | 2545         | 2509              | -36          | -1.4%      | 0.7        |
| SW 6th Ave @ SW Harrison St - West Entrance                          | 295          | 283               | -12          | -4.1%      | 0.7        |
| SW 6th Ave @ SW Hall St - West Entrance                              | 225          | 207               | -18          | -8.0%      | 0.0        |
| SW Broadway @ SW College St - West Entrance                          | 50           | 48                | -2           | -4.0%      | 0.0        |
| SW Broadway @ SW Jackson St - West Entrance                          | 175          | 172               | -3           | -1.7%      | 0.2        |
| SW 5th Ave @ SW Jackson St - West Entrance                           | 20           | 16                | -4           | -20.0%     | 0.9        |
| SW Broadway @ I-405 SB Off-Ramp/SW Lincoln St - West Entrance        | 2744         | 2485              | -259         | -9.4%      | 5.1        |
| SW 4th Ave @ SW Caruthers St - West Entrance                         | 60           | 57                | -3           | -5.0%      | 0.4        |
| SW 1st Ave @ SW Sheridan St - West Entrance                          | 40           | 40                | 0            | 0.0%       | 0.0        |
| SW Barbur Blvd @ SW Hooker St - West Entrance                        | 15           | 10                | -5           | -33.3%     | 1.4        |
| SW Kelly St/SW Corbett Ave @ SW Porter St/SW Hood Ave - West Entranc | 25           | 17                | -8           | -32.0%     | 1.7        |
| SW Barbur Blvd @ SW Woods St - West Entrance                         | 15           | 12                | -3           | -20.0%     | 0.8        |
| SW Naito Pkwy @ SW Whitaker St - West Entrance                       | 45           | 41                | -4           | -8.9%      | 0.6        |
| SW Kelly Ave @ SW Whitaker St - West Entrance                        | 410          | 406               | -4           | -1.0%      | 0.2        |
| SW Barbur Blvd @ SW Condor Ave - West Entrance                       | 230          | 228               | -2           | -0.9%      | 0.1        |
| SW Barbur Blvd @ SW Lane St - West Entrance                          | 370          | 364               | -6           | -1.6%      | 0.3        |
| SW Barbur Blvd @ SW Abernathy St - West Entrance                     | 50           | 48                | -2           | -4.0%      | 0.3        |
| SW Barbur Blvd @ SW Hamilton St - West Entrance                      | 335          | 322               | -13          | -3.9%      | 0.7        |
| SW Terwilliger Blvd @ SW Capitol Hwy - West Entrance                 | 1768         | 1773              | 5            | 0.3%       | 0.0        |
| SW Naito Pkwy @ Harrison Square Driveway - West Entrance             | 190          | 185               | -5           | -2.6%      | 0.0        |
| SW 1st Ave @ Make-A-Wish Driveway - West Entrance                    | 90           | 97                | 7            | 7.8%       | 0.0        |
| SW Naito Pkwy @ Ochin Inc Driveway - West Entrance                   | 65           | 64                | -1           | -1.5%      | 0.0        |
| SW 1st Ave @ Lincoln Apartments Driveway - West Entrance             | 20           | 17                | -3           | -15.0%     | 0.0        |
| SW 1st Ave @ ADP South East Driveway - West Entrance                 | 155          | 145               | -10          | -6.5%      | 1.0        |
| SW Barbur Blvd @ Under Armour Driveway - West Entrance               | 20           | 16                | -4           | -20.0%     | 2.0        |
| SW 1st Ave @ SW Hooker St - West Entrance                            | 720          | 683               | -37          | -5.1%      | 3.0        |
| SW Kelly Ave @ SW Curry St - West Entrance                           | 300          | 294               | -6           | -2.0%      | 4.0        |
| <b>Total</b>   | <b>50106</b> | <b>48666</b>      | <b>-1440</b> | <b>-3%</b> | <b>6.5</b> |

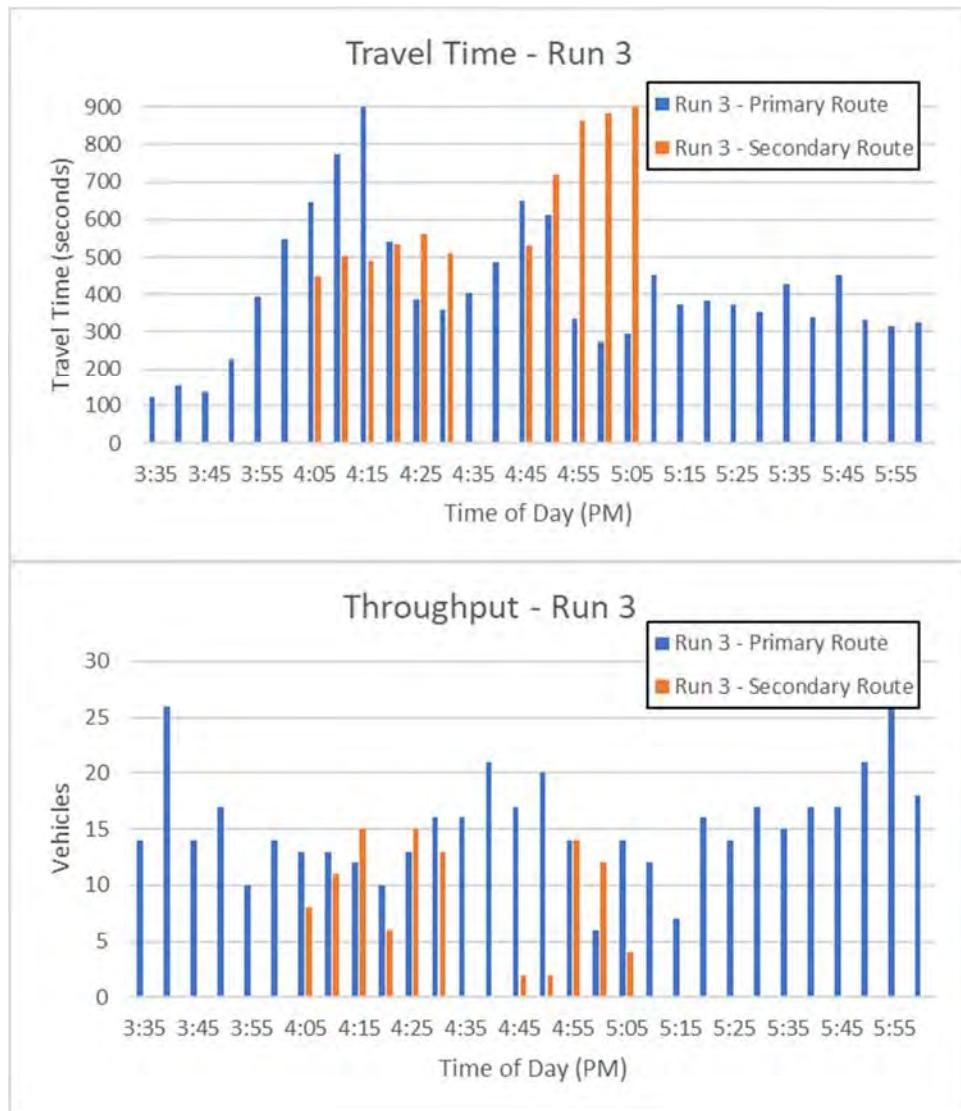
| Exit GEH (4-6 PM)  |          |                   |      |       |     |
|--|----------|-------------------|------|-------|-----|
| Exit Location  | Forecast | Vissim Throughput | Diff | %Diff | GEH |
| SW Naito Pkwy @ SW Jefferson St - North Exit                       | 2230     | 2195              | -35  | -2%   | 0.7 |
| SW 4th Ave @ SW Harrison St - North Exit                           | 2070     | 1954              | -116 | -6%   | 2.6 |
| SW 6th Ave @ SW Harrison St - North Exit                           | 1325     | 1234              | -91  | -7%   | 2.5 |
| SW 3rd Ave @ SW Lincoln St - North Exit                            | 15       | 14                | -1   | -7%   | 0.3 |
| SW 2nd Ave @ SW Lincoln St - North Exit                            | 65       | 65                | 0    | 0%    | 0.0 |
| SW Corbett Ave/SW Kelly St @ SW Macadam Ave - North Exit           | 165      | 145               | -20  | -12%  | 1.6 |
| SW Water Ave @ Ross Island Bridge - North Exit                     | 30       | 30                | 0    | 0%    | 0.0 |
| SE 8th Ave @ SE Powell Blvd - North Exit                           | 130      | 144               | 14   | 11%   | 1.2 |
| SE 10th Ave @ SE Powell Blvd - North Exit                          | 710      | 688               | -22  | -3%   | 0.8 |
| SE Milwaukie Ave @ SE Powell Blvd - North Exit                     | 950      | 924               | -26  | -3%   | 0.8 |
| SW Corbett Ave @ SW Bancroft St - North Exit                       | 1150     | 1050              | -100 | -9%   | 3.0 |
| SW Terwilliger Blvd @ SW Capitol Hwy - North Exit                  | 405      | 404               | -1   | 0%    | 0.0 |
| SW 3rd Ave Parking Lot IB @ SW Harrison St - North Exit            | 20       | 18                | -2   | -10%  | 0.5 |
| SW Hall St Parking Garage @ SW Hall St - North Exit                | 45       | 49                | 4    | 9%    | 0.6 |
| ADP South Driveway @ SW Arthur St - North Exit                     | 15       | 10                | -5   | -33%  | 1.4 |
| SW 1st Ave @ SW Madison St - South Exit                            | 1335     | 1335              | 0    | 0%    | 0.0 |
| SW 5th Ave @ SW Jackson St - South Exit                            | 415      | 408               | -7   | -2%   | 0.3 |
| SW 3rd Ave @ SW Lincoln St - South Exit                            | 70       | 74                | 4    | 6%    | 0.5 |
| SW 2nd Ave @ SW Lincoln St - South Exit                            | 55       | 59                | 4    | 7%    | 0.5 |
| SW 6th Ave/SW Terwilliger Blvd @ SW Sheridan St - South Exit       | 915      | 945               | 30   | 3%    | 1.0 |
| SW Kelly St/SW Corbett Ave @ SW Porter St/SW Hood Ave - South Exit | 90       | 110               | 20   | 22%   | 2.0 |
| Hwy 99E SB @ Ross Island Bridge EB - South Exit                    | 2494     | 2307              | -187 | -7%   | 3.8 |
| SE 8th Ave @ SE Powell Blvd - South Exit                           | 80       | 69                | -11  | -14%  | 1.3 |
| SE 10th Ave @ SE Powell Blvd - South Exit                          | 35       | 34                | -1   | -3%   | 0.2 |
| SE Milwaukie Ave @ SE Powell Blvd - South Exit                     | 990      | 976               | -14  | -1%   | 0.4 |
| SW Hamilton Blvd @ SW Corbett Ave - South Exit                     | 1315     | 1340              | 25   | 2%    | 0.7 |
| SW Barbur Blvd @ SW Capitol Hwy WB - South Exit                    | 2820     | 2729              | -91  | -3%   | 1.7 |
| SW Terwilliger Blvd @ SW Capitol Hwy - South Exit                  | 715      | 696               | -19  | -3%   | 0.7 |
| SW Harrison St Parking Garage @ SW Harrison St - South Exit        | 135      | 148               | 13   | 10%   | 1.1 |
| SW Broadway Dr @ SW Grant St - South Exit                          | 640      | 637               | -3   | 0%    | 0.1 |
| SW Arthur St Parking Garage @ SW Arthur St - South Exit            | 10       | 8                 | -2   | -20%  | 0.7 |
| Frontage Road @ SW Kelly Ave - South Exit                          | 5        | 32                | 27   | 540%  | 6.3 |
| SW Corbett Ave @ SW Gibbs St - South Exit                          | 520      | 529               | 9    | 2%    | 0.4 |
| SW Kelly Ave @ SW Curry St - South Exit                            | 100      | 97                | -3   | -3%   | 0.3 |
| SW Hood Ave @ SW Curry St - South Exit                             | 4250     | 4147              | -103 | -2%   | 1.6 |
| SW Naito Pkwy On-Ramp @ Hawthorne Bridge - East Exit               | 4170     | 3981              | -189 | -5%   | 3.0 |
| SW Naito Pkwy @ SW Market St - East Exit                           | 2895     | 2919              | 24   | 1%    | 0.4 |
| SW Naito Pkwy @ SW Harrison St - East Exit                         | 420      | 366               | -54  | -13%  | 2.7 |
| SW Water St @ SW Kelly St - East Exit                              | 435      | 426               | -9   | -2%   | 0.4 |
| SW Barbur Blvd @ SW Hooker St - East Exit                          | 260      | 255               | -5   | -2%   | 0.3 |
| SW Naito Pkwy @ SW Porter St - East Exit                           | 30       | 5                 | 0    | 0%    | 0.0 |
| SW Barbur Blvd @ SW Woods St - East Exit                           | 650      | 643               | -7   | -1%   | 0.3 |
| SE Milwaukie Ave @ SE Powell Blvd - East Exit                      | 4465     | 4311              | -4   | 0%    | 0.1 |
| SW Barbur Blvd @ SW Whitaker St - East Exit                        | 155      | 148               | -7   | -5%   | 0.6 |
| SW Barbur Blvd @ SW Pennoyer St - East Exit                        | 20       | 28                | 8    | 40%   | 1.6 |
| SW Barbur Blvd @ SW Lowell St - East Exit                          | 365      | 339               | -26  | -7%   | 1.4 |
| SW Corbett Ave @ SW Bancroft St - East Exit                        | 130      | 127               | -3   | -2%   | 0.3 |
| SW Hamilton Blvd @ SW Corbett Ave - East Exit                      | 165      | 150               | -15  | -9%   | 1.2 |
| SW Naito Pkwy @ Downtown PNR - East Exit                           | 10       | 14                | 4    | 40%   | 1.2 |
| SW 1st Ave @ Harrison Square Driveway - East Exit                  | 10       | 9                 | -1   | -10%  | 0.3 |
| SW 1st Ave @ Make-A-Wish Driveway - East Exit                      | 150      | 157               | 7    | 5%    | 0.6 |
| SW 4th Ave @ PSU Parking Garage - East Exit                        | 15       | 17                | 2    | 13%   | 0.5 |
| SW Broadway @ I-405 SB On-ramp - East Exit                         | 685      | 677               | -8   | -1%   | 0.3 |
| SW Barbur Blvd @ Barbur Apartments Driveway - East Exit            | 175      | 164               | -11  | -6%   | 0.8 |
| SW Naito Pkwy @ SW Jefferson St - West Exit                        | 390      | 381               | -9   | -2%   | 0.5 |
| SW 1st Ave @ SW Clay St - West Exit                                | 1090     | 1114              | 24   | 2%    | 0.7 |
| SW 6th Ave @ SW Harrison St - West Exit                            | 210      | 204               | -6   | -3%   | 0.4 |

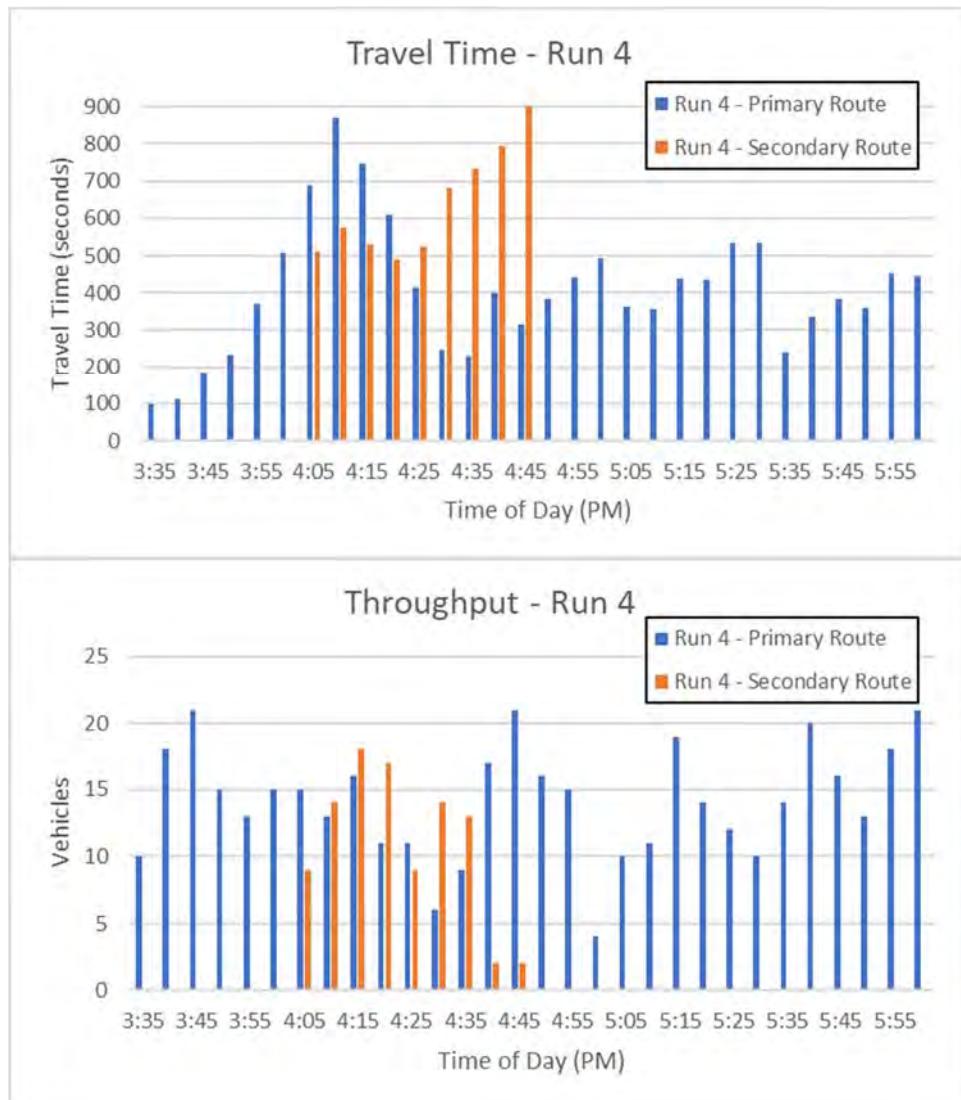
| Exit GEH (4-6 PM)   |              |                   |              |            |            |
|---|--------------|-------------------|--------------|------------|------------|
| Exit Location   | Forecast     | Vissim Throughput | Diff         | %Diff      | GEH        |
| SW 6th Ave @ SW Hall St - West Exit                               | 125          | 117               | -8           | -6%        | 0.7        |
| SW Broadway @ SW College St - West Exit                           | 40           | 40                | 0            | 0%         | 0.0        |
| SW Broadway @ SW Jackson St - West Exit                           | 110          | 112               | 2            | 2%         | 0.2        |
| SW 6th Ave @ I-405/Hwy 26 On-Ramp - West Exit                     | 2735         | 2536              | -199         | -7%        | 3.9        |
| SW 5th Ave @ SW Jackson St - West Exit                            | 20           | 19                | -1           | -5%        | 0.2        |
| SW Broadway @ I-405 SB Off-Ramp/SW Lincoln St - West Exit         | 10           | 10                | 0            | 0%         | 0.0        |
| SW 4th Ave @ SW Caruthers St - West Exit                          | 40           | 42                | 2            | 5%         | 0.3        |
| SW 6th Ave/SW Terwilliger Blvd @ SW Sheridan St - West Exit       | 30           | 32                | 2            | 7%         | 0.4        |
| SW 1st Ave @ SW Sheridan St - West Exit                           | 10           | 10                | 0            | 0%         | 0.0        |
| SW Barbur Blvd @ SW Hooker St - West Exit                         | 30           | 25                | -5           | -17%       | 1.0        |
| SW Kelly St/SW Corbett Ave @ SW Porter St/SW Hood Ave - West Exit | 60           | 77                | 17           | 28%        | 2.1        |
| SW Barbur Blvd @ SW Woods St - West Exit                          | 15           | 11                | -4           | -27%       | 1.1        |
| SW Naito Pkwy @ SW Whitaker St - West Exit                        | 90           | 86                | -4           | -4%        | 0.4        |
| SW Kelly Ave @ SW Whitaker St - West Exit                         | 150          | 136               | -14          | -9%        | 1.2        |
| SW Barbur Blvd @ SW Condor Ave - West Exit                        | 30           | 34                | 4            | 13%        | 0.7        |
| SW Barbur Blvd @ SW Lane St - West Exit                           | 70           | 67                | -3           | -4%        | 0.4        |
| SW Barbur Blvd @ SW Abernathy St - West Exit                      | 45           | 43                | -2           | -4%        | 0.3        |
| SW Barbur Blvd @ SW Hamilton St - West Exit                       | 200          | 189               | -11          | -6%        | 0.8        |
| SW Terwilliger Blvd @ SW Capitol Hwy - West Exit                  | 2890         | 2816              | -74          | -3%        | 1.4        |
| SW Naito Pkwy @ Harrison Square Driveway - West Exit              | 40           | 38                | -2           | -5%        | 0.3        |
| SW 6th Ave @ SW 6th Ave Parking Garage - West Exit                | 110          | 96                | -14          | -13%       | 1.4        |
| SW 1st Ave @ Make-A-Wish Driveway - West Exit                     | 15           | 16                | 1            | 7%         | 0.3        |
| SW Naito Pkwy @ Ochin Inc Driveway - West Exit                    | 80           | 79                | -1           | -1%        | 0.1        |
| SW 1st Ave @ Lincoln Apartments Driveway - West Exit              | 10           | 12                | 2            | 20%        | 0.6        |
| SW 1st Ave @ ADP South East Driveway - West Exit                  | 10           | 9                 | -1           | -10%       | 0.3        |
| SW Barbur Blvd @ Under Armour Driveway - West Exit                | 30           | 25                | -5           | -17%       | 1.0        |
| SW 1st Ave @ SW Hooker St - West Exit                             | 65           | 68                | 3            | 5%         | 0.4        |
| SW Kelly Ave @ SW Curry St - West Exit                            | 15           | 18                | 3            | 20%        | 0.7        |
| SW Barbur Blvd SB @ SW Bancroft St - West Exit                    | 75           | 73                | -2           | -3%        | 0.2        |
| <b>Total</b>  | <b>50179</b> | <b>48870</b>      | <b>-1309</b> | <b>-3%</b> | <b>5.9</b> |

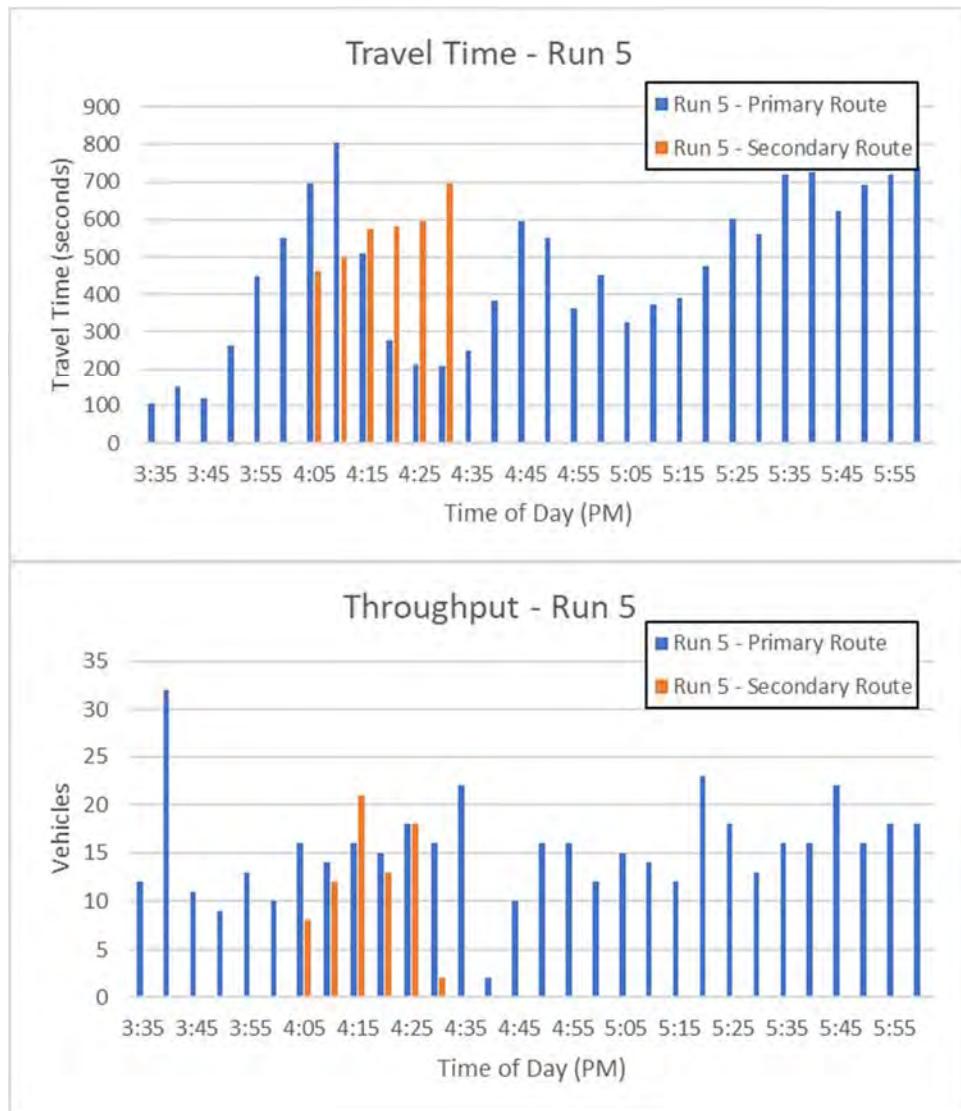
## **Attachment C: Dynamic Routing Results**

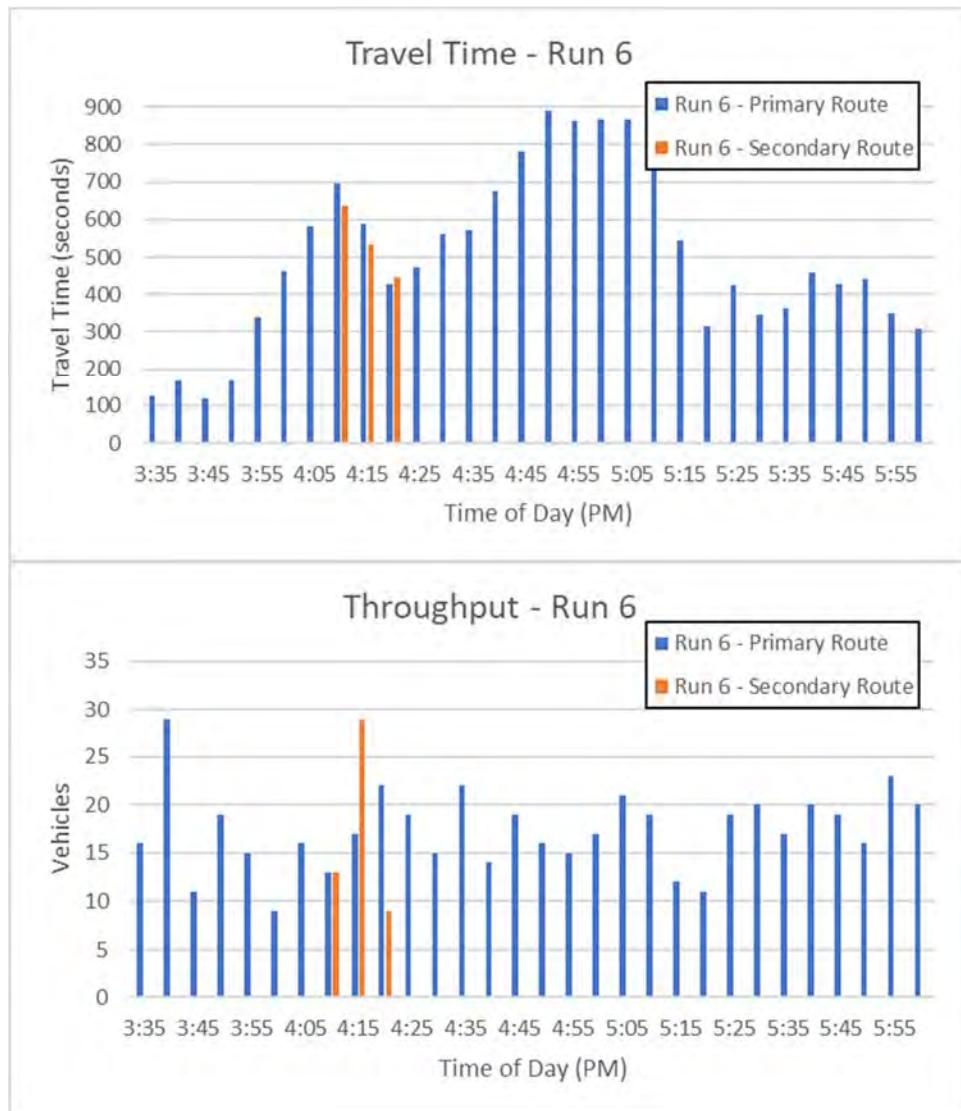


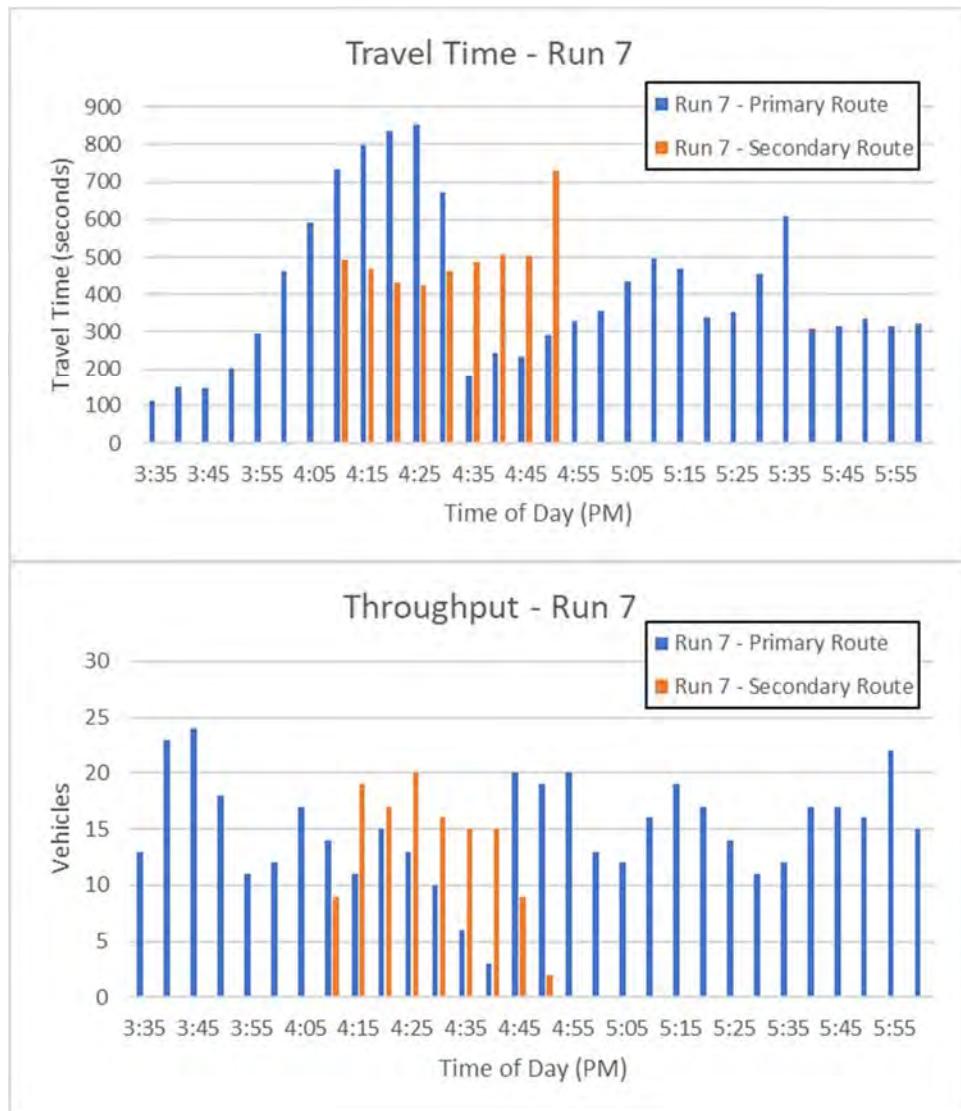


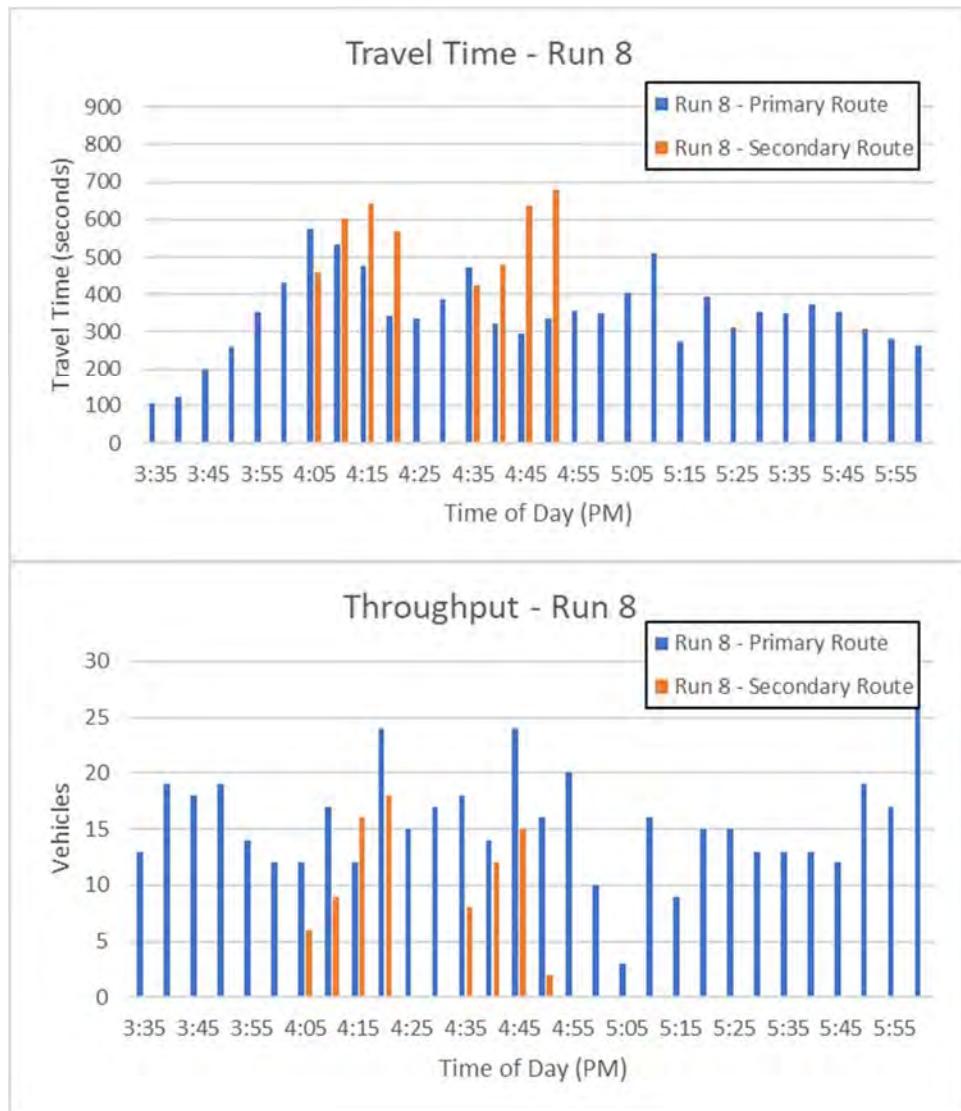


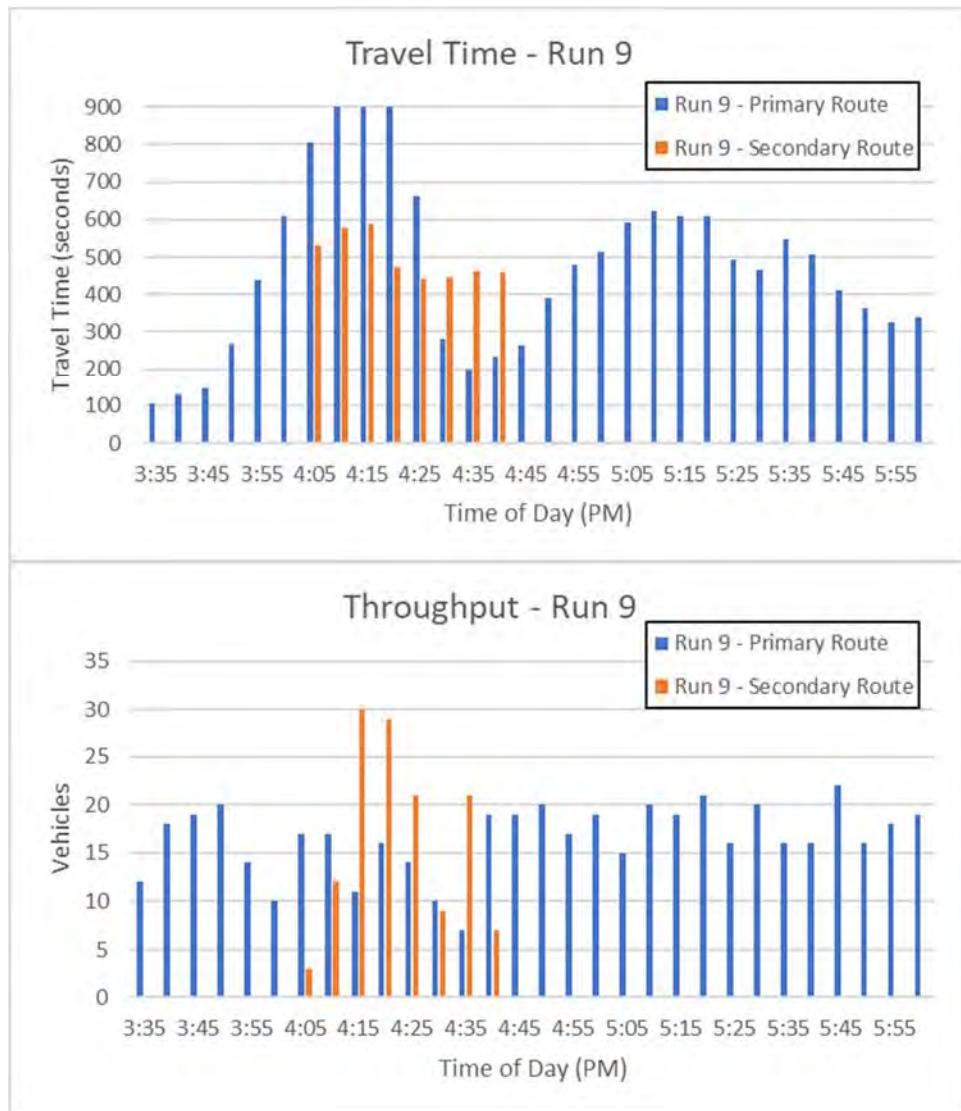


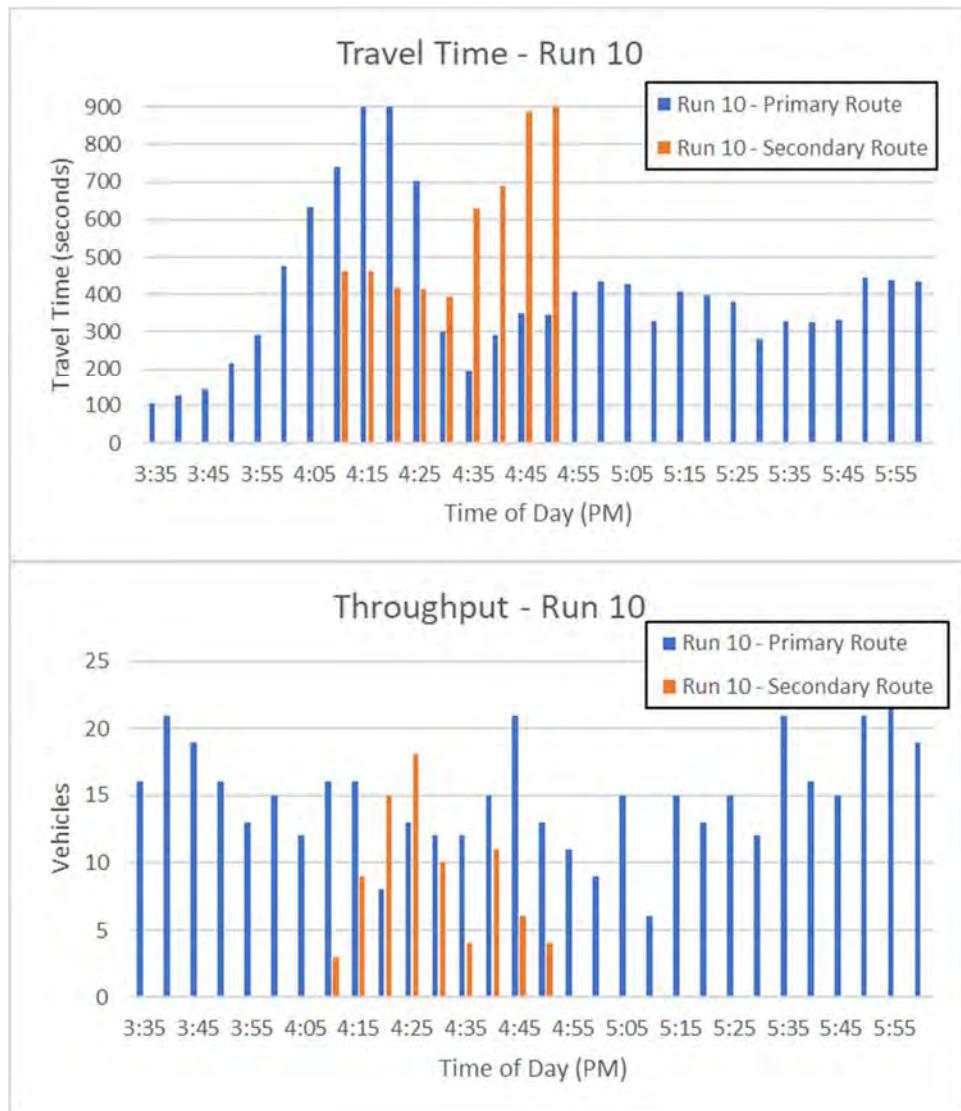


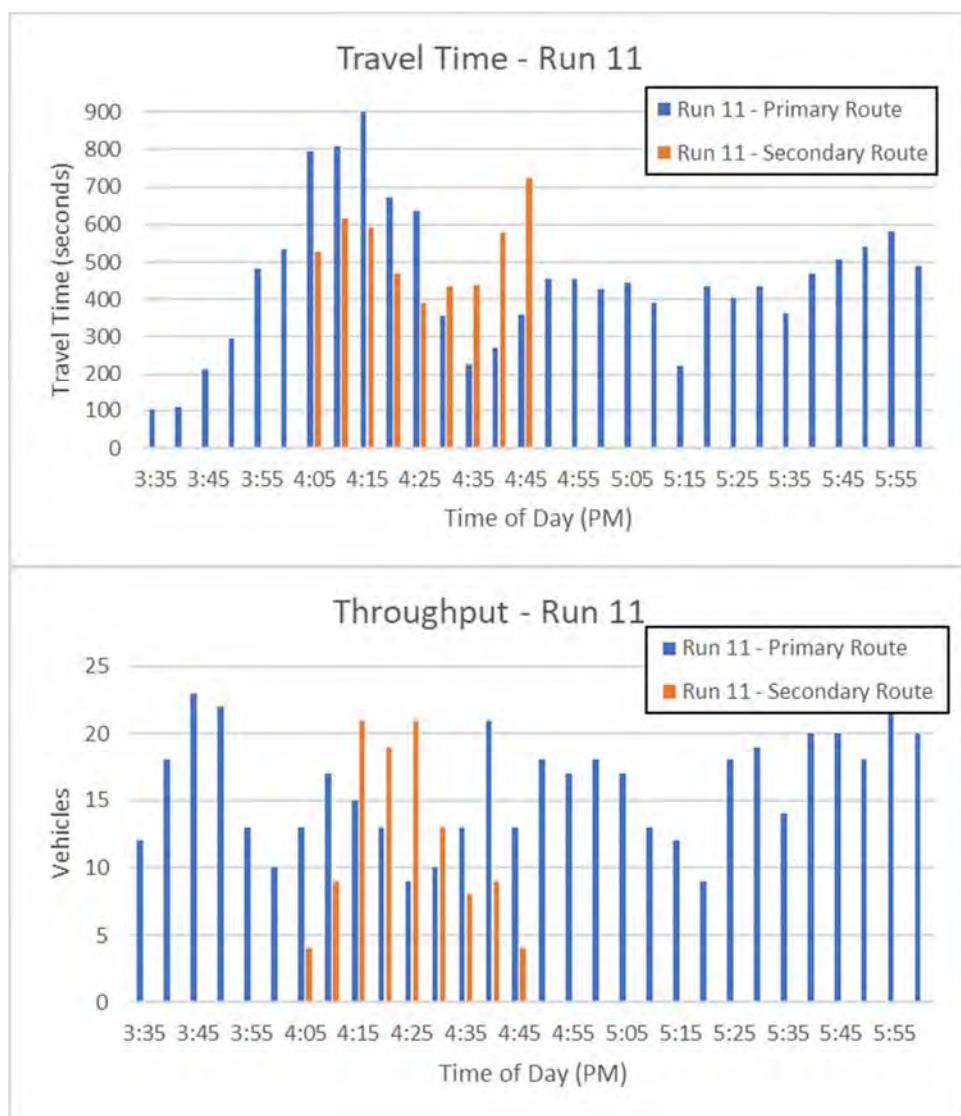


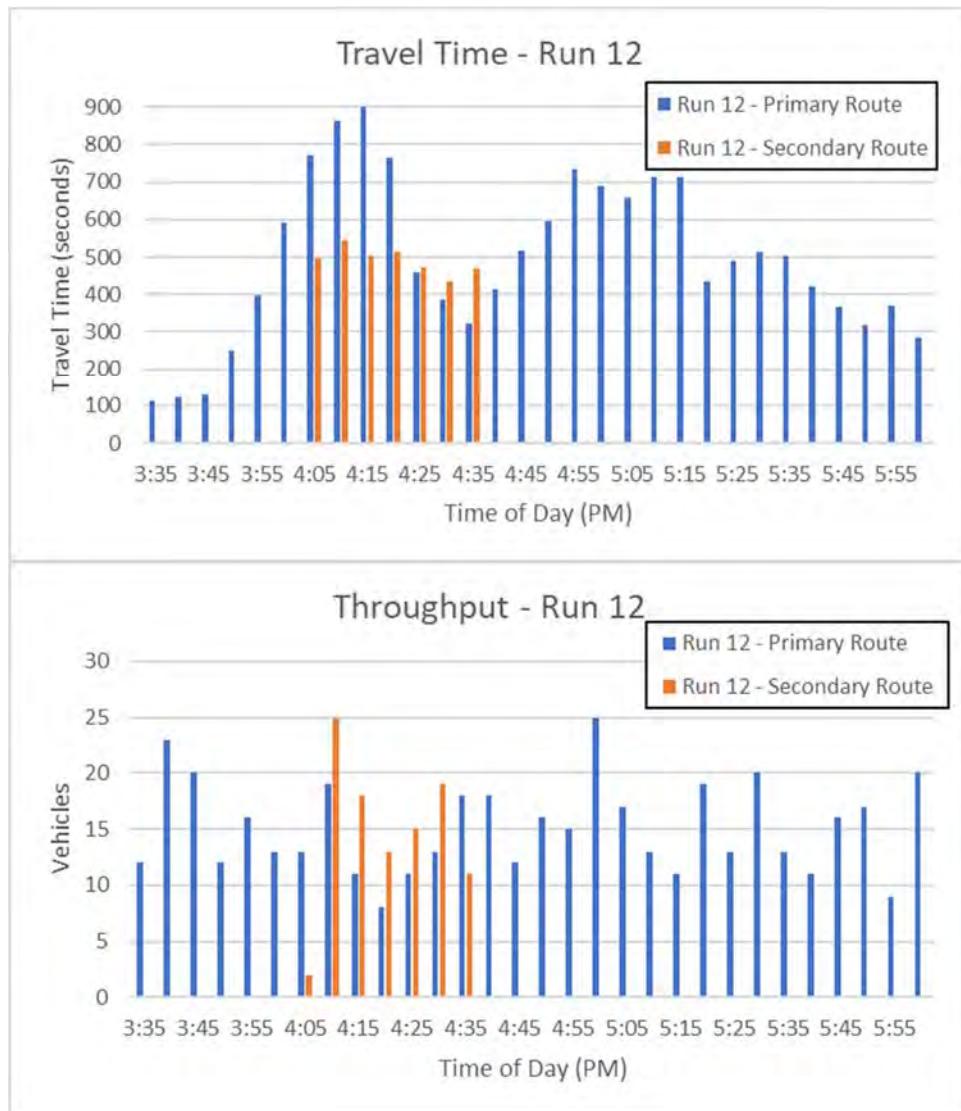


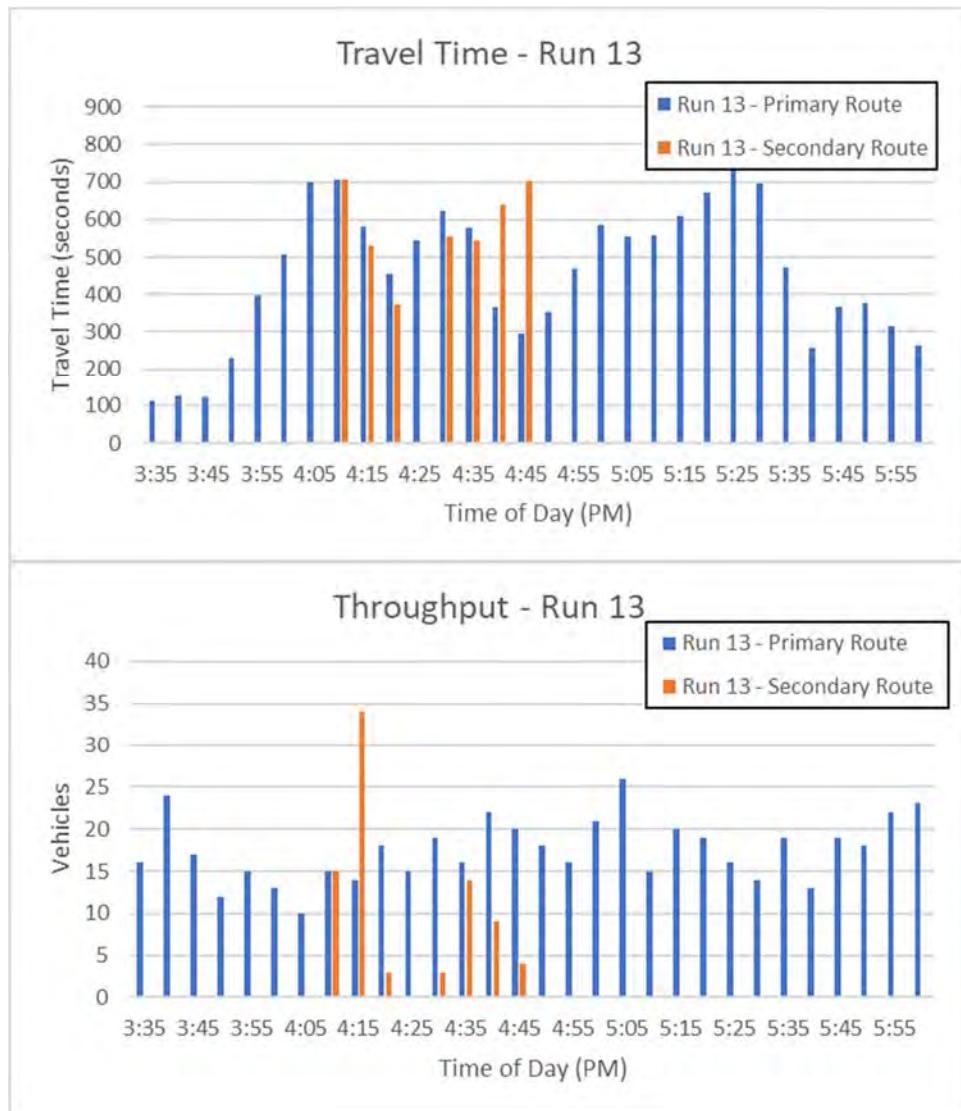


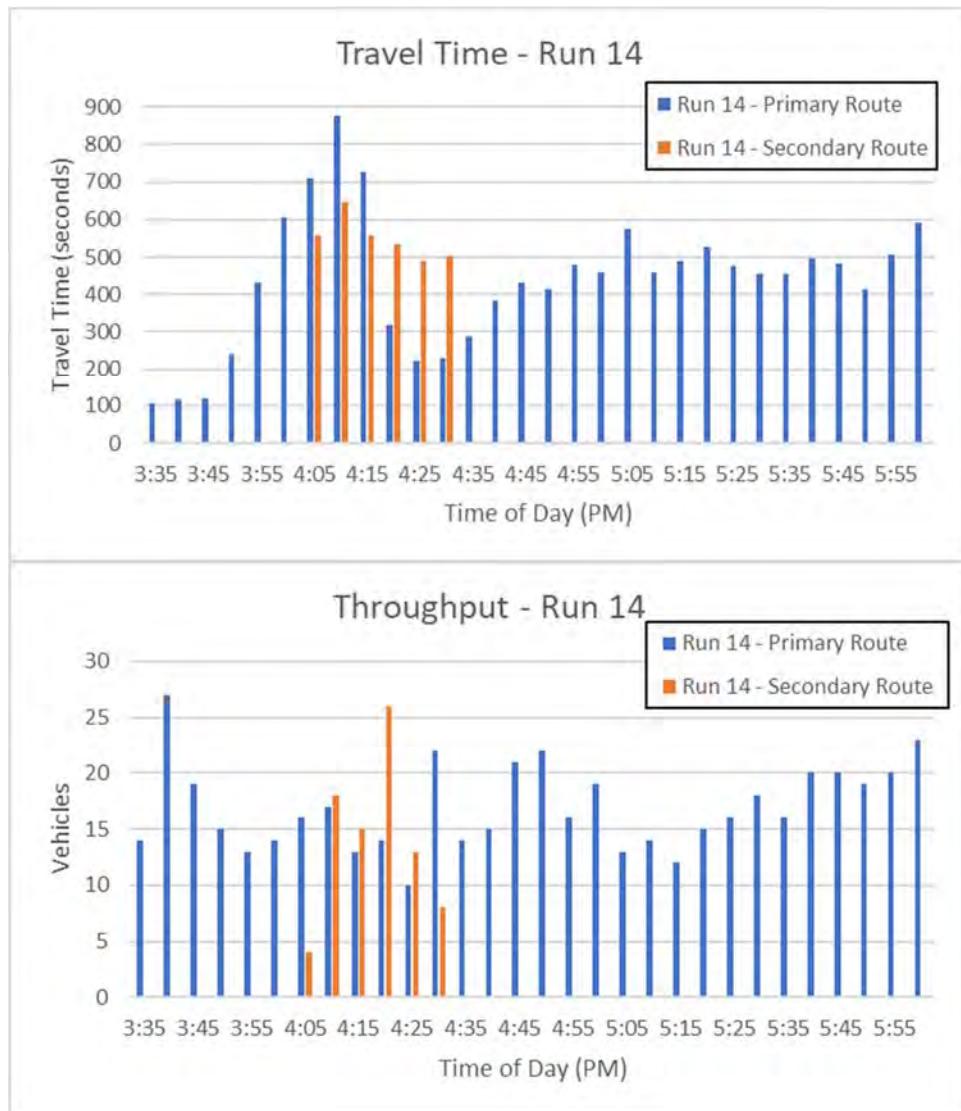


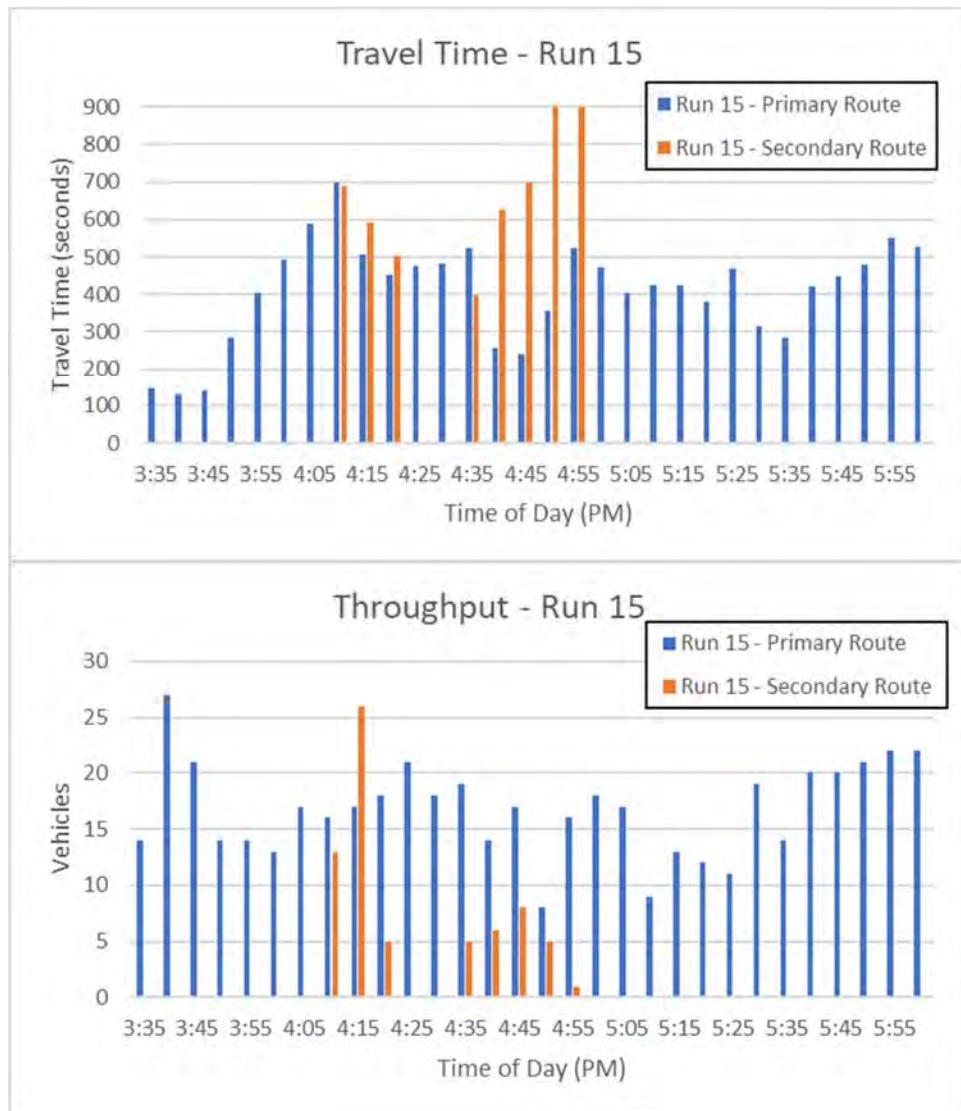












## **Attachment D: Intersection Delay**

**Delay Results for PM****Peak Hour****No Build Conditions****Delay (Sec)**

| Study Intersection No.    |          | 2  | 3                               | 4                              | 6                          |
|---------------------------|----------|--|---------------------------------|--------------------------------|----------------------------|
| Approach                  | Movement | SW Naito Pkwy On-Ramp @ Hawthorne Bridge | SW Naito Pkwy @ SW Jefferson St | SW Naito Pkwy @ SW Columbia St | SW Naito Pkwy @ SW Clay St |
| NB                        | Left     |  | 22                              |                                | 65                         |
|                           | Thru     |  | 1                               | 4                              | 10                         |
|                           | Right    | 27                                       |                                 |                                |                            |
| SB                        | Left     |  |                                 |                                |                            |
|                           | Thru     |  | 52                              | 12                             | 11                         |
|                           | Right    |  | 44                              |                                | 9                          |
| EB                        | Left     |  |                                 | 31                             |                            |
|                           | Thru     |  |                                 | 32                             |                            |
|                           | Right    | 13                                       |                                 |                                |                            |
| WB                        | Left     |  |                                 |                                | 37                         |
|                           | Thru     |  |                                 |                                |                            |
|                           | Right    |  |                                 |                                | 45                         |
| <b>Intersection Total</b> |          | <b>15</b>                                | <b>29</b>                       | <b>12</b>                      | <b>18</b>                  |

| Delay Results for PM Peak Hour |          |                              |                             |                                |                         |
|--------------------------------|----------|------------------------------|-----------------------------|--------------------------------|-------------------------|
| No Build Conditions            |          | Delay (Sec)                  |                             |                                |                         |
| Study Intersection No.         |          | 8                            | 12                          | 13                             | 19                      |
| Approach                       | Movement | SW Naito Pkwy @ SW Market St | SW 1st Ave @ SW Harrison St | SW Naito Pkwy @ SW Harrison St | SW 6th Ave @ SW Hall St |
| NB                             | Left     |                              | 30                          | 77                             | 15                      |
|                                | Thru     | 32                           |                             | 10                             | 11                      |
|                                | Right    | 14                           | 11                          | 8                              |                         |
| SB                             | Left     | 20                           | 46                          |                                |                         |
|                                | Thru     | 2                            | 45                          | 23                             |                         |
|                                | Right    |                              | 49                          | 24                             |                         |
| EB                             | Left     | 111                          |                             | 54                             | 9                       |
|                                | Thru     | 42                           | 54                          | 13                             |                         |
|                                | Right    | 133                          | 55                          | 31                             | 7                       |
| WB                             | Left     |                              | 25                          | 80                             |                         |
|                                | Thru     |                              | 18                          | 38                             | 10                      |
|                                | Right    |                              |                             | 24                             | 11                      |
| Intersection Total             |          | 51                           | 40                          | 29                             | 11                      |

| Delay Results for PM Peak Hour |          |                         |                         |                             |                            |
|--------------------------------|----------|-------------------------|-------------------------|-----------------------------|----------------------------|
| No Build Conditions            |          | Delay (Sec)             |                         |                             |                            |
| Study Intersection No.         |          | 20                      | 21                      | 22                          | 23                         |
| Approach                       | Movement | SW 5th Ave @ SW Hall St | SW 4th Ave @ SW Hall St | SW Broadway @ SW College St | SW 6th Ave @ SW College St |
| NB                             | Left     |                         | 12                      |                             | 12                         |
|                                | Thru     |                         | 6                       |                             | 9                          |
|                                | Right    |                         |                         |                             |                            |
| SB                             | Left     | 54                      |                         | 15                          |                            |
|                                | Thru     | 54                      |                         | 11                          |                            |
|                                | Right    |                         |                         | 9                           |                            |
| EB                             | Left     |                         | 17                      |                             | 31                         |
|                                | Thru     | 16                      |                         | 21                          |                            |
|                                | Right    | 26                      |                         | 18                          | 20                         |
| WB                             | Left     | 0                       |                         | 35                          |                            |
|                                | Thru     | 19                      |                         | 32                          | 10                         |
|                                | Right    |                         |                         |                             | 13                         |
| <b>Intersection Total</b>      |          | <b>44</b>               | <b>7</b>                | <b>16</b>                   | <b>11</b>                  |

| Delay Results for PM Peak Hour |          |                            |                            |                             |                            |
|--------------------------------|----------|----------------------------|----------------------------|-----------------------------|----------------------------|
| No Build Conditions            |          | Delay (Sec)                |                            |                             |                            |
| Study Intersection No.         |          | 24                         | 25                         | 26                          | 27                         |
| Approach                       | Movement | SW 5th Ave @ SW College St | SW 4th Ave @ SW College St | SW Broadway @ SW Jackson St | SW 6th Ave @ SW Jackson St |
| NB                             | Left     |                            | 12                         |                             | 9                          |
|                                | Thru     |                            | 13                         |                             | 1                          |
|                                | Right    |                            |                            |                             |                            |
| SB                             | Left     | 8                          |                            | 9                           |                            |
|                                | Thru     | 9                          |                            | 9                           |                            |
|                                | Right    |                            |                            | 11                          |                            |
| EB                             | Left     |                            | 15                         |                             | 12                         |
|                                | Thru     | 31                         |                            | 12                          |                            |
|                                | Right    | 22                         |                            | 18                          |                            |
| WB                             | Left     | 24                         |                            | 30                          |                            |
|                                | Thru     | 22                         |                            | 25                          |                            |
|                                | Right    |                            |                            |                             | 0                          |
| Intersection Total             |          | 15                         | 13                         | 13                          | 4                          |

| Delay Results for PM Peak Hour |          |                                   |                            |                            |                            |
|--------------------------------|----------|-----------------------------------|----------------------------|----------------------------|----------------------------|
| No Build Conditions            |          | Delay (Sec)                       |                            |                            |                            |
| Study Intersection No.         |          | 28                                | 29                         | 30                         | 31                         |
| Approach                       | Movement | SW 6th Ave @ I-405/Hwy 26 On-Ramp | SW 5th Ave @ SW Jackson St | SW 5th Ave @ SW Lincoln St | SW 4th Ave @ SW Lincoln St |
| NB                             | Left     | 10                                |                            |                            | 14                         |
|                                | Thru     |                                   |                            |                            | 16                         |
|                                | Right    |                                   |                            |                            |                            |
| SB                             | Left     |                                   | 13                         | 5                          |                            |
|                                | Thru     |                                   | 12                         | 4                          |                            |
|                                | Right    |                                   | 61                         |                            |                            |
| EB                             | Left     |                                   |                            |                            | 49                         |
|                                | Thru     |                                   | 44                         |                            |                            |
|                                | Right    |                                   | 29                         |                            | 14                         |
| WB                             | Left     |                                   |                            | 0                          |                            |
|                                | Thru     |                                   |                            |                            | 22                         |
|                                | Right    |                                   |                            |                            | 17                         |
| <b>Intersection Total</b>      |          | <b>10</b>                         | <b>14</b>                  | <b>9</b>                   | <b>17</b>                  |

| Delay Results for PM Peak Hour |          |                            |                            |                               |                          |
|--------------------------------|----------|----------------------------|----------------------------|-------------------------------|--------------------------|
| No Build Conditions            |          | Delay (Sec)                |                            |                               |                          |
| Study Intersection No.         |          | 33                         | 34                         | 35                            | 36                       |
| Approach                       | Movement | SW 2nd Ave @ SW Lincoln St | SW 1st Ave @ SW Lincoln St | SW Naito Pkwy @ SW Lincoln St | SW 4th Ave @ SW Grant St |
| NB                             | Left     | 15                         | 38                         |                               |                          |
|                                | Thru     |                            | 17                         | 6                             |                          |
|                                | Right    | 7                          |                            |                               |                          |
| SB                             | Left     | 10                         |                            |                               |                          |
|                                | Thru     |                            | 23                         | 7                             |                          |
|                                | Right    | 6                          | 26                         |                               |                          |
| EB                             | Left     | 31                         | 24                         |                               |                          |
|                                | Thru     | 29                         | 17                         |                               |                          |
|                                | Right    | 28                         |                            |                               |                          |
| WB                             | Left     | 28                         |                            |                               |                          |
|                                | Thru     | 14                         |                            |                               |                          |
|                                | Right    | 12                         |                            |                               |                          |
| Intersection Total             |          | 22                         | 22                         | 7                             | 9                        |

| Delay Results for PM Peak Hour |          |  |                                      |                          |                              |
|--------------------------------|----------|--|--------------------------------------|--------------------------|------------------------------|
| No Build Conditions            |          | Delay (Sec)                                      |                                      |                          |                              |
| Study Intersection No.         |          | 37   | 38                                   | 39                       | 40                           |
| Approach                       | Movement | SW Broadway @ I-405<br>SB Off-Ramp/SW Lincoln St | SW Broadway @ SW Grant St/SW 6th Ave | SW Broadway @ SW 5th Ave | SW 4th Ave @ SW Caruthers St |
| NB                             | Left     |  |                                      |                          | 52                           |
|                                | Thru     |  | 185                                  |                          | 51                           |
|                                | Right    | 121  |                                      |                          |                              |
| SB                             | Left     | 82   |                                      |                          |                              |
|                                | Thru     | 45   |                                      | 46                       | 4                            |
|                                | Right    | 54   |                                      |                          | 5                            |
| EB                             | Left     |  | 132                                  |                          | 110                          |
|                                | Thru     | 143  | 21                                   | 12                       | 57                           |
|                                | Right    | 158  | 36                                   |                          |                              |
| WB                             | Left     |  |                                      |                          | 24                           |
|                                | Thru     |  |                                      | 165                      | 29                           |
|                                | Right    |  | 26                                   |                          | 41                           |
| <b>Intersection Total</b>      |          | <b>126</b>                                       | <b>57</b>                            | <b>77</b>                | <b>28</b>                    |

| Delay Results for PM Peak Hour |          |                              |  |                             |   |
|--------------------------------|----------|------------------------------|--|-----------------------------|---|
| No Build Conditions            |          | Delay (Sec)                  |  |                             |   |
| Study Intersection No.         |          | 41                           | 42                                       | 43                          | 44  |
| Approach                       | Movement | SW 5th Ave @ SW Caruthers St | SW 4th Ave @ SW Caruthers St/SW Broadway | SW 5th Ave @ SW Sheridan St | SW 6th Ave/SW Terwilliger Blvd @ SW Sheridan St |
| NB                             | Left     |                              | 154                                      |                             | 0   |
|                                | Thru     |                              | 8  |                             | 85  |
|                                | Right    |                              |  |                             | 82  |
| SB                             | Left     |                              |  | 26                          | 16  |
|                                | Thru     | 27                           |  |                             | 1   |
|                                | Right    | 16                           |  |                             | 3   |
| EB                             | Left     |                              |  |                             | 0   |
|                                | Thru     |                              |  |                             | 0   |
|                                | Right    |                              |  | 50                          | 0   |
| WB                             | Left     | 40                           |  |                             |   |
|                                | Thru     | 40                           | 9  |                             |   |
|                                | Right    |                              | 1  |                             |   |
| <b>Intersection Total</b>      |          | <b>27</b>                    | <b>27</b>                                | <b>30</b>                   | <b>46</b>                                       |

| Delay Results for PM Peak Hour |          |  |                             |                                |                           |
|--------------------------------|----------|--|-----------------------------|--------------------------------|---------------------------|
| No Build Conditions            |          | Delay (Sec)                                |                             |                                |                           |
| Study Intersection No.         |          | 45   | 46                          | 47                             | 48                        |
| Approach                       | Movement | SW 4th Ave/SW Barbur Blvd @ SW Sheridan St | SW 1st Ave @ SW Sheridan St | SW Naito Pkwy @ SW Sheridan St | SW 1st Ave @ SW Arthur St |
| NB                             | Left     |  | 2                           |                                | 93                        |
|                                | Thru     | 119  | 0                           |                                | 67                        |
|                                | Right    | 104  | 1                           |                                | 86                        |
| SB                             | Left     |  | 23                          |                                | 68                        |
|                                | Thru     |  | 6                           |                                | 34                        |
|                                | Right    |  | 5                           |                                | 30                        |
| EB                             | Left     | 44   | 10                          |                                | 182                       |
|                                | Thru     | 1  | 8                           |                                | 187                       |
|                                | Right    | 33   | 14                          | 3                              | 222                       |
| WB                             | Left     |  | 14                          |                                |                           |
|                                | Thru     |  | 0                           | 3                              | 299                       |
|                                | Right    |  | 6                           |                                | 307                       |
| <b>Intersection Total</b>      |          | <b>49</b>                                  | <b>10</b>                   | <b>3</b>                       | <b>205</b>                |

| Delay Results for PM Peak Hour |          |                               |   |                              |                                   |
|--------------------------------|----------|-------------------------------|---|------------------------------|-----------------------------------|
| No Build Conditions            |          | Delay (Sec)                   |   |                              |                                   |
| Study Intersection No.         |          | 52                            | 56  | 58                           | 59                                |
| Approach                       | Movement | SW Barbur Blvd @ SW Hooker St | SW Kelly St/SW Corbett Ave @ SW Porter St/SW Hood Ave | SW Barbur Blvd @ SW Woods St | SW Water Ave @ Ross Island Bridge |
| NB                             | Left     | 31                            |   | 9                            |                                   |
|                                | Thru     | 26                            | 307   | 23                           |                                   |
|                                | Right    | 24                            | 336   | 23                           |                                   |
| SB                             | Left     | 29                            | 205   | 14                           |                                   |
|                                | Thru     | 15                            | 10  | 1                            |                                   |
|                                | Right    | 16                            | 8   | 2                            | 12                                |
| EB                             | Left     | 10                            |   | 20                           |                                   |
|                                | Thru     | 12                            | 6   | 10                           |                                   |
|                                | Right    | 11                            |   | 0                            |                                   |
| WB                             | Left     | 17                            |   | 15                           |                                   |
|                                | Thru     | 0                             |   | 0                            | 216                               |
|                                | Right    | 15                            |   | 10                           | 223                               |
| <b>Intersection Total</b>      |          | <b>21</b>                     | <b>297</b>  | <b>15</b>                    | <b>204</b>                        |

| Delay Results for PM Peak Hour |          |                              |                                    |                                  |   |
|--------------------------------|----------|------------------------------|------------------------------------|----------------------------------|---|
| No Build Conditions            |          | Delay (Sec)                  |                                    |                                  |   |
| Study Intersection No.         |          | 60                           | 61                                 | 62                               | 69                                      |
| Approach                       | Movement | SW Hood Ave @ SW Macadam Ave | SW Naito Pkwy @ Ross Island Bridge | Kelly Ramps @ Ross Island Bridge | SW Naito Pkwy @ SW Gibbs St/Naito Ramps |
| NB                             | Left     |                              |                                    |                                  |   |
|                                | Thru     |                              |                                    |                                  | 141                                     |
|                                | Right    |                              | 119                                | 56                               | 0                                       |
| SB                             | Left     |                              |                                    |                                  |   |
|                                | Thru     |                              |                                    |                                  |   |
|                                | Right    |                              |                                    |                                  |   |
| EB                             | Left     |                              |                                    |                                  |   |
|                                | Thru     | 5                            |                                    |                                  |   |
|                                | Right    |                              | 189                                |                                  |   |
| WB                             | Left     | 157                          |                                    |                                  |   |
|                                | Thru     |                              |                                    |                                  |   |
|                                | Right    |                              |                                    |                                  | 213                                     |
| <b>Intersection Total</b>      |          | <b>57</b>                    | <b>168</b>                         | <b>56</b>                        | <b>161</b>                              |

| Delay Results for PM Peak Hour |          |                            |                             |                                  |                                 |
|--------------------------------|----------|----------------------------|-----------------------------|----------------------------------|---------------------------------|
| No Build Conditions            |          | Delay (Sec)                |                             |                                  |                                 |
| Study Intersection No.         |          | 70                         | 77                          | 78                               | 80                              |
| Approach                       | Movement | SW Kelly Ave @ SW Gibbs St | SW Barbur Blvd @ SW Lane St | SW Barbur Blvd @ SW Abernathy St | SW Barbur Blvd @ SW Bancroft St |
| NB                             | Left     | 171                        | 8                           | 11                               |                                 |
|                                | Thru     | 177                        | 1                           |                                  |                                 |
|                                | Right    | 0                          |                             |                                  | 17                              |
| SB                             | Left     | 81                         |                             |                                  |                                 |
|                                | Thru     | 85                         | 6                           | 0                                |                                 |
|                                | Right    | 107                        | 7                           | 0                                |                                 |
| EB                             | Left     | 37                         | 18                          | 18                               |                                 |
|                                | Thru     | 23                         | 14                          | 14                               |                                 |
|                                | Right    | 0                          |                             |                                  |                                 |
| WB                             | Left     |                            |                             |                                  |                                 |
|                                | Thru     |                            |                             |                                  |                                 |
|                                | Right    |                            |                             |                                  | 11                              |
| Intersection Total             |          | 135                        | 4                           | 1                                | 15                              |

| Delay Results for PM Peak Hour |          |                                 |                                 |                                   |
|--------------------------------|----------|---------------------------------|---------------------------------|-----------------------------------|
| No Build Conditions            |          | Delay (Sec)                     |                                 |                                   |
| Study Intersection No.         |          | 81                              | 82                              | 83                                |
| Approach                       | Movement | SW Corbett Ave @ SW Bancroft St | SW Barbur Blvd @ SW Hamilton St | SW Hamilton Blvd @ SW Corbett Ave |
| NB                             | Left     | 4                               |                                 | 233                               |
|                                | Thru     | 2                               | 47                              | 231                               |
|                                | Right    | 3                               | 58                              | 232                               |
| SB                             | Left     | 6                               | 74                              | 51                                |
|                                | Thru     | 2                               | 15                              | 42                                |
|                                | Right    | 1                               | 18                              | 40                                |
| EB                             | Left     | 29                              | 241                             | 19                                |
|                                | Thru     | 25                              | 206                             | 18                                |
|                                | Right    | 24                              | 220                             | 22                                |
| WB                             | Left     | 16                              | 73                              | 22                                |
|                                | Thru     | 15                              | 76                              | 18                                |
|                                | Right    | 9                               | 29                              | 11                                |
| <b>Intersection Total</b>      |          | <b>8</b>                        | <b>44</b>                       | <b>95</b>                         |

## **Attachment E: 95<sup>th</sup> Percentile Queues**

| No Build Conditions 95th Percentile Queues (ft) - 4:00 PM - 6:00 PM |  |                    |              |                |                            |
|---|--|--------------------|--------------|----------------|----------------------------|
| Intersection #  | Movement                                     | Average Queue (ft) | Std Dev (ft) | Max Queue (ft) | 95th Percentile Queue (ft) |
| 2   | SW Naito Pkwy On-Ramp @ Hawthorne Bridge:NBR | 154                | 67           | 465            | 279                        |
| 3   | SW Naito Pkwy @ SW Jefferson St:NBL          | 51                 | 32           | 166            | 113                        |
| 3   | SW Naito Pkwy @ SW Jefferson St:SBT          | 734                | 588          | 2598           | 2012                       |
| 4   | SW Naito Pkwy @ SW Columbia St:NBL           | 4                  | 10           | 71             | 22                         |
| 4   | SW Naito Pkwy @ SW Columbia St:NBT           | 201                | 93           | 349            | 290                        |
| 4   | SW Naito Pkwy @ SW Columbia St:SBT           | 203                | 94           | 317            | 283                        |
| 4   | SW Naito Pkwy @ SW Columbia St:EBT           | 124                | 39           | 264            | 200                        |
| 6   | SW Naito Pkwy @ SW Clay St:NBL               | 29                 | 22           | 131            | 68                         |
| 6   | SW Naito Pkwy @ SW Clay St:NBT               | 165                | 64           | 311            | 272                        |
| 6   | SW Naito Pkwy @ SW Clay St:SBL               | 191                | 77           | 305            | 268                        |
| 6   | SW Naito Pkwy @ SW Clay St:SBT               | 172                | 55           | 281            | 265                        |
| 6   | SW Naito Pkwy @ SW Clay St:WBT               | 338                | 120          | 849            | 591                        |
| 6   | SW Naito Pkwy @ SW Clay St:WBR               | 0                  | 0            | 0              | 0                          |
| 8   | SW Naito Pkwy @ SW Market St:NBL             | 16                 | 18           | 137            | 45                         |
| 8   | SW Naito Pkwy @ SW Market St:NBT             | 152                | 52           | 439            | 244                        |
| 8   | SW Naito Pkwy @ SW Market St:SBL             | 251                | 42           | 345            | 289                        |
| 8   | SW Naito Pkwy @ SW Market St:SBT             | 37                 | 28           | 225            | 88                         |
| 8   | SW Naito Pkwy @ SW Market St:EBL             | 397                | 391          | 1782           | 1153                       |
| 8   | SW Naito Pkwy @ SW Market St:EBT             | 675                | 239          | 1777           | 1148                       |
| 8   | SW Naito Pkwy @ SW Market St:EBR             | 308                | 382          | 1774           | 1104                       |
| 12  | SW 1st Ave @ SW Harrison St:NBL              | 80                 | 50           | 288            | 169                        |
| 12  | SW 1st Ave @ SW Harrison St:NBR              | 31                 | 25           | 190            | 82                         |
| 12  | SW 1st Ave @ SW Harrison St:EBT              | 103                | 65           | 600            | 211                        |
| 12  | SW 1st Ave @ SW Harrison St:WBT              | 83                 | 39           | 284            | 154                        |
| 13  | SW Naito Pkwy @ SW Harrison St:NBL           | 174                | 115          | 592            | 413                        |
| 13  | SW Naito Pkwy @ SW Harrison St:NBT           | 65                 | 41           | 254            | 133                        |
| 13  | SW Naito Pkwy @ SW Harrison St:SBT           | 307                | 144          | 734            | 553                        |
| 13  | SW Naito Pkwy @ SW Harrison St:EBL           | 105                | 70           | 360            | 271                        |
| 13  | SW Naito Pkwy @ SW Harrison St:EBT           | 73                 | 55           | 353            | 178                        |
| 13  | SW Naito Pkwy @ SW Harrison St:EBR           | 84                 | 51           | 384            | 171                        |
| 13  | SW Naito Pkwy @ SW Harrison St:WBL           | 153                | 116          | 847            | 401                        |
| 13  | SW Naito Pkwy @ SW Harrison St:WBT           | 56                 | 42           | 395            | 125                        |
| 19  | SW 6th Ave @ SW Hall St:NBT                  | 110                | 44           | 295            | 185                        |
| 19  | SW 6th Ave @ SW Hall St:EBT                  | 31                 | 23           | 132            | 70                         |
| 19  | SW 6th Ave @ SW Hall St:WBT                  | 52                 | 48           | 258            | 152                        |
| 20  | SW 5th Ave @ SW Hall St:SBT                  | 205                | 231          | 1112           | 779                        |
| 20  | SW 5th Ave @ SW Hall St:EBT                  | 28                 | 22           | 141            | 67                         |
| 20  | SW 5th Ave @ SW Hall St:WBT                  | 72                 | 48           | 271            | 153                        |
| 21  | SW 4th Ave @ SW Hall St:NBT                  | 156                | 62           | 296            | 262                        |
| 21  | SW 4th Ave @ SW Hall St:EBT                  | 23                 | 19           | 151            | 64                         |
| 22  | SW Broadway @ SW College St:SBT              | 162                | 138          | 985            | 468                        |
| 22  | SW Broadway @ SW College St:EBT              | 13                 | 16           | 87             | 45                         |
| 22  | SW Broadway @ SW College St:WBT              | 96                 | 71           | 328            | 264                        |
| 23  | SW 6th Ave @ SW College St:NBT               | 91                 | 39           | 264            | 153                        |
| 23  | SW 6th Ave @ SW College St:EBT               | 39                 | 34           | 282            | 91                         |
| 23  | SW 6th Ave @ SW College St:WBT               | 41                 | 43           | 218            | 135                        |
| 24  | SW 5th Ave @ SW College St:SBT               | 89                 | 63           | 310            | 203                        |
| 24  | SW 5th Ave @ SW College St:EBT               | 27                 | 22           | 151            | 68                         |
| 24  | SW 5th Ave @ SW College St:WBT               | 100                | 62           | 304            | 261                        |
| 25  | SW 4th Ave @ SW College St:NBT               | 137                | 69           | 491            | 261                        |
| 25  | SW 4th Ave @ SW College St:EBR               | 14                 | 16           | 95             | 44                         |
| 26  | SW Broadway @ SW Jackson St:SBT              | 151                | 69           | 319            | 275                        |
| 26  | SW Broadway @ SW Jackson St:EBT              | 32                 | 26           | 209            | 86                         |
| 26  | SW Broadway @ SW Jackson St:WBT              | 140                | 147          | 1302           | 354                        |
| 27  | SW 6th Ave @ SW Jackson St:NBT               | 33                 | 106          | 1078           | 143                        |
| 27  | SW 6th Ave @ SW Jackson St:EBL               | 32                 | 29           | 264            | 78                         |
| 27  | SW 6th Ave @ SW Jackson St:WBR               | 1                  | 4            | 36             | 0                          |
| 28  | SW 6th Ave @ I-405/Hwy 26 On-Ramp:NBL        | 511                | 154          | 735            | 679                        |
| 29  | SW 5th Ave @ SW Jackson St:SBT               | 160                | 70           | 305            | 268                        |
| 29  | SW 5th Ave @ SW Jackson St:EBR               | 6                  | 10           | 47             | 23                         |

| No Build Conditions 95th Percentile Queues (ft) - 4:00 PM - 6:00 PM |   |                    |              |                |                            |
|---|---|--------------------|--------------|----------------|----------------------------|
| Intersection #  | Movement  | Average Queue (ft) | Std Dev (ft) | Max Queue (ft) | 95th Percentile Queue (ft) |
| 30  | SW 5th Ave @ SW Lincoln St:SBT                      | 20                 | 41           | 241            | 88                         |
| 30  | SW 5th Ave @ SW Lincoln St:WBR                      | 25                 | 21           | 158            | 67                         |
| 31  | SW 4th Ave @ SW Lincoln St:NBT                      | 179                | 114          | 822            | 331                        |
| 31  | SW 4th Ave @ SW Lincoln St:NBL                      | 57                 | 46           | 479            | 125                        |
| 31  | SW 4th Ave @ SW Lincoln St:EBL                      | 16                 | 19           | 108            | 48                         |
| 31  | SW 4th Ave @ SW Lincoln St:EBT                      | 54                 | 44           | 272            | 135                        |
| 31  | SW 4th Ave @ SW Lincoln St:WBT                      | 75                 | 56           | 339            | 182                        |
| 33  | SW 2nd Ave @ SW Lincoln St:NBT                      | 7                  | 11           | 82             | 20                         |
| 33  | SW 2nd Ave @ SW Lincoln St:SBT                      | 6                  | 10           | 47             | 22                         |
| 33  | SW 2nd Ave @ SW Lincoln St:EBL                      | 11                 | 15           | 93             | 43                         |
| 33  | SW 2nd Ave @ SW Lincoln St:EBT                      | 164                | 111          | 569            | 413                        |
| 33  | SW 2nd Ave @ SW Lincoln St:WBL                      | 11                 | 18           | 205            | 42                         |
| 33  | SW 2nd Ave @ SW Lincoln St:WBT                      | 86                 | 57           | 344            | 184                        |
| 34  | SW 1st Ave @ SW Lincoln St:NBL                      | 42                 | 29           | 186            | 92                         |
| 34  | SW 1st Ave @ SW Lincoln St:NBT                      | 56                 | 31           | 213            | 110                        |
| 34  | SW 1st Ave @ SW Lincoln St:SBT                      | 183                | 172          | 1941           | 464                        |
| 34  | SW 1st Ave @ SW Lincoln St:EBL                      | 36                 | 35           | 316            | 91                         |
| 34  | SW 1st Ave @ SW Lincoln St:EBR                      | 108                | 78           | 354            | 298                        |
| 35  | SW Naito Pkwy @ SW Lincoln St:NBT                   | 71                 | 70           | 657            | 199                        |
| 35  | SW Naito Pkwy @ SW Lincoln St:SBT                   | 181                | 145          | 560            | 458                        |
| 36  | SW 4th Ave @ SW Grant St:EBL                        | 18                 | 15           | 85             | 44                         |
| 37  | SW Broadway @ I-405 SB Off-Ramp/SW Lincoln St:NBR   | 343                | 42           | 401            | 370                        |
| 37  | SW Broadway @ I-405 SB Off-Ramp/SW Lincoln St:SBT   | 320                | 145          | 549            | 495                        |
| 37  | SW Broadway @ I-405 SB Off-Ramp/SW Lincoln St:EBT   | 1053               | 182          | 1155           | 1117                       |
| 38  | SW Broadway @ SW Grant St/SW 6th Ave:NBT            | 307                | 130          | 459            | 427                        |
| 38  | SW Broadway @ SW Grant St/SW 6th Ave:EBL            | 304                | 131          | 495            | 440                        |
| 38  | SW Broadway @ SW Grant St/SW 6th Ave:EBT            | 363                | 85           | 506            | 463                        |
| 38  | SW Broadway @ SW Grant St/SW 6th Ave:WBR            | 168                | 29           | 232            | 199                        |
| 39  | SW Broadway @ SW 5th Ave:SBR                        | 145                | 93           | 736            | 334                        |
| 39  | SW Broadway @ SW 5th Ave:EBT                        | 154                | 64           | 278            | 241                        |
| 39  | SW Broadway @ SW 5th Ave:WBR                        | 589                | 47           | 649            | 623                        |
| 40  | SW 4th Ave @ SW Caruthers St:NBT                    | 102                | 94           | 309            | 270                        |
| 40  | SW 4th Ave @ SW Caruthers St:SBT                    | 129                | 125          | 494            | 390                        |
| 40  | SW 4th Ave @ SW Caruthers St:EBL                    | 28                 | 34           | 139            | 118                        |
| 40  | SW 4th Ave @ SW Caruthers St:WBT                    | 65                 | 47           | 273            | 154                        |
| 41  | SW 5th Ave @ SW Caruthers St:SBT                    | 284                | 77           | 421            | 365                        |
| 41  | SW 5th Ave @ SW Caruthers St:WBT                    | 54                 | 67           | 365            | 177                        |
| 42  | SW 4th Ave @ SW Caruthers St/SW Broadway:NBL        | 187                | 73           | 316            | 260                        |
| 42  | SW 4th Ave @ SW Caruthers St/SW Broadway:NBT        | 102                | 55           | 316            | 202                        |
| 42  | SW 4th Ave @ SW Caruthers St/SW Broadway:WBT        | 1136               | 389          | 1461           | 1420                       |
| 43  | SW 5th Ave @ SW Sheridan St:SBL                     | 253                | 48           | 339            | 297                        |
| 43  | SW 5th Ave @ SW Sheridan St:EBT                     | 132                | 67           | 306            | 250                        |
| 44  | SW 6th Ave/SW Terwilliger Blvd @ SW Sheridan St:NBT | 605                | 494          | 1280           | 1224                       |
| 44  | SW 6th Ave/SW Terwilliger Blvd @ SW Sheridan St:SBL | 36                 | 48           | 286            | 137                        |
| 44  | SW 6th Ave/SW Terwilliger Blvd @ SW Sheridan St:SBT | 39                 | 53           | 287            | 154                        |
| 44  | SW 6th Ave/SW Terwilliger Blvd @ SW Sheridan St:EBT | 0                  | 0            | 0              | 0                          |
| 45  | SW 4th Ave/SW Barbur Blvd @ SW Sheridan St:NBL      | 425                | 353          | 1111           | 1072                       |
| 45  | SW 4th Ave/SW Barbur Blvd @ SW Sheridan St:NBT      | 318                | 289          | 1108           | 1069                       |
| 45  | SW 4th Ave/SW Barbur Blvd @ SW Sheridan St:EBT      | 246                | 43           | 304            | 282                        |
| 45  | SW 4th Ave/SW Barbur Blvd @ SW Sheridan St:EBR      | 17                 | 43           | 293            | 94                         |
| 46  | SW 1st Ave @ SW Sheridan St:SBL                     | 243                | 363          | 1147           | 1108                       |
| 46  | SW 1st Ave @ SW Sheridan St:EBT                     | 11                 | 12           | 89             | 22                         |
| 46  | SW 1st Ave @ SW Sheridan St:WBT                     | 18                 | 11           | 79             | 42                         |
| 48  | SW 1st Ave @ SW Arthur St:NBL                       | 34                 | 38           | 427            | 87                         |
| 48  | SW 1st Ave @ SW Arthur St:NBT                       | 138                | 152          | 805            | 396                        |
| 48  | SW 1st Ave @ SW Arthur St:SBL                       | 183                | 268          | 1569           | 626                        |
| 48  | SW 1st Ave @ SW Arthur St:SBT                       | 250                | 266          | 1567           | 664                        |
| 48  | SW 1st Ave @ SW Arthur St:SBR                       | 20                 | 26           | 172            | 71                         |
| 48  | SW 1st Ave @ SW Arthur St:EBL                       | 761                | 592          | 1331           | 1290                       |
| 48  | SW 1st Ave @ SW Arthur St:EBT                       | 1238               | 78           | 1328           | 1310                       |

| No Build Conditions 95th Percentile Queues (ft) - 4:00 PM - 6:00 PM |   |                    |              |                |                            |
|---|---|--------------------|--------------|----------------|----------------------------|
| Intersection #  | Movement  | Average Queue (ft) | Std Dev (ft) | Max Queue (ft) | 95th Percentile Queue (ft) |
| 48  | SW 1st Ave @ SW Arthur St:WBT                         | 4931               | 3444         | 11018          | 8497                       |
| 51  | SW Water St @ SW Kelly St:SBT                         | 273                | 127          | 413            | 357                        |
| 51  | SW Water St @ SW Kelly St:EBL                         | 19                 | 38           | 407            | 77                         |
| 52  | SW Barbur Blvd @ SW Hooker St:NBL                     | 2                  | 8            | 62             | 21                         |
| 52  | SW Barbur Blvd @ SW Hooker St:NBT                     | 311                | 555          | 2556           | 1935                       |
| 52  | SW Barbur Blvd @ SW Hooker St:SBL                     | 41                 | 94           | 997            | 144                        |
| 52  | SW Barbur Blvd @ SW Hooker St:SBT                     | 284                | 242          | 1046           | 762                        |
| 52  | SW Barbur Blvd @ SW Hooker St:EBT                     | 3                  | 7            | 21             | 20                         |
| 52  | SW Barbur Blvd @ SW Hooker St:WBT                     | 30                 | 20           | 173            | 64                         |
| 56  | SW Kelly St/SW Corbett Ave @ SW Porter St/SW Hood Ave | 26                 | 49           | 436            | 109                        |
| 56  | SW Kelly St/SW Corbett Ave @ SW Porter St/SW Hood Ave | 6                  | 9            | 60             | 20                         |
| 58  | SW Barbur Blvd @ SW Woods St:NBL                      | 0                  | 0            | 0              | 0                          |
| 58  | SW Barbur Blvd @ SW Woods St:SBL                      | 30                 | 47           | 582            | 101                        |
| 58  | SW Barbur Blvd @ SW Woods St:EBT                      | 4                  | 8            | 63             | 20                         |
| 58  | SW Barbur Blvd @ SW Woods St:WBT                      | 15                 | 14           | 82             | 38                         |
| 59  | SW Water Ave @ Ross Island Bridge:SBR                 | 18                 | 12           | 78             | 41                         |
| 61  | SW Naito Pkwy @ Ross Island Bridge:SBL                | 2104               | 928          | 4225           | 3775                       |
| 62  | Kelly Ramps @ Ross Island Bridge:NBR                  | 441                | 16           | 497            | 457                        |
| 62  | Kelly Ramps @ Ross Island Bridge:EBT                  | 2650               | 343          | 3977           | 3308                       |
| 69  | SW Naito Pkwy @ SW Gibbs St/Naito Ramps:WBR           | 1282               | 548          | 2510           | 1933                       |
| 70  | SW Kelly Ave @ SW Gibbs St:NBT                        | 1000               | 328          | 1565           | 1527                       |
| 70  | SW Kelly Ave @ SW Gibbs St:SBT                        | 7                  | 22           | 201            | 42                         |
| 70  | SW Kelly Ave @ SW Gibbs St:EBR                        | 51                 | 51           | 578            | 121                        |
| 71  | SW Barbur Blvd @ SW Whitaker St:SBL                   | 1                  | 5            | 69             | 0                          |
| 71  | SW Barbur Blvd @ SW Whitaker St:WBT                   | 16                 | 12           | 81             | 41                         |
| 73  | SW Kelly Ave @ SW Whitaker St:WBT                     | 4455               | 3849         | 11152          | 9604                       |
| 75  | SW Barbur Blvd @ SW Pennoyer St:SBL                   | 0                  | 2            | 34             | 0                          |
| 75  | SW Barbur Blvd @ SW Pennoyer St:WBT                   | 14                 | 12           | 65             | 22                         |
| 76  | SW Barbur Blvd @ SW Condor Ave:NBL                    | 0                  | 1            | 32             | 0                          |
| 76  | SW Barbur Blvd @ SW Condor Ave:EBT                    | 36                 | 21           | 216            | 79                         |
| 77  | SW Barbur Blvd @ SW Lane St:NBL                       | 2                  | 8            | 72             | 27                         |
| 77  | SW Barbur Blvd @ SW Lane St:NBT                       | 42                 | 191          | 1755           | 105                        |
| 77  | SW Barbur Blvd @ SW Lane St:SBL                       | 45                 | 200          | 2493           | 189                        |
| 77  | SW Barbur Blvd @ SW Lane St:EBL                       | 57                 | 35           | 245            | 117                        |
| 78  | SW Barbur Blvd @ SW Abernathy St:NBL                  | 90                 | 331          | 1980           | 1079                       |
| 78  | SW Barbur Blvd @ SW Abernathy St:EBT                  | 12                 | 12           | 67             | 23                         |
| 79  | SW Barbur Blvd @ SW Lowell St:WBR                     | 7                  | 14           | 100            | 24                         |
| 80  | SW Barbur Blvd @ SW Bancroft St:WBR                   | 45                 | 35           | 199            | 109                        |
| 81  | SW Corbett Ave @ SW Bancroft St:NBT                   | 50                 | 108          | 587            | 283                        |
| 81  | SW Corbett Ave @ SW Bancroft St:SBT                   | 24                 | 71           | 430            | 120                        |
| 81  | SW Corbett Ave @ SW Bancroft St:EBT                   | 223                | 165          | 852            | 534                        |
| 81  | SW Corbett Ave @ SW Bancroft St:WBT                   | 21                 | 15           | 105            | 45                         |
| 82  | SW Barbur Blvd @ SW Hamilton St:NBT                   | 672                | 447          | 3901           | 1213                       |
| 82  | SW Barbur Blvd @ SW Hamilton St:SBL                   | 505                | 446          | 4408           | 1158                       |
| 82  | SW Barbur Blvd @ SW Hamilton St:SBT                   | 419                | 422          | 4389           | 976                        |
| 82  | SW Barbur Blvd @ SW Hamilton St:EBT                   | 264                | 205          | 960            | 675                        |
| 82  | SW Barbur Blvd @ SW Hamilton St:WBT                   | 202                | 71           | 485            | 320                        |
| 82  | SW Barbur Blvd @ SW Hamilton St:WBR                   | 25                 | 30           | 474            | 63                         |
| 83  | SW Hamilton Blvd @ SW Corbett Ave:NBT                 | 1574               | 29           | 1636           | 1588                       |
| 83  | SW Hamilton Blvd @ SW Corbett Ave:SBT                 | 185                | 125          | 562            | 453                        |
| 83  | SW Hamilton Blvd @ SW Corbett Ave:EBT                 | 263                | 192          | 658            | 594                        |
| 83  | SW Hamilton Blvd @ SW Corbett Ave:WBT                 | 26                 | 15           | 130            | 47                         |
| 85  | SW Barbur Blvd @ SW Capitol Hwy EB:NBT                | 4                  | 54           | 1020           | 0                          |
| 85  | SW Barbur Blvd @ SW Capitol Hwy EB:WBR                | 3                  | 48           | 1019           | 0                          |
| 87  | SW Terwilliger Blvd @ SW Capitol Hwy:NBT              | 111                | 58           | 476            | 211                        |
| 87  | SW Terwilliger Blvd @ SW Capitol Hwy:SBT              | 348                | 135          | 815            | 594                        |
| 87  | SW Terwilliger Blvd @ SW Capitol Hwy:EBL              | 82                 | 44           | 282            | 159                        |
| 87  | SW Terwilliger Blvd @ SW Capitol Hwy:EBT              | 655                | 452          | 2015           | 1712                       |
| 87  | SW Terwilliger Blvd @ SW Capitol Hwy:EBR              | 186                | 400          | 2007           | 1147                       |
| 87  | SW Terwilliger Blvd @ SW Capitol Hwy:WBL              | 15                 | 27           | 643            | 46                         |

| No Build Conditions 95th Percentile Queues (ft) - 4:00 PM - 6:00 PM |  |                    |              |                |                            |
|---|--|--------------------|--------------|----------------|----------------------------|
| Intersection #  | Movement                                 | Average Queue (ft) | Std Dev (ft) | Max Queue (ft) | 95th Percentile Queue (ft) |
| 87  | SW Terwilliger Blvd @ SW Capitol Hwy:WBT | 332                | 140          | 963            | 591                        |
| 31  | SW 4th Ave @ SW Lincoln St:NBR           | 53                 | 49           | 480            | 124                        |

**Queue Results for PM****Peak Hour****No Build Conditions****95th Percentile****Queue**

| Study Intersection No. |          | 2  | 3                               | 4                              | 6                          |
|------------------------|----------|--|---------------------------------|--------------------------------|----------------------------|
| Approach               | Movement | SW Naito Pkwy On-Ramp @ Hawthorne Bridge | SW Naito Pkwy @ SW Jefferson St | SW Naito Pkwy @ SW Columbia St | SW Naito Pkwy @ SW Clay St |
| NB                     | Left     | -  | 113                             | 22                             | 68                         |
|                        | Thru     | -  | -                               | 290                            | 272                        |
|                        | Right    | 279                                      | -                               | -                              | -                          |
| SB                     | Left     | -  | -                               | -                              | 268                        |
|                        | Thru     | -  | 2012                            | 283                            | 265                        |
|                        | Right    | -  | -                               | -                              | -                          |
| EB                     | Left     | -  | -                               | -                              | -                          |
|                        | Thru     | -  | -                               | 200                            | -                          |
|                        | Right    | -  | -                               | -                              | -                          |
| WB                     | Left     | -  | -                               | -                              | -                          |
|                        | Thru     | -  | -                               | -                              | 591                        |
|                        | Right    | -  | -                               | -                              | 0                          |

| Queue Results for PM Peak Hour |          |                              |                             |                                |                         |
|--------------------------------|----------|------------------------------|-----------------------------|--------------------------------|-------------------------|
| No Build Conditions            |          | 95th Percentile              |                             |                                |                         |
| Queue                          |          |                              |                             |                                |                         |
| Study Intersection No.         |          | 8                            | 12                          | 13                             | 19                      |
| Approach                       | Movement | SW Naito Pkwy @ SW Market St | SW 1st Ave @ SW Harrison St | SW Naito Pkwy @ SW Harrison St | SW 6th Ave @ SW Hall St |
| NB                             | Left     | 45                           | 169                         | 413                            | -                       |
|                                | Thru     | 244                          | -                           | 133                            | 185                     |
|                                | Right    | -                            | 82                          | -                              | -                       |
| SB                             | Left     | 289                          | -                           | -                              | -                       |
|                                | Thru     | 88                           | -                           | 553                            | -                       |
|                                | Right    | -                            | -                           | -                              | -                       |
| EB                             | Left     | 1153                         | -                           | 271                            | -                       |
|                                | Thru     | 1148                         | 211                         | 178                            | 70                      |
|                                | Right    | 1104                         | -                           | 171                            | -                       |
| WB                             | Left     | -                            | -                           | 401                            | -                       |
|                                | Thru     | -                            | 154                         | 125                            | 152                     |
|                                | Right    | -                            | -                           | -                              | -                       |

| Queue Results for PM Peak Hour |          |                         |                         |                             |                            |
|--------------------------------|----------|-------------------------|-------------------------|-----------------------------|----------------------------|
| No Build Conditions            |          | 95th Percentile         |                         |                             |                            |
| Queue                          |          |                         |                         |                             |                            |
| Study Intersection No.         |          | 20                      | 21                      | 22                          | 23                         |
| Approach                       | Movement | SW 5th Ave @ SW Hall St | SW 4th Ave @ SW Hall St | SW Broadway @ SW College St | SW 6th Ave @ SW College St |
| NB                             | Left     | -                       | -                       | -                           | -                          |
|                                | Thru     | -                       | 262                     | -                           | 153                        |
|                                | Right    | -                       | -                       | -                           | -                          |
| SB                             | Left     | -                       | -                       | -                           | -                          |
|                                | Thru     | 779                     | -                       | 468                         | -                          |
|                                | Right    | -                       | -                       | -                           | -                          |
| EB                             | Left     | -                       | -                       | -                           | -                          |
|                                | Thru     | 67                      | 64                      | 45                          | 91                         |
|                                | Right    | -                       | -                       | -                           | -                          |
| WB                             | Left     | -                       | -                       | -                           | -                          |
|                                | Thru     | 153                     | -                       | 264                         | 135                        |
|                                | Right    | -                       | -                       | -                           | -                          |

| Queue Results for PM Peak Hour |          |                            |                            |                             |                            |
|--------------------------------|----------|----------------------------|----------------------------|-----------------------------|----------------------------|
| No Build Conditions            |          | 95th Percentile            |                            |                             |                            |
| Queue                          |          |                            |                            |                             |                            |
| Study Intersection No.         |          | 24                         | 25                         | 26                          | 27                         |
| Approach                       | Movement | SW 5th Ave @ SW College St | SW 4th Ave @ SW College St | SW Broadway @ SW Jackson St | SW 6th Ave @ SW Jackson St |
| NB                             | Left     | -                          | -                          | -                           | -                          |
|                                | Thru     | -                          | 261                        | -                           | 143                        |
|                                | Right    | -                          | -                          | -                           | -                          |
| SB                             | Left     | -                          | -                          | -                           | -                          |
|                                | Thru     | 203                        | -                          | 275                         | -                          |
|                                | Right    | -                          | -                          | -                           | -                          |
| EB                             | Left     | -                          | -                          | -                           | 78                         |
|                                | Thru     | 68                         | -                          | 86                          | -                          |
|                                | Right    | -                          | 44                         | -                           | -                          |
| WB                             | Left     | -                          | -                          | -                           | -                          |
|                                | Thru     | 261                        | -                          | 354                         | -                          |
|                                | Right    | -                          | -                          | -                           | 0                          |

| Queue Results for PM Peak Hour |          |                                   |                            |                            |                            |
|--------------------------------|----------|-----------------------------------|----------------------------|----------------------------|----------------------------|
| No Build Conditions            |          | 95th Percentile                   |                            |                            |                            |
| Queue                          |          |                                   |                            |                            |                            |
| Study Intersection No.         |          | 28                                | 29                         | 30                         | 31                         |
| Approach                       | Movement | SW 6th Ave @ I-405/Hwy 26 On-Ramp | SW 5th Ave @ SW Jackson St | SW 5th Ave @ SW Lincoln St | SW 4th Ave @ SW Lincoln St |
|                                | Left     | 679                               | -                          | -                          | 125                        |
|                                | Thru     | -                                 | -                          | -                          | 331                        |
| NB                             | Right    | -                                 | -                          | -                          | 124                        |
|                                | Left     | -                                 | -                          | -                          | -                          |
|                                | Thru     | -                                 | 268                        | 88                         | -                          |
| SB                             | Right    | -                                 | -                          | -                          | -                          |
|                                | Left     | -                                 | -                          | -                          | 48                         |
|                                | Thru     | -                                 | -                          | -                          | 135                        |
| EB                             | Right    | -                                 | 23                         | -                          | -                          |
|                                | Left     | -                                 | -                          | -                          | -                          |
|                                | Thru     | -                                 | -                          | -                          | 182                        |
| WB                             | Right    | -                                 | -                          | 67                         | -                          |

| Queue Results for PM Peak Hour |          |                            |                            |                               |                          |
|--------------------------------|----------|----------------------------|----------------------------|-------------------------------|--------------------------|
| No Build Conditions            |          | 95th Percentile            |                            |                               |                          |
| Queue                          |          |                            |                            |                               |                          |
| Study Intersection No.         |          | 33                         | 34                         | 35                            | 36                       |
| Approach                       | Movement | SW 2nd Ave @ SW Lincoln St | SW 1st Ave @ SW Lincoln St | SW Naito Pkwy @ SW Lincoln St | SW 4th Ave @ SW Grant St |
| NB                             | Left     | -                          | 92                         | -                             | -                        |
|                                | Thru     | 20                         | 110                        | 199                           | -                        |
|                                | Right    | -                          | -                          | -                             | -                        |
| SB                             | Left     | -                          | -                          | -                             | -                        |
|                                | Thru     | 22                         | 464                        | 458                           | -                        |
|                                | Right    | -                          | -                          | -                             | -                        |
| EB                             | Left     | 43                         | 91                         | -                             | 44                       |
|                                | Thru     | 413                        | -                          | -                             | -                        |
|                                | Right    | -                          | 298                        | -                             | -                        |
| WB                             | Left     | 42                         | -                          | -                             | -                        |
|                                | Thru     | 184                        | -                          | -                             | -                        |
|                                | Right    | -                          | -                          | -                             | -                        |

| Queue Results for PM Peak Hour |          |  |                                      |                          |                              |
|--------------------------------|----------|--|--------------------------------------|--------------------------|------------------------------|
| No Build Conditions            |          | 95th Percentile                                  |                                      |                          |                              |
| Queue                          |          |  |                                      |                          |                              |
| Study Intersection No.         |          | 37   | 38                                   | 39                       | 40                           |
| Approach                       | Movement | SW Broadway @ I-405<br>SB Off-Ramp/SW Lincoln St | SW Broadway @ SW Grant St/SW 6th Ave | SW Broadway @ SW 5th Ave | SW 4th Ave @ SW Caruthers St |
|                                |          | Left   | -                                    | -                        | -                            |
|                                |          | Thru   | -                                    | 427                      | 270                          |
| NB                             | Right    | 370  | -                                    | -                        | -                            |
|                                | Left     | -  | -                                    | -                        | -                            |
|                                | Thru     | 495  | -                                    | -                        | 390                          |
| SB                             | Right    | -  | -                                    | 334                      | -                            |
|                                | Left     | -  | 440                                  | -                        | 118                          |
|                                | Thru     | 1117   | 463                                  | 241                      | -                            |
| EB                             | Right    | -  | -                                    | -                        | -                            |
|                                | Left     | -  | -                                    | -                        | -                            |
|                                | Thru     | -  | -                                    | -                        | 154                          |
| WB                             | Right    | -  | 199                                  | 623                      | -                            |

| Queue Results for PM Peak Hour |          |                              |  |                             |   |
|--------------------------------|----------|------------------------------|--|-----------------------------|---|
| No Build Conditions            |          | 95th Percentile              |  |                             |   |
| Queue                          |          |                              |  |                             |   |
| Study Intersection No.         |          | 41                           | 42                                       | 43                          | 44  |
| Approach                       | Movement | SW 5th Ave @ SW Caruthers St | SW 4th Ave @ SW Caruthers St/SW Broadway | SW 5th Ave @ SW Sheridan St | SW 6th Ave/SW Terwilliger Blvd @ SW Sheridan St |
| NB                             | Left     | -                            | 260                                      | -                           | -   |
|                                | Thru     | -                            | 202                                      | -                           | 1224  |
|                                | Right    | -                            | -  | -                           | -   |
| SB                             | Left     | -                            | -  | 297                         | 137   |
|                                | Thru     | 365                          | -  | -                           | 154   |
|                                | Right    | -                            | -  | -                           | -   |
| EB                             | Left     | -                            | -  | -                           | -   |
|                                | Thru     | -                            | -  | 250                         | 0   |
|                                | Right    | -                            | -  | -                           | -   |
| WB                             | Left     | -                            | -  | -                           | -   |
|                                | Thru     | 177                          | 1420                                     | -                           | -   |
|                                | Right    | -                            | -  | -                           | -   |

| Queue Results for PM Peak Hour |          |  |                             |                                |                           |
|--------------------------------|----------|--|-----------------------------|--------------------------------|---------------------------|
| No Build Conditions            |          | 95th Percentile                            |                             |                                |                           |
| Queue                          |          |  |                             |                                |                           |
| Study Intersection No.         |          | 45   | 46                          | 47                             | 48                        |
| Approach                       | Movement | SW 4th Ave/SW Barbur Blvd @ SW Sheridan St | SW 1st Ave @ SW Sheridan St | SW Naito Pkwy @ SW Sheridan St | SW 1st Ave @ SW Arthur St |
| NB                             | Left     | 1072                                       | -                           | -                              | 87                        |
|                                | Thru     | 1069                                       | -                           | -                              | 396                       |
|                                | Right    | -  | -                           | -                              | -                         |
| SB                             | Left     | -  | 1108                        | -                              | 626                       |
|                                | Thru     | -  | -                           | -                              | 664                       |
|                                | Right    | -  | -                           | -                              | 71                        |
| EB                             | Left     | -  | -                           | -                              | 1290                      |
|                                | Thru     | 282  | 22                          | -                              | 1310                      |
|                                | Right    | 94   | -                           | -                              | -                         |
| WB                             | Left     | -  | -                           | -                              | -                         |
|                                | Thru     | -  | 42                          | -                              | 8497                      |
|                                | Right    | -  | -                           | -                              | -                         |

| Queue Results for PM Peak Hour |          |                               |   |                              |                                   |
|--------------------------------|----------|-------------------------------|---|------------------------------|-----------------------------------|
| No Build Conditions            |          | 95th Percentile               |   |                              |                                   |
| Queue                          |          |                               |   |                              |                                   |
| Study Intersection No.         |          | 52                            | 56  | 58                           | 59                                |
| Approach                       | Movement | SW Barbur Blvd @ SW Hooker St | SW Kelly St/SW Corbett Ave @ SW Porter St/SW Hood Ave | SW Barbur Blvd @ SW Woods St | SW Water Ave @ Ross Island Bridge |
|                                |          | Left                          | 21  | -                            | 0                                 |
|                                |          | Thru                          | 1935  | -                            | -                                 |
| NB                             |          | Right                         | -   | -                            | -                                 |
|                                |          | Left                          | 144   | 109                          | 101                               |
|                                |          | Thru                          | 762   | -                            | -                                 |
| SB                             |          | Right                         | -   | -                            | 41                                |
|                                |          | Left                          | -   | -                            | -                                 |
|                                |          | Thru                          | 20  | -                            | -                                 |
| EB                             |          | Right                         | -   | 20                           | -                                 |
|                                |          | Left                          | -   | -                            | -                                 |
|                                |          | Thru                          | 20  | -                            | -                                 |
| WB                             |          | Left                          | -   | -                            | -                                 |
|                                |          | Thru                          | 64  | -                            | -                                 |
|                                |          | Right                         | -   | -                            | -                                 |

| Queue Results for PM Peak Hour |          |                              |                                    |                                  |   |
|--------------------------------|----------|------------------------------|------------------------------------|----------------------------------|---|
| No Build Conditions            |          | 95th Percentile              |                                    |                                  |   |
| Queue                          |          |                              |                                    |                                  |   |
| Study Intersection No.         |          | 60                           | 61                                 | 62                               | 69                                      |
| Approach                       | Movement | SW Hood Ave @ SW Macadam Ave | SW Naito Pkwy @ Ross Island Bridge | Kelly Ramps @ Ross Island Bridge | SW Naito Pkwy @ SW Gibbs St/Naito Ramps |
|                                | Left     | -                            | -                                  | -                                | -                                       |
|                                | Thru     | -                            | -                                  | -                                | -                                       |
| NB                             | Right    | -                            | -                                  | 457                              | -                                       |
|                                | Left     | -                            | 3775                               | -                                | -                                       |
|                                | Thru     | -                            | -                                  | -                                | -                                       |
| SB                             | Right    | -                            | -                                  | -                                | -                                       |
|                                | Left     | -                            | -                                  | -                                | -                                       |
|                                | Thru     | -                            | -                                  | -                                | -                                       |
| EB                             | Right    | -                            | -                                  | -                                | -                                       |
|                                | Left     | -                            | -                                  | -                                | -                                       |
|                                | Thru     | -                            | -                                  | 3308                             | -                                       |
| WB                             | Right    | -                            | -                                  | -                                | -                                       |
|                                | Left     | -                            | -                                  | -                                | -                                       |
|                                | Thru     | -                            | -                                  | -                                | -                                       |
|                                | Right    | -                            | -                                  | -                                | 1933                                    |

| Queue Results for PM Peak Hour |          |                            |                             |                                  |                                 |
|--------------------------------|----------|----------------------------|-----------------------------|----------------------------------|---------------------------------|
| No Build Conditions            |          | 95th Percentile            |                             |                                  |                                 |
| Queue                          |          |                            |                             |                                  |                                 |
| Study Intersection No.         |          | 70                         | 77                          | 78                               | 80                              |
| Approach                       | Movement | SW Kelly Ave @ SW Gibbs St | SW Barbur Blvd @ SW Lane St | SW Barbur Blvd @ SW Abernathy St | SW Barbur Blvd @ SW Bancroft St |
|                                |          | Left                       | -                           | 27                               | 1079                            |
|                                |          | Thru                       | 1527                        | 105                              | -                               |
| NB                             |          | Right                      | -                           | -                                | -                               |
|                                |          | Left                       | -                           | 189                              | -                               |
|                                |          | Thru                       | 42                          | -                                | -                               |
| SB                             |          | Right                      | -                           | -                                | -                               |
|                                |          | Left                       | -                           | 117                              | -                               |
|                                |          | Thru                       | -                           | -                                | 23                              |
| EB                             |          | Right                      | 121                         | -                                | -                               |
|                                |          | Left                       | -                           | -                                | -                               |
|                                |          | Thru                       | -                           | -                                | -                               |
| WB                             |          | Right                      | -                           | -                                | 109                             |

**Queue Results for PM****Peak Hour****No Build Conditions****95th Percentile****Queue**

| Study Intersection No. |          | 81                              | 82                              | 83                                | 85                              | 87                                   |
|------------------------|----------|---------------------------------|---------------------------------|-----------------------------------|---------------------------------|--------------------------------------|
| Approach               | Movement | SW Corbett Ave @ SW Bancroft St | SW Barbur Blvd @ SW Hamilton St | SW Hamilton Blvd @ SW Corbett Ave | SW Barbur Blvd @ SW Capitol Hwy | SW Terwilliger Blvd @ SW Capitol Hwy |
| NB                     | Left     | -                               | -                               | -                                 | -                               | -                                    |
|                        | Thru     | 283                             | 1213                            | 1588                              | 0                               | 211                                  |
|                        | Right    | -                               | -                               | -                                 | -                               | -                                    |
| SB                     | Left     | -                               | 1158                            | -                                 | -                               | -                                    |
|                        | Thru     | 120                             | 976                             | 453                               | -                               | 594                                  |
|                        | Right    | -                               | -                               | -                                 | -                               | -                                    |
| EB                     | Left     | -                               | -                               | -                                 | -                               | 159                                  |
|                        | Thru     | 534                             | 675                             | 594                               | -                               | 1712                                 |
|                        | Right    | -                               | -                               | -                                 | -                               | 1147                                 |
| WB                     | Left     | -                               | -                               | -                                 | -                               | 46                                   |
|                        | Thru     | 45                              | 320                             | 47                                | -                               | 591                                  |
|                        | Right    | -                               | 63                              | -                                 | 0                               | -                                    |

## **Attachment F: Travel Time Results**

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| No-Build PM (4:00-6:00 PM)    |                                 |                  |                   |                |                    |      |       |                           |                             |                           |
|-------------------------------|---------------------------------|------------------|-------------------|----------------|--------------------|------|-------|---------------------------|-----------------------------|---------------------------|
| From                          | To                              | Distance<br>(ft) | Travel Time (Sec) |                |                    |      |       | Model Average Speed (mph) | Model 85th Percentile (mph) | Model Average Delay (min) |
|                               |                                 |                  | Vehicles          | 15-Run Average | Standard Deviation | Min  | Max   |                           |                             |                           |
| I-405 SB Exit Ramp @ Broadway | Hwy 99E on Powell Blvd          | 8812             | 325               | 15:40          | 2:34               | 8:32 | 26:39 | 6                         | 8                           | 12:10                     |
| Powell Blvd/Milwaukie Ave     | I-405 NB Entrance Ramp @ SW 6th | 9677             | 275               | 16:53          | 5:30               | 5:13 | 45:23 | 7                         | 10                          | 13:30                     |
| Barbur Blvd/Hamilton Street   | Hwy 99E on Powell Blvd          | 8020             | 755               | 10:53          | 3:34               | 5:50 | 24:27 | 8                         | 11                          | 8:09                      |
| Powell Blvd/Milwaukie Ave     | Barbur Blvd/Hamilton Street     | 9972             | 996               | 5:48           | 2:54               | 2:52 | 36:59 | 20                        | 28                          | 2:41                      |
| Macadam Ave/Curry St          | Hwy 99E on Powell Blvd          | 7216             | 350               | 11:46          | 3:27               | 4:49 | 27:48 | 7                         | 9                           | 8:56                      |
| Naito Pkwy/Harrison St        | Hwy 99E on Powell Blvd          | 7621             | 687               | 7:59           | 1:26               | 4:06 | 14:06 | 11                        | 13                          | 5:27                      |

| Future No-Build Vissim Travel Times (averaged over 15 simulations) |         |         |         |         |         |         |         |         |              |
|--|---------|---------|---------|---------|---------|---------|---------|---------|--------------|
| Travel Time Segment  | 4:00 PM | 4:15 PM | 4:30 PM | 4:45 PM | 5:00 PM | 5:15 PM | 5:30 PM | 5:45 PM | 4:30-5:30 PM |
| I-405 to Ross Island Bridge EB                                     | 15:46   | 19:00   | 16:08   | 15:38   | 15:13   | 15:10   | 14:30   | 14:30   | 15:32        |
| Ross Island Bridge to I-405 WB                                     | 8:40    | 12:44   | 17:09   | 20:35   | 22:21   | 21:51   | 18:27   | 13:08   | 20:37        |
| Hamilton to Ross Island Bridge                                     | 8:04    | 8:15    | 8:37    | 8:29    | 9:42    | 12:29   | 14:39   | 16:15   | 9:50         |
| Ross Island Bridge to Hamilton                                     | 3:58    | 5:16    | 4:46    | 7:00    | 7:36    | 7:04    | 6:35    | 4:40    | 6:34         |
| Macadam to Ross Island Bridge                                      | 14:07   | 11:46   | 11:02   | 12:18   | 12:31   | 11:30   | 10:43   | 9:27    | 11:48        |
| Naito to Ross Island Bridge EB                                     | 10:08   | 8:09    | 7:47    | 7:53    | 7:34    | 7:30    | 7:38    | 7:03    | 7:41         |

| Vissim Travel Time Data by Simulation Run |                                   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |                    |
|---|-----------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------------------|
|   | Vissim Travel Time (4:00-6:00 PM) |       |       |       |       |       |       |       |       |       |       |       |       |       |       | Standard Deviation |
| Travel Time Segment                       | 1                                 | 2     | 3     | 4     | 5     | 6     | 7     | 8     | 9     | 10    | 11    | 12    | 13    | 14    | 15    |                    |
| 1: I-405 to Ross Island Bridge EB         | 16:32                             | 16:13 | 15:56 | 14:52 | 15:48 | 14:47 | 15:16 | 15:11 | 15:53 | 15:50 | 16:05 | 16:46 | 16:32 | 15:26 | 14:11 | 0:44               |
| 2: Ross Island Bridge to I-405 WB         | 17:13                             | 16:26 | 14:43 | 17:31 | 18:07 | 16:40 | 16:59 | 16:40 | 15:59 | 18:52 | 16:30 | 19:35 | 14:33 | 17:01 | 16:02 | 1:21               |
| 3: Hamilton to Ross Island Bridge         | 10:37                             | 11:13 | 11:39 | 10:29 | 11:07 | 11:55 | 9:54  | 10:39 | 11:11 | 11:03 | 11:02 | 10:07 | 10:35 | 10:40 | 11:00 | 0:32               |
| 4: Ross Island Bridge to Hamilton         | 7:10                              | 7:39  | 4:13  | 5:36  | 5:30  | 6:29  | 6:05  | 5:36  | 5:34  | 6:49  | 5:28  | 6:40  | 4:09  | 5:50  | 5:04  | 0:59               |
| 5: Macadam to Ross Island Bridge          | 13:53                             | 14:18 | 11:15 | 11:13 | 11:49 | 12:31 | 10:27 | 9:55  | 11:50 | 10:47 | 11:22 | 12:11 | 11:39 | 11:17 | 11:03 | 1:10               |
| 6: Natio to Ross Island Bridge EB         | 7:56                              | 8:25  | 7:46  | 7:46  | 7:50  | 7:59  | 8:00  | 7:46  | 8:01  | 7:57  | 8:08  | 8:15  | 8:08  | 8:01  | 7:55  | 0:11               |
| 8: RI WB to I-5 SB Regular                | 10:03                             | 12:25 | 3:55  | 5:03  | 5:07  | 6:09  | 5:46  | 3:47  | 5:28  | 6:20  | 5:28  | 6:37  | 3:34  | 4:28  | 4:05  | 2:25               |
| 10: Macadam to RI EB Regular              | 11:14                             | 11:42 | 7:26  | 7:28  | 8:34  | 9:20  | 7:25  | 6:06  | 8:57  | 7:25  | 8:09  | 9:04  | 8:15  | 7:59  | 7:34  | 1:29               |
| 11: Macadam to RI EB Alternate            | 9:48                              | 9:53  | 10:29 | 9:51  | 9:20  | 9:05  | 7:51  | 9:28  | 8:21  | 8:53  | 8:25  | 8:14  | 9:41  | 9:14  | 10:40 | 0:49               |
| Vissim Throughput (4:00-6:00 PM)          |                                   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |                    |
|   | Vissim Throughput (4:00-6:00 PM)  |       |       |       |       |       |       |       |       |       |       |       |       |       |       | Standard Deviation |
| Travel Time Segment                       | 1                                 | 2     | 3     | 4     | 5     | 6     | 7     | 8     | 9     | 10    | 11    | 12    | 13    | 14    | 15    |                    |
| 1: I-405 to Ross Island Bridge EB         | 331                               | 303   | 340   | 317   | 313   | 371   | 322   | 343   | 315   | 323   | 290   | 317   | 328   | 307   | 358   | 21                 |
| 2: Ross Island Bridge to I-405 WB         | 281                               | 212   | 268   | 316   | 291   | 263   | 291   | 262   | 250   | 299   | 265   | 273   | 295   | 285   | 270   | 24                 |
| 3: Hamilton to Ross Island Bridge         | 777                               | 723   | 748   | 740   | 756   | 745   | 759   | 762   | 737   | 778   | 748   | 752   | 766   | 752   | 779   | 16                 |
| 4: Ross Island Bridge to Hamilton         | 923                               | 768   | 1054  | 1033  | 990   | 986   | 1040  | 962   | 1063  | 1015  | 1067  | 969   | 1051  | 1001  | 1020  | 75                 |
| 5: Macadam to Ross Island Bridge          | 408                               | 394   | 343   | 318   | 321   | 329   | 343   | 324   | 386   | 329   | 349   | 334   | 372   | 362   | 336   | 28                 |
| 6: Natio to Ross Island Bridge EB         | 692                               | 671   | 707   | 677   | 700   | 677   | 682   | 708   | 685   | 678   | 686   | 723   | 698   | 659   | 666   | 17                 |
| 8: RI WB to I-5 SB Regular                | 1314                              | 1088  | 1500  | 1491  | 1327  | 1448  | 1497  | 1458  | 1527  | 1421  | 1459  | 1348  | 1476  | 1483  | 1496  | 114                |
| 10: Macadam to RI EB Regular              | 401                               | 363   | 366   | 332   | 374   | 422   | 349   | 371   | 404   | 348   | 379   | 358   | 428   | 405   | 399   | 29                 |
| 11: Macadam to RI EB Alternate            | 151                               | 173   | 102   | 98    | 74    | 51    | 122   | 86    | 132   | 80    | 108   | 103   | 82    | 84    | 69    | 32                 |

## **Attachment G: Future No-Build Volumes**

| 4-6 PM 2035 No-Build Volumes             |     |             |                |              |            |                 |  |                |                          |                      |            |        |                |  |
|--|-----|-------------|----------------|--------------|------------|-----------------|--|----------------|--------------------------|----------------------|------------|--------|----------------|--|
|  |     | Orientation | Balanced Count | Initial Turn | NCHRP Turn | Turn Adjustment | Comment  | PSU Adjustment | I405 Off Ramp Adjustment | Water Ave Adjustment | Final Turn | Growth | Growth Percent |  |
| SW 1st Ave @ SW Madison St               | A1  | EBC         | 96             | 86           | 61         | 35              | Set to minimal growth                              | 0              | 0                        | 0                    | 100        | 4      | 4%             |  |
|  |     | EBT         | 3032           | 2723         | 2748       | 285             | Set to minimal growth                              | 0              | 0                        | 0                    | 3035       | 3      | 0%             |  |
|  |     | SBL         | 337            | 415          | 535        | -190            | Balance with EB                                    | 0              | 0                        | 0                    | 345        | 8      | 2%             |  |
|  |     | SBT         | 1072           | 1321         | 1201       | 30              | Match model growth                                 | 0              | 0                        | 0                    | 1235       | 163    | 15%            |  |
| SW Naito Pkwy On-Ramp @ Hawthorne Bridge | A2  | EBT         | 3369           | 3296         | 3296       | 80              | Balancing  | 0              | 0                        | 0                    | 3380       | 11     | 0%             |  |
|  |     | NBR         | 610            | 600          | 600        | 10              | Balancing  | 20             | 0                        | 0                    | 635        | 25     | 4%             |  |
| SW Naito Pkwy @ SW Jefferson St          | A3  | NBL         | 136            | 139          | 127        | 30              | Adjust to minimal growth                           | 0              | 0                        | 0                    | 160        | 24     | 18%            |  |
|  |     | NBR         | 610            | 624          | 599        | 15              | Set to minimal growth                              | 20             | 0                        | 0                    | 635        | 25     | 4%             |  |
|  |     | NBT         | 2150           | 2199         | 2220       | -15             | Shift to Hawthorne                                 | 20             | 0                        | 0                    | 2230       | 80     | 4%             |  |
|  |     | SBR         | 226            | 232          | 186        | 40              | Adjust to minimal growth                           | 0              | 0                        | 0                    | 230        | 4      | 2%             |  |
|  |     | SBT         | 2629           | 2694         | 2756       | -75             | Balancing  | 0              | 0                        | 0                    | 2685       | 56     | 2%             |  |
| SW Naito Pkwy @ SW Columbia St           | A4  | EBL         | 410            | 413          | 427        | -15             | Match model growth                                 | 0              | 0                        | 0                    | 415        | 5      | 1%             |  |
|  |     | EBR         | 575            | 579          | 564        | 15              | Adjust to minimal growth                           | 0              | 0                        | 0                    | 580        | 5      | 1%             |  |
|  |     | NBT         | 2486           | 2521         | 2525       | 45              | Balancing  | 40             | 0                        | 0                    | 2610       | 124    | 5%             |  |
|  |     | SBT         | 2629           | 2765         | 2762       | -80             | Match model growth                                 | 0              | 0                        | 0                    | 2685       | 56     | 2%             |  |
| SW 1st Ave @ SW Clay St                  | A5  | SBR         | 124            | 177          | 172        | 50              | Match model growth                                 | 0              | 0                        | 0                    | 225        | 101    | 81%            |  |
|  |     | SBT         | 868            | 1238         | 1243       |                 |  | 0              | 0                        | 0                    | 1245       | 377    | 43%            |  |
|  |     | WBL         | 90             | 103          | 106        | 0               |  | 0              | 0                        | 0                    | 110        | 20     | 22%            |  |
|  |     | WBT         | 754            | 860          | 857        | -35             | shift to Columbia                                  | 0              | 0                        | 40                   | 865        | 111    | 15%            |  |
| SW Naito Pkwy @ SW Clay St               | A6  | NBL         | 90             | 84           | 87         | 0               |  | 0              | 0                        | 0                    | 90         | 0      | 0%             |  |
|  |     | NBT         | 1639           | 1536         | 1525       | 110             | Set to minimal growth                              | 40             | 0                        | 0                    | 1680       | 41     | 3%             |  |
|  |     | SBR         | 175            | 180          | 158        | -20             | Match model growth                                 | 0              | 0                        | 0                    | 140        | -35    | -20%           |  |
|  |     | SBT         | 3029           | 3124         | 3160       | -35             | Balancing  | 0              | 0                        | 0                    | 3125       | 96     | 3%             |  |
|  |     | WBL         | 62             | 76           | 89         |                 |  | 0              | 0                        | 0                    | 90         | 28     | 45%            |  |
|  |     | WBR         | 847            | 1041         | 1013       | -85             | Balance out negative growth to TAZ 12              | 0              | 0                        | 0                    | 930        | 83     | 10%            |  |
|  |     | WBT         | 579            | 712          | 721        | -20             | Match model growth                                 | 0              | 0                        | 40                   | 745        | 166    | 29%            |  |
| SW 1st Ave @ SW Market St                | A7  | EBR         | 669            | 688          | 582        | 90              | Set to minimal growth                              | 0              | 0                        | 0                    | 675        | 6      | 1%             |  |
|  |     | EBT         | 1693           | 1741         | 1847       | 20              | Match model growth                                 | 0              | 0                        | 0                    | 1870       | 177    | 10%            |  |
|  |     | SBL         | 340            | 488          | 561        | 45              | Balance Growth to Market                           | 0              | 0                        | 0                    | 610        | 270    | 79%            |  |
|  |     | SBT         | 618            | 887          | 814        | -70             | Match model growth                                 | 0              | 0                        | 0                    | 745        | 127    | 21%            |  |
| SW Naito Pkwy @ SW Market St             | A8  | EBL         | 719            | 868          | 620        | 100             | Set to minimal growth                              | 0              | 0                        | 0                    | 720        | 1      | 0%             |  |
|  |     | EBR         | 488            | 589          | 591        | -100            | Match model growth                                 | 0              | 0                        | 0                    | 495        | 7      | 1%             |  |
|  |     | EBT         | 826            | 998          | 1245       | 15              | Match model growth minus negative growth to TAZ 12 | 0              | 0                        | 0                    | 1265       | 439    | 53%            |  |
|  |     | NBR         | 16             | 16           | 28         | 0               |  | 0              | 0                        | 0                    | 30         | 14     | 88%            |  |
|  |     | NBT         | 1010           | 1019         | 1006       | 0               |  | 40             | 0                        | 0                    | 1050       | 40     | 4%             |  |
|  |     | SBL         | 1478           | 1548         | 1726       | -130            | Match model growth for SBL                         | 0              | 0                        | 0                    | 1600       | 122    | 8%             |  |
|  |     | SBT         | 1613           | 1689         | 1512       | 100             | Adjust to minimal growth                           | 0              | 0                        | 0                    | 1615       | 2      | 0%             |  |
| SW 4th Ave @ SW Harrison St              | A9  | EBL         | 144            | 155          | 139        | 5               | Adjust to minimal growth                           | 0              | 0                        | 0                    | 145        | 1      | 1%             |  |
|  |     | EBT         | 227            | 244          | 259        | -30             | Balancing  | 110            | 0                        | 0                    | 340        | 113    | 50%            |  |
|  |     | NBL         | 76             | 80           | 91         | -15             | 4th Avenue project volume shift                    | 0              | 0                        | 0                    | 80         | 4      | 5%             |  |
|  |     | NBR         | 258            | 271          | 308        | -70             | 4th Avenue Project impacts                         | 0              | 0                        | 0                    | 240        | -18    | -7%            |  |
|  |     | NBT         | 1335           | 1401         | 1353       | -55             | 4th Avenue project impacts                         | 0              | 0                        | 0                    | 1300       | -35    | -3%            |  |
|  |     | WBL         | 572            | 562          | 528        | 100             | 4th Avenue project volume shift                    | 0              | 0                        | 0                    | 630        | 58     | 10%            |  |
| SW 3rd Ave @ SW Harrison St              | A10 | WBT         | 325            | 319          | 354        | 35              | 4th Ave project volume shift                       | 0              | 0                        | 0                    | 390        | 65     | 20%            |  |
|  |     | EBT         | 485            | 557          | 558        | -90             | Balancing  | 110            | 0                        | 0                    | 580        | 95     | 20%            |  |
|  |     | SBL         | 52             | 52           | 53         | 0               |  | 0              | 0                        | 0                    | 55         | 3      | 6%             |  |
|  |     | SBR         | 23             | 23           | 22         | 0               |  | 0              | 0                        | 0                    | 25         | 2      | 9%             |  |
|  |     | WBR         | 16             | 16           | 17         |                 |  | 0              | 0                        | 0                    | 20         | 4      | 25%            |  |
| SW 1st Ave @ SW Harrison St              | A12 | WBT         | 874            | 879          | 876        | 115             | 4th Avenue project volume shift                    | 0              | 0                        | 0                    | 995        | 121    | 14%            |  |
|  |     | EBC         | 151            | 175          | 200        | -55             | Match model growth                                 | 25             | 0                        | 0                    | 175        | 24     | 16%            |  |
|  |     | EBT         | 386            | 448          | 423        | -50             | Match model growth                                 | 85             | 0                        | 0                    | 460        | 74     | 19%            |  |
|  |     | NBL         | 186            | 211          | 188        | 75              | 4th Avenue project volume shift                    | 0              | 0                        | 0                    | 265        | 79     | 42%            |  |
|  |     | NBR         | 174            | 197          | 219        | -20             | Match model growth                                 | 0              | 0                        | 0                    | 200        | 26     | 15%            |  |
|  |     | SBL         | 403            | 445          | 403        | 0               |  | 0              | 0                        | 0                    | 405        | 2      | 0%             |  |
|  |     | SBR         | 189            | 208          | 152        | 40              | adjust to minimal growth                           | 0              | 0                        | 0                    | 195        | 6      | 3%             |  |
| SW 1st Ave @ SW Harrison St              |     | SBT         | 917            | 1011         | 1109       | -70             | Match model growth                                 | 0              | 0                        | 0                    | 1040       | 123    | 13%            |  |
|  |     | WBL         | 49             | 53           | 77         | 0               |  | 0              | 0                        | 0                    | 80         | 31     | 63%            |  |

| 4-6 PM 2035 No-Build Volumes   |     |             |                |              |            |                 |  |                |                          |                      |            |        |                |  |
|--------------------------------|-----|-------------|----------------|--------------|------------|-----------------|--|----------------|--------------------------|----------------------|------------|--------|----------------|--|
|                                |     | Orientation | Balanced Count | Initial Turn | NCHRP Turn | Turn Adjustment | Comment  | PSU Adjustment | I405 Off Ramp Adjustment | Water Ave Adjustment | Final Turn | Growth | Growth Percent |  |
| SW Naito Pkwy @ SW Harrison St | A13 | WBT         | 515            | 560          | 537        | 15              | Balancing                                      | 0              | 0                        | 0                    | 555        | 40     | 8%             |  |
|                                |     | EBL         | 237            | 263          | 201        | 35              | Adjust to minimal growth                       | 40             | 0                        | 0                    | 280        | 43     | 18%            |  |
|                                |     | EBR         | 516            | 573          | 531        | -15             | Match model growth                             | 45             | 0                        | 0                    | 565        | 49     | 9%             |  |
|                                |     | EBT         | 210            | 233          | 337        | -120            | Balance model growth                           | 0              | 0                        | 0                    | 220        | 10     | 5%             |  |
|                                |     | NBL         | 357            | 401          | 386        | 0               |  | 0              | 0                        | 0                    | 390        | 33     | 9%             |  |
|                                |     | NBR         | 48             | 54           | 97         | 100             | Match model growth                             | 0              | 0                        | 0                    | 200        | 152    | 317%           |  |
|                                |     | NBT         | 556            | 625          | 596        | -35             | Adjust to match model growth                   | 0              | 0                        | 0                    | 565        | 9      | 2%             |  |
|                                |     | SBR         | 97             | 98           | 82         | 15              | Adjust to minimal growth                       | 0              | 0                        | 0                    | 100        | 3      | 3%             |  |
|                                |     | SBT         | 2043           | 2064         | 2081       | -40             | Balance growth across turn movements           | 0              | 0                        | 0                    | 2045       | 2      | 0%             |  |
|                                |     | WBL         | 215            | 289          | 307        | -5              | Match model growth                             | 0              | 0                        | 0                    | 305        | 90     | 42%            |  |
| SW 5th Ave @ SW Montgomery St  | A16 | WBR         | 13             | 17           | 15         | 0               |  | 0              | 0                        | 0                    | 20         | 7      | 54%            |  |
|                                |     | WBT         | 110            | 148          | 131        | 10              | Match model growth (combined with Market/Clay) | 0              | 0                        | 0                    | 145        | 35     | 32%            |  |
| SW 6th Ave @ SW Harrison St    | A17 | SBT         | 607            | 569          | 569        | -115            | Match model growth                             | 160            | 0                        | 0                    | 615        | 8      | 1%             |  |
|                                |     | WBL         | 42             | 43           | 43         | 0               |  | 30             | 0                        | 0                    | 75         | 33     | 79%            |  |
|                                |     | EBL         | 84             | 88           | 72         | 10              | Adjust to minimal growth                       | 0              | 0                        | 0                    | 85         | 1      | 1%             |  |
|                                |     | EBT         | 164            | 171          | 187        | 0               |  | 20             | 0                        | 0                    | 210        | 46     | 28%            |  |
|                                | A18 | NBL         | 30             | 35           | 32         | 0               |  | 0              | 0                        | 0                    | 35         | 5      | 17%            |  |
|                                |     | NBR         | 180            | 207          | 263        | -30             | Balancing                                      | 0              | 0                        | 0                    | 235        | 55     | 31%            |  |
|                                |     | NBT         | 959            | 1104         | 1050       | -155            | Match model growth                             | 110            | 0                        | 0                    | 1010       | 51     | 5%             |  |
|                                |     | WBR         | 221            | 245          | 247        | -25             | Match model growth                             | 0              | 0                        | 0                    | 225        | 4      | 2%             |  |
| SW 5th Ave @ SW Harrison St    | A19 | WBT         | 104            | 115          | 113        | 60              | Match model growth                             | 0              | 0                        | 0                    | 175        | 71     | 68%            |  |
|                                |     | EBR         | 105            | 126          | 125        | 20              | Match model growth                             | 0              | 0                        | 0                    | 150        | 45     | 43%            |  |
|                                |     | EBT         | 243            | 292          | 292        | -40             | Match model volumes                            | 20             | 0                        | 0                    | 275        | 32     | 13%            |  |
|                                |     | SBL         | 128            | 119          | 120        | 0               |  | 90             | 0                        | 0                    | 210        | 82     | 64%            |  |
|                                |     | SBT         | 521            | 484          | 484        | -105            | 4th Avenue project impacts                     | 100            | 0                        | 0                    | 480        | -41    | -8%            |  |
|                                |     | WBL         | 69             | 74           | 74         | -5              | Match model growth                             | 0              | 0                        | 0                    | 70         | 1      | 1%             |  |
| SW 6th Ave @ SW Hall St        | A20 | WBT         | 332            | 356          | 356        | 40              | Match model growth                             | 0              | 0                        | 0                    | 400        | 68     | 20%            |  |
|                                |     | EBL         | 79             | 75           | 78         | 0               |  | 0              | 0                        | 0                    | 80         | 1      | 1%             |  |
|                                |     | EBT         | 140            | 133          | 130        | 0               |  | 10             | 0                        | 0                    | 145        | 5      | 4%             |  |
|                                |     | NBL         | 56             | 61           | 51         | 15              | Match model growth                             | 0              | 0                        | 0                    | 70         | 14     | 25%            |  |
|                                |     | NBT         | 1115           | 1223         | 1234       | -110            | Match model growth                             | 110            | 0                        | 0                    | 1235       | 120    | 11%            |  |
|                                |     | WBR         | 81             | 112          | 121        | -50             | 4th Avenue project impacts                     | 0              | 0                        | 0                    | 75         | -6     | -7%            |  |
| SW 5th Ave @ SW Hall St        | A21 | WBT         | 51             | 71           | 62         | -10             | Match model growth                             | 0              | 0                        | 0                    | 55         | 4      | 8%             |  |
|                                |     | EBR         | 62             | 58           | 58         | 0               |  | 10             | 0                        | 0                    | 70         | 8      | 13%            |  |
|                                |     | EBT         | 84             | 78           | 78         | -10             | 4th Avenue project impacts                     | 0              | 0                        | 0                    | 70         | -14    | -17%           |  |
|                                |     | SBL         | 68             | 65           | 64         | 5               | Adjust to minimal growth                       | 0              | 0                        | 0                    | 70         | 2      | 3%             |  |
|                                |     | SBT         | 627            | 598          | 599        | -70             | Match model growth                             | 100            | 0                        | 0                    | 630        | 3      | 0%             |  |
|                                |     | WBL         | 50             | 69           | 71         | -20             | 4th Avenue projec volume shift                 | 0              | 0                        | 0                    | 55         | 5      | 10%            |  |
| SW 4th Ave @ SW Hall St        | A22 | WBT         | 140            | 194          | 192        | -60             | 4th Avenue project volume shift                | 0              | 0                        | 0                    | 135        | -5     | -4%            |  |
|                                |     | EBL         | 152            | 140          | 140        | 0               |  | 0              | 0                        | 0                    | 140        | -12    | -8%            |  |
|                                |     | NBL         | 190            | 213          | 268        | -80             | 4th Avenue Project impacts                     | 0              | 0                        | 0                    | 190        | 0      | 0%             |  |
|                                |     | NBT         | 1517           | 1704         | 1650       | -170            | 4th Avenue Volume Shift                        | 0              | 0                        | 0                    | 1480       | -37    | -2%            |  |
|                                |     | EBR         | 21             | 21           | 22         | 0               |  | 0              | 0                        | 0                    | 25         | 4      | 19%            |  |
| SW Broadway @ SW College St    | A23 | EBT         | 15             | 15           | 14         | 10              | Balancing                                      | 0              | 0                        | 0                    | 25         | 10     | 67%            |  |
|                                |     | SBL         | 132            | 135          | 122        | 10              | Balancing                                      | 10             | 0                        | 0                    | 145        | 13     | 10%            |  |
|                                |     | SBR         | 13             | 13           | 13         | 0               |  | 0              | 0                        | 0                    | 15         | 2      | 15%            |  |
|                                |     | SBT         | 1348           | 1381         | 1395       | 35              | Match model growth                             | 0              | 0                        | 0                    | 1430       | 82     | 6%             |  |
|                                |     | WBL         | 338            | 369          | 370        | 0               |  | 0              | 0                        | 0                    | 370        | 32     | 9%             |  |
|                                |     | WBT         | 20             | 22           | 22         | 0               |  | 0              | 0                        | 0                    | 25         | 5      | 25%            |  |
| SW 6th Ave @ SW College St     | A24 | EBL         | 77             | 73           | 80         |                 |  | 0              | 0                        | 0                    | 85         | 8      | 10%            |  |
|                                |     | EBT         | 70             | 67           | 60         | 15              | Match model growth                             | 10             | 0                        | 0                    | 85         | 15     | 21%            |  |
|                                |     | NBL         | 212            | 224          | 218        | 10              | Match model growth                             | 0              | 0                        | 0                    | 230        | 18     | 8%             |  |
|                                |     | NBT         | 1022           | 1080         | 1089       | -45             | Balancing                                      | 110            | 0                        | 0                    | 1155       | 133    | 13%            |  |
|                                |     | WBR         | 72             | 81           | 83         | -20             | 4th Avenue project impacts                     | 0              | 0                        | 0                    | 65         | -7     | -10%           |  |
|                                |     | WBT         | 146            | 164          | 162        | 0               |  | 0              | 0                        | 0                    | 165        | 19     | 13%            |  |
|                                |     | EBR         | 49             | 42           | 47         | 0               |  | 10             | 0                        | 0                    | 60         | 11     | 22%            |  |
|                                |     | EBT         | 37             | 32           | 27         | -5              | 4th Avenue project impacts                     | 0              | 0                        | 0                    | 25         | -12    | -32%           |  |

| 4-6 PM 2035 No-Build Volumes                                |      |             |                |              |            |                 |   |                |                          |                      |            |        |                |  |
|---|------|-------------|----------------|--------------|------------|-----------------|---|----------------|--------------------------|----------------------|------------|--------|----------------|--|
|   |      | Orientation | Balanced Count | Initial Turn | NCHRP Turn | Turn Adjustment | Comment   | PSU Adjustment | I405 Off Ramp Adjustment | Water Ave Adjustment | Final Turn | Growth | Growth Percent |  |
| SW 5th Ave @ SW College St                                  | A24  | SBL         | 54             | 52           | 41         |                 |   | 0              | 0                        | 0                    | 45         | -9     | -17%           |  |
|   |      | SBT         | 684            | 655          | 666        | -70             | Match model growth                                  | 110            | 0                        | 0                    | 710        | 26     | 4%             |  |
|   |      | WBL         | 208            | 226          | 217        | 0               |   | 0              | 0                        | 0                    | 220        | 12     | 6%             |  |
|   |      | WBT         | 217            | 236          | 244        | -15             | 4th Ave volume shift                                | 0              | 0                        | 0                    | 230        | 13     | 6%             |  |
| SW 4th Ave @ SW College St                                  | A25A | EBL         | 91             | 66           | 66         | 0               |   | 0              | 0                        | 0                    | 70         | -21    | -23%           |  |
|   |      | NBL         | 425            | 490          | 473        | -25             | 4th Avenue project impacts                          | 0              | 0                        | 0                    | 450        | 25     | 6%             |  |
|   |      | NBT         | 1616           | 1862         | 1878       | -280            | 4th Avenue Volume shift                             | 0              | 0                        | 0                    | 1600       | -16    | -1%            |  |
| SW 4th Ave @ PSU Parking Garage Entrance near SW College St | A25B | NBR         | 12             | 14           | 13         | 0               |   | 0              | 0                        | 0                    | 15         | 3      | 25%            |  |
|   |      | NBT         | 1905           | 2244         | 2246       | -340            | 4th Avenue project volume shift to 1st              | 0              | 0                        | 0                    | 1910       | 5      | 0%             |  |
|   |      | WBR         | 136            | 136          | 136        | 0               |   | 0              | 0                        | 0                    | 140        | 4      | 3%             |  |
| SW Broadway @ SW Jackson St                                 | A26  | EBR         | 32             | 32           | 31         | 0               |   | 0              | 0                        | 0                    | 35         | 3      | 9%             |  |
|   |      | EBR2        | 64             | 64           | 63         | 0               |   | 0              | 0                        | 0                    | 65         | 1      | 2%             |  |
|   |      | EBT         | 71             | 71           | 73         | 0               |   | 0              | 0                        | 0                    | 75         | 4      | 6%             |  |
|   |      | SBL         | 85             | 90           | 94         | 0               |   | 0              | 0                        | 0                    | 95         | 10     | 12%            |  |
|   |      | SBR         | 83             | 88           | 90         | 0               |   | 0              | 0                        | 0                    | 90         | 7      | 8%             |  |
|   |      | SBT         | 1028           | 1093         | 1095       | 15              | Match model growth                                  | 0              | 0                        | 0                    | 1110       | 82     | 8%             |  |
|   |      | SBT         | 511            | 543          | 537        | -10             | Match model growth                                  | 0              | 0                        | 0                    | 530        | 19     | 4%             |  |
|   |      | WBL         | 243            | 242          | 243        |                 |   | 0              | 0                        | 0                    | 245        | 2      | 1%             |  |
|   |      | WBL2        | 121            | 120          | 119        | 0               |   | 0              | 0                        | 0                    | 120        | -1     | -1%            |  |
| SW 6th Ave @ I-405/Hwy 26 On-Ramp                           | A27  | WBT         | 19             | 19           | 19         | 0               |   | 0              | 0                        | 0                    | 20         | 1      | 5%             |  |
|   |      | NBT         | 1155           | 1178         | 1118       | -20             | Match model growth                                  | 110            | 0                        | 0                    | 1210       | 55     | 5%             |  |
| SW 6th Ave @ SW Jackson St                                  | A28  | NBL         | 2601           | 2653         | 2712       | 60              | Match model growth                                  | 0              | 0                        | -40                  | 2735       | 134    | 5%             |  |
|   |      | EBL         | 156            | 168          | 168        | 0               |   | 0              | 0                        | 0                    | 170        | 14     | 9%             |  |
|   |      | NBL         | 383            | 370          | 378        | 5               | adjust to minimal growth                            | 0              | 0                        | 0                    | 385        | 2      | 1%             |  |
|   |      | NBT         | 772            | 745          | 737        | -25             | Match model growth                                  | 110            | 0                        | 0                    | 825        | 53     | 7%             |  |
|   |      | WBT         | 322            | 390          | 390        | 0               |   | 0              | 0                        | 0                    | 390        | 68     | 21%            |  |
| SW 5th Ave @ SW Jackson St                                  | A29  | EBR         | 17             | 17           | 17         | 0               |   | 0              | 0                        | 0                    | 20         | 3      | 18%            |  |
|   |      | SBR         | 17             | 17           | 18         | 0               |   | 0              | 0                        | 0                    | 20         | 3      | 18%            |  |
|   |      | SBT         | 924            | 902          | 901        | -55             | Match model growth                                  | 120            | 0                        | 0                    | 970        | 46     | 5%             |  |
| SW 5th Ave @ "Little" 5th Ave/I-405 SB On-Ramp              | A30A | SBT         | 405            | 396          | 386        | 30              | Match model growth                                  | 0              | 0                        | 0                    | 420        | 15     | 4%             |  |
|   |      | SBT         | 214            | 209          | 219        | -65             | 4th Avenue project impacts                          | 0              | 0                        | 0                    | 155        | -59    | -28%           |  |
|   |      | SBT         | 322            | 315          | 315        | -20             | Match model growth                                  | 120            | 0                        | 0                    | 415        | 93     | 29%            |  |
| "Little" 5th Ave @ SW Lincoln St                            | A30B | SBL         | 161            | 165          | 166        | -70             | 4th Avenue project impacts                          | 0              | 0                        | 0                    | 100        | -61    | -38%           |  |
|   |      | SBT         | 53             | 54           | 54         | 0               |   | 0              | 0                        | 0                    | 55         | 2      | 4%             |  |
|   |      | WBL         | 15             | 14           | 14         | 0               |   | 0              | 0                        | 0                    | 15         | 0      | 0%             |  |
|   |      | WBU         | 53             | 51           | 51         | 65              | Match model land use growth                         | 0              | 0                        | 0                    | 120        | 67     | 126%           |  |
| SW 4th Ave @ SW Lincoln St                                  | A31  | EBL         | 43             | 45           | 58         | 0               |   | 0              | 0                        | 0                    | 60         | 17     | 40%            |  |
|   |      | EBT         | 171            | 178          | 164        | -5              | 4th Avenue project impacts                          | 0              | 0                        | 0                    | 160        | -11    | -6%            |  |
|   |      | NBL         | 38             | 41           | 35         | 50              | 4th Ave project impacts                             | 0              | 0                        | 0                    | 90         | 52     | 137%           |  |
|   |      | NBT         | 1317           | 1421         | 1427       | -140            | 4th Avenue project impacts                          | 0              | 0                        | 0                    | 1290       | -27    | -2%            |  |
|   |      | NWBR        | 118            | 165          | 130        | 250             | 4th Avenue project volume shift, match model growth | 0              | 0                        | 0                    | 380        | 262    | 222%           |  |
|   |      | NWBT        | 231            | 324          | 359        | -120            | 4th Avenue project volume shift                     | 0              | 0                        | 0                    | 240        | 9      | 4%             |  |
|   |      | WBR         | 326            | 359          | 365        | -30             | Match model growth                                  | 0              | 0                        | 0                    | 335        | 9      | 3%             |  |
|   |      | WBT         | 30             | 33           | 29         | 15              | Match model land use growth                         | 0              | 0                        | 0                    | 45         | 15     | 50%            |  |
| SW 3rd Ave @ SW Lincoln St                                  | A32  | EBR         | 21             | 22           | 22         | 40              | TAZ inbound growth                                  | 0              | 0                        | 0                    | 65         | 44     | 210%           |  |
|   |      | EBT         | 271            | 283          | 278        | 195             | Balancing 4th Ave impacts                           | 0              | 0                        | 0                    | 475        | 204    | 75%            |  |
|   |      | NBR         | 33             | 33           | 33         | 0               |   | 0              | 0                        | 0                    | 35         | 2      | 6%             |  |
|   |      | SBR         | 75             | 76           | 76         | 0               |   | 0              | 0                        | 0                    | 80         | 5      | 7%             |  |
|   |      | WBR         | 5              | 5            | 5          | 5               | Match model growth                                  | 0              | 0                        | 0                    | 15         | 10     | 200%           |  |
| SW 2nd Ave @ SW Lincoln St                                  | A33  | WBT         | 284            | 305          | 308        | -10             | Balancing   | 0              | 0                        | 0                    | 300        | 16     | 6%             |  |
|   |      | EBL         | 9              | 9            | 8          | 25              | TAZ inbound growth                                  | 0              | 0                        | 0                    | 35         | 26     | 289%           |  |
|   |      | EBR         | 9              | 9            | 9          | 20              | TAZ inbound growth                                  | 0              | 0                        | 0                    | 30         | 21     | 233%           |  |
|   |      | EBT         | 286            | 293          | 295        | 145             | Balancing 4th Ave impacts                           | 0              | 0                        | 0                    | 445        | 159    | 56%            |  |
|   |      | NBL         | 13             | 13           | 12         | 0               |   | 0              | 0                        | 0                    | 15         | 2      | 15%            |  |
|   |      | NBR         | 18             | 18           | 19         | 0               |   | 0              | 0                        | 0                    | 20         | 2      | 11%            |  |
|   |      | SEBL        | 17             | 17           | 18         | 0               |   | 0              | 0                        | 0                    | 20         | 3      | 18%            |  |

| 4-6 PM 2035 No-Build Volumes  |   |             |                |              |            |                 |                            |                |                          |                      |            |        |                |  |
|-------------------------------|---|-------------|----------------|--------------|------------|-----------------|----------------------------|----------------|--------------------------|----------------------|------------|--------|----------------|--|
|                               |   | Orientation | Balanced Count | Initial Turn | NCHRP Turn | Turn Adjustment | Comment                    | PSU Adjustment | I405 Off Ramp Adjustment | Water Ave Adjustment | Final Turn | Growth | Growth Percent |  |
|                               |   | SEBR        | 10             | 10           | 9          | 0               |                            | 0              | 0                        | 0                    | 10         | 0      | 0%             |  |
|                               |   | WBL         | 19             | 21           | 22         | 0               |                            | 0              | 0                        | 0                    | 25         | 6      | 32%            |  |
|                               |   | WBR         | 23             | 25           | 26         | 0               |                            | 0              | 0                        | 0                    | 30         | 7      | 30%            |  |
|                               |   | WBT         | 266            | 291          | 289        |                 |                            | 0              | 0                        | 0                    | 290        | 24     | 9%             |  |
|                               | SW 1st Ave @ SW Lincoln St                      | EBL         | 40             | 41           | 44         | 100             | Balancing 4th Ave impacts  | 0              | 0                        | 0                    | 145        | 105    | 263%           |  |
|                               |   | EBR         | 281            | 290          | 287        | 50              | 4th Avenue volume shift    | 0              | 0                        | 0                    | 340        | 59     | 21%            |  |
|                               |   | NBL         | 186            | 207          | 191        | 0               |                            | 0              | 0                        | 0                    | 195        | 9      | 5%             |  |
|                               |   | NBT         | 461            | 513          | 529        | -65             | Balancing                  | 0              | 0                        | 0                    | 465        | 4      | 1%             |  |
|                               |   | SBR         | 122            | 152          | 147        |                 |                            | 0              | 0                        | 0                    | 150        | 28     | 23%            |  |
|                               |   | SBT         | 1059           | 1321         | 1325       | -135            | Match model growth         | 25             | 0                        | 0                    | 1220       | 161    | 15%            |  |
| SW Naito Pkwy @ SW Lincoln St | A35   | NBT         | 981            | 1090         | 1090       | 85              | Balancing                  | 0              | 0                        | 0                    | 1175       | 194    | 20%            |  |
|                               |   | SBT         | 2823           | 2966         | 2966       | -95             | Balancing                  | 45             | 0                        | 0                    | 2920       | 97     | 3%             |  |
| SW 4th Ave @ SW Grant St      | A36   | EBL         | 68             | 68           | 68         | 0               |                            | 0              | 0                        | 0                    | 70         | 2      | 3%             |  |
|                               |   | NBT         | 1287           | 1361         | 1361       | -55             | Balancing                  | 0              | 0                        | 0                    | 1310       | 23     | 2%             |  |
|                               | SW Broadway @ I-405 SB Off-Ramp/SW Lincoln St   | NBR         | 288            | 288          | 288        | 10              | Balancing                  | 0              | 0                        | 0                    | 300        | 12     | 4%             |  |
|                               |   | SBL         | 1010           | 1062         | 1014       | 20              | Balancing                  | 0              | 0                        | 0                    | 1035       | 25     | 2%             |  |
|                               |   | SBR         | 10             | 11           | 10         | 0               |                            | 0              | 0                        | 0                    | 10         | 0      | 0%             |  |
|                               |   | SBT         | 315            | 331          | 380        | -5              | Match model growth         | 0              | 0                        | 0                    | 375        | 60     | 19%            |  |
|                               |   | SEBR        | 118            | 123          | 146        | 105             | Match model growth         | 0              | 0                        | 0                    | 255        | 137    | 116%           |  |
|                               |   | SEBR2       | 16             | 17           | 16         |                 |                            | 0              | 0                        | 0                    | 20         | 4      | 25%            |  |
|                               |   | SEBT        | 1868           | 1945         | 1922       | 5               | Match model growth         | 0              | 305                      | 0                    | 2235       | 367    | 20%            |  |
| SW Broadway @ SW Grant St     | A38A  | EBR         | 7              | 7            | 7          | 5               | Balancing                  | 0              | 0                        | 0                    | 15         | 8      | 114%           |  |
|                               |   | EBT         | 3184           | 3243         | 3243       | 5               | Balancing                  | 0              | 305                      | 0                    | 3555       | 371    | 12%            |  |
|                               |   | NBR         | 255            | 356          | 356        | 20              | Match model growth         | 0              | 0                        | 0                    | 380        | 125    | 49%            |  |
|                               | SW Broadway @ SW 6th Ave                        | EBL         | 385            | 402          | 347        | 40              | Adjust to minimal growth   | 0              | 0                        | 0                    | 390        | 5      | 1%             |  |
|                               |   | EBR         | 796            | 831          | 847        | 45              | Match model growth         | 0              | 100                      | 0                    | 995        | 199    | 25%            |  |
|                               |   | EBT         | 2258           | 2356         | 2403       | -60             | Match model growth         | 0              | 205                      | 0                    | 2550       | 292    | 13%            |  |
|                               |   | NBT         | 970            | 950          | 947        | -75             | Match model growth         | 110            | 0                        | 0                    | 985        | 15     | 2%             |  |
|                               |   | WBR         | 2401           | 2591         | 2584       | 25              | Match model growth         | 0              | 0                        | -40                  | 2570       | 169    | 7%             |  |
| SW Broadway @ SW 5th Ave      | A39   | EBT         | 2261           | 2398         | 2396       | -55             | Balancing                  | 0              | 205                      | 0                    | 2550       | 289    | 13%            |  |
|                               |   | SBL         | 405            | 386          | 386        | 30              | Match model growth         | 0              | 0                        | 0                    | 420        | 15     | 4%             |  |
|                               |   | WBT         | 2401           | 2597         | 2600       | 10              | Balancing                  | 0              | 0                        | -40                  | 2570       | 169    | 7%             |  |
|                               | SW 4th Ave @ SW Caruthers St                    | EBL         | 40             | 41           | 44         | 0               |                            | 0              | 0                        | 0                    | 45         | 5      | 13%            |  |
|                               |   | EBR         | 11             | 11           | 8          | 5               | Adjust to minimal growth   | 0              | 0                        | 0                    | 15         | 4      | 36%            |  |
|                               |   | NBL         | 4              | 4            | 3          | 0               |                            | 0              | 0                        | 0                    | 5          | 1      | 25%            |  |
|                               |   | NBT         | 865            | 789          | 796        | -40             | Match model growth         | 110            | 0                        | 0                    | 870        | 5      | 1%             |  |
|                               |   | SBR         | 21             | 22           | 25         | -5              | Match model volume         | 0              | 0                        | 0                    | 25         | 4      | 19%            |  |
|                               |   | SBT         | 775            | 814          | 805        | 65              | Match model volume         | 0              | 100                      | 0                    | 970        | 195    | 25%            |  |
|                               |   | WBL         | 164            | 230          | 200        | -40             | Match model volume         | 0              | 0                        | 0                    | 165        | 1      | 1%             |  |
|                               |   | WBR         | 68             | 95           | 125        | -55             | Match model growth         | 0              | 0                        | 0                    | 70         | 2      | 3%             |  |
|                               |   | WBT         | 4              | 6            | 6          | 0               |                            | 0              | 0                        | 0                    | 10         | 6      | 150%           |  |
|                               | SW 5th Ave @ SW Caruthers St                    | SBR         | 95             | 100          | 105        | -10             | Match model growth         | 0              | 0                        | 0                    | 100        | 5      | 5%             |  |
|                               |   | SBT         | 2571           | 2704         | 2699       | -35             | Balancing                  | 0              | 205                      | 0                    | 2870       | 299    | 12%            |  |
|                               |   | WBL         | 24             | 38           | 36         | -15             | Match model growth         | 0              | 0                        | 0                    | 25         | 1      | 4%             |  |
|                               |   | WBT         | 141            | 224          | 226        | -85             | Match model growth         | 0              | 0                        | 0                    | 145        | 4      | 3%             |  |
|                               | SW 4th Ave @ SW Caruthers St/SW Broadway        | NBL         | 397            | 448          | 468        | -10             | Balancing                  | 0              | 0                        | 0                    | 460        | 63     | 16%            |  |
|                               |   | NBL2        | 63             | 71           | 106        | -45             | Match model growth         | 0              | 0                        | 0                    | 65         | 2      | 3%             |  |
|                               |   | NBT         | 1112           | 1254         | 1198       | -65             | 4th Avenue Project Impacts | 0              | 0                        | 0                    | 1135       | 23     | 2%             |  |
|                               |   | WBL         | 102            | 111          | 156        | -55             | Match model growth         | 0              | 0                        | 0                    | 105        | 3      | 3%             |  |
|                               |   | WBR         | 175            | 190          | 172        | 0               |                            | 0              | 0                        | 0                    | 175        | 0      | 0%             |  |
|                               |   | WBT         | 2004           | 2177         | 2150       | 0               |                            | 0              | 0                        | -40                  | 2110       | 106    | 5%             |  |
| SW 5th Ave @ SW Sheridan St   | A43   | EBT         | 590            | 588          | 588        | -40             | Match model growth         | 0              | 50                       | 0                    | 600        | 10     | 2%             |  |
|                               |   | SBL         | 2595           | 2755         | 2755       | -70             | Balancing                  | 0              | 205                      | 0                    | 2895       | 300    | 12%            |  |
|                               | SW 6th Ave/SW Terwilliger Blvd @ SW Sheridan St | NEBR        | 439            | 418          | 438        | -45             | 4th Avenue project impacts | 0              | 0                        | 0                    | 395        | -44    | -10%           |  |
|                               |   | NEBT        | 869            | 826          | 804        | -40             | Match model growth         | 110            | 0                        | 0                    | 875        | 6      | 1%             |  |
|                               |   | SBL         | 151            | 159          | 152        | 0               |                            | 0              | 50                       | 0                    | 205        | 54     | 36%            |  |
|                               |   | SBT         | 19             | 20           | 22         | 5               | Balancing                  | 0              | 0                        | 0                    | 30         | 11     | 58%            |  |

| 4-6 PM 2035 No-Build Volumes               |     |             |                |              |            |                 |   |                |                          |                      |            |        |                |    |
|--|-----|-------------|----------------|--------------|------------|-----------------|---|----------------|--------------------------|----------------------|------------|--------|----------------|----|
|  |     | Orientation | Balanced Count | Initial Turn | NCHRP Turn | Turn Adjustment | Comment   | PSU Adjustment | I405 Off Ramp Adjustment | Water Ave Adjustment | Final Turn | Growth | Growth Percent |    |
| SW 4th Ave/SW Barbur Blvd @ SW Sheridan St | A45 | SBT         | 780            | 820          | 826        | 35              | Match model growth                              | 0              | 50                       | 0                    | 915        | 135    | 17%            |    |
|  |     | EBL         | 202            | 212          | 206        | 0               |   | 0              | 0                        | 0                    | 210        | 8      | 4%             |    |
|  |     | EBR         | 1324           | 1388         | 1387       | 5               | Match model growth                              | 0              | 100                      | 0                    | 1495       | 171    | 13%            |    |
|  |     | EBT         | 1659           | 1739         | 1746       | -115            | Balancing                                       | 0              | 155                      | 0                    | 1790       | 131    | 8%             |    |
|  |     | NBR         | 64             | 74           | 76         | 70              | Match model growth                              | 0              | 0                        | 0                    | 150        | 86     | 134%           |    |
|  |     | NBT         | 1370           | 1583         | 1580       | -135            | Balancing                                       | 0              | 0                        | 0                    | 1450       | 80     | 6%             |    |
| SW 1st Ave @ SW Sheridan St                | A46 | EBL         | 5              | 5            | 6          | 0               |   | 0              | 0                        | 0                    | 10         | 5      | 100%           |    |
|  |     | EBR         | 18             | 19           | 19         | 0               |   | 0              | 0                        | 0                    | 20         | 2      | 11%            |    |
|  |     | EBT         | 9              | 9            | 8          | 0               |   | 0              | 0                        | 0                    | 10         | 1      | 11%            |    |
|  |     | NBL         | 1              | 1            | 1          | 0               |   | 0              | 0                        | 0                    | 5          | 4      | 400%           |    |
|  |     | NBR         | 288            | 279          | 229        | 60              | Adjust to minimal growth                        | 0              | 0                        | 0                    | 290        | 2      | 1%             |    |
|  |     | NBT         | 340            | 330          | 380        | -30             | Match model growth                              | 0              | 0                        | 0                    | 350        | 10     | 3%             |    |
|  |     | SBL         | 684            | 818          | 719        | 20              | Match model growth                              | 25             | 0                        | 0                    | 765        | 81     | 12%            |    |
|  |     | SBR         | 2              | 2            | 3          | 0               |   | 0              | 0                        | 0                    | 5          | 3      | 150%           |    |
|  |     | SBT         | 654            | 782          | 881        | -85             | Balancing                                       | 0              | 0                        | 0                    | 800        | 146    | 22%            |    |
|  |     | WBL         | 48             | 60           | 57         | -10             | Match model growth                              | 0              | 0                        | 0                    | 50         | 2      | 4%             |    |
| SW Naito Pkwy @ SW Sheridan St             | A47 | WBR         | 59             | 73           | 76         | -20             | Match model growth                              | 0              | 0                        | 0                    | 60         | 1      | 2%             |    |
|  |     | EBR         | 981            | 948          | 948        | 90              | Match model growth                              | 25             | 0                        | 0                    | 1065       | 84     | 9%             |    |
|  |     | NBT         | 1210           | 1332         | 1333       | 70              | Balancing                                       | 0              | 0                        | 0                    | 1405       | 195    | 16%            |    |
|  |     | SBR         | 107            | 112          | 134        | -25             | Match model growth                              | 0              | 0                        | 0                    | 110        | 3      | 3%             |    |
|  |     | SBT         | 2702           | 2837         | 2814       | -60             | Balancing                                       | 45             | 0                        | 0                    | 2800       | 98     | 4%             |    |
| SW 1st Ave @ SW Arthur St                  | A48 | EBL         | 60             | 63           | 49         | 15              | Adjust to minimal growth                        | 0              | 0                        | 0                    | 65         | 5      | 8%             |    |
|  |     | EBR         | 144            | 152          | 309        | -165            | Match model growth                              | 0              | 0                        | 0                    | 145        | 1      | 1%             |    |
|  |     | EBT         | 1775           | 1877         | 1746       | 90              | Balancing                                       | 0              | 155                      | 0                    | 1995       | 220    | 12%            |    |
|  |     | NBL         | 50             | 55           | 58         | 0               |   | 0              | 0                        | 0                    | 60         | 10     | 20%            |    |
|  |     | NBR         | 158            | 175          | 190        | 50              | Match model growth                              | 0              | 0                        | 0                    | 245        | 87     | 55%            |    |
|  |     | NBT         | 186            | 206          | 187        | -65             | Match model growth                              | 0              | 0                        | 0                    | 125        | -61    | -33%           |    |
|  |     | SBL         | 215            | 260          | 154        | 80              | Match model growth                              | 0              | 0                        | 0                    | 235        | 20     | 9%             |    |
|  |     | SBR         | 133            | 161          | 91         | 50              | Adjust to minimal growth                        | 0              | 0                        | 0                    | 145        | 12     | 9%             |    |
|  |     | SBT         | 522            | 632          | 814        | -180            | Match model growth                              | 0              | 0                        | 0                    | 635        | 113    | 22%            |    |
|  |     | WBR         | 383            | 424          | 376        | 75              | Adjust to model growth                          | 0              | 0                        | 0                    | 455        | 72     | 19%            |    |
| SW Naito Pkwy @ SW Arthur St               | A49 | WBT         | 1952           | 2158         | 2189       | -115            | Balancing                                       | 0              | 0                        | 0                    | -40        | 2035   | 83             | 4% |
|  |     | EBR         | 1943           | 1907         | 1984       | 30              | Balance   | 0              | 105                      | 0                    | 2120       | 177    | 9%             |    |
|  |     | EBT         | 205            | 201          | 154        | 150             | Match model growth                              | 0              | 50                       | 0                    | 355        | 150    | 73%            |    |
|  |     | WBT         | 2335           | 2589         | 2560       | -30             | Balancing                                       | 0              | 0                        | -40                  | 2490       | 155    | 7%             |    |
| SW Naito Pkwy @ SW Kelly St                | A50 | EBR         | 3              | 2            | 3          | 0               |   | 0              | 0                        | 0                    | 5          | 2      | 67%            |    |
|  |     | EBT         | 202            | 153          | 148        | 150             | Match model growth                              | 0              | 50                       | 0                    | 350        | 148    | 73%            |    |
|  |     | NBL         | 32             | 33           | 45         | -10             | Match model growth                              | 0              | 0                        | 0                    | 35         | 3      | 9%             |    |
|  |     | NBR         | 68             | 70           | 57         | 10              | Adjust to minimal growth                        | 0              | 0                        | 0                    | 70         | 2      | 3%             |    |
|  |     | WBR         | 611            | 671          | 670        | 35              | Balancing                                       | 0              | 0                        | 0                    | 710        | 99     | 16%            |    |
|  |     | WBT         | 2303           | 2528         | 2534       | -40             | Balancing                                       | 0              | 0                        | -40                  | 2455       | 152    | 7%             |    |
| SW Water St @ SW Kelly St                  | A51 | EBL         | 38             | 28           | 114        |                 |   | 0              | 0                        | 0                    | 115        | 77     | 203%           |    |
|  |     | EBT         | 232            | 174          | 88         | 165             | Include NUNM growth                             | 0              | 50                       | 0                    | 305        | 73     | 31%            |    |
|  |     | SBL         | 63             | 261          | 235        | 85              | Match model distribution and growth             | 0              | 0                        | -200                 | 125        | 62     | 98%            |    |
|  |     | SBR         | 145            | 600          | 625        | -190            | Match model distribution                        | 0              | 0                        | -165                 | 270        | 125    | 86%            |    |
|  |     | WBR         | 61             | 65           | 392        | -75             | Shift to adjust thru movement to minimal growth | 0              | 0                        | 0                    | 320        | 259    | 425%           |    |
|  |     | WBT         | 2769           | 2947         | 2620       | 150             | Adjust to minimal growth                        | 0              | 0                        | 125                  | 2895       | 126    | 5%             |    |
| SW Barbur Blvd @ SW Hooker St              | A52 | EBL         | 4              | 4            | 4          | 0               |   | 0              | 0                        | 0                    | 5          | 1      | 25%            |    |
|  |     | EBR         | 3              | 3            | 3          | 0               |   | 0              | 0                        | 0                    | 5          | 2      | 67%            |    |
|  |     | EBT         | 3              | 3            | 3          | 0               |   | 0              | 0                        | 0                    | 5          | 2      | 67%            |    |
|  |     | NBL         | 11             | 13           | 13         | 0               |   | 0              | 0                        | 0                    | 15         | 4      | 36%            |    |
|  |     | NBR         | 67             | 78           | 80         | 10              | Match model growth                              | 0              | 0                        | 0                    | 90         | 23     | 34%            |    |
|  |     | NBT         | 1353           | 1572         | 1573       | -60             | Balancing                                       | 0              | 0                        | 0                    | 1515       | 162    | 12%            |    |
|  |     | SBL         | 103            | 108          | 117        | 20              | Shift from SBT                                  | 0              | 25                       | 0                    | 165        | 62     | 60%            |    |
|  |     | SBR         | 8              | 8            | 9          | 0               |   | 0              | 0                        | 0                    | 10         | 2      | 25%            |    |
|  |     | SBT         | 1215           | 1271         | 1259       | -15             | Shift to SBL                                    | 0              | 75                       | 0                    | 1320       | 105    | 9%             |    |
|  |     | WBL         | 45             | 47           | 45         | 15              | Match model growth                              | 0              | 0                        | 0                    | 60         | 15     | 33%            |    |

| 4-6 PM 2035 No-Build Volumes                               |         |             |                |              |            |                 |  |                |                          |                      |            |        |      |                |
|--|---------|-------------|----------------|--------------|------------|-----------------|--|----------------|--------------------------|----------------------|------------|--------|------|----------------|
|  |         | Orientation | Balanced Count | Initial Turn | NCHRP Turn | Turn Adjustment | Comment  | PSU Adjustment | I405 Off Ramp Adjustment | Water Ave Adjustment | Final Turn | Growth |      | Growth Percent |
|  |         | WBR         | 86             | 89           | 91         | -5              | Match model growth                                     | 0              | 0                        | 0                    | 90         | 4      | 5%   |                |
|  |         | WBT         | 2              | 2            | 2          | 0               |  | 0              | 0                        | 0                    | 5          | 3      | 150% |                |
| SW Naito Pkwy @ SW Hooker St/US Hwy 26                     | A53A    | NBT         | 545            | 604          | 612        | 20              | Match model growth                                     | 0              | 0                        | 0                    | 635        | 90     | 17%  |                |
|  |         | SBT         | 1977           | 2006         | 2161       | -80             | Match model growth                                     | 45             | 0                        | 0                    | 2130       | 153    | 8%   |                |
|  |         | SBT         | 1706           | 1731         | 1568       | 140             | Match model growth                                     | 25             | 0                        | 0                    | 1735       | 29     | 2%   |                |
|  |         | WBR         | 54             | 56           | 56         | 0               |  | 0              | 0                        | 0                    | 60         | 6      | 11%  |                |
| US Hwy 26 @ SW Naito Pkwy SB Ramp to Ross Island Bridge    | A53B    | SBT         | 1943           | 2008         | 2008       | 5               | Balance  | 0              | 105                      | 0                    | 2120       | 177    | 9%   |                |
|  |         | WBL         | 1706           | 1568         | 1568       | 140             | Match model growth                                     | 25             | 0                        | 0                    | 1735       | 29     | 2%   |                |
| SW Corbett Ave/SW Kelly St @ SW Macadam Ave                | A54     | EBT         | 295            | 319          | 320        | 255             | Match model growth                                     | 0              | 50                       | -200                 | 430        | 135    | 46%  |                |
|  |         | NBL         | 1621           | 1780         | 1779       | 30              | Balancing  | 0              | 0                        | 0                    | 1810       | 189    | 12%  |                |
|  |         | WBR         | 44             | 52           | 196        | -35             | Match model growth                                     | 0              | 0                        | 0                    | 165        | 121    | 275% |                |
|  |         | WBT         | 1209           | 1422         | 1278       | 0               |  | 0              | 0                        | 125                  | 1405       | 196    | 16%  |                |
| SW Naito Pkwy @ SW Porter St                               | A55     | NBR         | 23             | 26           | 27         | 0               |  | 0              | 0                        | 0                    | 30         | 7      | 30%  |                |
|  |         | NBT         | 545            | 609          | 608        | 25              | Match model growth                                     | 0              | 0                        | 0                    | 635        | 90     | 17%  |                |
|  |         | SBT         | 1977           | 2147         | 2147       | -65             | Balancing  | 45             | 0                        | 0                    | 2130       | 153    | 8%   |                |
| SW Kelly St/SW Corbett Ave @ SW Porter St/SW Hood Ave      | A56A    | EBR         | 20             | 21           | 21         | 0               |  | 0              | 0                        | 0                    | 25         | 5      | 25%  |                |
|  |         | NBT         | 1621           | 1784         | 1784       | 25              | Balancing  | 0              | 0                        | 0                    | 1810       | 189    | 12%  |                |
|  |         | SBL         | 194            | 210          | 200        | 250             | Match model grwoth                                     | 0              | 50                       | -200                 | 305        | 111    | 57%  |                |
|  |         | SBR         | 49             | 53           | 57         | 0               |  | 0              | 0                        | 0                    | 60         | 11     | 22%  |                |
|  |         | SBT         | 52             | 56           | 62         | 0               |  | 0              | 0                        | 0                    | 65         | 13     | 25%  |                |
| SW Kelly St/SW Corbett Ave @ SW Porter St/SW Hood Ave NBR  | A56B    | NBR         | 1405           | 1505         | 1455       | 0               |  | 0              | 0                        | 0                    | 1460       | 55     | 4%   |                |
|  |         | NBT         | 1621           | 1736         | 1786       | 20              | Balancing  | 0              | 0                        | 0                    | 1810       | 189    | 12%  |                |
| SW Macadam @ SW Hood St                                    | A57/A60 | WBL         | 858            | 1005         | 994        | -30             | Match model growth                                     | 0              | 0                        | 125                  | 1090       | 232    | 27%  |                |
|  |         | WBT         | 1253           | 1467         | 1478       | -35             | Match model growth                                     | 0              | 0                        | 0                    | 125        | 1570   | 317  | 25%            |
| SW Barbur Blvd @ SW Woods St                               | A58A    | NBR         | 361            | 416          | 404        | -10             | Match model growth                                     | 0              | 0                        | 0                    | 395        | 34     | 9%   |                |
|  |         | NBT         | 1402           | 1614         | 1629       | -45             | Match model growth                                     | 0              | 0                        | 0                    | 1585       | 183    | 13%  |                |
|  |         | SBL         | 221            | 229          | 267        | -40             | Match model growth                                     | 0              | 25                       | 0                    | 255        | 34     | 15%  |                |
|  |         | SBT         | 1042           | 1078         | 1036       | 40              | Match model growth                                     | 0              | 50                       | 0                    | 1130       | 88     | 8%   |                |
|  |         | WBL         | 21             | 22           | 19         | 5               | Adjust to minimal growth                               | 0              | 0                        | 0                    | 25         | 4      | 19%  |                |
|  |         | WBR         | 29             | 30           | 33         | 0               |  | 0              | 0                        | 0                    | 35         | 6      | 21%  |                |
| SW Barbur Blvd @ SW 3rd Ave                                | A58B    | EBL         | 6              | 7            | 7          | 0               |  | 0              | 0                        | 0                    | 10         | 4      | 67%  |                |
|  |         | EBR         | 3              | 3            | 3          | 0               |  | 0              | 0                        | 0                    | 5          | 2      | 67%  |                |
|  |         | NBL         | 3              | 3            | 3          | 0               |  | 0              | 0                        | 0                    | 5          | 2      | 67%  |                |
|  |         | NBT         | 1757           | 2023         | 2023       | -55             | Balancing  | 0              | 0                        | 0                    | 1970       | 213    | 12%  |                |
|  |         | SBR         | 1              | 1            | 1          | 0               |  | 0              | 0                        | 0                    | 5          | 4      | 400% |                |
|  |         | SBT         | 1062           | 1054         | 1054       | 45              | Balance  | 0              | 50                       | 0                    | 1150       | 88     | 8%   |                |
| SW Water Ave @ Ross Island Bridge                          | A59     | SBR         | 95             | 98           | 98         | 0               |  | 0              | 0                        | 0                    | 100        | 5      | 5%   |                |
|  |         | WBR         | 23             | 25           | 27         | 0               |  | 0              | 0                        | 0                    | 30         | 7      | 30%  |                |
|  |         | WBT         | 1552           | 1676         | 1674       | -10             | Balancing  | 0              | 0                        | 0                    | 1665       | 113    | 7%   |                |
| SW Naito Pkwy NB Ramp @ Ross Island Bridge                 | A61A    | EBT         | 3344           | 3229         | 3231       | 115             | Balancing  | 0              | 105                      | 0                    | 3455       | 111    | 3%   |                |
|  |         | SBL         | 1531           | 1520         | 1521       | 10              | Adjust to minimal growth (model shows negative growth) | 0              | 25                       | 0                    | 1560       | 29     | 2%   |                |
|  |         | WBT         | 1575           | 1702         | 1699       | -5              | Balancing  | 0              | 0                        | 0                    | 1695       | 120    | 8%   |                |
| SW Naito Pkwy/Ross Island Bridge @ Ramp to SB SW Kelly Ave | A61B    | EBT         | 3344           | 3297         | 3227       | 120             | Balancing  | 0              | 105                      | 0                    | 3455       | 111    | 3%   |                |
|  |         | EBT         | 305            | 301          | 371        | 0               |  | 25             | 0                        | 0                    | 400        | 95     | 31%  |                |
| Kelly Ramps @ Ross Island Bridge                           | A62     | EBT         | 4875           | 4748         | 4733       | 150             | Balancing  | 0              | 130                      | 0                    | 5015       | 140    | 3%   |                |
|  |         | NBR         | 1334           | 1480         | 1475       | -170            | Adjust to match model growth                           | 0              | 50                       | 0                    | 1355       | 21     | 2%   |                |
|  |         | WBR         | 3026           | 3245         | 3250       | 20              | Match model growth                                     | 0              | 0                        | 0                    | 3270       | 244    | 8%   |                |
|  |         | WBT         | 1575           | 1689         | 1704       | -10             | Match model growth                                     | 0              | 0                        | 0                    | 1695       | 120    | 8%   |                |
| Hwy 99E SB @ Ross Island Bridge EB                         | A63     | EBR         | 2286           | 2282         | 2273       | -15             | Match model growth                                     | 0              | 80                       | 0                    | 2340       | 54     | 2%   |                |
|  |         | EBT         | 3923           | 3916         | 3927       |                 |  | 0              | 100                      | 0                    | 4030       | 107    | 3%   |                |
|  |         | WBT         | 4601           | 4943         | 4941       | 20              | Balancing  | 0              | 0                        | 0                    | 4965       | 364    | 8%   |                |
| Hwy 99E NB @ Ross Island Bridge EB                         | A64     | EBT         | 3923           | 3927         | 3927       |                 |  | 0              | 100                      | 0                    | 4030       | 107    | 3%   |                |
|  |         | NBR         | 59             | 69           | 69         | 0               |  | 0              | 0                        | 0                    | 70         | 11     | 19%  |                |
|  |         | WBT         | 4601           | 4942         | 4942       | 20              | Balancing  | 0              | 0                        | 0                    | 4965       | 364    | 8%   |                |
|  |         | EBR         | 67             | 67           | 77         | 0               |  | 0              | 0                        | 0                    | 80         | 13     | 19%  |                |
|  |         | EBT         | 3915           | 3927         | 3904       | 15              | Balancing  | 0              | 100                      | 0                    | 4020       | 105    | 3%   |                |

| 4-6 PM 2035 No-Build Volumes                 |      |             |                |              |            |                 |                          |                |                          |                      |            |        |  |                |  |
|--|------|-------------|----------------|--------------|------------|-----------------|--------------------------|----------------|--------------------------|----------------------|------------|--------|--|----------------|--|
|  |      | Orientation | Balanced Count | Initial Turn | NCHRP Turn | Turn Adjustment | Comment                  | PSU Adjustment | I405 Off Ramp Adjustment | Water Ave Adjustment | Final Turn | Growth |  | Growth Percent |  |
| SE 8th Ave @ SE Powell Blvd                  | A65  | NBR         | 15             | 17           | 17         | 0               |                          | 0              | 0                        | 0                    | 20         | 5      |  | 33%            |  |
|  |      | SBR         | 1641           | 1787         | 1791       |                 |                          | 0              | 0                        | 0                    | 1795       | 154    |  | 9%             |  |
|  |      | WBR         | 123            | 131          | 135        | -10             | Match model growth       | 0              | 0                        | 0                    | 130        | 7      |  | 6%             |  |
|  |      | WBT         | 2960           | 3149         | 3153       | 15              | Balancing                | 0              | 0                        | 0                    | 3170       | 210    |  | 7%             |  |
| SE 10th Ave @ SE Powell Blvd                 | A66  | EBL         | 613            | 611          | 644        |                 |                          | 0              | 0                        | 0                    | 645        | 32     |  | 5%             |  |
|  |      | EBR         | 19             | 19           | 20         | 0               |                          | 0              | 0                        | 0                    | 20         | 1      |  | 5%             |  |
|  |      | EBT         | 3298           | 3289         | 3250       | 20              | Match model growth       | 0              | 100                      | 0                    | 3375       | 77     |  | 2%             |  |
|  |      | NBR         | 22             | 21           | 21         | 0               |                          | 0              | 0                        | 0                    | 25         | 3      |  | 14%            |  |
|  |      | SBR         | 168            | 164          | 164        | 15              | Adjust to minimal growth | 0              | 0                        | 0                    | 180        | 12     |  | 7%             |  |
|  |      | WBL         | 13             | 14           | 14         | 0               |                          | 0              | 0                        | 0                    | 15         | 2      |  | 15%            |  |
|  |      | WBR         | 57             | 61           | 62         | 0               |                          | 0              | 0                        | 0                    | 65         | 8      |  | 14%            |  |
| SE Milwaukie Ave @ SE Powell Blvd            | A67  | WBT         | 2915           | 3114         | 3118       | 0               |                          | 0              | 0                        | 0                    | 3120       | 205    |  | 7%             |  |
|  |      | EBR         | 147            | 145          | 158        | 30              | Match model growth       | 0              | 0                        | 0                    | 190        | 43     |  | 29%            |  |
|  |      | EBT         | 3173           | 3123         | 3109       | 0               |                          | 0              | 100                      | 0                    | 3210       | 37     |  | 1%             |  |
|  |      | NBL         | 300            | 383          | 389        | -20             | Match model growth       | 0              | 0                        | 0                    | 370        | 70     |  | 23%            |  |
|  |      | NBR         | 148            | 189          | 186        | 0               |                          | 0              | 0                        | 0                    | 190        | 42     |  | 28%            |  |
|  |      | NBT         | 363            | 463          | 460        |                 |                          | 0              | 0                        | 0                    | 460        | 97     |  | 27%            |  |
|  |      | SBL         | 814            | 814          | 784        | 30              | Adjust to minimal growth | 0              | 0                        | 0                    | 815        | 1      |  | 0%             |  |
|  |      | SBR         | 242            | 242          | 241        | 30              | Match model growth       | 0              | 0                        | 0                    | 275        | 33     |  | 14%            |  |
|  |      | SBT         | 567            | 567          | 597        | -30             | Match model growth       | 0              | 0                        | 0                    | 570        | 3      |  | 1%             |  |
|  |      | WBL         | 207            | 217          | 229        |                 |                          | 0              | 0                        | 0                    | 230        | 23     |  | 11%            |  |
| SW Water Ave @ SW Grover St                  | A68  | WBR         | 452            | 474          | 463        | 25              | Match model growth       | 0              | 0                        | 0                    | 490        | 38     |  | 8%             |  |
|  |      | WBT         | 2443           | 2562         | 2562       | -10             | Match model growth       | 0              | 0                        | 0                    | 2555       | 112    |  | 5%             |  |
|  |      | EBR         | 364            | 531          | 364        | -5              | Balancing                | 0              | 25                       | 0                    | 385        | 21     |  | 6%             |  |
|  |      | EBT         | 646            | 942          | 1109       | -390            | Balancing                | 0              | 25                       | 0                    | 745        | 99     |  | 15%            |  |
| SW Naito Pkwy @ SW Gibbs St/Naito Ramps      | A69  | WBL         | 8              | 10           | 8          | 0               |                          | 0              | 0                        | 0                    | 10         | 2      |  | 25%            |  |
|  |      | WBT         | 105            | 133          | 134        | -10             | Match model growth       | 0              | 0                        | 0                    | 125        | 20     |  | 19%            |  |
|  |      | EBR         | 1647           | 1774         | 1771       | -10             | Match model growth       | 0              | 0                        | 0                    | 1765       | 118    |  | 7%             |  |
|  |      | NBR         | 933            | 961          | 917        | 15              | Adjust to minimal growth | 0              | 0                        | 0                    | 935        | 2      |  | 0%             |  |
|  |      | NBR2        | 7              | 7            | 7          | 0               |                          | 0              | 0                        | 0                    | 10         | 3      |  | 43%            |  |
|  |      | NBT         | 568            | 585          | 634        | 30              | Balance                  | 0              | 0                        | 0                    | 665        | 97     |  | 17%            |  |
| SW Kelly Ave @ SW Gibbs St                   | A70  | SBT         | 1977           | 2149         | 2145       | -65             | Balance                  | 45             | 0                        | 0                    | 2130       | 153    |  | 8%             |  |
|  |      | WBR         | 598            | 599          | 600        | -5              | Balance                  | 0              | 25                       | 0                    | 625        | 27     |  | 5%             |  |
|  |      | EBR         | 175            | 577          | 569        | -370            | Balancing                | 0              | 25                       | 0                    | 225        | 50     |  | 29%            |  |
|  |      | NBL         | 4              | 4            | 4          | 0               |                          | 0              | 0                        | 0                    | 5          | 1      |  | 25%            |  |
|  |      | NBR         | 2              | 2            | 4          | 0               |                          | 0              | 0                        | 0                    | 5          | 3      |  | 150%           |  |
|  |      | NBT         | 1334           | 1478         | 1490       | -190            | Match model growth       | 0              | 50                       | 0                    | 1355       | 21     |  | 2%             |  |
| SW Barbur Blvd @ SW Whitaker St              | A71  | SBL         | 14             | 17           | 39         | -25             | Match existing           | 0              | 0                        | 0                    | 15         | 1      |  | 7%             |  |
|  |      | SBT         | 7              | 8            | 9          | 0               |                          | 0              | 0                        | 0                    | 10         | 3      |  | 43%            |  |
|  |      | SBT         | 284            | 344          | 315        | 30              | Balance                  | 25             | 0                        | 0                    | 375        | 91     |  | 32%            |  |
|  |      | NBR         | 107            | 123          | 120        |                 |                          | 0              | 0                        | 0                    | 125        | 18     |  | 17%            |  |
|  |      | NBT         | 1739           | 1996         | 2004       | -55             | Match model growth       | 0              | 0                        | 0                    | 1950       | 211    |  | 12%            |  |
|  |      | SBL         | 24             | 24           | 26         | 0               |                          | 0              | 0                        | 0                    | 30         | 6      |  | 25%            |  |
| SW Naito Pkwy @ SB Frontage (SW Whitaker St) | A72A | SBT         | 1041           | 1032         | 1025       | 50              | Match model growth       | 0              | 50                       | 0                    | 1125       | 84     |  | 8%             |  |
|  |      | WBL         | 40             | 43           | 42         | 0               |                          | 0              | 0                        | 0                    | 45         | 5      |  | 13%            |  |
|  |      | WBR         | 21             | 23           | 24         | 0               |                          | 0              | 0                        | 0                    | 25         | 4      |  | 19%            |  |
|  |      | EBR         | 3              | 4            | 4          | 0               |                          | 0              | 0                        | 0                    | 5          | 2      |  | 67%            |  |
| SW Naito Pkwy SB Frontage @ SW Whitaker St   | A72B | NBT         | 1508           | 1551         | 1552       | 55              | Match model volumes      | 0              | 0                        | 0                    | 1610       | 102    |  | 7%             |  |
|  |      | SBT         | 57             | 62           | 63         | 20              | Match model growth       | 0              | 0                        | 0                    | 85         | 28     |  | 49%            |  |
|  |      | SBT         | 3567           | 3858         | 3856       | -95             | Match model growth       | 45             | 0                        | 0                    | 3810       | 243    |  | 7%             |  |
|  |      | SBL         | 3              | 3            | 4          | 0               |                          | 0              | 0                        | 0                    | 5          | 2      |  | 67%            |  |
| SW Naito Pkwy SB Frontage @ SW Whitaker St   | A72B | SBT         | 33             | 36           | 36         | 0               |                          | 0              | 0                        | 0                    | 40         | 7      |  | 21%            |  |
|  |      | WBL         | 57             | 63           | 63         | 20              | Match model growth       | 0              | 0                        | 0                    | 85         | 28     |  | 49%            |  |
|  |      | EBL         | 400            | 380          | 379        | 25              | Adjust to minimal growth | 0              | 0                        | 0                    | 405        | 5      |  | 1%             |  |
|  |      | EBR         | 3              | 3            | 3          | 0               |                          | 0              | 0                        | 0                    | 5          | 2      |  | 67%            |  |
| SW Kelly Ave @ SW Whitaker St                | A73  | NBL         | 10             | 10           | 42         | -30             | Match model growth       | 0              | 0                        | 0                    | 15         | 5      |  | 50%            |  |
|  |      | NBT         | 408            | 415          | 382        | 25              | Adjust to minimal growth | 0              | 0                        | 0                    | 410        | 2      |  | 0%             |  |
|  |      | SBR         | 4              | 8            | 31         | -25             | Match model growth       | 0              | 0                        | 0                    | 10         | 6      |  | 150%           |  |

| 4-6 PM 2035 No-Build Volumes                  |        |             |                |              |            |                 |                       |                |                          |                      |            |        |                |  |
|---|--------|-------------|----------------|--------------|------------|-----------------|-----------------------|----------------|--------------------------|----------------------|------------|--------|----------------|--|
|   |        | Orientation | Balanced Count | Initial Turn | NCHRP Turn | Turn Adjustment | Comment               | PSU Adjustment | I405 Off Ramp Adjustment | Water Ave Adjustment | Final Turn | Growth | Growth Percent |  |
|   |        | SBT         | 455            | 865          | 844        | -305            | Balancing Adjustments | 25             | 25                       | 0                    | 590        | 135    | 30%            |  |
|   |        | WBL         | 5              | 7            | 8          | 35              | Match model growth    | 0              | 0                        | 0                    | 45         | 40     | 800%           |  |
|   |        | WBR         | 532            | 778          | 743        | -245            | Match model growth    | 0              | 50                       | 0                    | 550        | 18     | 3%             |  |
|   |        | WBT         | 7              | 10           | 44         | 80              | Match model growth    | 0              | 0                        | 0                    | 125        | 118    | 1686%          |  |
| SW Hood Ave @ SW Whitaker St                  | A74    | SBR         | 544            | 588          | 804        | -135            | Match model growth    | 0              | 50                       | 0                    | 720        | 176    | 32%            |  |
|   |        | SBT         | 1934           | 2091         | 1875       | 355             | Match model growth    | 0              | 0                        | -75                  | 2155       | 221    | 11%            |  |
| SW Barbur Blvd @ SW Pennoyer St/SW Condor Ave | A75/76 | EBL         | 197            | 214          | 214        | 0               |                       | 0              | 0                        | 0                    | 215        | 18     | 9%             |  |
|   |        | EBR         | 5              | 5            | 5          | 0               |                       | 0              | 0                        | 0                    | 10         | 5      | 100%           |  |
|   |        | EBT         | 1              | 1            | 1          | 0               |                       | 0              | 0                        | 0                    | 5          | 4      | 400%           |  |
|   |        | NBL         | 3              | 3            | 4          | 0               |                       | 0              | 0                        | 0                    | 5          | 2      | 67%            |  |
|   |        | NBR         | 7              | 8            | 8          | 0               |                       | 0              | 0                        | 0                    | 10         | 3      | 43%            |  |
|   |        | NBT         | 1634           | 1892         | 1891       | -55             | Match model growth    | 0              | 0                        | 0                    | 1840       | 206    | 13%            |  |
|   |        | SBL         | 7              | 7            | 7          | 0               |                       | 0              | 0                        | 0                    | 10         | 3      | 43%            |  |
|   |        | SBR         | 17             | 17           | 18         | 0               |                       | 0              | 0                        | 0                    | 20         | 3      | 18%            |  |
|   |        | SBT         | 1057           | 1042         | 1041       | 45              | Match model growth    | 0              | 50                       | 0                    | 1140       | 83     | 8%             |  |
|   |        | WBL         | 16             | 17           | 17         | 0               |                       | 0              | 0                        | 0                    | 20         | 4      | 25%            |  |
|   |        | WBR         | 15             | 16           | 16         | 0               |                       | 0              | 0                        | 0                    | 20         | 5      | 33%            |  |
|   |        | WBT         | 6              | 7            | 7          | 0               |                       | 0              | 0                        | 0                    | 10         | 4      | 67%            |  |
| SW Barbur Blvd @ SW Lane St                   | A77    | EBL         | 43             | 52           | 77         | -35             | Match model growth    | 0              | 0                        | 0                    | 45         | 2      | 5%             |  |
|   |        | EBR         | 291            | 351          | 321        | 0               |                       | 0              | 0                        | 0                    | 325        | 34     | 12%            |  |
|   |        | NBL         | 58             | 65           | 63         | -5              | Match model growth    | 0              | 0                        | 0                    | 60         | 2      | 3%             |  |
|   |        | NBT         | 1601           | 1807         | 1835       | -25             | Balancing             | 0              | 0                        | 0                    | 1810       | 209    | 13%            |  |
|   |        | SBR         | 5              | 5            | 7          | 0               |                       | 0              | 0                        | 0                    | 10         | 5      | 100%           |  |
| SW Barbur Blvd @ SW Abernathy St              | A78    | SBT         | 1073           | 1055         | 1032       | 75              | Balance               | 0              | 50                       | 0                    | 1160       | 87     | 8%             |  |
|   |        | EBL         | 22             | 27           | 28         | 0               |                       | 0              | 0                        | 0                    | 30         | 8      | 36%            |  |
|   |        | EBR         | 16             | 19           | 18         | 0               |                       | 0              | 0                        | 0                    | 20         | 4      | 25%            |  |
|   |        | NBL         | 16             | 17           | 17         | 0               |                       | 0              | 0                        | 0                    | 20         | 4      | 25%            |  |
|   |        | NBR         | 1508           | 1621         | 1546       | 60              | Match model growth    | 0              | 0                        | 0                    | 1610       | 102    | 7%             |  |
|   |        | NBT         | 1637           | 1760         | 1845       | -5              | Match model growth    | 0              | 0                        | 0                    | 1840       | 203    | 12%            |  |
|   |        | SBR         | 18             | 18           | 20         | 0               |                       | 0              | 0                        | 0                    | 25         | 7      | 39%            |  |
| SW Barbur Blvd @ SW Lowell St                 | A79    | SBT         | 1346           | 1335         | 1323       | 85              | Balance               | 0              | 50                       | 0                    | 1460       | 114    | 8%             |  |
|   |        | EBT         | 3570           | 3856         | 3848       | -80             | Mathc model growth    | 45             | 0                        | 0                    | 3815       | 245    | 7%             |  |
|   |        | NBR         | 355            | 381          | 394        | -30             | Match model growth    | 0              | 0                        | 0                    | 365        | 10     | 3%             |  |
|   |        | NBT         | 3145           | 3372         | 3369       | 80              | Balancing             | 0              | 0                        | 0                    | 3450       | 305    | 10%            |  |
|   |        | SBT         | 1351           | 1334         | 1331       | 95              | Match model growth    | 0              | 50                       | 0                    | 1480       | 129    | 10%            |  |
| SW Barbur Blvd @ SW Bancroft St               | A80    | WBR         | 16             | 19           | 19         |                 |                       | 0              | 0                        | 0                    | 20         | 4      | 25%            |  |
|   |        | NBR         | 532            | 568          | 581        | 15              | Match model growth    | 0              | 0                        | 0                    | 600        | 68     | 13%            |  |
|   |        | NBT         | 3377           | 3607         | 3602       | -15             | Balancing             | 0              | 0                        | 0                    | 3590       | 213    | 6%             |  |
|   |        | SBR         | 57             | 60           | 63         | 10              | Match model growth    | 0              | 0                        | 0                    | 75         | 18     | 32%            |  |
|   |        | SBT         | 4864           | 5120         | 5108       | 15              | Balancing             | 45             | 50                       | 0                    | 5220       | 356    | 7%             |  |
| SW Corbett Ave @ SW Bancroft St               | A81    | WBR         | 123            | 149          | 150        | 75              | Match model growth    | 0              | 0                        | 0                    | 225        | 102    | 83%            |  |
|   |        | EBL         | 426            | 465          | 458        | 30              | Match model growth    | 0              | 0                        | 0                    | 490        | 64     | 15%            |  |
|   |        | EBR         | 33             | 36           | 44         | -10             | Match model growth    | 0              | 0                        | 0                    | 35         | 2      | 6%             |  |
|   |        | EBT         | 73             | 80           | 76         | -5              | Match model growth    | 0              | 0                        | 0                    | 75         | 2      | 3%             |  |
|   |        | NBL         | 99             | 108          | 119        | 75              | Match model growth    | 0              | 0                        | 0                    | 195        | 96     | 97%            |  |
|   |        | NBR         | 34             | 37           | 36         | -5              | Match model growth    | 0              | 0                        | 0                    | 35         | 1      | 3%             |  |
|   |        | NBT         | 633            | 692          | 680        | -45             | Match model growth    | 0              | 0                        | 0                    | 635        | 2      | 0%             |  |
|   |        | SBL         | 13             | 20           | 16         | 0               |                       | 0              | 0                        | 0                    | 20         | 7      | 54%            |  |
|   |        | SBR         | 10             | 15           | 14         | 0               |                       | 0              | 0                        | 0                    | 15         | 5      | 50%            |  |
|   |        | SBT         | 438            | 676          | 686        | -15             | Match model growth    | 0              | 0                        | 0                    | 675        | 237    | 54%            |  |
|   |        | WBL         | 45             | 54           | 59         | -10             | Match model growth    | 0              | 0                        | 0                    | 50         | 5      | 11%            |  |
|   |        | WBR         | 20             | 24           | 21         | 0               |                       | 0              | 0                        | 0                    | 25         | 5      | 25%            |  |
|   |        | WBT         | 14             | 17           | 16         | -5              | Match model growth    | 0              | 0                        | 0                    | 15         | 1      | 7%             |  |
|   |        | EBL         | 148            | 179          | 181        | 0               |                       | 0              | 0                        | 0                    | 185        | 37     | 25%            |  |
|   |        | EBR         | 20             | 24           | 24         | 0               |                       | 0              | 0                        | 0                    | 25         | 5      | 25%            |  |
|   |        | EBT         | 116            | 141          | 140        |                 |                       | 0              | 0                        | 0                    | 140        | 24     | 21%            |  |
|   |        | NBR         | 368            | 384          | 379        | -10             | Match model growth    | 0              | 0                        | 0                    | 370        | 2      | 1%             |  |
|   |        | NBT         | 3532           | 3682         | 3687       | 40              | Balancing             | 0              | 0                        | 0                    | 3730       | 198    | 6%             |  |

| 4-6 PM 2035 No-Build Volumes                      |         |             |                |              |            |                 |                          |                |                          |                      |            |        |                |  |
|---|---------|-------------|----------------|--------------|------------|-----------------|--------------------------|----------------|--------------------------|----------------------|------------|--------|----------------|--|
|   |         | Orientation | Balanced Count | Initial Turn | NCHRP Turn | Turn Adjustment | Comment                  | PSU Adjustment | I405 Off Ramp Adjustment | Water Ave Adjustment | Final Turn | Growth | Growth Percent |  |
| SW Barbur Blvd @ SW Hamilton St (both approaches) | A82/A84 | SBL         | 683            | 718          | 721        | 0               |                          | 0              | 0                        | 0                    | 725        | 42     | 6%             |  |
|   |         | SBR         | 91             | 96           | 90         | 0               |                          | 0              | 0                        | 0                    | 95         | 4      | 4%             |  |
|   |         | SBT         | 4090           | 4300         | 4302       | 0               |                          | 45             | 50                       | 0                    | 4400       | 310    | 8%             |  |
|   |         | WBL         | 534            | 691          | 693        | -10             | Balancing                | 0              | 0                        | 0                    | 685        | 151    | 28%            |  |
|   |         | WBR         | 229            | 296          | 302        | -30             | Match model growth       | 0              | 0                        | 0                    | 275        | 46     | 20%            |  |
|   |         | WBT         | 91             | 118          | 111        | -10             | Match model growth       | 0              | 0                        | 0                    | 105        | 14     | 15%            |  |
| SW Hamilton Blvd @ SW Corbett Ave                 | A83     | EBL         | 250            | 265          | 262        | 15              | Match model growth       | 0              | 0                        | 0                    | 280        | 30     | 12%            |  |
|   |         | EBC         | 835            | 884          | 886        | -20             | Match model growth       | 0              | 0                        | 0                    | 870        | 35     | 4%             |  |
|   |         | EBT         | 82             | 87           | 87         | -5              | Match model growth       | 0              | 0                        | 0                    | 85         | 3      | 4%             |  |
|   |         | NBL         | 556            | 647          | 668        | -25             | Match model growth       | 0              | 0                        | 0                    | 645        | 89     | 16%            |  |
|   |         | NBR         | 71             | 83           | 81         | -10             | Match model growth       | 0              | 0                        | 0                    | 75         | 4      | 6%             |  |
|   |         | NBT         | 510            | 594          | 574        |                 |                          | 0              | 0                        | 0                    | 575        | 65     | 13%            |  |
|   |         | SBL         | 3              | 5            | 4          | 0               |                          | 0              | 0                        | 0                    | 5          | 2      | 67%            |  |
|   |         | SBR         | 225            | 342          | 352        | -20             | Match model growth       | 0              | 0                        | 0                    | 335        | 110    | 49%            |  |
|   |         | SBT         | 288            | 437          | 427        | -10             | Match model growth       | 0              | 0                        | 0                    | 420        | 132    | 46%            |  |
|   |         | WBL         | 23             | 28           | 27         | -5              | Match model growth       | 0              | 0                        | 0                    | 25         | 2      | 9%             |  |
|   |         | WBR         | 6              | 7            | 7          | 0               |                          | 0              | 0                        | 0                    | 10         | 4      | 67%            |  |
|   |         | WBT         | 73             | 88           | 89         | -5              | Match model growth       | 0              | 0                        | 0                    | 85         | 12     | 16%            |  |
| SW Barbur Blvd @ SW Capitol Hwy (EB and WB)       | A85/86  | EBL         | 1413           | 1413         | 1414       | 20              | Match model growth       | 0              | 0                        | 0                    | 1435       | 22     | 2%             |  |
|   |         | NBT         | 2571           | 2749         | 2750       | 0               |                          | 0              | 0                        | 0                    | 2755       | 184    | 7%             |  |
|   |         | SBR         | 1937           | 2086         | 2178       | 5               | Match model growth       | 15             | 25                       | 0                    | 2225       | 288    | 15%            |  |
|   |         | SBT         | 2645           | 2848         | 2753       | 10              | Match model growth       | 30             | 25                       | 0                    | 2820       | 175    | 7%             |  |
| SW Terwilliger Blvd @ SW Capitol Hwy              | A87     | 27          | 31             | 30           | 0          |                 |                          | 0              | 0                        | 0                    | 30         | 3      | 11%            |  |
|   |         | 28          | 32             | 27           | 0          |                 |                          | 0              | 0                        | 0                    | 30         | 2      | 7%             |  |
|   |         | 1882        | 2136           | 2145         | -25        | Balancing       |                          | 15             | 25                       | 2165                 | 283        | 15%    |                |  |
|   |         | 15          | 16             | 14           | 0          |                 |                          | 0              | 0                        | 0                    | 15         | 0      | 0%             |  |
|   |         | 158         | 171            | 170          | 0          |                 |                          | 70             | 0                        | 0                    | 240        | 82     | 52%            |  |
|   |         | 176         | 191            | 195          | 0          |                 |                          | 0              | 0                        | 0                    | 195        | 19     | 11%            |  |
|   |         | 34          | 34             | 30           | 0          |                 |                          | 0              | 0                        | 0                    | 35         | 1      | 3%             |  |
|   |         | 499         | 493            | 457          | 0          |                 |                          | 0              | 0                        | 50                   | 510        | 11     | 2%             |  |
|   |         | 518         | 511            | 551          | 0          |                 |                          | 0              | 0                        | 0                    | 555        | 37     | 7%             |  |
|   |         | 1364        | 1421           | 1394         | -10        | Balancing       |                          | 0              | 0                        | 0                    | 1385       | 21     | 2%             |  |
|   |         | 167         | 174            | 196          | 0          |                 |                          | 30             | 0                        | 0                    | 230        | 63     | 38%            |  |
|   |         | 184         | 192            | 192          | 0          |                 |                          | 0              | 0                        | 0                    | 195        | 11     | 6%             |  |
| SW Kelly Ave @ SW Curry St                        | A90     | EBL         | 161            | 177          | 122        | 40              | Adjust to minimal growth | 0              | 0                        | 0                    | 165        | 4      | 2%             |  |
|   |         | EBR         | 6              | 7            | 6          | 0               |                          | 0              | 0                        | 0                    | 10         | 4      | 67%            |  |
|   |         | EBT         | 118            | 130          | 184        | -60             | Match model growth       | 0              | 0                        | 0                    | 125        | 7      | 6%             |  |
|   |         | NBL         | 5              | 6            | 6          | 0               |                          | 0              | 0                        | 0                    | 10         | 5      | 100%           |  |
|   |         | NBR         | 10             | 12           | 24         | -10             | Match model growth       | 0              | 0                        | 0                    | 15         | 5      | 50%            |  |
|   |         | NBT         | 257            | 314          | 301        | -45             | Match model growth       | 0              | 0                        | 0                    | 260        | 3      | 1%             |  |
|   |         | SBL         | 435            | 806          | 824        | -330            | Match model growth       | 25             | 25                       | 0                    | 545        | 110    | 25%            |  |
|   |         | SBR         | 3              | 6            | 3          | 0               |                          | 0              | 0                        | 0                    | 5          | 2      | 67%            |  |
|   |         | SBT         | 25             | 46           | 32         | 55              | Match model growth       | 0              | 0                        | 0                    | 90         | 65     | 260%           |  |

**APPENDIX B10**  
Segment A – AM LPA HCM Results



# HCM Signalized Intersection Capacity Analysis

12: SW 1st Ave & SW Harrison Street

06/02/2020



| Movement               | EBL  | EBT  | EBR  | WBL  | WBT   | WBR  | NBL   | NBT   | NBR  | SBL   | SBT  | SBR  |
|------------------------|------|------|------|------|-------|------|-------|-------|------|-------|------|------|
| Lane Configurations    |      |      |      |      |       |      |       |       |      |       |      |      |
| Traffic Volume (vph)   | 0    | 130  | 40   | 20   | 155   | 0    | 130   | 0     | 120  | 35    | 115  | 45   |
| Future Volume (vph)    | 0    | 130  | 40   | 20   | 155   | 0    | 130   | 0     | 120  | 35    | 115  | 45   |
| Ideal Flow (vphpl)     | 1750 | 1750 | 1750 | 1750 | 1750  | 1750 | 1750  | 1750  | 1750 | 1750  | 1750 | 1750 |
| Grade (%)              | -3%  |      |      |      | 3%    |      |       |       | 0%   |       |      | 0%   |
| 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  | 1.00  | 1.00 | 1.00  | 1.00 | 0.95 |
| Frpb, ped/bikes        | 0.98 |      |      |      | 1.00  |      | 1.00  | 1.00  | 0.92 | 1.00  | 1.00 | 0.99 |
| Flpb, ped/bikes        | 1.00 |      |      |      | 0.99  |      | 0.98  | 1.00  | 0.97 | 1.00  |      |      |
| Fr <sub>t</sub>        | 0.96 |      |      |      | 1.00  |      | 1.00  | 1.00  | 0.85 | 1.00  | 1.00 | 0.96 |
| Flt Protected          | 1.00 |      |      |      | 0.99  |      | 0.95  | 1.00  | 0.95 | 1.00  |      |      |
| Satd. Flow (prot)      | 2754 |      |      |      | 2928  |      | 1516  | 1338  | 1563 | 2989  |      |      |
| Flt Permitted          | 1.00 |      |      |      | 0.92  |      | 0.36  | 1.00  | 0.95 | 1.00  |      |      |
| Satd. Flow (perm)      | 2754 |      |      |      | 2707  |      | 580   | 1338  | 1563 | 2989  |      |      |
| Peak-hour factor, PHF  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00  | 1.00  | 1.00 | 1.00  | 1.00 | 1.00 |
| Adj. Flow (vph)        | 0    | 130  | 40   | 20   | 155   | 0    | 130   | 0     | 120  | 35    | 115  | 45   |
| RTOR Reduction (vph)   | 0    | 27   | 0    | 0    | 0     | 0    | 0     | 0     | 101  | 0     | 29   | 0    |
| Lane Group Flow (vph)  | 0    | 143  | 0    | 0    | 175   | 0    | 130   | 0     | 19   | 35    | 131  | 0    |
| Confl. Peds. (#/hr)    | 50   |      | 61   | 61   |       | 50   | 29    |       | 37   | 37    |      | 29   |
| Confl. Bikes (#/hr)    |      |      | 4    |      |       | 38   |       |       | 2    |       |      | 26   |
| Heavy Vehicles (%)     | 0%   | 20%  | 4%   | 0%   | 12%   | 0%   | 8%    | 0%    | 2%   | 3%    | 3%   | 10%  |
| Turn Type              | NA   |      | Perm | NA   |       | Perm |       | Perm  | Perm | Perm  | NA   |      |
| Protected Phases       | 8    |      |      |      | 4     |      |       |       |      |       | 2    |      |
| Permitted Phases       |      |      | 4    |      |       |      | 1     |       | 1    | 2     |      |      |
| Actuated Green, G (s)  | 22.0 |      |      |      | 22.0  |      | 11.0  | 11.0  | 24.0 | 24.0  |      |      |
| Effective Green, g (s) | 22.0 |      |      |      | 22.0  |      | 11.0  | 11.0  | 24.0 | 24.0  |      |      |
| Actuated g/C Ratio     | 0.32 |      |      |      | 0.32  |      | 0.16  | 0.16  | 0.35 | 0.35  |      |      |
| Clearance Time (s)     | 4.0  |      |      |      | 4.0   |      | 4.0   | 4.0   | 4.0  | 4.0   |      |      |
| Vehicle Extension (s)  | 3.0  |      |      |      | 3.0   |      | 3.0   | 3.0   | 3.0  | 3.0   |      |      |
| Lane Grp Cap (vph)     | 878  |      |      |      | 863   |      | 92    | 213   | 543  | 1039  |      |      |
| v/s Ratio Prot         | 0.05 |      |      |      |       |      |       |       |      | c0.04 |      |      |
| v/s Ratio Perm         |      |      |      |      | c0.06 |      | c0.22 | 0.01  | 0.02 |       |      |      |
| v/c Ratio              | 0.16 |      |      |      | 0.20  |      | 1.41  | 0.09  | 0.06 | 0.13  |      |      |
| Uniform Delay, d1      | 16.9 |      |      |      | 17.1  |      | 29.0  | 24.7  | 15.0 | 15.3  |      |      |
| Progression Factor     | 1.00 |      |      |      | 1.00  |      | 1.00  | 1.00  | 1.00 | 1.00  |      |      |
| Incremental Delay, d2  | 0.1  |      |      |      | 0.1   |      | 238.1 | 0.8   | 0.1  | 0.1   |      |      |
| Delay (s)              | 17.0 |      |      |      | 17.2  |      | 267.1 | 25.6  | 15.1 | 15.4  |      |      |
| Level of Service       | B    |      |      |      | B     |      | F     | C     | B    | B     |      |      |
| Approach Delay (s)     | 17.0 |      |      |      | 17.2  |      |       | 151.2 |      |       | 15.3 |      |
| Approach LOS           | B    |      |      |      | B     |      |       | F     |      |       | B    |      |

## Intersection Summary

|                                   |       |                           |      |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay            | 59.1  | HCM 2000 Level of Service | E    |
| HCM 2000 Volume to Capacity ratio | 0.40  |                           |      |
| Actuated Cycle Length (s)         | 69.0  | Sum of lost time (s)      | 12.0 |
| Intersection Capacity Utilization | 59.5% | ICU Level of Service      | B    |
| Analysis Period (min)             | 15    |                           |      |

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

13: SW Naito Parkway & SW Harrison Street

06/02/2020

| Movement                          | EBL   | EBT   | EBR  | WBL  | WBT  | WBR  | NBL                       | NBT   | NBR  | SBL  | SBT  | SBR  |
|-----------------------------------|-------|-------|------|------|------|------|---------------------------|-------|------|------|------|------|
| Lane Configurations               | ↑     | ↑     | ↑    | ↑    | ↑    | ↑    | ↑                         | ↑↑    |      | ↑↑   | ↑↑   |      |
| Traffic Volume (vph)              | 110   | 90    | 85   | 75   | 50   | 15   | 95                        | 1195  | 40   | 0    | 510  | 30   |
| Future Volume (vph)               | 110   | 90    | 85   | 75   | 50   | 15   | 95                        | 1195  | 40   | 0    | 510  | 30   |
| Ideal Flow (vphpl)                | 1750  | 1750  | 1750 | 1750 | 1750 | 1750 | 1750                      | 1750  | 1750 | 1750 | 1750 | 1750 |
| 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  | 1.00  | 1.00 | 1.00 | 1.00 |      | 1.00                      | 0.95  |      |      | 0.95 |      |
| Frpb, ped/bikes                   | 1.00  | 1.00  | 1.00 | 1.00 | 0.99 |      | 1.00                      | 1.00  |      |      | 1.00 |      |
| Flpb, ped/bikes                   | 1.00  | 1.00  | 1.00 | 1.00 | 1.00 |      | 1.00                      | 1.00  |      |      | 1.00 |      |
| Fr <sub>t</sub>                   | 1.00  | 1.00  | 0.85 | 1.00 | 0.97 |      | 1.00                      | 1.00  |      |      | 0.99 |      |
| Flt Protected                     | 0.95  | 1.00  | 1.00 | 0.95 | 1.00 |      | 0.95                      | 1.00  |      |      | 1.00 |      |
| Satd. Flow (prot)                 | 1453  | 1291  | 1206 | 1425 | 1307 |      | 1412                      | 2868  |      |      | 2828 |      |
| Flt Permitted                     | 0.95  | 1.00  | 1.00 | 0.95 | 1.00 |      | 0.95                      | 1.00  |      |      | 1.00 |      |
| Satd. Flow (perm)                 | 1453  | 1291  | 1206 | 1425 | 1307 |      | 1412                      | 2868  |      |      | 2828 |      |
| Peak-hour factor, PHF             | 1.00  | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00                      | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph)                   | 110   | 90    | 85   | 75   | 50   | 15   | 95                        | 1195  | 40   | 0    | 510  | 30   |
| RTOR Reduction (vph)              | 0     | 0     | 76   | 0    | 13   | 0    | 0                         | 0     | 0    | 0    | 4    | 0    |
| Lane Group Flow (vph)             | 110   | 90    | 9    | 75   | 52   | 0    | 95                        | 1235  | 0    | 0    | 536  | 0    |
| Confl. Peds. (#/hr)               | 40    |       | 22   | 22   |      | 40   | 13                        |       | 25   | 25   |      | 13   |
| Confl. Bikes (#/hr)               |       |       | 20   |      |      | 2    |                           |       | 3    |      |      |      |
| Heavy Vehicles (%)                | 3%    | 22%   | 11%  | 5%   | 19%  | 0%   | 6%                        | 2%    | 0%   | 0%   | 3%   | 5%   |
| Bus Blockages (#/hr)              | 0     | 0     | 0    | 0    | 0    | 0    | 0                         | 8     | 8    | 0    | 8    | 8    |
| Turn Type                         | Prot  | NA    | Over | Prot | NA   |      | Prot                      | NA    |      |      | NA   |      |
| Protected Phases                  | 3     | 8     | 1    | 7    | 4    |      | 1                         | 6     |      |      | 2    |      |
| Permitted Phases                  |       |       |      |      |      |      |                           |       |      |      |      |      |
| Actuated Green, G (s)             | 8.7   | 11.3  | 9.4  | 6.4  | 8.7  |      | 9.4                       | 50.4  |      |      | 38.3 |      |
| Effective Green, g (s)            | 7.7   | 11.3  | 8.4  | 5.4  | 9.0  |      | 8.4                       | 51.3  |      |      | 38.9 |      |
| Actuated g/C Ratio                | 0.10  | 0.14  | 0.11 | 0.07 | 0.11 |      | 0.11                      | 0.64  |      |      | 0.49 |      |
| Clearance Time (s)                | 3.0   | 4.0   | 3.0  | 3.0  | 4.3  |      | 3.0                       | 4.9   |      |      | 4.6  |      |
| Vehicle Extension (s)             | 3.0   | 3.0   | 3.0  | 3.0  | 3.0  |      | 3.0                       | 3.0   |      |      | 3.0  |      |
| Lane Grp Cap (vph)                | 139   | 182   | 126  | 96   | 147  |      | 148                       | 1839  |      |      | 1375 |      |
| v/s Ratio Prot                    | c0.08 | c0.07 | 0.01 | 0.05 | 0.04 |      | 0.07                      | c0.43 |      |      | 0.19 |      |
| v/s Ratio Perm                    |       |       |      |      |      |      |                           |       |      |      |      |      |
| v/c Ratio                         | 0.79  | 0.49  | 0.07 | 0.78 | 0.35 |      | 0.64                      | 0.67  |      |      | 0.39 |      |
| Uniform Delay, d1                 | 35.4  | 31.7  | 32.3 | 36.7 | 32.8 |      | 34.4                      | 9.0   |      |      | 13.0 |      |
| Progression Factor                | 1.00  | 1.00  | 1.00 | 1.00 | 1.00 |      | 0.74                      | 1.67  |      |      | 1.00 |      |
| Incremental Delay, d2             | 25.7  | 2.1   | 0.2  | 32.8 | 1.5  |      | 7.8                       | 1.7   |      |      | 0.8  |      |
| Delay (s)                         | 61.1  | 33.8  | 32.5 | 69.5 | 34.3 |      | 33.1                      | 16.8  |      |      | 13.9 |      |
| Level of Service                  | E     | C     | C    | E    | C    |      | C                         | B     |      |      | B    |      |
| Approach Delay (s)                |       | 43.9  |      |      | 53.1 |      |                           | 18.0  |      |      | 13.9 |      |
| Approach LOS                      |       | D     |      |      | D    |      |                           | B     |      |      | B    |      |
| Intersection Summary              |       |       |      |      |      |      |                           |       |      |      |      |      |
| HCM 2000 Control Delay            |       | 22.4  |      |      |      |      | HCM 2000 Level of Service |       | C    |      |      |      |
| HCM 2000 Volume to Capacity ratio |       | 0.71  |      |      |      |      |                           |       |      |      |      |      |
| Actuated Cycle Length (s)         |       | 80.0  |      |      |      |      | Sum of lost time (s)      |       | 16.0 |      |      |      |
| Intersection Capacity Utilization |       | 63.5% |      |      |      |      | ICU Level of Service      |       | B    |      |      |      |
| Analysis Period (min)             |       | 15    |      |      |      |      |                           |       |      |      |      |      |
| c Critical Lane Group             |       |       |      |      |      |      |                           |       |      |      |      |      |

# HCM Signalized Intersection Capacity Analysis

21: 4th Ave & Hall

06/02/2020



| Movement               | EBL   | EBR  | NBL  | NBT   | SBT  | SBR  |
|------------------------|-------|------|------|-------|------|------|
| Lane Configurations    |       |      |      |       |      |      |
| Traffic Volume (vph)   | 20    | 0    | 70   | 1155  | 0    | 0    |
| Future Volume (vph)    | 20    | 0    | 70   | 1155  | 0    | 0    |
| Ideal Flow (vphpl)     | 1750  | 1750 | 1750 | 1750  | 1750 | 1750 |
| Total Lost time (s)    | 4.0   |      |      | 4.0   |      |      |
| Lane Util. Factor      | 1.00  |      |      | 1.00  |      |      |
| Frpb, ped/bikes        | 1.00  |      |      | 1.00  |      |      |
| Flpb, ped/bikes        | 1.00  |      |      | 1.00  |      |      |
| Fr <sub>t</sub>        | 1.00  |      |      | 1.00  |      |      |
| Flt Protected          | 0.95  |      |      | 0.95  |      |      |
| Satd. Flow (prot)      | 1309  |      |      | 984   |      |      |
| Flt Permitted          | 0.95  |      |      | 0.95  |      |      |
| Satd. Flow (perm)      | 1309  |      |      | 984   |      |      |
| Peak-hour factor, PHF  | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 |
| Adj. Flow (vph)        | 20    | 0    | 70   | 1155  | 0    | 0    |
| RTOR Reduction (vph)   | 0     | 0    | 0    | 0     | 0    | 0    |
| Lane Group Flow (vph)  | 20    | 0    | 70   | 1155  | 0    | 0    |
| Confl. Peds. (#/hr)    | 120   | 2    |      |       |      |      |
| Confl. Bikes (#/hr)    |       | 2    |      |       |      |      |
| Heavy Vehicles (%)     | 0%    | 0%   | 33%  | 2%    | 0%   | 0%   |
| Parking (#/hr)         | 5     |      | 5    | 5     |      |      |
| Turn Type              | Prot  |      | Perm | NA    |      |      |
| Protected Phases       | 2     |      |      | 4     |      |      |
| Permitted Phases       |       |      | 4    |       |      |      |
| Actuated Green, G (s)  | 20.5  |      | 26.9 | 26.9  |      |      |
| Effective Green, g (s) | 21.1  |      | 26.9 | 26.9  |      |      |
| Actuated g/C Ratio     | 0.38  |      | 0.48 | 0.48  |      |      |
| Clearance Time (s)     | 4.6   |      | 4.0  | 4.0   |      |      |
| Vehicle Extension (s)  | 0.2   |      | 0.2  | 0.2   |      |      |
| Lane Grp Cap (vph)     | 493   |      | 472  | 1320  |      |      |
| v/s Ratio Prot         | c0.02 |      |      | c0.42 |      |      |
| v/s Ratio Perm         |       |      | 0.07 |       |      |      |
| v/c Ratio              | 0.04  |      | 0.15 | 0.88  |      |      |
| Uniform Delay, d1      | 11.0  |      | 8.1  | 13.0  |      |      |
| Progression Factor     | 1.00  |      | 1.87 | 1.80  |      |      |
| Incremental Delay, d2  | 0.2   |      | 0.0  | 3.6   |      |      |
| Delay (s)              | 11.2  |      | 15.3 | 27.0  |      |      |
| Level of Service       | B     |      | B    | C     |      |      |
| Approach Delay (s)     | 11.2  |      |      | 26.3  | 0.0  |      |
| Approach LOS           | B     |      |      | C     | A    |      |

## Intersection Summary

|                                   |       |                           |     |
|-----------------------------------|-------|---------------------------|-----|
| HCM 2000 Control Delay            | 26.1  | HCM 2000 Level of Service | C   |
| HCM 2000 Volume to Capacity ratio | 0.51  |                           |     |
| Actuated Cycle Length (s)         | 56.0  | Sum of lost time (s)      | 8.0 |
| Intersection Capacity Utilization | 59.3% | ICU Level of Service      | B   |
| Analysis Period (min)             | 15    |                           |     |

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

23: 6th Ave & College St

06/02/2020



| Movement               | EBL  | EBT  | EBR  | WBL  | WBT   | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|------------------------|------|------|------|------|-------|------|------|------|------|------|------|------|
| Lane Configurations    |      |      |      |      |       |      |      |      |      |      |      |      |
| Traffic Volume (vph)   | 20   | 30   | 0    | 0    | 70    | 35   | 190  | 665  | 0    | 0    | 0    | 0    |
| Future Volume (vph)    | 20   | 30   | 0    | 0    | 70    | 35   | 190  | 665  | 0    | 0    | 0    | 0    |
| Ideal Flow (vphpl)     | 1750 | 1750 | 1750 | 1750 | 1750  | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time (s)    |      |      |      |      |       |      |      |      |      |      |      |      |
|                        | 4.0  |      |      |      | 4.0   |      |      |      | 4.0  |      |      |      |
| Lane Util. Factor      |      | 1.00 |      |      |       | 1.00 |      |      | 0.91 |      |      |      |
| Frbp, ped/bikes        |      | 1.00 |      |      |       | 0.97 |      |      | 1.00 |      |      |      |
| Flpb, ped/bikes        |      | 0.97 |      |      |       | 1.00 |      |      | 0.95 |      |      |      |
| Fr <sub>t</sub>        |      | 1.00 |      |      |       | 0.95 |      |      | 1.00 |      |      |      |
| Flt Protected          |      | 0.98 |      |      |       | 1.00 |      |      | 0.99 |      |      |      |
| Satd. Flow (prot)      |      | 1214 |      |      |       | 1264 |      |      | 3850 |      |      |      |
| Flt Permitted          |      | 0.89 |      |      |       | 1.00 |      |      | 0.99 |      |      |      |
| Satd. Flow (perm)      |      | 1103 |      |      |       | 1264 |      |      | 3850 |      |      |      |
| Peak-hour factor, PHF  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph)        | 20   | 30   | 0    | 0    | 70    | 35   | 190  | 665  | 0    | 0    | 0    | 0    |
| RTOR Reduction (vph)   | 0    | 0    | 0    | 0    | 0     | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Lane Group Flow (vph)  | 0    | 50   | 0    | 0    | 105   | 0    | 0    | 855  | 0    | 0    | 0    | 0    |
| Confl. Peds. (#/hr)    | 92   |      |      |      | 188   |      | 92   | 109  |      | 142  |      | 109  |
| Confl. Bikes (#/hr)    |      |      |      |      |       |      | 4    |      |      |      |      |      |
| Heavy Vehicles (%)     | 14%  | 4%   | 2%   | 0%   | 0%    | 2%   | 2%   | 6%   | 0%   | 2%   | 0%   | 0%   |
| Parking (#/hr)         | 5    | 5    |      |      | 5     | 5    |      |      |      |      |      |      |
| Turn Type              | Perm | NA   |      |      | NA    |      | Perm | NA   |      |      |      |      |
| Protected Phases       |      | 4    |      |      |       | 4    |      |      | 2    |      |      |      |
| Permitted Phases       | 4    |      |      |      |       |      | 2    |      |      |      |      |      |
| Actuated Green, G (s)  |      | 14.4 |      |      |       | 14.4 |      |      | 33.0 |      |      |      |
| Effective Green, g (s) |      | 14.4 |      |      |       | 14.4 |      |      | 33.6 |      |      |      |
| Actuated g/C Ratio     |      | 0.26 |      |      |       | 0.26 |      |      | 0.60 |      |      |      |
| Clearance Time (s)     |      | 4.0  |      |      |       | 4.0  |      |      | 4.6  |      |      |      |
| Vehicle Extension (s)  |      | 0.2  |      |      |       | 0.2  |      |      | 0.2  |      |      |      |
| Lane Grp Cap (vph)     |      | 283  |      |      |       | 325  |      |      | 2310 |      |      |      |
| v/s Ratio Prot         |      |      |      |      | c0.08 |      |      |      |      |      |      |      |
| v/s Ratio Perm         |      | 0.05 |      |      |       |      |      | 0.22 |      |      |      |      |
| v/c Ratio              |      | 0.18 |      |      |       | 0.32 |      |      | 0.37 |      |      |      |
| Uniform Delay, d1      |      | 16.2 |      |      |       | 16.9 |      |      | 5.8  |      |      |      |
| Progression Factor     |      | 1.00 |      |      |       | 1.00 |      |      | 1.51 |      |      |      |
| Incremental Delay, d2  |      | 0.1  |      |      |       | 0.2  |      |      | 0.4  |      |      |      |
| Delay (s)              |      | 16.3 |      |      |       | 17.1 |      |      | 9.1  |      |      |      |
| Level of Service       |      | B    |      |      |       | B    |      |      | A    |      |      |      |
| Approach Delay (s)     |      | 16.3 |      |      |       | 17.1 |      |      | 9.1  |      | 0.0  |      |
| Approach LOS           |      | B    |      |      |       | B    |      |      | A    |      | A    |      |

## Intersection Summary

|                                   |       |                           |     |
|-----------------------------------|-------|---------------------------|-----|
| HCM 2000 Control Delay            | 10.3  | HCM 2000 Level of Service | B   |
| HCM 2000 Volume to Capacity ratio | 0.36  |                           |     |
| Actuated Cycle Length (s)         | 56.0  | Sum of lost time (s)      | 8.0 |
| Intersection Capacity Utilization | 43.7% | ICU Level of Service      | A   |
| Analysis Period (min)             | 15    |                           |     |

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

25: 4th Ave & College St

06/02/2020



| Movement                          | EBL   | EBR  | NBL                       | NBT  | SBT  | SBR  |
|-----------------------------------|-------|------|---------------------------|------|------|------|
| Lane Configurations               |       |      |                           |      |      |      |
| Traffic Volume (vph)              | 25    | 0    | 195                       | 1200 | 0    | 0    |
| Future Volume (vph)               | 25    | 0    | 195                       | 1200 | 0    | 0    |
| Ideal Flow (vphpl)                | 1750  | 1750 | 1750                      | 1750 | 1750 | 1750 |
| Total Lost time (s)               | 4.0   |      | 4.0                       | 4.0  |      |      |
| Lane Util. Factor                 | 1.00  |      | 1.00                      | 0.95 |      |      |
| Frpb, ped/bikes                   | 1.00  |      | 1.00                      | 1.00 |      |      |
| Flpb, ped/bikes                   | 1.00  |      | 0.83                      | 1.00 |      |      |
| Fr <sub>t</sub>                   | 1.00  |      | 1.00                      | 1.00 |      |      |
| Flt Protected                     | 0.95  |      | 0.95                      | 1.00 |      |      |
| Satd. Flow (prot)                 | 1235  |      | 1064                      | 2724 |      |      |
| Flt Permitted                     | 0.95  |      | 0.95                      | 1.00 |      |      |
| Satd. Flow (perm)                 | 1235  |      | 1064                      | 2724 |      |      |
| Peak-hour factor, PHF             | 1.00  | 1.00 | 1.00                      | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph)                   | 25    | 0    | 195                       | 1200 | 0    | 0    |
| RTOR Reduction (vph)              | 0     | 0    | 0                         | 0    | 0    | 0    |
| Lane Group Flow (vph)             | 25    | 0    | 195                       | 1200 | 0    | 0    |
| Confl. Peds. (#/hr)               | 82    | 77   | 122                       |      | 122  |      |
| Heavy Vehicles (%)                | 6%    | 0%   | 2%                        | 3%   | 0%   | 0%   |
| Parking (#/hr)                    | 5     |      | 5                         | 5    |      |      |
| Turn Type                         | Prot  |      | Perm                      | NA   |      |      |
| Protected Phases                  | 4     |      | 2                         |      |      |      |
| Permitted Phases                  |       |      | 2                         |      |      |      |
| Actuated Green, G (s)             | 19.0  |      | 28.4                      | 28.4 |      |      |
| Effective Green, g (s)            | 19.0  |      | 29.0                      | 29.0 |      |      |
| Actuated g/C Ratio                | 0.34  |      | 0.52                      | 0.52 |      |      |
| Clearance Time (s)                | 4.0   |      | 4.6                       | 4.6  |      |      |
| Vehicle Extension (s)             | 3.0   |      | 3.0                       | 3.0  |      |      |
| Lane Grp Cap (vph)                | 419   |      | 551                       | 1410 |      |      |
| v/s Ratio Prot                    | c0.02 |      | c0.44                     |      |      |      |
| v/s Ratio Perm                    |       |      | 0.18                      |      |      |      |
| v/c Ratio                         | 0.06  |      | 0.35                      | 0.85 |      |      |
| Uniform Delay, d1                 | 12.5  |      | 8.0                       | 11.6 |      |      |
| Progression Factor                | 1.00  |      | 1.00                      | 1.00 |      |      |
| Incremental Delay, d2             | 0.1   |      | 1.8                       | 6.6  |      |      |
| Delay (s)                         | 12.5  |      | 9.7                       | 18.3 |      |      |
| Level of Service                  | B     |      | A                         | B    |      |      |
| Approach Delay (s)                | 12.5  |      |                           | 17.1 | 0.0  |      |
| Approach LOS                      | B     |      |                           | B    | A    |      |
| <b>Intersection Summary</b>       |       |      |                           |      |      |      |
| HCM 2000 Control Delay            | 17.0  |      | HCM 2000 Level of Service |      | B    |      |
| HCM 2000 Volume to Capacity ratio | 0.54  |      |                           |      |      |      |
| Actuated Cycle Length (s)         | 56.0  |      | Sum of lost time (s)      |      | 8.0  |      |
| Intersection Capacity Utilization | 60.8% |      | ICU Level of Service      |      | B    |      |
| Analysis Period (min)             |       |      | 15                        |      |      |      |
| c Critical Lane Group             |       |      |                           |      |      |      |

# HCM Signalized Intersection Capacity Analysis

27: 6th Ave & Jackson St

06/02/2020



| Movement                              | EBL   | EBR   | NBL  | NBT                       | NBR  | SBL  | SBT  | SBR  | NWL  | NWR  |
|---------------------------------------|-------|-------|------|---------------------------|------|------|------|------|------|------|
| Lane Configurations                   |       |       |      |                           |      |      |      |      |      |      |
| Traffic Volume (vph)                  | 35    | 0     | 285  | 415                       | 0    | 0    | 0    | 0    | 0    | 405  |
| Future Volume (vph)                   | 35    | 0     | 285  | 415                       | 0    | 0    | 0    | 0    | 0    | 405  |
| Ideal Flow (vphpl)                    | 1750  | 1750  | 1750 | 1750                      | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time (s)                   | 4.0   |       |      |                           |      |      |      |      |      | 4.0  |
| Lane Util. Factor                     | 1.00  |       |      |                           | 1.00 |      |      |      |      | 1.00 |
| Frpb, ped/bikes                       | 1.00  |       |      |                           | 1.00 |      |      |      |      | 1.00 |
| Flpb, ped/bikes                       | 1.00  |       |      |                           | 0.93 |      |      |      |      | 1.00 |
| Fr <sub>t</sub>                       | 1.00  |       |      |                           | 1.00 |      |      |      |      | 1.00 |
| Flt Protected                         | 0.95  |       |      |                           | 0.98 |      |      |      |      | 1.00 |
| Satd. Flow (prot)                     | 1458  |       |      |                           | 1523 |      |      |      |      | 1716 |
| Flt Permitted                         | 0.95  |       |      |                           | 0.98 |      |      |      |      | 1.00 |
| Satd. Flow (perm)                     | 1458  |       |      |                           | 1523 |      |      |      |      | 1716 |
| Peak-hour factor, PHF                 | 1.00  | 1.00  | 1.00 | 1.00                      | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph)                       | 35    | 0     | 285  | 415                       | 0    | 0    | 0    | 0    | 0    | 405  |
| RTOR Reduction (vph)                  | 0     | 0     | 0    | 0                         | 0    | 0    | 0    | 0    | 0    | 217  |
| Lane Group Flow (vph)                 | 35    | 0     | 0    | 700                       | 0    | 0    | 0    | 0    | 0    | 188  |
| Confl. Peds. (#/hr)                   |       |       |      | 109                       |      |      |      | 109  |      |      |
| Heavy Vehicles (%)                    | 14%   | 2%    | 2%   | 6%                        | 2%   | 2%   | 0%   | 0%   | 2%   | 2%   |
| Turn Type                             | Prot  |       | Perm | NA                        |      |      |      |      |      | Prot |
| Protected Phases                      | 4     |       |      | 2!                        |      |      |      |      |      | 2!   |
| Permitted Phases                      |       |       | 2    |                           |      |      |      |      |      |      |
| Actuated Green, G (s)                 | 22.0  |       |      | 26.0                      |      |      |      |      |      | 26.0 |
| Effective Green, g (s)                | 22.0  |       |      | 26.0                      |      |      |      |      |      | 26.0 |
| Actuated g/C Ratio                    | 0.39  |       |      | 0.46                      |      |      |      |      |      | 0.46 |
| Clearance Time (s)                    | 4.0   |       |      | 4.0                       |      |      |      |      |      | 4.0  |
| Vehicle Extension (s)                 | 3.0   |       |      | 3.0                       |      |      |      |      |      | 3.0  |
| Lane Grp Cap (vph)                    | 572   |       |      | 707                       |      |      |      |      |      | 796  |
| v/s Ratio Prot                        | c0.02 |       |      |                           |      |      |      |      |      | 0.11 |
| v/s Ratio Perm                        |       |       | 0.46 |                           |      |      |      |      |      |      |
| v/c Ratio                             | 0.06  |       | 0.99 |                           |      |      |      |      |      | 0.24 |
| Uniform Delay, d1                     | 10.6  |       | 14.9 |                           |      |      |      |      |      | 9.0  |
| Progression Factor                    | 1.00  |       | 1.00 |                           |      |      |      |      |      | 1.00 |
| Incremental Delay, d2                 | 0.0   |       | 31.5 |                           |      |      |      |      |      | 0.7  |
| Delay (s)                             | 10.6  |       | 46.4 |                           |      |      |      |      |      | 9.7  |
| Level of Service                      | B     |       | D    |                           |      |      |      |      |      | A    |
| Approach Delay (s)                    | 10.6  |       | 46.4 |                           |      | 0.0  |      |      |      | 9.7  |
| Approach LOS                          | B     |       | D    |                           |      | A    |      |      |      | A    |
| Intersection Summary                  |       |       |      |                           |      |      |      |      |      |      |
| HCM 2000 Control Delay                |       | 32.3  |      | HCM 2000 Level of Service |      |      | C    |      |      |      |
| HCM 2000 Volume to Capacity ratio     |       | 0.56  |      |                           |      |      |      |      |      |      |
| Actuated Cycle Length (s)             |       | 56.0  |      | Sum of lost time (s)      |      |      | 8.0  |      |      |      |
| Intersection Capacity Utilization     |       | 74.7% |      | ICU Level of Service      |      |      | D    |      |      |      |
| Analysis Period (min)                 |       | 15    |      |                           |      |      |      |      |      |      |
| ! Phase conflict between lane groups. |       |       |      |                           |      |      |      |      |      |      |
| c Critical Lane Group                 |       |       |      |                           |      |      |      |      |      |      |

# HCM Signalized Intersection Capacity Analysis

31: 4th Ave & I-405 WB Off Ramp & Lincoln St

06/02/2020



| Movement               | EBL   | EBT   | WBT   | WBR  | NBL  | NBT  | NWR  | NWR2 |
|------------------------|-------|-------|-------|------|------|------|------|------|
| Lane Configurations    | ↑ ↗   | ↑ ↘   | ↗ ↙   |      |      | ↖ ↗  | ↖ ↘  | ↖ ↙  |
| Traffic Volume (vph)   | 30    | 50    | 10    | 175  | 10   | 825  | 365  | 100  |
| Future Volume (vph)    | 30    | 50    | 10    | 175  | 10   | 825  | 365  | 100  |
| Ideal Flow (vphpl)     | 1750  | 1750  | 1750  | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time (s)    | 5.0   | 4.0   | 4.0   |      |      | 4.0  | 4.0  | 4.0  |
| Lane Util. Factor      | 1.00  | 1.00  | 1.00  |      |      | 0.95 | 1.00 | 1.00 |
| Frpb, ped/bikes        | 1.00  | 1.00  | 0.94  |      |      | 1.00 | 1.00 | 1.00 |
| Flpb, ped/bikes        | 1.00  | 1.00  | 1.00  |      |      | 1.00 | 1.00 | 1.00 |
| Fr <sub>t</sub>        | 1.00  | 1.00  | 0.87  |      |      | 1.00 | 1.00 | 0.85 |
| Flt Protected          | 0.95  | 1.00  | 1.00  |      |      | 1.00 | 1.00 | 1.00 |
| Satd. Flow (prot)      | 1496  | 1133  | 1288  |      |      | 2930 | 1514 | 1287 |
| Flt Permitted          | 0.95  | 1.00  | 1.00  |      |      | 1.00 | 1.00 | 1.00 |
| Satd. Flow (perm)      | 1496  | 1133  | 1288  |      |      | 2930 | 1514 | 1287 |
| Peak-hour factor, PHF  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph)        | 30    | 50    | 10    | 175  | 10   | 825  | 365  | 100  |
| RTOR Reduction (vph)   | 0     | 0     | 0     | 0    | 0    | 0    | 0    | 0    |
| Lane Group Flow (vph)  | 30    | 50    | 185   | 0    | 0    | 835  | 365  | 100  |
| Confl. Peds. (#/hr)    | 36    |       |       | 36   | 53   |      |      |      |
| Confl. Bikes (#/hr)    |       |       |       |      | 5    |      |      |      |
| Heavy Vehicles (%)     | 0%    | 39%   | 10%   | 0%   | 0%   | 2%   | 4%   | 4%   |
| Turn Type              | Prot  | NA    | NA    |      | Perm | NA   | Prot | Prot |
| Protected Phases       | 7     | 4     | 8     |      |      | 2!   | 2!   | 5    |
| Permitted Phases       |       |       |       |      | 2    |      |      |      |
| Actuated Green, G (s)  | 2.1   | 26.9  | 20.8  |      |      | 41.5 | 41.5 | 12.0 |
| Effective Green, g (s) | 1.1   | 26.9  | 20.8  |      |      | 41.5 | 41.5 | 12.0 |
| Actuated g/C Ratio     | 0.01  | 0.35  | 0.27  |      |      | 0.54 | 0.54 | 0.16 |
| Clearance Time (s)     | 4.0   | 4.0   | 4.0   |      |      | 4.0  | 4.0  | 4.0  |
| Vehicle Extension (s)  | 3.0   | 2.0   | 2.0   |      |      | 0.2  | 0.2  | 3.0  |
| Lane Grp Cap (vph)     | 21    | 398   | 350   |      |      | 1591 | 822  | 202  |
| v/s Ratio Prot         | c0.02 | 0.04  | c0.14 |      |      |      | 0.24 | 0.08 |
| v/s Ratio Perm         |       |       |       |      |      | 0.28 |      |      |
| v/c Ratio              | 1.43  | 0.13  | 0.53  |      |      | 0.52 | 0.44 | 0.50 |
| Uniform Delay, d1      | 37.7  | 16.8  | 23.6  |      |      | 11.1 | 10.5 | 29.4 |
| Progression Factor     | 1.00  | 1.00  | 1.00  |      |      | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2  | 350.2 | 0.1   | 0.7   |      |      | 0.1  | 0.1  | 1.9  |
| Delay (s)              | 387.9 | 16.8  | 24.3  |      |      | 11.3 | 10.6 | 31.3 |
| Level of Service       | F     | B     | C     |      |      | B    | B    | C    |
| Approach Delay (s)     |       | 156.0 | 24.3  |      |      | 11.3 |      |      |
| Approach LOS           |       | F     | C     |      |      | B    |      |      |

## Intersection Summary

|                                   |       |                           |      |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay            | 21.4  | HCM 2000 Level of Service | C    |
| HCM 2000 Volume to Capacity ratio | 0.61  |                           |      |
| Actuated Cycle Length (s)         | 76.4  | Sum of lost time (s)      | 20.0 |
| Intersection Capacity Utilization | 89.3% | ICU Level of Service      | E    |
| Analysis Period (min)             | 15    |                           |      |

! Phase conflict between lane groups.

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
34: SW 1st Avenue/SW 1st Ave & SW Lincoln Street/SW Lincoln St

06/02/2020

| Movement                          | EBL   | EBT   | EBR  | WBL  | WBT                       | WBR  | NBL   | NBT  | NBR  | SBL  | SBT   | SBR  |
|-----------------------------------|-------|-------|------|------|---------------------------|------|-------|------|------|------|-------|------|
| Lane Configurations               | ↑     | ↑     |      |      | ↑                         |      | ↑     | ↑↑   |      |      | ↑↑    |      |
| Traffic Volume (vph)              | 25    | 5     | 90   | 0    | 5                         | 0    | 95    | 235  | 0    | 0    | 105   | 80   |
| Future Volume (vph)               | 25    | 5     | 90   | 0    | 5                         | 0    | 95    | 235  | 0    | 0    | 105   | 80   |
| Ideal Flow (vphpl)                | 1750  | 1750  | 1750 | 1750 | 1750                      | 1750 | 1750  | 1750 | 1750 | 1750 | 1750  | 1750 |
| Total Lost time (s)               | 4.0   | 4.0   |      |      | 4.0                       |      | 4.0   | 4.0  |      |      | 4.0   |      |
| Lane Util. Factor                 | 1.00  | 1.00  |      |      | 1.00                      |      | 1.00  | 0.95 |      |      | 0.95  |      |
| Frpb, ped/bikes                   | 1.00  | 0.96  |      |      | 1.00                      |      | 1.00  | 1.00 |      |      | 0.98  |      |
| Flpb, ped/bikes                   | 1.00  | 1.00  |      |      | 1.00                      |      | 1.00  | 1.00 |      |      | 1.00  |      |
| Fr <sub>t</sub>                   | 1.00  | 0.86  |      |      | 1.00                      |      | 1.00  | 1.00 |      |      | 0.94  |      |
| Flt Protected                     | 0.95  | 1.00  |      |      | 1.00                      |      | 0.95  | 1.00 |      |      | 1.00  |      |
| Satd. Flow (prot)                 | 1425  | 1174  |      |      | 788                       |      | 1453  | 2823 |      |      | 2693  |      |
| Flt Permitted                     | 0.95  | 1.00  |      |      | 1.00                      |      | 0.95  | 1.00 |      |      | 1.00  |      |
| Satd. Flow (perm)                 | 1425  | 1174  |      |      | 788                       |      | 1453  | 2823 |      |      | 2693  |      |
| Peak-hour factor, PHF             | 1.00  | 1.00  | 1.00 | 1.00 | 1.00                      | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 |
| Adj. Flow (vph)                   | 25    | 5     | 90   | 0    | 5                         | 0    | 95    | 235  | 0    | 0    | 105   | 80   |
| RTOR Reduction (vph)              | 0     | 0     | 0    | 0    | 0                         | 0    | 0     | 0    | 0    | 0    | 0     | 0    |
| Lane Group Flow (vph)             | 25    | 95    | 0    | 0    | 5                         | 0    | 95    | 235  | 0    | 0    | 185   | 0    |
| Confl. Peds. (#/hr)               | 18    |       | 15   | 15   |                           | 18   | 10    |      | 40   | 40   |       | 10   |
| Confl. Bikes (#/hr)               |       |       | 17   |      |                           |      |       |      | 10   |      |       | 6    |
| Heavy Vehicles (%)                | 5%    | 100%  | 5%   | 0%   | 100%                      | 0%   | 3%    | 6%   | 0%   | 0%   | 3%    | 1%   |
| Turn Type                         | Prot  | NA    |      |      | NA                        |      | Prot  | NA   |      |      | NA    |      |
| Protected Phases                  | 7     | 4     |      |      | 8                         |      | 1     | 6    |      |      | 2     |      |
| Permitted Phases                  |       |       |      |      |                           |      |       |      |      |      |       |      |
| Actuated Green, G (s)             | 1.2   | 12.7  |      |      | 7.5                       |      | 8.5   | 54.0 |      |      | 41.5  |      |
| Effective Green, g (s)            | 1.2   | 12.7  |      |      | 7.5                       |      | 8.5   | 54.0 |      |      | 41.5  |      |
| Actuated g/C Ratio                | 0.02  | 0.17  |      |      | 0.10                      |      | 0.11  | 0.72 |      |      | 0.56  |      |
| Clearance Time (s)                | 4.0   | 4.0   |      |      | 4.0                       |      | 4.0   | 4.0  |      |      | 4.0   |      |
| Vehicle Extension (s)             | 0.5   | 2.0   |      |      | 2.0                       |      | 3.0   | 2.0  |      |      | 2.0   |      |
| Lane Grp Cap (vph)                | 22    | 199   |      |      | 79                        |      | 165   | 2040 |      |      | 1496  |      |
| v/s Ratio Prot                    | c0.02 | c0.08 |      |      | 0.01                      |      | c0.07 | 0.08 |      |      | c0.07 |      |
| v/s Ratio Perm                    |       |       |      |      |                           |      |       |      |      |      |       |      |
| v/c Ratio                         | 1.14  | 0.48  |      |      | 0.06                      |      | 0.58  | 0.12 |      |      | 0.12  |      |
| Uniform Delay, d1                 | 36.8  | 28.0  |      |      | 30.4                      |      | 31.4  | 3.1  |      |      | 7.9   |      |
| Progression Factor                | 1.00  | 1.00  |      |      | 1.00                      |      | 1.00  | 1.00 |      |      | 1.00  |      |
| Incremental Delay, d2             | 237.5 | 0.7   |      |      | 0.1                       |      | 4.8   | 0.1  |      |      | 0.2   |      |
| Delay (s)                         | 274.3 | 28.7  |      |      | 30.5                      |      | 36.2  | 3.2  |      |      | 8.1   |      |
| Level of Service                  | F     | C     |      |      | C                         |      | D     | A    |      |      | A     |      |
| Approach Delay (s)                |       | 79.8  |      |      | 30.5                      |      |       | 12.7 |      |      | 8.1   |      |
| Approach LOS                      |       | E     |      |      | C                         |      |       | B    |      |      | A     |      |
| <b>Intersection Summary</b>       |       |       |      |      |                           |      |       |      |      |      |       |      |
| HCM 2000 Control Delay            |       | 24.1  |      |      | HCM 2000 Level of Service |      |       | C    |      |      |       |      |
| HCM 2000 Volume to Capacity ratio |       | 0.27  |      |      |                           |      |       |      |      |      |       |      |
| Actuated Cycle Length (s)         |       | 74.7  |      |      | Sum of lost time (s)      |      |       | 16.0 |      |      |       |      |
| Intersection Capacity Utilization |       | 49.7% |      |      | ICU Level of Service      |      |       | A    |      |      |       |      |
| Analysis Period (min)             |       | 15    |      |      |                           |      |       |      |      |      |       |      |
| c Critical Lane Group             |       |       |      |      |                           |      |       |      |      |      |       |      |

# HCM Signalized Intersection Capacity Analysis

35: SW Naito Parkway & SW Lincoln St

06/02/2020



| Movement                          | EBL   | EBT  | EBR  | WBL  | WBT                       | WBR  | NBL  | NBT   | NBR  | SBL  | SBT  | SBR  |
|-----------------------------------|-------|------|------|------|---------------------------|------|------|-------|------|------|------|------|
| Lane Configurations               |       |      |      |      |                           |      |      |       |      |      |      |      |
| Traffic Volume (vph)              | 0     | 5    | 0    | 0    | 5                         | 0    | 0    | 1385  | 0    | 0    | 505  | 0    |
| Future Volume (vph)               | 0     | 5    | 0    | 0    | 5                         | 0    | 0    | 1385  | 0    | 0    | 505  | 0    |
| Ideal Flow (vphpl)                | 1750  | 1750 | 1750 | 1750 | 1750                      | 1750 | 1750 | 1750  | 1750 | 1750 | 1750 | 1750 |
| Total Lost time (s)               |       | 2.0  |      |      |                           | 4.0  |      |       | 4.0  |      |      | 4.0  |
| Lane Util. Factor                 | 1.00  |      |      |      | 1.00                      |      |      | 0.95  |      |      | 0.95 |      |
| Frpb, ped/bikes                   | 1.00  |      |      |      | 1.00                      |      |      | 1.00  |      |      | 1.00 |      |
| Flpb, ped/bikes                   | 1.00  |      |      |      | 1.00                      |      |      | 1.00  |      |      | 1.00 |      |
| Fr <sub>t</sub>                   | 1.00  |      |      |      | 1.00                      |      |      | 1.00  |      |      | 1.00 |      |
| Flt Protected                     | 1.00  |      |      |      | 1.00                      |      |      | 1.00  |      |      | 1.00 |      |
| Satd. Flow (prot)                 | 788   |      |      |      | 788                       |      |      | 2934  |      |      | 2877 |      |
| Flt Permitted                     | 1.00  |      |      |      | 1.00                      |      |      | 1.00  |      |      | 1.00 |      |
| Satd. Flow (perm)                 | 788   |      |      |      | 788                       |      |      | 2934  |      |      | 2877 |      |
| Peak-hour factor, PHF             | 1.00  | 1.00 | 1.00 | 1.00 | 1.00                      | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph)                   | 0     | 5    | 0    | 0    | 5                         | 0    | 0    | 1385  | 0    | 0    | 505  | 0    |
| RTOR Reduction (vph)              | 0     | 0    | 0    | 0    | 0                         | 0    | 0    | 0     | 0    | 0    | 0    | 0    |
| Lane Group Flow (vph)             | 0     | 5    | 0    | 0    | 5                         | 0    | 0    | 1385  | 0    | 0    | 505  | 0    |
| Confl. Peds. (#/hr)               | 9     |      | 23   | 23   |                           | 9    | 16   |       | 6    | 6    |      | 16   |
| Confl. Bikes (#/hr)               |       |      | 15   |      |                           |      |      |       |      |      |      |      |
| Heavy Vehicles (%)                | 0%    | 100% | 0%   | 0%   | 100%                      | 0%   | 0%   | 2%    | 0%   | 0%   | 4%   | 0%   |
| Turn Type                         |       | NA   |      |      | NA                        |      |      | NA    |      |      | NA   |      |
| Protected Phases                  | 7     | 8    |      |      | 4                         |      |      | 6     |      |      | 2    |      |
| Permitted Phases                  |       |      |      |      |                           |      |      |       |      |      |      |      |
| Actuated Green, G (s)             | 7.8   |      |      |      | 8.8                       |      |      | 63.2  |      |      | 63.2 |      |
| Effective Green, g (s)            | 8.8   |      |      |      | 8.8                       |      |      | 63.2  |      |      | 63.2 |      |
| Actuated g/C Ratio                | 0.11  |      |      |      | 0.11                      |      |      | 0.79  |      |      | 0.79 |      |
| Clearance Time (s)                |       |      |      |      | 4.0                       |      |      | 4.0   |      |      | 4.0  |      |
| Vehicle Extension (s)             |       |      |      |      | 0.5                       |      |      | 0.5   |      |      | 0.5  |      |
| Lane Grp Cap (vph)                | 86    |      |      |      | 86                        |      |      | 2317  |      |      | 2272 |      |
| v/s Ratio Prot                    | c0.01 |      |      |      | 0.01                      |      |      | c0.47 |      |      | 0.18 |      |
| v/s Ratio Perm                    |       |      |      |      |                           |      |      |       |      |      |      |      |
| v/c Ratio                         | 0.06  |      |      |      | 0.06                      |      |      | 0.60  |      |      | 0.22 |      |
| Uniform Delay, d1                 | 31.9  |      |      |      | 31.9                      |      |      | 3.3   |      |      | 2.1  |      |
| Progression Factor                | 1.00  |      |      |      | 1.00                      |      |      | 1.00  |      |      | 0.22 |      |
| Incremental Delay, d2             | 0.1   |      |      |      | 0.1                       |      |      | 1.1   |      |      | 0.2  |      |
| Delay (s)                         | 32.0  |      |      |      | 32.0                      |      |      | 4.5   |      |      | 0.7  |      |
| Level of Service                  | C     |      |      |      | C                         |      |      | A     |      |      | A    |      |
| Approach Delay (s)                | 32.0  |      |      |      | 32.0                      |      |      | 4.5   |      |      | 0.7  |      |
| Approach LOS                      | C     |      |      |      | C                         |      |      | A     |      |      | A    |      |
| <b>Intersection Summary</b>       |       |      |      |      |                           |      |      |       |      |      |      |      |
| HCM 2000 Control Delay            | 3.6   |      |      |      | HCM 2000 Level of Service |      |      | A     |      |      |      |      |
| HCM 2000 Volume to Capacity ratio | 0.55  |      |      |      |                           |      |      |       |      |      |      |      |
| Actuated Cycle Length (s)         | 80.0  |      |      |      | Sum of lost time (s)      |      |      | 10.0  |      |      |      |      |
| Intersection Capacity Utilization | 63.3% |      |      |      | ICU Level of Service      |      |      | B     |      |      |      |      |
| Analysis Period (min)             | 15    |      |      |      |                           |      |      |       |      |      |      |      |
| c Critical Lane Group             |       |      |      |      |                           |      |      |       |      |      |      |      |

HCM Signalized Intersection Capacity Analysis  
 37: Broadway Dr/Broadway Ave & SW Lincoln St & I-405 SB Exit Ramp

06/02/2020



| Movement               | NBR  | SBL  | SBT  | SBR   | SET   | SER  | SER2 |
|------------------------|------|------|------|-------|-------|------|------|
| Lane Configurations    |      |      |      |       |       |      |      |
| Traffic Volume (vph)   | 205  | 305  | 115  | 5     | 1485  | 75   | 15   |
| Future Volume (vph)    | 205  | 305  | 115  | 5     | 1485  | 75   | 15   |
| Ideal Flow (vphpl)     | 1900 | 1900 | 1900 | 1900  | 1900  | 1900 | 1900 |
| Total Lost time (s)    | 4.0  | 4.0  | 4.0  |       | 4.0   |      |      |
| Lane Util. Factor      | 1.00 | 0.91 | 0.91 |       | *0.75 |      |      |
| Frpb, ped/bikes        | 0.99 | 1.00 | 1.00 |       | 1.00  |      |      |
| Flpb, ped/bikes        | 1.00 | 1.00 | 1.00 |       | 1.00  |      |      |
| Fr <sub>t</sub>        | 0.86 | 1.00 | 1.00 |       | 0.99  |      |      |
| Flt Protected          | 1.00 | 0.95 | 0.98 |       | 1.00  |      |      |
| Satd. Flow (prot)      | 1418 | 2816 | 1378 |       | 3639  |      |      |
| Flt Permitted          | 1.00 | 0.95 | 0.98 |       | 1.00  |      |      |
| Satd. Flow (perm)      | 1418 | 2816 | 1378 |       | 3639  |      |      |
| Peak-hour factor, PHF  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  | 1.00 | 1.00 |
| Adj. Flow (vph)        | 205  | 305  | 115  | 5     | 1485  | 75   | 15   |
| RTOR Reduction (vph)   | 0    | 0    | 0    | 0     | 1     | 0    | 0    |
| Lane Group Flow (vph)  | 205  | 235  | 190  | 0     | 1574  | 0    | 0    |
| Confl. Peds. (#/hr)    |      |      |      | 4     |       |      |      |
| Confl. Bikes (#/hr)    | 2    |      |      | 17    |       |      |      |
| Heavy Vehicles (%)     | 3%   | 5%   | 11%  | 0%    | 5%    | 2%   | 1%   |
| Bus Blockages (#/hr)   | 0    | 0    | 4    | 0     | 0     | 0    | 0    |
| Turn Type              | Perm | Perm | NA   |       | NA    |      |      |
| Protected Phases       |      |      | 2    |       | 4     |      |      |
| Permitted Phases       | 2    | 4    | 2    |       |       |      |      |
| Actuated Green, G (s)  | 90.0 | 31.0 | 31.0 |       | 47.4  |      |      |
| Effective Green, g (s) | 85.6 | 32.6 | 32.6 |       | 49.4  |      |      |
| Actuated g/C Ratio     | 0.95 | 0.36 | 0.36 |       | 0.55  |      |      |
| Clearance Time (s)     |      | 5.6  | 5.6  |       | 6.0   |      |      |
| Vehicle Extension (s)  |      | 0.2  | 0.2  |       | 2.0   |      |      |
| Lane Grp Cap (vph)     | 1348 | 1020 | 499  |       | 1997  |      |      |
| v/s Ratio Prot         |      |      |      | c0.43 |       |      |      |
| v/s Ratio Perm         | 0.14 | 0.08 | 0.14 |       |       |      |      |
| v/c Ratio              | 0.15 | 0.23 | 0.38 |       | 0.79  |      |      |
| Uniform Delay, d1      | 0.1  | 20.0 | 21.2 |       | 16.1  |      |      |
| Progression Factor     | 1.00 | 1.00 | 1.00 |       | 1.00  |      |      |
| Incremental Delay, d2  | 0.0  | 0.5  | 2.2  |       | 2.0   |      |      |
| Delay (s)              | 0.1  | 20.5 | 23.4 |       | 18.1  |      |      |
| Level of Service       | A    | C    | C    |       | B     |      |      |
| Approach Delay (s)     |      |      | 21.8 |       | 18.1  |      |      |
| Approach LOS           |      |      | C    |       | B     |      |      |

Intersection Summary

|                                   |       |                           |     |
|-----------------------------------|-------|---------------------------|-----|
| HCM 2000 Control Delay            | 17.2  | HCM 2000 Level of Service | B   |
| HCM 2000 Volume to Capacity ratio | 0.63  |                           |     |
| Actuated Cycle Length (s)         | 90.0  | Sum of lost time (s)      | 8.0 |
| Intersection Capacity Utilization | 71.5% | ICU Level of Service      | C   |
| Analysis Period (min)             | 15    |                           |     |

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

38: 6th Ave & Broadway

06/02/2020



| Movement               | EBL   | EBT  | EBR    | WBL  | WBT  | WBR   | NBL  | NBT   | NBR  | SBL  | SBT  | SBR  |
|------------------------|-------|------|--------|------|------|-------|------|-------|------|------|------|------|
| Lane Configurations    | ↑     | ↑↑   | ↑      |      |      | ↑↑↑   |      | ↑↑↓   |      |      |      |      |
| Traffic Volume (vph)   | 305   | 1270 | 600    | 0    | 0    | 1780  | 0    | 355   | 0    | 0    | 0    | 0    |
| Future Volume (vph)    | 305   | 1270 | 600    | 0    | 0    | 1780  | 0    | 355   | 0    | 0    | 0    | 0    |
| 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      | 1.00  | 0.95 | 1.00   |      |      | *0.70 |      | 0.91  |      |      |      |      |
| Frpb, ped/bikes        | 1.00  | 1.00 | 0.97   |      |      | 1.00  |      | 1.00  |      |      |      |      |
| Flpb, ped/bikes        | 1.00  | 1.00 | 1.00   |      |      | 1.00  |      | 1.00  |      |      |      |      |
| Fr <sub>t</sub>        | 1.00  | 1.00 | 0.95   |      |      | 0.95  |      | 1.00  |      |      |      |      |
| Flt Protected          | 0.95  | 1.00 | 1.00   |      |      | 1.00  |      | 1.00  |      |      |      |      |
| Satd. Flow (prot)      | 1577  | 3124 | 1534   |      |      | 3280  |      | 4293  |      |      |      |      |
| Flt Permitted          | 0.95  | 1.00 | 1.00   |      |      | 1.00  |      | 1.00  |      |      |      |      |
| Satd. Flow (perm)      | 1577  | 3124 | 1534   |      |      | 3280  |      | 4293  |      |      |      |      |
| Peak-hour factor, PHF  | 1.00  | 1.00 | 1.00   | 1.00 | 1.00 | 1.00  | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph)        | 305   | 1270 | 600    | 0    | 0    | 1780  | 0    | 355   | 0    | 0    | 0    | 0    |
| RTOR Reduction (vph)   | 132   | 0    | 0      | 0    | 0    | 0     | 0    | 0     | 0    | 0    | 0    | 0    |
| Lane Group Flow (vph)  | 173   | 1270 | 600    | 0    | 0    | 1780  | 0    | 355   | 0    | 0    | 0    | 0    |
| Confl. Peds. (#/hr)    | 5     |      | 10     | 10   |      | 5     | 35   |       | 9    | 9    |      | 35   |
| Confl. Bikes (#/hr)    |       |      | 15     |      |      | 1     |      | 30    |      |      |      |      |
| Heavy Vehicles (%)     | 3%    | 4%   | 3%     | 0%   | 0%   | 4%    | 0%   | 7%    | 0%   | 0%   | 0%   | 0%   |
| Bus Blockages (#/hr)   | 0     | 0    | 0      | 0    | 0    | 0     | 0    | 12    | 12   | 0    | 0    | 0    |
| Turn Type              | Prot  | NA   | custom |      |      | Prot  |      | NA    |      |      |      |      |
| Protected Phases       | 1     | 5    | 6      | 8    |      | 2     |      | 4     |      |      |      |      |
| Permitted Phases       |       |      |        | 6    |      |       |      |       |      |      |      |      |
| Actuated Green, G (s)  | 11.6  | 61.0 | 55.2   |      |      | 46.2  |      | 19.8  |      |      |      |      |
| Effective Green, g (s) | 10.6  | 60.0 | 53.2   |      |      | 45.4  |      | 22.0  |      |      |      |      |
| Actuated g/C Ratio     | 0.12  | 0.67 | 0.59   |      |      | 0.50  |      | 0.24  |      |      |      |      |
| Clearance Time (s)     | 3.0   |      | 3.0    |      |      | 3.2   |      | 6.2   |      |      |      |      |
| Vehicle Extension (s)  | 0.5   |      | 0.2    |      |      | 0.2   |      | 2.0   |      |      |      |      |
| Lane Grp Cap (vph)     | 185   | 2082 | 974    |      |      | 1654  |      | 1049  |      |      |      |      |
| v/s Ratio Prot         | c0.11 | 0.41 | c0.10  |      |      | c0.54 |      | c0.08 |      |      |      |      |
| v/s Ratio Perm         |       |      | 0.29   |      |      |       |      |       |      |      |      |      |
| v/c Ratio              | 0.93  | 0.61 | 0.62   |      |      | 1.08  |      | 0.34  |      |      |      |      |
| Uniform Delay, d1      | 39.3  | 8.4  | 11.8   |      |      | 22.3  |      | 28.0  |      |      |      |      |
| Progression Factor     | 1.62  | 0.52 | 0.73   |      |      | 0.41  |      | 1.00  |      |      |      |      |
| Incremental Delay, d2  | 42.3  | 1.1  | 0.7    |      |      | 39.1  |      | 0.1   |      |      |      |      |
| Delay (s)              | 106.2 | 5.5  | 9.4    |      |      | 48.3  |      | 28.1  |      |      |      |      |
| Level of Service       | F     | A    | A      |      |      | D     |      | C     |      |      |      |      |
| Approach Delay (s)     |       | 20.7 |        |      |      | 48.3  |      | 28.1  |      | 0.0  |      |      |
| Approach LOS           |       | C    |        |      |      | D     |      | C     |      | A    |      |      |

## Intersection Summary

|                                   |       |                           |      |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay            | 32.7  | HCM 2000 Level of Service | C    |
| HCM 2000 Volume to Capacity ratio | 0.94  |                           |      |
| Actuated Cycle Length (s)         | 90.0  | Sum of lost time (s)      | 15.0 |
| Intersection Capacity Utilization | 87.6% | ICU Level of Service      | E    |
| Analysis Period (min)             | 15    |                           |      |

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

39: 5th Ave & Broadway

06/02/2020



| Movement                          | EBL  | EBT   | EBR  | WBL                       | WBT   | WBR  | NBL   | NBT  | NBR  | SBL  | SBT  | SBR   |
|-----------------------------------|------|-------|------|---------------------------|-------|------|-------|------|------|------|------|-------|
| Lane Configurations               |      |       |      |                           |       |      |       |      |      |      |      |       |
| Traffic Volume (vph)              | 0    | 0     | 1270 | 0                         | 1780  | 0    | 0     | 0    | 0    | 0    | 90   | 0     |
| Future Volume (vph)               | 0    | 0     | 1270 | 0                         | 1780  | 0    | 0     | 0    | 0    | 0    | 90   | 0     |
| Ideal Flow (vphpl)                | 1900 | 1900  | 1900 | 1900                      | 1750  | 1900 | 1900  | 1900 | 1900 | 1900 | 1900 | 1900  |
| Total Lost time (s)               |      |       |      |                           | 4.0   |      | 4.0   |      |      |      |      | 4.0   |
| Lane Util. Factor                 |      |       |      |                           | *0.95 |      | *0.80 |      |      |      |      | 1.00  |
| Frpb, ped/bikes                   |      |       |      |                           |       | 1.00 |       |      |      |      |      | 1.00  |
| Flpb, ped/bikes                   |      |       |      |                           |       | 1.00 |       |      |      |      |      | 1.00  |
| Fr <sub>t</sub>                   |      |       |      |                           |       | 1.00 |       |      |      |      |      | 1.00  |
| Flt Protected                     |      |       |      |                           |       | 1.00 |       |      |      |      |      | 1.00  |
| Satd. Flow (prot)                 |      |       |      |                           | 3215  |      | 3635  |      |      |      |      | 1179  |
| Flt Permitted                     |      |       |      |                           |       | 1.00 |       |      |      |      |      | 1.00  |
| Satd. Flow (perm)                 |      |       |      |                           | 3124  |      | 3635  |      |      |      |      | 1179  |
| Peak-hour factor, PHF             | 1.00 | 1.00  | 1.00 | 1.00                      | 1.00  | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |
| Adj. Flow (vph)                   | 0    | 0     | 1270 | 0                         | 1780  | 0    | 0     | 0    | 0    | 0    | 90   | 0     |
| RTOR Reduction (vph)              | 0    | 0     | 0    | 0                         | 0     | 0    | 0     | 0    | 0    | 0    | 0    | 0     |
| Lane Group Flow (vph)             | 0    | 0     | 1270 | 0                         | 1780  | 0    | 0     | 0    | 0    | 0    | 90   | 0     |
| Confl. Peds. (#/hr)               |      |       |      | 27                        | 27    |      |       |      | 36   | 36   |      |       |
| Confl. Bikes (#/hr)               |      |       |      | 3                         |       | 1    |       |      |      |      |      | 2     |
| Heavy Vehicles (%)                | 0%   | 0%    | 4%   | 0%                        | 4%    | 0%   | 0%    | 0%   | 0%   | 0%   | 45%  | 0%    |
| Turn Type                         |      |       |      | Prot                      |       | NA   |       |      |      |      |      | NA    |
| Protected Phases                  |      |       |      | 6                         |       | 2    |       |      |      |      |      | 4     |
| Permitted Phases                  |      |       |      |                           |       |      |       |      |      |      |      |       |
| Actuated Green, G (s)             |      |       | 40.0 |                           | 46.2  |      |       |      |      |      |      | 19.8  |
| Effective Green, g (s)            |      |       | 39.0 |                           | 45.4  |      |       |      |      |      |      | 22.0  |
| Actuated g/C Ratio                |      |       | 0.43 |                           | 0.50  |      |       |      |      |      |      | 0.24  |
| Clearance Time (s)                |      |       | 3.0  |                           | 3.2   |      |       |      |      |      |      | 6.2   |
| Vehicle Extension (s)             |      |       | 0.2  |                           | 0.2   |      |       |      |      |      |      | 2.0   |
| Lane Grp Cap (vph)                |      | 1393  |      | 1833                      |       |      |       |      |      |      |      | 288   |
| v/s Ratio Prot                    |      | c0.40 |      | c0.49                     |       |      |       |      |      |      |      | c0.08 |
| v/s Ratio Perm                    |      |       |      |                           |       |      |       |      |      |      |      |       |
| v/c Ratio                         |      | 0.91  |      | 0.97                      |       |      |       |      |      |      |      | 0.31  |
| Uniform Delay, d1                 |      | 23.9  |      | 21.7                      |       |      |       |      |      |      |      | 27.8  |
| Progression Factor                |      | 0.70  |      | 0.85                      |       |      |       |      |      |      |      | 1.00  |
| Incremental Delay, d2             |      | 8.8   |      | 8.9                       |       |      |       |      |      |      |      | 0.2   |
| Delay (s)                         |      | 25.6  |      | 27.2                      |       |      |       |      |      |      |      | 28.0  |
| Level of Service                  |      | C     |      | C                         |       |      |       |      |      |      |      | C     |
| Approach Delay (s)                | 25.6 |       |      | 27.2                      |       |      | 0.0   |      |      |      |      | 28.0  |
| Approach LOS                      | C    |       |      | C                         |       |      | A     |      |      |      |      | C     |
| <b>Intersection Summary</b>       |      |       |      |                           |       |      |       |      |      |      |      |       |
| HCM 2000 Control Delay            |      | 26.6  |      | HCM 2000 Level of Service |       |      | C     |      |      |      |      |       |
| HCM 2000 Volume to Capacity ratio |      | 0.80  |      |                           |       |      |       |      |      |      |      |       |
| Actuated Cycle Length (s)         |      | 90.0  |      | Sum of lost time (s)      |       |      | 13.0  |      |      |      |      |       |
| Intersection Capacity Utilization |      | 68.5% |      | ICU Level of Service      |       |      | C     |      |      |      |      |       |
| Analysis Period (min)             |      | 15    |      |                           |       |      |       |      |      |      |      |       |
| c Critical Lane Group             |      |       |      |                           |       |      |       |      |      |      |      |       |

# HCM Signalized Intersection Capacity Analysis

## 42: Caruthers & 4th Ave & Broadway

06/02/2020



| Movement                          | WBL  | WBT   | WBR  | NBL2                      | NBL   | NBT  |
|-----------------------------------|------|-------|------|---------------------------|-------|------|
| Lane Configurations               |      |       |      |                           |       |      |
| Traffic Volume (vph)              | 95   | 1255  | 145  | 60                        | 525   | 675  |
| Future Volume (vph)               | 95   | 1255  | 145  | 60                        | 525   | 675  |
| Ideal Flow (vphpl)                | 1900 | 1900  | 1900 | 1900                      | 1900  | 1900 |
| Total Lost time (s)               |      | 4.0   |      |                           | 4.0   | 4.0  |
| Lane Util. Factor                 |      | *0.78 |      |                           | *0.94 | 0.95 |
| Frpb, ped/bikes                   |      | 1.00  |      |                           | 1.00  | 1.00 |
| Flpb, ped/bikes                   |      | 0.99  |      |                           | 1.00  | 1.00 |
| Fr <sub>t</sub>                   |      | 0.99  |      |                           | 1.00  | 1.00 |
| Flt Protected                     |      | 1.00  |      |                           | 0.95  | 1.00 |
| Satd. Flow (prot)                 |      | 3761  |      |                           | 2971  | 3154 |
| Flt Permitted                     |      | 1.00  |      |                           | 0.95  | 1.00 |
| Satd. Flow (perm)                 |      | 3761  |      |                           | 2971  | 3154 |
| Peak-hour factor, PHF             | 1.00 | 1.00  | 1.00 | 1.00                      | 1.00  | 1.00 |
| Adj. Flow (vph)                   | 95   | 1255  | 145  | 60                        | 525   | 675  |
| RTOR Reduction (vph)              | 0    | 11    | 0    | 0                         | 0     | 0    |
| Lane Group Flow (vph)             | 0    | 1484  | 0    | 0                         | 585   | 675  |
| Confl. Peds. (#/hr)               | 69   |       |      |                           |       |      |
| Confl. Bikes (#/hr)               |      |       | 1    |                           |       |      |
| Heavy Vehicles (%)                | 3%   | 4%    | 2%   | 1%                        | 3%    | 3%   |
| Turn Type                         | Perm | NA    |      | custom                    | Prot  | NA   |
| Protected Phases                  |      |       | 2    |                           | 7 11  | 4    |
| Permitted Phases                  | 2    |       |      | 7 11                      |       |      |
| Actuated Green, G (s)             |      | 36.2  |      |                           | 26.6  | 24.6 |
| Effective Green, g (s)            |      | 36.8  |      |                           | 27.2  | 25.2 |
| Actuated g/C Ratio                |      | 0.41  |      |                           | 0.30  | 0.28 |
| Clearance Time (s)                |      | 4.6   |      |                           | 4.6   |      |
| Vehicle Extension (s)             |      | 0.2   |      |                           | 1.8   |      |
| Lane Grp Cap (vph)                |      | 1537  |      |                           | 897   | 883  |
| v/s Ratio Prot                    |      |       |      |                           | c0.21 |      |
| v/s Ratio Perm                    |      | 0.39  |      |                           | 0.20  |      |
| v/c Ratio                         |      | 0.97  |      |                           | 0.65  | 0.76 |
| Uniform Delay, d1                 |      | 26.0  |      |                           | 27.3  | 29.7 |
| Progression Factor                |      | 1.00  |      |                           | 0.87  | 1.51 |
| Incremental Delay, d2             |      | 16.1  |      |                           | 1.2   | 4.3  |
| Delay (s)                         |      | 42.0  |      |                           | 25.0  | 49.3 |
| Level of Service                  |      | D     |      |                           | C     | D    |
| Approach Delay (s)                |      | 42.0  |      |                           | 38.0  |      |
| Approach LOS                      |      | D     |      |                           | D     |      |
| <b>Intersection Summary</b>       |      |       |      |                           |       |      |
| HCM 2000 Control Delay            |      | 40.2  |      | HCM 2000 Level of Service |       | D    |
| HCM 2000 Volume to Capacity ratio |      | 0.91  |      |                           |       |      |
| Actuated Cycle Length (s)         |      | 90.0  |      | Sum of lost time (s)      |       | 16.0 |
| Intersection Capacity Utilization |      | 62.3% |      | ICU Level of Service      |       | B    |
| Analysis Period (min)             |      | 15    |      |                           |       |      |
| c Critical Lane Group             |      |       |      |                           |       |      |

# HCM Signalized Intersection Capacity Analysis

45: Barbur Blvd/4th Ave & Sheridan St

06/02/2020



| Movement                          | EBL  | EBT   | EBR    | WBL  | WBT  | WBR  | NBL  | NBT                       | NBR  | SBL  | SBT  | SBR  |
|-----------------------------------|------|-------|--------|------|------|------|------|---------------------------|------|------|------|------|
| Lane Configurations               |      | ↑↑    | ↑      |      |      |      |      | ↑↑↑                       |      |      |      |      |
| Traffic Volume (vph)              | 80   | 1120  | 450    | 0    | 0    | 0    | 0    | 1180                      | 60   | 0    | 0    | 0    |
| Future Volume (vph)               | 80   | 1120  | 450    | 0    | 0    | 0    | 0    | 1180                      | 60   | 0    | 0    | 0    |
| Ideal Flow (vphpl)                | 1900 | 1900  | 1900   | 1900 | 1900 | 1900 | 1900 | 1900                      | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s)               |      |       |        | 4.0  | 4.6  |      |      |                           | 4.0  |      |      |      |
| Lane Util. Factor                 |      | 0.95  | 1.00   |      |      |      |      |                           | 0.91 |      |      |      |
| Frpb, ped/bikes                   |      | 1.00  | 1.00   |      |      |      |      |                           | 1.00 |      |      |      |
| Flpb, ped/bikes                   |      | 1.00  | 1.00   |      |      |      |      |                           | 1.00 |      |      |      |
| Fr <sub>t</sub>                   |      | 1.00  | 0.85   |      |      |      |      |                           | 0.99 |      |      |      |
| Flt Protected                     |      | 1.00  | 1.00   |      |      |      |      |                           | 1.00 |      |      |      |
| Satd. Flow (prot)                 |      | 3080  | 1346   |      |      |      |      |                           | 4491 |      |      |      |
| Flt Permitted                     |      | 1.00  | 1.00   |      |      |      |      |                           | 1.00 |      |      |      |
| Satd. Flow (perm)                 |      | 3080  | 1346   |      |      |      |      |                           | 4491 |      |      |      |
| Peak-hour factor, PHF             | 1.00 | 1.00  | 1.00   | 1.00 | 1.00 | 1.00 | 1.00 | 1.00                      | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph)                   | 80   | 1120  | 450    | 0    | 0    | 0    | 0    | 1180                      | 60   | 0    | 0    | 0    |
| RTOR Reduction (vph)              | 0    | 24    | 74     | 0    | 0    | 0    | 0    | 7                         | 0    | 0    | 0    | 0    |
| Lane Group Flow (vph)             | 0    | 1176  | 376    | 0    | 0    | 0    | 0    | 1233                      | 0    | 0    | 0    | 0    |
| Confl. Peds. (#/hr)               |      |       | 18     | 18   |      |      | 22   |                           | 12   | 12   |      | 22   |
| Confl. Bikes (#/hr)               |      |       |        | 2    |      |      |      |                           | 29   |      |      |      |
| Heavy Vehicles (%)                | 7%   | 5%    | 8%     | 0%   | 0%   | 0%   | 0%   | 3%                        | 1%   | 0%   | 0%   | 0%   |
| Turn Type                         | Perm | NA    | custom |      |      |      |      |                           | NA   |      |      |      |
| Protected Phases                  |      | 2     | 2 8    |      |      |      |      |                           | 4    |      |      |      |
| Permitted Phases                  |      | 2     |        |      |      |      |      |                           |      |      |      |      |
| Actuated Green, G (s)             | 50.2 | 75.2  |        |      |      |      |      | 30.6                      |      |      |      |      |
| Effective Green, g (s)            | 50.8 | 75.2  |        |      |      |      |      | 31.2                      |      |      |      |      |
| Actuated g/C Ratio                | 0.56 | 0.84  |        |      |      |      |      | 0.35                      |      |      |      |      |
| Clearance Time (s)                |      | 4.6   |        |      |      |      |      | 4.6                       |      |      |      |      |
| Vehicle Extension (s)             |      | 0.2   |        |      |      |      |      | 1.0                       |      |      |      |      |
| Lane Grp Cap (vph)                | 1738 | 1124  |        |      |      |      |      | 1556                      |      |      |      |      |
| v/s Ratio Prot                    |      |       | 0.28   |      |      |      |      | c0.27                     |      |      |      |      |
| v/s Ratio Perm                    |      | 0.38  |        |      |      |      |      |                           |      |      |      |      |
| v/c Ratio                         | 0.68 | 0.33  |        |      |      |      |      | 0.79                      |      |      |      |      |
| Uniform Delay, d1                 | 13.8 | 1.7   |        |      |      |      |      | 26.5                      |      |      |      |      |
| Progression Factor                | 1.00 | 1.00  |        |      |      |      |      | 1.00                      |      |      |      |      |
| Incremental Delay, d2             | 2.1  | 0.1   |        |      |      |      |      | 2.7                       |      |      |      |      |
| Delay (s)                         | 15.9 | 1.8   |        |      |      |      |      | 29.2                      |      |      |      |      |
| Level of Service                  | B    | A     |        |      |      |      |      | C                         |      |      |      |      |
| Approach Delay (s)                | 12.1 |       |        | 0.0  |      |      |      | 29.2                      |      | 0.0  |      |      |
| Approach LOS                      | B    |       |        |      | A    |      |      | C                         |      | A    |      |      |
| <b>Intersection Summary</b>       |      |       |        |      |      |      |      |                           |      |      |      |      |
| HCM 2000 Control Delay            |      | 19.4  |        |      |      |      |      | 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)      |      | 12.2 |      |      |
| Intersection Capacity Utilization |      | 70.5% |        |      |      |      |      | ICU Level of Service      |      | C    |      |      |
| Analysis Period (min)             |      |       | 15     |      |      |      |      |                           |      |      |      |      |
| c Critical Lane Group             |      |       |        |      |      |      |      |                           |      |      |      |      |

Intersection

Int Delay, s/veh 2.1

| Movement                 | WBL  | WBR  | NBT  | NBR  | SBL  | SBT  |
|--------------------------|------|------|------|------|------|------|
| Lane Configurations      | W    |      | ↑↑   |      | ↑    | ↑↑   |
| Traffic Vol, veh/h       | 45   | 10   | 315  | 40   | 60   | 135  |
| Future Vol, veh/h        | 45   | 10   | 315  | 40   | 60   | 135  |
| Conflicting Peds, #/hr   | 3    | 0    | 0    | 44   | 44   | 0    |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | -    | 200  | -    |
| Veh in Median Storage, # | 0    | -    | 0    | -    | -    | 0    |
| Grade, %                 | 0    | -    | 0    | -    | -    | 0    |
| Peak Hour Factor         | 100  | 100  | 100  | 100  | 100  | 100  |
| Heavy Vehicles, %        | 2    | 4    | 6    | 24   | 0    | 3    |
| Mvmt Flow                | 45   | 10   | 315  | 40   | 60   | 135  |

| Major/Minor          | Minor1 | Major1 | Major2 |      |
|----------------------|--------|--------|--------|------|
| Conflicting Flow All | 570    | 222    | 0      | 0    |
| Stage 1              | 379    | -      | -      | -    |
| Stage 2              | 191    | -      | -      | -    |
| Critical Hdwy        | 6.84   | 6.98   | -      | 4.1  |
| Critical Hdwy Stg 1  | 5.84   | -      | -      | -    |
| Critical Hdwy Stg 2  | 5.84   | -      | -      | -    |
| Follow-up Hdwy       | 3.52   | 3.34   | -      | 2.2  |
| Pot Cap-1 Maneuver   | 452    | 775    | -      | 1171 |
| Stage 1              | 662    | -      | -      | -    |
| Stage 2              | 822    | -      | -      | -    |
| Platoon blocked, %   | -      | -      | -      | -    |
| Mov Cap-1 Maneuver   | 411    | 747    | -      | 1128 |
| Mov Cap-2 Maneuver   | 411    | -      | -      | -    |
| Stage 1              | 638    | -      | -      | -    |
| Stage 2              | 777    | -      | -      | -    |

| Approach             | WB   | NB | SB  |
|----------------------|------|----|-----|
| HCM Control Delay, s | 14.2 | 0  | 2.6 |
| HCM LOS              | B    |    |     |

| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 | SBL   | SBT |
|-----------------------|-----|-----|-------|-------|-----|
| Capacity (veh/h)      | -   | -   | 448   | 1128  | -   |
| HCM Lane V/C Ratio    | -   | -   | 0.123 | 0.053 | -   |
| HCM Control Delay (s) | -   | -   | 14.2  | 8.4   | -   |
| HCM Lane LOS          | -   | -   | B     | A     | -   |
| HCM 95th %tile Q(veh) | -   | -   | 0.4   | 0.2   | -   |

Intersection

Int Delay, s/veh 0

| Movement                 | EBL  | EBR  | NBL  | NBT  | SBT  | SBR  |
|--------------------------|------|------|------|------|------|------|
| Lane Configurations      |      | ↑    |      | ↑↑   | ↑↑   | ↑    |
| Traffic Vol, veh/h       | 0    | 100  | 0    | 1395 | 440  | 55   |
| Future Vol, veh/h        | 0    | 100  | 0    | 1395 | 440  | 55   |
| Conflicting Peds, #/hr   | 0    | 0    | 0    | 0    | 0    | 0    |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | Free | -    | None | -    | Free |
| Storage Length           | -    | 0    | -    | -    | -    | 150  |
| Veh in Median Storage, # | 0    | -    | -    | 0    | 0    | -    |
| Grade, %                 | 0    | -    | -    | 0    | 0    | -    |
| Peak Hour Factor         | 100  | 100  | 100  | 100  | 100  | 100  |
| Heavy Vehicles, %        | 0    | 4    | 0    | 3    | 4    | 5    |
| Mvmt Flow                | 0    | 100  | 0    | 1395 | 440  | 55   |

| Major/Minor          | Minor2 | Major1 | Major2 |
|----------------------|--------|--------|--------|
| Conflicting Flow All | -      | -      | 0      |
| Stage 1              | -      | -      | -      |
| Stage 2              | -      | -      | -      |
| Critical Hdwy        | -      | -      | -      |
| Critical Hdwy Stg 1  | -      | -      | -      |
| Critical Hdwy Stg 2  | -      | -      | -      |
| Follow-up Hdwy       | -      | -      | -      |
| Pot Cap-1 Maneuver   | 0      | 0      | 0      |
| Stage 1              | 0      | 0      | 0      |
| Stage 2              | 0      | 0      | 0      |
| Platoon blocked, %   | -      | -      | -      |
| Mov Cap-1 Maneuver   | -      | -      | -      |
| Mov Cap-2 Maneuver   | -      | -      | -      |
| Stage 1              | -      | -      | -      |
| Stage 2              | -      | -      | -      |

| Approach             | EB | NB | SB |
|----------------------|----|----|----|
| HCM Control Delay, s | 0  | 0  | 0  |
| HCM LOS              | A  |    |    |

| Minor Lane/Major Mvmt | NBT | EBLn1 | SBT |
|-----------------------|-----|-------|-----|
| Capacity (veh/h)      | -   | -     | -   |
| HCM Lane V/C Ratio    | -   | -     | -   |
| HCM Control Delay (s) | -   | 0     | -   |
| HCM Lane LOS          | -   | A     | -   |
| HCM 95th %tile Q(veh) | -   | -     | -   |

# HCM Signalized Intersection Capacity Analysis

48: 1st Ave & Arthur

06/02/2020



| Movement               | EBL  | EBT   | EBR  | WBL  | WBT   | WBR  | NBL  | NBT   | NBR  | SBL   | SBT  | SBR  |
|------------------------|------|-------|------|------|-------|------|------|-------|------|-------|------|------|
| Lane Configurations    | ↑ ↗  | ↑ ↘   |      |      | ↑ ↗   | ↑ ↘  | ↑ ↗  | ↑ ↘   |      | ↑ ↗   | ↑ ↘  | ↑ ↗  |
| Traffic Volume (vph)   | 65   | 975   | 30   | 0    | 1375  | 155  | 55   | 135   | 40   | 60    | 60   | 45   |
| Future Volume (vph)    | 65   | 975   | 30   | 0    | 1375  | 155  | 55   | 135   | 40   | 60    | 60   | 45   |
| 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   |      | 4.0   | 4.0  | 4.0  |
| Lane Util. Factor      | 1.00 | 0.95  |      |      | 0.95  |      | 1.00 | 1.00  |      | 1.00  | 1.00 | 1.00 |
| Frpb, ped/bikes        | 1.00 | 1.00  |      |      | 0.99  |      | 1.00 | 0.98  |      | 1.00  | 1.00 | 0.95 |
| Flpb, ped/bikes        | 1.00 | 1.00  |      |      | 1.00  |      | 1.00 | 1.00  |      | 1.00  | 1.00 | 1.00 |
| Fr <sub>t</sub>        | 1.00 | 1.00  |      |      | 0.98  |      | 1.00 | 0.97  |      | 1.00  | 1.00 | 0.85 |
| Flt Protected          | 0.95 | 1.00  |      |      | 1.00  |      | 0.95 | 1.00  |      | 0.95  | 1.00 | 1.00 |
| Satd. Flow (prot)      | 1533 | 3095  |      |      | 3044  |      | 1518 | 1496  |      | 1533  | 1676 | 1281 |
| Flt Permitted          | 0.95 | 1.00  |      |      | 1.00  |      | 0.95 | 1.00  |      | 0.95  | 1.00 | 1.00 |
| Satd. Flow (perm)      | 1533 | 3095  |      |      | 3044  |      | 1518 | 1496  |      | 1533  | 1676 | 1281 |
| Peak-hour factor, PHF  | 1.00 | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00  | 1.00 | 1.00 |
| Adj. Flow (vph)        | 65   | 975   | 30   | 0    | 1375  | 155  | 55   | 135   | 40   | 60    | 60   | 45   |
| RTOR Reduction (vph)   | 0    | 2     | 0    | 0    | 9     | 0    | 0    | 13    | 0    | 0     | 0    | 37   |
| Lane Group Flow (vph)  | 65   | 1003  | 0    | 0    | 1522  | 0    | 55   | 162   | 0    | 60    | 60   | 8    |
| Confl. Peds. (#/hr)    | 24   |       | 22   | 22   |       | 24   | 33   |       | 45   | 45    |      | 33   |
| Confl. Bikes (#/hr)    |      |       |      |      |       | 2    |      |       | 6    |       |      | 4    |
| Heavy Vehicles (%)     | 6%   | 4%    | 5%   | 0%   | 4%    | 7%   | 7%   | 2%    | 0%   | 6%    | 2%   | 5%   |
| Bus Blockages (#/hr)   | 0    | 1     | 1    | 0    | 1     | 1    | 0    | 16    | 16   | 0     | 0    | 6    |
| Turn Type              | Prot | NA    |      |      | NA    |      | Prot | NA    |      | Prot  | NA   | Perm |
| Protected Phases       | 1    | 6     |      |      | 2     |      | 7    | 4     |      | 3     | 8    |      |
| Permitted Phases       |      |       |      |      |       |      |      |       |      |       |      | 8    |
| Actuated Green, G (s)  | 7.3  | 57.2  |      |      | 46.9  |      | 4.7  | 15.4  |      | 4.9   | 15.8 | 15.8 |
| Effective Green, g (s) | 6.3  | 57.8  |      |      | 47.5  |      | 4.2  | 15.6  |      | 4.6   | 16.0 | 16.0 |
| Actuated g/C Ratio     | 0.07 | 0.64  |      |      | 0.53  |      | 0.05 | 0.17  |      | 0.05  | 0.18 | 0.18 |
| Clearance Time (s)     | 3.0  | 4.6   |      |      | 4.6   |      | 3.5  | 4.2   |      | 3.7   | 4.2  | 4.2  |
| Vehicle Extension (s)  | 0.5  | 1.0   |      |      | 1.0   |      | 0.5  | 1.5   |      | 0.5   | 0.5  | 0.5  |
| Lane Grp Cap (vph)     | 107  | 1987  |      |      | 1606  |      | 70   | 259   |      | 78    | 297  | 227  |
| v/s Ratio Prot         | 0.04 | c0.32 |      |      | c0.50 |      | 0.04 | c0.11 |      | c0.04 | 0.04 |      |
| v/s Ratio Perm         |      |       |      |      |       |      |      |       |      |       |      | 0.01 |
| v/c Ratio              | 0.61 | 0.50  |      |      | 0.95  |      | 0.79 | 0.62  |      | 0.77  | 0.20 | 0.04 |
| Uniform Delay, d1      | 40.6 | 8.5   |      |      | 20.1  |      | 42.5 | 34.5  |      | 42.2  | 31.6 | 30.6 |
| Progression Factor     | 1.00 | 1.00  |      |      | 1.00  |      | 1.00 | 1.00  |      | 1.00  | 1.00 | 1.00 |
| Incremental Delay, d2  | 6.5  | 0.9   |      |      | 13.0  |      | 40.0 | 3.4   |      | 32.7  | 0.1  | 0.0  |
| Delay (s)              | 47.2 | 9.4   |      |      | 33.1  |      | 82.4 | 37.8  |      | 74.9  | 31.7 | 30.6 |
| Level of Service       | D    | A     |      |      | C     |      | F    | D     |      | E     | C    | C    |
| Approach Delay (s)     |      | 11.7  |      |      | 33.1  |      |      | 48.5  |      |       | 47.1 |      |
| Approach LOS           |      | B     |      |      | C     |      |      | D     |      |       | D    |      |

## Intersection Summary

|                                   |       |                           |      |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay            | 27.4  | HCM 2000 Level of Service | C    |
| HCM 2000 Volume to Capacity ratio | 0.84  |                           |      |
| Actuated Cycle Length (s)         | 90.0  | Sum of lost time (s)      | 16.0 |
| Intersection Capacity Utilization | 85.1% | ICU Level of Service      | E    |
| Analysis Period (min)             | 15    |                           |      |

c Critical Lane Group

Intersection

Int Delay, s/veh 19.3

| Movement                 | SEL  | SET  | NWT  | NWR  | SWL  | SWR  |
|--------------------------|------|------|------|------|------|------|
| Lane Configurations      | ↖    | ↑    | ↑↑↑  | ↗    | ↖    | ↗    |
| Traffic Vol, veh/h       | 140  | 175  | 2060 | 255  | 60   | 240  |
| Future Vol, veh/h        | 140  | 175  | 2060 | 255  | 60   | 240  |
| Conflicting Peds, #/hr   | 0    | 0    | 0    | 0    | 0    | 0    |
| Sign Control             | Free | Free | Free | Free | Stop | Stop |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 75   | -    | -    | -    | 0    | 50   |
| Veh in Median Storage, # | -    | 0    | 0    | -    | 0    | -    |
| Grade, %                 | -    | 0    | 0    | -    | 0    | -    |
| Peak Hour Factor         | 100  | 100  | 100  | 100  | 100  | 100  |
| Heavy Vehicles, %        | 2    | 2    | 2    | 2    | 2    | 2    |
| Mvmt Flow                | 140  | 175  | 2060 | 255  | 60   | 240  |

| Major/Minor          | Major1 | Major2 | Minor2  |
|----------------------|--------|--------|---------|
| Conflicting Flow All | 2315   | 0      | -       |
| Stage 1              | -      | -      | 2188    |
| Stage 2              | -      | -      | 455     |
| Critical Hdwy        | 5.33   | -      | -       |
| Critical Hdwy Stg 1  | -      | -      | 6.63    |
| Critical Hdwy Stg 2  | -      | -      | 5.43    |
| Follow-up Hdwy       | 3.119  | -      | -       |
| Pot Cap-1 Maneuver   | ~ 87   | -      | -       |
| Stage 1              | -      | -      | ~ 44    |
| Stage 2              | -      | -      | 617     |
| Platoon blocked, %   | -      | -      | -       |
| Mov Cap-1 Maneuver   | ~ 87   | -      | 0 ~ 163 |
| Mov Cap-2 Maneuver   | -      | -      | 0       |
| Stage 1              | -      | -      | 0       |
| Stage 2              | -      | -      | 617     |

| Approach | SE | NW | SW |
|----------|----|----|----|
|----------|----|----|----|

HCM Control Delay, s 179.7 0

HCM LOS -

| Minor Lane/Major Mvmt | NWT | NWR      | SEL   | SET | SWLn1 | SWLn2 |
|-----------------------|-----|----------|-------|-----|-------|-------|
| Capacity (veh/h)      | -   | -        | ~ 87  | -   | -     | 163   |
| HCM Lane V/C Ratio    | -   | -        | 1.609 | -   | -     | 1.472 |
| HCM Control Delay (s) | -   | \$ 404.2 | -     | -   | 294.4 | -     |
| HCM Lane LOS          | -   | -        | F     | -   | -     | F     |
| HCM 95th %tile Q(veh) | -   | -        | 11.3  | -   | -     | 15.4  |

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined \*: All major volume in platoon

# HCM Signalized Intersection Capacity Analysis

52: Barbur & Hooker

06/02/2020



| Movement                          | EBL  | EBT   | EBR  | WBL  | WBT  | WBR                       | NBL  | NBT  | NBR   | SBL  | SBT   | SBR  |
|-----------------------------------|------|-------|------|------|------|---------------------------|------|------|-------|------|-------|------|
| Lane Configurations               |      |       |      |      |      |                           |      |      |       |      |       |      |
| Traffic Volume (vph)              | 5    | 5     | 5    | 15   | 5    | 75                        | 5    | 1165 | 55    | 60   | 390   | 5    |
| Future Volume (vph)               | 5    | 5     | 5    | 15   | 5    | 75                        | 5    | 1165 | 55    | 60   | 390   | 5    |
| 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                 |      | 1.00  |      |      |      | 1.00                      |      | 1.00 | 1.00  |      | 1.00  | 1.00 |
| Frpb, ped/bikes                   |      | 0.98  |      |      |      | 0.96                      |      | 1.00 | 1.00  |      | 1.00  | 1.00 |
| Flpb, ped/bikes                   |      | 0.99  |      |      |      | 0.99                      |      | 1.00 | 1.00  |      | 1.00  | 1.00 |
| Fr <sub>t</sub>                   |      | 0.95  |      |      |      | 0.89                      |      | 1.00 | 0.99  |      | 1.00  | 1.00 |
| Flt Protected                     |      | 0.98  |      |      |      | 0.99                      |      | 0.95 | 1.00  |      | 0.95  | 1.00 |
| Satd. Flow (prot)                 |      | 1738  |      |      |      | 1567                      |      | 1805 | 1843  |      | 1805  | 1740 |
| Flt Permitted                     |      | 0.93  |      |      |      | 0.96                      |      | 0.95 | 1.00  |      | 0.95  | 1.00 |
| Satd. Flow (perm)                 |      | 1649  |      |      |      | 1521                      |      | 1805 | 1843  |      | 1805  | 1740 |
| Peak-hour factor, PHF             | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00                      | 1.00 | 1.00 | 1.00  | 1.00 | 1.00  | 1.00 |
| Adj. Flow (vph)                   | 5    | 5     | 5    | 15   | 5    | 75                        | 5    | 1165 | 55    | 60   | 390   | 5    |
| RTOR Reduction (vph)              | 0    | 4     | 0    | 0    | 29   | 0                         | 0    | 1    | 0     | 0    | 0     | 0    |
| Lane Group Flow (vph)             | 0    | 11    | 0    | 0    | 66   | 0                         | 5    | 1219 | 0     | 60   | 395   | 0    |
| Confl. Peds. (#/hr)               | 15   |       | 19   | 19   |      | 15                        | 14   |      | 16    | 16   |       | 14   |
| Confl. Bikes (#/hr)               |      |       | 1    |      |      | 4                         |      |      | 29    |      |       | 2    |
| Heavy Vehicles (%)                | 0%   | 0%    | 0%   | 14%  | 0%   | 0%                        | 0%   | 2%   | 2%    | 0%   | 9%    | 0%   |
| Turn Type                         | Perm | NA    |      | Perm | NA   |                           | Prot | NA   |       | Prot | NA    |      |
| Protected Phases                  |      | 4     |      |      |      | 8                         |      | 5    | 2     |      | 1     | 6    |
| Permitted Phases                  | 4    |       |      |      | 8    |                           |      |      |       |      |       |      |
| Actuated Green, G (s)             |      | 21.9  |      |      |      | 21.9                      |      | 1.4  | 73.2  |      | 10.5  | 82.3 |
| Effective Green, g (s)            |      | 22.9  |      |      |      | 22.9                      |      | 1.9  | 74.1  |      | 11.0  | 83.2 |
| Actuated g/C Ratio                |      | 0.19  |      |      |      | 0.19                      |      | 0.02 | 0.62  |      | 0.09  | 0.69 |
| Clearance Time (s)                |      | 5.0   |      |      |      | 5.0                       |      | 4.5  | 4.9   |      | 4.5   | 4.9  |
| Vehicle Extension (s)             |      | 3.0   |      |      |      | 3.0                       |      | 3.0  | 3.0   |      | 3.0   | 3.0  |
| Lane Grp Cap (vph)                |      | 314   |      |      |      | 290                       |      | 28   | 1138  |      | 165   | 1206 |
| v/s Ratio Prot                    |      |       |      |      |      |                           |      | 0.00 | c0.66 |      | c0.03 | 0.23 |
| v/s Ratio Perm                    |      | 0.01  |      |      |      | c0.04                     |      |      |       |      |       |      |
| v/c Ratio                         |      | 0.03  |      |      |      | 0.23                      |      | 0.18 | 1.07  |      | 0.36  | 0.33 |
| Uniform Delay, d1                 |      | 39.5  |      |      |      | 41.1                      |      | 58.3 | 23.0  |      | 51.2  | 7.3  |
| Progression Factor                |      | 1.00  |      |      |      | 1.00                      |      | 0.71 | 1.09  |      | 1.00  | 1.00 |
| Incremental Delay, d2             |      | 0.0   |      |      |      | 0.4                       |      | 1.7  | 42.0  |      | 1.4   | 0.7  |
| Delay (s)                         |      | 39.6  |      |      |      | 41.5                      |      | 42.9 | 67.0  |      | 52.6  | 8.0  |
| Level of Service                  |      | D     |      |      |      | D                         |      | D    | E     |      | D     | A    |
| Approach Delay (s)                |      | 39.6  |      |      |      | 41.5                      |      |      | 66.9  |      |       | 13.9 |
| Approach LOS                      |      | D     |      |      |      | D                         |      |      | E     |      |       | B    |
| <b>Intersection Summary</b>       |      |       |      |      |      |                           |      |      |       |      |       |      |
| HCM 2000 Control Delay            |      | 51.8  |      |      |      | 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)      |      |      | 12.5  |      |       |      |
| Intersection Capacity Utilization |      | 86.4% |      |      |      | ICU Level of Service      |      |      | E     |      |       |      |
| Analysis Period (min)             |      | 15    |      |      |      |                           |      |      |       |      |       |      |
| c Critical Lane Group             |      |       |      |      |      |                           |      |      |       |      |       |      |

## Intersection

Int Delay, s/veh 2.3

| Movement                   | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|----------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| <b>Lane Configurations</b> |      |      |      |      |      |      |      |      |      |      |      |      |
| Traffic Vol, veh/h         | 0    | 0    | 45   | 0    | 0    | 0    | 0    | 1395 | 1190 | 195  | 5    | 35   |
| Future Vol, veh/h          | 0    | 0    | 45   | 0    | 0    | 0    | 0    | 1395 | 1190 | 195  | 5    | 35   |
| Conflicting Peds, #/hr     | 3    | 0    | 0    | 0    | 0    | 3    | 1    | 0    | 1    | 1    | 0    | 1    |
| Sign Control               | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized             | -    | -    | None | -    | -    | None | -    | -    | Free | -    | -    | None |
| Storage Length             | -    | -    | 0    | -    | -    | -    | -    | -    | -    | 200  | -    | -    |
| Veh in Median Storage, #   | -    | 0    | -    | -    | -    | -    | -    | 0    | -    | -    | 0    | -    |
| Grade, %                   | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    |
| Peak Hour Factor           | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  |
| Heavy Vehicles, %          | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 2    | 4    | 6    | 0    | 0    |
| Mvmt Flow                  | 0    | 0    | 45   | 0    | 0    | 0    | 0    | 1395 | 1190 | 195  | 5    | 35   |

| Major/Minor          | Minor2   | Major1 | Major2    |
|----------------------|----------|--------|-----------|
| Conflicting Flow All | - - 24   | - 0 -  | 1396 0 0  |
| Stage 1              | - - -    | - - -  | - - -     |
| Stage 2              | - - -    | - - -  | - - -     |
| Critical Hdwy        | - - 6.2  | - - -  | 4.19 - -  |
| Critical Hdwy Stg 1  | - - -    | - - -  | - - -     |
| Critical Hdwy Stg 2  | - - -    | - - -  | - - -     |
| Follow-up Hdwy       | - - 3.3  | - - -  | 2.257 - - |
| Pot Cap-1 Maneuver   | 0 0 1058 | 0 - 0  | 471 - -   |
| Stage 1              | 0 0 -    | 0 - 0  | - - -     |
| Stage 2              | 0 0 -    | 0 - 0  | - - -     |
| Platoon blocked, %   | - - -    | - - -  | - - -     |
| Mov Cap-1 Maneuver   | - 0 1057 | - - -  | 471 - -   |
| Mov Cap-2 Maneuver   | - 0 -    | - - -  | - - -     |
| Stage 1              | - 0 -    | - - -  | - - -     |
| Stage 2              | - 0 -    | - - -  | - - -     |

| Approach             | EB  | NB | SB   |
|----------------------|-----|----|------|
| HCM Control Delay, s | 8.6 | 0  | 14.9 |
| HCM LOS              | A   |    |      |

| Minor Lane/Major Mvmt | NBT | EBLn1 | SBL   | SBT | SBR |
|-----------------------|-----|-------|-------|-----|-----|
| Capacity (veh/h)      | -   | 1057  | 471   | -   | -   |
| HCM Lane V/C Ratio    | -   | 0.043 | 0.414 | -   | -   |
| HCM Control Delay (s) | -   | 8.6   | 17.9  | -   | -   |
| HCM Lane LOS          | -   | A     | C     | -   | -   |
| HCM 95th %tile Q(veh) | -   | 0.1   | 2     | -   | -   |

**Intersection**

Int Delay, s/veh 78

| Movement                 | EBL  | EBT  | WBT  | WBR  | SEL  | SER  |
|--------------------------|------|------|------|------|------|------|
| Lane Configurations      |      |      |      |      |      |      |
| Traffic Vol, veh/h       | 0    | 815  | 0    | 0    | 735  | 0    |
| Future Vol, veh/h        | 0    | 815  | 0    | 0    | 735  | 0    |
| Conflicting Peds, #/hr   | 2    | 0    | 0    | 2    | 0    | 0    |
| Sign Control             | Free | Free | Free | Free | Stop | Stop |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | -    | -    | -    | -    | 0    | -    |
| Veh in Median Storage, # | -    | 0    | -    | -    | 0    | -    |
| Grade, %                 | -    | 0    | 0    | -    | 0    | -    |
| Peak Hour Factor         | 100  | 100  | 100  | 100  | 100  | 100  |
| Heavy Vehicles, %        | 0    | 5    | 0    | 2    | 2    | 2    |
| Mvmt Flow                | 0    | 815  | 0    | 0    | 735  | 0    |

**Major/Minor**      Major1      Minor2

|                      |   |   |       |   |
|----------------------|---|---|-------|---|
| Conflicting Flow All | - | 0 | 408   | - |
| Stage 1              | - | - | 0     | - |
| Stage 2              | - | - | 408   | - |
| Critical Hdwy        | - | - | 6.84  | - |
| Critical Hdwy Stg 1  | - | - | -     | - |
| Critical Hdwy Stg 2  | - | - | 5.84  | - |
| Follow-up Hdwy       | - | - | 3.52  | - |
| Pot Cap-1 Maneuver   | 0 | - | ~ 571 | 0 |
| Stage 1              | 0 | - | -     | 0 |
| Stage 2              | 0 | - | ~ 640 | 0 |
| Platoon blocked, %   | - |   |       |   |
| Mov Cap-1 Maneuver   | - | - | ~ 571 | - |
| Mov Cap-2 Maneuver   | - | - | ~ 571 | - |
| Stage 1              | - | - | -     | - |
| Stage 2              | - | - | ~ 640 | - |

**Approach**      EB      SE

|                      |   |       |
|----------------------|---|-------|
| HCM Control Delay, s | 0 | 164.4 |
| HCM LOS              |   | F     |

**Minor Lane/Major Mvmt**      EBT SELn1

|                       |   |       |
|-----------------------|---|-------|
| Capacity (veh/h)      | - | 571   |
| HCM Lane V/C Ratio    | - | 1.287 |
| HCM Control Delay (s) | - | 164.4 |
| HCM Lane LOS          | - | F     |
| HCM 95th %tile Q(veh) | - | 29.8  |

**Notes**

~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

**Intersection**

Int Delay, s/veh 22.1

| Movement                 | EBT  | EBR  | WBL  | WBT  | NBL  | NBR  |
|--------------------------|------|------|------|------|------|------|
| Lane Configurations      | ↑↑   |      |      |      | ↗    |      |
| Traffic Vol, veh/h       | 1550 | 0    | 0    | 0    | 0    | 370  |
| Future Vol, veh/h        | 1550 | 0    | 0    | 0    | 0    | 370  |
| Conflicting Peds, #/hr   | 0    | 0    | 0    | 0    | 0    | 0    |
| Sign Control             | Free | Free | Free | Free | Stop | Stop |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | -    | -    | -    | -    | -    | 0    |
| Veh in Median Storage, # | 0    | -    | -    | -    | 0    | -    |
| Grade, %                 | 0    | -    | -    | 0    | 0    | -    |
| Peak Hour Factor         | 100  | 100  | 100  | 100  | 100  | 100  |
| Heavy Vehicles, %        | 5    | 0    | 0    | 4    | 0    | 4    |
| Mvmt Flow                | 1550 | 0    | 0    | 0    | 0    | 370  |

| Major/Minor          | Major1 | Minor1  |
|----------------------|--------|---------|
| Conflicting Flow All | 0      | -       |
| Stage 1              | -      | -       |
| Stage 2              | -      | -       |
| Critical Hdwy        | -      | -       |
| Critical Hdwy Stg 1  | -      | -       |
| Critical Hdwy Stg 2  | -      | -       |
| Follow-up Hdwy       | -      | -       |
| Pot Cap-1 Maneuver   | -      | 0 ~ 336 |
| Stage 1              | -      | 0       |
| Stage 2              | -      | 0       |
| Platoon blocked, %   | -      |         |
| Mov Cap-1 Maneuver   | -      | - ~ 336 |
| Mov Cap-2 Maneuver   | -      | -       |
| Stage 1              | -      | -       |
| Stage 2              | -      | -       |

| Approach             | EB | NB    |
|----------------------|----|-------|
| HCM Control Delay, s | 0  | 114.8 |
| HCM LOS              |    | F     |

| Minor Lane/Major Mvmt | NBLn1 | EBT |
|-----------------------|-------|-----|
| Capacity (veh/h)      | 336   | -   |
| HCM Lane V/C Ratio    | 1.101 | -   |
| HCM Control Delay (s) | 114.8 | -   |
| HCM Lane LOS          | F     | -   |
| HCM 95th %tile Q(veh) | 14.1  | -   |

**Notes**

~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

Intersection

Int Delay, s/veh 4.8

| Movement                 | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  | SWL  | SWR  |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Traffic Vol, veh/h       | 0    | 0    | 840  | 0    | 0    | 15   | 0    | 720  | 715  | 0    | 265  | 0    | 0    | 0    |
| Future Vol, veh/h        | 0    | 0    | 840  | 0    | 0    | 15   | 0    | 720  | 715  | 0    | 265  | 0    | 0    | 0    |
| Conflicting Peds, #/hr   | 1    | 0    | 1    | 1    | 0    | 1    | 1    | 0    | 3    | 3    | 0    | 1    | 0    | 0    |
| Sign Control             | Free | Free | Free | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free | Stop | Stop |
| RT Channelized           | -    | -    | Free | -    | -    | -    | -    | -    | -    | -    | -    | None | -    | -    |
| Storage Length           | -    | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | -    | -    | -    | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    | -    | -    |
| Grade, %                 | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    | 0    | -    |
| Peak Hour Factor         | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  |
| Heavy Vehicles, %        | 0    | 0    | 2    | 0    | 0    | 5    | 0    | 3    | 2    | 0    | 7    | 0    | 0    | 0    |
| Mvmt Flow                | 0    | 0    | 840  | 0    | 0    | 15   | 0    | 720  | 715  | 0    | 265  | 0    | 0    | 0    |

| Major/Minor          | Minor1       | Major1        | Major2    |
|----------------------|--------------|---------------|-----------|
| Conflicting Flow All | -            | 721 265       | 0 0 - - 0 |
| Stage 1              | -            | -             | -         |
| Stage 2              | -            | -             | -         |
| Critical Hdwy        | -            | 6.275 4.145   | - - - -   |
| Critical Hdwy Stg 1  | -            | -             | -         |
| Critical Hdwy Stg 2  | -            | -             | -         |
| Follow-up Hdwy       | -            | 3.3475 2.2285 | - - - -   |
| Pot Cap-1 Maneuver   | 0 0 420 1291 | - - 0 - 0     | -         |
| Stage 1              | 0 0 - -      | - - 0 - 0     | -         |
| Stage 2              | 0 0 - -      | - - 0 - 0     | -         |
| Platoon blocked, %   | -            | -             | -         |
| Mov Cap-1 Maneuver   | - 0 420 1291 | - - - -       | -         |
| Mov Cap-2 Maneuver   | - 0 - -      | - - - -       | -         |
| Stage 1              | - 0 - -      | - - - -       | -         |
| Stage 2              | - 0 - -      | - - - -       | -         |

| Approach              | WB    | NB  | SB            |
|-----------------------|-------|-----|---------------|
| HCM Control Delay, s  | 13.9  | 5.6 | 0             |
| HCM LOS               | B     |     |               |
| <hr/>                 |       |     |               |
| Minor Lane/Major Mvmt | NBT   | NBR | NBR2WBLn1 SBT |
| Capacity (veh/h)      | 1291  | - - | 420 -         |
| HCM Lane V/C Ratio    | 0.558 | - - | 0.036 -       |
| HCM Control Delay (s) | 11.2  | - - | 13.9 -        |
| HCM Lane LOS          | B     | - - | B -           |
| HCM 95th %tile Q(veh) | 3.6   | - - | 0.1 -         |

# HCM Signalized Intersection Capacity Analysis

71: Barbur & Whitaker

06/02/2020



| Movement                          | WBL   | WBR   | NBT  | NBR                       | SBL  | SBT  |
|-----------------------------------|-------|-------|------|---------------------------|------|------|
| Lane Configurations               |       |       |      |                           |      |      |
| Traffic Volume (vph)              | 60    | 85    | 1135 | 35                        | 30   | 380  |
| Future Volume (vph)               | 60    | 85    | 1135 | 35                        | 30   | 380  |
| Ideal Flow (vphpl)                | 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 |                           | 1.00 |      |
| Frpb, ped/bikes                   | 0.99  |       | 1.00 |                           | 1.00 |      |
| Flpb, ped/bikes                   | 1.00  |       | 1.00 |                           | 1.00 |      |
| Fr <sub>t</sub>                   | 0.92  |       | 1.00 |                           | 1.00 |      |
| Flt Protected                     | 0.98  |       | 1.00 |                           | 0.95 | 1.00 |
| Satd. Flow (prot)                 | 1650  |       | 1848 |                           | 1543 | 1743 |
| Flt Permitted                     | 0.98  |       | 1.00 |                           | 0.95 | 1.00 |
| Satd. Flow (perm)                 | 1650  |       | 1848 |                           | 1543 | 1743 |
| Peak-hour factor, PHF             | 1.00  | 1.00  | 1.00 | 1.00                      | 1.00 | 1.00 |
| Adj. Flow (vph)                   | 60    | 85    | 1135 | 35                        | 30   | 380  |
| RTOR Reduction (vph)              | 48    | 0     | 1    | 0                         | 0    | 0    |
| Lane Group Flow (vph)             | 97    | 0     | 1169 | 0                         | 30   | 380  |
| Confl. Bikes (#/hr)               |       | 2     |      | 30                        |      |      |
| Heavy Vehicles (%)                | 0%    | 4%    | 2%   | 11%                       | 17%  | 9%   |
| Turn Type                         | Perm  |       | NA   |                           | Prot | NA   |
| Protected Phases                  |       |       | 2    |                           | 1    | 6    |
| Permitted Phases                  | 4     |       |      |                           |      |      |
| Actuated Green, G (s)             | 17.4  |       | 84.4 |                           | 3.3  | 92.2 |
| Effective Green, g (s)            | 17.9  |       | 86.3 |                           | 3.8  | 94.1 |
| Actuated g/C Ratio                | 0.15  |       | 0.72 |                           | 0.03 | 0.78 |
| Clearance Time (s)                | 4.5   |       | 5.9  |                           | 4.5  | 5.9  |
| Vehicle Extension (s)             | 3.0   |       | 2.0  |                           | 1.2  | 2.0  |
| Lane Grp Cap (vph)                | 246   |       | 1329 |                           | 48   | 1366 |
| v/s Ratio Prot                    |       | c0.63 |      | c0.02                     | 0.22 |      |
| v/s Ratio Perm                    | c0.06 |       |      |                           |      |      |
| v/c Ratio                         | 0.39  |       | 0.88 |                           | 0.62 | 0.28 |
| Uniform Delay, d1                 | 46.1  |       | 12.9 |                           | 57.4 | 3.6  |
| Progression Factor                | 1.00  |       | 1.00 |                           | 1.21 | 0.50 |
| Incremental Delay, d2             | 1.0   |       | 8.6  |                           | 16.3 | 0.5  |
| Delay (s)                         | 47.2  |       | 21.5 |                           | 85.5 | 2.3  |
| Level of Service                  | D     |       | C    |                           | F    | A    |
| Approach Delay (s)                | 47.2  |       | 21.5 |                           |      | 8.4  |
| Approach LOS                      | D     |       | C    |                           |      | A    |
| Intersection Summary              |       |       |      |                           |      |      |
| HCM 2000 Control Delay            |       | 20.5  |      | HCM 2000 Level of Service |      | C    |
| HCM 2000 Volume to Capacity ratio |       | 0.79  |      |                           |      |      |
| Actuated Cycle Length (s)         |       | 120.0 |      | Sum of lost time (s)      |      | 12.5 |
| Intersection Capacity Utilization |       | 77.1% |      | ICU Level of Service      |      | D    |
| Analysis Period (min)             |       | 15    |      |                           |      |      |

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

78: Barbur Blvd & SW Naito Pkwy

06/02/2020



| Movement                          | NBT   | NBR    | SBL  | SBT                       | SWL   | SWR  |
|-----------------------------------|-------|--------|------|---------------------------|-------|------|
| Lane Configurations               | ↑↑    | ↑↑     |      | ↑↑                        | ↑↑    |      |
| Traffic Volume (vph)              | 1180  | 1445   | 0    | 440                       | 1200  | 5    |
| Future Volume (vph)               | 1180  | 1445   | 0    | 440                       | 1200  | 5    |
| Ideal Flow (vphpl)                | 2100  | 1900   | 1900 | 1900                      | 1900  | 1900 |
| Total Lost time (s)               | 5.0   | 5.0    |      | 5.0                       | 5.0   |      |
| Lane Util. Factor                 | *0.78 | 0.88   |      | 0.95                      | 0.97  |      |
| Frbp, ped/bikes                   | 1.00  | 1.00   |      | 1.00                      | 1.00  |      |
| Flpb, ped/bikes                   | 1.00  | 1.00   |      | 1.00                      | 1.00  |      |
| Fr <sub>t</sub>                   | 1.00  | 0.85   |      | 1.00                      | 1.00  |      |
| Flt Protected                     | 1.00  | 1.00   |      | 1.00                      | 0.95  |      |
| Satd. Flow (prot)                 | 3212  | 2787   |      | 3539                      | 3440  |      |
| Flt Permitted                     | 1.00  | 1.00   |      | 1.00                      | 0.95  |      |
| Satd. Flow (perm)                 | 3212  | 2787   |      | 3539                      | 3440  |      |
| Peak-hour factor, PHF             | 1.00  | 1.00   | 1.00 | 1.00                      | 1.00  | 1.00 |
| Adj. Flow (vph)                   | 1180  | 1445   | 0    | 440                       | 1200  | 5    |
| RTOR Reduction (vph)              | 0     | 0      | 0    | 0                         | 0     | 0    |
| Lane Group Flow (vph)             | 1180  | 1445   | 0    | 440                       | 1205  | 0    |
| Confl. Peds. (#/hr)               |       | 5      | 23   |                           | 14    |      |
| Confl. Bikes (#/hr)               |       | 24     |      |                           |       |      |
| Turn Type                         | NA    | custom |      | NA                        | Prot  |      |
| Protected Phases                  | 2     | 6      | 5    | 2                         | 6     | 5    |
| Permitted Phases                  |       |        |      |                           |       |      |
| Actuated Green, G (s)             | 64.0  | 76.0   |      | 64.0                      | 46.0  |      |
| Effective Green, g (s)            | 64.0  | 76.0   |      | 64.0                      | 46.0  |      |
| Actuated g/C Ratio                | 0.53  | 0.63   |      | 0.53                      | 0.38  |      |
| Clearance Time (s)                |       |        |      |                           | 5.0   |      |
| Vehicle Extension (s)             |       |        |      |                           | 3.0   |      |
| Lane Grp Cap (vph)                | 1713  | 1765   |      | 1887                      | 1318  |      |
| v/s Ratio Prot                    | c0.37 | c0.52  |      | 0.12                      | c0.35 |      |
| v/s Ratio Perm                    |       |        |      |                           |       |      |
| v/c Ratio                         | 0.69  | 0.82   |      | 0.23                      | 0.91  |      |
| Uniform Delay, d1                 | 20.7  | 16.8   |      | 14.9                      | 35.1  |      |
| Progression Factor                | 1.00  | 1.00   |      | 1.00                      | 1.00  |      |
| Incremental Delay, d2             | 1.2   | 3.1    |      | 0.1                       | 9.9   |      |
| Delay (s)                         | 21.8  | 19.8   |      | 15.0                      | 45.0  |      |
| Level of Service                  | C     | B      |      | B                         | D     |      |
| Approach Delay (s)                | 20.7  |        |      | 15.0                      | 45.0  |      |
| Approach LOS                      | C     |        |      | B                         | D     |      |
| Intersection Summary              |       |        |      |                           |       |      |
| HCM 2000 Control Delay            |       | 27.0   |      | HCM 2000 Level of Service | C     |      |
| HCM 2000 Volume to Capacity ratio |       | 0.85   |      |                           |       |      |
| Actuated Cycle Length (s)         |       | 120.0  |      | Sum of lost time (s)      | 15.0  |      |
| Intersection Capacity Utilization |       | 72.2%  |      | ICU Level of Service      | C     |      |
| Analysis Period (min)             |       | 15     |      |                           |       |      |

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

80: Barbur Blvd & SW Bancroft St

06/02/2020



| Movement               | WBL  | WBR   | NBT  | NBR  | SBU   | SBL   | SBT  |
|------------------------|------|-------|------|------|-------|-------|------|
| Lane Configurations    |      | ↑     | ↑↑   |      |       | ↑     | ↑↑   |
| Traffic Volume (vph)   | 0    | 190   | 2335 | 40   | 80    | 220   | 1200 |
| Future Volume (vph)    | 0    | 190   | 2335 | 40   | 80    | 220   | 1200 |
| Ideal Flow (vphpl)     | 1900 | 1900  | 2100 | 1900 | 1900  | 1900  | 1900 |
| Grade (%)              | 13%  |       |      | 0%   |       |       | 0%   |
| Total Lost time (s)    |      | 4.0   | 4.0  |      | 4.0   | 4.0   |      |
| Lane Util. Factor      | 1.00 | 0.95  |      |      | 1.00  | 0.95  |      |
| Frpb, ped/bikes        | 0.99 | 1.00  |      |      | 1.00  | 1.00  |      |
| Flpb, ped/bikes        | 1.00 | 1.00  |      |      | 1.00  | 1.00  |      |
| Fr <sub>t</sub>        | 0.86 | 1.00  |      |      | 1.00  | 1.00  |      |
| Flt Protected          | 1.00 | 1.00  |      |      | 0.95  | 1.00  |      |
| Satd. Flow (prot)      | 1515 | 3863  |      |      | 1754  | 3574  |      |
| Flt Permitted          | 1.00 | 1.00  |      |      | 0.95  | 1.00  |      |
| Satd. Flow (perm)      | 1515 | 3863  |      |      | 1754  | 3574  |      |
| Peak-hour factor, PHF  | 1.00 | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00 |
| Adj. Flow (vph)        | 0    | 190   | 2335 | 40   | 80    | 220   | 1200 |
| RTOR Reduction (vph)   | 0    | 9     | 1    | 0    | 0     | 0     | 0    |
| Lane Group Flow (vph)  | 0    | 181   | 2374 | 0    | 0     | 300   | 1200 |
| Confl. Peds. (#/hr)    | 2    |       |      | 3    |       | 3     |      |
| Confl. Bikes (#/hr)    |      | 2     |      | 24   |       |       |      |
| Heavy Vehicles (%)     | 0%   | 0%    | 3%   | 0%   | 0%    | 4%    | 1%   |
| Turn Type              |      | Perm  | NA   |      | Prot  | Prot  | NA   |
| Protected Phases       |      |       | 2    |      | 1 7   | 1 7   | 6    |
| Permitted Phases       |      | 1 7   |      |      |       |       |      |
| Actuated Green, G (s)  | 33.5 | 108.0 |      |      | 33.5  | 126.7 |      |
| Effective Green, g (s) | 33.5 | 108.5 |      |      | 33.5  | 127.2 |      |
| Actuated g/C Ratio     | 0.22 | 0.72  |      |      | 0.22  | 0.85  |      |
| Clearance Time (s)     |      | 4.5   |      |      | 4.5   |       |      |
| Vehicle Extension (s)  |      | 3.0   |      |      | 3.0   |       |      |
| Lane Grp Cap (vph)     | 338  | 2794  |      |      | 391   | 3030  |      |
| v/s Ratio Prot         |      | c0.61 |      |      | c0.17 | 0.34  |      |
| v/s Ratio Perm         |      | 0.12  |      |      |       |       |      |
| v/c Ratio              | 0.54 | 0.85  |      |      | 0.77  | 0.40  |      |
| Uniform Delay, d1      | 51.4 | 14.9  |      |      | 54.6  | 2.6   |      |
| Progression Factor     | 1.00 | 0.93  |      |      | 1.00  | 1.00  |      |
| Incremental Delay, d2  |      | 1.6   | 2.1  |      | 8.7   | 0.4   |      |
| Delay (s)              | 53.0 | 15.9  |      |      | 63.3  | 3.0   |      |
| Level of Service       | D    | B     |      |      | E     | A     |      |
| Approach Delay (s)     | 53.0 | 15.9  |      |      | 15.1  |       |      |
| Approach LOS           | D    | B     |      |      |       | B     |      |

## Intersection Summary

|                                   |       |                           |      |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay            | 17.3  | HCM 2000 Level of Service | B    |
| HCM 2000 Volume to Capacity ratio | 0.85  |                           |      |
| Actuated Cycle Length (s)         | 150.0 | Sum of lost time (s)      | 12.0 |
| Intersection Capacity Utilization | 97.9% | ICU Level of Service      | F    |
| Analysis Period (min)             | 15    |                           |      |

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

81: SW Corbett Ave/Corbett Ave & Bancroft St

06/02/2020



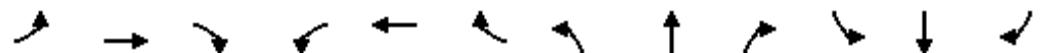
| Movement                          | EBL   | EBR   | NBL                       | NBT   | SBT  | SBR  |
|-----------------------------------|-------|-------|---------------------------|-------|------|------|
| Lane Configurations               |       |       |                           |       |      |      |
| Traffic Volume (vph)              | 0     | 260   | 150                       | 240   | 120  | 40   |
| Future Volume (vph)               | 0     | 260   | 150                       | 240   | 120  | 40   |
| Ideal Flow (vphpl)                | 1750  | 1750  | 1750                      | 1750  | 1750 | 1750 |
| Total Lost time (s)               |       | 4.0   |                           | 4.0   |      | 4.0  |
| Lane Util. Factor                 |       | 1.00  |                           | 1.00  |      | 1.00 |
| Frt                               |       | 0.86  |                           | 1.00  |      | 0.97 |
| Flt Protected                     |       | 1.00  |                           | 0.98  |      | 1.00 |
| Satd. Flow (prot)                 |       | 1484  |                           | 1683  |      | 1658 |
| Flt Permitted                     |       | 1.00  |                           | 0.89  |      | 1.00 |
| Satd. Flow (perm)                 |       | 1484  |                           | 1531  |      | 1658 |
| Peak-hour factor, PHF             | 1.00  | 1.00  | 1.00                      | 1.00  | 1.00 | 1.00 |
| Adj. Flow (vph)                   | 0     | 260   | 150                       | 240   | 120  | 40   |
| RTOR Reduction (vph)              | 0     | 0     | 0                         | 0     | 19   | 0    |
| Lane Group Flow (vph)             | 0     | 260   | 0                         | 390   | 141  | 0    |
| Turn Type                         | pm+ov | pm+pt | NA                        | NA    |      |      |
| Protected Phases                  | 5     | 5     | 2                         | 6     |      |      |
| Permitted Phases                  | 4     | 2     |                           |       |      |      |
| Actuated Green, G (s)             | 51.4  |       | 63.8                      | 11.6  |      |      |
| Effective Green, g (s)            | 51.4  |       | 63.8                      | 11.6  |      |      |
| Actuated g/C Ratio                | 0.69  |       | 0.85                      | 0.15  |      |      |
| Clearance Time (s)                | 4.0   |       | 4.0                       | 4.0   |      |      |
| Vehicle Extension (s)             | 3.0   |       | 3.0                       | 3.0   |      |      |
| Lane Grp Cap (vph)                | 1096  |       | 1400                      | 256   |      |      |
| v/s Ratio Prot                    | c0.15 |       | c0.18                     | c0.08 |      |      |
| v/s Ratio Perm                    | 0.02  |       | 0.06                      |       |      |      |
| v/c Ratio                         | 0.24  |       | 0.28                      | 0.55  |      |      |
| Uniform Delay, d1                 | 4.4   |       | 1.1                       | 29.3  |      |      |
| Progression Factor                | 1.00  |       | 0.73                      | 1.00  |      |      |
| Incremental Delay, d2             | 0.1   |       | 0.1                       | 2.4   |      |      |
| Delay (s)                         | 4.5   |       | 0.9                       | 31.7  |      |      |
| Level of Service                  | A     |       | A                         | C     |      |      |
| Approach Delay (s)                | 4.5   |       | 0.9                       | 31.7  |      |      |
| Approach LOS                      | A     |       | A                         | C     |      |      |
| Intersection Summary              |       |       |                           |       |      |      |
| HCM 2000 Control Delay            | 8.2   |       | HCM 2000 Level of Service |       | A    |      |
| HCM 2000 Volume to Capacity ratio | 0.34  |       |                           |       |      |      |
| Actuated Cycle Length (s)         | 75.0  |       | Sum of lost time (s)      |       | 12.0 |      |
| Intersection Capacity Utilization | 38.9% |       | ICU Level of Service      |       | A    |      |
| Analysis Period (min)             | 15    |       |                           |       |      |      |

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

82: Barbur Blvd & SW Hamilton St

06/02/2020



| Movement               | EBL   | EBT  | EBR  | WBL   | WBT   | WBR  | NBL  | NBT   | NBR   | SBL  | SBT   | SBR  |
|------------------------|-------|------|------|-------|-------|------|------|-------|-------|------|-------|------|
| Lane Configurations    | ↑     | ↓    |      | ↑     | ↓     | ↑    |      | ↑     | ↓     |      | ↑↓    |      |
| Traffic Volume (vph)   | 85    | 50   | 15   | 175   | 215   | 125  | 0    | 2165  | 330   | 0    | 1100  | 100  |
| Future Volume (vph)    | 85    | 50   | 15   | 175   | 215   | 125  | 0    | 2165  | 330   | 0    | 1100  | 100  |
| Ideal Flow (vphpl)     | 1900  | 1900 | 1900 | 1900  | 1900  | 1900 | 1900 | 2100  | 1900  | 1900 | 1900  | 1900 |
| Grade (%)              |       |      |      |       |       | 10%  |      |       | 0%    |      |       | 0%   |
| Total Lost time (s)    | 4.0   | 4.0  |      | 5.0   | 6.0   | 6.0  |      | 8.0   | 8.0   |      | 8.0   |      |
| Lane Util. Factor      | 0.95  | 0.95 |      | 0.95  | 1.00  |      |      | 0.95  | 1.00  |      | 0.95  |      |
| Frpb, ped/bikes        | 1.00  | 0.98 |      | 1.00  | 1.00  | 1.00 |      | 1.00  | 0.96  |      | 1.00  |      |
| Flpb, ped/bikes        | 1.00  | 1.00 |      | 1.00  | 1.00  | 1.00 |      | 1.00  | 1.00  |      | 1.00  |      |
| Fr <sub>t</sub>        | 1.00  | 0.97 |      | 1.00  | 1.00  | 0.85 |      | 1.00  | 0.85  |      | 0.99  |      |
| Flt Protected          | 0.95  | 0.99 |      | 0.95  | 1.00  | 1.00 |      | 1.00  | 1.00  |      | 1.00  |      |
| Satd. Flow (prot)      | 1681  | 1706 |      | 1597  | 1715  | 1519 |      | 3703  | 1539  |      | 3422  |      |
| Flt Permitted          | 0.95  | 0.99 |      | 0.95  | 1.00  | 1.00 |      | 1.00  | 1.00  |      | 1.00  |      |
| Satd. Flow (perm)      | 1681  | 1706 |      | 1597  | 1715  | 1519 |      | 3703  | 1539  |      | 3422  |      |
| Peak-hour factor, PHF  | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00 | 1.00  | 1.00 |
| Adj. Flow (vph)        | 85    | 50   | 15   | 175   | 215   | 125  | 0    | 2165  | 330   | 0    | 1100  | 100  |
| RTOR Reduction (vph)   | 0     | 6    | 0    | 0     | 0     | 35   | 0    | 0     | 97    | 0    | 4     | 0    |
| Lane Group Flow (vph)  | 75    | 69   | 0    | 175   | 215   | 90   | 0    | 2165  | 233   | 0    | 1196  | 0    |
| Confl. Peds. (#/hr)    |       |      | 27   | 27    |       |      | 11   |       |       |      | 11    |      |
| Confl. Bikes (#/hr)    |       |      |      |       |       |      |      |       |       | 33   |       |      |
| Heavy Vehicles (%)     | 2%    | 0%   | 0%   | 2%    | 0%    | 1%   | 0%   | 3%    | 1%    | 3%   | 4%    | 1%   |
| Bus Blockages (#/hr)   | 0     | 0    | 0    | 0     | 0     | 0    | 0    | 22    | 0     | 0    | 0     | 0    |
| Turn Type              | Split | NA   |      | Split | NA    | Perm |      | NA    | Perm  |      | NA    |      |
| Protected Phases       | 3!    | 3!   |      | 3 4!  | 3 4!  |      |      | 6     |       |      | 2     |      |
| Permitted Phases       |       |      |      |       |       | 3 4  |      |       | 6     |      |       |      |
| Actuated Green, G (s)  | 16.1  | 16.1 |      | 32.2  | 32.2  | 32.2 |      | 104.8 | 104.8 |      | 104.8 |      |
| Effective Green, g (s) | 17.1  | 17.1 |      | 32.2  | 31.2  | 31.2 |      | 105.8 | 105.8 |      | 105.8 |      |
| Actuated g/C Ratio     | 0.11  | 0.11 |      | 0.21  | 0.21  | 0.21 |      | 0.71  | 0.71  |      | 0.71  |      |
| Clearance Time (s)     | 5.0   | 5.0  |      |       |       |      |      | 9.0   | 9.0   |      | 9.0   |      |
| Vehicle Extension (s)  | 0.5   | 0.5  |      |       |       |      |      | 3.0   | 3.0   |      | 3.0   |      |
| Lane Grp Cap (vph)     | 191   | 194  |      | 342   | 356   | 315  |      | 2611  | 1085  |      | 2413  |      |
| v/s Ratio Prot         | 0.04  | 0.04 |      | 0.11  | c0.13 |      |      | c0.58 |       |      | 0.35  |      |
| v/s Ratio Perm         |       |      |      |       |       | 0.06 |      |       | 0.15  |      |       |      |
| v/c Ratio              | 0.39  | 0.35 |      | 0.51  | 0.60  | 0.29 |      | 0.83  | 0.21  |      | 0.50  |      |
| Uniform Delay, d1      | 61.6  | 61.4 |      | 52.0  | 53.8  | 50.0 |      | 15.7  | 7.7   |      | 10.0  |      |
| Progression Factor     | 1.00  | 1.00 |      | 1.06  | 1.05  | 1.13 |      | 1.35  | 4.81  |      | 0.86  |      |
| Incremental Delay, d2  | 0.5   | 0.4  |      | 0.4   | 1.6   | 0.1  |      | 1.5   | 0.2   |      | 0.7   |      |
| Delay (s)              | 62.1  | 61.8 |      | 55.4  | 58.3  | 56.5 |      | 22.7  | 37.2  |      | 9.3   |      |
| Level of Service       | E     | E    |      | E     | E     | E    |      | C     | D     |      | A     |      |
| Approach Delay (s)     |       | 61.9 |      |       | 56.9  |      |      | 24.6  |       |      | 9.3   |      |
| Approach LOS           |       | E    |      |       | E     |      |      | C     |       |      | A     |      |

## Intersection Summary

|                                   |       |                           |      |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay            | 25.5  | HCM 2000 Level of Service | C    |
| HCM 2000 Volume to Capacity ratio | 0.81  |                           |      |
| Actuated Cycle Length (s)         | 150.0 | Sum of lost time (s)      | 19.0 |
| Intersection Capacity Utilization | 84.8% | ICU Level of Service      | E    |
| Analysis Period (min)             | 15    |                           |      |

! Phase conflict between lane groups.

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

83: SW Corbett Ave & SW Hamilton St

06/02/2020



| Movement                          | EBL   | EBT   | EBR  | WBL  | WBT                       | WBR   | NBL  | NBT  | NBR   | SBL  | SBT  | SBR  |
|-----------------------------------|-------|-------|------|------|---------------------------|-------|------|------|-------|------|------|------|
| Lane Configurations               |       |       |      |      |                           |       |      |      |       |      |      |      |
| Traffic Volume (vph)              | 105   | 60    | 215  | 15   | 70                        | 5     | 360  | 280  | 20    | 5    | 295  | 85   |
| Future Volume (vph)               | 105   | 60    | 215  | 15   | 70                        | 5     | 360  | 280  | 20    | 5    | 295  | 85   |
| Ideal Flow (vphpl)                | 1900  | 1900  | 1900 | 1900 | 1900                      | 1900  | 1900 | 1900 | 1900  | 1900 | 1900 | 1900 |
| Grade (%)                         |       | 10%   |      |      | 0%                        |       |      | 0%   |       | 0%   |      | 0%   |
| Total Lost time (s)               |       | 4.0   | 4.0  |      | 4.0                       |       | 4.0  | 4.0  |       | 4.0  |      | 3.5  |
| Lane Util. Factor                 |       | 1.00  | 1.00 |      | 1.00                      |       | 1.00 | 1.00 |       | 1.00 |      | 1.00 |
| Frpb, ped/bikes                   |       | 1.00  | 1.00 |      | 1.00                      |       | 1.00 | 1.00 |       | 1.00 |      | 0.92 |
| Flpb, ped/bikes                   |       | 1.00  | 1.00 |      | 0.99                      |       | 1.00 | 1.00 |       | 1.00 |      | 1.00 |
| Fr <sub>t</sub>                   |       | 1.00  | 0.85 |      | 0.99                      |       | 1.00 | 1.00 |       | 1.00 |      | 0.85 |
| Flt Protected                     |       | 0.97  | 1.00 |      | 0.99                      |       | 0.95 | 1.00 |       | 1.00 |      | 1.00 |
| Satd. Flow (prot)                 |       | 1386  | 1217 |      | 1465                      |       | 1420 | 1489 |       | 1424 |      | 1180 |
| Flt Permitted                     |       | 0.77  | 1.00 |      | 0.95                      |       | 0.95 | 1.00 |       | 0.99 |      | 1.00 |
| Satd. Flow (perm)                 |       | 1105  | 1217 |      | 1407                      |       | 1420 | 1489 |       | 1417 |      | 1180 |
| Peak-hour factor, PHF             | 1.00  | 1.00  | 1.00 | 1.00 | 1.00                      | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph)                   | 105   | 60    | 215  | 15   | 70                        | 5     | 360  | 280  | 20    | 5    | 295  | 85   |
| RTOR Reduction (vph)              | 0     | 0     | 153  | 0    | 3                         | 0     | 0    | 4    | 0     | 0    | 0    | 64   |
| Lane Group Flow (vph)             | 0     | 165   | 62   | 0    | 87                        | 0     | 360  | 296  | 0     | 0    | 300  | 21   |
| Confl. Peds. (#/hr)               | 3     |       | 15   | 15   |                           | 3     | 23   |      | 17    | 17   |      | 23   |
| Confl. Bikes (#/hr)               |       |       | 2    |      |                           |       |      | 1    |       |      |      |      |
| Heavy Vehicles (%)                | 1%    | 0%    | 1%   | 0%   | 2%                        | 0%    | 1%   | 1%   | 0%    | 0%   | 6%   | 0%   |
| Bus Blockages (#/hr)              | 0     | 0     | 0    | 0    | 0                         | 0     | 2    | 2    | 2     | 2    | 2    | 2    |
| Parking (#/hr)                    | 2     | 2     | 2    | 2    | 2                         | 2     | 2    | 2    | 2     | 2    | 2    | 2    |
| Turn Type                         | Perm  | NA    | Over | Perm | NA                        |       | Prot | NA   |       | Perm | NA   | Perm |
| Protected Phases                  |       | 4     | 5    |      | 8                         |       | 5    | 2    |       |      | 6    |      |
| Permitted Phases                  | 4     |       |      | 8    |                           |       |      |      | 6     |      | 6    |      |
| Actuated Green, G (s)             | 23.4  | 22.2  |      | 23.4 |                           | 22.2  | 44.6 |      |       | 18.9 | 18.9 |      |
| Effective Green, g (s)            | 22.9  | 21.7  |      | 22.9 |                           | 21.7  | 44.1 |      |       | 18.4 | 18.9 |      |
| Actuated g/C Ratio                | 0.31  | 0.29  |      | 0.31 |                           | 0.29  | 0.59 |      |       | 0.25 | 0.25 |      |
| Clearance Time (s)                | 3.5   | 3.5   |      | 3.5  |                           | 3.5   | 3.5  |      |       | 3.5  | 3.5  |      |
| Vehicle Extension (s)             | 3.0   | 3.0   |      | 3.0  |                           | 3.0   | 3.0  |      |       | 3.0  | 3.0  |      |
| Lane Grp Cap (vph)                | 337   | 352   |      | 429  |                           | 410   | 875  |      |       | 347  | 297  |      |
| v/s Ratio Prot                    |       | 0.05  |      |      |                           | c0.25 | 0.20 |      |       |      |      |      |
| v/s Ratio Perm                    |       | c0.15 |      | 0.06 |                           |       |      |      | c0.21 | 0.02 |      |      |
| v/c Ratio                         | 0.49  | 0.18  |      | 0.20 |                           | 0.88  | 0.34 |      |       | 0.86 | 0.07 |      |
| Uniform Delay, d1                 | 21.3  | 20.0  |      | 19.3 |                           | 25.4  | 7.9  |      |       | 27.1 | 21.4 |      |
| Progression Factor                | 1.20  | 1.83  |      | 1.00 |                           | 1.00  | 1.00 |      |       | 0.81 | 0.51 |      |
| Incremental Delay, d2             | 4.9   | 0.2   |      | 0.2  |                           | 18.7  | 0.2  |      |       | 19.1 | 0.1  |      |
| Delay (s)                         | 30.5  | 36.8  |      | 19.5 |                           | 44.1  | 8.2  |      |       | 41.1 | 11.1 |      |
| Level of Service                  | C     | D     |      | B    |                           | D     | A    |      |       | D    | B    |      |
| Approach Delay (s)                | 34.0  |       |      | 19.5 |                           |       | 27.8 |      |       | 34.4 |      |      |
| Approach LOS                      | C     |       |      | B    |                           |       | C    |      |       | C    |      |      |
| Intersection Summary              |       |       |      |      |                           |       |      |      |       |      |      |      |
| HCM 2000 Control Delay            | 30.5  |       |      |      | HCM 2000 Level of Service |       | C    |      |       |      |      |      |
| HCM 2000 Volume to Capacity ratio | 0.73  |       |      |      |                           |       |      |      |       |      |      |      |
| Actuated Cycle Length (s)         | 75.0  |       |      |      | Sum of lost time (s)      |       | 12.0 |      |       |      |      |      |
| Intersection Capacity Utilization | 66.4% |       |      |      | ICU Level of Service      |       | C    |      |       |      |      |      |
| Analysis Period (min)             | 15    |       |      |      |                           |       |      |      |       |      |      |      |

c Critical Lane Group



**APPENDIX B11**  
Segment A – PM LPA HCM Results



# HCM Signalized Intersection Capacity Analysis

12: SW 1st Ave & SW Harrison Street

05/12/2020



| Movement               | EBL  | EBT  | EBR  | WBL   | WBT   | WBR  | NBL  | NBT  | NBR   | SBL   | SBT  | SBR  |
|------------------------|------|------|------|-------|-------|------|------|------|-------|-------|------|------|
| Lane Configurations    |      | ↑↑   |      |       | ↑↑    |      | ↑    |      | ↑     | ↑↑    | ↑↑   |      |
| Traffic Volume (vph)   | 0    | 240  | 110  | 25    | 295   | 0    | 125  | 0    | 115   | 230   | 570  | 110  |
| Future Volume (vph)    | 0    | 240  | 110  | 25    | 295   | 0    | 125  | 0    | 115   | 230   | 570  | 110  |
| Ideal Flow (vphpl)     | 1750 | 1750 | 1750 | 1750  | 1750  | 1750 | 1750 | 1750 | 1750  | 1750  | 1750 | 1750 |
| Grade (%)              | -3%  |      |      |       | 3%    |      |      |      | 0%    |       |      | 0%   |
| 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 |      | 1.00  | 1.00  |      | 0.95 |
| Frpb, ped/bikes        | 0.98 |      |      |       | 1.00  |      | 1.00 |      | 0.90  | 1.00  |      | 0.99 |
| Flpb, ped/bikes        | 1.00 |      |      |       | 1.00  |      | 1.00 |      | 1.00  | 1.00  |      | 1.00 |
| Fr <sub>t</sub>        | 0.95 |      |      |       | 1.00  |      | 1.00 |      | 0.85  | 1.00  |      | 0.98 |
| Flt Protected          | 1.00 |      |      |       | 1.00  |      | 0.95 |      | 1.00  | 0.95  |      | 1.00 |
| Satd. Flow (prot)      | 2619 |      |      |       | 2827  |      | 1312 |      | 1194  | 1496  |      | 2859 |
| Flt Permitted          | 1.00 |      |      |       | 0.91  |      | 0.95 |      | 1.00  | 0.95  |      | 1.00 |
| Satd. Flow (perm)      | 2619 |      |      |       | 2593  |      | 1312 |      | 1194  | 1496  |      | 2859 |
| Peak-hour factor, PHF  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  | 1.00 | 1.00 |
| Adj. Flow (vph)        | 0    | 240  | 110  | 25    | 295   | 0    | 125  | 0    | 115   | 230   | 570  | 110  |
| RTOR Reduction (vph)   | 0    | 56   | 0    | 0     | 0     | 0    | 0    | 0    | 99    | 0     | 19   | 0    |
| Lane Group Flow (vph)  | 0    | 294  | 0    | 0     | 320   | 0    | 125  | 0    | 16    | 230   | 661  | 0    |
| Confl. Peds. (#/hr)    | 44   |      | 39   | 39    |       | 44   | 42   |      | 42    | 42    |      | 42   |
| Confl. Bikes (#/hr)    |      |      | 35   |       |       | 1    |      |      |       |       |      | 16   |
| Heavy Vehicles (%)     | 0%   | 10%  | 4%   | 0%    | 4%    | 0%   | 14%  | 0%   | 1%    | 0%    | 1%   | 2%   |
| Turn Type              | NA   |      | Perm | NA    |       | Prot |      | Perm | Split | NA    |      |      |
| Protected Phases       | 8    |      |      | 4     |       | 1    |      |      | 2     | 2     |      |      |
| Permitted Phases       |      |      | 4    |       |       |      |      | 1    |       |       |      |      |
| Actuated Green, G (s)  | 22.1 |      |      | 22.1  |       | 9.4  |      | 9.4  | 22.8  | 22.8  |      |      |
| Effective Green, g (s) | 22.1 |      |      | 22.1  |       | 9.4  |      | 9.4  | 22.8  | 22.8  |      |      |
| Actuated g/C Ratio     | 0.33 |      |      | 0.33  |       | 0.14 |      | 0.14 | 0.34  | 0.34  |      |      |
| Clearance Time (s)     | 4.0  |      |      | 4.0   |       | 4.0  |      | 4.0  | 4.0   | 4.0   |      |      |
| Vehicle Extension (s)  | 0.2  |      |      | 2.0   |       | 0.2  |      | 0.2  | 0.2   | 0.2   |      |      |
| Lane Grp Cap (vph)     | 873  |      |      | 864   |       | 186  |      | 169  | 514   | 983   |      |      |
| v/s Ratio Prot         | 0.11 |      |      |       | c0.10 |      |      |      | 0.15  | c0.23 |      |      |
| v/s Ratio Perm         |      |      |      | c0.12 |       |      |      | 0.01 |       |       |      |      |
| v/c Ratio              | 0.34 |      |      | 0.37  |       | 0.67 |      | 0.10 | 0.45  | 0.67  |      |      |
| Uniform Delay, d1      | 16.6 |      |      | 16.8  |       | 27.0 |      | 24.8 | 16.9  | 18.6  |      |      |
| Progression Factor     | 1.00 |      |      | 1.00  |       | 1.00 |      | 1.00 | 1.00  | 1.00  |      |      |
| Incremental Delay, d2  | 0.1  |      |      | 0.1   |       | 7.3  |      | 0.1  | 0.2   | 1.4   |      |      |
| Delay (s)              | 16.7 |      |      | 16.9  |       | 34.3 |      | 24.8 | 17.1  | 20.0  |      |      |
| Level of Service       | B    |      |      | B     |       | C    |      | C    | B     | B     |      |      |
| Approach Delay (s)     | 16.7 |      |      | 16.9  |       |      | 29.8 |      |       | 19.3  |      |      |
| Approach LOS           | B    |      |      | B     |       |      | C    |      |       | B     |      |      |

## Intersection Summary

|                                   |       |                           |      |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay            | 19.7  | HCM 2000 Level of Service | B    |
| HCM 2000 Volume to Capacity ratio | 0.55  |                           |      |
| Actuated Cycle Length (s)         | 66.3  | Sum of lost time (s)      | 12.0 |
| Intersection Capacity Utilization | 75.1% | ICU Level of Service      | D    |
| Analysis Period (min)             | 15    |                           |      |

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

13: SW Naito Parkway & SW Harrison Street

05/12/2020

| Movement                          | EBL  | EBT   | EBC  | WBL   | WBT  | WBR  | NBL                       | NBT  | NBR  | SBL  | SBT   | SBR  |
|-----------------------------------|------|-------|------|-------|------|------|---------------------------|------|------|------|-------|------|
| Lane Configurations               | ↑    | ↑     | ↑    | ↑     | ↑    | ↑    | ↑                         | ↑    | ↑    | ↑    | ↑↑    | ↑↑   |
| Traffic Volume (vph)              | 150  | 150   | 285  | 150   | 70   | 10   | 200                       | 335  | 45   | 0    | 1045  | 50   |
| Future Volume (vph)               | 150  | 150   | 285  | 150   | 70   | 10   | 200                       | 335  | 45   | 0    | 1045  | 50   |
| Ideal Flow (vphpl)                | 1750 | 1750  | 1750 | 1750  | 1750 | 1750 | 1750                      | 1750 | 1750 | 1750 | 1750  | 1750 |
| 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 | 1.00  | 1.00 | 1.00  | 1.00 |      | 1.00                      | 0.95 |      |      | 0.95  |      |
| Frpb, ped/bikes                   | 1.00 | 1.00  | 1.00 | 1.00  | 0.99 |      | 1.00                      | 0.99 |      |      | 1.00  |      |
| Flpb, ped/bikes                   | 1.00 | 1.00  | 1.00 | 1.00  | 1.00 |      | 1.00                      | 1.00 |      |      | 1.00  |      |
| Fr <sub>t</sub>                   | 1.00 | 1.00  | 0.85 | 1.00  | 0.98 |      | 1.00                      | 0.98 |      |      | 0.99  |      |
| Flt Protected                     | 0.95 | 1.00  | 1.00 | 0.95  | 1.00 |      | 0.95                      | 1.00 |      |      | 1.00  |      |
| Satd. Flow (prot)                 | 1481 | 1324  | 1312 | 1481  | 1344 |      | 1453                      | 2816 |      |      | 2898  |      |
| Flt Permitted                     | 0.95 | 1.00  | 1.00 | 0.95  | 1.00 |      | 0.95                      | 1.00 |      |      | 1.00  |      |
| Satd. Flow (perm)                 | 1481 | 1324  | 1312 | 1481  | 1344 |      | 1453                      | 2816 |      |      | 2898  |      |
| Peak-hour factor, PHF             | 1.00 | 1.00  | 1.00 | 1.00  | 1.00 | 1.00 | 1.00                      | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 |
| Adj. Flow (vph)                   | 150  | 150   | 285  | 150   | 70   | 10   | 200                       | 335  | 45   | 0    | 1045  | 50   |
| RTOR Reduction (vph)              | 0    | 0     | 234  | 0     | 6    | 0    | 0                         | 0    | 0    | 0    | 4     | 0    |
| Lane Group Flow (vph)             | 150  | 150   | 51   | 150   | 74   | 0    | 200                       | 380  | 0    | 0    | 1091  | 0    |
| Confl. Peds. (#/hr)               | 39   |       | 26   | 26    |      | 39   | 18                        |      | 11   | 11   |       | 18   |
| Confl. Bikes (#/hr)               |      |       | 20   |       |      | 2    |                           |      | 3    |      |       |      |
| Heavy Vehicles (%)                | 1%   | 19%   | 2%   | 1%    | 16%  | 0%   | 3%                        | 2%   | 5%   | 0%   | 1%    | 0%   |
| Bus Blockages (#/hr)              | 0    | 0     | 0    | 0     | 0    | 0    | 0                         | 7    | 7    | 0    | 7     | 7    |
| Turn Type                         | Prot | NA    | Over | Prot  | NA   |      | Prot                      | NA   |      |      | NA    |      |
| Protected Phases                  | 3    | 8     | 1    | 7     | 4    |      | 1                         | 6    |      |      | 2     |      |
| Permitted Phases                  |      |       |      |       |      |      |                           |      |      |      |       |      |
| Actuated Green, G (s)             | 11.8 | 15.9  | 17.0 | 10.0  | 13.8 |      | 17.0                      | 52.2 |      |      | 32.5  |      |
| Effective Green, g (s)            | 10.8 | 15.9  | 16.0 | 9.0   | 14.1 |      | 16.0                      | 53.1 |      |      | 33.1  |      |
| Actuated g/C Ratio                | 0.12 | 0.18  | 0.18 | 0.10  | 0.16 |      | 0.18                      | 0.59 |      |      | 0.37  |      |
| Clearance Time (s)                | 3.0  | 4.0   | 3.0  | 3.0   | 4.3  |      | 3.0                       | 4.9  |      |      | 4.6   |      |
| Vehicle Extension (s)             | 3.0  | 3.0   | 3.0  | 3.0   | 3.0  |      | 3.0                       | 3.0  |      |      | 3.0   |      |
| Lane Grp Cap (vph)                | 177  | 233   | 233  | 148   | 210  |      | 258                       | 1661 |      |      | 1065  |      |
| v/s Ratio Prot                    | 0.10 | c0.11 | 0.04 | c0.10 | 0.06 |      | c0.14                     | 0.13 |      |      | c0.38 |      |
| v/s Ratio Perm                    |      |       |      |       |      |      |                           |      |      |      |       |      |
| v/c Ratio                         | 0.85 | 0.64  | 0.22 | 1.01  | 0.35 |      | 0.78                      | 0.23 |      |      | 1.02  |      |
| Uniform Delay, d1                 | 38.8 | 34.4  | 31.6 | 40.5  | 33.9 |      | 35.3                      | 8.7  |      |      | 28.4  |      |
| Progression Factor                | 1.00 | 1.00  | 1.00 | 1.00  | 1.00 |      | 0.92                      | 0.67 |      |      | 1.00  |      |
| Incremental Delay, d2             | 29.4 | 6.0   | 0.5  | 77.6  | 1.0  |      | 13.4                      | 0.3  |      |      | 34.0  |      |
| Delay (s)                         | 68.2 | 40.4  | 32.1 | 118.1 | 34.9 |      | 45.9                      | 6.2  |      |      | 62.4  |      |
| Level of Service                  | E    | D     | C    | F     | C    |      | D                         | A    |      |      | E     |      |
| Approach Delay (s)                |      | 43.5  |      |       | 89.1 |      |                           | 19.9 |      |      | 62.4  |      |
| Approach LOS                      |      | D     |      |       | F    |      |                           | B    |      |      | E     |      |
| Intersection Summary              |      |       |      |       |      |      |                           |      |      |      |       |      |
| HCM 2000 Control Delay            |      |       |      | 50.5  |      |      | HCM 2000 Level of Service |      |      | D    |       |      |
| HCM 2000 Volume to Capacity ratio |      |       |      | 0.89  |      |      |                           |      |      |      |       |      |
| Actuated Cycle Length (s)         |      |       |      | 90.0  |      |      | Sum of lost time (s)      |      |      | 16.0 |       |      |
| Intersection Capacity Utilization |      |       |      | 87.2% |      |      | ICU Level of Service      |      |      | E    |       |      |
| Analysis Period (min)             |      |       |      | 15    |      |      |                           |      |      |      |       |      |
| c Critical Lane Group             |      |       |      |       |      |      |                           |      |      |      |       |      |

# HCM Signalized Intersection Capacity Analysis

21: 4th Ave & Hall

05/12/2020



| Movement               | EBL   | EBR  | NBL  | NBT   | SBT  | SBR  |
|------------------------|-------|------|------|-------|------|------|
| Lane Configurations    | ↑     |      | ↑    | ↑↑    |      |      |
| Traffic Volume (vph)   | 75    | 0    | 50   | 755   | 0    | 0    |
| Future Volume (vph)    | 75    | 0    | 50   | 755   | 0    | 0    |
| Ideal Flow (vphpl)     | 1750  | 1750 | 1750 | 1750  | 1750 | 1750 |
| Total Lost time (s)    | 4.0   |      |      | 4.0   |      |      |
| Lane Util. Factor      | 1.00  |      |      | 1.00  |      | 0.95 |
| Frpb, ped/bikes        | 1.00  |      |      | 1.00  |      |      |
| Flpb, ped/bikes        | 1.00  |      |      | 1.00  |      |      |
| Fr <sub>t</sub>        | 1.00  |      |      | 1.00  |      |      |
| Flt Protected          | 0.95  |      |      | 0.95  |      | 1.00 |
| Satd. Flow (prot)      | 1271  |      |      | 1119  |      | 2698 |
| Flt Permitted          | 0.95  |      |      | 0.95  |      | 1.00 |
| Satd. Flow (perm)      | 1271  |      |      | 1119  |      | 2698 |
| Peak-hour factor, PHF  | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 |
| Adj. Flow (vph)        | 75    | 0    | 50   | 755   | 0    | 0    |
| RTOR Reduction (vph)   | 0     | 0    | 0    | 0     | 0    | 0    |
| Lane Group Flow (vph)  | 75    | 0    | 50   | 755   | 0    | 0    |
| Confl. Peds. (#/hr)    | 208   | 1    |      |       |      |      |
| Confl. Bikes (#/hr)    |       | 2    |      |       |      |      |
| Heavy Vehicles (%)     | 3%    | 0%   | 17%  | 4%    | 0%   | 0%   |
| Parking (#/hr)         | 5     |      | 5    | 5     |      |      |
| Turn Type              | Prot  |      | Perm | NA    |      |      |
| Protected Phases       | 2     |      |      | 4     |      |      |
| Permitted Phases       |       |      | 4    |       |      |      |
| Actuated Green, G (s)  | 29.9  |      | 21.5 | 21.5  |      |      |
| Effective Green, g (s) | 30.5  |      | 21.5 | 21.5  |      |      |
| Actuated g/C Ratio     | 0.51  |      | 0.36 | 0.36  |      |      |
| Clearance Time (s)     | 4.6   |      | 4.0  | 4.0   |      |      |
| Vehicle Extension (s)  | 0.2   |      | 0.2  | 0.2   |      |      |
| Lane Grp Cap (vph)     | 646   |      | 400  | 966   |      |      |
| v/s Ratio Prot         | c0.06 |      |      | c0.28 |      |      |
| v/s Ratio Perm         |       |      | 0.04 |       |      |      |
| v/c Ratio              | 0.12  |      | 0.12 | 0.78  |      |      |
| Uniform Delay, d1      | 7.7   |      | 12.9 | 17.2  |      |      |
| Progression Factor     | 1.00  |      | 1.45 | 1.40  |      |      |
| Incremental Delay, d2  | 0.4   |      | 0.0  | 3.5   |      |      |
| Delay (s)              | 8.1   |      | 18.8 | 27.4  |      |      |
| Level of Service       | A     |      | B    | C     |      |      |
| Approach Delay (s)     | 8.1   |      |      | 26.9  | 0.0  |      |
| Approach LOS           | A     |      |      | C     | A    |      |

## Intersection Summary

|                                   |       |                           |     |
|-----------------------------------|-------|---------------------------|-----|
| HCM 2000 Control Delay            | 25.3  | HCM 2000 Level of Service | C   |
| HCM 2000 Volume to Capacity ratio | 0.39  |                           |     |
| Actuated Cycle Length (s)         | 60.0  | Sum of lost time (s)      | 8.0 |
| Intersection Capacity Utilization | 46.0% | ICU Level of Service      | A   |
| Analysis Period (min)             | 15    |                           |     |

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

23: 6th Ave & College St

05/12/2020



| Movement               | EBL  | EBT  | EBR  | WBL   | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|------------------------|------|------|------|-------|------|------|------|------|------|------|------|------|
| Lane Configurations    |      |      |      |       |      |      |      |      |      |      |      |      |
| Traffic Volume (vph)   | 35   | 55   | 0    | 0     | 80   | 40   | 130  | 670  | 0    | 0    | 0    | 0    |
| Future Volume (vph)    | 35   | 55   | 0    | 0     | 80   | 40   | 130  | 670  | 0    | 0    | 0    | 0    |
| Ideal Flow (vphpl)     | 1750 | 1750 | 1750 | 1750  | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time (s)    |      |      |      |       | 4.0  |      |      |      | 4.0  |      |      |      |
| Lane Util. Factor      |      | 1.00 |      |       |      | 1.00 |      |      | 0.91 |      |      |      |
| Frpb, ped/bikes        |      | 1.00 |      |       |      | 0.93 |      |      | 1.00 |      |      |      |
| Flpb, ped/bikes        |      | 0.93 |      |       |      | 1.00 |      |      | 0.92 |      |      |      |
| Fr <sub>t</sub>        |      | 1.00 |      |       |      | 0.95 |      |      | 1.00 |      |      |      |
| Flt Protected          |      | 0.98 |      |       |      | 1.00 |      |      | 0.99 |      |      |      |
| Satd. Flow (prot)      |      | 1246 |      |       |      | 1221 |      |      | 3683 |      |      |      |
| Flt Permitted          |      | 0.87 |      |       |      | 1.00 |      |      | 0.99 |      |      |      |
| Satd. Flow (perm)      |      | 1103 |      |       |      | 1221 |      |      | 3683 |      |      |      |
| Peak-hour factor, PHF  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph)        | 35   | 55   | 0    | 0     | 80   | 40   | 130  | 670  | 0    | 0    | 0    | 0    |
| RTOR Reduction (vph)   | 0    | 0    | 0    | 0     | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Lane Group Flow (vph)  | 0    | 90   | 0    | 0     | 120  | 0    | 0    | 800  | 0    | 0    | 0    | 0    |
| Confl. Peds. (#/hr)    | 205  |      |      |       | 393  |      | 205  | 238  |      | 231  |      | 238  |
| Confl. Bikes (#/hr)    |      |      |      |       |      |      | 5    |      |      | 51   |      |      |
| Heavy Vehicles (%)     | 3%   | 0%   | 2%   | 0%    | 0%   | 0%   | 3%   | 7%   | 0%   | 2%   | 0%   | 0%   |
| Parking (#/hr)         | 5    | 5    |      |       | 5    | 5    |      |      |      |      |      |      |
| Turn Type              | Perm | NA   |      |       | NA   |      | Perm | NA   |      |      |      |      |
| Protected Phases       |      | 4    |      |       |      | 4    |      |      | 2    |      |      |      |
| Permitted Phases       | 4    |      |      |       |      |      | 2    |      |      |      |      |      |
| Actuated Green, G (s)  |      | 14.4 |      |       |      | 14.4 |      |      | 37.0 |      |      |      |
| Effective Green, g (s) |      | 14.4 |      |       |      | 14.4 |      |      | 37.6 |      |      |      |
| Actuated g/C Ratio     |      | 0.24 |      |       |      | 0.24 |      |      | 0.63 |      |      |      |
| Clearance Time (s)     |      | 4.0  |      |       |      | 4.0  |      |      | 4.6  |      |      |      |
| Vehicle Extension (s)  |      | 0.2  |      |       |      | 0.2  |      |      | 0.2  |      |      |      |
| Lane Grp Cap (vph)     | 264  |      |      |       | 293  |      |      | 2308 |      |      |      |      |
| v/s Ratio Prot         |      |      |      | c0.10 |      |      |      |      |      |      |      |      |
| v/s Ratio Perm         |      | 0.08 |      |       |      |      |      | 0.22 |      |      |      |      |
| v/c Ratio              |      | 0.34 |      |       |      | 0.41 |      |      | 0.35 |      |      |      |
| Uniform Delay, d1      |      | 18.9 |      |       |      | 19.2 |      |      | 5.3  |      |      |      |
| Progression Factor     |      | 1.00 |      |       |      | 0.52 |      |      | 1.75 |      |      |      |
| Incremental Delay, d2  |      | 0.3  |      |       |      | 0.3  |      |      | 0.3  |      |      |      |
| Delay (s)              |      | 19.2 |      |       |      | 10.4 |      |      | 9.7  |      |      |      |
| Level of Service       |      | B    |      |       |      | B    |      |      | A    |      |      |      |
| Approach Delay (s)     |      | 19.2 |      |       |      | 10.4 |      |      | 9.7  |      | 0.0  |      |
| Approach LOS           |      | B    |      |       |      | B    |      |      | A    |      | A    |      |

## Intersection Summary

|                                   |       |                           |     |
|-----------------------------------|-------|---------------------------|-----|
| HCM 2000 Control Delay            | 10.6  | HCM 2000 Level of Service | B   |
| HCM 2000 Volume to Capacity ratio | 0.36  |                           |     |
| Actuated Cycle Length (s)         | 60.0  | Sum of lost time (s)      | 8.0 |
| Intersection Capacity Utilization | 42.6% | ICU Level of Service      | A   |
| Analysis Period (min)             | 15    |                           |     |

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

25: 4th Ave & College St

05/12/2020



| Movement               | EBL   | EBR  | NBL  | NBT   | SBT  | SBR  |
|------------------------|-------|------|------|-------|------|------|
| Lane Configurations    |       |      |      |       |      |      |
| Traffic Volume (vph)   | 35    | 0    | 220  | 770   | 0    | 0    |
| Future Volume (vph)    | 35    | 0    | 220  | 770   | 0    | 0    |
| Ideal Flow (vphpl)     | 1750  | 1750 | 1750 | 1750  | 1750 | 1750 |
| Total Lost time (s)    | 4.0   |      | 4.0  | 4.0   |      |      |
| Lane Util. Factor      | 1.00  |      | 1.00 | 0.95  |      |      |
| Frpb, ped/bikes        | 1.00  |      | 1.00 | 1.00  |      |      |
| Flpb, ped/bikes        | 1.00  |      | 0.84 | 1.00  |      |      |
| Fr <sub>t</sub>        | 1.00  |      | 1.00 | 1.00  |      |      |
| Flt Protected          | 0.95  |      | 0.95 | 1.00  |      |      |
| Satd. Flow (prot)      | 1259  |      | 1086 | 2850  |      |      |
| Flt Permitted          | 0.95  |      | 0.95 | 1.00  |      |      |
| Satd. Flow (perm)      | 1259  |      | 1086 | 2850  |      |      |
| Peak-hour factor, PHF  | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 |
| Adj. Flow (vph)        | 35    | 0    | 220  | 770   | 0    | 0    |
| RTOR Reduction (vph)   | 0     | 0    | 0    | 0     | 0    | 0    |
| Lane Group Flow (vph)  | 35    | 0    | 220  | 770   | 0    | 0    |
| Confl. Peds. (#/hr)    | 107   | 178  | 108  |       | 108  |      |
| Confl. Bikes (#/hr)    |       |      | 4    |       |      |      |
| Heavy Vehicles (%)     | 4%    | 0%   | 1%   | 5%    | 0%   | 0%   |
| Parking (#/hr)         | 5     |      | 5    |       |      |      |
| Turn Type              | Prot  |      | Perm | NA    |      |      |
| Protected Phases       | 4     |      |      | 2     |      |      |
| Permitted Phases       |       |      | 2    |       |      |      |
| Actuated Green, G (s)  | 19.0  |      | 32.4 | 32.4  |      |      |
| Effective Green, g (s) | 19.0  |      | 33.0 | 33.0  |      |      |
| Actuated g/C Ratio     | 0.32  |      | 0.55 | 0.55  |      |      |
| Clearance Time (s)     | 4.0   |      | 4.6  | 4.6   |      |      |
| Vehicle Extension (s)  | 3.0   |      | 3.0  | 3.0   |      |      |
| Lane Grp Cap (vph)     | 398   |      | 597  | 1567  |      |      |
| v/s Ratio Prot         | c0.03 |      |      | c0.27 |      |      |
| v/s Ratio Perm         |       |      | 0.20 |       |      |      |
| v/c Ratio              | 0.09  |      | 0.37 | 0.49  |      |      |
| Uniform Delay, d1      | 14.4  |      | 7.6  | 8.3   |      |      |
| Progression Factor     | 0.30  |      | 1.00 | 1.00  |      |      |
| Incremental Delay, d2  | 0.1   |      | 1.7  | 1.1   |      |      |
| Delay (s)              | 4.4   |      | 9.4  | 9.4   |      |      |
| Level of Service       | A     |      | A    | A     |      |      |
| Approach Delay (s)     | 4.4   |      |      | 9.4   | 0.0  |      |
| Approach LOS           | A     |      |      | A     | A    |      |

## Intersection Summary

|                                   |       |                           |     |
|-----------------------------------|-------|---------------------------|-----|
| HCM 2000 Control Delay            | 9.2   | HCM 2000 Level of Service | A   |
| HCM 2000 Volume to Capacity ratio | 0.34  |                           |     |
| Actuated Cycle Length (s)         | 60.0  | Sum of lost time (s)      | 8.0 |
| Intersection Capacity Utilization | 48.2% | ICU Level of Service      | A   |
| Analysis Period (min)             | 15    |                           |     |

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

27: 6th Ave & Jackson St

05/12/2020



| Movement                              | EBL   | EBR   | NBL  | NBT                       | NBR  | SBL  | SBT  | SBR  | NWL  | NWR  |
|---------------------------------------|-------|-------|------|---------------------------|------|------|------|------|------|------|
| Lane Configurations                   |       |       |      |                           |      |      |      |      |      |      |
| Traffic Volume (vph)                  | 80    | 0     | 195  | 405                       | 0    | 0    | 0    | 0    | 0    | 315  |
| Future Volume (vph)                   | 80    | 0     | 195  | 405                       | 0    | 0    | 0    | 0    | 0    | 315  |
| Ideal Flow (vphpl)                    | 1750  | 1750  | 1750 | 1750                      | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time (s)                   | 4.0   |       |      |                           |      |      |      |      |      | 4.0  |
| Lane Util. Factor                     | 1.00  |       |      |                           | 1.00 |      |      |      |      | 1.00 |
| Frpb, ped/bikes                       | 1.00  |       |      |                           | 1.00 |      |      |      |      | 1.00 |
| Flpb, ped/bikes                       | 1.00  |       |      |                           | 0.94 |      |      |      |      | 1.00 |
| Fr <sub>t</sub>                       | 1.00  |       |      |                           | 1.00 |      |      |      |      | 1.00 |
| Flt Protected                         | 0.95  |       |      |                           | 0.98 |      |      |      |      | 1.00 |
| Satd. Flow (prot)                     | 1662  |       |      |                           | 1565 |      |      |      |      | 1716 |
| Flt Permitted                         | 0.95  |       |      |                           | 0.98 |      |      |      |      | 1.00 |
| Satd. Flow (perm)                     | 1662  |       |      |                           | 1565 |      |      |      |      | 1716 |
| Peak-hour factor, PHF                 | 1.00  | 1.00  | 1.00 | 1.00                      | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph)                       | 80    | 0     | 195  | 405                       | 0    | 0    | 0    | 0    | 0    | 315  |
| RTOR Reduction (vph)                  | 0     | 0     | 0    | 0                         | 0    | 0    | 0    | 0    | 0    | 0    |
| Lane Group Flow (vph)                 | 80    | 0     | 0    | 600                       | 0    | 0    | 0    | 0    | 0    | 315  |
| Confl. Peds. (#/hr)                   | 150   |       |      | 100                       |      |      |      |      |      |      |
| Heavy Vehicles (%)                    | 0%    | 2%    | 1%   | 5%                        | 2%   | 2%   | 0%   | 0%   | 2%   | 2%   |
| Turn Type                             | Prot  |       | Perm | NA                        |      |      |      |      |      | Prot |
| Protected Phases                      | 4     |       |      | 2!                        |      |      |      |      |      | 2!   |
| Permitted Phases                      |       |       | 2    |                           |      |      |      |      |      |      |
| Actuated Green, G (s)                 | 22.0  |       |      | 30.0                      |      |      |      |      |      | 30.0 |
| Effective Green, g (s)                | 22.0  |       |      | 30.0                      |      |      |      |      |      | 30.0 |
| Actuated g/C Ratio                    | 0.37  |       |      | 0.50                      |      |      |      |      |      | 0.50 |
| Clearance Time (s)                    | 4.0   |       |      | 4.0                       |      |      |      |      |      | 4.0  |
| Vehicle Extension (s)                 | 3.0   |       |      | 3.0                       |      |      |      |      |      | 3.0  |
| Lane Grp Cap (vph)                    | 609   |       |      | 782                       |      |      |      |      |      | 858  |
| v/s Ratio Prot                        | c0.05 |       |      |                           |      |      |      |      |      | 0.18 |
| v/s Ratio Perm                        |       |       | 0.38 |                           |      |      |      |      |      |      |
| v/c Ratio                             | 0.13  |       | 0.77 |                           |      |      |      |      |      | 0.37 |
| Uniform Delay, d1                     | 12.6  |       | 12.2 |                           |      |      |      |      |      | 9.2  |
| Progression Factor                    | 1.00  |       | 1.00 |                           |      |      |      |      |      | 1.00 |
| Incremental Delay, d2                 | 0.1   |       | 7.1  |                           |      |      |      |      |      | 1.2  |
| Delay (s)                             | 12.7  |       | 19.3 |                           |      |      |      |      |      | 10.4 |
| Level of Service                      | B     |       | B    |                           |      |      |      |      |      | B    |
| Approach Delay (s)                    | 12.7  |       | 19.3 |                           |      | 0.0  |      | 10.4 |      |      |
| Approach LOS                          | B     |       | B    |                           |      | A    |      | B    |      |      |
| <b>Intersection Summary</b>           |       |       |      |                           |      |      |      |      |      |      |
| HCM 2000 Control Delay                |       | 15.9  |      | HCM 2000 Level of Service |      |      |      | B    |      |      |
| HCM 2000 Volume to Capacity ratio     |       | 0.50  |      |                           |      |      |      |      |      |      |
| Actuated Cycle Length (s)             |       | 60.0  |      | Sum of lost time (s)      |      |      |      | 8.0  |      |      |
| Intersection Capacity Utilization     |       | 62.7% |      | ICU Level of Service      |      |      |      | B    |      |      |
| Analysis Period (min)                 |       | 15    |      |                           |      |      |      |      |      |      |
| ! Phase conflict between lane groups. |       |       |      |                           |      |      |      |      |      |      |
| c Critical Lane Group                 |       |       |      |                           |      |      |      |      |      |      |

# HCM Signalized Intersection Capacity Analysis

31: 4th Ave & I-405 WB Off Ramp & Lincoln St

05/12/2020



| Movement                              | EBL   | EBT  | WBT   | WBR  | NBL                       | NBT  | NWR   | NWR2 |
|---------------------------------------|-------|------|-------|------|---------------------------|------|-------|------|
| Lane Configurations                   | ↑ ↗   | ↑ ↘  | ↗ ↖   |      |                           | ↖ ↗  | ↖ ↘   | ↖ ↘  |
| Traffic Volume (vph)                  | 30    | 95   | 30    | 200  | 45                        | 620  | 150   | 195  |
| Future Volume (vph)                   | 30    | 95   | 30    | 200  | 45                        | 620  | 150   | 195  |
| Ideal Flow (vphpl)                    | 1750  | 1750 | 1750  | 1750 | 1750                      | 1750 | 1750  | 1750 |
| Total Lost time (s)                   | 3.0   | 4.0  | 4.0   |      |                           | 4.0  | 4.0   | 4.0  |
| Lane Util. Factor                     | 1.00  | 1.00 | 1.00  |      |                           | 0.95 | 1.00  | 1.00 |
| Frt                                   | 1.00  | 1.00 | 0.88  |      |                           | 1.00 | 1.00  | 0.85 |
| Flt Protected                         | 0.95  | 1.00 | 1.00  |      |                           | 1.00 | 1.00  | 1.00 |
| Satd. Flow (prot)                     | 1496  | 1575 | 1390  |      |                           | 2982 | 1514  | 1287 |
| Flt Permitted                         | 0.95  | 1.00 | 1.00  |      |                           | 1.00 | 1.00  | 1.00 |
| Satd. Flow (perm)                     | 1496  | 1575 | 1390  |      |                           | 2982 | 1514  | 1287 |
| Peak-hour factor, PHF                 | 1.00  | 1.00 | 1.00  | 1.00 | 1.00                      | 1.00 | 1.00  | 1.00 |
| Adj. Flow (vph)                       | 30    | 95   | 30    | 200  | 45                        | 620  | 150   | 195  |
| RTOR Reduction (vph)                  | 0     | 0    | 0     | 0    | 0                         | 0    | 0     | 0    |
| Lane Group Flow (vph)                 | 30    | 95   | 230   | 0    | 0                         | 665  | 150   | 195  |
| Heavy Vehicles (%)                    | 0%    | 0%   | 0%    | 0%   | 0%                        | 0%   | 4%    | 4%   |
| Turn Type                             | Prot  | NA   | NA    |      | Perm                      | NA   | Prot  | Prot |
| Protected Phases                      | 7     | 4    | 8     |      |                           | 2!   | 2!    | 5    |
| Permitted Phases                      |       |      |       |      | 2                         |      |       |      |
| Actuated Green, G (s)                 | 1.7   | 26.3 | 21.6  |      |                           | 44.0 | 44.0  | 13.5 |
| Effective Green, g (s)                | 1.7   | 26.3 | 21.6  |      |                           | 44.0 | 44.0  | 13.5 |
| Actuated g/C Ratio                    | 0.02  | 0.34 | 0.28  |      |                           | 0.56 | 0.56  | 0.17 |
| Clearance Time (s)                    | 3.0   | 4.0  | 4.0   |      |                           | 4.0  | 4.0   | 4.0  |
| Vehicle Extension (s)                 | 3.0   | 2.0  | 2.0   |      |                           | 0.2  | 0.2   | 3.0  |
| Lane Grp Cap (vph)                    | 32    | 529  | 383   |      |                           | 1675 | 850   | 221  |
| v/s Ratio Prot                        | c0.02 | 0.06 | c0.17 |      |                           | 0.10 | c0.15 |      |
| v/s Ratio Perm                        |       |      |       |      | 0.22                      |      |       |      |
| v/c Ratio                             | 0.94  | 0.18 | 0.60  |      |                           | 0.40 | 0.18  | 0.88 |
| Uniform Delay, d1                     | 38.2  | 18.4 | 24.6  |      |                           | 9.7  | 8.3   | 31.6 |
| Progression Factor                    | 1.00  | 1.00 | 1.00  |      |                           | 1.00 | 1.00  | 1.00 |
| Incremental Delay, d2                 | 131.8 | 0.1  | 1.8   |      |                           | 0.1  | 0.0   | 31.1 |
| Delay (s)                             | 170.0 | 18.4 | 26.4  |      |                           | 9.7  | 8.4   | 62.7 |
| Level of Service                      | F     | B    | C     |      |                           | A    | A     | E    |
| Approach Delay (s)                    |       | 54.8 | 26.4  |      |                           | 9.7  |       |      |
| Approach LOS                          |       | D    | C     |      |                           | A    |       |      |
| <b>Intersection Summary</b>           |       |      |       |      |                           |      |       |      |
| HCM 2000 Control Delay                |       |      | 24.1  |      | HCM 2000 Level of Service |      | C     |      |
| HCM 2000 Volume to Capacity ratio     |       |      | 0.62  |      |                           |      |       |      |
| Actuated Cycle Length (s)             |       |      | 78.3  |      | Sum of lost time (s)      |      | 18.0  |      |
| Intersection Capacity Utilization     |       |      | 72.4% |      | ICU Level of Service      |      | C     |      |
| Analysis Period (min)                 |       |      | 15    |      |                           |      |       |      |
| ! Phase conflict between lane groups. |       |      |       |      |                           |      |       |      |
| c Critical Lane Group                 |       |      |       |      |                           |      |       |      |

HCM Signalized Intersection Capacity Analysis  
34: SW 1st Avenue/SW 1st Ave & SW Lincoln Street/SW Lincoln St

05/12/2020

| Movement                          | EBL   | EBT   | EBR  | WBL  | WBT                       | WBR  | NBL   | NBT  | NBR  | SBL  | SBT   | SBR  |
|-----------------------------------|-------|-------|------|------|---------------------------|------|-------|------|------|------|-------|------|
| Lane Configurations               | ↑     | ↑↑↓   |      |      | ↑                         |      | ↑     | ↑↑   |      |      | ↑↑↓   |      |
| Traffic Volume (vph)              | 85    | 5     | 190  | 0    | 5                         | 0    | 100   | 230  | 0    | 0    | 660   | 75   |
| Future Volume (vph)               | 85    | 5     | 190  | 0    | 5                         | 0    | 100   | 230  | 0    | 0    | 660   | 75   |
| Ideal Flow (vphpl)                | 1750  | 1750  | 1750 | 1750 | 1750                      | 1750 | 1750  | 1750 | 1750 | 1750 | 1750  | 1750 |
| Total Lost time (s)               | 4.0   | 4.0   |      |      | 4.0                       |      | 4.0   | 4.0  |      |      | 4.0   |      |
| Lane Util. Factor                 | 1.00  | 0.95  |      |      | 1.00                      |      | 1.00  | 0.95 |      |      | 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  |      |
| Fr <sub>t</sub>                   | 1.00  | 0.85  |      |      | 1.00                      |      | 1.00  | 1.00 |      |      | 0.98  |      |
| Flt Protected                     | 0.95  | 1.00  |      |      | 1.00                      |      | 0.95  | 1.00 |      |      | 1.00  |      |
| Satd. Flow (prot)                 | 1453  | 2337  |      |      | 788                       |      | 1467  | 2877 |      |      | 2882  |      |
| Flt Permitted                     | 0.95  | 1.00  |      |      | 1.00                      |      | 0.95  | 1.00 |      |      | 1.00  |      |
| Satd. Flow (perm)                 | 1453  | 2337  |      |      | 788                       |      | 1467  | 2877 |      |      | 2882  |      |
| Peak-hour factor, PHF             | 1.00  | 1.00  | 1.00 | 1.00 | 1.00                      | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 |
| Adj. Flow (vph)                   | 85    | 5     | 190  | 0    | 5                         | 0    | 100   | 230  | 0    | 0    | 660   | 75   |
| RTOR Reduction (vph)              | 0     | 0     | 0    | 0    | 0                         | 0    | 0     | 0    | 0    | 0    | 0     | 0    |
| Lane Group Flow (vph)             | 85    | 195   | 0    | 0    | 5                         | 0    | 100   | 230  | 0    | 0    | 735   | 0    |
| Confl. Peds. (#/hr)               | 15    |       | 18   | 18   |                           | 15   | 11    |      | 28   | 28   |       | 11   |
| Confl. Bikes (#/hr)               |       |       | 17   |      |                           |      |       |      | 10   |      |       | 6    |
| Heavy Vehicles (%)                | 3%    | 100%  | 2%   | 100% | 100%                      | 0%   | 2%    | 4%   | 0%   | 0%   | 2%    | 0%   |
| Turn Type                         | Prot  | NA    |      |      | NA                        |      | Prot  | NA   |      |      | NA    |      |
| Protected Phases                  | 7     | 4     |      |      | 8                         |      | 1     | 6    |      |      | 2     |      |
| Permitted Phases                  |       |       |      |      |                           |      |       |      |      |      |       |      |
| Actuated Green, G (s)             | 7.8   | 20.4  |      |      | 8.6                       |      | 9.2   | 56.7 |      |      | 43.5  |      |
| Effective Green, g (s)            | 7.8   | 20.4  |      |      | 8.6                       |      | 9.2   | 56.7 |      |      | 43.5  |      |
| Actuated g/C Ratio                | 0.09  | 0.24  |      |      | 0.10                      |      | 0.11  | 0.67 |      |      | 0.51  |      |
| Clearance Time (s)                | 4.0   | 4.0   |      |      | 4.0                       |      | 4.0   | 4.0  |      |      | 4.0   |      |
| Vehicle Extension (s)             | 0.5   | 2.0   |      |      | 2.0                       |      | 3.0   | 2.0  |      |      | 2.0   |      |
| Lane Grp Cap (vph)                | 133   | 560   |      |      | 79                        |      | 158   | 1916 |      |      | 1473  |      |
| v/s Ratio Prot                    | c0.06 | c0.08 |      |      | 0.01                      |      | c0.07 | 0.08 |      |      | c0.26 |      |
| v/s Ratio Perm                    |       |       |      |      |                           |      |       |      |      |      |       |      |
| v/c Ratio                         | 0.64  | 0.35  |      |      | 0.06                      |      | 0.63  | 0.12 |      |      | 0.50  |      |
| Uniform Delay, d1                 | 37.3  | 26.8  |      |      | 34.6                      |      | 36.3  | 5.2  |      |      | 13.6  |      |
| Progression Factor                | 1.00  | 1.00  |      |      | 1.00                      |      | 1.00  | 1.00 |      |      | 1.00  |      |
| Incremental Delay, d2             | 7.2   | 0.1   |      |      | 0.1                       |      | 8.0   | 0.1  |      |      | 1.2   |      |
| Delay (s)                         | 44.5  | 27.0  |      |      | 34.7                      |      | 44.4  | 5.3  |      |      | 14.9  |      |
| Level of Service                  | D     | C     |      |      | C                         |      | D     | A    |      |      | B     |      |
| Approach Delay (s)                |       | 32.3  |      |      | 34.7                      |      |       | 17.1 |      |      | 14.9  |      |
| Approach LOS                      |       | C     |      |      | C                         |      |       | B    |      |      | B     |      |
| <b>Intersection Summary</b>       |       |       |      |      |                           |      |       |      |      |      |       |      |
| HCM 2000 Control Delay            |       | 19.1  |      |      | HCM 2000 Level of Service |      |       | B    |      |      |       |      |
| HCM 2000 Volume to Capacity ratio |       | 0.53  |      |      |                           |      |       |      |      |      |       |      |
| Actuated Cycle Length (s)         |       | 85.1  |      |      | Sum of lost time (s)      |      |       | 16.0 |      |      |       |      |
| Intersection Capacity Utilization |       | 57.9% |      |      | ICU Level of Service      |      |       | B    |      |      |       |      |
| Analysis Period (min)             |       | 15    |      |      |                           |      |       |      |      |      |       |      |
| c Critical Lane Group             |       |       |      |      |                           |      |       |      |      |      |       |      |

# HCM Signalized Intersection Capacity Analysis

35: SW Naito Parkway & SW Lincoln St

05/12/2020



| Movement                          | EBL   | EBT  | EBR  | WBL  | WBT                       | WBR  | NBL  | NBT  | NBR  | SBL  | SBT   | SBR  |
|-----------------------------------|-------|------|------|------|---------------------------|------|------|------|------|------|-------|------|
| Lane Configurations               |       | ↑    |      |      | ↑                         |      |      | ↑↑   |      |      | ↑↑    |      |
| Traffic Volume (vph)              | 0     | 5    | 0    | 0    | 5                         | 0    | 0    | 585  | 0    | 0    | 1475  | 0    |
| Future Volume (vph)               | 0     | 5    | 0    | 0    | 5                         | 0    | 0    | 585  | 0    | 0    | 1475  | 0    |
| Ideal Flow (vphpl)                | 1750  | 1750 | 1750 | 1750 | 1750                      | 1750 | 1750 | 1750 | 1750 | 1750 | 1750  | 1750 |
| Total Lost time (s)               |       | 3.0  |      |      |                           | 4.0  |      |      | 4.0  |      |       | 4.0  |
| Lane Util. Factor                 | 1.00  |      |      |      | 1.00                      |      |      | 0.95 |      |      | 0.95  |      |
| Frpb, ped/bikes                   | 1.00  |      |      |      | 1.00                      |      |      | 1.00 |      |      | 1.00  |      |
| Flpb, ped/bikes                   | 1.00  |      |      |      | 1.00                      |      |      | 1.00 |      |      | 1.00  |      |
| Fr <sub>t</sub>                   | 1.00  |      |      |      | 1.00                      |      |      | 1.00 |      |      | 1.00  |      |
| Flt Protected                     | 1.00  |      |      |      | 1.00                      |      |      | 1.00 |      |      | 1.00  |      |
| Satd. Flow (prot)                 | 788   |      |      |      | 788                       |      |      | 2905 |      |      | 2963  |      |
| Flt Permitted                     | 1.00  |      |      |      | 1.00                      |      |      | 1.00 |      |      | 1.00  |      |
| Satd. Flow (perm)                 | 788   |      |      |      | 788                       |      |      | 2905 |      |      | 2963  |      |
| Peak-hour factor, PHF             | 1.00  | 1.00 | 1.00 | 1.00 | 1.00                      | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 |
| Adj. Flow (vph)                   | 0     | 5    | 0    | 0    | 5                         | 0    | 0    | 585  | 0    | 0    | 1475  | 0    |
| RTOR Reduction (vph)              | 0     | 0    | 0    | 0    | 0                         | 0    | 0    | 0    | 0    | 0    | 0     | 0    |
| Lane Group Flow (vph)             | 0     | 5    | 0    | 0    | 5                         | 0    | 0    | 585  | 0    | 0    | 1475  | 0    |
| Confl. Peds. (#/hr)               | 11    |      | 14   | 14   |                           | 11   | 27   |      | 5    | 5    |       | 27   |
| Confl. Bikes (#/hr)               |       |      | 15   |      |                           |      |      |      |      |      |       |      |
| Heavy Vehicles (%)                | 0%    | 100% | 0%   | 0%   | 100%                      | 0%   | 0%   | 3%   | 0%   | 0%   | 1%    | 0%   |
| Turn Type                         |       | NA   |      |      | NA                        |      |      | NA   |      |      | NA    |      |
| Protected Phases                  | 7     | 8    |      |      | 4                         |      |      | 6    |      |      | 2     |      |
| Permitted Phases                  |       |      |      |      |                           |      |      |      |      |      |       |      |
| Actuated Green, G (s)             | 9.0   |      |      |      | 8.0                       |      |      | 74.0 |      |      | 74.0  |      |
| Effective Green, g (s)            | 9.0   |      |      |      | 8.0                       |      |      | 74.0 |      |      | 74.0  |      |
| Actuated g/C Ratio                | 0.10  |      |      |      | 0.09                      |      |      | 0.82 |      |      | 0.82  |      |
| Clearance Time (s)                |       |      |      |      | 4.0                       |      |      | 4.0  |      |      | 4.0   |      |
| Vehicle Extension (s)             |       |      |      |      | 0.5                       |      |      | 0.5  |      |      | 0.5   |      |
| Lane Grp Cap (vph)                | 78    |      |      |      | 70                        |      |      | 2388 |      |      | 2436  |      |
| v/s Ratio Prot                    | c0.01 |      |      |      | 0.01                      |      |      | 0.20 |      |      | c0.50 |      |
| v/s Ratio Perm                    |       |      |      |      |                           |      |      |      |      |      |       |      |
| v/c Ratio                         | 0.06  |      |      |      | 0.07                      |      |      | 0.24 |      |      | 0.61  |      |
| Uniform Delay, d1                 | 36.7  |      |      |      | 37.6                      |      |      | 1.8  |      |      | 2.8   |      |
| Progression Factor                | 1.00  |      |      |      | 1.00                      |      |      | 1.00 |      |      | 2.18  |      |
| Incremental Delay, d2             | 0.1   |      |      |      | 0.2                       |      |      | 0.2  |      |      | 0.4   |      |
| Delay (s)                         | 36.8  |      |      |      | 37.8                      |      |      | 2.0  |      |      | 6.6   |      |
| Level of Service                  | D     |      |      |      | D                         |      |      | A    |      |      | A     |      |
| Approach Delay (s)                | 36.8  |      |      |      | 37.8                      |      |      | 2.0  |      |      | 6.6   |      |
| Approach LOS                      | D     |      |      |      | D                         |      |      | A    |      |      | A     |      |
| <b>Intersection Summary</b>       |       |      |      |      |                           |      |      |      |      |      |       |      |
| HCM 2000 Control Delay            | 5.4   |      |      |      | HCM 2000 Level of Service |      |      | A    |      |      |       |      |
| HCM 2000 Volume to Capacity ratio | 0.58  |      |      |      |                           |      |      |      |      |      |       |      |
| Actuated Cycle Length (s)         | 90.0  |      |      |      | Sum of lost time (s)      |      |      | 12.0 |      |      |       |      |
| Intersection Capacity Utilization | 66.7% |      |      |      | ICU Level of Service      |      |      | C    |      |      |       |      |
| Analysis Period (min)             | 15    |      |      |      |                           |      |      |      |      |      |       |      |
| c Critical Lane Group             |       |      |      |      |                           |      |      |      |      |      |       |      |

HCM Signalized Intersection Capacity Analysis  
 37: Broadway Dr/Broadway Ave & SW Lincoln St & I-405 SB Exit Ramp

05/12/2020



| Movement                          | NBR  | SBL   | SBT                       | SET   | SER  | SER2 |
|-----------------------------------|------|-------|---------------------------|-------|------|------|
| Lane Configurations               |      |       |                           |       |      |      |
| Traffic Volume (vph)              | 145  | 650   | 170                       | 1245  | 120  | 10   |
| Future Volume (vph)               | 145  | 650   | 170                       | 1245  | 120  | 10   |
| Ideal Flow (vphpl)                | 1900 | 1900  | 1900                      | 1900  | 1900 | 1900 |
| Total Lost time (s)               | 4.0  | 4.0   | 4.0                       | 4.0   |      |      |
| Lane Util. Factor                 | 1.00 | 0.91  | 0.91                      | *0.75 |      |      |
| Frt                               | 0.86 | 1.00  | 1.00                      | 0.99  |      |      |
| Flt Protected                     | 1.00 | 0.95  | 0.98                      | 1.00  |      |      |
| Satd. Flow (prot)                 | 1479 | 2957  | 1496                      | 3622  |      |      |
| Flt Permitted                     | 1.00 | 0.95  | 0.98                      | 1.00  |      |      |
| Satd. Flow (perm)                 | 1479 | 2957  | 1496                      | 3622  |      |      |
| Peak-hour factor, PHF             | 1.00 | 1.00  | 1.00                      | 1.00  | 1.00 | 1.00 |
| Adj. Flow (vph)                   | 145  | 650   | 170                       | 1245  | 120  | 10   |
| RTOR Reduction (vph)              | 0    | 0     | 0                         | 1     | 0    | 0    |
| Lane Group Flow (vph)             | 145  | 500   | 320                       | 1374  | 0    | 0    |
| Heavy Vehicles (%)                | 0%   | 0%    | 0%                        | 5%    | 2%   | 1%   |
| Bus Blockages (#/hr)              | 0    | 0     | 4                         | 0     | 0    | 0    |
| Turn Type                         | Perm | Perm  | NA                        | NA    |      |      |
| Protected Phases                  |      |       | 2                         | 4     |      |      |
| Permitted Phases                  | 2    | 4     | 2                         |       |      |      |
| Actuated Green, G (s)             | 90.0 | 38.0  | 38.0                      | 40.4  |      |      |
| Effective Green, g (s)            | 85.6 | 39.6  | 39.6                      | 42.4  |      |      |
| Actuated g/C Ratio                | 0.95 | 0.44  | 0.44                      | 0.47  |      |      |
| Clearance Time (s)                |      |       | 5.6                       | 5.6   | 6.0  |      |
| Vehicle Extension (s)             |      |       | 0.2                       | 0.2   | 2.0  |      |
| Lane Grp Cap (vph)                | 1406 | 1301  | 658                       | 1706  |      |      |
| v/s Ratio Prot                    |      |       |                           | c0.38 |      |      |
| v/s Ratio Perm                    | 0.10 | 0.17  | 0.21                      |       |      |      |
| v/c Ratio                         | 0.10 | 0.38  | 0.49                      | 0.81  |      |      |
| Uniform Delay, d1                 | 0.1  | 17.0  | 18.0                      | 20.3  |      |      |
| Progression Factor                | 1.00 | 1.00  | 1.00                      | 1.00  |      |      |
| Incremental Delay, d2             | 0.0  | 0.9   | 2.6                       | 2.7   |      |      |
| Delay (s)                         | 0.1  | 17.8  | 20.5                      | 23.0  |      |      |
| Level of Service                  | A    | B     | C                         | C     |      |      |
| Approach Delay (s)                |      |       | 18.9                      | 23.0  |      |      |
| Approach LOS                      |      |       | B                         | C     |      |      |
| <b>Intersection Summary</b>       |      |       |                           |       |      |      |
| HCM 2000 Control Delay            |      | 20.1  | HCM 2000 Level of Service |       | C    |      |
| HCM 2000 Volume to Capacity ratio |      | 0.65  |                           |       |      |      |
| Actuated Cycle Length (s)         |      | 90.0  | Sum of lost time (s)      |       | 8.0  |      |
| Intersection Capacity Utilization |      | 66.6% | ICU Level of Service      |       | C    |      |
| Analysis Period (min)             |      | 15    |                           |       |      |      |

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

38: 6th Ave & Broadway

05/12/2020



| Movement               | EBL   | EBT   | EBR    | WBL  | WBT  | WBR   | NBL  | NBT   | NBR  | SBL  | SBT  | SBR  |
|------------------------|-------|-------|--------|------|------|-------|------|-------|------|------|------|------|
| Lane Configurations    | ↑     | ↑↑    | ↑      |      |      | ↑↑↑   |      | ↑↑↑   |      |      |      |      |
| Traffic Volume (vph)   | 205   | 1385  | 500    | 0    | 0    | 1285  | 0    | 665   | 0    | 0    | 0    | 0    |
| Future Volume (vph)    | 205   | 1385  | 500    | 0    | 0    | 1285  | 0    | 665   | 0    | 0    | 0    | 0    |
| 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      | 1.00  | 0.95  | 1.00   |      |      | *0.65 |      | *0.80 |      |      |      |      |
| Frpb, ped/bikes        | 1.00  | 1.00  | 0.98   |      |      | 1.00  |      | 1.00  |      |      |      |      |
| Flpb, ped/bikes        | 1.00  | 1.00  | 1.00   |      |      | 1.00  |      | 1.00  |      |      |      |      |
| Fr <sub>t</sub>        | 1.00  | 1.00  | 0.95   |      |      | 0.95  |      | 1.00  |      |      |      |      |
| Flt Protected          | 0.95  | 1.00  | 1.00   |      |      | 1.00  |      | 1.00  |      |      |      |      |
| Satd. Flow (prot)      | 1593  | 3000  | 1524   |      |      | 3106  |      | 3883  |      |      |      |      |
| Flt Permitted          | 0.95  | 1.00  | 1.00   |      |      | 1.00  |      | 1.00  |      |      |      |      |
| Satd. Flow (perm)      | 1593  | 3185  | 1524   |      |      | 3106  |      | 3883  |      |      |      |      |
| Peak-hour factor, PHF  | 1.00  | 1.00  | 1.00   | 1.00 | 1.00 | 1.00  | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph)        | 205   | 1385  | 500    | 0    | 0    | 1285  | 0    | 665   | 0    | 0    | 0    | 0    |
| RTOR Reduction (vph)   | 0     | 0     | 0      | 0    | 0    | 0     | 0    | 0     | 0    | 0    | 0    | 0    |
| Lane Group Flow (vph)  | 205   | 1385  | 500    | 0    | 0    | 1285  | 0    | 665   | 0    | 0    | 0    | 0    |
| Confl. Peds. (#/hr)    |       |       | 12     | 12   |      |       | 19   |       | 60   | 60   |      | 19   |
| Confl. Bikes (#/hr)    |       |       | 19     |      |      |       |      | 29    |      |      |      |      |
| Heavy Vehicles (%)     | 2%    | 2%    | 4%     | 0%   | 0%   | 2%    | 0%   | 4%    | 0%   | 0%   | 0%   | 0%   |
| Bus Blockages (#/hr)   | 0     | 0     | 0      | 0    | 0    | 0     | 0    | 12    | 12   | 0    | 0    | 0    |
| Turn Type              | Prot  | NA    | custom |      |      | Prot  |      | NA    |      |      |      |      |
| Protected Phases       | 1     | 5     | 6      | 8    |      | 2     |      | 4     |      |      |      |      |
| Permitted Phases       |       |       |        | 6    |      |       |      |       |      |      |      |      |
| Actuated Green, G (s)  | 13.0  | 55.2  | 42.2   |      |      | 39.0  |      | 25.6  |      |      |      |      |
| Effective Green, g (s) | 12.0  | 54.2  | 40.2   |      |      | 38.2  |      | 27.8  |      |      |      |      |
| Actuated g/C Ratio     | 0.13  | 0.60  | 0.45   |      |      | 0.42  |      | 0.31  |      |      |      |      |
| Clearance Time (s)     | 3.0   |       | 3.0    |      |      | 3.2   |      | 6.2   |      |      |      |      |
| Vehicle Extension (s)  | 0.5   |       | 0.2    |      |      | 0.2   |      | 2.0   |      |      |      |      |
| Lane Grp Cap (vph)     | 212   | 1806  | 748    |      |      | 1318  |      | 1199  |      |      |      |      |
| v/s Ratio Prot         | c0.13 | c0.46 | c0.15  |      |      | c0.41 |      | c0.17 |      |      |      |      |
| v/s Ratio Perm         |       |       | 0.18   |      |      |       |      |       |      |      |      |      |
| v/c Ratio              | 0.97  | 0.77  | 0.67   |      |      | 0.97  |      | 0.55  |      |      |      |      |
| Uniform Delay, d1      | 38.8  | 13.2  | 19.6   |      |      | 25.4  |      | 25.9  |      |      |      |      |
| Progression Factor     | 1.00  | 1.00  | 1.00   |      |      | 0.30  |      | 1.00  |      |      |      |      |
| Incremental Delay, d2  | 51.6  | 3.2   | 4.7    |      |      | 11.6  |      | 0.3   |      |      |      |      |
| Delay (s)              | 90.4  | 16.4  | 24.3   |      |      | 19.3  |      | 26.3  |      |      |      |      |
| Level of Service       | F     | B     | C      |      |      | B     |      | C     |      |      |      |      |
| Approach Delay (s)     |       | 25.6  |        |      |      | 19.3  |      | 26.3  |      | 0.0  |      |      |
| Approach LOS           |       | C     |        |      |      | B     |      | C     |      | A    |      |      |

## Intersection Summary

|                                   |       |                           |      |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay            | 23.7  | HCM 2000 Level of Service | C    |
| HCM 2000 Volume to Capacity ratio | 0.89  |                           |      |
| Actuated Cycle Length (s)         | 90.0  | Sum of lost time (s)      | 15.0 |
| Intersection Capacity Utilization | 73.7% | ICU Level of Service      | D    |
| Analysis Period (min)             | 15    |                           |      |

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

39: 5th Ave & Broadway

05/12/2020



| Movement                          | EBL  | EBT   | EBR    | WBL  | WBT                       | WBR  | NBL   | NBT  | NBR  | SBL  | SBT  | SBR   |
|-----------------------------------|------|-------|--------|------|---------------------------|------|-------|------|------|------|------|-------|
| Lane Configurations               |      |       |        |      |                           |      |       |      |      |      |      |       |
| Traffic Volume (vph)              | 0    | 0     | 1390   | 0    | 1285                      | 0    | 0     | 0    | 0    | 0    | 220  | 0     |
| Future Volume (vph)               | 0    | 0     | 1390   | 0    | 1285                      | 0    | 0     | 0    | 0    | 0    | 220  | 0     |
| 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   |
| Lane Util. Factor                 |      |       |        |      | 0.88                      |      | *0.65 |      |      |      |      | 1.00  |
| Frpb, ped/bikes                   |      |       |        |      | 1.00                      |      | 1.00  |      |      |      |      | 1.00  |
| Flpb, ped/bikes                   |      |       |        |      | 1.00                      |      | 1.00  |      |      |      |      | 1.00  |
| Fr <sub>t</sub>                   |      |       |        |      | 1.00                      |      | 1.00  |      |      |      |      | 1.00  |
| Flt Protected                     |      |       |        |      | 1.00                      |      | 1.00  |      |      |      |      | 1.00  |
| Satd. Flow (prot)                 |      |       |        |      | 3215                      |      | 3269  |      |      |      |      | 1710  |
| Flt Permitted                     |      |       |        |      | 1.00                      |      | 1.00  |      |      |      |      | 1.00  |
| Satd. Flow (perm)                 |      |       |        |      | 3010                      |      | 3269  |      |      |      |      | 1710  |
| Peak-hour factor, PHF             | 1.00 | 1.00  | 1.00   | 1.00 | 1.00                      | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |
| Adj. Flow (vph)                   | 0    | 0     | 1390   | 0    | 1285                      | 0    | 0     | 0    | 0    | 0    | 220  | 0     |
| RTOR Reduction (vph)              | 0    | 0     | 0      | 0    | 0                         | 0    | 0     | 0    | 0    | 0    | 0    | 0     |
| Lane Group Flow (vph)             | 0    | 0     | 1390   | 0    | 1285                      | 0    | 0     | 0    | 0    | 0    | 220  | 0     |
| Confl. Peds. (#/hr)               | 10   |       | 2      | 2    |                           | 10   |       |      | 1    | 1    |      |       |
| Confl. Bikes (#/hr)               |      |       | 2      |      |                           |      |       |      |      |      |      | 9     |
| Heavy Vehicles (%)                | 0%   | 2%    | 0%     | 0%   | 2%                        | 0%   | 0%    | 0%   | 0%   | 14%  | 0%   | 0%    |
| Turn Type                         |      |       | custom |      |                           | NA   |       |      |      |      | NA   |       |
| Protected Phases                  |      |       | 5 6    |      |                           | 2    |       |      |      |      |      | 4     |
| Permitted Phases                  |      |       |        |      |                           |      |       |      |      |      |      |       |
| Actuated Green, G (s)             |      |       | 55.2   |      | 39.0                      |      |       |      |      |      |      | 25.6  |
| Effective Green, g (s)            |      |       | 54.2   |      | 38.2                      |      |       |      |      |      |      | 27.8  |
| Actuated g/C Ratio                |      |       | 0.60   |      | 0.42                      |      |       |      |      |      |      | 0.31  |
| Clearance Time (s)                |      |       |        |      | 3.2                       |      |       |      |      |      |      | 6.2   |
| Vehicle Extension (s)             |      |       |        |      | 0.2                       |      |       |      |      |      |      | 2.0   |
| Lane Grp Cap (vph)                |      |       | 1936   |      | 1387                      |      |       |      |      |      |      | 528   |
| v/s Ratio Prot                    |      |       | c0.43  |      | c0.39                     |      |       |      |      |      |      | c0.13 |
| v/s Ratio Perm                    |      |       |        |      |                           |      |       |      |      |      |      |       |
| v/c Ratio                         |      |       | 0.72   |      | 0.93                      |      |       |      |      |      |      | 0.42  |
| Uniform Delay, d1                 |      |       | 12.5   |      | 24.6                      |      |       |      |      |      |      | 24.7  |
| Progression Factor                |      |       | 0.24   |      | 0.43                      |      |       |      |      |      |      | 1.00  |
| Incremental Delay, d2             |      |       | 1.5    |      | 7.0                       |      |       |      |      |      |      | 0.2   |
| Delay (s)                         |      |       | 4.6    |      | 17.7                      |      |       |      |      |      |      | 24.9  |
| Level of Service                  |      |       | A      |      | B                         |      |       |      |      |      |      | C     |
| Approach Delay (s)                | 4.6  |       |        |      | 17.7                      |      |       | 0.0  |      |      |      | 24.9  |
| Approach LOS                      | A    |       |        |      | B                         |      |       | A    |      |      |      | C     |
| <b>Intersection Summary</b>       |      |       |        |      |                           |      |       |      |      |      |      |       |
| HCM 2000 Control Delay            |      | 12.0  |        |      | HCM 2000 Level of Service |      |       |      |      | B    |      |       |
| HCM 2000 Volume to Capacity ratio |      | 0.75  |        |      |                           |      |       |      |      |      |      |       |
| Actuated Cycle Length (s)         |      | 90.0  |        |      | Sum of lost time (s)      |      |       | 14.0 |      |      |      |       |
| Intersection Capacity Utilization |      | 73.8% |        |      | ICU Level of Service      |      |       | D    |      |      |      |       |
| Analysis Period (min)             |      | 15    |        |      |                           |      |       |      |      |      |      |       |
| c Critical Lane Group             |      |       |        |      |                           |      |       |      |      |      |      |       |

# HCM Signalized Intersection Capacity Analysis

## 42: Caruthers & 4th Ave & Broadway

05/12/2020



| Movement                          | WBL  | WBT   | WBR  | NBL2                      | NBL   | NBT  |
|-----------------------------------|------|-------|------|---------------------------|-------|------|
| Lane Configurations               |      | ↑↑    |      |                           | ↑↑    |      |
| Traffic Volume (vph)              | 55   | 1135  | 80   | 30                        | 150   | 580  |
| Future Volume (vph)               | 55   | 1135  | 80   | 30                        | 150   | 580  |
| Ideal Flow (vphpl)                | 1900 | 1900  | 1900 | 1900                      | 1900  | 1900 |
| Total Lost time (s)               |      | 4.0   |      |                           | 4.6   | 4.0  |
| Lane Util. Factor                 |      | *0.65 |      |                           | *0.80 | 0.95 |
| Frpb, ped/bikes                   |      | 1.00  |      |                           | 1.00  | 1.00 |
| Flpb, ped/bikes                   |      | 1.00  |      |                           | 1.00  | 1.00 |
| Fr <sub>t</sub>                   |      | 0.99  |      |                           | 1.00  | 1.00 |
| Flt Protected                     |      | 1.00  |      |                           | 0.95  | 1.00 |
| Satd. Flow (prot)                 |      | 3253  |      |                           | 2550  | 3154 |
| Flt Permitted                     |      | 1.00  |      |                           | 0.95  | 1.00 |
| Satd. Flow (perm)                 |      | 3253  |      |                           | 2550  | 3154 |
| Peak-hour factor, PHF             | 1.00 | 1.00  | 1.00 | 1.00                      | 1.00  | 1.00 |
| Adj. Flow (vph)                   | 55   | 1135  | 80   | 30                        | 150   | 580  |
| RTOR Reduction (vph)              | 0    | 6     | 0    | 0                         | 0     | 0    |
| Lane Group Flow (vph)             | 0    | 1264  | 0    | 0                         | 180   | 580  |
| Confl. Peds. (#/hr)               |      |       | 4    |                           | 1     |      |
| Confl. Bikes (#/hr)               |      |       |      |                           |       |      |
| Heavy Vehicles (%)                | 0%   | 1%    | 5%   | 1%                        | 2%    | 3%   |
| Turn Type                         | Perm | NA    |      | custom                    | Prot  | NA   |
| Protected Phases                  |      | 2     |      |                           | 7 11  | 4    |
| Permitted Phases                  | 2    |       |      | 7 11                      |       |      |
| Actuated Green, G (s)             |      | 37.8  |      |                           | 25.0  | 23.0 |
| Effective Green, g (s)            |      | 38.4  |      |                           | 25.0  | 23.6 |
| Actuated g/C Ratio                |      | 0.43  |      |                           | 0.28  | 0.26 |
| Clearance Time (s)                |      | 4.6   |      |                           | 4.6   |      |
| Vehicle Extension (s)             |      | 0.2   |      |                           | 1.8   |      |
| Lane Grp Cap (vph)                |      | 1387  |      |                           | 708   | 827  |
| v/s Ratio Prot                    |      |       |      |                           | c0.18 |      |
| v/s Ratio Perm                    |      | 0.39  |      |                           | 0.07  |      |
| v/c Ratio                         |      | 0.91  |      |                           | 0.25  | 0.70 |
| Uniform Delay, d1                 |      | 24.2  |      |                           | 25.3  | 30.0 |
| Progression Factor                |      | 1.44  |      |                           | 0.56  | 0.35 |
| Incremental Delay, d2             |      | 7.1   |      |                           | 0.1   | 1.9  |
| Delay (s)                         |      | 42.1  |      |                           | 14.2  | 12.5 |
| Level of Service                  |      | D     |      |                           | B     | B    |
| Approach Delay (s)                |      | 42.1  |      |                           | 12.9  |      |
| Approach LOS                      |      | D     |      |                           | B     |      |
| <b>Intersection Summary</b>       |      |       |      |                           |       |      |
| HCM 2000 Control Delay            |      | 31.1  |      | 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)      |       | 17.2 |
| Intersection Capacity Utilization |      | 52.1% |      | ICU Level of Service      |       | A    |
| Analysis Period (min)             |      | 15    |      |                           |       |      |
| c Critical Lane Group             |      |       |      |                           |       |      |

# HCM Signalized Intersection Capacity Analysis

45: Barbur Blvd/4th Ave & Sheridan St

05/12/2020



| Movement                          | EBL   | EBT   | EBR    | WBL  | WBT  | WBR  | NBL  | NBT                  | NBR  | SBL  | SBT  | SBR  |
|-----------------------------------|-------|-------|--------|------|------|------|------|----------------------|------|------|------|------|
| Lane Configurations               |       | ↑↑    | ↑      |      |      |      |      | ↑↑↑                  |      |      |      |      |
| Traffic Volume (vph)              | 165   | 905   | 945    | 0    | 0    | 0    | 0    | 595                  | 70   | 0    | 0    | 0    |
| Future Volume (vph)               | 165   | 905   | 945    | 0    | 0    | 0    | 0    | 595                  | 70   | 0    | 0    | 0    |
| 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  |      |      |      |
| Lane Util. Factor                 |       | 0.95  | 1.00   |      |      |      |      |                      | 0.91 |      |      |      |
| Frpb, ped/bikes                   |       | 1.00  | 1.00   |      |      |      |      |                      | 1.00 |      |      |      |
| Flpb, ped/bikes                   |       | 1.00  | 1.00   |      |      |      |      |                      | 1.00 |      |      |      |
| Fr <sub>t</sub>                   |       | 1.00  | 0.85   |      |      |      |      |                      | 0.98 |      |      |      |
| Flt Protected                     |       | 0.99  | 1.00   |      |      |      |      |                      | 1.00 |      |      |      |
| Satd. Flow (prot)                 |       | 3068  | 1411   |      |      |      |      |                      | 4488 |      |      |      |
| Flt Permitted                     |       | 0.99  | 1.00   |      |      |      |      |                      | 1.00 |      |      |      |
| Satd. Flow (perm)                 |       | 3068  | 1411   |      |      |      |      |                      | 4488 |      |      |      |
| Peak-hour factor, PHF             | 1.00  | 1.00  | 1.00   | 1.00 | 1.00 | 1.00 | 1.00 | 1.00                 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph)                   | 165   | 905   | 945    | 0    | 0    | 0    | 0    | 595                  | 70   | 0    | 0    | 0    |
| RTOR Reduction (vph)              | 0     | 18    | 149    | 0    | 0    | 0    | 0    | 17                   | 0    | 0    | 0    | 0    |
| Lane Group Flow (vph)             | 0     | 1052  | 796    | 0    | 0    | 0    | 0    | 648                  | 0    | 0    | 0    | 0    |
| Confl. Peds. (#/hr)               | 7     |       |        |      |      | 7    | 19   |                      | 5    | 5    |      | 19   |
| Confl. Bikes (#/hr)               |       |       | 12     |      |      |      |      |                      | 2    |      |      |      |
| Heavy Vehicles (%)                | 10%   | 4%    | 3%     | 0%   | 0%   | 0%   | 0%   | 2%                   | 3%   | 0%   | 0%   | 0%   |
| Turn Type                         | Perm  | NA    | custom |      |      |      |      |                      | NA   |      |      |      |
| Protected Phases                  |       | 2     | 2 8    |      |      |      |      |                      | 4    |      |      |      |
| Permitted Phases                  | 2     |       |        |      |      |      |      |                      |      |      |      |      |
| Actuated Green, G (s)             | 60.7  | 75.2  |        |      |      |      |      | 20.1                 |      |      |      |      |
| Effective Green, g (s)            | 61.3  | 75.8  |        |      |      |      |      | 20.7                 |      |      |      |      |
| Actuated g/C Ratio                | 0.68  | 0.84  |        |      |      |      |      | 0.23                 |      |      |      |      |
| Clearance Time (s)                | 4.6   |       |        |      |      |      |      | 4.6                  |      |      |      |      |
| Vehicle Extension (s)             | 0.2   |       |        |      |      |      |      | 1.0                  |      |      |      |      |
| Lane Grp Cap (vph)                | 2089  | 1188  |        |      |      |      |      | 1032                 |      |      |      |      |
| v/s Ratio Prot                    |       | c0.56 |        |      |      |      |      | c0.14                |      |      |      |      |
| v/s Ratio Perm                    | 0.34  |       |        |      |      |      |      |                      |      |      |      |      |
| v/c Ratio                         | 0.50  | 0.67  |        |      |      |      |      | 0.63                 |      |      |      |      |
| Uniform Delay, d1                 | 7.0   | 2.6   |        |      |      |      |      | 31.2                 |      |      |      |      |
| Progression Factor                | 1.00  | 1.00  |        |      |      |      |      | 1.00                 |      |      |      |      |
| Incremental Delay, d2             | 0.9   | 1.1   |        |      |      |      |      | 0.9                  |      |      |      |      |
| Delay (s)                         | 7.8   | 3.7   |        |      |      |      |      | 32.1                 |      |      |      |      |
| Level of Service                  | A     | A     |        |      |      |      |      | C                    |      |      |      |      |
| Approach Delay (s)                | 5.9   |       | 0.0    |      |      |      |      | 32.1                 |      | 0.0  |      |      |
| Approach LOS                      | A     |       | A      |      |      |      |      | C                    |      | A    |      |      |
| <b>Intersection Summary</b>       |       |       |        |      |      |      |      |                      |      |      |      |      |
| HCM 2000 Control Delay            | 12.4  |       |        |      |      |      |      |                      | B    |      |      |      |
| HCM 2000 Volume to Capacity ratio | 0.71  |       |        |      |      |      |      |                      |      |      |      |      |
| Actuated Cycle Length (s)         | 90.0  |       |        |      |      |      |      | Sum of lost time (s) | 11.0 |      |      |      |
| Intersection Capacity Utilization | 68.3% |       |        |      |      |      |      | ICU Level of Service | C    |      |      |      |
| Analysis Period (min)             | 15    |       |        |      |      |      |      |                      |      |      |      |      |
| c Critical Lane Group             |       |       |        |      |      |      |      |                      |      |      |      |      |

Intersection

Int Delay, s/veh 4.6

| Movement                 | WBL  | WBR  | NBT  | NBR  | SBL  | SBT  |
|--------------------------|------|------|------|------|------|------|
| Lane Configurations      | W    |      | ↑↑   |      | ↑    | ↑↑   |
| Traffic Vol, veh/h       | 20   | 40   | 175  | 165  | 400  | 455  |
| Future Vol, veh/h        | 20   | 40   | 175  | 165  | 400  | 455  |
| Conflicting Peds, #/hr   | 4    | 0    | 0    | 59   | 59   | 0    |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | -    | 200  | -    |
| Veh in Median Storage, # | 0    | -    | 0    | -    | -    | 0    |
| Grade, %                 | 0    | -    | 0    | -    | -    | 0    |
| Peak Hour Factor         | 100  | 100  | 100  | 100  | 100  | 100  |
| Heavy Vehicles, %        | 0    | 8    | 6    | 1    | 0    | 3    |
| Mvmt Flow                | 20   | 40   | 175  | 165  | 400  | 455  |

| Major/Minor          | Minor1 | Major1 | Major2 |   |      |
|----------------------|--------|--------|--------|---|------|
| Conflicting Flow All | 1349   | 229    | 0      | 0 | 399  |
| Stage 1              | 317    | -      | -      | - | -    |
| Stage 2              | 1032   | -      | -      | - | -    |
| Critical Hdwy        | 6.8    | 7.06   | -      | - | 4.1  |
| Critical Hdwy Stg 1  | 5.8    | -      | -      | - | -    |
| Critical Hdwy Stg 2  | 5.8    | -      | -      | - | -    |
| Follow-up Hdwy       | 3.5    | 3.38   | -      | - | 2.2  |
| Pot Cap-1 Maneuver   | 144    | 755    | -      | - | 1171 |
| Stage 1              | 717    | -      | -      | - | -    |
| Stage 2              | 309    | -      | -      | - | -    |
| Platoon blocked, %   | -      | -      | -      | - | -    |
| Mov Cap-1 Maneuver   | 88     | 718    | -      | - | 1113 |
| Mov Cap-2 Maneuver   | 88     | -      | -      | - | -    |
| Stage 1              | 682    | -      | -      | - | -    |
| Stage 2              | 197    | -      | -      | - | -    |

| Approach             | WB   | NB | SB  |
|----------------------|------|----|-----|
| HCM Control Delay, s | 28.6 | 0  | 4.7 |
| HCM LOS              | D    |    |     |

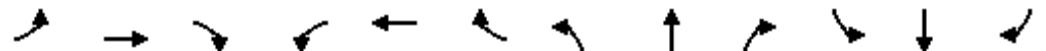
| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 | SBL   | SBT |
|-----------------------|-----|-----|-------|-------|-----|
| Capacity (veh/h)      | -   | -   | 212   | 1113  | -   |
| HCM Lane V/C Ratio    | -   | -   | 0.283 | 0.359 | -   |
| HCM Control Delay (s) | -   | -   | 28.6  | 10    | -   |
| HCM Lane LOS          | -   | -   | D     | B     | -   |
| HCM 95th %tile Q(veh) | -   | -   | 1.1   | 1.7   | -   |

| Intersection             |        |        |        |      |      |      |
|--------------------------|--------|--------|--------|------|------|------|
| Int Delay, s/veh         | 0      |        |        |      |      |      |
| Movement                 | EBL    | EBR    | NBL    | NBT  | SBT  | SBR  |
| Lane Configurations      |        | ↑      |        | ↑↑   | ↑↑   | ↑    |
| Traffic Vol, veh/h       | 0      | 570    | 0      | 700  | 1395 | 60   |
| Future Vol, veh/h        | 0      | 570    | 0      | 700  | 1395 | 60   |
| Conflicting Peds, #/hr   | 0      | 2      | 0      | 0    | 0    | 0    |
| Sign Control             | Stop   | Stop   | Free   | Free | Free | Free |
| RT Channelized           | -      | Free   | -      | None | -    | Free |
| Storage Length           | -      | 0      | -      | -    | -    | 150  |
| Veh in Median Storage, # | 0      | -      | -      | 0    | 0    | -    |
| Grade, %                 | 0      | -      | -      | 0    | 0    | -    |
| Peak Hour Factor         | 100    | 100    | 100    | 100  | 100  | 100  |
| Heavy Vehicles, %        | 0      | 0      | 0      | 3    | 1    | 9    |
| Mvmt Flow                | 0      | 570    | 0      | 700  | 1395 | 60   |
| Major/Minor              | Minor2 | Major1 | Major2 |      |      |      |
| Conflicting Flow All     | -      | -      | -      | 0    | -    | 0    |
| Stage 1                  | -      | -      | -      | -    | -    | -    |
| Stage 2                  | -      | -      | -      | -    | -    | -    |
| Critical Hdwy            | -      | -      | -      | -    | -    | -    |
| Critical Hdwy Stg 1      | -      | -      | -      | -    | -    | -    |
| Critical Hdwy Stg 2      | -      | -      | -      | -    | -    | -    |
| Follow-up Hdwy           | -      | -      | -      | -    | -    | -    |
| Pot Cap-1 Maneuver       | 0      | 0      | 0      | -    | -    | 0    |
| Stage 1                  | 0      | 0      | 0      | -    | -    | 0    |
| Stage 2                  | 0      | 0      | 0      | -    | -    | 0    |
| Platoon blocked, %       |        |        |        | -    | -    |      |
| Mov Cap-1 Maneuver       | -      | -      | -      | -    | -    | -    |
| Mov Cap-2 Maneuver       | -      | -      | -      | -    | -    | -    |
| Stage 1                  | -      | -      | -      | -    | -    | -    |
| Stage 2                  | -      | -      | -      | -    | -    | -    |
| Approach                 | EB     | NB     | SB     |      |      |      |
| HCM Control Delay, s     | 0      | 0      | 0      |      |      |      |
| HCM LOS                  | A      |        |        |      |      |      |
| Minor Lane/Major Mvmt    | NBT    | EBLn1  | SBT    |      |      |      |
| Capacity (veh/h)         | -      | -      | -      |      |      |      |
| HCM Lane V/C Ratio       | -      | -      | -      |      |      |      |
| HCM Control Delay (s)    | -      | 0      | -      |      |      |      |
| HCM Lane LOS             | -      | A      | -      |      |      |      |
| HCM 95th %tile Q(veh)    | -      | -      | -      |      |      |      |

# HCM Signalized Intersection Capacity Analysis

48: 1st Ave & Arthur

05/12/2020



| Movement               | EBL  | EBT   | EBR  | WBL  | WBT   | WBR  | NBL   | NBT  | NBR  | SBL   | SBT   | SBR  |
|------------------------|------|-------|------|------|-------|------|-------|------|------|-------|-------|------|
| Lane Configurations    | ↑    | ↑↑    |      |      | ↑↑    |      | ↑     | ↑    |      | ↑     | ↑     | ↑    |
| Traffic Volume (vph)   | 40   | 1030  | 40   | 0    | 1130  | 225  | 35    | 75   | 150  | 130   | 375   | 65   |
| Future Volume (vph)    | 40   | 1030  | 40   | 0    | 1130  | 225  | 35    | 75   | 150  | 130   | 375   | 65   |
| 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  | 4.0  | 4.0   | 4.0   | 4.0  |
| Lane Util. Factor      | 1.00 | 0.95  |      |      | 0.95  |      | 1.00  | 1.00 |      | 1.00  | 1.00  | 1.00 |
| Frpb, ped/bikes        | 1.00 | 1.00  |      |      | 0.99  |      | 1.00  | 0.98 |      | 1.00  | 1.00  | 0.96 |
| Flpb, ped/bikes        | 1.00 | 1.00  |      |      | 1.00  |      | 1.00  | 1.00 |      | 1.00  | 1.00  | 1.00 |
| Fr <sub>t</sub>        | 1.00 | 0.99  |      |      | 0.98  |      | 1.00  | 0.90 |      | 1.00  | 1.00  | 0.85 |
| Flt Protected          | 0.95 | 1.00  |      |      | 1.00  |      | 0.95  | 1.00 |      | 0.95  | 1.00  | 1.00 |
| Satd. Flow (prot)      | 1624 | 3094  |      |      | 3064  |      | 1624  | 1407 |      | 1562  | 1686  | 1392 |
| Flt Permitted          | 0.95 | 1.00  |      |      | 1.00  |      | 0.95  | 1.00 |      | 0.95  | 1.00  | 1.00 |
| Satd. Flow (perm)      | 1624 | 3094  |      |      | 3064  |      | 1624  | 1407 |      | 1562  | 1686  | 1392 |
| Peak-hour factor, PHF  | 1.00 | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00 |
| Adj. Flow (vph)        | 40   | 1030  | 40   | 0    | 1130  | 225  | 35    | 75   | 150  | 130   | 375   | 65   |
| RTOR Reduction (vph)   | 0    | 2     | 0    | 0    | 17    | 0    | 0     | 78   | 0    | 0     | 0     | 48   |
| Lane Group Flow (vph)  | 40   | 1068  | 0    | 0    | 1338  | 0    | 35    | 147  | 0    | 130   | 375   | 17   |
| Confl. Peds. (#/hr)    | 16   |       | 9    | 9    |       | 16   | 28    |      | 14   | 14    |       | 28   |
| Confl. Bikes (#/hr)    |      |       |      |      |       |      |       |      |      |       |       | 1    |
| Heavy Vehicles (%)     | 0%   | 3%    | 3%   | 0%   | 2%    | 5%   | 0%    | 1%   | 0%   | 4%    | 1%    | 0%   |
| Bus Blockages (#/hr)   | 0    | 6     | 6    | 0    | 1     | 1    | 0     | 16   | 16   | 0     | 1     | 0    |
| Turn Type              | Prot | NA    |      |      | NA    |      | Prot  | NA   |      | Prot  | NA    | Perm |
| Protected Phases       | 1    | 6     |      |      | 2     |      | 7     | 4    |      | 3     | 8     |      |
| Permitted Phases       |      |       |      |      |       |      |       |      |      |       |       | 8    |
| Actuated Green, G (s)  | 5.1  | 52.3  |      |      | 44.2  |      | 2.6   | 16.2 |      | 9.0   | 22.8  | 22.8 |
| Effective Green, g (s) | 4.1  | 52.9  |      |      | 44.8  |      | 2.1   | 16.4 |      | 8.7   | 23.0  | 23.0 |
| Actuated g/C Ratio     | 0.05 | 0.59  |      |      | 0.50  |      | 0.02  | 0.18 |      | 0.10  | 0.26  | 0.26 |
| Clearance Time (s)     | 3.0  | 4.6   |      |      | 4.6   |      | 3.5   | 4.2  |      | 3.7   | 4.2   | 4.2  |
| Vehicle Extension (s)  | 0.5  | 1.0   |      |      | 1.0   |      | 0.5   | 1.5  |      | 0.5   | 0.5   | 0.5  |
| Lane Grp Cap (vph)     | 73   | 1818  |      |      | 1525  |      | 37    | 256  |      | 150   | 430   | 355  |
| v/s Ratio Prot         | 0.02 | c0.35 |      |      | c0.44 |      | 0.02  | 0.10 |      | c0.08 | c0.22 |      |
| v/s Ratio Perm         |      |       |      |      |       |      |       |      |      |       |       | 0.01 |
| v/c Ratio              | 0.55 | 0.59  |      |      | 0.88  |      | 0.95  | 0.58 |      | 0.87  | 0.87  | 0.05 |
| Uniform Delay, d1      | 42.0 | 11.7  |      |      | 20.2  |      | 43.9  | 33.6 |      | 40.1  | 32.1  | 25.2 |
| Progression Factor     | 1.04 | 0.83  |      |      | 1.00  |      | 1.00  | 1.00 |      | 1.00  | 1.00  | 1.00 |
| Incremental Delay, d2  | 4.1  | 1.3   |      |      | 7.4   |      | 124.3 | 1.9  |      | 36.3  | 16.9  | 0.0  |
| Delay (s)              | 47.6 | 11.0  |      |      | 27.6  |      | 168.2 | 35.6 |      | 76.4  | 49.0  | 25.3 |
| Level of Service       | D    | B     |      |      | C     |      | F     | D    |      | E     | D     | C    |
| Approach Delay (s)     |      | 12.3  |      |      | 27.6  |      |       | 53.4 |      |       | 52.5  |      |
| Approach LOS           |      | B     |      |      | C     |      |       | D    |      |       | D     |      |

## Intersection Summary

|                                   |       |                           |      |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay            | 28.8  | HCM 2000 Level of Service | C    |
| HCM 2000 Volume to Capacity ratio | 0.90  |                           |      |
| Actuated Cycle Length (s)         | 90.0  | Sum of lost time (s)      | 16.0 |
| Intersection Capacity Utilization | 78.2% | ICU Level of Service      | D    |
| Analysis Period (min)             | 15    |                           |      |

c Critical Lane Group

Intersection

Int Delay, s/veh 10.4

| Movement                 | SEL  | SET  | NWT  | NWR  | SWL  | SWR  |
|--------------------------|------|------|------|------|------|------|
| Lane Configurations      | ↖    | ↑    | ↑↑↑  | ↗    | ↖    | ↗    |
| Traffic Vol, veh/h       | 60   | 165  | 1545 | 170  | 60   | 150  |
| Future Vol, veh/h        | 60   | 165  | 1545 | 170  | 60   | 150  |
| Conflicting Peds, #/hr   | 0    | 0    | 0    | 0    | 0    | 0    |
| Sign Control             | Free | Free | Free | Free | Stop | Stop |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 75   | -    | -    | -    | 0    | 50   |
| Veh in Median Storage, # | -    | 0    | 0    | -    | 0    | -    |
| Grade, %                 | -    | 0    | 0    | -    | 0    | -    |
| Peak Hour Factor         | 100  | 100  | 100  | 100  | 100  | 100  |
| Heavy Vehicles, %        | 2    | 2    | 2    | 2    | 2    | 2    |
| Mvmt Flow                | 60   | 165  | 1545 | 170  | 60   | 150  |

| Major/Minor          | Major1 | Major2 | Minor2 |
|----------------------|--------|--------|--------|
| Conflicting Flow All | 1715   | 0      | -      |
| Stage 1              | -      | -      | 1630   |
| Stage 2              | -      | -      | 285    |
| Critical Hdwy        | 5.33   | -      | -      |
| 6.08                 |        |        | 7.13   |
| Critical Hdwy Stg 1  | -      | -      | 6.63   |
| Critical Hdwy Stg 2  | -      | -      | 5.43   |
| Follow-up Hdwy       | 3.119  | -      | -      |
| 3.669                |        |        | 3.919  |
| Pot Cap-1 Maneuver   | 175    | -      | -      |
| Stage 1              | -      | -      | 100    |
| Stage 2              | -      | -      | 736    |
| Platoon blocked, %   | -      | -      | -      |
| Mov Cap-1 Maneuver   | 175    | -      | -      |
| ~ 58                 |        |        | 258    |
| Mov Cap-2 Maneuver   | -      | -      | -      |
| Stage 1              | -      | -      | 66     |
| Stage 2              | -      | -      | 736    |

| Approach             | SE  | NW | SW   |
|----------------------|-----|----|------|
| HCM Control Delay, s | 9.6 | 0  | 96.2 |
| HCM LOS              |     | F  |      |

| Minor Lane/Major Mvmt | NWT | NWR | SEL   | SET | SWLn1 | SWLn2 |
|-----------------------|-----|-----|-------|-----|-------|-------|
| Capacity (veh/h)      | -   | -   | 175   | -   | 58    | 258   |
| HCM Lane V/C Ratio    | -   | -   | 0.343 | -   | 1.034 | 0.581 |
| HCM Control Delay (s) | -   | -   | 35.9  | -   | 245   | 36.7  |
| HCM Lane LOS          | -   | -   | E     | -   | F     | E     |
| HCM 95th %tile Q(veh) | -   | -   | 1.4   | -   | 4.9   | 3.3   |

Notes

~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

# HCM Signalized Intersection Capacity Analysis

52: Barbur & Hooker

05/12/2020



| Movement                          | EBL   | EBT  | EBR  | WBL                       | WBT  | WBR  | NBU  | NBL  | NBT  | NBR   | SBL   | SBT  |
|-----------------------------------|-------|------|------|---------------------------|------|------|------|------|------|-------|-------|------|
| Lane Configurations               |       |      |      |                           |      |      |      |      |      |       |       |      |
| Traffic Volume (vph)              | 5     | 0    | 5    | 40                        | 0    | 45   | 60   | 10   | 570  | 50    | 170   | 780  |
| Future Volume (vph)               | 5     | 0    | 5    | 40                        | 0    | 45   | 60   | 10   | 570  | 50    | 170   | 780  |
| 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 |      |      |      | 1.00 | 1.00  | 1.00  | 1.00 |
| Frbp, ped/bikes                   | 0.97  |      |      |                           | 0.97 |      |      |      | 1.00 | 1.00  | 1.00  | 1.00 |
| Flpb, ped/bikes                   | 0.99  |      |      |                           | 0.98 |      |      |      | 1.00 | 1.00  | 1.00  | 1.00 |
| Fr <sub>t</sub>                   | 0.93  |      |      |                           | 0.93 |      |      |      | 1.00 | 0.99  | 1.00  | 1.00 |
| Flt Protected                     | 0.98  |      |      |                           | 0.98 |      |      |      | 0.95 | 1.00  | 0.95  | 1.00 |
| Satd. Flow (prot)                 | 1665  |      |      |                           | 1648 |      |      |      | 1775 | 1830  | 1805  | 1843 |
| Flt Permitted                     | 0.91  |      |      |                           | 0.87 |      |      |      | 0.95 | 1.00  | 0.95  | 1.00 |
| Satd. Flow (perm)                 | 1545  |      |      |                           | 1465 |      |      |      | 1775 | 1830  | 1805  | 1843 |
| Peak-hour factor, PHF             | 1.00  | 1.00 | 1.00 | 1.00                      | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  | 1.00 |
| Adj. Flow (vph)                   | 5     | 0    | 5    | 40                        | 0    | 45   | 60   | 10   | 570  | 50    | 170   | 780  |
| RTOR Reduction (vph)              | 0     | 8    | 0    | 0                         | 70   | 0    | 0    | 0    | 2    | 0     | 0     | 0    |
| Lane Group Flow (vph)             | 0     | 2    | 0    | 0                         | 15   | 0    | 0    | 70   | 618  | 0     | 170   | 785  |
| Confl. Peds. (#/hr)               | 14    |      | 18   | 18                        |      | 14   |      | 9    |      | 3     | 3     |      |
| Confl. Bikes (#/hr)               |       |      |      |                           |      | 4    |      |      |      | 3     |       |      |
| Heavy Vehicles (%)                | 0%    | 0%   | 0%   | 0%                        | 0%   | 0%   | 2%   | 0%   | 2%   | 6%    | 0%    | 3%   |
| Turn Type                         | Perm  | NA   |      | Perm                      | NA   |      | Prot | Prot | NA   |       | Prot  | NA   |
| Protected Phases                  |       | 4    |      |                           | 8    |      | 5    | 5    | 2    |       | 1     | 6    |
| Permitted Phases                  | 4     |      |      | 8                         |      |      |      |      |      |       |       |      |
| Actuated Green, G (s)             | 20.3  |      |      | 20.3                      |      |      | 6.2  | 70.1 |      | 15.2  | 79.1  |      |
| Effective Green, g (s)            | 21.3  |      |      | 21.3                      |      |      | 6.7  | 71.0 |      | 15.7  | 80.0  |      |
| Actuated g/C Ratio                | 0.18  |      |      | 0.18                      |      |      | 0.06 | 0.59 |      | 0.13  | 0.67  |      |
| Clearance Time (s)                | 5.0   |      |      | 5.0                       |      |      | 4.5  | 4.9  |      | 4.5   | 4.9   |      |
| Vehicle Extension (s)             | 3.0   |      |      | 3.0                       |      |      | 3.0  | 3.0  |      | 3.0   | 3.0   |      |
| Lane Grp Cap (vph)                | 274   |      |      | 260                       |      |      | 99   | 1082 |      | 236   | 1228  |      |
| v/s Ratio Prot                    |       |      |      |                           |      |      | 0.04 | 0.34 |      | c0.09 | c0.43 |      |
| v/s Ratio Perm                    | 0.00  |      |      | c0.01                     |      |      |      |      |      |       |       |      |
| v/c Ratio                         | 0.01  |      |      | 0.06                      |      |      | 0.71 | 0.57 |      | 0.72  | 0.64  |      |
| Uniform Delay, d1                 | 40.6  |      |      | 41.0                      |      |      | 55.7 | 15.1 |      | 50.0  | 11.6  |      |
| Progression Factor                | 1.00  |      |      | 1.00                      |      |      | 1.05 | 0.71 |      | 1.00  | 1.00  |      |
| Incremental Delay, d2             | 0.0   |      |      | 0.1                       |      |      | 15.5 | 1.6  |      | 10.3  | 2.6   |      |
| Delay (s)                         | 40.6  |      |      | 41.1                      |      |      | 73.8 | 12.4 |      | 60.4  | 14.2  |      |
| Level of Service                  | D     |      |      | D                         |      |      | E    | B    |      | E     | B     |      |
| Approach Delay (s)                | 40.6  |      |      | 41.1                      |      |      |      | 18.6 |      |       | 22.4  |      |
| Approach LOS                      | D     |      |      | D                         |      |      |      | B    |      |       | C     |      |
| <b>Intersection Summary</b>       |       |      |      |                           |      |      |      |      |      |       |       |      |
| HCM 2000 Control Delay            | 21.9  |      |      | HCM 2000 Level of Service |      |      |      | C    |      |       |       |      |
| HCM 2000 Volume to Capacity ratio | 0.55  |      |      |                           |      |      |      |      |      |       |       |      |
| Actuated Cycle Length (s)         | 120.0 |      |      | Sum of lost time (s)      |      |      |      | 12.5 |      |       |       |      |
| Intersection Capacity Utilization | 69.5% |      |      | ICU Level of Service      |      |      |      | C    |      |       |       |      |
| Analysis Period (min)             | 15    |      |      |                           |      |      |      |      |      |       |       |      |
| c Critical Lane Group             |       |      |      |                           |      |      |      |      |      |       |       |      |

| Movement               | SBR  |
|------------------------|------|
| Lane Configurations    |      |
| Traffic Volume (vph)   | 5    |
| Future Volume (vph)    | 5    |
| Ideal Flow (vphpl)     | 1900 |
| Total Lost time (s)    |      |
| Lane Util. Factor      |      |
| Frpb, ped/bikes        |      |
| Flpb, ped/bikes        |      |
| Fr                     |      |
| Flt Protected          |      |
| Satd. Flow (prot)      |      |
| Flt Permitted          |      |
| Satd. Flow (perm)      |      |
| Peak-hour factor, PHF  | 1.00 |
| Adj. Flow (vph)        | 5    |
| RTOR Reduction (vph)   | 0    |
| Lane Group Flow (vph)  | 0    |
| Confl. Peds. (#/hr)    | 9    |
| Confl. Bikes (#/hr)    | 10   |
| 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   |      |

## Intersection

Int Delay, s/veh 1.8

| Movement                   | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|----------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| <b>Lane Configurations</b> |      |      |      |      |      |      |      |      |      |      |      |      |
| Traffic Vol, veh/h         | 0    | 0    | 20   | 0    | 0    | 0    | 0    | 935  | 745  | 175  | 25   | 25   |
| Future Vol, veh/h          | 0    | 0    | 20   | 0    | 0    | 0    | 0    | 935  | 745  | 175  | 25   | 25   |
| Conflicting Peds, #/hr     | 5    | 0    | 0    | 0    | 0    | 5    | 1    | 0    | 0    | 0    | 0    | 1    |
| Sign Control               | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized             | -    | -    | None | -    | -    | None | -    | -    | Free | -    | -    | None |
| Storage Length             | -    | -    | 0    | -    | -    | -    | -    | -    | -    | 100  | -    | -    |
| Veh in Median Storage, #   | -    | 0    | -    | -    | -    | -    | -    | 0    | -    | -    | 0    | -    |
| Grade, %                   | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    |
| Peak Hour Factor           | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  |
| Heavy Vehicles, %          | 100  | 0    | 0    | 0    | 0    | 0    | 0    | 4    | 4    | 1    | 0    | 6    |
| Mvmt Flow                  | 0    | 0    | 20   | 0    | 0    | 0    | 0    | 935  | 745  | 175  | 25   | 25   |

| Major/Minor          | Minor2   | Major1 | Major2     |
|----------------------|----------|--------|------------|
| Conflicting Flow All | - - 39   | - 0 -  | 935 0 0    |
| Stage 1              | - - -    | - - -  | - - -      |
| Stage 2              | - - -    | - - -  | - - -      |
| Critical Hdwy        | - - 6.2  | - - -  | 4.115 - -  |
| Critical Hdwy Stg 1  | - - -    | - - -  | - - -      |
| Critical Hdwy Stg 2  | - - -    | - - -  | - - -      |
| Follow-up Hdwy       | - - 3.3  | - - -  | - 2.2095 - |
| Pot Cap-1 Maneuver   | 0 0 1038 | 0 - 0  | 735 - -    |
| Stage 1              | 0 0 -    | 0 - 0  | - - -      |
| Stage 2              | 0 0 -    | 0 - 0  | - - -      |
| Platoon blocked, %   | - - -    | - - -  | - - -      |
| Mov Cap-1 Maneuver   | - 0 1037 | - - -  | 735 - -    |
| Mov Cap-2 Maneuver   | - 0 -    | - - -  | - - -      |
| Stage 1              | - 0 -    | - - -  | - - -      |
| Stage 2              | - 0 -    | - - -  | - - -      |

| Approach              | EB        | NB      | SB  |
|-----------------------|-----------|---------|-----|
| HCM Control Delay, s  | 8.5       | 0       | 8.9 |
| HCM LOS               | A         |         |     |
| <hr/>                 |           |         |     |
| Minor Lane/Major Mvmt | NBT EBLn1 | SBL SBT | SBR |
| Capacity (veh/h)      | - 1037    | 735 -   | -   |
| HCM Lane V/C Ratio    | - 0.019   | 0.238 - | -   |
| HCM Control Delay (s) | - 8.5     | 11.4 -  | -   |
| HCM Lane LOS          | - A       | B -     | -   |
| HCM 95th %tile Q(veh) | - 0.1     | 0.9 -   | -   |

**Intersection**

Int Delay, s/veh 254.4

| Movement                 | EBL  | EBT  | WBT  | WBR  | SEL  | SER  |
|--------------------------|------|------|------|------|------|------|
| Lane Configurations      |      |      |      |      |      |      |
| Traffic Vol, veh/h       | 0    | 1785 | 0    | 0    | 780  | 0    |
| Future Vol, veh/h        | 0    | 1785 | 0    | 0    | 780  | 0    |
| Conflicting Peds, #/hr   | 3    | 0    | 0    | 3    | 0    | 0    |
| Sign Control             | Free | Free | Free | Free | Stop | Stop |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | -    | -    | -    | -    | 0    | -    |
| Veh in Median Storage, # | -    | 0    | -    | -    | 0    | -    |
| Grade, %                 | -    | 0    | 0    | -    | 0    | -    |
| Peak Hour Factor         | 100  | 100  | 100  | 100  | 100  | 100  |
| Heavy Vehicles, %        | 0    | 2    | 0    | 1    | 2    | 2    |
| Mvmt Flow                | 0    | 1785 | 0    | 0    | 780  | 0    |

**Major/Minor**      Major1      Minor2

|                      |   |   |       |   |
|----------------------|---|---|-------|---|
| Conflicting Flow All | - | 0 | 893   | - |
| Stage 1              | - | - | 0     | - |
| Stage 2              | - | - | 893   | - |
| Critical Hdwy        | - | - | 6.84  | - |
| Critical Hdwy Stg 1  | - | - | -     | - |
| Critical Hdwy Stg 2  | - | - | 5.84  | - |
| Follow-up Hdwy       | - | - | 3.52  | - |
| Pot Cap-1 Maneuver   | 0 | - | ~ 281 | 0 |
| Stage 1              | 0 | - | -     | 0 |
| Stage 2              | 0 | - | ~ 360 | 0 |
| Platoon blocked, %   | - |   |       |   |
| Mov Cap-1 Maneuver   | - | - | ~ 281 | - |
| Mov Cap-2 Maneuver   | - | - | ~ 281 | - |
| Stage 1              | - | - | -     | - |
| Stage 2              | - | - | ~ 360 | - |

**Approach**      EB      SE

|                      |   |          |
|----------------------|---|----------|
| HCM Control Delay, s | 0 | \$ 836.5 |
| HCM LOS              |   | F        |

| Minor Lane/Major Mvmt | EBT SELn1 |
|-----------------------|-----------|
| Capacity (veh/h)      | - 281     |
| HCM Lane V/C Ratio    | - 2.776   |
| HCM Control Delay (s) | -\$ 836.5 |
| HCM Lane LOS          | - F       |
| HCM 95th %tile Q(veh) | - 66.8    |

**Notes**

~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

**Intersection**

Int Delay, s/veh 320.8

| Movement                 | EBT  | EBR  | WBL  | WBT  | NBL  | NBR  |
|--------------------------|------|------|------|------|------|------|
| Lane Configurations      | ↑↑   |      |      |      | ↗    |      |
| Traffic Vol, veh/h       | 2540 | 0    | 0    | 0    | 0    | 680  |
| Future Vol, veh/h        | 2540 | 0    | 0    | 0    | 0    | 680  |
| Conflicting Peds, #/hr   | 0    | 0    | 0    | 0    | 0    | 0    |
| Sign Control             | Free | Free | Free | Free | Stop | Stop |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | -    | -    | -    | -    | -    | 0    |
| Veh in Median Storage, # | 0    | -    | -    | -    | 0    | -    |
| Grade, %                 | 0    | -    | -    | 0    | 0    | -    |
| Peak Hour Factor         | 100  | 100  | 100  | 100  | 100  | 100  |
| Heavy Vehicles, %        | 2    | 0    | 0    | 1    | 0    | 1    |
| Mvmt Flow                | 2540 | 0    | 0    | 0    | 0    | 680  |

| Major/Minor          | Major1 | Minor1  |
|----------------------|--------|---------|
| Conflicting Flow All | 0      | -       |
| Stage 1              | -      | -       |
| Stage 2              | -      | -       |
| Critical Hdwy        | -      | -       |
| Critical Hdwy Stg 1  | -      | -       |
| Critical Hdwy Stg 2  | -      | -       |
| Follow-up Hdwy       | -      | -       |
| Pot Cap-1 Maneuver   | -      | 0 ~ 160 |
| Stage 1              | -      | 0       |
| Stage 2              | -      | 0       |
| Platoon blocked, %   | -      |         |
| Mov Cap-1 Maneuver   | -      | - ~ 160 |
| Mov Cap-2 Maneuver   | -      | -       |
| Stage 1              | -      | -       |
| Stage 2              | -      | -       |

| Approach | EB | NB |
|----------|----|----|
|----------|----|----|

HCM Control Delay, s 0 \$ 1518.9

HCM LOS F

| Minor Lane/Major Mvmt | NBLn1     | EBT |
|-----------------------|-----------|-----|
| Capacity (veh/h)      | 160       | -   |
| HCM Lane V/C Ratio    | 4.25      | -   |
| HCM Control Delay (s) | \$ 1518.9 | -   |
| HCM Lane LOS          | F         | -   |
| HCM 95th %tile Q(veh) | 68.7      | -   |

**Notes**

~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

## Intersection

Int Delay, s/veh 4.9

| Movement                   | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  | SWL  | SWR  |
|----------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| <b>Lane Configurations</b> |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Traffic Vol, veh/h         | 0    | 0    | 905  | 0    | 0    | 0    | 0    | 315  | 450  | 0    | 1060 | 0    | 0    | 0    |
| Future Vol, veh/h          | 0    | 0    | 905  | 0    | 0    | 0    | 0    | 315  | 450  | 0    | 1060 | 0    | 0    | 0    |
| Conflicting Peds, #/hr     | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Sign Control               | Free | Free | Free | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free | Stop | Stop |
| RT Channelized             | -    | -    | Free | -    | -    | -    | -    | -    | -    | -    | -    | None | -    | -    |
| Storage Length             | -    | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    | -    | -    | -    | -    |
| Veh in Median Storage, #   | -    | -    | -    | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    | -    | -    |
| Grade, %                   | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    | 0    | -    |
| Peak Hour Factor           | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  |
| Heavy Vehicles, %          | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 2    | 2    |
| Mvmt Flow                  | 0    | 0    | 905  | 0    | 0    | 0    | 0    | 315  | 450  | 0    | 1060 | 0    | 0    | 0    |

| Major/Minor          | Minor1      | Major1    | Major2    |
|----------------------|-------------|-----------|-----------|
| Conflicting Flow All | -           | 453 1060  | 0 0 - - 0 |
| Stage 1              | -           | -         | -         |
| Stage 2              | -           | -         | -         |
| Critical Hdwy        | -           | 6.2 4.1   | - - - -   |
| Critical Hdwy Stg 1  | -           | -         | -         |
| Critical Hdwy Stg 2  | -           | -         | -         |
| Follow-up Hdwy       | -           | 3.3 2.2   | - - -     |
| Pot Cap-1 Maneuver   | 0 0 611 665 | - - 0 - 0 | -         |
| Stage 1              | 0 0 - -     | - - 0 - 0 | -         |
| Stage 2              | 0 0 - -     | - - 0 - 0 | -         |
| Platoon blocked, %   | -           | -         | -         |
| Mov Cap-1 Maneuver   | - 0 611 665 | - - - -   | -         |
| Mov Cap-2 Maneuver   | - 0 - -     | - - - -   | -         |
| Stage 1              | - 0 - -     | - - - -   | -         |
| Stage 2              | - 0 - -     | - - - -   | -         |

| Approach              | WB    | NB  | SB            |
|-----------------------|-------|-----|---------------|
| HCM Control Delay, s  | 17.6  | 6.2 | 0             |
| HCM LOS               | C     | -   | -             |
| <hr/>                 |       |     |               |
| Minor Lane/Major Mvmt | NBT   | NBR | NBR2WBLn1 SBT |
| Capacity (veh/h)      | 665   | - - | 611 -         |
| HCM Lane V/C Ratio    | 0.474 | - - | 0.54 -        |
| HCM Control Delay (s) | 15.2  | - - | 17.6 -        |
| HCM Lane LOS          | C     | - - | C -           |
| HCM 95th %tile Q(veh) | 2.6   | - - | 3.2 -         |

# HCM Signalized Intersection Capacity Analysis

71: Barbur & Whitaker

05/12/2020



| Movement                          | WBL  | WBR   | NBT  | NBR                       | SBU   | SBL  | SBT  |
|-----------------------------------|------|-------|------|---------------------------|-------|------|------|
| Lane Configurations               | WBL  | WBR   | NBT  | NBR                       | SBU   | SBL  | SBT  |
| Traffic Volume (vph)              | 55   | 25    | 815  | 90                        | 10    | 90   | 795  |
| Future Volume (vph)               | 55   | 25    | 815  | 90                        | 10    | 90   | 795  |
| Ideal Flow (vphpl)                | 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 |                           |       | 1.00 | 1.00 |
| Frpb, ped/bikes                   | 0.99 |       | 1.00 |                           |       | 1.00 | 1.00 |
| Flpb, ped/bikes                   | 1.00 |       | 1.00 |                           |       | 1.00 | 1.00 |
| Fr <sub>t</sub>                   | 0.96 |       | 0.99 |                           |       | 1.00 | 1.00 |
| Flt Protected                     | 0.97 |       | 1.00 |                           |       | 0.95 | 1.00 |
| Satd. Flow (prot)                 | 1746 |       | 1837 |                           |       | 1801 | 1845 |
| Flt Permitted                     | 0.97 |       | 1.00 |                           |       | 0.95 | 1.00 |
| Satd. Flow (perm)                 | 1746 |       | 1837 |                           |       | 1801 | 1845 |
| Peak-hour factor, PHF             | 1.00 | 1.00  | 1.00 | 1.00                      | 1.00  | 1.00 | 1.00 |
| Adj. Flow (vph)                   | 55   | 25    | 815  | 90                        | 10    | 90   | 795  |
| RTOR Reduction (vph)              | 16   | 0     | 2    | 0                         | 0     | 0    | 0    |
| Lane Group Flow (vph)             | 64   | 0     | 903  | 0                         | 0     | 100  | 795  |
| Confl. Bikes (#/hr)               |      | 1     |      | 4                         |       |      |      |
| Heavy Vehicles (%)                | 0%   | 0%    | 2%   | 0%                        | 2%    | 0%   | 3%   |
| Turn Type                         | Perm |       | NA   |                           | Prot  | Prot | NA   |
| Protected Phases                  |      |       | 2    |                           | 1     | 1    | 6    |
| Permitted Phases                  |      | 4     |      |                           |       |      |      |
| Actuated Green, G (s)             | 11.8 |       | 82.5 |                           |       | 10.8 | 97.8 |
| Effective Green, g (s)            | 12.3 |       | 84.4 |                           |       | 11.3 | 99.7 |
| Actuated g/C Ratio                | 0.10 |       | 0.70 |                           |       | 0.09 | 0.83 |
| Clearance Time (s)                | 4.5  |       | 5.9  |                           |       | 4.5  | 5.9  |
| Vehicle Extension (s)             | 3.0  |       | 3.0  |                           |       | 3.0  | 3.0  |
| Lane Grp Cap (vph)                | 178  |       | 1292 |                           |       | 169  | 1532 |
| v/s Ratio Prot                    |      | c0.49 |      |                           | c0.06 | 0.43 |      |
| v/s Ratio Perm                    |      | c0.04 |      |                           |       |      |      |
| v/c Ratio                         | 0.36 |       | 0.70 |                           |       | 0.59 | 0.52 |
| Uniform Delay, d1                 | 50.2 |       | 10.4 |                           |       | 52.1 | 3.0  |
| Progression Factor                | 1.00 |       | 1.00 |                           |       | 1.20 | 0.25 |
| Incremental Delay, d2             | 1.2  |       | 3.2  |                           |       | 4.5  | 1.0  |
| Delay (s)                         | 51.4 |       | 13.5 |                           |       | 66.9 | 1.8  |
| Level of Service                  | D    |       | B    |                           |       | E    | A    |
| Approach Delay (s)                | 51.4 |       | 13.5 |                           |       |      | 9.0  |
| Approach LOS                      | D    |       | B    |                           |       |      | A    |
| Intersection Summary              |      |       |      |                           |       |      |      |
| HCM 2000 Control Delay            |      | 13.0  |      | HCM 2000 Level of Service |       | B    |      |
| HCM 2000 Volume to Capacity ratio |      | 0.65  |      |                           |       |      |      |
| Actuated Cycle Length (s)         |      | 120.0 |      | Sum of lost time (s)      |       | 13.0 |      |
| Intersection Capacity Utilization |      | 68.5% |      | ICU Level of Service      |       | C    |      |
| Analysis Period (min)             |      | 15    |      |                           |       |      |      |

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

78: Barbur Blvd & SW Naito Pkwy

05/12/2020



| Movement                          | WBL   | WBR   | NBT   | NBR                       | SBL  | SBT   |
|-----------------------------------|-------|-------|-------|---------------------------|------|-------|
| Lane Configurations               | YY    |       | TT    | TT                        |      | TT    |
| Traffic Volume (vph)              | 1910  | 10    | 905   | 770                       | 0    | 875   |
| Future Volume (vph)               | 1910  | 10    | 905   | 770                       | 0    | 875   |
| Ideal Flow (vphpl)                | 1900  | 1900  | 1900  | 1900                      | 1900 | 1900  |
| Total Lost time (s)               | 4.0   |       | 4.0   | 4.0                       |      | 4.0   |
| Lane Util. Factor                 | 0.97  |       | *0.84 | 0.88                      |      | *0.75 |
| Frpb, ped/bikes                   | 1.00  |       | 1.00  | 1.00                      |      | 1.00  |
| Flpb, ped/bikes                   | 1.00  |       | 1.00  | 1.00                      |      | 1.00  |
| Fr <sub>t</sub>                   | 1.00  |       | 1.00  | 0.85                      |      | 1.00  |
| Flt Protected                     | 0.95  |       | 1.00  | 1.00                      |      | 1.00  |
| Satd. Flow (prot)                 | 3509  |       | 3069  | 2760                      |      | 2767  |
| Flt Permitted                     | 0.95  |       | 1.00  | 1.00                      |      | 1.00  |
| Satd. Flow (perm)                 | 3509  |       | 3069  | 2760                      |      | 2767  |
| Peak-hour factor, PHF             | 1.00  | 1.00  | 1.00  | 1.00                      | 1.00 | 1.00  |
| Adj. Flow (vph)                   | 1910  | 10    | 905   | 770                       | 0    | 875   |
| RTOR Reduction (vph)              | 0     | 0     | 0     | 0                         | 0    | 0     |
| Lane Group Flow (vph)             | 1920  | 0     | 905   | 770                       | 0    | 875   |
| Confl. Peds. (#/hr)               | 23    |       |       | 23                        | 23   |       |
| Confl. Bikes (#/hr)               |       |       |       |                           | 7    |       |
| Heavy Vehicles (%)                | 0%    | 0%    | 4%    | 3%                        | 0%   | 3%    |
| Turn Type                         | Prot  |       | NA    | custom                    |      | NA    |
| Protected Phases                  | 8     |       | 2 6   | 6 8                       |      | 2 6   |
| Permitted Phases                  |       |       |       |                           |      |       |
| Actuated Green, G (s)             | 87.8  |       | 52.2  | 105.8                     |      | 52.2  |
| Effective Green, g (s)            | 88.8  |       | 53.2  | 106.8                     |      | 53.2  |
| Actuated g/C Ratio                | 0.59  |       | 0.35  | 0.71                      |      | 0.35  |
| Clearance Time (s)                | 5.0   |       |       |                           |      |       |
| Vehicle Extension (s)             | 3.0   |       |       |                           |      |       |
| Lane Grp Cap (vph)                | 2077  |       | 1088  | 1965                      |      | 981   |
| v/s Ratio Prot                    | c0.55 |       | 0.29  | 0.28                      |      | c0.32 |
| v/s Ratio Perm                    |       |       |       |                           |      |       |
| v/c Ratio                         | 0.92  |       | 0.83  | 0.39                      |      | 0.89  |
| Uniform Delay, d1                 | 27.6  |       | 44.3  | 8.6                       |      | 45.7  |
| Progression Factor                | 1.00  |       | 1.00  | 1.00                      |      | 1.00  |
| Incremental Delay, d2             | 7.5   |       | 7.4   | 0.1                       |      | 12.1  |
| Delay (s)                         | 35.1  |       | 51.8  | 8.8                       |      | 57.8  |
| Level of Service                  | D     |       | D     | A                         |      | E     |
| Approach Delay (s)                | 35.1  |       | 32.0  |                           |      | 57.8  |
| Approach LOS                      | D     |       | C     |                           |      | E     |
| <b>Intersection Summary</b>       |       |       |       |                           |      |       |
| HCM 2000 Control Delay            |       | 38.4  |       | HCM 2000 Level of Service |      | D     |
| HCM 2000 Volume to Capacity ratio |       | 0.94  |       |                           |      |       |
| Actuated Cycle Length (s)         |       | 150.0 |       | Sum of lost time (s)      |      | 12.0  |
| Intersection Capacity Utilization |       | 89.0% |       | ICU Level of Service      |      | E     |
| Analysis Period (min)             |       | 15    |       |                           |      |       |
| c Critical Lane Group             |       |       |       |                           |      |       |

# HCM Signalized Intersection Capacity Analysis

80: Barbur Blvd & SW Bancroft St

05/12/2020



| Movement                              | NBT   | NBR  | SBU   | SBL   | SBT                       | NWL  | NWR   |
|---------------------------------------|-------|------|-------|-------|---------------------------|------|-------|
| Lane Configurations                   |       |      |       |       |                           |      |       |
| Traffic Volume (vph)                  | 1750  | 60   | 90    | 350   | 2425                      | 0    | 85    |
| Future Volume (vph)                   | 1750  | 60   | 90    | 350   | 2425                      | 0    | 85    |
| Ideal Flow (vphpl)                    | 2100  | 1900 | 1900  | 1900  | 1900                      | 1900 | 1900  |
| Grade (%)                             | 0%    |      |       |       | 0%                        | 13%  |       |
| Total Lost time (s)                   | 4.0   |      |       | 4.0   | 4.0                       |      | 4.0   |
| Lane Util. Factor                     | 0.95  |      |       | 1.00  | 0.95                      |      | 1.00  |
| Frpb, ped/bikes                       | 1.00  |      |       | 1.00  | 1.00                      |      | 1.00  |
| Flpb, ped/bikes                       | 1.00  |      |       | 1.00  | 1.00                      |      | 1.00  |
| Fr <sub>t</sub>                       | 1.00  |      |       | 1.00  | 1.00                      |      | 0.86  |
| Flt Protected                         | 1.00  |      |       | 0.95  | 1.00                      |      | 1.00  |
| Satd. Flow (prot)                     | 3852  |      |       | 1797  | 3539                      |      | 1537  |
| Flt Permitted                         | 1.00  |      |       | 0.95  | 1.00                      |      | 1.00  |
| Satd. Flow (perm)                     | 3852  |      |       | 1797  | 3539                      |      | 1537  |
| Peak-hour factor, PHF                 | 1.00  | 1.00 | 0.92  | 1.00  | 1.00                      | 1.00 | 1.00  |
| Adj. Flow (vph)                       | 1750  | 60   | 98    | 350   | 2425                      | 0    | 85    |
| RTOR Reduction (vph)                  | 1     | 0    | 0     | 0     | 0                         | 0    | 12    |
| Lane Group Flow (vph)                 | 1809  | 0    | 0     | 448   | 2425                      | 0    | 73    |
| Confl. Peds. (#/hr)                   |       | 6    |       | 6     |                           |      |       |
| Confl. Bikes (#/hr)                   |       | 11   |       |       |                           |      |       |
| Heavy Vehicles (%)                    | 3%    | 1%   | 2%    | 0%    | 2%                        | 0%   | 0%    |
| Turn Type                             | NA    |      | Prot  | Prot  | NA                        |      | pt+ov |
| Protected Phases                      | 2     |      | 1 7!  | 1 7   | 6                         |      | 1 7!  |
| Permitted Phases                      |       |      |       |       |                           |      |       |
| Actuated Green, G (s)                 | 94.9  |      |       | 46.6  | 128.2                     |      | 46.6  |
| Effective Green, g (s)                | 95.4  |      |       | 46.6  | 128.7                     |      | 46.6  |
| Actuated g/C Ratio                    | 0.64  |      |       | 0.31  | 0.86                      |      | 0.31  |
| Clearance Time (s)                    | 4.5   |      |       | 4.5   |                           |      |       |
| Vehicle Extension (s)                 | 3.0   |      |       | 3.0   |                           |      |       |
| Lane Grp Cap (vph)                    | 2449  |      |       | 558   | 3036                      |      | 477   |
| v/s Ratio Prot                        | 0.47  |      | c0.25 | c0.69 |                           | 0.05 |       |
| v/s Ratio Perm                        |       |      |       |       |                           |      |       |
| v/c Ratio                             | 0.74  |      |       | 0.80  | 0.80                      |      | 0.15  |
| Uniform Delay, d1                     | 18.7  |      |       | 47.5  | 4.8                       |      | 37.4  |
| Progression Factor                    | 1.07  |      |       | 0.87  | 1.68                      |      | 1.15  |
| Incremental Delay, d2                 | 1.7   |      |       | 4.5   | 1.2                       |      | 0.1   |
| Delay (s)                             | 21.7  |      |       | 46.0  | 9.3                       |      | 43.2  |
| Level of Service                      | C     |      |       | D     | A                         |      | D     |
| Approach Delay (s)                    | 21.7  |      |       |       | 15.0                      | 43.2 |       |
| Approach LOS                          | C     |      |       |       | B                         | D    |       |
| <b>Intersection Summary</b>           |       |      |       |       |                           |      |       |
| HCM 2000 Control Delay                | 18.1  |      |       |       | HCM 2000 Level of Service |      | B     |
| HCM 2000 Volume to Capacity ratio     | 0.84  |      |       |       |                           |      |       |
| Actuated Cycle Length (s)             | 150.0 |      |       |       | Sum of lost time (s)      |      | 12.0  |
| Intersection Capacity Utilization     | 85.2% |      |       |       | ICU Level of Service      |      | E     |
| Analysis Period (min)                 | 15    |      |       |       |                           |      |       |
| ! Phase conflict between lane groups. |       |      |       |       |                           |      |       |
| c Critical Lane Group                 |       |      |       |       |                           |      |       |

# HCM Signalized Intersection Capacity Analysis

81: Corbett Ave & SW Bancroft St

05/12/2020



| Movement                          | NBL   | NBT  | SBT                       | SBR   | SEL   | SER  |
|-----------------------------------|-------|------|---------------------------|-------|-------|------|
| Lane Configurations               |       |      |                           |       |       |      |
| Traffic Volume (vph)              | 65    | 540  | 270                       | 20    | 0     | 410  |
| Future Volume (vph)               | 65    | 540  | 270                       | 20    | 0     | 410  |
| Ideal Flow (vphpl)                | 1900  | 1900 | 1900                      | 1900  | 1900  | 1900 |
| Total Lost time (s)               |       | 4.0  | 4.0                       |       | 4.0   |      |
| Lane Util. Factor                 |       | 1.00 | 1.00                      |       | 1.00  |      |
| Frpb, ped/bikes                   |       | 1.00 | 1.00                      |       | 0.98  |      |
| Flpb, ped/bikes                   |       | 1.00 | 1.00                      |       | 1.00  |      |
| Fr <sub>t</sub>                   |       | 1.00 | 0.99                      |       | 0.86  |      |
| Flt Protected                     |       | 0.99 | 1.00                      |       | 1.00  |      |
| Satd. Flow (prot)                 |       | 1486 | 1491                      |       | 1288  |      |
| Flt Permitted                     |       | 0.94 | 1.00                      |       | 1.00  |      |
| Satd. Flow (perm)                 |       | 1407 | 1491                      |       | 1288  |      |
| Peak-hour factor, PHF             | 1.00  | 1.00 | 1.00                      | 1.00  | 1.00  | 1.00 |
| Adj. Flow (vph)                   | 65    | 540  | 270                       | 20    | 0     | 410  |
| RTOR Reduction (vph)              | 0     | 0    | 2                         | 0     | 0     | 243  |
| Lane Group Flow (vph)             | 0     | 605  | 288                       | 0     | 0     | 167  |
| Confl. Peds. (#/hr)               | 11    |      |                           | 11    | 1     | 2    |
| Confl. Bikes (#/hr)               |       |      |                           | 3     |       | 4    |
| Heavy Vehicles (%)                | 0%    | 1%   | 0%                        | 0%    | 0%    | 0%   |
| Bus Blockages (#/hr)              | 2     | 2    | 2                         | 2     | 0     | 0    |
| Parking (#/hr)                    | 2     | 2    | 2                         | 2     | 2     | 2    |
| Turn Type                         | pm+pt | NA   | NA                        |       | pm+ov |      |
| Protected Phases                  | 5     | 2    | 6                         |       | 5     |      |
| Permitted Phases                  | 2     |      |                           |       | 4     |      |
| Actuated Green, G (s)             | 50.0  | 40.0 |                           | 23.0  |       |      |
| Effective Green, g (s)            | 50.0  | 40.0 |                           | 23.0  |       |      |
| Actuated g/C Ratio                | 0.67  | 0.53 |                           | 0.31  |       |      |
| Clearance Time (s)                | 4.0   | 4.0  |                           | 4.0   |       |      |
| Vehicle Extension (s)             | 3.0   | 3.0  |                           | 3.0   |       |      |
| Lane Grp Cap (vph)                | 944   | 795  |                           | 463   |       |      |
| v/s Ratio Prot                    | c0.05 | 0.19 |                           | c0.03 |       |      |
| v/s Ratio Perm                    | c0.38 |      |                           | 0.10  |       |      |
| v/c Ratio                         | 0.64  | 0.36 |                           | 0.36  |       |      |
| Uniform Delay, d1                 | 7.3   | 10.1 |                           | 20.3  |       |      |
| Progression Factor                | 1.30  | 1.00 |                           | 6.96  |       |      |
| Incremental Delay, d2             | 0.9   | 1.3  |                           | 0.3   |       |      |
| Delay (s)                         | 10.3  | 11.4 |                           | 141.4 |       |      |
| Level of Service                  | B     | B    |                           | F     |       |      |
| Approach Delay (s)                | 10.3  | 11.4 |                           | 141.4 |       |      |
| Approach LOS                      | B     | B    |                           | F     |       |      |
| Intersection Summary              |       |      |                           |       |       |      |
| HCM 2000 Control Delay            | 51.7  |      | HCM 2000 Level of Service | D     |       |      |
| HCM 2000 Volume to Capacity ratio | 0.61  |      |                           |       |       |      |
| Actuated Cycle Length (s)         | 75.0  |      | Sum of lost time (s)      | 12.0  |       |      |
| Intersection Capacity Utilization | 76.1% |      | ICU Level of Service      | D     |       |      |
| Analysis Period (min)             | 15    |      |                           |       |       |      |
| c Critical Lane Group             |       |      |                           |       |       |      |

# HCM Signalized Intersection Capacity Analysis

82: Barbur Blvd & SW Hamilton St

05/12/2020



| Movement               | EBL   | EBT   | EBR  | WBL   | WBT   | WBR  | NBL  | NBT   | NBR   | SBL  | SBT   | SBR  |
|------------------------|-------|-------|------|-------|-------|------|------|-------|-------|------|-------|------|
| Lane Configurations    | ↑     | ↔     |      | ↑     | ↔     | ↑    |      | ↑↔    | ↑     |      | ↑↔    |      |
| Traffic Volume (vph)   | 65    | 110   | 15   | 355   | 55    | 105  | 0    | 1640  | 350   | 0    | 2350  | 75   |
| Future Volume (vph)    | 65    | 110   | 15   | 355   | 55    | 105  | 0    | 1640  | 350   | 0    | 2350  | 75   |
| Ideal Flow (vphpl)     | 1900  | 1900  | 1900 | 1900  | 1900  | 1900 | 1900 | 2100  | 1900  | 1900 | 1900  | 1900 |
| Grade (%)              |       |       |      |       | 10%   |      |      | 0%    |       |      | 0%    |      |
| Total Lost time (s)    | 5.0   | 5.0   |      | 5.0   | 5.0   |      |      | 8.0   | 9.0   |      | 8.0   |      |
| Lane Util. Factor      | 0.95  | 0.95  |      | 0.95  | 0.95  | 1.00 |      | 0.95  | 1.00  |      | 0.95  |      |
| Frpb, ped/bikes        | 1.00  | 0.99  |      | 1.00  | 1.00  | 0.98 |      | 1.00  | 0.97  |      | 1.00  |      |
| Flpb, ped/bikes        | 1.00  | 1.00  |      | 1.00  | 1.00  | 1.00 |      | 1.00  | 1.00  |      | 1.00  |      |
| Fr <sub>t</sub>        | 1.00  | 0.98  |      | 1.00  | 1.00  | 0.85 |      | 1.00  | 0.85  |      | 1.00  |      |
| Flt Protected          | 0.95  | 1.00  |      | 0.95  | 0.96  | 1.00 |      | 1.00  | 1.00  |      | 1.00  |      |
| Satd. Flow (prot)      | 1715  | 1746  |      | 1613  | 1642  | 1496 |      | 3740  | 1573  |      | 3519  |      |
| Flt Permitted          | 0.95  | 1.00  |      | 0.95  | 0.96  | 1.00 |      | 1.00  | 1.00  |      | 1.00  |      |
| Satd. Flow (perm)      | 1715  | 1746  |      | 1613  | 1642  | 1496 |      | 3740  | 1573  |      | 3519  |      |
| Peak-hour factor, PHF  | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00 | 1.00  | 1.00 |
| Adj. Flow (vph)        | 65    | 110   | 15   | 355   | 55    | 105  | 0    | 1640  | 350   | 0    | 2350  | 75   |
| RTOR Reduction (vph)   | 0     | 3     | 0    | 0     | 0     | 35   | 0    | 0     | 102   | 0    | 1     | 0    |
| Lane Group Flow (vph)  | 58    | 129   | 0    | 202   | 208   | 70   | 0    | 1640  | 248   | 0    | 2424  | 0    |
| Confl. Peds. (#/hr)    |       |       | 33   | 33    |       |      |      | 7     |       |      | 7     |      |
| Confl. Bikes (#/hr)    |       |       | 2    |       |       | 3    |      |       | 12    |      | 24    |      |
| Heavy Vehicles (%)     | 0%    | 0%    | 0%   | 1%    | 0%    | 1%   | 0%   | 2%    | 0%    | 1%   | 2%    | 0%   |
| Bus Blockages (#/hr)   | 0     | 0     | 0    | 0     | 0     | 0    | 0    | 22    | 0     | 0    | 0     | 0    |
| Turn Type              | Split | NA    |      | Split | NA    | Perm |      | NA    | Perm  |      | NA    |      |
| Protected Phases       | 3!    | 3!    |      | 3 4!  | 3 4!  |      |      |       | 6     |      |       | 2    |
| Permitted Phases       |       |       |      |       |       | 3 4  |      |       |       | 6    |       |      |
| Actuated Green, G (s)  | 14.6  | 14.6  |      | 30.8  | 30.8  | 30.8 |      | 106.2 | 106.2 |      | 106.2 |      |
| Effective Green, g (s) | 14.6  | 14.6  |      | 30.8  | 30.8  | 30.8 |      | 107.2 | 106.2 |      | 107.2 |      |
| Actuated g/C Ratio     | 0.10  | 0.10  |      | 0.21  | 0.21  | 0.21 |      | 0.71  | 0.71  |      | 0.71  |      |
| Clearance Time (s)     | 5.0   | 5.0   |      |       |       |      |      | 9.0   | 9.0   |      | 9.0   |      |
| Vehicle Extension (s)  | 0.5   | 0.5   |      |       |       |      |      | 3.0   | 3.0   |      | 3.0   |      |
| Lane Grp Cap (vph)     | 166   | 169   |      | 331   | 337   | 307  |      | 2672  | 1113  |      | 2514  |      |
| v/s Ratio Prot         | 0.03  | c0.07 |      | 0.13  | c0.13 |      |      | 0.44  |       |      | c0.69 |      |
| v/s Ratio Perm         |       |       |      |       |       | 0.05 |      |       | 0.16  |      |       |      |
| v/c Ratio              | 0.35  | 0.77  |      | 0.61  | 0.62  | 0.23 |      | 0.61  | 0.22  |      | 0.96  |      |
| Uniform Delay, d1      | 63.3  | 66.0  |      | 54.1  | 54.2  | 49.7 |      | 10.9  | 7.6   |      | 19.6  |      |
| Progression Factor     | 1.00  | 1.00  |      | 0.84  | 0.84  | 0.77 |      | 0.52  | 0.62  |      | 0.57  |      |
| Incremental Delay, d2  | 0.5   | 16.8  |      | 1.2   | 1.2   | 0.1  |      | 0.7   | 0.3   |      | 7.5   |      |
| Delay (s)              | 63.7  | 82.8  |      | 46.9  | 47.0  | 38.1 |      | 6.4   | 5.0   |      | 18.8  |      |
| Level of Service       | E     | F     |      | D     | D     | D    |      | A     | A     |      | B     |      |
| Approach Delay (s)     |       | 77.0  |      |       | 45.1  |      |      | 6.1   |       |      | 18.8  |      |
| Approach LOS           |       | E     |      |       | D     |      |      | A     |       |      | B     |      |

## Intersection Summary

|                                   |       |                           |      |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay            | 18.7  | HCM 2000 Level of Service | B    |
| HCM 2000 Volume to Capacity ratio | 0.92  |                           |      |
| Actuated Cycle Length (s)         | 150.0 | Sum of lost time (s)      | 17.0 |
| Intersection Capacity Utilization | 99.8% | ICU Level of Service      | F    |
| Analysis Period (min)             | 15    |                           |      |

! Phase conflict between lane groups.

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

83: SW Corbett Ave & SW Hamilton St

05/12/2020



| Movement                          | EBL   | EBT   | EBR   | WBL  | WBT                       | WBR   | NBL   | NBT  | NBR  | SBL   | SBT  | SBR  |
|-----------------------------------|-------|-------|-------|------|---------------------------|-------|-------|------|------|-------|------|------|
| Lane Configurations               |       |       |       |      |                           |       |       |      |      |       |      |      |
| Traffic Volume (vph)              | 335   | 45    | 80    | 15   | 45                        | 5     | 370   | 265  | 40   | 5     | 575  | 100  |
| Future Volume (vph)               | 335   | 45    | 80    | 15   | 45                        | 5     | 370   | 265  | 40   | 5     | 575  | 100  |
| Ideal Flow (vphpl)                | 1900  | 1900  | 1900  | 1900 | 1900                      | 1900  | 1900  | 1900 | 1900 | 1900  | 1900 | 1900 |
| Grade (%)                         |       | 10%   |       |      | 0%                        |       |       | 0%   |      | 0%    |      | 0%   |
| Total Lost time (s)               |       | 4.0   | 4.0   |      | 4.0                       |       | 4.0   | 4.0  |      | 4.0   |      | 3.5  |
| Lane Util. Factor                 |       | 1.00  | 1.00  |      | 1.00                      |       | 1.00  | 1.00 |      | 1.00  |      | 1.00 |
| Frpb, ped/bikes                   |       | 1.00  | 0.96  |      | 1.00                      |       | 1.00  | 0.99 |      | 1.00  |      | 0.97 |
| Flpb, ped/bikes                   |       | 0.99  | 1.00  |      | 1.00                      |       | 1.00  | 1.00 |      | 1.00  |      | 1.00 |
| Fr <sub>t</sub>                   |       | 1.00  | 0.85  |      | 0.99                      |       | 1.00  | 1.00 |      | 1.00  |      | 0.85 |
| Flt Protected                     |       | 0.96  | 1.00  |      | 0.99                      |       | 0.95  | 1.00 |      | 1.00  |      | 1.00 |
| Satd. Flow (prot)                 |       | 1373  | 1169  |      | 1443                      |       | 1406  | 1479 |      | 1494  |      | 1240 |
| Flt Permitted                     |       | 0.74  | 1.00  |      | 0.90                      |       | 0.13  | 1.00 |      | 1.00  |      | 1.00 |
| Satd. Flow (perm)                 |       | 1062  | 1169  |      | 1319                      |       | 197   | 1479 |      | 1491  |      | 1240 |
| Peak-hour factor, PHF             | 1.00  | 1.00  | 1.00  | 1.00 | 1.00                      | 1.00  | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 |
| Adj. Flow (vph)                   | 335   | 45    | 80    | 15   | 45                        | 5     | 370   | 265  | 40   | 5     | 575  | 100  |
| RTOR Reduction (vph)              | 0     | 0     | 41    | 0    | 3                         | 0     | 0     | 7    | 0    | 0     | 0    | 58   |
| Lane Group Flow (vph)             | 0     | 380   | 39    | 0    | 62                        | 0     | 370   | 298  | 0    | 0     | 580  | 42   |
| Confl. Peds. (#/hr)               | 4     |       | 15    | 15   |                           | 4     | 13    |      | 11   | 11    |      | 13   |
| Confl. Bikes (#/hr)               |       |       | 6     |      |                           | 1     |       |      |      |       |      | 2    |
| Heavy Vehicles (%)                | 0%    | 0%    | 1%    | 11%  | 0%                        | 0%    | 2%    | 1%   | 4%   | 0%    | 1%   | 0%   |
| Bus Blockages (#/hr)              | 0     | 0     | 0     | 0    | 0                         | 0     | 2     | 2    | 2    | 2     | 2    | 2    |
| Parking (#/hr)                    | 2     | 2     | 2     | 2    | 2                         | 2     | 2     | 2    | 2    | 2     | 2    | 2    |
| Turn Type                         | Perm  | NA    | pm+ov | Perm | NA                        |       | pm+pt | NA   |      | Perm  | NA   | Perm |
| Protected Phases                  |       | 4     | 5     |      | 8                         |       | 5     | 2    |      |       | 6    |      |
| Permitted Phases                  | 4     |       | 4     | 8    |                           |       | 2     |      |      | 6     |      | 6    |
| Actuated Green, G (s)             | 23.5  | 38.0  |       | 23.5 |                           | 44.5  | 44.5  |      |      | 26.5  |      | 26.5 |
| Effective Green, g (s)            | 23.0  | 37.0  |       | 23.0 |                           | 44.0  | 44.0  |      |      | 26.0  |      | 26.5 |
| Actuated g/C Ratio                | 0.31  | 0.49  |       | 0.31 |                           | 0.59  | 0.59  |      |      | 0.35  |      | 0.35 |
| Clearance Time (s)                | 3.5   | 3.5   |       | 3.5  |                           | 3.5   | 3.5   |      |      | 3.5   |      | 3.5  |
| Vehicle Extension (s)             | 3.0   | 3.0   |       | 3.0  |                           | 3.0   | 3.0   |      |      | 3.0   |      | 3.0  |
| Lane Grp Cap (vph)                | 325   | 639   |       | 404  |                           | 341   | 867   |      |      | 516   |      | 438  |
| v/s Ratio Prot                    |       | 0.01  |       |      |                           | c0.20 | 0.20  |      |      |       |      |      |
| v/s Ratio Perm                    |       | c0.36 | 0.02  |      | 0.05                      |       | c0.43 |      |      | 0.39  |      | 0.03 |
| v/c Ratio                         | 1.17  | 0.06  |       | 0.15 |                           | 1.09  | 0.34  |      |      | 1.12  |      | 0.10 |
| Uniform Delay, d1                 | 26.0  | 9.9   |       | 18.9 |                           | 20.9  | 8.0   |      |      | 24.5  |      | 16.2 |
| Progression Factor                | 1.30  | 3.49  |       | 1.00 |                           | 1.00  | 1.00  |      |      | 1.32  |      | 1.31 |
| Incremental Delay, d2             | 102.7 | 0.0   |       | 0.2  |                           | 73.4  | 1.1   |      |      | 76.8  |      | 0.4  |
| Delay (s)                         | 136.4 | 34.7  |       | 19.1 |                           | 94.3  | 9.1   |      |      | 109.1 |      | 21.6 |
| Level of Service                  | F     | C     |       | B    |                           | F     | A     |      |      | F     |      | C    |
| Approach Delay (s)                | 118.7 |       |       | 19.1 |                           |       | 55.8  |      |      | 96.3  |      |      |
| Approach LOS                      | F     |       |       | B    |                           |       | E     |      |      | F     |      |      |
| <b>Intersection Summary</b>       |       |       |       |      |                           |       |       |      |      |       |      |      |
| HCM 2000 Control Delay            |       | 84.6  |       |      | HCM 2000 Level of Service |       |       | F    |      |       |      |      |
| HCM 2000 Volume to Capacity ratio |       | 1.16  |       |      |                           |       |       |      |      |       |      |      |
| Actuated Cycle Length (s)         |       | 75.0  |       |      | Sum of lost time (s)      |       |       | 12.0 |      |       |      |      |
| Intersection Capacity Utilization |       | 96.6% |       |      | ICU Level of Service      |       |       | F    |      |       |      |      |
| Analysis Period (min)             |       | 15    |       |      |                           |       |       |      |      |       |      |      |

c Critical Lane Group



## APPENDIX B12

Segment A – AM Bridgehead HCM Results



# HCM Signalized Intersection Capacity Analysis

12: SW 1st Ave & SW Harrison Street

06/02/2020



| Movement               | EBL   | EBT  | EBR  | WBL  | WBT  | WBR   | NBL  | NBT  | NBR  | SBL   | SBT  | SBR  |
|------------------------|-------|------|------|------|------|-------|------|------|------|-------|------|------|
| Lane Configurations    |       | ↑↑   |      |      | ↑↑   |       | ↑    |      | ↑    | ↑↑    | ↑↑   |      |
| Traffic Volume (vph)   | 0     | 125  | 45   | 25   | 40   | 0     | 360  | 0    | 5    | 35    | 150  | 50   |
| Future Volume (vph)    | 0     | 125  | 45   | 25   | 40   | 0     | 360  | 0    | 5    | 35    | 150  | 50   |
| Ideal Flow (vphpl)     | 1750  | 1750 | 1750 | 1750 | 1750 | 1750  | 1750 | 1750 | 1750 | 1750  | 1750 | 1750 |
| Grade (%)              | -3%   |      |      |      | 3%   |       |      | 0%   |      |       | 0%   |      |
| 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 |      | 1.00 | 1.00  | 0.95 |      |
| Frpb, ped/bikes        | 0.98  |      |      |      | 1.00 |       | 1.00 |      | 0.96 | 1.00  | 0.98 |      |
| Flpb, ped/bikes        | 1.00  |      |      |      | 0.98 |       | 1.00 |      | 1.00 | 0.96  | 1.00 |      |
| Fr <sub>t</sub>        | 0.96  |      |      |      | 1.00 |       | 1.00 |      | 0.85 | 1.00  | 0.96 |      |
| Flt Protected          | 1.00  |      |      |      | 0.98 |       | 0.95 |      | 1.00 | 0.95  | 1.00 |      |
| Satd. Flow (prot)      | 2734  |      |      |      | 2924 |       | 1539 |      | 1394 | 1547  | 3006 |      |
| Flt Permitted          | 1.00  |      |      |      | 0.84 |       | 0.95 |      | 1.00 | 0.95  | 1.00 |      |
| Satd. Flow (perm)      | 2734  |      |      |      | 2513 |       | 1539 |      | 1394 | 1547  | 3006 |      |
| Peak-hour factor, PHF  | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 |
| Adj. Flow (vph)        | 0     | 125  | 45   | 25   | 40   | 0     | 360  | 0    | 5    | 35    | 150  | 50   |
| RTOR Reduction (vph)   | 0     | 34   | 0    | 0    | 0    | 0     | 0    | 0    | 3    | 0     | 37   | 0    |
| Lane Group Flow (vph)  | 0     | 136  | 0    | 0    | 65   | 0     | 360  | 0    | 2    | 35    | 163  | 0    |
| Confl. Peds. (#/hr)    | 50    |      | 61   | 61   |      | 50    | 29   |      | 37   | 37    |      | 29   |
| Confl. Bikes (#/hr)    |       |      | 4    |      |      | 38    |      |      | 2    |       |      | 26   |
| Heavy Vehicles (%)     | 0%    | 20%  | 4%   | 0%   | 12%  | 0%    | 8%   | 0%   | 2%   | 3%    | 3%   | 10%  |
| Turn Type              | NA    |      | Perm | NA   |      | Prot  |      | Perm | Perm | NA    |      |      |
| Protected Phases       | 8     |      |      | 4    |      | 1     |      |      |      | 2     |      |      |
| Permitted Phases       |       |      | 4    |      |      |       |      | 1    | 2    |       |      |      |
| Actuated Green, G (s)  | 22.0  |      |      | 22.0 |      | 32.0  |      | 32.0 | 24.0 | 24.0  |      |      |
| Effective Green, g (s) | 22.0  |      |      | 22.0 |      | 32.0  |      | 32.0 | 24.0 | 24.0  |      |      |
| Actuated g/C Ratio     | 0.24  |      |      | 0.24 |      | 0.36  |      | 0.36 | 0.27 | 0.27  |      |      |
| Clearance Time (s)     | 4.0   |      |      | 4.0  |      | 4.0   |      | 4.0  | 4.0  | 4.0   |      |      |
| Vehicle Extension (s)  | 3.0   |      |      | 3.0  |      | 3.0   |      | 3.0  | 3.0  | 3.0   |      |      |
| Lane Grp Cap (vph)     | 668   |      |      | 614  |      | 547   |      | 495  | 412  | 801   |      |      |
| v/s Ratio Prot         | c0.05 |      |      |      |      | c0.23 |      |      |      | c0.05 |      |      |
| v/s Ratio Perm         |       |      |      | 0.03 |      |       |      | 0.00 | 0.02 |       |      |      |
| v/c Ratio              | 0.20  |      |      | 0.11 |      | 0.66  |      | 0.00 | 0.08 | 0.20  |      |      |
| Uniform Delay, d1      | 27.0  |      |      | 26.4 |      | 24.4  |      | 18.7 | 24.8 | 25.6  |      |      |
| Progression Factor     | 1.00  |      |      | 1.00 |      | 1.00  |      | 1.00 | 1.00 | 1.00  |      |      |
| Incremental Delay, d2  | 0.2   |      |      | 0.1  |      | 6.1   |      | 0.0  | 0.1  | 0.1   |      |      |
| Delay (s)              | 27.2  |      |      | 26.4 |      | 30.5  |      | 18.7 | 24.9 | 25.7  |      |      |
| Level of Service       | C     |      |      | C    |      | C     |      | B    | C    | C     |      |      |
| Approach Delay (s)     | 27.2  |      |      | 26.4 |      |       | 30.3 |      |      | 25.6  |      |      |
| Approach LOS           | C     |      |      | C    |      | C     |      | C    |      | C     |      |      |

## Intersection Summary

|                                   |       |                           |      |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay            | 28.1  | HCM 2000 Level of Service | C    |
| HCM 2000 Volume to Capacity ratio | 0.39  |                           |      |
| Actuated Cycle Length (s)         | 90.0  | Sum of lost time (s)      | 12.0 |
| Intersection Capacity Utilization | 74.6% | ICU Level of Service      | D    |
| Analysis Period (min)             | 15    |                           |      |

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

13: SW Naito Parkway & SW Harrison Street

06/02/2020



| Movement               | EBL   | EBT   | EBR  | WBL   | WBT   | WBR  | NBL  | NBT   | NBR  | SBL  | SBT  | SBR  |
|------------------------|-------|-------|------|-------|-------|------|------|-------|------|------|------|------|
| Lane Configurations    | ↑ ↗   | ↑ ↘   | ↗ ↖  | ↑ ↗   | ↑ ↘   | ↖ ↖  | ↑ ↗  | ↑ ↘   | ↖ ↖  | ↑ ↗  | ↑ ↘  | ↖ ↖  |
| Traffic Volume (vph)   | 25    | 65    | 60   | 75    | 40    | 25   | 15   | 1145  | 80   | 0    | 490  | 20   |
| Future Volume (vph)    | 25    | 65    | 60   | 75    | 40    | 25   | 15   | 1145  | 80   | 0    | 490  | 20   |
| Ideal Flow (vphpl)     | 1750  | 1750  | 1750 | 1750  | 1750  | 1750 | 1750 | 1750  | 1750 | 1750 | 1750 | 1750 |
| 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  | 1.00  | 1.00 | 1.00  | 1.00  |      | 1.00 | 0.95  |      |      | 0.95 |      |
| Frpb, ped/bikes        | 1.00  | 1.00  | 1.00 | 1.00  | 0.98  |      | 1.00 | 1.00  |      |      | 1.00 |      |
| Flpb, ped/bikes        | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  |      | 1.00 | 1.00  |      |      | 1.00 |      |
| Fr <sub>t</sub>        | 1.00  | 1.00  | 0.85 | 1.00  | 0.94  |      | 1.00 | 0.99  |      |      | 0.99 |      |
| Flt Protected          | 0.95  | 1.00  | 1.00 | 0.95  | 1.00  |      | 0.95 | 1.00  |      |      | 1.00 |      |
| Satd. Flow (prot)      | 1453  | 1291  | 1206 | 1425  | 1297  |      | 1412 | 2849  |      |      | 2837 |      |
| Flt Permitted          | 0.95  | 1.00  | 1.00 | 0.95  | 1.00  |      | 0.95 | 1.00  |      |      | 1.00 |      |
| Satd. Flow (perm)      | 1453  | 1291  | 1206 | 1425  | 1297  |      | 1412 | 2849  |      |      | 2837 |      |
| Peak-hour factor, PHF  | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph)        | 25    | 65    | 60   | 75    | 40    | 25   | 15   | 1145  | 80   | 0    | 490  | 20   |
| RTOR Reduction (vph)   | 0     | 0     | 56   | 0     | 21    | 0    | 0    | 0     | 0    | 0    | 3    | 0    |
| Lane Group Flow (vph)  | 25    | 65    | 4    | 75    | 44    | 0    | 15   | 1225  | 0    | 0    | 507  | 0    |
| Confl. Peds. (#/hr)    | 40    |       | 22   | 22    |       | 40   | 13   |       | 25   | 25   |      | 13   |
| Confl. Bikes (#/hr)    |       |       | 20   |       |       | 2    |      |       | 3    |      |      |      |
| Heavy Vehicles (%)     | 3%    | 22%   | 11%  | 5%    | 19%   | 0%   | 6%   | 2%    | 0%   | 0%   | 3%   | 5%   |
| Bus Blockages (#/hr)   | 0     | 0     | 0    | 0     | 0     | 0    | 0    | 8     | 8    | 0    | 8    | 8    |
| Turn Type              | Prot  | NA    | Over | Prot  | NA    |      | Prot | NA    |      |      | NA   |      |
| Protected Phases       | 3     | 8     | 1    | 7     | 4     |      | 1    | 6     |      |      | 2    |      |
| Permitted Phases       |       |       |      |       |       |      |      |       |      |      |      |      |
| Actuated Green, G (s)  | 2.8   | 9.6   | 6.4  | 6.4   | 12.9  |      | 6.4  | 52.1  |      |      | 43.0 |      |
| Effective Green, g (s) | 1.8   | 9.6   | 5.4  | 5.4   | 13.2  |      | 5.4  | 53.0  |      |      | 43.6 |      |
| Actuated g/C Ratio     | 0.02  | 0.12  | 0.07 | 0.07  | 0.16  |      | 0.07 | 0.66  |      |      | 0.55 |      |
| Clearance Time (s)     | 3.0   | 4.0   | 3.0  | 3.0   | 4.3   |      | 3.0  | 4.9   |      |      | 4.6  |      |
| Vehicle Extension (s)  | 3.0   | 3.0   | 3.0  | 3.0   | 3.0   |      | 3.0  | 3.0   |      |      | 3.0  |      |
| Lane Grp Cap (vph)     | 32    | 154   | 81   | 96    | 214   |      | 95   | 1887  |      |      | 1546 |      |
| v/s Ratio Prot         | 0.02  | c0.05 | 0.00 | c0.05 | c0.03 |      | 0.01 | c0.43 |      |      | 0.18 |      |
| v/s Ratio Perm         |       |       |      |       |       |      |      |       |      |      |      |      |
| v/c Ratio              | 0.78  | 0.42  | 0.05 | 0.78  | 0.21  |      | 0.16 | 0.65  |      |      | 0.33 |      |
| Uniform Delay, d1      | 38.9  | 32.6  | 34.9 | 36.7  | 28.9  |      | 35.2 | 8.0   |      |      | 10.1 |      |
| Progression Factor     | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  |      | 0.73 | 1.81  |      |      | 1.00 |      |
| Incremental Delay, d2  | 74.5  | 1.9   | 0.3  | 32.8  | 0.5   |      | 0.7  | 1.5   |      |      | 0.6  |      |
| Delay (s)              | 113.4 | 34.5  | 35.2 | 69.5  | 29.4  |      | 26.3 | 16.0  |      |      | 10.7 |      |
| Level of Service       | F     | C     | D    | E     | C     |      | C    | B     |      |      | B    |      |
| Approach Delay (s)     |       | 47.9  |      |       | 50.8  |      |      | 16.1  |      |      | 10.7 |      |
| Approach LOS           |       | D     |      |       | D     |      |      | B     |      |      | B    |      |

## Intersection Summary

|                                   |       |                           |      |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay            | 19.5  | HCM 2000 Level of Service | B    |
| HCM 2000 Volume to Capacity ratio | 0.64  |                           |      |
| Actuated Cycle Length (s)         | 80.0  | Sum of lost time (s)      | 16.0 |
| Intersection Capacity Utilization | 63.4% | ICU Level of Service      | B    |
| Analysis Period (min)             | 15    |                           |      |

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

21: 4th Ave & Hall

06/02/2020



| Movement               | EBL   | EBR  | NBL  | NBT   | SBT  | SBR  |
|------------------------|-------|------|------|-------|------|------|
| Lane Configurations    |       |      |      |       |      |      |
| Traffic Volume (vph)   | 20    | 0    | 125  | 1160  | 0    | 0    |
| Future Volume (vph)    | 20    | 0    | 125  | 1160  | 0    | 0    |
| Ideal Flow (vphpl)     | 1750  | 1750 | 1750 | 1750  | 1750 | 1750 |
| Total Lost time (s)    | 4.0   |      |      | 4.0   |      |      |
| Lane Util. Factor      | 1.00  |      |      | 1.00  |      |      |
| Frpb, ped/bikes        | 1.00  |      |      | 1.00  |      |      |
| Flpb, ped/bikes        | 1.00  |      |      | 1.00  |      |      |
| Fr <sub>t</sub>        | 1.00  |      |      | 1.00  |      |      |
| Flt Protected          | 0.95  |      |      | 0.95  |      |      |
| Satd. Flow (prot)      | 1309  |      |      | 984   |      |      |
| Flt Permitted          | 0.95  |      |      | 0.95  |      |      |
| Satd. Flow (perm)      | 1309  |      |      | 984   |      |      |
| Peak-hour factor, PHF  | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 |
| Adj. Flow (vph)        | 20    | 0    | 125  | 1160  | 0    | 0    |
| RTOR Reduction (vph)   | 0     | 0    | 0    | 0     | 0    | 0    |
| Lane Group Flow (vph)  | 20    | 0    | 125  | 1160  | 0    | 0    |
| Confl. Peds. (#/hr)    | 120   | 2    |      |       |      |      |
| Confl. Bikes (#/hr)    |       | 2    |      |       |      |      |
| Heavy Vehicles (%)     | 0%    | 0%   | 33%  | 2%    | 0%   | 0%   |
| Parking (#/hr)         | 5     |      | 5    | 5     |      |      |
| Turn Type              | Prot  |      | Perm | NA    |      |      |
| Protected Phases       | 2     |      |      | 4     |      |      |
| Permitted Phases       |       |      | 4    |       |      |      |
| Actuated Green, G (s)  | 20.5  |      | 26.9 | 26.9  |      |      |
| Effective Green, g (s) | 21.1  |      | 26.9 | 26.9  |      |      |
| Actuated g/C Ratio     | 0.38  |      | 0.48 | 0.48  |      |      |
| Clearance Time (s)     | 4.6   |      | 4.0  | 4.0   |      |      |
| Vehicle Extension (s)  | 0.2   |      | 0.2  | 0.2   |      |      |
| Lane Grp Cap (vph)     | 493   |      | 472  | 1320  |      |      |
| v/s Ratio Prot         | c0.02 |      |      | c0.42 |      |      |
| v/s Ratio Perm         |       |      | 0.13 |       |      |      |
| v/c Ratio              | 0.04  |      | 0.26 | 0.88  |      |      |
| Uniform Delay, d1      | 11.0  |      | 8.7  | 13.1  |      |      |
| Progression Factor     | 1.00  |      | 1.90 | 1.77  |      |      |
| Incremental Delay, d2  | 0.2   |      | 0.1  | 3.5   |      |      |
| Delay (s)              | 11.2  |      | 16.5 | 26.7  |      |      |
| Level of Service       | B     |      | B    | C     |      |      |
| Approach Delay (s)     | 11.2  |      |      | 25.7  | 0.0  |      |
| Approach LOS           | B     |      |      | C     | A    |      |

## Intersection Summary

|                                   |       |                           |     |
|-----------------------------------|-------|---------------------------|-----|
| HCM 2000 Control Delay            | 25.5  | HCM 2000 Level of Service | C   |
| HCM 2000 Volume to Capacity ratio | 0.51  |                           |     |
| Actuated Cycle Length (s)         | 56.0  | Sum of lost time (s)      | 8.0 |
| Intersection Capacity Utilization | 59.5% | ICU Level of Service      | B   |
| Analysis Period (min)             | 15    |                           |     |

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

23: 6th Ave & College St

06/02/2020



| Movement               | EBL  | EBT  | EBR  | WBL   | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|------------------------|------|------|------|-------|------|------|------|------|------|------|------|------|
| Lane Configurations    |      |      |      |       |      |      |      |      |      |      |      |      |
| Traffic Volume (vph)   | 20   | 40   | 0    | 0     | 75   | 35   | 185  | 665  | 0    | 0    | 0    | 0    |
| Future Volume (vph)    | 20   | 40   | 0    | 0     | 75   | 35   | 185  | 665  | 0    | 0    | 0    | 0    |
| Ideal Flow (vphpl)     | 1750 | 1750 | 1750 | 1750  | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time (s)    |      |      |      |       | 4.0  |      |      |      | 4.0  |      |      |      |
| Lane Util. Factor      |      | 1.00 |      |       |      | 1.00 |      |      | 0.91 |      |      |      |
| Frpb, ped/bikes        |      | 1.00 |      |       |      | 0.97 |      |      | 1.00 |      |      |      |
| Flpb, ped/bikes        |      | 0.98 |      |       |      | 1.00 |      |      | 0.95 |      |      |      |
| Fr <sub>t</sub>        |      | 1.00 |      |       |      | 0.96 |      |      | 1.00 |      |      |      |
| Flt Protected          |      | 0.98 |      |       |      | 1.00 |      |      | 0.99 |      |      |      |
| Satd. Flow (prot)      |      | 1232 |      |       |      | 1269 |      |      | 3854 |      |      |      |
| Flt Permitted          |      | 0.91 |      |       |      | 1.00 |      |      | 0.99 |      |      |      |
| Satd. Flow (perm)      |      | 1134 |      |       |      | 1269 |      |      | 3854 |      |      |      |
| Peak-hour factor, PHF  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph)        | 20   | 40   | 0    | 0     | 75   | 35   | 185  | 665  | 0    | 0    | 0    | 0    |
| RTOR Reduction (vph)   | 0    | 0    | 0    | 0     | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Lane Group Flow (vph)  | 0    | 60   | 0    | 0     | 110  | 0    | 0    | 850  | 0    | 0    | 0    | 0    |
| Confl. Peds. (#/hr)    | 92   |      |      |       | 188  |      | 92   | 109  |      | 142  |      | 109  |
| Confl. Bikes (#/hr)    |      |      |      |       |      | 4    |      |      |      |      |      |      |
| Heavy Vehicles (%)     | 14%  | 4%   | 2%   | 0%    | 0%   | 2%   | 2%   | 6%   | 0%   | 2%   | 0%   | 0%   |
| Parking (#/hr)         | 5    | 5    |      |       | 5    | 5    |      |      |      |      |      |      |
| Turn Type              | Perm | NA   |      |       | NA   |      | Perm | NA   |      |      |      |      |
| Protected Phases       |      | 4    |      |       |      | 4    |      |      | 2    |      |      |      |
| Permitted Phases       | 4    |      |      |       |      |      | 2    |      |      |      |      |      |
| Actuated Green, G (s)  |      | 14.4 |      |       | 14.4 |      |      | 33.0 |      |      |      |      |
| Effective Green, g (s) |      | 14.4 |      |       | 14.4 |      |      | 33.6 |      |      |      |      |
| Actuated g/C Ratio     |      | 0.26 |      |       | 0.26 |      |      | 0.60 |      |      |      |      |
| Clearance Time (s)     |      | 4.0  |      |       | 4.0  |      |      | 4.6  |      |      |      |      |
| Vehicle Extension (s)  |      | 0.2  |      |       | 0.2  |      |      | 0.2  |      |      |      |      |
| Lane Grp Cap (vph)     | 291  |      |      |       | 326  |      |      | 2312 |      |      |      |      |
| v/s Ratio Prot         |      |      |      | c0.09 |      |      |      |      |      |      |      |      |
| v/s Ratio Perm         |      | 0.05 |      |       |      |      | 0.22 |      |      |      |      |      |
| v/c Ratio              |      | 0.21 |      |       | 0.34 |      |      | 0.37 |      |      |      |      |
| Uniform Delay, d1      |      | 16.3 |      |       | 16.9 |      |      | 5.7  |      |      |      |      |
| Progression Factor     |      | 1.00 |      |       | 1.00 |      |      | 1.92 |      |      |      |      |
| Incremental Delay, d2  |      | 0.1  |      |       | 0.2  |      |      | 0.3  |      |      |      |      |
| Delay (s)              |      | 16.4 |      |       | 17.1 |      |      | 11.3 |      |      |      |      |
| Level of Service       |      | B    |      |       | B    |      |      | B    |      |      |      |      |
| Approach Delay (s)     |      | 16.4 |      |       | 17.1 |      |      | 11.3 |      | 0.0  |      |      |
| Approach LOS           |      | B    |      |       | B    |      |      | B    |      | A    |      |      |

## Intersection Summary

|                                   |       |                           |     |
|-----------------------------------|-------|---------------------------|-----|
| HCM 2000 Control Delay            | 12.3  | HCM 2000 Level of Service | B   |
| HCM 2000 Volume to Capacity ratio | 0.36  |                           |     |
| Actuated Cycle Length (s)         | 56.0  | Sum of lost time (s)      | 8.0 |
| Intersection Capacity Utilization | 43.6% | ICU Level of Service      | A   |
| Analysis Period (min)             | 15    |                           |     |

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

25: 4th Ave & College St

06/02/2020



| Movement                          | EBL   | EBR   | NBL  | NBT                       | SBT  | SBR  |
|-----------------------------------|-------|-------|------|---------------------------|------|------|
| Lane Configurations               |       |       |      |                           |      |      |
| Traffic Volume (vph)              | 25    | 0     | 205  | 1240                      | 0    | 0    |
| Future Volume (vph)               | 25    | 0     | 205  | 1240                      | 0    | 0    |
| Ideal Flow (vphpl)                | 1750  | 1750  | 1750 | 1750                      | 1750 | 1750 |
| Total Lost time (s)               | 4.0   |       |      | 4.0                       |      |      |
| Lane Util. Factor                 | 1.00  |       |      | 1.00                      |      |      |
| Frpb, ped/bikes                   | 1.00  |       |      | 1.00                      |      |      |
| Flpb, ped/bikes                   | 1.00  |       |      | 0.83                      |      |      |
| Fr <sub>t</sub>                   | 1.00  |       |      | 1.00                      |      |      |
| Flt Protected                     | 0.95  |       |      | 0.95                      |      |      |
| Satd. Flow (prot)                 | 1235  |       |      | 1064                      |      |      |
| Flt Permitted                     | 0.95  |       |      | 0.95                      |      |      |
| Satd. Flow (perm)                 | 1235  |       |      | 1064                      |      |      |
| Peak-hour factor, PHF             | 1.00  | 1.00  | 1.00 | 1.00                      | 1.00 | 1.00 |
| Adj. Flow (vph)                   | 25    | 0     | 205  | 1240                      | 0    | 0    |
| RTOR Reduction (vph)              | 0     | 0     | 0    | 0                         | 0    | 0    |
| Lane Group Flow (vph)             | 25    | 0     | 205  | 1240                      | 0    | 0    |
| Confl. Peds. (#/hr)               | 82    | 77    | 122  |                           |      | 122  |
| Heavy Vehicles (%)                | 6%    | 0%    | 2%   | 3%                        | 0%   | 0%   |
| Parking (#/hr)                    | 5     |       | 5    |                           | 5    |      |
| Turn Type                         | Prot  |       | Perm | NA                        |      |      |
| Protected Phases                  | 4     |       |      | 2                         |      |      |
| Permitted Phases                  |       |       | 2    |                           |      |      |
| Actuated Green, G (s)             | 19.0  |       | 28.4 | 28.4                      |      |      |
| Effective Green, g (s)            | 19.0  |       | 29.0 | 29.0                      |      |      |
| Actuated g/C Ratio                | 0.34  |       | 0.52 | 0.52                      |      |      |
| Clearance Time (s)                | 4.0   |       | 4.6  | 4.6                       |      |      |
| Vehicle Extension (s)             | 3.0   |       | 3.0  | 3.0                       |      |      |
| Lane Grp Cap (vph)                | 419   |       | 551  | 1410                      |      |      |
| v/s Ratio Prot                    | c0.02 |       |      | c0.46                     |      |      |
| v/s Ratio Perm                    |       |       | 0.19 |                           |      |      |
| v/c Ratio                         | 0.06  |       | 0.37 | 0.88                      |      |      |
| Uniform Delay, d1                 | 12.5  |       | 8.1  | 12.0                      |      |      |
| Progression Factor                | 1.00  |       | 1.00 | 1.00                      |      |      |
| Incremental Delay, d2             | 0.1   |       | 1.9  | 8.1                       |      |      |
| Delay (s)                         | 12.5  |       | 10.0 | 20.1                      |      |      |
| Level of Service                  | B     |       | A    | C                         |      |      |
| Approach Delay (s)                | 12.5  |       |      | 18.6                      | 0.0  |      |
| Approach LOS                      | B     |       |      | B                         | A    |      |
| <b>Intersection Summary</b>       |       |       |      |                           |      |      |
| HCM 2000 Control Delay            |       | 18.5  |      | HCM 2000 Level of Service |      | B    |
| HCM 2000 Volume to Capacity ratio |       | 0.55  |      |                           |      |      |
| Actuated Cycle Length (s)         |       | 56.0  |      | Sum of lost time (s)      |      | 8.0  |
| Intersection Capacity Utilization |       | 62.2% |      | ICU Level of Service      |      | B    |
| Analysis Period (min)             |       | 15    |      |                           |      |      |
| c Critical Lane Group             |       |       |      |                           |      |      |

# HCM Signalized Intersection Capacity Analysis

27: 6th Ave & Jackson St

06/02/2020



| Movement                              | EBL   | EBR   | NBL  | NBT                       | NBR  | SBL  | SBT  | SBR  | NWL  | NWR  |
|---------------------------------------|-------|-------|------|---------------------------|------|------|------|------|------|------|
| Lane Configurations                   |       |       |      |                           |      |      |      |      |      |      |
| Traffic Volume (vph)                  | 35    | 0     | 280  | 410                       | 0    | 0    | 0    | 0    | 0    | 415  |
| Future Volume (vph)                   | 35    | 0     | 280  | 410                       | 0    | 0    | 0    | 0    | 0    | 415  |
| Ideal Flow (vphpl)                    | 1750  | 1750  | 1750 | 1750                      | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time (s)                   | 4.0   |       |      |                           |      |      |      |      |      | 4.0  |
| Lane Util. Factor                     | 1.00  |       |      |                           | 1.00 |      |      |      |      | 1.00 |
| Frpb, ped/bikes                       | 1.00  |       |      |                           | 1.00 |      |      |      |      | 1.00 |
| Flpb, ped/bikes                       | 1.00  |       |      |                           | 0.93 |      |      |      |      | 1.00 |
| Fr <sub>t</sub>                       | 1.00  |       |      |                           | 1.00 |      |      |      |      | 1.00 |
| Flt Protected                         | 0.95  |       |      |                           | 0.98 |      |      |      |      | 1.00 |
| Satd. Flow (prot)                     | 1458  |       |      |                           | 1524 |      |      |      |      | 1716 |
| Flt Permitted                         | 0.95  |       |      |                           | 0.98 |      |      |      |      | 1.00 |
| Satd. Flow (perm)                     | 1458  |       |      |                           | 1524 |      |      |      |      | 1716 |
| Peak-hour factor, PHF                 | 1.00  | 1.00  | 1.00 | 1.00                      | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph)                       | 35    | 0     | 280  | 410                       | 0    | 0    | 0    | 0    | 0    | 415  |
| RTOR Reduction (vph)                  | 0     | 0     | 0    | 0                         | 0    | 0    | 0    | 0    | 0    | 0    |
| Lane Group Flow (vph)                 | 35    | 0     | 0    | 690                       | 0    | 0    | 0    | 0    | 0    | 415  |
| Confl. Peds. (#/hr)                   |       |       |      | 109                       |      |      |      | 109  |      |      |
| Heavy Vehicles (%)                    | 14%   | 2%    | 2%   | 6%                        | 2%   | 2%   | 0%   | 0%   | 2%   | 2%   |
| Turn Type                             | Prot  |       | Perm | NA                        |      |      |      |      | Prot |      |
| Protected Phases                      | 4     |       |      | 2!                        |      |      |      |      | 2!   |      |
| Permitted Phases                      |       |       | 2    |                           |      |      |      |      |      |      |
| Actuated Green, G (s)                 | 22.0  |       |      | 26.0                      |      |      |      |      | 26.0 |      |
| Effective Green, g (s)                | 22.0  |       |      | 26.0                      |      |      |      |      | 26.0 |      |
| Actuated g/C Ratio                    | 0.39  |       |      | 0.46                      |      |      |      |      | 0.46 |      |
| Clearance Time (s)                    | 4.0   |       |      | 4.0                       |      |      |      |      | 4.0  |      |
| Vehicle Extension (s)                 | 3.0   |       |      | 3.0                       |      |      |      |      | 3.0  |      |
| Lane Grp Cap (vph)                    | 572   |       |      | 707                       |      |      |      |      | 796  |      |
| v/s Ratio Prot                        | c0.02 |       |      |                           |      |      |      |      | 0.24 |      |
| v/s Ratio Perm                        |       |       | 0.45 |                           |      |      |      |      |      |      |
| v/c Ratio                             | 0.06  |       | 0.98 |                           |      |      |      |      | 0.52 |      |
| Uniform Delay, d1                     | 10.6  |       | 14.7 |                           |      |      |      |      | 10.6 |      |
| Progression Factor                    | 1.00  |       | 1.00 |                           |      |      |      |      | 1.00 |      |
| Incremental Delay, d2                 | 0.0   |       | 28.5 |                           |      |      |      |      | 2.4  |      |
| Delay (s)                             | 10.6  |       | 43.2 |                           |      |      |      |      | 13.0 |      |
| Level of Service                      | B     |       | D    |                           |      |      |      |      | B    |      |
| Approach Delay (s)                    | 10.6  |       | 43.2 |                           |      | 0.0  |      | 13.0 |      |      |
| Approach LOS                          | B     |       | D    |                           |      | A    |      | B    |      |      |
| <b>Intersection Summary</b>           |       |       |      |                           |      |      |      |      |      |      |
| HCM 2000 Control Delay                |       | 31.2  |      | HCM 2000 Level of Service |      |      |      | C    |      |      |
| HCM 2000 Volume to Capacity ratio     |       | 0.56  |      |                           |      |      |      |      |      |      |
| Actuated Cycle Length (s)             |       | 56.0  |      | Sum of lost time (s)      |      |      |      | 8.0  |      |      |
| Intersection Capacity Utilization     |       | 74.8% |      | ICU Level of Service      |      |      |      | D    |      |      |
| Analysis Period (min)                 |       | 15    |      |                           |      |      |      |      |      |      |
| ! Phase conflict between lane groups. |       |       |      |                           |      |      |      |      |      |      |
| c Critical Lane Group                 |       |       |      |                           |      |      |      |      |      |      |

# HCM Signalized Intersection Capacity Analysis

31: 4th Ave & I-405 WB Off Ramp & Lincoln St

06/02/2020



| Movement               | EBL   | EBT   | WBT   | WBR  | NBL  | NBT  | NWR  | NWR2 |
|------------------------|-------|-------|-------|------|------|------|------|------|
| Lane Configurations    | ↑ ↗   | ↑ ↘   | ↗ ↖   |      |      | ↖ ↗  | ↖ ↘  | ↖ ↖  |
| Traffic Volume (vph)   | 30    | 55    | 10    | 210  | 15   | 845  | 355  | 100  |
| Future Volume (vph)    | 30    | 55    | 10    | 210  | 15   | 845  | 355  | 100  |
| Ideal Flow (vphpl)     | 1750  | 1750  | 1750  | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time (s)    | 5.0   | 4.0   | 4.0   |      |      | 4.0  | 4.0  | 4.0  |
| Lane Util. Factor      | 1.00  | 1.00  | 1.00  |      |      | 0.95 | 1.00 | 1.00 |
| Frpb, ped/bikes        | 1.00  | 1.00  | 0.94  |      |      | 1.00 | 1.00 | 1.00 |
| Flpb, ped/bikes        | 1.00  | 1.00  | 1.00  |      |      | 1.00 | 1.00 | 1.00 |
| Fr <sub>t</sub>        | 1.00  | 1.00  | 0.87  |      |      | 1.00 | 1.00 | 0.85 |
| Flt Protected          | 0.95  | 1.00  | 1.00  |      |      | 1.00 | 1.00 | 1.00 |
| Satd. Flow (prot)      | 1496  | 1133  | 1286  |      |      | 2929 | 1514 | 1287 |
| Flt Permitted          | 0.95  | 1.00  | 1.00  |      |      | 1.00 | 1.00 | 1.00 |
| Satd. Flow (perm)      | 1496  | 1133  | 1286  |      |      | 2929 | 1514 | 1287 |
| Peak-hour factor, PHF  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph)        | 30    | 55    | 10    | 210  | 15   | 845  | 355  | 100  |
| RTOR Reduction (vph)   | 0     | 0     | 0     | 0    | 0    | 0    | 0    | 0    |
| Lane Group Flow (vph)  | 30    | 55    | 220   | 0    | 0    | 860  | 355  | 100  |
| Confl. Peds. (#/hr)    | 36    |       |       | 36   | 53   |      |      |      |
| Confl. Bikes (#/hr)    |       |       |       |      | 5    |      |      |      |
| Heavy Vehicles (%)     | 0%    | 39%   | 10%   | 0%   | 0%   | 2%   | 4%   | 4%   |
| Turn Type              | Prot  | NA    | NA    |      | Perm | NA   | Prot | Prot |
| Protected Phases       | 7     | 4     | 8     |      |      | 2!   | 2!   | 5    |
| Permitted Phases       |       |       |       |      | 2    |      |      |      |
| Actuated Green, G (s)  | 2.4   | 28.5  | 22.1  |      |      | 41.7 | 41.7 | 12.0 |
| Effective Green, g (s) | 1.4   | 28.5  | 22.1  |      |      | 41.7 | 41.7 | 12.0 |
| Actuated g/C Ratio     | 0.02  | 0.36  | 0.28  |      |      | 0.53 | 0.53 | 0.15 |
| Clearance Time (s)     | 4.0   | 4.0   | 4.0   |      |      | 4.0  | 4.0  | 4.0  |
| Vehicle Extension (s)  | 3.0   | 2.0   | 2.0   |      |      | 0.2  | 0.2  | 3.0  |
| Lane Grp Cap (vph)     | 26    | 412   | 363   |      |      | 1561 | 807  | 197  |
| v/s Ratio Prot         | c0.02 | 0.05  | c0.17 |      |      |      | 0.23 | 0.08 |
| v/s Ratio Perm         |       |       |       |      |      | 0.29 |      |      |
| v/c Ratio              | 1.15  | 0.13  | 0.61  |      |      | 0.55 | 0.44 | 0.51 |
| Uniform Delay, d1      | 38.4  | 16.6  | 24.3  |      |      | 12.1 | 11.1 | 30.4 |
| Progression Factor     | 1.00  | 1.00  | 1.00  |      |      | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2  | 227.3 | 0.1   | 2.0   |      |      | 0.2  | 0.1  | 2.1  |
| Delay (s)              | 265.7 | 16.7  | 26.2  |      |      | 12.3 | 11.3 | 32.4 |
| Level of Service       | F     | B     | C     |      |      | B    | B    | C    |
| Approach Delay (s)     |       | 104.6 | 26.2  |      |      | 12.3 |      |      |
| Approach LOS           |       | F     | C     |      |      | B    |      |      |

## Intersection Summary

|                                   |       |                           |      |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay            | 20.1  | HCM 2000 Level of Service | C    |
| HCM 2000 Volume to Capacity ratio | 0.65  |                           |      |
| Actuated Cycle Length (s)         | 78.2  | Sum of lost time (s)      | 20.0 |
| Intersection Capacity Utilization | 92.0% | ICU Level of Service      | F    |
| Analysis Period (min)             | 15    |                           |      |

! Phase conflict between lane groups.

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
34: SW 1st Avenue/SW 1st Ave & SW Lincoln Street/SW Lincoln St

06/02/2020

| Movement                          | EBL   | EBT   | EBR  | WBL  | WBT                       | WBR  | NBL   | NBT  | NBR  | SBL  | SBT   | SBR  |
|-----------------------------------|-------|-------|------|------|---------------------------|------|-------|------|------|------|-------|------|
| Lane Configurations               | ↑     | ↑     |      |      | ↑                         |      | ↑     | ↑↑   |      |      | ↑↑    |      |
| Traffic Volume (vph)              | 25    | 5     | 95   | 0    | 5                         | 0    | 115   | 275  | 0    | 0    | 145   | 90   |
| Future Volume (vph)               | 25    | 5     | 95   | 0    | 5                         | 0    | 115   | 275  | 0    | 0    | 145   | 90   |
| Ideal Flow (vphpl)                | 1750  | 1750  | 1750 | 1750 | 1750                      | 1750 | 1750  | 1750 | 1750 | 1750 | 1750  | 1750 |
| Total Lost time (s)               | 4.0   | 4.0   |      |      | 4.0                       |      | 4.0   | 4.0  |      |      | 4.0   |      |
| Lane Util. Factor                 | 1.00  | 1.00  |      |      | 1.00                      |      | 1.00  | 0.95 |      |      | 0.95  |      |
| Frpb, ped/bikes                   | 1.00  | 0.96  |      |      | 1.00                      |      | 1.00  | 1.00 |      |      | 0.98  |      |
| Flpb, ped/bikes                   | 1.00  | 1.00  |      |      | 1.00                      |      | 1.00  | 1.00 |      |      | 1.00  |      |
| Fr <sub>t</sub>                   | 1.00  | 0.86  |      |      | 1.00                      |      | 1.00  | 1.00 |      |      | 0.94  |      |
| Flt Protected                     | 0.95  | 1.00  |      |      | 1.00                      |      | 0.95  | 1.00 |      |      | 1.00  |      |
| Satd. Flow (prot)                 | 1425  | 1176  |      |      | 788                       |      | 1453  | 2823 |      |      | 2717  |      |
| Flt Permitted                     | 0.95  | 1.00  |      |      | 1.00                      |      | 0.95  | 1.00 |      |      | 1.00  |      |
| Satd. Flow (perm)                 | 1425  | 1176  |      |      | 788                       |      | 1453  | 2823 |      |      | 2717  |      |
| Peak-hour factor, PHF             | 1.00  | 1.00  | 1.00 | 1.00 | 1.00                      | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 |
| Adj. Flow (vph)                   | 25    | 5     | 95   | 0    | 5                         | 0    | 115   | 275  | 0    | 0    | 145   | 90   |
| RTOR Reduction (vph)              | 0     | 0     | 0    | 0    | 0                         | 0    | 0     | 0    | 0    | 0    | 0     | 0    |
| Lane Group Flow (vph)             | 25    | 100   | 0    | 0    | 5                         | 0    | 115   | 275  | 0    | 0    | 235   | 0    |
| Confl. Peds. (#/hr)               | 18    |       | 15   | 15   |                           | 18   | 10    |      | 40   | 40   |       | 10   |
| Confl. Bikes (#/hr)               |       |       | 17   |      |                           |      |       |      | 10   |      |       | 6    |
| Heavy Vehicles (%)                | 5%    | 100%  | 5%   | 0%   | 100%                      | 0%   | 3%    | 6%   | 0%   | 0%   | 3%    | 1%   |
| Turn Type                         | Prot  | NA    |      |      | NA                        |      | Prot  | NA   |      |      | NA    |      |
| Protected Phases                  | 7     | 4     |      |      | 8                         |      | 1     | 6    |      |      | 2     |      |
| Permitted Phases                  |       |       |      |      |                           |      |       |      |      |      |       |      |
| Actuated Green, G (s)             | 1.2   | 12.9  |      |      | 7.7                       |      | 9.3   | 54.9 |      |      | 41.6  |      |
| Effective Green, g (s)            | 1.2   | 12.9  |      |      | 7.7                       |      | 9.3   | 54.9 |      |      | 41.6  |      |
| Actuated g/C Ratio                | 0.02  | 0.17  |      |      | 0.10                      |      | 0.12  | 0.72 |      |      | 0.55  |      |
| Clearance Time (s)                | 4.0   | 4.0   |      |      | 4.0                       |      | 4.0   | 4.0  |      |      | 4.0   |      |
| Vehicle Extension (s)             | 0.5   | 2.0   |      |      | 2.0                       |      | 3.0   | 2.0  |      |      | 2.0   |      |
| Lane Grp Cap (vph)                | 22    | 200   |      |      | 80                        |      | 178   | 2044 |      |      | 1491  |      |
| v/s Ratio Prot                    | 0.02  | c0.09 |      |      | 0.01                      |      | c0.08 | 0.10 |      |      | c0.09 |      |
| v/s Ratio Perm                    |       |       |      |      |                           |      |       |      |      |      |       |      |
| v/c Ratio                         | 1.14  | 0.50  |      |      | 0.06                      |      | 0.65  | 0.13 |      |      | 0.16  |      |
| Uniform Delay, d1                 | 37.3  | 28.5  |      |      | 30.8                      |      | 31.7  | 3.2  |      |      | 8.4   |      |
| Progression Factor                | 1.00  | 1.00  |      |      | 1.00                      |      | 1.00  | 1.00 |      |      | 1.00  |      |
| Incremental Delay, d2             | 237.5 | 0.7   |      |      | 0.1                       |      | 7.8   | 0.1  |      |      | 0.2   |      |
| Delay (s)                         | 274.8 | 29.2  |      |      | 30.9                      |      | 39.5  | 3.3  |      |      | 8.7   |      |
| Level of Service                  | F     | C     |      |      | C                         |      | D     | A    |      |      | A     |      |
| Approach Delay (s)                |       | 78.4  |      |      | 30.9                      |      |       | 14.0 |      |      | 8.7   |      |
| Approach LOS                      |       | E     |      |      | C                         |      |       | B    |      |      | A     |      |
| <b>Intersection Summary</b>       |       |       |      |      |                           |      |       |      |      |      |       |      |
| HCM 2000 Control Delay            |       | 23.1  |      |      | HCM 2000 Level of Service |      |       | C    |      |      |       |      |
| HCM 2000 Volume to Capacity ratio |       | 0.32  |      |      |                           |      |       |      |      |      |       |      |
| Actuated Cycle Length (s)         |       | 75.8  |      |      | Sum of lost time (s)      |      |       | 16.0 |      |      |       |      |
| Intersection Capacity Utilization |       | 51.2% |      |      | ICU Level of Service      |      |       | A    |      |      |       |      |
| Analysis Period (min)             |       | 15    |      |      |                           |      |       |      |      |      |       |      |
| c Critical Lane Group             |       |       |      |      |                           |      |       |      |      |      |       |      |

# HCM Signalized Intersection Capacity Analysis

35: SW Naito Parkway & SW Lincoln St

06/02/2020



| Movement                          | EBL   | EBT  | EBR  | WBL  | WBT                       | WBR  | NBL  | NBT   | NBR  | SBL  | SBT  | SBR  |
|-----------------------------------|-------|------|------|------|---------------------------|------|------|-------|------|------|------|------|
| Lane Configurations               |       |      |      |      |                           |      |      |       |      |      |      |      |
| Traffic Volume (vph)              | 0     | 5    | 0    | 0    | 5                         | 0    | 0    | 1290  | 0    | 0    | 465  | 0    |
| Future Volume (vph)               | 0     | 5    | 0    | 0    | 5                         | 0    | 0    | 1290  | 0    | 0    | 465  | 0    |
| Ideal Flow (vphpl)                | 1750  | 1750 | 1750 | 1750 | 1750                      | 1750 | 1750 | 1750  | 1750 | 1750 | 1750 | 1750 |
| Total Lost time (s)               |       | 2.0  |      |      |                           | 4.0  |      |       |      |      |      | 4.0  |
| Lane Util. Factor                 | 1.00  |      |      |      | 1.00                      |      |      | 0.95  |      |      | 0.95 |      |
| Frpb, ped/bikes                   | 1.00  |      |      |      | 1.00                      |      |      | 1.00  |      |      | 1.00 |      |
| Flpb, ped/bikes                   | 1.00  |      |      |      | 1.00                      |      |      | 1.00  |      |      | 1.00 |      |
| Fr <sub>t</sub>                   | 1.00  |      |      |      | 1.00                      |      |      | 1.00  |      |      | 1.00 |      |
| Flt Protected                     | 1.00  |      |      |      | 1.00                      |      |      | 1.00  |      |      | 1.00 |      |
| Satd. Flow (prot)                 | 788   |      |      |      | 788                       |      |      | 2934  |      |      | 2877 |      |
| Flt Permitted                     | 1.00  |      |      |      | 1.00                      |      |      | 1.00  |      |      | 1.00 |      |
| Satd. Flow (perm)                 | 788   |      |      |      | 788                       |      |      | 2934  |      |      | 2877 |      |
| Peak-hour factor, PHF             | 1.00  | 1.00 | 1.00 | 1.00 | 1.00                      | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph)                   | 0     | 5    | 0    | 0    | 5                         | 0    | 0    | 1290  | 0    | 0    | 465  | 0    |
| RTOR Reduction (vph)              | 0     | 0    | 0    | 0    | 0                         | 0    | 0    | 0     | 0    | 0    | 0    | 0    |
| Lane Group Flow (vph)             | 0     | 5    | 0    | 0    | 5                         | 0    | 0    | 1290  | 0    | 0    | 465  | 0    |
| Confl. Peds. (#/hr)               | 9     |      | 23   | 23   |                           | 9    | 16   |       | 6    | 6    |      | 16   |
| Confl. Bikes (#/hr)               |       |      | 15   |      |                           |      |      |       |      |      |      |      |
| Heavy Vehicles (%)                | 0%    | 100% | 0%   | 0%   | 100%                      | 0%   | 0%   | 2%    | 0%   | 0%   | 4%   | 0%   |
| Turn Type                         |       | NA   |      |      | NA                        |      |      | NA    |      |      | NA   |      |
| Protected Phases                  | 7     | 8    |      |      | 4                         |      |      | 6     |      |      | 2    |      |
| Permitted Phases                  |       |      |      |      |                           |      |      |       |      |      |      |      |
| Actuated Green, G (s)             | 7.8   |      |      |      | 8.8                       |      |      | 63.2  |      |      | 63.2 |      |
| Effective Green, g (s)            | 8.8   |      |      |      | 8.8                       |      |      | 63.2  |      |      | 63.2 |      |
| Actuated g/C Ratio                | 0.11  |      |      |      | 0.11                      |      |      | 0.79  |      |      | 0.79 |      |
| Clearance Time (s)                |       |      |      |      | 4.0                       |      |      | 4.0   |      |      | 4.0  |      |
| Vehicle Extension (s)             |       |      |      |      | 0.5                       |      |      | 0.5   |      |      | 0.5  |      |
| Lane Grp Cap (vph)                | 86    |      |      |      | 86                        |      |      | 2317  |      |      | 2272 |      |
| v/s Ratio Prot                    | c0.01 |      |      |      | 0.01                      |      |      | c0.44 |      |      | 0.16 |      |
| v/s Ratio Perm                    |       |      |      |      |                           |      |      |       |      |      |      |      |
| v/c Ratio                         | 0.06  |      |      |      | 0.06                      |      |      | 0.56  |      |      | 0.20 |      |
| Uniform Delay, d1                 | 31.9  |      |      |      | 31.9                      |      |      | 3.1   |      |      | 2.1  |      |
| Progression Factor                | 1.00  |      |      |      | 1.00                      |      |      | 1.00  |      |      | 0.77 |      |
| Incremental Delay, d2             | 0.1   |      |      |      | 0.1                       |      |      | 1.0   |      |      | 0.2  |      |
| Delay (s)                         | 32.0  |      |      |      | 32.0                      |      |      | 4.1   |      |      | 1.8  |      |
| Level of Service                  | C     |      |      |      | C                         |      |      | A     |      |      | A    |      |
| Approach Delay (s)                | 32.0  |      |      |      | 32.0                      |      |      | 4.1   |      |      | 1.8  |      |
| Approach LOS                      | C     |      |      |      | C                         |      |      | A     |      |      | A    |      |
| <b>Intersection Summary</b>       |       |      |      |      |                           |      |      |       |      |      |      |      |
| HCM 2000 Control Delay            | 3.7   |      |      |      | HCM 2000 Level of Service |      |      | A     |      |      |      |      |
| HCM 2000 Volume to Capacity ratio | 0.51  |      |      |      |                           |      |      |       |      |      |      |      |
| Actuated Cycle Length (s)         | 80.0  |      |      |      | Sum of lost time (s)      |      |      | 10.0  |      |      |      |      |
| Intersection Capacity Utilization | 60.2% |      |      |      | ICU Level of Service      |      |      | B     |      |      |      |      |
| Analysis Period (min)             | 15    |      |      |      |                           |      |      |       |      |      |      |      |
| c Critical Lane Group             |       |      |      |      |                           |      |      |       |      |      |      |      |

HCM Signalized Intersection Capacity Analysis  
 37: Broadway Dr/Broadway Ave & SW Lincoln St & I-405 SB Exit Ramp

06/02/2020



| Movement               | NBR  | SBL  | SBT  | SBR   | SET   | SER  | SER2 |
|------------------------|------|------|------|-------|-------|------|------|
| Lane Configurations    |      |      |      |       |       |      |      |
| Traffic Volume (vph)   | 205  | 315  | 115  | 5     | 1520  | 75   | 15   |
| Future Volume (vph)    | 205  | 315  | 115  | 5     | 1520  | 75   | 15   |
| Ideal Flow (vphpl)     | 1900 | 1900 | 1900 | 1900  | 1900  | 1900 | 1900 |
| Total Lost time (s)    | 4.0  | 4.0  | 4.0  |       | 4.0   |      |      |
| Lane Util. Factor      | 1.00 | 0.91 | 0.91 |       | *0.75 |      |      |
| Frpb, ped/bikes        | 0.99 | 1.00 | 1.00 |       | 1.00  |      |      |
| Flpb, ped/bikes        | 1.00 | 1.00 | 1.00 |       | 1.00  |      |      |
| Fr <sub>t</sub>        | 0.86 | 1.00 | 1.00 |       | 0.99  |      |      |
| Flt Protected          | 1.00 | 0.95 | 0.98 |       | 1.00  |      |      |
| Satd. Flow (prot)      | 1418 | 2816 | 1379 |       | 3640  |      |      |
| Flt Permitted          | 1.00 | 0.95 | 0.98 |       | 1.00  |      |      |
| Satd. Flow (perm)      | 1418 | 2816 | 1379 |       | 3640  |      |      |
| Peak-hour factor, PHF  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  | 1.00 | 1.00 |
| Adj. Flow (vph)        | 205  | 315  | 115  | 5     | 1520  | 75   | 15   |
| RTOR Reduction (vph)   | 0    | 0    | 0    | 0     | 1     | 0    | 0    |
| Lane Group Flow (vph)  | 205  | 243  | 192  | 0     | 1609  | 0    | 0    |
| Confl. Peds. (#/hr)    |      |      |      | 4     |       |      |      |
| Confl. Bikes (#/hr)    | 2    |      |      | 17    |       |      |      |
| Heavy Vehicles (%)     | 3%   | 5%   | 11%  | 0%    | 5%    | 2%   | 1%   |
| Bus Blockages (#/hr)   | 0    | 0    | 4    | 0     | 0     | 0    | 0    |
| Turn Type              | Perm | Perm | NA   |       | NA    |      |      |
| Protected Phases       |      |      | 2    |       | 4     |      |      |
| Permitted Phases       | 2    | 4    | 2    |       |       |      |      |
| Actuated Green, G (s)  | 90.0 | 30.5 | 30.5 |       | 47.9  |      |      |
| Effective Green, g (s) | 85.6 | 32.1 | 32.1 |       | 49.9  |      |      |
| Actuated g/C Ratio     | 0.95 | 0.36 | 0.36 |       | 0.55  |      |      |
| Clearance Time (s)     |      | 5.6  | 5.6  |       | 6.0   |      |      |
| Vehicle Extension (s)  |      | 0.2  | 0.2  |       | 2.0   |      |      |
| Lane Grp Cap (vph)     | 1348 | 1004 | 491  |       | 2018  |      |      |
| v/s Ratio Prot         |      |      |      | c0.44 |       |      |      |
| v/s Ratio Perm         | 0.14 | 0.09 | 0.14 |       |       |      |      |
| v/c Ratio              | 0.15 | 0.24 | 0.39 |       | 0.80  |      |      |
| Uniform Delay, d1      | 0.1  | 20.4 | 21.6 |       | 16.0  |      |      |
| Progression Factor     | 1.00 | 1.00 | 1.00 |       | 1.00  |      |      |
| Incremental Delay, d2  | 0.0  | 0.6  | 2.3  |       | 2.1   |      |      |
| Delay (s)              | 0.1  | 21.0 | 24.0 |       | 18.1  |      |      |
| Level of Service       | A    | C    | C    |       | B     |      |      |
| Approach Delay (s)     |      |      | 22.3 |       | 18.1  |      |      |
| Approach LOS           |      |      | C    |       | B     |      |      |

Intersection Summary

|                                   |       |                           |     |
|-----------------------------------|-------|---------------------------|-----|
| HCM 2000 Control Delay            | 17.3  | HCM 2000 Level of Service | B   |
| HCM 2000 Volume to Capacity ratio | 0.64  |                           |     |
| Actuated Cycle Length (s)         | 90.0  | Sum of lost time (s)      | 8.0 |
| Intersection Capacity Utilization | 72.3% | ICU Level of Service      | C   |
| Analysis Period (min)             | 15    |                           |     |

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

38: 6th Ave & Broadway

06/02/2020



| Movement               | EBL   | EBT  | EBR    | WBL  | WBT  | WBR   | NBL  | NBT   | NBR  | SBL  | SBT  | SBR  |
|------------------------|-------|------|--------|------|------|-------|------|-------|------|------|------|------|
| Lane Configurations    | ↑     | ↑↑   | ↑      |      |      | ↑↑↑   |      | ↑↑    |      |      |      |      |
| Traffic Volume (vph)   | 295   | 1330 | 600    | 0    | 0    | 1830  | 0    | 350   | 0    | 0    | 0    | 0    |
| Future Volume (vph)    | 295   | 1330 | 600    | 0    | 0    | 1830  | 0    | 350   | 0    | 0    | 0    | 0    |
| 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      | 1.00  | 0.95 | 1.00   |      |      | *0.70 |      | 0.91  |      |      |      |      |
| Frpb, ped/bikes        | 1.00  | 1.00 | 0.97   |      |      | 1.00  |      | 1.00  |      |      |      |      |
| Flpb, ped/bikes        | 1.00  | 1.00 | 1.00   |      |      | 1.00  |      | 1.00  |      |      |      |      |
| Fr <sub>t</sub>        | 1.00  | 1.00 | 0.95   |      |      | 0.95  |      | 1.00  |      |      |      |      |
| Flt Protected          | 0.95  | 1.00 | 1.00   |      |      | 1.00  |      | 1.00  |      |      |      |      |
| Satd. Flow (prot)      | 1577  | 3124 | 1534   |      |      | 3280  |      | 4293  |      |      |      |      |
| Flt Permitted          | 0.95  | 1.00 | 1.00   |      |      | 1.00  |      | 1.00  |      |      |      |      |
| Satd. Flow (perm)      | 1577  | 3124 | 1534   |      |      | 3280  |      | 4293  |      |      |      |      |
| Peak-hour factor, PHF  | 1.00  | 1.00 | 1.00   | 1.00 | 1.00 | 1.00  | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph)        | 295   | 1330 | 600    | 0    | 0    | 1830  | 0    | 350   | 0    | 0    | 0    | 0    |
| RTOR Reduction (vph)   | 134   | 0    | 0      | 0    | 0    | 0     | 0    | 0     | 0    | 0    | 0    | 0    |
| Lane Group Flow (vph)  | 162   | 1330 | 600    | 0    | 0    | 1830  | 0    | 350   | 0    | 0    | 0    | 0    |
| Confl. Peds. (#/hr)    | 5     |      | 10     | 10   |      | 5     | 35   |       | 9    | 9    |      | 35   |
| Confl. Bikes (#/hr)    |       |      | 15     |      |      | 1     |      | 30    |      |      |      |      |
| Heavy Vehicles (%)     | 3%    | 4%   | 3%     | 0%   | 0%   | 4%    | 0%   | 7%    | 0%   | 0%   | 0%   | 0%   |
| Bus Blockages (#/hr)   | 0     | 0    | 0      | 0    | 0    | 0     | 0    | 12    | 12   | 0    | 0    | 0    |
| Turn Type              | Prot  | NA   | custom |      |      | Prot  |      | NA    |      |      |      |      |
| Protected Phases       | 1     | 5    | 6      | 8    |      | 2     |      | 4     |      |      |      |      |
| Permitted Phases       |       |      |        | 6    |      |       |      |       |      |      |      |      |
| Actuated Green, G (s)  | 10.9  | 61.0 | 55.2   |      |      | 46.9  |      | 19.8  |      |      |      |      |
| Effective Green, g (s) | 9.9   | 60.0 | 53.2   |      |      | 46.1  |      | 22.0  |      |      |      |      |
| Actuated g/C Ratio     | 0.11  | 0.67 | 0.59   |      |      | 0.51  |      | 0.24  |      |      |      |      |
| Clearance Time (s)     | 3.0   |      | 3.0    |      |      | 3.2   |      | 6.2   |      |      |      |      |
| Vehicle Extension (s)  | 0.5   |      | 0.2    |      |      | 0.2   |      | 2.0   |      |      |      |      |
| Lane Grp Cap (vph)     | 173   | 2082 | 906    |      |      | 1680  |      | 1049  |      |      |      |      |
| v/s Ratio Prot         | c0.10 | 0.43 | c0.10  |      |      | c0.56 |      | c0.08 |      |      |      |      |
| v/s Ratio Perm         |       |      | 0.29   |      |      |       |      |       |      |      |      |      |
| v/c Ratio              | 0.93  | 0.64 | 0.66   |      |      | 1.09  |      | 0.33  |      |      |      |      |
| Uniform Delay, d1      | 39.7  | 8.7  | 12.4   |      |      | 21.9  |      | 28.0  |      |      |      |      |
| Progression Factor     | 0.65  | 1.62 | 0.70   |      |      | 0.33  |      | 1.00  |      |      |      |      |
| Incremental Delay, d2  | 43.8  | 1.3  | 1.2    |      |      | 44.1  |      | 0.1   |      |      |      |      |
| Delay (s)              | 69.8  | 15.4 | 9.9    |      |      | 51.4  |      | 28.0  |      |      |      |      |
| Level of Service       | E     | B    | A      |      |      | D     |      | C     |      |      |      |      |
| Approach Delay (s)     |       | 21.1 |        |      |      | 51.4  |      | 28.0  |      | 0.0  |      |      |
| Approach LOS           |       | C    |        |      |      | D     |      | C     |      | A    |      |      |

## Intersection Summary

|                                   |       |                           |      |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay            | 34.3  | HCM 2000 Level of Service | C    |
| HCM 2000 Volume to Capacity ratio | 0.95  |                           |      |
| Actuated Cycle Length (s)         | 90.0  | Sum of lost time (s)      | 15.0 |
| Intersection Capacity Utilization | 88.3% | ICU Level of Service      | E    |
| Analysis Period (min)             | 15    |                           |      |

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

39: 5th Ave & Broadway

06/02/2020



| Movement                          | EBL   | EBT   | EBR  | WBL                       | WBT   | WBR  | NBL   | NBT  | NBR  | SBL  | SBT  | SBR   |
|-----------------------------------|-------|-------|------|---------------------------|-------|------|-------|------|------|------|------|-------|
| Lane Configurations               |       |       |      |                           |       |      |       |      |      |      |      |       |
| Traffic Volume (vph)              | 0     | 0     | 1330 | 0                         | 1830  | 0    | 0     | 0    | 0    | 0    | 95   | 0     |
| Future Volume (vph)               | 0     | 0     | 1330 | 0                         | 1830  | 0    | 0     | 0    | 0    | 0    | 95   | 0     |
| Ideal Flow (vphpl)                | 1900  | 1900  | 1900 | 1900                      | 1750  | 1900 | 1900  | 1900 | 1900 | 1900 | 1900 | 1900  |
| Total Lost time (s)               |       |       |      |                           | 4.0   |      | 4.0   |      |      |      |      | 4.0   |
| Lane Util. Factor                 |       |       |      |                           | *0.95 |      | *0.80 |      |      |      |      | 1.00  |
| Frpb, ped/bikes                   |       |       |      |                           |       | 1.00 |       |      |      |      |      | 1.00  |
| Flpb, ped/bikes                   |       |       |      |                           |       | 1.00 |       |      |      |      |      | 1.00  |
| Fr <sub>t</sub>                   |       |       |      |                           |       | 1.00 |       |      |      |      |      | 1.00  |
| Flt Protected                     |       |       |      |                           |       | 1.00 |       |      |      |      |      | 1.00  |
| Satd. Flow (prot)                 |       |       |      |                           | 3215  |      | 3635  |      |      |      |      | 1179  |
| Flt Permitted                     |       |       |      |                           |       | 1.00 |       |      |      |      |      | 1.00  |
| Satd. Flow (perm)                 |       |       |      |                           | 3124  |      | 3635  |      |      |      |      | 1179  |
| Peak-hour factor, PHF             | 1.00  | 1.00  | 1.00 | 1.00                      | 1.00  | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |
| Adj. Flow (vph)                   | 0     | 0     | 1330 | 0                         | 1830  | 0    | 0     | 0    | 0    | 0    | 95   | 0     |
| RTOR Reduction (vph)              | 0     | 0     | 0    | 0                         | 0     | 0    | 0     | 0    | 0    | 0    | 0    | 0     |
| Lane Group Flow (vph)             | 0     | 0     | 1330 | 0                         | 1830  | 0    | 0     | 0    | 0    | 0    | 95   | 0     |
| Confl. Peds. (#/hr)               |       |       |      | 27                        | 27    |      |       |      | 36   | 36   |      |       |
| Confl. Bikes (#/hr)               |       |       |      | 3                         |       | 1    |       |      |      |      |      | 2     |
| Heavy Vehicles (%)                | 0%    | 0%    | 4%   | 0%                        | 4%    | 0%   | 0%    | 0%   | 0%   | 0%   | 45%  | 0%    |
| Turn Type                         |       |       |      | Prot                      |       | NA   |       |      |      |      |      | NA    |
| Protected Phases                  |       |       |      | 6                         |       | 2    |       |      |      |      |      | 4     |
| Permitted Phases                  |       |       |      |                           |       |      |       |      |      |      |      |       |
| Actuated Green, G (s)             |       |       | 40.0 |                           | 46.9  |      |       |      |      |      |      | 19.8  |
| Effective Green, g (s)            |       |       | 39.0 |                           | 46.1  |      |       |      |      |      |      | 22.0  |
| Actuated g/C Ratio                |       |       | 0.43 |                           | 0.51  |      |       |      |      |      |      | 0.24  |
| Clearance Time (s)                |       |       | 3.0  |                           | 3.2   |      |       |      |      |      |      | 6.2   |
| Vehicle Extension (s)             |       |       | 0.2  |                           | 0.2   |      |       |      |      |      |      | 2.0   |
| Lane Grp Cap (vph)                |       | 1393  |      | 1861                      |       |      |       |      |      |      |      | 288   |
| v/s Ratio Prot                    |       | c0.41 |      | c0.50                     |       |      |       |      |      |      |      | c0.08 |
| v/s Ratio Perm                    |       |       |      |                           |       |      |       |      |      |      |      |       |
| v/c Ratio                         |       | 0.95  |      | 0.98                      |       |      |       |      |      |      |      | 0.33  |
| Uniform Delay, d1                 |       | 24.6  |      | 21.6                      |       |      |       |      |      |      |      | 27.9  |
| Progression Factor                |       | 0.53  |      | 0.44                      |       |      |       |      |      |      |      | 1.00  |
| Incremental Delay, d2             |       | 13.0  |      | 9.2                       |       |      |       |      |      |      |      | 0.2   |
| Delay (s)                         |       | 26.1  |      | 18.6                      |       |      |       |      |      |      |      | 28.2  |
| Level of Service                  |       | C     |      | B                         |       |      |       |      |      |      |      | C     |
| Approach Delay (s)                | 26.1  |       |      | 18.6                      |       |      | 0.0   |      |      |      |      | 28.2  |
| Approach LOS                      | C     |       |      | B                         |       |      | A     |      |      |      |      | C     |
| <b>Intersection Summary</b>       |       |       |      |                           |       |      |       |      |      |      |      |       |
| HCM 2000 Control Delay            | 22.0  |       |      | HCM 2000 Level of Service |       |      |       |      |      |      |      | C     |
| HCM 2000 Volume to Capacity ratio | 0.83  |       |      |                           |       |      |       |      |      |      |      |       |
| Actuated Cycle Length (s)         | 90.0  |       |      | Sum of lost time (s)      |       |      |       | 13.0 |      |      |      |       |
| Intersection Capacity Utilization | 70.8% |       |      | ICU Level of Service      |       |      |       | C    |      |      |      |       |
| Analysis Period (min)             | 15    |       |      |                           |       |      |       |      |      |      |      |       |
| c Critical Lane Group             |       |       |      |                           |       |      |       |      |      |      |      |       |

# HCM Signalized Intersection Capacity Analysis

## 42: Caruthers & 4th Ave & Broadway

06/02/2020



| Movement                          | WBL   | WBT   | WBR  | NBL2                      | NBL   | NBT  |
|-----------------------------------|-------|-------|------|---------------------------|-------|------|
| Lane Configurations               |       |       |      |                           |       |      |
| Traffic Volume (vph)              | 110   | 1280  | 125  | 50                        | 555   | 715  |
| Future Volume (vph)               | 110   | 1280  | 125  | 50                        | 555   | 715  |
| Ideal Flow (vphpl)                | 1900  | 1900  | 1900 | 1900                      | 1900  | 1900 |
| Total Lost time (s)               |       | 4.0   |      |                           | 4.0   | 4.0  |
| Lane Util. Factor                 |       | *0.78 |      |                           | *0.94 | 0.95 |
| Frpb, ped/bikes                   |       | 1.00  |      |                           | 1.00  | 1.00 |
| Flpb, ped/bikes                   |       | 0.99  |      |                           | 1.00  | 1.00 |
| Fr <sub>t</sub>                   |       | 0.99  |      |                           | 1.00  | 1.00 |
| Flt Protected                     |       | 1.00  |      |                           | 0.95  | 1.00 |
| Satd. Flow (prot)                 |       | 3764  |      |                           | 2970  | 3154 |
| Flt Permitted                     |       | 1.00  |      |                           | 0.95  | 1.00 |
| Satd. Flow (perm)                 |       | 3764  |      |                           | 2970  | 3154 |
| Peak-hour factor, PHF             | 1.00  | 1.00  | 1.00 | 1.00                      | 1.00  | 1.00 |
| Adj. Flow (vph)                   | 110   | 1280  | 125  | 50                        | 555   | 715  |
| RTOR Reduction (vph)              | 0     | 10    | 0    | 0                         | 0     | 0    |
| Lane Group Flow (vph)             | 0     | 1505  | 0    | 0                         | 605   | 715  |
| Confl. Peds. (#/hr)               | 69    |       |      |                           |       |      |
| Confl. Bikes (#/hr)               |       |       | 1    |                           |       |      |
| Heavy Vehicles (%)                | 3%    | 4%    | 2%   | 1%                        | 3%    | 3%   |
| Turn Type                         | Perm  | NA    |      | custom                    | Prot  | NA   |
| Protected Phases                  |       |       | 2    |                           | 7 11  | 4    |
| Permitted Phases                  | 2     |       |      | 7 11                      |       |      |
| Actuated Green, G (s)             | 35.9  |       |      | 22.3                      | 24.9  |      |
| Effective Green, g (s)            | 36.5  |       |      | 23.5                      | 25.5  |      |
| Actuated g/C Ratio                | 0.41  |       |      | 0.26                      | 0.28  |      |
| Clearance Time (s)                | 4.6   |       |      | 4.6                       |       |      |
| Vehicle Extension (s)             | 0.2   |       |      | 1.8                       |       |      |
| Lane Grp Cap (vph)                | 1526  |       |      | 775                       | 893   |      |
| v/s Ratio Prot                    |       |       |      | c0.23                     |       |      |
| v/s Ratio Perm                    | 0.40  |       |      | 0.20                      |       |      |
| v/c Ratio                         | 0.99  |       |      | 0.78                      | 0.80  |      |
| Uniform Delay, d1                 | 26.5  |       |      | 30.9                      | 29.9  |      |
| Progression Factor                | 1.00  |       |      | 1.44                      | 1.46  |      |
| Incremental Delay, d2             | 20.1  |       |      | 3.3                       | 4.9   |      |
| Delay (s)                         | 46.6  |       |      | 47.8                      | 48.5  |      |
| Level of Service                  | D     |       |      | D                         | D     |      |
| Approach Delay (s)                | 46.6  |       |      | 48.2                      |       |      |
| Approach LOS                      | D     |       |      | D                         |       |      |
| <b>Intersection Summary</b>       |       |       |      |                           |       |      |
| HCM 2000 Control Delay            | 47.3  |       |      | HCM 2000 Level of Service | D     |      |
| HCM 2000 Volume to Capacity ratio | 0.94  |       |      |                           |       |      |
| Actuated Cycle Length (s)         | 90.0  |       |      | Sum of lost time (s)      | 16.0  |      |
| Intersection Capacity Utilization | 63.9% |       |      | ICU Level of Service      | B     |      |
| Analysis Period (min)             | 15    |       |      |                           |       |      |
| c Critical Lane Group             |       |       |      |                           |       |      |

# HCM Signalized Intersection Capacity Analysis

45: Barbur Blvd/4th Ave & Sheridan St

06/02/2020



| Movement                          | EBL   | EBT  | EBR    | WBL  | WBT  | WBR  | NBL  | NBT                       | NBR  | SBL  | SBT  | SBR  |
|-----------------------------------|-------|------|--------|------|------|------|------|---------------------------|------|------|------|------|
| Lane Configurations               |       | ↑↑   | ↑      |      |      |      |      | ↑↑↑                       |      |      |      |      |
| Traffic Volume (vph)              | 85    | 1165 | 465    | 0    | 0    | 0    | 0    | 1225                      | 70   | 0    | 0    | 0    |
| Future Volume (vph)               | 85    | 1165 | 465    | 0    | 0    | 0    | 0    | 1225                      | 70   | 0    | 0    | 0    |
| Ideal Flow (vphpl)                | 1900  | 1900 | 1900   | 1900 | 1900 | 1900 | 1900 | 1900                      | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s)               |       |      |        | 4.0  | 4.6  |      |      |                           | 4.0  |      |      |      |
| Lane Util. Factor                 |       | 0.95 | 1.00   |      |      |      |      |                           | 0.91 |      |      |      |
| Frpb, ped/bikes                   |       | 1.00 | 1.00   |      |      |      |      |                           | 1.00 |      |      |      |
| Flpb, ped/bikes                   |       | 1.00 | 1.00   |      |      |      |      |                           | 1.00 |      |      |      |
| Fr <sub>t</sub>                   |       | 1.00 | 0.85   |      |      |      |      |                           | 0.99 |      |      |      |
| Flt Protected                     |       | 1.00 | 1.00   |      |      |      |      |                           | 1.00 |      |      |      |
| Satd. Flow (prot)                 |       | 3080 | 1346   |      |      |      |      |                           | 4486 |      |      |      |
| Flt Permitted                     |       | 1.00 | 1.00   |      |      |      |      |                           | 1.00 |      |      |      |
| Satd. Flow (perm)                 |       | 3080 | 1346   |      |      |      |      |                           | 4486 |      |      |      |
| Peak-hour factor, PHF             | 1.00  | 1.00 | 1.00   | 1.00 | 1.00 | 1.00 | 1.00 | 1.00                      | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph)                   | 85    | 1165 | 465    | 0    | 0    | 0    | 0    | 1225                      | 70   | 0    | 0    | 0    |
| RTOR Reduction (vph)              | 0     | 25   | 76     | 0    | 0    | 0    | 0    | 7                         | 0    | 0    | 0    | 0    |
| Lane Group Flow (vph)             | 0     | 1225 | 389    | 0    | 0    | 0    | 0    | 1288                      | 0    | 0    | 0    | 0    |
| Confl. Peds. (#/hr)               |       |      | 18     | 18   |      |      | 22   |                           | 12   | 12   |      | 22   |
| Confl. Bikes (#/hr)               |       |      |        | 2    |      |      |      |                           | 29   |      |      |      |
| Heavy Vehicles (%)                | 7%    | 5%   | 8%     | 0%   | 0%   | 0%   | 0%   | 3%                        | 1%   | 0%   | 0%   | 0%   |
| Turn Type                         | Perm  | NA   | custom |      |      |      |      |                           | NA   |      |      |      |
| Protected Phases                  |       | 2    | 2 8    |      |      |      |      |                           | 4    |      |      |      |
| Permitted Phases                  |       | 2    |        |      |      |      |      |                           |      |      |      |      |
| Actuated Green, G (s)             | 49.5  | 75.2 |        |      |      |      |      | 31.3                      |      |      |      |      |
| Effective Green, g (s)            | 50.1  | 75.2 |        |      |      |      |      | 31.9                      |      |      |      |      |
| Actuated g/C Ratio                | 0.56  | 0.84 |        |      |      |      |      | 0.35                      |      |      |      |      |
| Clearance Time (s)                |       | 4.6  |        |      |      |      |      | 4.6                       |      |      |      |      |
| Vehicle Extension (s)             |       | 0.2  |        |      |      |      |      | 1.0                       |      |      |      |      |
| Lane Grp Cap (vph)                | 1714  | 1124 |        |      |      |      |      | 1590                      |      |      |      |      |
| v/s Ratio Prot                    |       |      | 0.29   |      |      |      |      | c0.29                     |      |      |      |      |
| v/s Ratio Perm                    |       | 0.40 |        |      |      |      |      |                           |      |      |      |      |
| v/c Ratio                         | 0.71  | 0.35 |        |      |      |      |      | 0.81                      |      |      |      |      |
| Uniform Delay, d1                 | 14.7  | 1.7  |        |      |      |      |      | 26.3                      |      |      |      |      |
| Progression Factor                | 1.00  | 1.00 |        |      |      |      |      | 1.00                      |      |      |      |      |
| Incremental Delay, d2             | 2.6   | 0.1  |        |      |      |      |      | 3.0                       |      |      |      |      |
| Delay (s)                         | 17.3  | 1.8  |        |      |      |      |      | 29.3                      |      |      |      |      |
| Level of Service                  | B     | A    |        |      |      |      |      | C                         |      |      |      |      |
| Approach Delay (s)                | 13.1  |      |        | 0.0  |      |      |      | 29.3                      |      | 0.0  |      |      |
| Approach LOS                      | B     |      |        | A    |      |      |      | C                         |      | A    |      |      |
| <b>Intersection Summary</b>       |       |      |        |      |      |      |      |                           |      |      |      |      |
| HCM 2000 Control Delay            | 20.0  |      |        |      |      |      |      | HCM 2000 Level of Service |      | C    |      |      |
| HCM 2000 Volume to Capacity ratio | 0.79  |      |        |      |      |      |      |                           |      |      |      |      |
| Actuated Cycle Length (s)         | 90.0  |      |        |      |      |      |      | Sum of lost time (s)      |      | 12.2 |      |      |
| Intersection Capacity Utilization | 73.3% |      |        |      |      |      |      | ICU Level of Service      |      | D    |      |      |
| Analysis Period (min)             |       | 15   |        |      |      |      |      |                           |      |      |      |      |
| c Critical Lane Group             |       |      |        |      |      |      |      |                           |      |      |      |      |

# HCM Signalized Intersection Capacity Analysis

46: 1st Ave & Sheridan

06/02/2020



| Movement                          | EBL   | EBT  | EBR  | WBL  | WBT                       | WBR  | NBL  | NBT   | NBR  | SBL   | SBT  | SBR  |
|-----------------------------------|-------|------|------|------|---------------------------|------|------|-------|------|-------|------|------|
| Lane Configurations               |       |      |      |      |                           |      |      |       |      |       |      |      |
| Traffic Volume (vph)              | 0     | 0    | 5    | 295  | 0                         | 10   | 0    | 395   | 135  | 10    | 230  | 5    |
| Future Volume (vph)               | 0     | 0    | 5    | 295  | 0                         | 10   | 0    | 395   | 135  | 10    | 230  | 5    |
| Ideal Flow (vphpl)                | 1900  | 1900 | 1900 | 1900 | 1900                      | 1900 | 1900 | 1900  | 1900 | 1900  | 1900 | 1900 |
| Total Lost time (s)               |       |      |      |      |                           |      |      |       |      |       |      |      |
| Lane Util. Factor                 | 1.00  |      |      |      | 1.00                      |      |      | 0.95  |      | 1.00  |      | 0.95 |
| Frpb, ped/bikes                   | 1.00  |      |      |      | 1.00                      |      |      | 0.97  |      | 1.00  |      | 1.00 |
| Flpb, ped/bikes                   | 1.00  |      |      |      | 1.00                      |      |      | 1.00  |      | 1.00  |      | 1.00 |
| Fr <sub>t</sub>                   | 0.86  |      |      |      | 1.00                      |      |      | 0.96  |      | 1.00  |      | 1.00 |
| Flt Protected                     | 1.00  |      |      |      | 0.95                      |      |      | 1.00  |      | 0.95  |      | 1.00 |
| Satd. Flow (prot)                 | 1611  |      |      |      | 1759                      |      |      | 3034  |      | 1805  |      | 3494 |
| Flt Permitted                     | 1.00  |      |      |      | 0.73                      |      |      | 1.00  |      | 0.95  |      | 1.00 |
| Satd. Flow (perm)                 | 1611  |      |      |      | 1346                      |      |      | 3034  |      | 1805  |      | 3494 |
| Peak-hour factor, PHF             | 1.00  | 1.00 | 1.00 | 1.00 | 1.00                      | 1.00 | 1.00 | 1.00  | 1.00 | 1.00  | 1.00 | 1.00 |
| Adj. Flow (vph)                   | 0     | 0    | 5    | 295  | 0                         | 10   | 0    | 395   | 135  | 10    | 230  | 5    |
| RTOR Reduction (vph)              | 0     | 4    | 0    | 0    | 48                        | 0    | 0    | 16    | 0    | 0     | 1    | 0    |
| Lane Group Flow (vph)             | 0     | 1    | 0    | 0    | 257                       | 0    | 0    | 514   | 0    | 10    | 234  | 0    |
| Confl. Peds. (#/hr)               |       |      |      |      | 3                         |      |      |       | 44   | 44    |      |      |
| Confl. Bikes (#/hr)               |       |      |      |      |                           | 2    |      |       |      | 8     |      |      |
| Heavy Vehicles (%)                | 2%    | 2%   | 2%   | 2%   | 2%                        | 4%   | 2%   | 6%    | 24%  | 0%    | 3%   | 2%   |
| Turn Type                         |       | NA   |      | Perm |                           | NA   |      | NA    |      | Prot  | NA   |      |
| Protected Phases                  |       | 4    |      |      |                           | 8    |      |       | 2    |       | 1    | 6    |
| Permitted Phases                  | 4     |      |      |      | 8                         |      |      |       |      |       |      |      |
| Actuated Green, G (s)             | 29.0  |      |      |      | 29.0                      |      |      | 76.5  |      | 1.5   | 81.0 |      |
| Effective Green, g (s)            | 30.0  |      |      |      | 30.0                      |      |      | 77.5  |      | 1.5   | 82.0 |      |
| Actuated g/C Ratio                | 0.25  |      |      |      | 0.25                      |      |      | 0.65  |      | 0.01  | 0.68 |      |
| Clearance Time (s)                | 5.0   |      |      |      | 5.0                       |      |      | 5.0   |      | 3.0   | 5.0  |      |
| Vehicle Extension (s)             | 3.0   |      |      |      | 3.0                       |      |      | 3.0   |      | 3.0   | 3.0  |      |
| Lane Grp Cap (vph)                | 402   |      |      |      | 336                       |      |      | 1959  |      | 22    | 2387 |      |
| v/s Ratio Prot                    | 0.00  |      |      |      |                           |      |      | c0.17 |      | c0.01 | 0.07 |      |
| v/s Ratio Perm                    |       |      |      |      | c0.19                     |      |      |       |      |       |      |      |
| v/c Ratio                         | 0.00  |      |      |      | 0.76                      |      |      | 0.26  |      | 0.45  | 0.10 |      |
| Uniform Delay, d1                 | 33.8  |      |      |      | 41.7                      |      |      | 9.1   |      | 58.8  | 6.4  |      |
| Progression Factor                | 1.00  |      |      |      | 0.94                      |      |      | 0.50  |      | 1.00  | 1.00 |      |
| Incremental Delay, d2             | 0.0   |      |      |      | 9.9                       |      |      | 0.3   |      | 14.2  | 0.1  |      |
| Delay (s)                         | 33.8  |      |      |      | 49.0                      |      |      | 4.8   |      | 73.0  | 6.5  |      |
| Level of Service                  | C     |      |      |      | D                         |      |      | A     |      | E     | A    |      |
| Approach Delay (s)                | 33.8  |      |      |      | 49.0                      |      |      | 4.8   |      |       | 9.2  |      |
| Approach LOS                      | C     |      |      |      | D                         |      |      | A     |      |       | A    |      |
| <b>Intersection Summary</b>       |       |      |      |      |                           |      |      |       |      |       |      |      |
| HCM 2000 Control Delay            | 18.4  |      |      |      | HCM 2000 Level of Service |      |      | B     |      |       |      |      |
| HCM 2000 Volume to Capacity ratio | 0.40  |      |      |      |                           |      |      |       |      |       |      |      |
| Actuated Cycle Length (s)         | 120.0 |      |      |      | Sum of lost time (s)      |      |      | 11.0  |      |       |      |      |
| Intersection Capacity Utilization | 50.3% |      |      |      | ICU Level of Service      |      |      | A     |      |       |      |      |
| Analysis Period (min)             | 15    |      |      |      |                           |      |      |       |      |       |      |      |
| c Critical Lane Group             |       |      |      |      |                           |      |      |       |      |       |      |      |

# HCM Signalized Intersection Capacity Analysis

47: Naito & Sheridan

06/02/2020



| Movement                          | EBL   | EBR   | NBL   | NBT                       | SBT  | SBR  |
|-----------------------------------|-------|-------|-------|---------------------------|------|------|
| Lane Configurations               |       |       |       |                           |      |      |
| Traffic Volume (vph)              | 115   | 30    | 10    | 1250                      | 135  | 295  |
| Future Volume (vph)               | 115   | 30    | 10    | 1250                      | 135  | 295  |
| Ideal Flow (vphpl)                | 1900  | 1900  | 1900  | 1900                      | 1900 | 1900 |
| Total Lost time (s)               | 4.0   |       |       | 4.0                       |      | 4.0  |
| Lane Util. Factor                 | 1.00  |       |       | 1.00                      |      | 0.95 |
| Frpb, ped/bikes                   | 1.00  |       |       | 1.00                      |      | 1.00 |
| Flpb, ped/bikes                   | 1.00  |       |       | 1.00                      |      | 1.00 |
| Fr <sub>t</sub>                   | 0.97  |       |       | 1.00                      |      | 0.90 |
| Flt Protected                     | 0.96  |       |       | 0.95                      |      | 1.00 |
| Satd. Flow (prot)                 | 1757  |       |       | 1805                      |      | 1845 |
| Flt Permitted                     | 0.96  |       |       | 0.95                      |      | 1.00 |
| Satd. Flow (perm)                 | 1757  |       |       | 1805                      |      | 1845 |
| Peak-hour factor, PHF             | 1.00  | 1.00  | 1.00  | 1.00                      | 1.00 | 1.00 |
| Adj. Flow (vph)                   | 115   | 30    | 10    | 1250                      | 135  | 295  |
| RTOR Reduction (vph)              | 9     | 0     | 0     | 0                         | 68   | 0    |
| Lane Group Flow (vph)             | 136   | 0     | 10    | 1250                      | 362  | 0    |
| Confl. Bikes (#/hr)               |       |       | 1     |                           |      |      |
| Heavy Vehicles (%)                | 0%    | 4%    | 0%    | 3%                        | 4%   | 5%   |
| Turn Type                         | Prot  |       | Prot  | NA                        | NA   |      |
| Protected Phases                  | 4     |       | 5     | 2                         | 6    |      |
| Permitted Phases                  |       |       |       |                           |      |      |
| Actuated Green, G (s)             | 14.9  |       | 0.8   | 97.1                      | 92.3 |      |
| Effective Green, g (s)            | 14.9  |       | 0.8   | 97.1                      | 92.3 |      |
| Actuated g/C Ratio                | 0.12  |       | 0.01  | 0.81                      | 0.77 |      |
| Clearance Time (s)                | 4.0   |       | 4.0   | 4.0                       | 4.0  |      |
| Vehicle Extension (s)             | 3.0   |       | 3.0   | 3.0                       | 3.0  |      |
| Lane Grp Cap (vph)                | 218   |       | 12    | 1492                      | 2379 |      |
| v/s Ratio Prot                    | c0.08 |       | 0.01  | c0.68                     | 0.12 |      |
| v/s Ratio Perm                    |       |       |       |                           |      |      |
| v/c Ratio                         | 0.62  |       | 0.83  | 0.84                      | 0.15 |      |
| Uniform Delay, d1                 | 49.9  |       | 59.5  | 6.8                       | 3.6  |      |
| Progression Factor                | 0.76  |       | 1.00  | 1.00                      | 1.00 |      |
| Incremental Delay, d2             | 5.4   |       | 168.3 | 5.8                       | 0.1  |      |
| Delay (s)                         | 43.1  |       | 227.8 | 12.6                      | 3.8  |      |
| Level of Service                  | D     |       | F     | B                         | A    |      |
| Approach Delay (s)                | 43.1  |       |       | 14.3                      | 3.8  |      |
| Approach LOS                      | D     |       |       | B                         | A    |      |
| Intersection Summary              |       |       |       |                           |      |      |
| HCM 2000 Control Delay            |       | 14.1  |       | HCM 2000 Level of Service |      | B    |
| HCM 2000 Volume to Capacity ratio |       | 0.84  |       |                           |      |      |
| Actuated Cycle Length (s)         |       | 120.0 |       | Sum of lost time (s)      |      | 12.0 |
| Intersection Capacity Utilization |       | 80.7% |       | ICU Level of Service      |      | D    |
| Analysis Period (min)             |       | 15    |       |                           |      |      |

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

48: 1st Ave & Arthur

06/02/2020



| Movement               | EBL   | EBT   | EBR  | WBL  | WBT   | WBR  | NBL  | NBT   | NBR  | SBL   | SBT  | SBR  |
|------------------------|-------|-------|------|------|-------|------|------|-------|------|-------|------|------|
| Lane Configurations    | ↑ ↗   | ↑ ↘   |      |      | ↑ ↗   | ↑ ↘  | ↑ ↗  | ↑ ↘   |      | ↑ ↗   | ↑ ↘  |      |
| Traffic Volume (vph)   | 55    | 1120  | 30   | 0    | 1510  | 315  | 45   | 155   | 40   | 390   | 60   | 50   |
| Future Volume (vph)    | 55    | 1120  | 30   | 0    | 1510  | 315  | 45   | 155   | 40   | 390   | 60   | 50   |
| Ideal Flow (vphpl)     | 1900  | 1900  | 1900 | 1900 | 1900  | 1900 | 1900 | 1900  | 1900 | 1900  | 1900 | 1900 |
| Total Lost time (s)    | 2.0   | 4.0   |      |      | 4.0   | 4.0  | 4.0  | 4.0   |      | 4.0   | 4.0  |      |
| Lane Util. Factor      | 1.00  | 0.95  |      |      | 0.95  | 1.00 | 1.00 | 1.00  |      | 0.97  | 1.00 |      |
| Frpb, ped/bikes        | 1.00  | 1.00  |      |      | 1.00  | 0.95 | 1.00 | 0.98  |      | 1.00  | 0.97 |      |
| Flpb, ped/bikes        | 1.00  | 1.00  |      |      | 1.00  | 1.00 | 1.00 | 1.00  |      | 1.00  | 1.00 |      |
| Fr <sub>t</sub>        | 1.00  | 1.00  |      |      | 1.00  | 0.85 | 1.00 | 0.97  |      | 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)      | 1533  | 3097  |      |      | 3118  | 1286 | 1518 | 1496  |      | 2973  | 1495 |      |
| Flt Permitted          | 0.07  | 1.00  |      |      | 1.00  | 1.00 | 0.95 | 1.00  |      | 0.95  | 1.00 |      |
| Satd. Flow (perm)      | 114   | 3097  |      |      | 3118  | 1286 | 1518 | 1496  |      | 2973  | 1495 |      |
| Peak-hour factor, PHF  | 1.00  | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00  | 1.00 | 1.00 |
| Adj. Flow (vph)        | 55    | 1120  | 30   | 0    | 1510  | 315  | 45   | 155   | 40   | 390   | 60   | 50   |
| RTOR Reduction (vph)   | 0     | 2     | 0    | 0    | 0     | 79   | 0    | 8     | 0    | 0     | 27   | 0    |
| Lane Group Flow (vph)  | 55    | 1148  | 0    | 0    | 1510  | 236  | 45   | 187   | 0    | 390   | 83   | 0    |
| Confl. Peds. (#/hr)    | 24    |       | 22   | 22   |       | 24   | 33   |       | 45   | 45    |      | 33   |
| Confl. Bikes (#/hr)    |       |       |      |      |       | 2    |      |       | 6    |       |      | 4    |
| Heavy Vehicles (%)     | 6%    | 4%    | 5%   | 0%   | 4%    | 7%   | 7%   | 2%    | 0%   | 6%    | 2%   | 5%   |
| Bus Blockages (#/hr)   | 0     | 1     | 1    | 0    | 1     | 1    | 0    | 16    | 16   | 0     | 0    | 6    |
| Turn Type              | pm+pt | NA    |      |      | NA    | Perm | Prot | NA    |      | Prot  | NA   |      |
| Protected Phases       | 1     | 6     |      |      | 2     |      | 7    | 4     |      | 3     | 8    |      |
| Permitted Phases       | 6     |       |      |      | 2     |      |      |       |      |       |      |      |
| Actuated Green, G (s)  | 70.6  | 70.6  |      |      | 66.0  | 66.0 | 14.1 | 17.4  |      | 18.0  | 21.3 |      |
| Effective Green, g (s) | 70.6  | 71.6  |      |      | 67.0  | 67.0 | 14.1 | 18.4  |      | 18.0  | 22.3 |      |
| Actuated g/C Ratio     | 0.59  | 0.60  |      |      | 0.56  | 0.56 | 0.12 | 0.15  |      | 0.15  | 0.19 |      |
| Clearance Time (s)     | 2.0   | 5.0   |      |      | 5.0   | 5.0  | 4.0  | 5.0   |      | 4.0   | 5.0  |      |
| Vehicle Extension (s)  | 0.5   | 1.0   |      |      | 1.0   | 1.0  | 0.5  | 1.5   |      | 0.5   | 0.5  |      |
| Lane Grp Cap (vph)     | 97    | 1847  |      |      | 1740  | 718  | 178  | 229   |      | 445   | 277  |      |
| v/s Ratio Prot         | 0.01  | c0.37 |      |      | c0.48 |      | 0.03 | c0.13 |      | c0.13 | 0.06 |      |
| v/s Ratio Perm         | 0.32  |       |      |      |       | 0.18 |      |       |      |       |      |      |
| v/c Ratio              | 0.57  | 0.62  |      |      | 0.87  | 0.33 | 0.25 | 0.82  |      | 0.88  | 0.30 |      |
| Uniform Delay, d1      | 18.8  | 15.5  |      |      | 22.7  | 14.3 | 48.2 | 49.2  |      | 49.9  | 42.1 |      |
| Progression Factor     | 1.00  | 1.00  |      |      | 0.32  | 0.03 | 1.00 | 1.00  |      | 1.29  | 1.19 |      |
| Incremental Delay, d2  | 4.5   | 1.6   |      |      | 3.5   | 0.7  | 0.3  | 18.9  |      | 16.5  | 0.2  |      |
| Delay (s)              | 23.3  | 17.1  |      |      | 10.8  | 1.1  | 48.4 | 68.1  |      | 81.0  | 50.3 |      |
| Level of Service       | C     | B     |      |      | B     | A    | D    | E     |      | F     | D    |      |
| Approach Delay (s)     |       | 17.4  |      |      |       | 9.1  |      | 64.4  |      |       | 74.2 |      |
| Approach LOS           |       | B     |      |      |       | A    |      | E     |      |       | E    |      |

## Intersection Summary

|                                   |       |                           |      |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay            | 23.9  | HCM 2000 Level of Service | C    |
| HCM 2000 Volume to Capacity ratio | 0.85  |                           |      |
| Actuated Cycle Length (s)         | 120.0 | Sum of lost time (s)      | 14.0 |
| Intersection Capacity Utilization | 88.9% | ICU Level of Service      | E    |
| Analysis Period (min)             | 15    |                           |      |

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

51: SW Kelly Ave & Water

06/02/2020



| Movement                          | SEL  | SET   | NWT   | NWR                       | SWL  | SWR  |
|-----------------------------------|------|-------|-------|---------------------------|------|------|
| Lane Configurations               |      |       |       |                           |      |      |
| Traffic Volume (vph)              | 125  | 1450  | 1615  | 120                       | 75   | 200  |
| Future Volume (vph)               | 125  | 1450  | 1615  | 120                       | 75   | 200  |
| Ideal Flow (vphpl)                | 1900 | 1900  | 1900  | 1900                      | 1900 | 1900 |
| Total Lost time (s)               | 4.0  | 4.0   | 4.0   |                           | 4.0  |      |
| Lane Util. Factor                 | 1.00 | 0.95  | 0.95  |                           | 1.00 |      |
| Frt                               | 1.00 | 1.00  | 0.99  |                           | 0.90 |      |
| Flt Protected                     | 0.95 | 1.00  | 1.00  |                           | 0.99 |      |
| Satd. Flow (prot)                 | 1770 | 3539  | 3502  |                           | 1657 |      |
| Flt Permitted                     | 0.95 | 1.00  | 1.00  |                           | 0.99 |      |
| Satd. Flow (perm)                 | 1770 | 3539  | 3502  |                           | 1657 |      |
| Peak-hour factor, PHF             | 1.00 | 1.00  | 1.00  | 1.00                      | 1.00 | 1.00 |
| Adj. Flow (vph)                   | 125  | 1450  | 1615  | 120                       | 75   | 200  |
| RTOR Reduction (vph)              | 0    | 0     | 5     | 0                         | 80   | 0    |
| Lane Group Flow (vph)             | 125  | 1450  | 1730  | 0                         | 195  | 0    |
| Turn Type                         | Prot | NA    | NA    |                           | Perm |      |
| Protected Phases                  | 1    | 6     | 2     |                           |      |      |
| Permitted Phases                  |      |       |       |                           | 8    |      |
| Actuated Green, G (s)             | 14.0 | 87.0  | 69.0  |                           | 23.0 |      |
| Effective Green, g (s)            | 14.0 | 88.0  | 70.0  |                           | 24.0 |      |
| Actuated g/C Ratio                | 0.12 | 0.73  | 0.58  |                           | 0.20 |      |
| Clearance Time (s)                | 4.0  | 5.0   | 5.0   |                           | 5.0  |      |
| Vehicle Extension (s)             | 3.0  | 3.0   | 3.0   |                           | 3.0  |      |
| Lane Grp Cap (vph)                | 206  | 2595  | 2042  |                           | 331  |      |
| v/s Ratio Prot                    | 0.07 | c0.41 | c0.49 |                           |      |      |
| v/s Ratio Perm                    |      |       |       | c0.12                     |      |      |
| v/c Ratio                         | 0.61 | 0.56  | 0.85  |                           | 0.59 |      |
| Uniform Delay, d1                 | 50.4 | 7.2   | 20.6  |                           | 43.5 |      |
| Progression Factor                | 0.87 | 0.28  | 1.04  |                           | 1.00 |      |
| Incremental Delay, d2             | 3.7  | 0.6   | 2.5   |                           | 7.5  |      |
| Delay (s)                         | 47.4 | 2.7   | 24.0  |                           | 51.0 |      |
| Level of Service                  | D    | A     | C     |                           | D    |      |
| Approach Delay (s)                |      | 6.2   | 24.0  |                           | 51.0 |      |
| Approach LOS                      |      | A     | C     |                           | D    |      |
| Intersection Summary              |      |       |       |                           |      |      |
| HCM 2000 Control Delay            |      |       | 18.3  | HCM 2000 Level of Service | B    |      |
| HCM 2000 Volume to Capacity ratio |      |       | 0.77  |                           |      |      |
| Actuated Cycle Length (s)         |      |       | 120.0 | Sum of lost time (s)      | 13.0 |      |
| Intersection Capacity Utilization |      |       | 81.9% | ICU Level of Service      | D    |      |
| Analysis Period (min)             |      |       | 15    |                           |      |      |

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

52: Barbur & Hooker

06/02/2020

| Movement                          | EBL  | EBT   | EBR  | WBL  | WBT                       | WBR  | NBU  | NBL  | NBT   | NBR  | SBL   | SBT  |
|-----------------------------------|------|-------|------|------|---------------------------|------|------|------|-------|------|-------|------|
| Lane Configurations               |      |       |      |      |                           |      |      |      |       |      |       |      |
| Traffic Volume (vph)              | 5    | 5     | 5    | 15   | 5                         | 75   | 5    | 5    | 1220  | 55   | 60    | 405  |
| Future Volume (vph)               | 5    | 5     | 5    | 15   | 5                         | 75   | 5    | 5    | 1220  | 55   | 60    | 405  |
| 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 |      |      | 1.00  | 1.00 |       | 1.00 |
| Frpb, ped/bikes                   |      | 0.98  |      |      |                           | 0.96 |      |      | 1.00  | 1.00 |       | 1.00 |
| Flpb, ped/bikes                   |      | 0.99  |      |      |                           | 0.99 |      |      | 1.00  | 1.00 |       | 1.00 |
| Fr <sub>t</sub>                   |      | 0.95  |      |      |                           | 0.89 |      |      | 1.00  | 0.99 |       | 1.00 |
| Flt Protected                     |      | 0.98  |      |      |                           | 0.99 |      |      | 0.95  | 1.00 |       | 0.95 |
| Satd. Flow (prot)                 |      | 1738  |      |      |                           | 1567 |      |      | 1787  | 1844 |       | 1805 |
| Flt Permitted                     |      | 0.93  |      |      |                           | 0.96 |      |      | 0.95  | 1.00 |       | 0.95 |
| Satd. Flow (perm)                 |      | 1649  |      |      |                           | 1521 |      |      | 1787  | 1844 |       | 1805 |
| Peak-hour factor, PHF             | 1.00 | 1.00  | 1.00 | 1.00 | 1.00                      | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00  | 1.00 |
| Adj. Flow (vph)                   | 5    | 5     | 5    | 15   | 5                         | 75   | 5    | 5    | 1220  | 55   | 60    | 405  |
| RTOR Reduction (vph)              | 0    | 4     | 0    | 0    | 28                        | 0    | 0    | 0    | 1     | 0    | 0     | 0    |
| Lane Group Flow (vph)             | 0    | 11    | 0    | 0    | 67                        | 0    | 0    | 10   | 1274  | 0    | 60    | 410  |
| Confl. Peds. (#/hr)               | 15   |       | 19   | 19   |                           | 15   |      | 14   |       | 16   | 16    |      |
| Confl. Bikes (#/hr)               |      |       | 1    |      |                           | 4    |      |      |       | 29   |       |      |
| Heavy Vehicles (%)                | 0%   | 0%    | 0%   | 14%  | 0%                        | 0%   | 2%   | 0%   | 2%    | 2%   | 0%    | 9%   |
| Turn Type                         | Perm | NA    |      | Perm | NA                        |      | Prot | Prot | NA    |      | Prot  | NA   |
| Protected Phases                  |      | 4     |      |      | 8                         |      | 5    | 5    | 2     |      | 1     | 6    |
| Permitted Phases                  | 4    |       |      | 8    |                           |      |      |      |       |      |       |      |
| Actuated Green, G (s)             |      | 21.9  |      |      | 21.9                      |      |      | 1.5  | 73.2  |      | 10.5  | 82.2 |
| Effective Green, g (s)            |      | 22.9  |      |      | 22.9                      |      |      | 2.0  | 74.1  |      | 11.0  | 83.1 |
| Actuated g/C Ratio                |      | 0.19  |      |      | 0.19                      |      |      | 0.02 | 0.62  |      | 0.09  | 0.69 |
| Clearance Time (s)                |      | 5.0   |      |      | 5.0                       |      |      | 4.5  | 4.9   |      | 4.5   | 4.9  |
| Vehicle Extension (s)             |      | 3.0   |      |      | 3.0                       |      |      | 3.0  | 3.0   |      | 3.0   | 3.0  |
| Lane Grp Cap (vph)                |      | 314   |      |      | 290                       |      |      | 29   | 1138  |      | 165   | 1204 |
| v/s Ratio Prot                    |      |       |      |      |                           |      |      | 0.01 | c0.69 |      | c0.03 | 0.24 |
| v/s Ratio Perm                    |      | 0.01  |      |      | c0.04                     |      |      |      |       |      |       |      |
| v/c Ratio                         |      | 0.03  |      |      | 0.23                      |      |      | 0.34 | 1.12  |      | 0.36  | 0.34 |
| Uniform Delay, d1                 |      | 39.5  |      |      | 41.1                      |      |      | 58.4 | 23.0  |      | 51.2  | 7.4  |
| Progression Factor                |      | 1.00  |      |      | 1.00                      |      |      | 0.71 | 1.10  |      | 1.00  | 1.00 |
| Incremental Delay, d2             |      | 0.0   |      |      | 0.4                       |      |      | 2.9  | 59.4  |      | 1.4   | 0.8  |
| Delay (s)                         |      | 39.6  |      |      | 41.5                      |      |      | 44.5 | 84.7  |      | 52.6  | 8.2  |
| Level of Service                  |      | D     |      |      | D                         |      |      | D    | F     |      | D     | A    |
| Approach Delay (s)                |      | 39.6  |      |      | 41.5                      |      |      |      | 84.4  |      |       | 13.9 |
| Approach LOS                      |      | D     |      |      | D                         |      |      |      | F     |      |       | B    |
| <b>Intersection Summary</b>       |      |       |      |      |                           |      |      |      |       |      |       |      |
| HCM 2000 Control Delay            |      | 64.1  |      |      | HCM 2000 Level of Service |      |      | E    |       |      |       |      |
| HCM 2000 Volume to Capacity ratio |      | 0.86  |      |      |                           |      |      |      |       |      |       |      |
| Actuated Cycle Length (s)         |      | 120.0 |      |      | Sum of lost time (s)      |      |      | 12.5 |       |      |       |      |
| Intersection Capacity Utilization |      | 89.3% |      |      | ICU Level of Service      |      |      | E    |       |      |       |      |
| Analysis Period (min)             |      | 15    |      |      |                           |      |      |      |       |      |       |      |
| c Critical Lane Group             |      |       |      |      |                           |      |      |      |       |      |       |      |

| Movement               | SBR  |
|------------------------|------|
| Lane Configurations    |      |
| Traffic Volume (vph)   | 5    |
| Future Volume (vph)    | 5    |
| Ideal Flow (vphpl)     | 1900 |
| Total Lost time (s)    |      |
| Lane Util. Factor      |      |
| Frpb, ped/bikes        |      |
| Flpb, ped/bikes        |      |
| Fr                     |      |
| Flt Protected          |      |
| Satd. Flow (prot)      |      |
| Flt Permitted          |      |
| Satd. Flow (perm)      |      |
| Peak-hour factor, PHF  | 1.00 |
| Adj. Flow (vph)        | 5    |
| RTOR Reduction (vph)   | 0    |
| Lane Group Flow (vph)  | 0    |
| Confl. Peds. (#/hr)    | 14   |
| Confl. Bikes (#/hr)    | 2    |
| 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   |      |

# HCM Signalized Intersection Capacity Analysis

53: Naito & Hooker

06/02/2020



| Movement                          | EBL  | EBT   | EBR  | WBL  | WBT   | WBR  | NBL                       | NBT  | NBR   | SBL   | SBT  | SBR  |
|-----------------------------------|------|-------|------|------|-------|------|---------------------------|------|-------|-------|------|------|
| Lane Configurations               |      |       |      |      |       |      |                           |      |       |       |      |      |
| Traffic Volume (vph)              | 0    | 5     | 0    | 0    | 10    | 15   | 90                        | 1245 | 0     | 0     | 135  | 30   |
| Future Volume (vph)               | 0    | 5     | 0    | 0    | 10    | 15   | 90                        | 1245 | 0     | 0     | 135  | 30   |
| 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  |
| Lane Util. Factor                 |      | 1.00  |      |      |       |      | 1.00                      | 1.00 |       |       |      | 1.00 |
| Frt                               |      | 1.00  |      |      |       |      | 0.92                      | 1.00 | 1.00  |       |      | 0.97 |
| Flt Protected                     |      | 1.00  |      |      |       |      | 1.00                      | 0.95 | 1.00  |       |      | 1.00 |
| Satd. Flow (prot)                 |      | 1863  |      |      |       |      | 1732                      | 1770 | 1900  |       |      | 1841 |
| Flt Permitted                     |      | 1.00  |      |      |       |      | 1.00                      | 0.95 | 1.00  |       |      | 1.00 |
| Satd. Flow (perm)                 |      | 1863  |      |      |       |      | 1732                      | 1770 | 1900  |       |      | 1841 |
| Peak-hour factor, PHF             | 1.00 | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00                      | 1.00 | 1.00  | 1.00  | 1.00 | 1.00 |
| Adj. Flow (vph)                   | 0    | 5     | 0    | 0    | 10    | 15   | 90                        | 1245 | 0     | 0     | 135  | 30   |
| RTOR Reduction (vph)              | 0    | 0     | 0    | 0    | 14    | 0    | 0                         | 0    | 0     | 0     | 5    | 0    |
| Lane Group Flow (vph)             | 0    | 5     | 0    | 0    | 11    | 0    | 90                        | 1245 | 0     | 0     | 160  | 0    |
| Heavy Vehicles (%)                | 2%   | 2%    | 2%   | 0%   | 2%    | 0%   | 2%                        | 0%   | 0%    | 0%    | 0%   | 2%   |
| Turn Type                         |      | NA    |      |      |       |      | NA                        |      | Prot  | NA    |      | Prot |
| Protected Phases                  |      | 4     |      |      |       |      | 8                         |      | 5     | 2     |      | 1    |
| Permitted Phases                  |      | 4     |      |      |       |      | 8                         |      |       |       |      | 6    |
| Actuated Green, G (s)             |      | 5.8   |      |      |       |      | 5.8                       |      | 10.8  | 104.2 |      | 90.4 |
| Effective Green, g (s)            |      | 6.8   |      |      |       |      | 6.8                       |      | 9.8   | 105.2 |      | 91.4 |
| Actuated g/C Ratio                |      | 0.06  |      |      |       |      | 0.06                      |      | 0.08  | 0.88  |      | 0.76 |
| Clearance Time (s)                |      | 5.0   |      |      |       |      | 5.0                       |      | 3.0   | 5.0   |      | 5.0  |
| Vehicle Extension (s)             |      | 3.0   |      |      |       |      | 3.0                       |      | 3.0   | 3.0   |      | 3.0  |
| Lane Grp Cap (vph)                |      | 105   |      |      |       |      | 98                        |      | 144   | 1665  |      | 1402 |
| v/s Ratio Prot                    |      | 0.00  |      |      | c0.01 |      |                           | 0.05 | c0.66 |       |      | 0.09 |
| v/s Ratio Perm                    |      |       |      |      |       |      |                           |      |       |       |      |      |
| v/c Ratio                         |      | 0.05  |      |      |       |      | 0.11                      |      | 0.62  | 0.75  |      | 0.11 |
| Uniform Delay, d1                 |      | 53.5  |      |      |       |      | 53.7                      |      | 53.3  | 2.6   |      | 3.7  |
| Progression Factor                |      | 1.00  |      |      |       |      | 1.00                      |      | 0.89  | 0.66  |      | 1.00 |
| Incremental Delay, d2             |      | 0.2   |      |      |       |      | 0.5                       |      | 5.7   | 2.1   |      | 0.2  |
| Delay (s)                         |      | 53.7  |      |      |       |      | 54.2                      |      | 53.2  | 3.9   |      | 3.9  |
| Level of Service                  |      | D     |      |      |       |      | D                         |      | D     | A     |      | A    |
| Approach Delay (s)                |      | 53.7  |      |      |       |      | 54.2                      |      |       | 7.2   |      | 3.9  |
| Approach LOS                      |      | D     |      |      |       |      | D                         |      |       | A     |      | A    |
| <b>Intersection Summary</b>       |      |       |      |      |       |      |                           |      |       |       |      |      |
| HCM 2000 Control Delay            |      | 7.8   |      |      |       |      | HCM 2000 Level of Service |      |       | A     |      |      |
| HCM 2000 Volume to Capacity ratio |      | 0.74  |      |      |       |      |                           |      |       |       |      |      |
| Actuated Cycle Length (s)         |      | 120.0 |      |      |       |      | Sum of lost time (s)      |      |       | 12.0  |      |      |
| Intersection Capacity Utilization |      | 82.2% |      |      |       |      | ICU Level of Service      |      |       | E     |      |      |
| Analysis Period (min)             |      | 15    |      |      |       |      |                           |      |       |       |      |      |
| c Critical Lane Group             |      |       |      |      |       |      |                           |      |       |       |      |      |

# HCM Signalized Intersection Capacity Analysis

56: SW Kelly St & SW Macadam

06/02/2020



| Movement                          | WBL  | WBR   | NBT   | NBR   | SBL                       | SBT  |
|-----------------------------------|------|-------|-------|-------|---------------------------|------|
| Lane Configurations               | ↑↑   | ↑↑    | ↑↑    | ↑     | ↑                         | ↑↑   |
| Traffic Volume (vph)              | 305  | 1115  | 985   | 970   | 350                       | 1175 |
| Future Volume (vph)               | 305  | 1115  | 985   | 970   | 350                       | 1175 |
| Ideal Flow (vphpl)                | 1900 | 1900  | 1900  | 1900  | 1900                      | 1900 |
| Total Lost time (s)               | 4.0  | 3.0   | 4.0   | 3.0   | 4.0                       | 4.0  |
| Lane Util. Factor                 | 0.97 | *0.68 | 0.95  | 1.00  | 1.00                      | 0.95 |
| Frt                               | 1.00 | 0.85  | 1.00  | 0.85  | 1.00                      | 1.00 |
| Flt Protected                     | 0.95 | 1.00  | 1.00  | 1.00  | 0.95                      | 1.00 |
| Satd. Flow (prot)                 | 3433 | 2153  | 3539  | 1583  | 1770                      | 3539 |
| Flt Permitted                     | 0.95 | 1.00  | 1.00  | 1.00  | 0.95                      | 1.00 |
| Satd. Flow (perm)                 | 3433 | 2153  | 3539  | 1583  | 1770                      | 3539 |
| Peak-hour factor, PHF             | 1.00 | 1.00  | 1.00  | 1.00  | 1.00                      | 1.00 |
| Adj. Flow (vph)                   | 305  | 1115  | 985   | 970   | 350                       | 1175 |
| RTOR Reduction (vph)              | 0    | 0     | 0     | 0     | 0                         | 0    |
| Lane Group Flow (vph)             | 305  | 1115  | 985   | 970   | 350                       | 1175 |
| Turn Type                         | Prot | pt+ov | NA    | pt+ov | Prot                      | NA   |
| Protected Phases                  | 4    | 4 1   | 2     | 2 4   | 1                         | 6    |
| Permitted Phases                  |      |       |       |       |                           |      |
| Actuated Green, G (s)             | 34.0 | 65.9  | 44.1  | 83.1  | 26.9                      | 68.8 |
| Effective Green, g (s)            | 35.0 | 67.9  | 45.1  | 85.1  | 27.9                      | 69.8 |
| Actuated g/C Ratio                | 0.29 | 0.57  | 0.38  | 0.71  | 0.23                      | 0.58 |
| Clearance Time (s)                | 5.0  |       | 5.0   |       | 5.0                       | 5.0  |
| Vehicle Extension (s)             | 3.0  |       | 3.0   |       | 3.0                       | 3.0  |
| Lane Grp Cap (vph)                | 1001 | 1218  | 1330  | 1122  | 411                       | 2058 |
| v/s Ratio Prot                    | 0.09 | c0.52 | 0.28  | c0.61 | 0.20                      | 0.33 |
| v/s Ratio Perm                    |      |       |       |       |                           |      |
| v/c Ratio                         | 0.30 | 0.92  | 0.74  | 0.86  | 0.85                      | 0.57 |
| Uniform Delay, d1                 | 33.0 | 23.5  | 32.4  | 13.1  | 44.1                      | 15.7 |
| Progression Factor                | 1.00 | 1.00  | 1.00  | 1.00  | 1.02                      | 1.46 |
| Incremental Delay, d2             | 0.2  | 10.7  | 3.7   | 7.1   | 13.3                      | 1.0  |
| Delay (s)                         | 33.2 | 34.2  | 36.1  | 20.2  | 58.3                      | 23.9 |
| Level of Service                  | C    | C     | D     | C     | E                         | C    |
| Approach Delay (s)                | 34.0 |       | 28.2  |       | 31.8                      |      |
| Approach LOS                      | C    |       | C     |       | C                         |      |
| Intersection Summary              |      |       |       |       |                           |      |
| HCM 2000 Control Delay            |      |       | 31.0  |       | HCM 2000 Level of Service | C    |
| HCM 2000 Volume to Capacity ratio |      |       | 0.96  |       |                           |      |
| Actuated Cycle Length (s)         |      |       | 120.0 |       | Sum of lost time (s)      | 13.0 |
| Intersection Capacity Utilization |      |       | 86.1% |       | ICU Level of Service      | E    |
| Analysis Period (min)             |      |       | 15    |       |                           |      |

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 60: SW Naito Pkwy & Connection B

06/02/2020



| Movement                          | WBL  | WBR    | NBT    | NBR                       | SBL   | SBT  |
|-----------------------------------|------|--------|--------|---------------------------|-------|------|
| Lane Configurations               |      |        | ↑      | ↑                         |       | ↑↑   |
| Traffic Volume (vph)              | 0    | 0      | 665    | 845                       | 0     | 1160 |
| Future Volume (vph)               | 0    | 0      | 665    | 845                       | 0     | 1160 |
| Ideal Flow (vphpl)                | 1900 | 1900   | 1900   | 1900                      | 1900  | 1900 |
| Total Lost time (s)               |      |        | 3.0    | 4.0                       |       | 4.0  |
| Lane Util. Factor                 |      |        | 1.00   | 1.00                      |       | 0.95 |
| Frt                               |      |        | 1.00   | 0.85                      |       | 1.00 |
| Flt Protected                     |      |        | 1.00   | 1.00                      |       | 1.00 |
| Satd. Flow (prot)                 |      |        | 1863   | 1583                      |       | 3539 |
| Flt Permitted                     |      |        | 1.00   | 1.00                      |       | 1.00 |
| Satd. Flow (perm)                 |      |        | 1863   | 1583                      |       | 3539 |
| Peak-hour factor, PHF             | 1.00 | 1.00   | 1.00   | 1.00                      | 1.00  | 1.00 |
| Adj. Flow (vph)                   | 0    | 0      | 665    | 845                       | 0     | 1160 |
| RTOR Reduction (vph)              | 0    | 0      | 0      | 211                       | 0     | 0    |
| Lane Group Flow (vph)             | 0    | 0      | 665    | 634                       | 0     | 1160 |
| Turn Type                         |      | NA     | custom |                           | NA    |      |
| Protected Phases                  |      | 2      | 1      | 2                         |       | 6    |
| Permitted Phases                  |      |        |        | 4                         |       |      |
| Actuated Green, G (s)             |      | 104.8  | 88.0   |                           | 104.8 |      |
| Effective Green, g (s)            |      | 106.8  | 90.0   |                           | 105.8 |      |
| Actuated g/C Ratio                |      | 0.89   | 0.75   |                           | 0.88  |      |
| Clearance Time (s)                |      |        | 5.0    |                           | 5.0   |      |
| Vehicle Extension (s)             |      |        | 3.0    |                           | 3.0   |      |
| Lane Grp Cap (vph)                |      | 1658   | 1240   |                           | 3120  |      |
| v/s Ratio Prot                    |      | c0.36  | c0.36  |                           | 0.33  |      |
| v/s Ratio Perm                    |      |        | 0.04   |                           |       |      |
| v/c Ratio                         |      | 0.40   | 0.51   |                           | 0.37  |      |
| Uniform Delay, d1                 |      | 1.1    | 6.1    |                           | 1.2   |      |
| Progression Factor                |      | 0.05   | 3.15   |                           | 1.71  |      |
| Incremental Delay, d2             |      | 0.1    | 0.3    |                           | 0.3   |      |
| Delay (s)                         |      | 0.2    | 19.5   |                           | 2.4   |      |
| Level of Service                  |      | A      | B      |                           | A     |      |
| Approach Delay (s)                | 0.0  |        | 11.0   |                           | 2.4   |      |
| Approach LOS                      | A    |        | B      |                           | A     |      |
| Intersection Summary              |      |        |        |                           |       |      |
| HCM 2000 Control Delay            |      | 7.3    |        | HCM 2000 Level of Service |       | A    |
| HCM 2000 Volume to Capacity ratio |      | 0.52   |        |                           |       |      |
| Actuated Cycle Length (s)         |      | 120.0  |        | Sum of lost time (s)      |       | 12.0 |
| Intersection Capacity Utilization |      | 111.6% |        | ICU Level of Service      |       | H    |
| Analysis Period (min)             |      | 15     |        |                           |       |      |

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 61: SW Naito Pkwy & Connection A

06/02/2020



| Movement                          | WBL   | WBR    | NBT   | NBR                       | SBL  | SBT  |
|-----------------------------------|-------|--------|-------|---------------------------|------|------|
| Lane Configurations               | ↑↑    | ↑      | ↑     |                           |      | ↑↑   |
| Traffic Volume (vph)              | 1025  | 735    | 665   | 0                         | 0    | 135  |
| Future Volume (vph)               | 1025  | 735    | 665   | 0                         | 0    | 135  |
| Ideal Flow (vphpl)                | 1900  | 1900   | 1900  | 1900                      | 1900 | 1900 |
| Total Lost time (s)               | 4.0   | 4.0    | 4.0   |                           |      | 4.0  |
| Lane Util. Factor                 | 0.97  | 1.00   | 1.00  |                           |      | 0.95 |
| Frt                               | 1.00  | 0.85   | 1.00  |                           |      | 1.00 |
| Flt Protected                     | 0.95  | 1.00   | 1.00  |                           |      | 1.00 |
| Satd. Flow (prot)                 | 3433  | 1583   | 1863  |                           |      | 3539 |
| Flt Permitted                     | 0.95  | 1.00   | 1.00  |                           |      | 1.00 |
| Satd. Flow (perm)                 | 3433  | 1583   | 1863  |                           |      | 3539 |
| Peak-hour factor, PHF             | 1.00  | 1.00   | 1.00  | 1.00                      | 1.00 | 1.00 |
| Adj. Flow (vph)                   | 1025  | 735    | 665   | 0                         | 0    | 135  |
| RTOR Reduction (vph)              | 0     | 283    | 0     | 0                         | 0    | 0    |
| Lane Group Flow (vph)             | 1025  | 452    | 665   | 0                         | 0    | 135  |
| Turn Type                         | Prot  | Prot   | NA    |                           |      | NA   |
| Protected Phases                  | 8     | 4      | 2     |                           |      | 6    |
| Permitted Phases                  |       |        |       |                           |      |      |
| Actuated Green, G (s)             | 49.5  | 40.1   | 60.5  |                           |      | 60.5 |
| Effective Green, g (s)            | 50.5  | 41.1   | 61.5  |                           |      | 61.5 |
| Actuated g/C Ratio                | 0.42  | 0.34   | 0.51  |                           |      | 0.51 |
| Clearance Time (s)                | 5.0   | 5.0    | 5.0   |                           |      | 5.0  |
| Vehicle Extension (s)             | 3.0   | 3.0    | 3.0   |                           |      | 3.0  |
| Lane Grp Cap (vph)                | 1444  | 542    | 954   |                           |      | 1813 |
| v/s Ratio Prot                    | c0.30 | c0.29  | c0.36 |                           |      | 0.04 |
| v/s Ratio Perm                    |       |        |       |                           |      |      |
| v/c Ratio                         | 0.71  | 0.83   | 0.70  |                           |      | 0.07 |
| Uniform Delay, d1                 | 28.7  | 36.3   | 22.2  |                           |      | 14.8 |
| Progression Factor                | 1.00  | 1.00   | 0.32  |                           |      | 0.74 |
| Incremental Delay, d2             | 1.6   | 10.6   | 4.0   |                           |      | 0.1  |
| Delay (s)                         | 30.3  | 46.9   | 11.1  |                           |      | 11.1 |
| Level of Service                  | C     | D      | B     |                           |      | B    |
| Approach Delay (s)                | 37.2  |        | 11.1  |                           |      | 11.1 |
| Approach LOS                      | D     |        | B     |                           |      | B    |
| Intersection Summary              |       |        |       |                           |      |      |
| HCM 2000 Control Delay            |       | 29.1   |       | HCM 2000 Level of Service |      | C    |
| HCM 2000 Volume to Capacity ratio |       | 0.77   |       |                           |      |      |
| Actuated Cycle Length (s)         |       | 120.0  |       | Sum of lost time (s)      |      | 13.0 |
| Intersection Capacity Utilization |       | 111.6% |       | ICU Level of Service      |      | H    |
| Analysis Period (min)             |       | 15     |       |                           |      |      |

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 62: Connection B & Kelly Ramp

06/02/2020



| Movement                          | EBL   | SEL                       | SER  | SWR  |
|-----------------------------------|-------|---------------------------|------|------|
| Lane Configurations               | ↖ ↗   | ↖ ↗                       |      |      |
| Traffic Volume (vph)              | 845   | 1430                      | 0    | 0    |
| Future Volume (vph)               | 845   | 1430                      | 0    | 0    |
| Ideal Flow (vphpl)                | 1900  | 1900                      | 1900 | 1900 |
| Grade (%)                         | 0%    | 4%                        |      | 0%   |
| Total Lost time (s)               | 4.0   | 4.0                       |      |      |
| Lane Util. Factor                 | 0.97  | 0.97                      |      |      |
| Frt                               | 1.00  | 1.00                      |      |      |
| Flt Protected                     | 1.00  | 0.95                      |      |      |
| Satd. Flow (prot)                 | 3614  | 3364                      |      |      |
| Flt Permitted                     | 1.00  | 0.95                      |      |      |
| Satd. Flow (perm)                 | 3614  | 3364                      |      |      |
| Peak-hour factor, PHF             | 1.00  | 1.00                      | 1.00 | 1.00 |
| Adj. Flow (vph)                   | 845   | 1430                      | 0    | 0    |
| RTOR Reduction (vph)              | 0     | 0                         | 0    | 0    |
| Lane Group Flow (vph)             | 845   | 1430                      | 0    | 0    |
| Turn Type                         | Prot  | Prot                      |      |      |
| Protected Phases                  | 4     | 6                         |      |      |
| Permitted Phases                  |       |                           |      |      |
| Actuated Green, G (s)             | 20.9  | 41.1                      |      |      |
| Effective Green, g (s)            | 20.9  | 41.1                      |      |      |
| Actuated g/C Ratio                | 0.30  | 0.59                      |      |      |
| Clearance Time (s)                | 4.0   | 4.0                       |      |      |
| Vehicle Extension (s)             | 3.0   | 3.0                       |      |      |
| Lane Grp Cap (vph)                | 1079  | 1975                      |      |      |
| v/s Ratio Prot                    | c0.23 | c0.43                     |      |      |
| v/s Ratio Perm                    |       |                           |      |      |
| v/c Ratio                         | 0.78  | 0.72                      |      |      |
| Uniform Delay, d1                 | 22.5  | 10.4                      |      |      |
| Progression Factor                | 1.00  | 1.00                      |      |      |
| Incremental Delay, d2             | 3.8   | 2.3                       |      |      |
| Delay (s)                         | 26.3  | 12.7                      |      |      |
| Level of Service                  | C     | B                         |      |      |
| Approach Delay (s)                | 26.3  | 12.7                      | 0.0  |      |
| Approach LOS                      | C     | B                         | A    |      |
| <b>Intersection Summary</b>       |       |                           |      |      |
| HCM 2000 Control Delay            | 17.8  | HCM 2000 Level of Service | B    |      |
| HCM 2000 Volume to Capacity ratio | 0.74  |                           |      |      |
| Actuated Cycle Length (s)         | 70.0  | Sum of lost time (s)      | 8.0  |      |
| Intersection Capacity Utilization | 71.6% | ICU Level of Service      | C    |      |
| Analysis Period (min)             | 15    |                           |      |      |
| c Critical Lane Group             |       |                           |      |      |

# HCM Signalized Intersection Capacity Analysis

69: SW Naito Pkwy & Gibbs

06/02/2020



| Movement                          | EBL   | EBT  | EBR  | WBL                       | WBT  | WBR  | NBL   | NBT  | NBR  | SBL  | SBT  | SBR  |
|-----------------------------------|-------|------|------|---------------------------|------|------|-------|------|------|------|------|------|
| Lane Configurations               |       |      |      |                           |      |      |       |      |      |      |      |      |
| Traffic Volume (vph)              | 5     | 200  | 5    | 5                         | 190  | 35   | 0     | 1470 | 10   | 0    | 1130 | 35   |
| Future Volume (vph)               | 5     | 200  | 5    | 5                         | 190  | 35   | 0     | 1470 | 10   | 0    | 1130 | 35   |
| Ideal Flow (vphpl)                | 1900  | 1900 | 1900 | 1900                      | 1750 | 1900 | 1900  | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s)               |       |      |      |                           |      |      |       |      |      |      |      | 4.0  |
| Lane Util. Factor                 | 1.00  |      |      |                           | 1.00 |      |       | 0.95 |      |      | 0.95 |      |
| Frpb, ped/bikes                   | 1.00  |      |      |                           | 1.00 |      |       | 1.00 |      |      | 1.00 |      |
| Flpb, ped/bikes                   | 1.00  |      |      |                           | 1.00 |      |       | 1.00 |      |      | 1.00 |      |
| Fr <sub>t</sub>                   | 1.00  |      |      |                           | 0.98 |      |       | 1.00 |      |      | 1.00 |      |
| Flt Protected                     | 1.00  |      |      |                           | 1.00 |      |       | 1.00 |      |      | 1.00 |      |
| Satd. Flow (prot)                 | 1853  |      |      |                           | 1684 |      |       | 3606 |      |      | 3592 |      |
| Flt Permitted                     | 0.99  |      |      |                           | 0.99 |      |       | 1.00 |      |      | 1.00 |      |
| Satd. Flow (perm)                 | 1842  |      |      |                           | 1677 |      |       | 3606 |      |      | 3592 |      |
| Peak-hour factor, PHF             | 1.00  | 1.00 | 1.00 | 1.00                      | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph)                   | 5     | 200  | 5    | 5                         | 190  | 35   | 0     | 1470 | 10   | 0    | 1130 | 35   |
| RTOR Reduction (vph)              | 0     | 1    | 0    | 0                         | 7    | 0    | 0     | 0    | 0    | 0    | 1    | 0    |
| Lane Group Flow (vph)             | 0     | 209  | 0    | 0                         | 223  | 0    | 0     | 1480 | 0    | 0    | 1164 | 0    |
| Confl. Peds. (#/hr)               | 10    |      | 10   |                           |      |      |       |      |      |      |      |      |
| Heavy Vehicles (%)                | 2%    | 2%   | 2%   | 0%                        | 2%   | 0%   | 2%    | 0%   | 2%   | 0%   | 0%   | 2%   |
| Turn Type                         | Perm  | NA   |      | Perm                      | NA   |      |       | NA   |      | NA   |      |      |
| Protected Phases                  |       | 4    |      |                           | 8    |      |       | 2    |      | 6    |      |      |
| Permitted Phases                  | 4     |      |      | 8                         |      |      |       |      |      |      |      |      |
| Actuated Green, G (s)             | 21.2  |      |      | 21.2                      |      |      | 88.8  |      |      | 88.8 |      |      |
| Effective Green, g (s)            | 22.2  |      |      | 22.2                      |      |      | 89.8  |      |      | 89.8 |      |      |
| Actuated g/C Ratio                | 0.18  |      |      | 0.18                      |      |      | 0.75  |      |      | 0.75 |      |      |
| Clearance Time (s)                | 5.0   |      |      | 5.0                       |      |      | 5.0   |      |      | 5.0  |      |      |
| Vehicle Extension (s)             | 3.0   |      |      | 3.0                       |      |      | 3.0   |      |      | 3.0  |      |      |
| Lane Grp Cap (vph)                | 340   |      |      | 310                       |      |      | 2698  |      |      | 2688 |      |      |
| v/s Ratio Prot                    |       |      |      |                           |      |      | c0.41 |      |      | 0.32 |      |      |
| v/s Ratio Perm                    | 0.11  |      |      | c0.13                     |      |      |       |      |      |      |      |      |
| v/c Ratio                         | 0.62  |      |      | 0.72                      |      |      | 0.55  |      |      | 0.43 |      |      |
| Uniform Delay, d1                 | 45.0  |      |      | 46.0                      |      |      | 6.4   |      |      | 5.6  |      |      |
| Progression Factor                | 1.00  |      |      | 1.00                      |      |      | 0.34  |      |      | 0.73 |      |      |
| Incremental Delay, d2             | 3.3   |      |      | 8.0                       |      |      | 0.4   |      |      | 0.5  |      |      |
| Delay (s)                         | 48.3  |      |      | 54.0                      |      |      | 2.6   |      |      | 4.6  |      |      |
| Level of Service                  | D     |      |      | D                         |      |      | A     |      |      | A    |      |      |
| Approach Delay (s)                | 48.3  |      |      | 54.0                      |      |      | 2.6   |      |      | 4.6  |      |      |
| Approach LOS                      | D     |      |      | D                         |      |      | A     |      |      | A    |      |      |
| Intersection Summary              |       |      |      |                           |      |      |       |      |      |      |      |      |
| HCM 2000 Control Delay            | 10.3  |      |      | HCM 2000 Level of Service |      |      | B     |      |      |      |      |      |
| HCM 2000 Volume to Capacity ratio | 0.58  |      |      |                           |      |      |       |      |      |      |      |      |
| Actuated Cycle Length (s)         | 120.0 |      |      | Sum of lost time (s)      |      |      | 8.0   |      |      |      |      |      |
| Intersection Capacity Utilization | 63.4% |      |      | ICU Level of Service      |      |      | B     |      |      |      |      |      |
| Analysis Period (min)             | 15    |      |      |                           |      |      |       |      |      |      |      |      |
| c Critical Lane Group             |       |      |      |                           |      |      |       |      |      |      |      |      |

# HCM Signalized Intersection Capacity Analysis

71: Barbur & Whitaker

06/02/2020



| Movement                          | WBL   | WBR   | NBT  | NBR                       | SBU    | SBL  | SBT  |
|-----------------------------------|-------|-------|------|---------------------------|--------|------|------|
| Lane Configurations               |       |       |      |                           |        |      |      |
| Traffic Volume (vph)              | 60    | 85    | 1190 | 35                        | 5      | 30   | 395  |
| Future Volume (vph)               | 60    | 85    | 1190 | 35                        | 5      | 30   | 395  |
| Ideal Flow (vphpl)                | 1900  | 1900  | 1900 | 1900                      | 1900   | 1900 | 1900 |
| Total Lost time (s)               | 4.0   |       |      |                           | 4.0    |      | 4.0  |
| Lane Util. Factor                 | 1.00  |       |      |                           | 1.00   |      | 1.00 |
| Frpb, ped/bikes                   | 0.99  |       |      |                           | 1.00   |      | 1.00 |
| Flpb, ped/bikes                   | 1.00  |       |      |                           | 1.00   |      | 1.00 |
| Fr <sub>t</sub>                   | 0.92  |       |      |                           | 1.00   |      | 1.00 |
| Flt Protected                     | 0.98  |       |      |                           | 0.95   |      | 1.00 |
| Satd. Flow (prot)                 | 1650  |       |      |                           | 1572   |      | 1743 |
| Flt Permitted                     | 0.98  |       |      |                           | 0.53   |      | 1.00 |
| Satd. Flow (perm)                 | 1650  |       |      |                           | 882    |      | 1743 |
| Peak-hour factor, PHF             | 1.00  | 1.00  | 1.00 | 1.00                      | 1.00   | 1.00 | 1.00 |
| Adj. Flow (vph)                   | 60    | 85    | 1190 | 35                        | 5      | 30   | 395  |
| RTOR Reduction (vph)              | 48    | 0     | 1    | 0                         | 0      | 0    | 0    |
| Lane Group Flow (vph)             | 97    | 0     | 1224 | 0                         | 0      | 35   | 395  |
| Confl. Bikes (#/hr)               |       | 2     |      | 30                        |        |      |      |
| Heavy Vehicles (%)                | 0%    | 4%    | 2%   | 11%                       | 2%     | 17%  | 9%   |
| Turn Type                         | Perm  |       | NA   |                           | custom | Prot | NA   |
| Protected Phases                  |       |       | 2    |                           |        | 1    | 6    |
| Permitted Phases                  | 4     |       |      |                           | 1      |      |      |
| Actuated Green, G (s)             | 17.4  |       | 80.7 |                           |        | 7.0  | 92.2 |
| Effective Green, g (s)            | 17.9  |       | 82.6 |                           |        | 7.5  | 94.1 |
| Actuated g/C Ratio                | 0.15  |       | 0.69 |                           |        | 0.06 | 0.78 |
| Clearance Time (s)                | 4.5   |       | 5.9  |                           |        | 4.5  | 5.9  |
| Vehicle Extension (s)             | 3.0   |       | 2.0  |                           |        | 1.2  | 2.0  |
| Lane Grp Cap (vph)                | 246   |       | 1272 |                           |        | 55   | 1366 |
| v/s Ratio Prot                    |       | c0.66 |      |                           |        |      | 0.23 |
| v/s Ratio Perm                    | c0.06 |       |      |                           | c0.04  |      |      |
| v/c Ratio                         | 0.39  |       | 0.96 |                           |        | 0.64 | 0.29 |
| Uniform Delay, d1                 | 46.1  |       | 17.3 |                           |        | 54.9 | 3.6  |
| Progression Factor                | 1.00  |       | 1.00 |                           |        | 1.18 | 0.38 |
| Incremental Delay, d2             | 1.0   |       | 17.7 |                           |        | 15.8 | 0.5  |
| Delay (s)                         | 47.2  |       | 35.0 |                           |        | 80.9 | 1.9  |
| Level of Service                  | D     |       | C    |                           |        | F    | A    |
| Approach Delay (s)                | 47.2  |       | 35.0 |                           |        |      | 8.3  |
| Approach LOS                      | D     |       | C    |                           |        |      | A    |
| Intersection Summary              |       |       |      |                           |        |      |      |
| HCM 2000 Control Delay            |       | 29.6  |      | HCM 2000 Level of Service |        | C    |      |
| HCM 2000 Volume to Capacity ratio |       | 0.85  |      |                           |        |      |      |
| Actuated Cycle Length (s)         |       | 120.0 |      | Sum of lost time (s)      |        | 12.5 |      |
| Intersection Capacity Utilization |       | 80.0% |      | ICU Level of Service      |        | D    |      |
| Analysis Period (min)             |       | 15    |      |                           |        |      |      |

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

78: Barbur Blvd & SW Naito Pkwy

06/02/2020



| Movement                          | NBT   | NBR    | SBL  | SBT                       | SWL   | SWR  |
|-----------------------------------|-------|--------|------|---------------------------|-------|------|
| Lane Configurations               |       |        |      |                           |       |      |
| Traffic Volume (vph)              | 1215  | 1465   | 0    | 455                       | 1205  | 5    |
| Future Volume (vph)               | 1215  | 1465   | 0    | 455                       | 1205  | 5    |
| Ideal Flow (vphpl)                | 2100  | 1900   | 1900 | 1900                      | 1900  | 1900 |
| Total Lost time (s)               | 5.0   | 5.0    |      | 5.0                       | 5.0   |      |
| Lane Util. Factor                 | *0.78 | 0.88   |      | 0.95                      | 0.97  |      |
| Frbp, ped/bikes                   | 1.00  | 1.00   |      | 1.00                      | 1.00  |      |
| Flpb, ped/bikes                   | 1.00  | 1.00   |      | 1.00                      | 1.00  |      |
| Fr <sub>t</sub>                   | 1.00  | 0.85   |      | 1.00                      | 1.00  |      |
| Flt Protected                     | 1.00  | 1.00   |      | 1.00                      | 0.95  |      |
| Satd. Flow (prot)                 | 3212  | 2787   |      | 3539                      | 3440  |      |
| Flt Permitted                     | 1.00  | 1.00   |      | 1.00                      | 0.95  |      |
| Satd. Flow (perm)                 | 3212  | 2787   |      | 3539                      | 3440  |      |
| Peak-hour factor, PHF             | 1.00  | 1.00   | 1.00 | 1.00                      | 1.00  | 1.00 |
| Adj. Flow (vph)                   | 1215  | 1465   | 0    | 455                       | 1205  | 5    |
| RTOR Reduction (vph)              | 0     | 0      | 0    | 0                         | 0     | 0    |
| Lane Group Flow (vph)             | 1215  | 1465   | 0    | 455                       | 1210  | 0    |
| Confl. Peds. (#/hr)               |       | 5      | 23   |                           | 14    |      |
| Confl. Bikes (#/hr)               |       | 24     |      |                           |       |      |
| Turn Type                         | NA    | custom |      | NA                        | Prot  |      |
| Protected Phases                  | 2     | 6      | 6    | 5                         |       |      |
| Permitted Phases                  |       |        |      |                           |       |      |
| Actuated Green, G (s)             | 64.0  | 76.0   |      | 64.0                      | 46.0  |      |
| Effective Green, g (s)            | 64.0  | 76.0   |      | 64.0                      | 46.0  |      |
| Actuated g/C Ratio                | 0.53  | 0.63   |      | 0.53                      | 0.38  |      |
| Clearance Time (s)                |       |        |      |                           | 5.0   |      |
| Vehicle Extension (s)             |       |        |      |                           | 3.0   |      |
| Lane Grp Cap (vph)                | 1713  | 1765   |      | 1887                      | 1318  |      |
| v/s Ratio Prot                    | c0.38 | c0.53  |      | 0.13                      | c0.35 |      |
| v/s Ratio Perm                    |       |        |      |                           |       |      |
| v/c Ratio                         | 0.71  | 0.83   |      | 0.24                      | 0.92  |      |
| Uniform Delay, d1                 | 21.0  | 17.0   |      | 15.0                      | 35.2  |      |
| Progression Factor                | 1.00  | 1.00   |      | 1.00                      | 0.40  |      |
| Incremental Delay, d2             | 1.4   | 3.5    |      | 0.1                       | 9.7   |      |
| Delay (s)                         | 22.4  | 20.5   |      | 15.1                      | 23.7  |      |
| Level of Service                  | C     | C      |      | B                         | C     |      |
| Approach Delay (s)                | 21.3  |        |      | 15.1                      | 23.7  |      |
| Approach LOS                      | C     |        |      | B                         | C     |      |
| Intersection Summary              |       |        |      |                           |       |      |
| HCM 2000 Control Delay            |       | 21.3   |      | HCM 2000 Level of Service |       | C    |
| HCM 2000 Volume to Capacity ratio |       | 0.87   |      |                           |       |      |
| Actuated Cycle Length (s)         |       | 120.0  |      | Sum of lost time (s)      |       | 15.0 |
| Intersection Capacity Utilization |       | 73.3%  |      | ICU Level of Service      |       | D    |
| Analysis Period (min)             |       | 15     |      |                           |       |      |
| c Critical Lane Group             |       |        |      |                           |       |      |

# HCM Signalized Intersection Capacity Analysis

80: Barbur Blvd & SW Bancroft St

06/02/2020



| Movement               | NBT   | NBR  | SBU  | SBL   | SBT   | NWL  | NWR  |
|------------------------|-------|------|------|-------|-------|------|------|
| Lane Configurations    |       |      |      |       |       |      |      |
| Traffic Volume (vph)   | 2335  | 40   | 80   | 240   | 1200  | 0    | 245  |
| Future Volume (vph)    | 2335  | 40   | 80   | 240   | 1200  | 0    | 245  |
| Ideal Flow (vphpl)     | 2100  | 1900 | 1900 | 1900  | 1900  | 1900 | 1900 |
| Grade (%)              | 0%    |      |      |       | 0%    | 13%  |      |
| Total Lost time (s)    | 4.0   |      |      | 4.0   | 4.0   |      | 4.0  |
| Lane Util. Factor      | 0.95  |      |      | 1.00  | 0.95  |      | 1.00 |
| Frpb, ped/bikes        | 1.00  |      |      | 1.00  | 1.00  |      | 0.99 |
| Flpb, ped/bikes        | 1.00  |      |      | 1.00  | 1.00  |      | 1.00 |
| Fr <sub>t</sub>        | 1.00  |      |      | 1.00  | 1.00  |      | 0.86 |
| Flt Protected          | 1.00  |      |      | 0.95  | 1.00  |      | 1.00 |
| Satd. Flow (prot)      | 3863  |      |      | 1752  | 3574  |      | 1515 |
| Flt Permitted          | 1.00  |      |      | 0.95  | 1.00  |      | 1.00 |
| Satd. Flow (perm)      | 3863  |      |      | 1752  | 3574  |      | 1515 |
| Peak-hour factor, PHF  | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00 | 1.00 |
| Adj. Flow (vph)        | 2335  | 40   | 80   | 240   | 1200  | 0    | 245  |
| RTOR Reduction (vph)   | 1     | 0    | 0    | 0     | 0     | 0    | 9    |
| Lane Group Flow (vph)  | 2374  | 0    | 0    | 320   | 1200  | 0    | 236  |
| Confl. Peds. (#/hr)    |       | 3    |      | 3     |       | 2    |      |
| Confl. Bikes (#/hr)    |       | 24   |      |       |       | 2    |      |
| Heavy Vehicles (%)     | 3%    | 0%   | 0%   | 4%    | 1%    | 0%   | 0%   |
| Turn Type              | NA    |      | Prot | Prot  | NA    |      | Perm |
| Protected Phases       | 2     |      | 1 7  | 1 7   | 6     |      |      |
| Permitted Phases       |       |      |      |       | 1 7   |      |      |
| Actuated Green, G (s)  | 107.5 |      |      | 34.0  | 126.5 |      | 34.0 |
| Effective Green, g (s) | 108.0 |      |      | 34.0  | 127.0 |      | 34.0 |
| Actuated g/C Ratio     | 0.72  |      |      | 0.23  | 0.85  |      | 0.23 |
| Clearance Time (s)     | 4.5   |      |      | 4.5   |       |      |      |
| Vehicle Extension (s)  | 3.0   |      |      | 3.0   |       |      |      |
| Lane Grp Cap (vph)     | 2781  |      |      | 397   | 3025  |      | 343  |
| v/s Ratio Prot         | c0.61 |      |      | c0.18 | 0.34  |      |      |
| v/s Ratio Perm         |       |      |      |       | 0.16  |      |      |
| v/c Ratio              | 0.85  |      |      | 0.81  | 0.40  |      | 0.69 |
| Uniform Delay, d1      | 15.3  |      |      | 54.9  | 2.7   |      | 53.2 |
| Progression Factor     | 0.23  |      |      | 1.00  | 1.00  |      | 1.06 |
| Incremental Delay, d2  | 2.2   |      |      | 11.3  | 0.4   |      | 5.6  |
| Delay (s)              | 5.7   |      |      | 66.2  | 3.0   |      | 61.9 |
| Level of Service       | A     |      |      | E     | A     |      | E    |
| Approach Delay (s)     | 5.7   |      |      |       | 16.3  | 61.9 |      |
| Approach LOS           | A     |      |      |       | B     | E    |      |

## Intersection Summary

|                                   |        |                           |      |
|-----------------------------------|--------|---------------------------|------|
| HCM 2000 Control Delay            | 12.9   | HCM 2000 Level of Service | B    |
| HCM 2000 Volume to Capacity ratio | 0.87   |                           |      |
| Actuated Cycle Length (s)         | 150.0  | Sum of lost time (s)      | 12.0 |
| Intersection Capacity Utilization | 102.5% | ICU Level of Service      | G    |
| Analysis Period (min)             | 15     |                           |      |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
81: SW Corbett Ave/Corbett Ave & SW Bancroft (South)

06/02/2020



| Movement                          | NBL   | NBT   | SBT  | SBR                       | SEL   | SER  |
|-----------------------------------|-------|-------|------|---------------------------|-------|------|
| Lane Configurations               |       | ↑     | ↓    | ↔                         | ↗     | ↖    |
| Traffic Volume (vph)              | 220   | 195   | 135  | 25                        | 0     | 285  |
| Future Volume (vph)               | 220   | 195   | 135  | 25                        | 0     | 285  |
| Ideal Flow (vphpl)                | 1900  | 1900  | 1900 | 1900                      | 1900  | 1900 |
| Total Lost time (s)               |       | 4.0   | 4.0  |                           | 4.0   |      |
| Lane Util. Factor                 |       | 1.00  | 1.00 |                           | 1.00  |      |
| Frt                               |       | 1.00  | 0.98 |                           | 0.86  |      |
| Flt Protected                     |       | 0.97  | 1.00 |                           | 1.00  |      |
| Satd. Flow (prot)                 |       | 1815  | 1823 |                           | 1611  |      |
| Flt Permitted                     |       | 0.63  | 1.00 |                           | 1.00  |      |
| Satd. Flow (perm)                 |       | 1171  | 1823 |                           | 1611  |      |
| Peak-hour factor, PHF             | 1.00  | 1.00  | 1.00 | 1.00                      | 1.00  | 1.00 |
| Adj. Flow (vph)                   | 220   | 195   | 135  | 25                        | 0     | 285  |
| RTOR Reduction (vph)              | 0     | 0     | 12   | 0                         | 0     | 0    |
| Lane Group Flow (vph)             | 0     | 415   | 148  | 0                         | 0     | 285  |
| Turn Type                         | pm+pt | NA    | NA   |                           | pm+ov |      |
| Protected Phases                  | 5     | 2     | 6    |                           | 5     |      |
| Permitted Phases                  | 2     |       |      |                           | 4     |      |
| Actuated Green, G (s)             | 63.8  | 11.4  |      | 51.6                      |       |      |
| Effective Green, g (s)            | 63.8  | 11.4  |      | 51.6                      |       |      |
| Actuated g/C Ratio                | 0.85  | 0.15  |      | 0.69                      |       |      |
| Clearance Time (s)                | 4.0   | 4.0   |      | 4.0                       |       |      |
| Vehicle Extension (s)             | 3.0   | 3.0   |      | 3.0                       |       |      |
| Lane Grp Cap (vph)                | 1411  | 277   |      | 1194                      |       |      |
| v/s Ratio Prot                    | c0.19 | c0.08 |      | c0.15                     |       |      |
| v/s Ratio Perm                    | 0.06  |       |      | 0.02                      |       |      |
| v/c Ratio                         | 0.29  | 0.53  |      | 0.24                      |       |      |
| Uniform Delay, d1                 | 1.1   | 29.4  |      | 4.4                       |       |      |
| Progression Factor                | 1.49  | 1.00  |      | 2.20                      |       |      |
| Incremental Delay, d2             | 0.1   | 2.0   |      | 0.1                       |       |      |
| Delay (s)                         | 1.8   | 31.3  |      | 9.7                       |       |      |
| Level of Service                  | A     | C     |      | A                         |       |      |
| Approach Delay (s)                | 1.8   | 31.3  |      | 9.7                       |       |      |
| Approach LOS                      | A     | C     |      | A                         |       |      |
| Intersection Summary              |       |       |      |                           |       |      |
| HCM 2000 Control Delay            |       | 9.9   |      | HCM 2000 Level of Service | A     |      |
| HCM 2000 Volume to Capacity ratio |       | 0.34  |      |                           |       |      |
| Actuated Cycle Length (s)         |       | 75.0  |      | Sum of lost time (s)      | 12.0  |      |
| Intersection Capacity Utilization |       | 37.7% |      | ICU Level of Service      | A     |      |
| Analysis Period (min)             |       | 15    |      |                           |       |      |

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

82: Barbur Blvd & SW Hamilton St

06/02/2020



| Movement               | EBL   | EBT  | EBR  | WBL   | WBT   | WBR  | NBL  | NBT   | NBR   | SBL  | SBT   | SBR  |
|------------------------|-------|------|------|-------|-------|------|------|-------|-------|------|-------|------|
| Lane Configurations    | 1     | 4    |      | 1     | 4     | 1    |      | 1     | 4     |      | 1     | 4    |
| Traffic Volume (vph)   | 85    | 50   | 15   | 175   | 215   | 125  | 0    | 2165  | 330   | 0    | 1100  | 100  |
| Future Volume (vph)    | 85    | 50   | 15   | 175   | 215   | 125  | 0    | 2165  | 330   | 0    | 1100  | 100  |
| Ideal Flow (vphpl)     | 1900  | 1900 | 1900 | 1900  | 1900  | 1900 | 1900 | 2100  | 1900  | 1900 | 1900  | 1900 |
| Grade (%)              |       |      |      |       |       | 10%  |      |       | 0%    |      |       | 0%   |
| Total Lost time (s)    | 4.0   | 4.0  |      | 5.0   | 6.0   | 6.0  |      | 8.0   | 8.0   |      | 8.0   |      |
| Lane Util. Factor      | 0.95  | 0.95 |      | 0.95  | 1.00  |      |      | 0.95  | 1.00  |      | 0.95  |      |
| Frpb, ped/bikes        | 1.00  | 0.98 |      | 1.00  | 1.00  | 1.00 |      | 1.00  | 0.96  |      | 1.00  |      |
| Flpb, ped/bikes        | 1.00  | 1.00 |      | 1.00  | 1.00  | 1.00 |      | 1.00  | 1.00  |      | 1.00  |      |
| Fr <sub>t</sub>        | 1.00  | 0.97 |      | 1.00  | 1.00  | 0.85 |      | 1.00  | 0.85  |      | 0.99  |      |
| Flt Protected          | 0.95  | 0.99 |      | 0.95  | 1.00  | 1.00 |      | 1.00  | 1.00  |      | 1.00  |      |
| Satd. Flow (prot)      | 1681  | 1697 |      | 1597  | 1715  | 1519 |      | 3703  | 1539  |      | 3422  |      |
| Flt Permitted          | 0.95  | 0.99 |      | 0.95  | 1.00  | 1.00 |      | 1.00  | 1.00  |      | 1.00  |      |
| Satd. Flow (perm)      | 1681  | 1697 |      | 1597  | 1715  | 1519 |      | 3703  | 1539  |      | 3422  |      |
| Peak-hour factor, PHF  | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00 | 1.00  | 1.00 |
| Adj. Flow (vph)        | 85    | 50   | 15   | 175   | 215   | 125  | 0    | 2165  | 330   | 0    | 1100  | 100  |
| RTOR Reduction (vph)   | 0     | 6    | 0    | 0     | 0     | 37   | 0    | 0     | 97    | 0    | 4     | 0    |
| Lane Group Flow (vph)  | 75    | 69   | 0    | 175   | 215   | 88   | 0    | 2165  | 233   | 0    | 1196  | 0    |
| Confl. Peds. (#/hr)    |       |      | 27   | 27    |       |      | 11   |       |       |      | 11    |      |
| Confl. Bikes (#/hr)    |       |      |      |       |       |      |      |       | 33    |      |       |      |
| Heavy Vehicles (%)     | 2%    | 0%   | 0%   | 2%    | 0%    | 1%   | 0%   | 3%    | 1%    | 3%   | 4%    | 1%   |
| Bus Blockages (#/hr)   | 0     | 0    | 0    | 0     | 0     | 0    | 0    | 22    | 0     | 0    | 0     | 0    |
| Turn Type              | Split | NA   |      | Split | NA    | Perm |      | NA    | Perm  |      | NA    |      |
| Protected Phases       | 3!    | 3!   |      | 3 4!  | 3 4!  |      |      | 6     |       |      | 2     |      |
| Permitted Phases       |       |      |      |       |       | 3 4  |      |       | 6     |      |       |      |
| Actuated Green, G (s)  | 11.2  | 11.2 |      | 31.1  | 31.1  | 31.1 |      | 104.9 | 104.9 |      | 104.9 |      |
| Effective Green, g (s) | 12.2  | 12.2 |      | 27.1  | 25.1  | 25.1 |      | 105.9 | 105.9 |      | 105.9 |      |
| Actuated g/C Ratio     | 0.08  | 0.08 |      | 0.18  | 0.17  | 0.17 |      | 0.71  | 0.71  |      | 0.71  |      |
| Clearance Time (s)     | 5.0   | 5.0  |      |       |       |      |      | 9.0   | 9.0   |      | 9.0   |      |
| Vehicle Extension (s)  | 0.5   | 0.5  |      |       |       |      |      | 3.0   | 3.0   |      | 3.0   |      |
| Lane Grp Cap (vph)     | 136   | 138  |      | 288   | 286   | 254  |      | 2614  | 1086  |      | 2415  |      |
| v/s Ratio Prot         | 0.04  | 0.04 |      | 0.11  | c0.13 |      |      | c0.58 |       |      | 0.35  |      |
| v/s Ratio Perm         |       |      |      |       |       | 0.06 |      |       | 0.15  |      |       |      |
| v/c Ratio              | 0.55  | 0.50 |      | 0.61  | 0.75  | 0.35 |      | 0.83  | 0.21  |      | 0.50  |      |
| Uniform Delay, d1      | 66.3  | 66.0 |      | 56.6  | 59.5  | 55.2 |      | 15.6  | 7.6   |      | 10.0  |      |
| Progression Factor     | 1.00  | 1.00 |      | 1.21  | 1.19  | 1.36 |      | 1.17  | 4.61  |      | 0.74  |      |
| Incremental Delay, d2  | 2.7   | 1.0  |      | 2.0   | 7.6   | 0.2  |      | 1.5   | 0.2   |      | 0.7   |      |
| Delay (s)              | 69.0  | 67.0 |      | 70.3  | 78.4  | 75.5 |      | 19.7  | 35.4  |      | 8.1   |      |
| Level of Service       | E     | E    |      | E     | E     | E    |      | B     | D     |      | A     |      |
| Approach Delay (s)     |       | 68.0 |      |       | 74.9  |      |      | 21.8  |       |      | 8.1   |      |
| Approach LOS           |       | E    |      |       | E     |      |      | C     |       |      | A     |      |

## Intersection Summary

|                                   |       |                           |      |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay            | 25.9  | HCM 2000 Level of Service | C    |
| HCM 2000 Volume to Capacity ratio | 0.81  |                           |      |
| Actuated Cycle Length (s)         | 150.0 | Sum of lost time (s)      | 19.0 |
| Intersection Capacity Utilization | 84.8% | ICU Level of Service      | E    |
| Analysis Period (min)             | 15    |                           |      |

! Phase conflict between lane groups.

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

83: SW Corbett Ave & SW Hamilton St

06/02/2020



| Movement                          | EBL   | EBT   | EBR  | WBL  | WBT                       | WBR   | NBL  | NBT  | NBR  | SBL   | SBT  | SBR  |
|-----------------------------------|-------|-------|------|------|---------------------------|-------|------|------|------|-------|------|------|
| Lane Configurations               |       |       |      |      |                           |       |      |      |      |       |      |      |
| Traffic Volume (vph)              | 105   | 60    | 215  | 15   | 70                        | 5     | 360  | 280  | 20   | 5     | 295  | 85   |
| Future Volume (vph)               | 105   | 60    | 215  | 15   | 70                        | 5     | 360  | 280  | 20   | 5     | 295  | 85   |
| Ideal Flow (vphpl)                | 1900  | 1900  | 1900 | 1900 | 1900                      | 1900  | 1900 | 1900 | 1900 | 1900  | 1900 | 1900 |
| Grade (%)                         |       | 10%   |      |      | 0%                        |       |      | 0%   |      |       | 0%   |      |
| Total Lost time (s)               |       | 4.0   | 4.0  |      | 4.0                       |       | 4.0  | 4.0  |      |       | 4.0  | 3.5  |
| Lane Util. Factor                 |       | 1.00  | 1.00 |      | 1.00                      |       | 1.00 | 1.00 |      |       | 1.00 | 1.00 |
| Frpb, ped/bikes                   |       | 1.00  | 1.00 |      | 1.00                      |       | 1.00 | 1.00 |      |       | 1.00 | 0.92 |
| Flpb, ped/bikes                   |       | 1.00  | 1.00 |      | 0.99                      |       | 1.00 | 1.00 |      |       | 1.00 | 1.00 |
| Fr <sub>t</sub>                   |       | 1.00  | 0.85 |      | 0.99                      |       | 1.00 | 1.00 |      |       | 1.00 | 0.85 |
| Flt Protected                     |       | 0.97  | 1.00 |      | 0.99                      |       | 0.95 | 1.00 |      |       | 1.00 | 1.00 |
| Satd. Flow (prot)                 |       | 1386  | 1217 |      | 1465                      |       | 1420 | 1489 |      |       | 1424 | 1180 |
| Flt Permitted                     |       | 0.77  | 1.00 |      | 0.95                      |       | 0.95 | 1.00 |      |       | 0.99 | 1.00 |
| Satd. Flow (perm)                 |       | 1105  | 1217 |      | 1407                      |       | 1420 | 1489 |      |       | 1417 | 1180 |
| Peak-hour factor, PHF             | 1.00  | 1.00  | 1.00 | 1.00 | 1.00                      | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 |
| Adj. Flow (vph)                   | 105   | 60    | 215  | 15   | 70                        | 5     | 360  | 280  | 20   | 5     | 295  | 85   |
| RTOR Reduction (vph)              | 0     | 0     | 153  | 0    | 3                         | 0     | 0    | 4    | 0    | 0     | 0    | 64   |
| Lane Group Flow (vph)             | 0     | 165   | 62   | 0    | 87                        | 0     | 360  | 296  | 0    | 0     | 300  | 21   |
| Confl. Peds. (#/hr)               | 3     |       | 15   | 15   |                           | 3     | 23   |      | 17   | 17    |      | 23   |
| Confl. Bikes (#/hr)               |       |       | 2    |      |                           |       |      | 1    |      |       |      |      |
| Heavy Vehicles (%)                | 1%    | 0%    | 1%   | 0%   | 2%                        | 0%    | 1%   | 1%   | 0%   | 0%    | 6%   | 0%   |
| Bus Blockages (#/hr)              | 0     | 0     | 0    | 0    | 0                         | 0     | 2    | 2    | 2    | 2     | 2    | 2    |
| Parking (#/hr)                    | 2     | 2     | 2    | 2    | 2                         | 2     | 2    | 2    | 2    | 2     | 2    | 2    |
| Turn Type                         | Perm  | NA    | Over | Perm | NA                        |       | Prot | NA   |      | Perm  | NA   | Perm |
| Protected Phases                  |       | 4     | 5    |      | 8                         |       | 5    | 2    |      |       | 6    |      |
| Permitted Phases                  | 4     |       |      | 8    |                           |       |      |      |      | 6     |      | 6    |
| Actuated Green, G (s)             | 23.4  | 22.2  |      | 23.4 |                           | 22.2  | 44.6 |      |      |       | 18.9 | 18.9 |
| Effective Green, g (s)            | 22.9  | 21.7  |      | 22.9 |                           | 21.7  | 44.1 |      |      |       | 18.4 | 18.9 |
| Actuated g/C Ratio                | 0.31  | 0.29  |      | 0.31 |                           | 0.29  | 0.59 |      |      |       | 0.25 | 0.25 |
| Clearance Time (s)                | 3.5   | 3.5   |      | 3.5  |                           | 3.5   | 3.5  | 3.5  |      |       | 3.5  | 3.5  |
| Vehicle Extension (s)             | 3.0   | 3.0   |      | 3.0  |                           | 3.0   | 3.0  | 3.0  |      |       | 3.0  | 3.0  |
| Lane Grp Cap (vph)                | 337   | 352   |      | 429  |                           | 410   | 875  |      |      | 347   | 297  |      |
| v/s Ratio Prot                    |       | 0.05  |      |      |                           | c0.25 | 0.20 |      |      |       |      |      |
| v/s Ratio Perm                    |       | c0.15 |      | 0.06 |                           |       |      |      |      | c0.21 | 0.02 |      |
| v/c Ratio                         | 0.49  | 0.18  |      | 0.20 |                           | 0.88  | 0.34 |      |      | 0.86  | 0.07 |      |
| Uniform Delay, d1                 | 21.3  | 20.0  |      | 19.3 |                           | 25.4  | 7.9  |      |      | 27.1  | 21.4 |      |
| Progression Factor                | 1.32  | 1.42  |      | 1.00 |                           | 1.00  | 1.00 |      |      | 1.28  | 2.01 |      |
| Incremental Delay, d2             | 4.9   | 0.2   |      | 0.2  |                           | 18.7  | 0.2  |      |      | 19.2  | 0.1  |      |
| Delay (s)                         | 32.9  | 28.6  |      | 19.5 |                           | 44.1  | 8.2  |      |      | 53.9  | 43.0 |      |
| Level of Service                  | C     | C     |      | B    |                           | D     | A    |      |      | D     | D    |      |
| Approach Delay (s)                | 30.5  |       |      | 19.5 |                           |       | 27.8 |      |      | 51.5  |      |      |
| Approach LOS                      | C     |       |      | B    |                           |       | C    |      |      | D     |      |      |
| Intersection Summary              |       |       |      |      |                           |       |      |      |      |       |      |      |
| HCM 2000 Control Delay            | 34.0  |       |      |      | HCM 2000 Level of Service |       | C    |      |      |       |      |      |
| HCM 2000 Volume to Capacity ratio | 0.73  |       |      |      |                           |       |      |      |      |       |      |      |
| Actuated Cycle Length (s)         | 75.0  |       |      |      | Sum of lost time (s)      |       | 12.0 |      |      |       |      |      |
| Intersection Capacity Utilization | 66.4% |       |      |      | ICU Level of Service      |       | C    |      |      |       |      |      |
| Analysis Period (min)             | 15    |       |      |      |                           |       |      |      |      |       |      |      |

c Critical Lane Group

