

# Multnomah County Courthouse Relocation

Portland, Oregon

## Transportation Alternatives Analysis Technical Memorandum: **FINAL**

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**Prepared for**

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## 1. PURPOSE AND STUDY AREA

Multnomah County is working to identify a location for a new county central courthouse. The existing courthouse is located in downtown Portland at 1021 Southwest 4<sup>th</sup> Avenue. As part of the selection process to identify a preferred location for the new courthouse, Multnomah County has identified two potential locations in downtown Portland:

- **Hawthorne Bridgehead Site:** located at the west end of the Hawthorne bridge on the block between SW 1<sup>st</sup> Avenue and SW Naito Parkway , and SW Madison and SW Jefferson Streets
- **Block 128 Site:** located on the block between SW 1<sup>st</sup> and SW 2<sup>nd</sup> Avenues, and SW Columbia and SW Clay Streets

This memorandum will discuss the traffic analysis completed to evaluate the transportation impacts associated with each site. The analysis included a PM peak hour operations analysis, building access driveway evaluation and determination of implications to pedestrian, transit, and bicycle operations and safety.

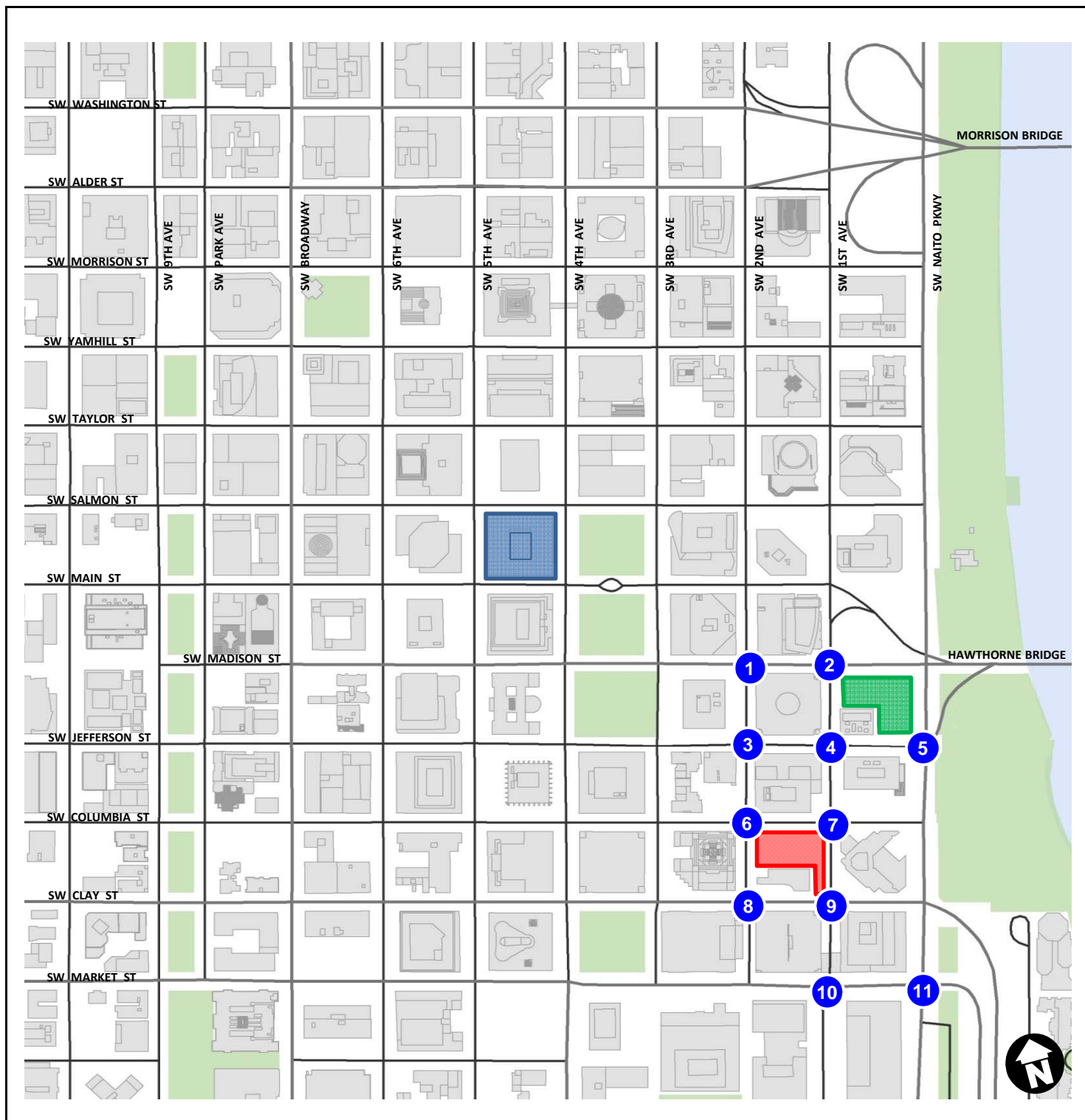
In order to capture the impacts of each site, 11 intersections were selected within the area of SW Market Street on the south, SW Madison Street on the north, SW 2<sup>nd</sup> Avenue on the west, and SW Naito Parkway on the east. The 11 study area intersections are:

- |   |  |
|---|--|
| 1. SW Madison Street at SW 2 <sup>nd</sup> Avenue   | 6. SW Columbia Street at SW 2 <sup>nd</sup> Avenue |
| 2. SW Madison Street at SW 1 <sup>st</sup> Avenue   | 7. SW Columbia Street at SW 1 <sup>st</sup> Avenue |
| 3. SW Jefferson Street at SW 2 <sup>nd</sup> Avenue | 8. SW Clay Street at SW 2 <sup>nd</sup> Avenue     |
| 4. SW Jefferson Street at SW 1 <sup>st</sup> Avenue | 9. SW Clay Street at SW 1 <sup>st</sup> Avenue     |
| 5. SW Jefferson Street at SW Naito Parkway          | 10. SW Market Street at SW 1 <sup>st</sup> Avenue  |
|   | 11. SW Market Street at SW Naito Parkway           |

**Figure 1** shows the study area and the 11 study area intersections located in downtown Portland.

## 2. FINDINGS

The results of the transportation analysis indicate that neither the Hawthorne Bridgehead nor Block 128 sites have fatal flaws with respect to transportation. There are unique transportation challenges for each site; however, there are no significant transportation concerns at either location. The overall traffic operations, bicycle, pedestrian, transit, and parking considerations for each site are comparable and do not preclude either site from consideration.



## MULTNOMAH COUNTY COURTHOUSE TRAFFIC STUDY

### Legend

- # Intersection Number
- Hawthorne Bridgehead Site
- Block 128 Site
- Existing Courthouse

*Note: Shape depicts block location only and does not represent the footprint of the proposed courthouse*

**Figure 1**  
Study Area

### 3. ANALYSIS ALTERNATIVES

Multnomah County has identified two potential locations in downtown Portland where the new county central courthouse could be sited. Each location is described in further detail below.

#### Hawthorne Bridgehead

The Hawthorne Bridgehead site is enclosed by SW Madison Street on the north, SW Jefferson Street on the south, SW 1<sup>st</sup> Avenue on the west, and SW Naito Parkway on the east. The site is accessible by all means of transportation including pedestrian, bicycle, auto, bus, and MAX. Traffic circulation around this site would be unchanged from what it is today. This site would have access to an existing garage near the site for public parking and possible secure judge parking. The new courthouse will provide a Sally Port for secure prisoner transfers, with vehicles entering from southbound SW Naito Parkway and exiting onto SW Jefferson Street.

#### Block 128

The Block 128 site is enclosed by SW Columbia Street on the north, SW Clay Street on the south, SW 2<sup>nd</sup> Avenue on the west, and SW 1<sup>st</sup> Avenue on the east. The site is accessible by all means of transportation including pedestrian, bicycle, auto, bus, and MAX. Traffic circulation around this site would be unchanged from what it is today. This site would have access to an existing garage near the site for public parking. The new courthouse will provide a Sally Port for secure prisoner transfers, with vehicles entering from southbound SW 2<sup>nd</sup> Avenue and exiting onto SW Columbia Street.

### 4. TRANSPORTATION ANALYSIS OVERVIEW

This section provides the methodology and overview of the transportation analysis. The transportation analysis provides a discussion of existing traffic volumes, the opening year traffic estimates, assumptions for the projected opening year volumes, and a summary of traffic operations. The traffic operations analysis for each of the traffic alignments discussed above was performed on an assumed opening year of 2020.

#### Existing Traffic Volumes

The existing traffic count data included number of vehicles, vehicle classifications, and bicycle and pedestrian volumes. Traffic volume data collected for this project consisted of PM peak hour intersection turn movement counts collected on Thursday, February 26, 2015 from 4:00 to 6:00 PM.

The turning movement counts were examined to determine the common weekday PM peak hours among the intersections based on the hour with the highest total volume of vehicles on the network. The common peak hour for the intersections was determined to be 4:45 to 5:45 PM. While the peak hour at each intersection may or may not correspond with the common peak hour, all individual peak hours overlap with at least a portion of the common

peak hour. **Figure 2** shows the PM peak hour volumes collected. Detailed traffic count data can be seen in **Appendix A**.

## Mode Split

A Central Courthouse Community Survey was conducted by Multnomah County between August 27, 2014 and November 17, 2014. The survey focused on a variety of topics including how users travel to the existing courthouse. The survey found that approximately 38% of all responders travel to the courthouse by motor vehicle (drive or carpool). Twenty-one percent of all responders use transit, four percent bicycle, and 37% walk to the courthouse. Mode split for the new courthouse is not expected to change significantly as a result of relocating the courthouse to either of the proposed sites.

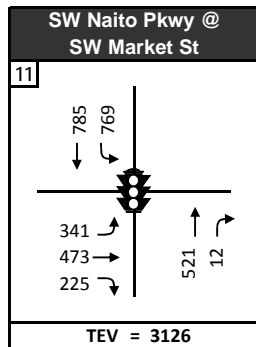
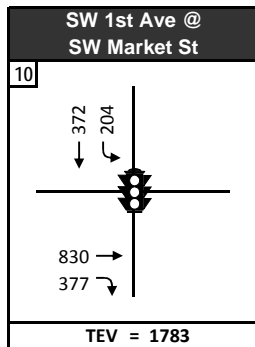
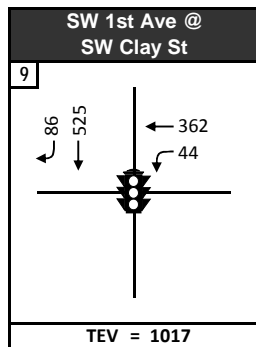
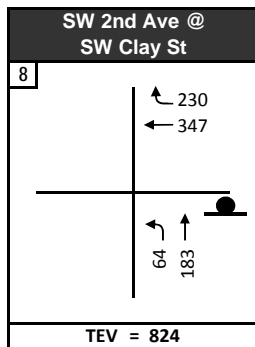
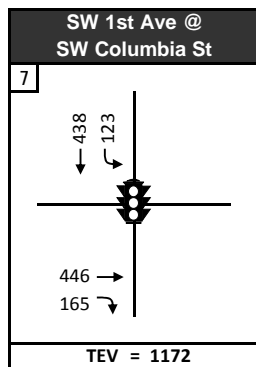
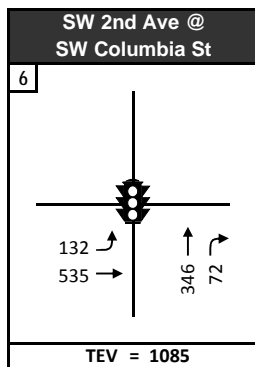
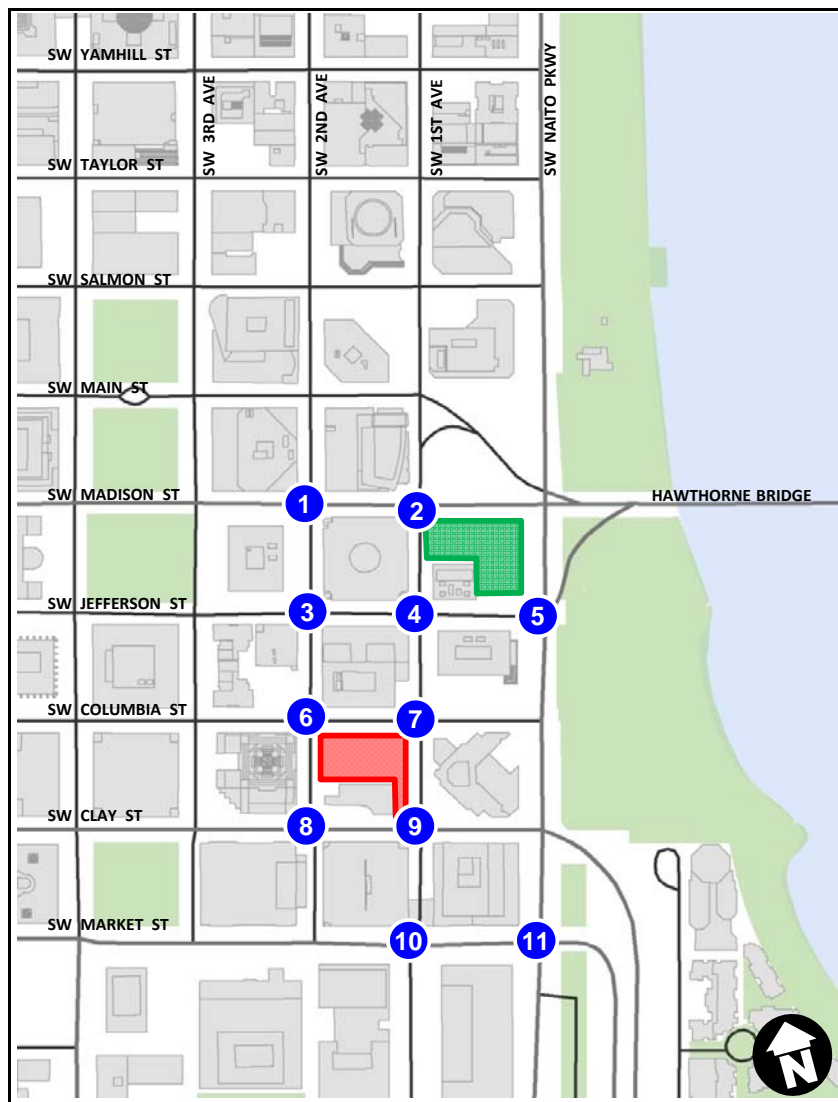
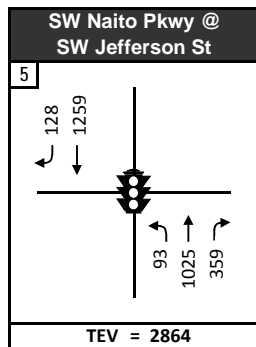
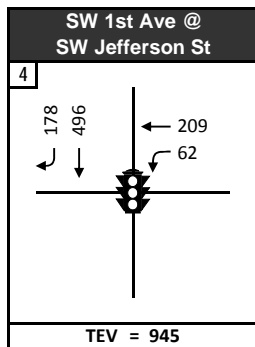
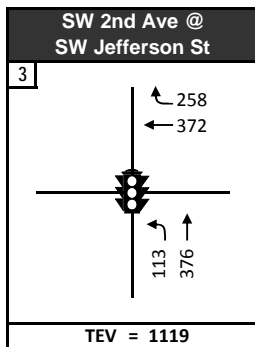
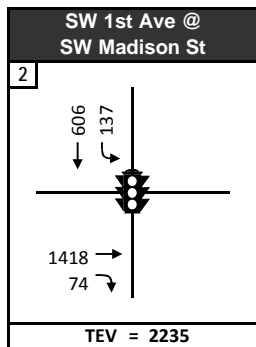
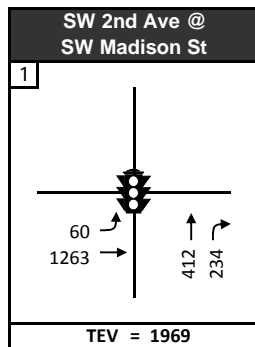
## Opening Year Traffic Volumes

Opening year for the new courthouse was assumed to be 2020. To estimate 2020 traffic volumes, PM peak hour turn movements were projected using a linear growth rate of one percent. **Figure 3** shows the PM peak hour volumes for the opening year of 2020. Calculations used to grow existing 2015 volumes to opening year 2020 volumes can be found in **Appendix B**.

For developing opening year (2020) volumes it was assumed that the relocated courthouse will add no net new vehicular trips to the overall downtown network, eliminating the need for a baseline versus build scenario analysis. The new courthouse is expected to feature similar numbers of employees and courtrooms; however, the new courthouse will not have four (4) high volume courtrooms (parking citations, other violations (primarily traffic citations), Small Claims, and Landlord-Tenant (FED) cases which are major trip generator for the current courthouse. The comparable numbers of employees and courts suggest that the current trips generated by the existing courthouse will simply be diverted to the new location a few blocks southeast of the current site and are not new trips to the downtown network. Furthermore, the lack of high volume courts in the new courthouse indicates that trips generated by the existing traffic courts will not be diverted to the new site at all. The total trips traveling to the new courthouse are not anticipated to exceed the number of existing trips.

For the majority of courthouse employees and visitors traveling to the courthouse from the west side, routes to the two proposed courthouse locations will be mostly unchanged. For employees and visitors traveling from the east side, slight shifts in trips across the Willamette River bridges may be experienced due to the relocation of the courthouse a few blocks to the south. It is assumed general PM peak hour travel patterns to the new sites will reflect typical downtown travel patterns and result in no change in traffic volumes. Travel patterns to the two proposed sites are likely to be very similar due to their close proximity to each other and the existing site. To quantify any potential shifts in traffic patterns and volumes that may occur at either of the proposed sites would require a detailed trip generation study of the existing courthouse.





## MULTNOMAH COUNTY COURTHOUSE TRAFFIC STUDY

### Legend

↪ Turning Movement  
### PM Peak Hour Volume

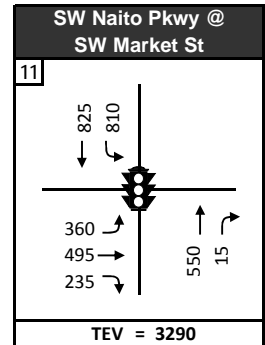
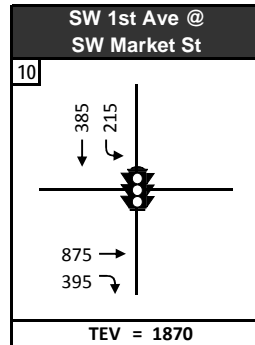
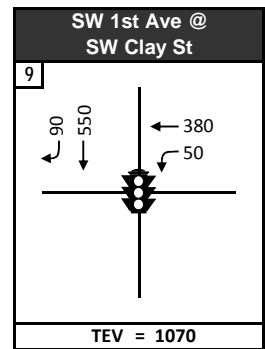
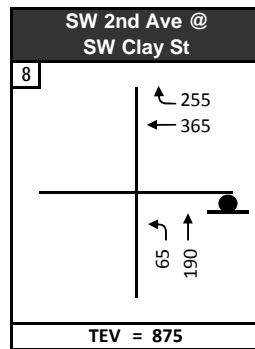
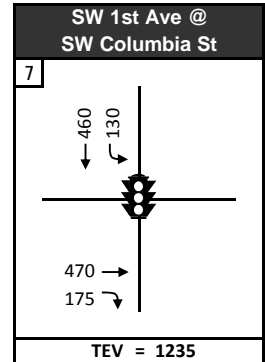
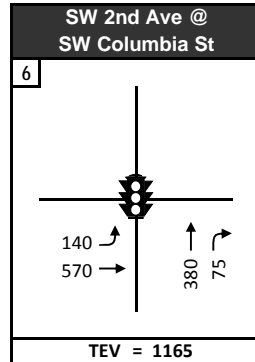
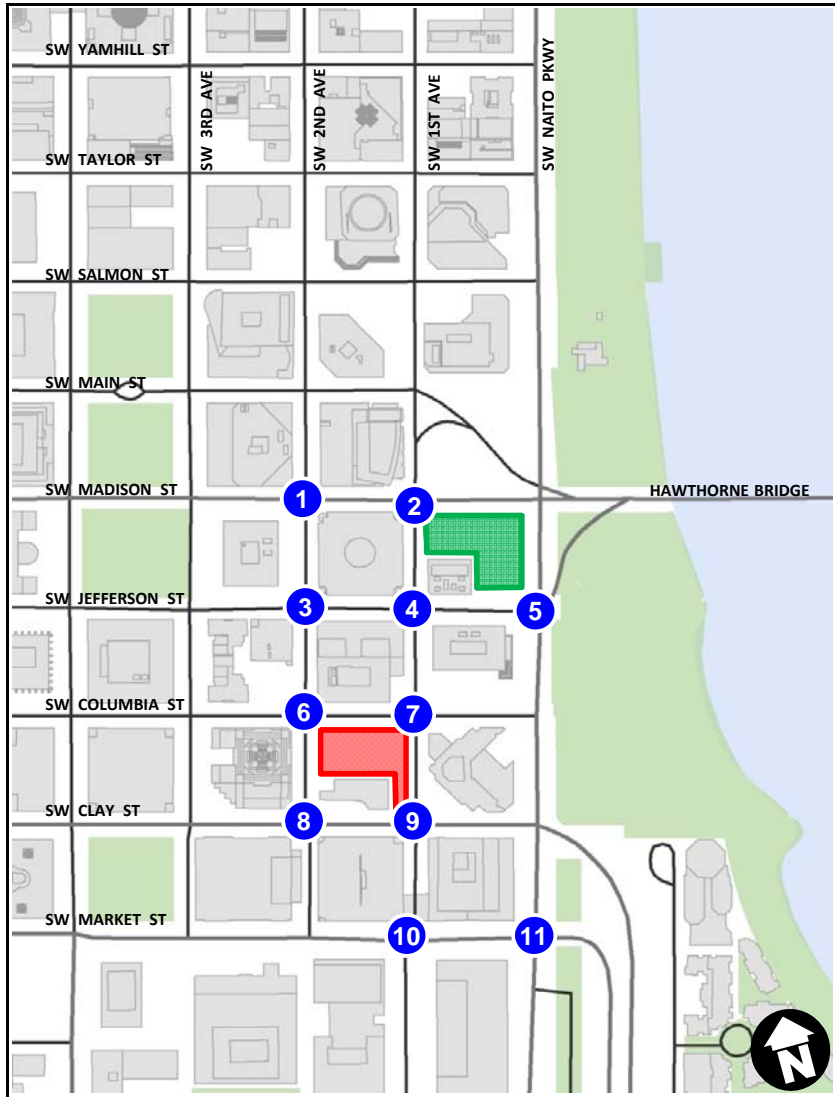
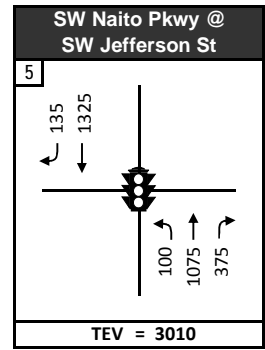
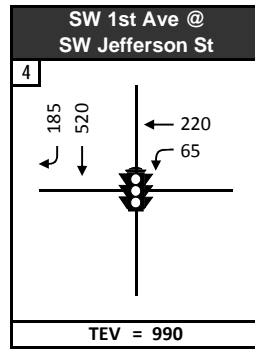
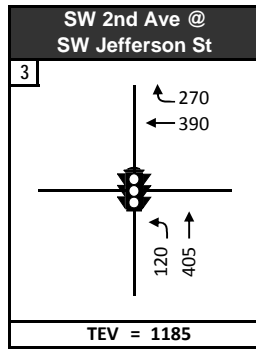
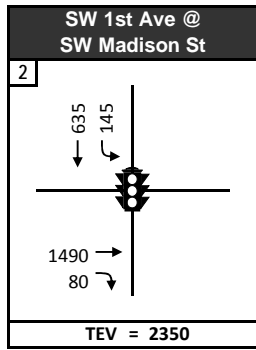
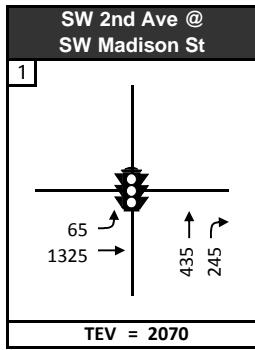
TEV: Total Entering Volume

● STOP Control  
🚦 Signalized Intersection  
# Intersection Number

■ Hawthorne Bridgehead Site  
■ Block 128 Site

Note: Shape depicts block location only and does not represent the footprint of the proposed courthouse

**Figure 2**  
Existing (2015) Conditions  
PM Peak Hour Traffic Counts



## MULTNOMAH COUNTY COURTHOUSE TRAFFIC STUDY

### Legend

- Turning Movement
- #### PM Peak Hour Volume
- TEV: Total Entering Volume
- STOP Control
- Signalized Intersection
- Intersection Number
- Hawthorne Bridgehead Site
- Block 128 Site

Note: Shape depicts block location only and does not represent the footprint of the proposed courthouse

### Figure 3

Opening Year (2020) Conditions  
PM Peak Hour Volumes

## Traffic Operations Overview

### *Operational Criteria*

Transportation engineers have established various methods for measuring traffic operations of roadways and intersections. Most jurisdictions use either volume-to-capacity (v/c) ratio or level of service (LOS) to establish performance criteria. Both the LOS and v/c ratio concepts require consideration of factors that include traffic demand, capacity of the intersection or roadway, delay, frequency of interruptions in traffic flow, relative freedom for traffic maneuvers, driving comfort, convenience, and operating cost.

### *Volume-to-Capacity (v/c) Ratio*

A comparison of traffic volume demand to intersection capacity is one method of evaluating how well an intersection is operating. This comparison is presented as a v/c ratio. A v/c ratio of less than 1.00 indicates that the volume is less than capacity. When the v/c ratio is closer to zero, traffic conditions are generally good, with little congestion and low delays for most intersection movements. As the v/c ratio approaches 1.00, traffic becomes more congested and unstable, with longer delays.

### *Level of Service (LOS)*

LOS is also a widely recognized and accepted measure and descriptor of traffic operations. At both STOP-controlled and signalized intersections, LOS is a function of control delay, which includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. Six standards have been established, ranging from LOS A, where there is little or no delay, to LOS F, where there is delay of more than 50 seconds at unsignalized intersections, or more than 80 seconds at signalized intersections. Table 1 illustrates the level of service criteria for signalized and unsignalized intersections according to the Highway Capacity Manual.

**Table 1: Level of Service Criteria**

Level of Service	Average Control Delay (sec/veh)	
	<i>Signalized Intersections</i>	<i>Unsignalized Intersections</i>
<b>A</b>	≤10	0 – 10
<b>B</b>	>10 - 20	>10 – 15
<b>C</b>	>20 - 35	>15 – 25
<b>D</b>	>35 - 55	>25 – 35
<b>E</b>	>55 - 80	>35 – 50
<b>F</b>	>80	>50
<i>Source: 2000 Highway Capacity Manual</i>		

It should be noted that, although delays can sometimes be long for some movements at a STOP-controlled intersection, the v/c ratio may indicate that there is adequate capacity to process the demand for that movement. Similarly, at signalized intersections, some

movements, particularly side street approaches or left turns onto side streets, may experience longer delays because they receive only a small portion of the green time during a signal cycle, but their v/c ratio may be relatively low. For these reasons, it is important to examine both v/c ratio and LOS when evaluating overall intersection operations. Both are reported in the following section.

### ***Operational Guidelines***

The City of Portland uses a performance guideline based on LOS. The Portland Bureau of Transportation (PBOT) Transportation System Plan (TSP) states that signalized intersections must meet LOS D. Unsignalized intersections are required to operate at LOS E. In addition, the City of Portland has a practice not to reduce the portal capacity into downtown. This means that additional queuing or increased delay that would reduce the number of vehicles entering into downtown would be unacceptable.

### ***Traffic Operations Analysis Procedures***

All operations were evaluated using the methodology outlined in the *2000 Highway Capacity Manual* (HCM). The Synchro/SimTraffic analysis software was selected for performing the intersection analysis, since it can provide the v/c ratio and LOS output of an HCM analysis as well as consider the systematic interaction of the intersections with regard to queuing and delays.

Synchro is a macroscopic model similar to the Highway Capacity Software (HCS), and like the HCS, is based on the 2000 HCM. The Synchro model explicitly evaluates traffic operations under coordinated and uncoordinated systems of signalized and unsignalized intersections. The v/c ratios and LOS presented in this report are based on the Synchro model output.

### **Signal Timing**

The downtown signal system is currently operating with a 60-second cycle length during the PM peak hour. All signals along SW 1<sup>st</sup> Avenue and SW 2<sup>nd</sup> Avenue are two-phase signals. The signals at the intersection of Jefferson Street at Naito Parkway and Market Street and Naito Parkway are actuated coordinated signals with a 90-second cycle lengths. It was assumed that the cycle lengths and splits would remain unchanged for the traffic operations analysis.

## **5. OPENING YEAR 2020 TRAFFIC OPERATIONS**

Opening year 2020 traffic operations were evaluated for both of the potential sites based on background growth of the existing peak hour volumes. The following section describes the expected traffic operations on the network surrounding the two sites.

### **2020 Hawthorne Bridgehead Site Operations**

Traffic operations near the Hawthorne Bridgehead site are represented by study area intersections one through five between SW 1<sup>st</sup> and SW 2<sup>nd</sup> Avenues and SW Madison Street, SW Jefferson Street, and SW Naito Parkway. All five study area intersections around this site are

expected to meet operational standards with an overall intersection LOS of D or better. Operations at the intersections on the corners of the Bridgehead site all operate at a LOS B, with the intersection of SW 2<sup>nd</sup> Avenue and SW Madison Street operating at LOS C. Although within overall intersection standards, the northbound left from Naito Parkway to Jefferson Street is projected to be overcapacity in the year 2020 PM peak hour. Traffic operations are shown on **Figure 4** and can be found in **Appendix C**.

## 2020 Block 128 Site Operations

Operations of the Block 128 site are represented by the performance of study area intersections six through 11 between SW 1<sup>st</sup> and SW 2<sup>nd</sup> Avenues, SW Naito Parkway, and SW Clay and SW Market Streets. Similar to the Hawthorne Bridgehead site, all of the intersections surrounding the Block 128 site meet operational standards with an overall intersection LOS D or better. Of the intersections directly adjacent to the site, the overall operations for signalized intersections are LOS B or better. The unsignalized intersection of SW 2<sup>nd</sup> Avenue and SW Clay Street has a STOP controlled through movement on SW 2<sup>nd</sup> Avenue that experiences LOS D; however, the movement v/c ratio (0.58) indicates that the approach has adequate capacity. Traffic operations are shown on **Figure 4** and can be found in **Appendix C**.

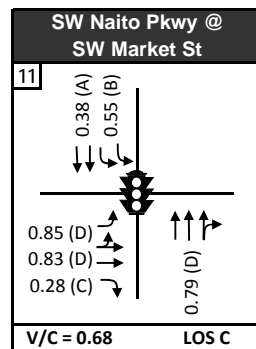
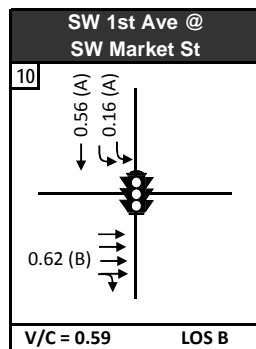
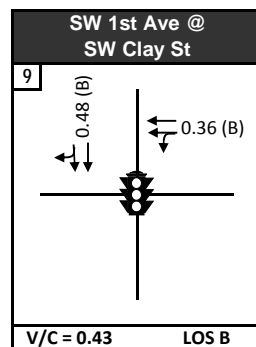
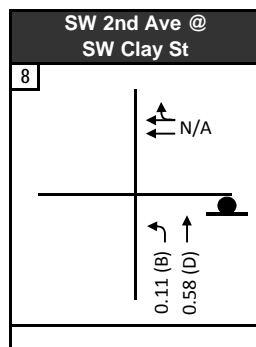
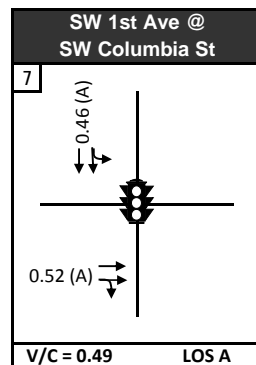
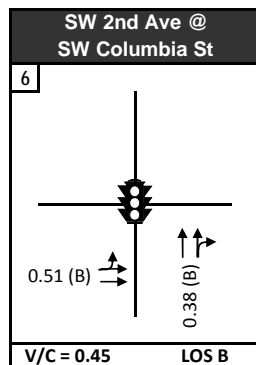
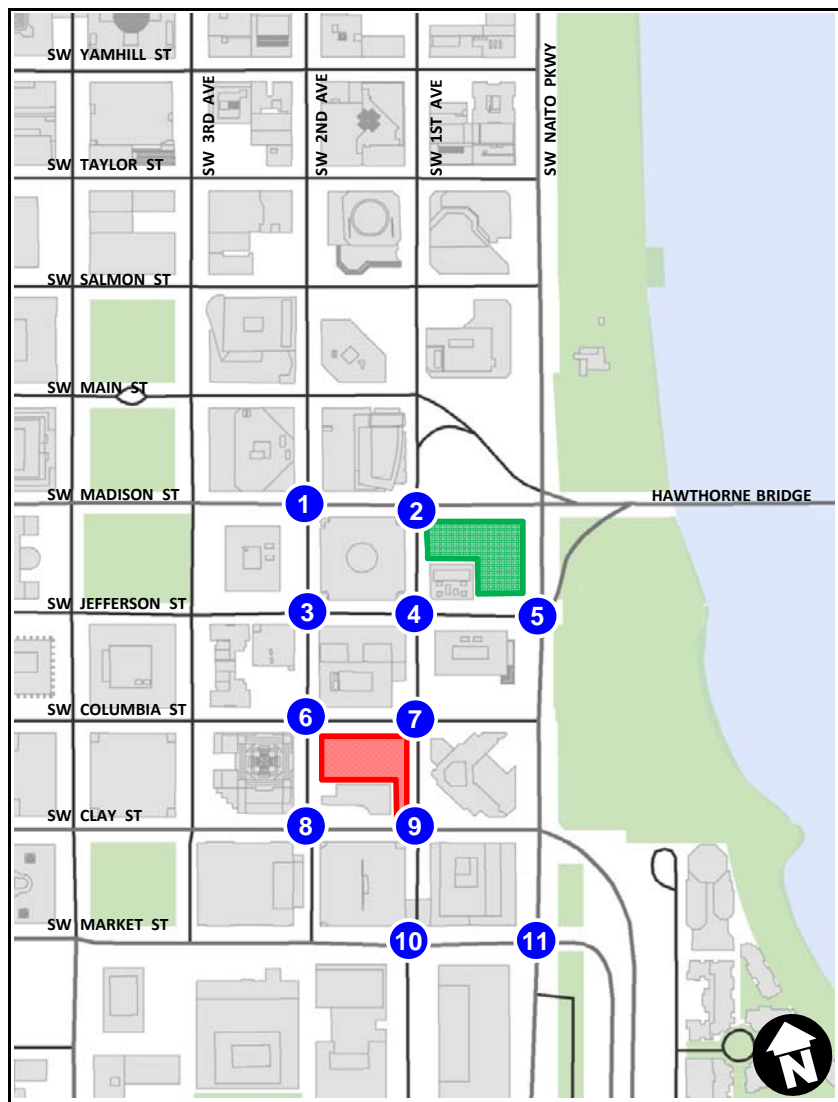
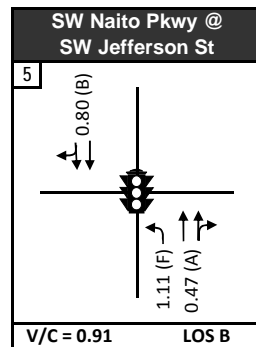
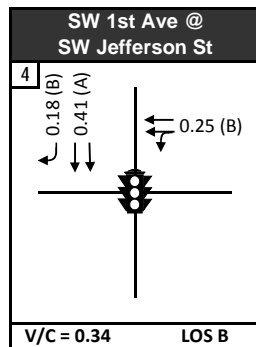
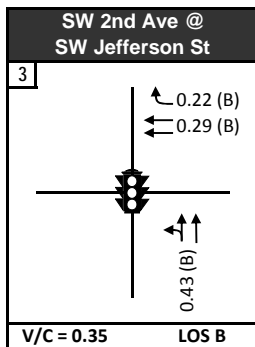
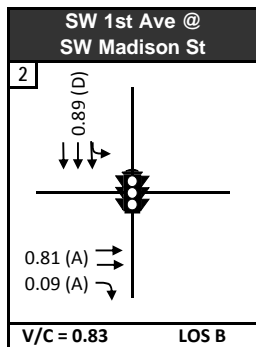
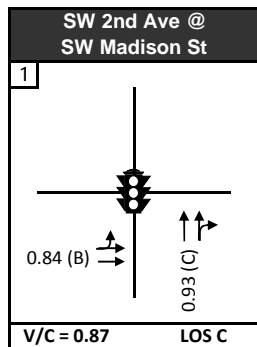
There are no significant concerns or differences with traffic operations at the two proposed sites.

## 6. PARKING CONSIDERATIONS

The existing courthouse has no parking on-site. The majority of parking for employees and visitors is provided off-site through a variety of public parking lots and garages in the area. Similar to the existing courthouse, the new courthouse will provide no parking. The majority of parking for employees and those using the courthouse will be offsite. Due to the close proximity of both preliminary sites, each site will have access to the same number of parking spots provided by a variety of public parking lots and garages in the area. **Figure 5** below shows the parking availability in the vicinity of both the existing and proposed courthouse sites.

The on-street parking available around each site consists of paid parking for anywhere from 15-minutes to 2-hours. At the Hawthorne Bridgehead site, the only available on-street parking is along SW Jefferson Street. There is space for approximately four to five one-hour parking stalls on the north side of SW Jefferson Street and two 15-minute parking stalls on the south side.

At the Block 128 site, there is parking provided along SW Clay Street, SW 1<sup>st</sup> Avenue, and SW 2<sup>nd</sup> Avenue. Along SW Clay Street there is space for four two-hour parking stalls with additional curb space dedicated for motorcycle parking on the north side, and space for five 90-minute stalls and one 15-minute stall on the south side. Parking on SW 1<sup>st</sup> Avenue is only allowed on the west side where there are five two-hour parking stalls. Parking on SW 2<sup>nd</sup> Avenue is located on the west side where there are two 15-minute parking stalls. Building on Block 128 will eliminate 150 off-street parking spots



## MULTNOMAH COUNTY COURTHOUSE TRAFFIC STUDY

### Legend

↔ Lane Configurations

V/C Volume-to-capacity

LOS Level of service

### (A) V/C (LOS)

● STOP Control

● Signalized Intersection

# Intersection Number

■ Hawthorne Bridgehead Site

■ Block 128 Site

Overall LOS and V/C are reported for signalized intersections. Unsignalized intersections only report V/C and LOS for STOP controlled movements.

**Figure 4**  
Opening Year (2020)  
Traffic Operations  
PM Peak Hour

Note: Shape depicts block location only and does not represent the footprint of the proposed courthouse



## MULTNOMAH COUNTY COURTHOUSE TRAFFIC STUDY

### Legend

- 1 Intersection Number
- P Available parking
- P Hawthorne Bridgehead Site
- P Block 128 Site
- P Existing Courthouse

Note: Shape depicts block location only and does not represent the footprint of the proposed courthouse

**Figure 5**  
Available Parking



While there is more on-street parking available directly adjacent to the Block 128 site, the abundance of off-street parking and nearby on-street parking in close proximity to the two sites indicates there are no significant concerns with parking at the two proposed sites.

## 7. PEDESTRIAN CONSIDERATIONS

Due to the lack of parking provided on-site, the majority of employees and visitors accessing the site will be pedestrians, traveling to and from available parking resources or transit stops in the vicinity. Pedestrian access to the sites will be from crosswalks at the existing intersections adjacent to the Hawthorne Bridgehead and Block 128 sites. Pedestrian crossings will be unchanged from today. The number of pedestrians using these intersections will increase with addition of the new courthouse. Each site is discussed in more detail below.

### Hawthorne Bridgehead

There are currently three intersections that front the Hawthorne Bridgehead site. Of these, the intersections of SW Jefferson Street and SW Madison Street with SW 1st Avenue provide crosswalks on the north, south, east, and west sides of the intersection. The intersection of SW Jefferson Street with SW Naito Parkway has one crosswalk located on the west side of the intersection crossing Jefferson. Because there are no pedestrian crossings of Naito Parkway at Jefferson, pedestrians wishing to access the waterfront would have to walk out of direction to cross SW Naito Parkway at SW Columbia Street, at SW Madison Street via the elevated structure and stairwell, or at the crosswalk at the extension of SW Main Street. Current pedestrian crossings in the area range from 25 to 250 pedestrian crossings per crosswalk in the PM peak hour.

Drivers coming to the Hawthorne Bridgehead site would likely park in a garage to the west or south of the site (see **Figure 5** above). As a result, the two intersections along SW 1st Avenue are likely to see an increase in the number of pedestrians crossing at these signals. This would result in a reduction to vehicular capacity at these intersections and an increase in delay for turning vehicles. Specifically, the dedicated eastbound right turn lane on SW Madison Street approaching the intersection with SW 1st Avenue is likely to experience additional conflicting pedestrian volumes crossing SW 1st Avenue towards the courthouse. Any increases in pedestrian crossings are unlikely to cause significant enough delays to affect the overall performance of the intersections as the right turn is a small fraction of the total intersection volume. Also as a dedicated right-turn lane, queuing in that lane is less likely to impact the adjacent through traffic lanes onto the Hawthorne Bridge.

### Block 128

All four corners of Block 128 provide pedestrian crossings. The intersections of SW Columbia Street at SW 1<sup>st</sup> Avenue, SW Columbia Street at SW 2<sup>nd</sup> Avenue, and SW Clay Street at SW 1<sup>st</sup> Avenue have crosswalks on the north, south, east, and west sides of the intersections. The intersection of SW Clay Street at SW 2<sup>nd</sup> Avenue does not provide a striped crosswalk on the



north side of the intersection. There are crosswalks on the south, east, and west side of the intersection.

Drivers coming to the Block 128 site would likely park in a garage to the west, north, or south of the site (see **Figure 5** above). As a result, the two intersections along SW 2<sup>st</sup> Avenue and the intersection of SW Clay Street at SW 1<sup>st</sup> Avenue are likely to see an increase in the number of pedestrians crossing at these signals. Current pedestrian crossings are within 50 to 175 pedestrian crossings per crosswalk during the PM peak hour at these intersections. This would result in a reduction to vehicular capacity at these intersections. An increase in conflicting pedestrian movements are not anticipated to increase vehicular delay or reduce capacity to a point where adjacent intersections fail to meet operational standards.

Pedestrian access at the proposed Block 128 site is slightly better than the Hawthorne Bridgehead site due to the limited crossing of Naito Parkway. However, there are no significant concerns with pedestrian access at the two proposed sites.

## 8. BICYCLE CONSIDERATIONS

Bicycling around the two sites would be unchanged from how cyclists currently use the road. The number of cyclists riding to each site would increase with the new courthouse. Each site will provide bike parking for employees and it is expected to be well utilized. Specifics for each site are discussed below.

### Hawthorne Bridgehead

Cyclists in downtown Portland are active users of the travel lane. Cyclists typically do not ride on the sidewalks in downtown. For cyclists coming to the Hawthorne Bridgehead site from the east side of the Willamette River via the Hawthorne Bridge would have to enter the travel lanes from the raised multi-use path and cross two lanes of traffic to make a left on SW 1<sup>st</sup> Avenue. As alternative to this movement, cyclists could take the designated bicycle and pedestrian exit ramp from the bridge to the at-grade crossing of SW Naito Parkway at the striped crosswalk north of the bridge. Cyclists heading east from the courthouse would be able to access SW Madison Street from SW 1<sup>st</sup> Avenue and continue across the bike path on the Hawthorne Bridge.

Cyclists on the west side of the Willamette River heading to or from the courthouse will continue to use the downtown grid system. Currently, there is an eastbound right turn lane at the intersection of SW Madison Street and SW 1<sup>st</sup> Avenue. It is expected that cyclists will use this lane to turn right; however, this is also an active bus stop used by multiple routes. Buses are permitted to go straight from the right turn lane through the intersection towards the Hawthorne Bridge. The striped bike lane for this block is between the through lane and the right turn lane. With the additional cyclists trying to reach the courthouse, this could increase the potential for conflicts between cyclists trying to turn right in front of buses accessing the Hawthorne Bridge from the curb-tight bus stop. When the Tilikum Crossing and new Sellwood Bridge open, lines 31, 32, 33 and 99 will no longer stop at this bus stop.

There is also a right turn lane along SW 1<sup>st</sup> Avenue at the intersection with SW Jefferson Street. The bike lane is striped between the through and the right turn lane. Again, the increase in the number of cyclists in this area may increase the potential for conflict between vehicles crossing over the bike lane.

### **Block 128**

Block 128 is surrounded by four one-way streets. Bicyclists heading to or from the courthouse will continue to use the downtown grid system. There are no right turn lanes on the adjacent roadways. Bicyclists are expected to be traveling in the vehicular lane or on the outside of vehicular traffic. The building fronts along SW 1<sup>st</sup> Avenue and SW Clay Street currently have on street parking. The increased number of cyclists will increase the number of parking/bicycle conflicts surrounding the block.

Bicycle operations at the proposed Block 128 site is slightly better than the Hawthorne Bridgehead site due more standard roadway grid and reduced bus conflict points. However, there are no significant concerns with bicycle operations at the two proposed sites.

## **9. TRANSIT CONSIDERATIONS**

### **Hawthorne Bridgehead**

The Hawthorne Bridgehead site is currently serviced by 13 bus lines and is within five blocks of the blue, red, green, and yellow MAX lines. Bus lines 4, 6, 10, 14, 31, 32, 33, and 99 all utilize the Hawthorne Bridge and have stops along SW Madison and SW Main Streets. Lines 38, 45, 55, 92, and 96 run along SW Naito Parkway/SW Jefferson Street and SW Columbia Street/SW 1<sup>st</sup> Avenue. When the Tilikum Crossing opens, lines 31, 32, and 33 will no longer service downtown Portland. Current users would be expected to transfer to the MAX orange line. In addition, line 99 would be rerouted from the Hawthorne Bridge and moved to the Sellwood Bridge via Macadam Avenue once the Sellwood Bridge opens to bus traffic. The rerouting of these four bus lines will reduce bus frequency at the stop on Madison Street adjacent to the site.

### **Block 128**

The Block 128 site is currently serviced by 13 bus lines within three blocks and is within six blocks of the blue, red, green and yellow MAX lines. Bus lines 4, 6, 10, 14, 31, 32, 33, and 99 all utilize the Hawthorne Bridge and have stops along SW Madison and SW Main Streets. Lines 38, 45, 55, 92, and 96 run along SW Naito Parkway/SW Jefferson Street and SW Columbia Street/SW 1<sup>st</sup> Avenue.

Transit access at the proposed sites are similar. There are no significant concerns with transit access at the two proposed sites.

## 10. SITE ACCESS CONSIDERATIONS

The only vehicle access provided to the new courthouse at either the Hawthorne Bridgehead or the Block 128 sites will be via a sally port. For the Hawthorne Bridgehead site, vehicles will enter from southbound SW Naito Parkway and exit onto SW Jefferson Street. At Block 128, vehicles will enter from SW 2<sup>nd</sup> Avenue and exit onto SW Columbia Street. The sally port is expected to have four trips per day for secure prisoner transfers. One trip will occur during the AM peak, two will occur mid-day, and the last trip will be during the PM peak hour. Given the very low volume, vehicle access at either proposed site is not a concern. Compared to the existing courthouse where SW 5<sup>th</sup> Avenue is closed during prisoner transfers, the sally port will significantly improve vehicle access by having a secure location off-street to transfer prisoners which will not require street closures.

## 11. FREIGHT LOADING CONSIDERATIONS

The sally port access has been provided for secure prisoner transfers at the new courthouse. It is possible the County could use the sally port for freight delivery. This option would be further explored during the design of the site. If the sally port can't be used for freight, deliveries are expected to be similar to the existing courthouse. The existing Multnomah County Courthouse has dedicated a portion of the on-street parking to be for freight delivery between 7 AM and 7 PM. For the Hawthorne Bridgehead site, there is existing freight delivery located along SW Jefferson Street between 7 AM and 7 PM. For Block 128 there is not existing freight delivery signed adjacent to the block. There is a freight delivery zone across the street on the west side of SW 2<sup>nd</sup> Avenue.

If the sally ports cannot be used for freight loading, the existing loading zone on SW Jefferson Street at the Hawthorne Bridgehead site could potentially be used, or reconfigured, to accommodate truck deliveries to the new courthouse. Since the existing loading zone at the Block 128 site is across the street, it is likely that a new loading zone would have to be identified for Block 128. In any case, the loading zone will have to be located in a place on-street that is conducive to the new courthouse building design, which may require new loading zone locations.

## 12. TEMPORARY CONSTRUCTION IMPACTS

For the purposes of this Transportation Alternatives Analysis, it is assumed that the contractor will need to close one lane on multiple block faces adjacent to the proposed sites. The temporary lane closures present specific issues at each location.

### Hawthorne Bridgehead

The Hawthorne Bridgehead is enclosed by SW Madison Street on the north, SW Jefferson Street on the south, SW 1<sup>st</sup> Avenue on the west, and SW Naito Parkway on the east. The contractor would likely close lanes on SW 1<sup>st</sup> Avenue and SW Jefferson Street. It is unlikely the City of

Portland would permit the contractor to close lanes along SW Madison Street and SW Naito Parkway during the peak hours, restricting lane closures to the nighttime and midday periods. Exact hours of closures will need to be coordinated with the City of Portland Bureau of Transportation and the County will require the Contractor to work with the adjacent building owner's to minimize impacts to their on-going operations.

Closing one lane adjacent to the site will interfere with the four one-hour on-street parking stalls, truck loading zone and bus stop on SW Jefferson Street, but would not result in a loss of travel lane. Blocking the bus stop and truck loading zones may require trucks and buses to reroute to temporary transit stops and loading zones for the duration of construction. Lane closures on SW 1<sup>st</sup> Avenue would result in the loss of a travel lane during construction.

Construction staging will occur at the North Triangle for lay down/staging areas. It is also possible the contractor may use the top of the City Garage for lighter materials.

### **Block 128**

The Block 128 site is enclosed by SW Columbia Street on the north, SW Clay Street on the south, SW 2<sup>nd</sup> Avenue on the west, and SW 1<sup>st</sup> Avenue on the east. It is unlikely the City of Portland would permit the contractor to take lanes along SW Clay Street during the peak hours, restricting lane closures to the nighttime and midday periods. Exact hours of closures will need to be coordinated with the City of Portland Bureau of Transportation.

Closing the lanes adjacent to the Block 128 site will interfere with a bus stop on SW Columbia Street which will require the bus stop to be relocated to a nearby location. Additionally, six two-hour on-street parking stalls on SW 1<sup>st</sup> Avenue, and four two-hour on-street parking stalls and on-street motorcycle parking on SW Clay Street will be affected by temporary lane closures. The driveway to the existing underground parking and freight loading area located on-site is also accessed from SW Clay Street and would likely have to be maintained for operations during construction. Lane closures would result in the loss of a travel lane on SW 2<sup>nd</sup> Avenue.

Construction staging for this site is to be determined.

There are no significant concerns or differences with construction impacts to traffic at the two proposed sites.

### 13. CONCLUSIONS

The relocated courthouse is not expected to alter downtown traffic patterns or operations significantly. It is assumed that the trips generated for the new courthouse will be comparable to the trips generated by the existing courthouse; therefore no net new trips are expected to be added to the downtown network. Traffic operations for the 2020 opening year volume forecasts, based on background growth rates, indicate that all study area intersections are expected to operate within the overall intersection LOS D standard for signalized intersections and LOS E standard for unsignalized intersections.

Due to the close proximity of the two proposed sites and the availability of off-site parking around both, travel patterns for commuters and visitors are expected to be similar for both sites. Adjacent intersections at either location should expect increases in pedestrian and bicycle crossings which may reduce the vehicular capacity of conflicting turning movements and increases in delay. The effects of this increased pedestrian and bicycle activity pose unique challenges for each location, but are not expected to affect the overall traffic operations for any study area intersections significantly.

Temporary traffic impacts due to construction will require the contractor to block travel lanes or on-street parking lanes for both locations. The specific impacts are unique to each site, but may both result in loss of on-street parking, through lane capacity, relocated bus stops, and time-of-day restrictions for travel lane closures on major roadways.

In summary, the transportation analysis for the two proposed sites does not preclude either site from consideration as there are no fatal flaws with respect to transportation for either site.

## **APPENDIX A – Traffic Counts**



Project: Hawthorne Bridge  
 Job #: Multi00000-049  
 Subject: **PM Turning Movement Volumes**  
 Created: 3/2/2015  
 Rev. Date: 3/6/2015

3/6/2015

E-W ID	Synchro ID	Intersection	Direction	Movement	Int ID	4:00 PM	4:15 PM	4:30 PM	4:45 PM	5:00 PM	5:15 PM	5:30 PM	5:45 PM	Max	Hour	Delta	USE
1	10	SW 2nd Ave @SW Madison St 2 hr PM Turning Movement Count Count Date: 2/26/2015 2015 PM Peak Hour: 4:45 PM-5:45 PM PM Peak Hour Used: 4:45 PM-5:45 PM Volume Difference: 0 PHF: 0.95	EB	EBL	10	24	19	20	22	17	11	10	15				60
				EBT	10	233	270	285	279	317	330	337	297				1263
				EBR	10	0	0	0	0	0	0	0	0				0
			WB	WBL	10	0	0	0	0	0	0	0	0				0
				WBT	10	0	0	0	0	0	0	0	0				0
				WBR	10	0	0	0	0	0	0	0	0				0
			NB	NBL	10	0	0	0	0	0	0	0	0				0
				NBT	10	87	76	102	106	98	103	105	73				412
				NBR	10	62	56	51	58	49	63	64	60				234
			SB	SBL	10	0	0	0	0	0	0	0	0				0
				SBT	10	0	0	0	0	0	0	0	0				0
				SBR	10	0	0	0	0	0	0	0	0				0
			TEV			406	827	1285	1750	1825	1911	1969	1949	1969	5:30 PM	0	1969
2	20	SW 1st Ave @SW Madison St 2 hr PM Turning Movement Count Count Date: 2/26/2015 2015 PM Peak Hour: 5:00 PM-6:00 PM PM Peak Hour Used: 4:45 PM-5:45 PM Volume Difference: 23 PHF: 0.95	EB	EBL	20	0	0	0	0	0	0	0	0				0
				EBT	20	263	303	314	320	340	378	380	344				1418
				EBR	20	22	22	21	22	17	16	19	15				74
			WB	WBL	20	0	0	0	0	0	0	0	0				0
				WBT	20	0	0	0	0	0	0	0	0				0
				WBR	20	0	0	0	0	0	0	0	0				0
			NB	NBL	20	0	0	0	0	0	0	0	0				0
				NBT	20	0	0	0	0	0	0	0	0				0
				NBR	20	0	0	0	0	0	0	0	0				0
			SB	SBL	20	26	27	33	30	25	42	40	43				137
				SBT	20	136	130	155	149	166	151	140	142				606
				SBR	20	0	0	0	0	0	0	0	0				0
			TEV			447	929	1452	1973	2074	2179	2235	2258	2258	5:45 PM	23	2235
3	30	SW 2nd Ave @SW Jefferson St 2 hr PM Turning Movement Count Count Date: 2/26/2015 2015 PM Peak Hour: 4:30 PM-5:30 PM PM Peak Hour Used: 4:45 PM-5:45 PM Volume Difference: 29 PHF: 0.95	EB	EBL	30	0	0	0	0	0	0	0	0				0
				EBT	30	0	0	0	0	0	0	0	0				0
				EBR	30	0	0	0	0	0	0	0	0				0
			WB	WBL	30	0	0	0	0	0	0	0	0				0
				WBT	30	97	97	102	98	117	80	77	83				372
				WBR	30	66	47	75	67	63	79	49	33				258
			NB	NBL	30	19	24	33	35	27	28	23	18				113
				NBT	30	87	91	83	92	88	81	115	100				376
				NBR	30	0	0	0	0	0	0	0	0				0
			SB	SBL	30	0	0	0	0	0	0	0	0				0
				SBT	30	0	0	0	0	0	0	0	0				0
				SBR	30	0	0	0	0	0	0	0	0				0
			TEV			269	528	821	1113	1139	1148	1119	1061	1148	5:15 PM	29	1119
4	40	SW 1st Ave @SW Jefferson St 2 hr PM Turning Movement Count Count Date: 2/26/2015 2015 PM Peak Hour: 4:30 PM-5:30 PM PM Peak Hour Used: 4:45 PM-5:45 PM Volume Difference: 52 PHF: 0.86	EB	EBL	40	0	0	0	0	0	0	0	0				0
				EBT	40	0	0	0	0	0	0	0	0				0
				EBR	40	0	0	0	0	0	0	0	0				0
			WB	WBL	40	11	11	13	12	21	17	12	12				62
				WBT	40	48	49	67	44	66	59	40	40				209
				WBR	40	0	0	0	0	0	0	0	0				0
			NB	NBL	40	0	0	0	0	0	0	0	0				0
				NBT	40	0	0	0	0	0	0	0	0				0
				NBR	40	0	0	0	0	0	0	0	0				0
			SB	SBL	40	0	0	0	0	0	0	0	0				0
				SBT	40	106	113	119	109	133	130	124	107				496
				SBR	40	59	42	57	58	54	38	28	46				178
			TEV			224	439	695	918	968	997	945	927	997	5:15 PM	52	945
5	50	SW Naito Pkwy @SW Jefferson St 2 hr PM Turning Movement Count Count Date: 2/26/2015 2015 PM Peak Hour: 4:00 PM-5:00 PM PM Peak Hour Used: 4:45 PM-5:45 PM Volume Difference: 98 PHF: 0.96	EB	EBL	50	0	0	0	0	0	0	0	0				0
				EBT	50	0	0	0	0	0	0	0	0				0
				EBR	50	0	0	0	0	0	0	0	0				0
			WB	WBL	50	0	0	0	0	0	0	0	0				0
				WBT	50	0	0	0	0	0	0	0	0				0
				WBR	50	0	0	0	0	0	0	0	0				0
			NB	NBL	50	20	33	27	27	31	21	14	16				93
				NBT	50	242	256	267	253	261	266	245	206				1025
				NBR	50	119	104	104	94	89	95	71	76				359
			SB	SBL	50	0	0	0	0	0	0	0	0				0
				SBT	50	339	315	320	318	319	313	309	280				1259
				SBR	50	34	21	43	26	36	30	28	28				128
			TEV			754	1483	2244	2962	2954	2956	2864	2752	2962	4:45 PM	98	2864

Bikes	Peds
0	
214	North
0	130
0	
0	South
1	246
0	
13	East
16	247
15	
0	West
0	157
259	780
0	
252	North
3	23
0	
0	South
0	103
0	
0	East
5	91
16	
13	West
1	235
290	452
0	
0	North
0	39
0	
12	South
5	79
3	
26	East
0	164
0	
0	West
0	77
46	359
0	
0	North
4	75
6	
0	South
0	76
0	
0	East
0	168
0	
11	West
5	185
32	504
0	
0	North
0	1
0	
0	South
0	0
2	
6	East
5	0
0	
3	West
12	16
28	17



Project: Hawthorne Bridge  
 Job #: Multi00000-049  
 Subject: **PM Turning Movement Volumes**  
 Created: 3/2/2015  
 Rev. Date: 3/6/2015

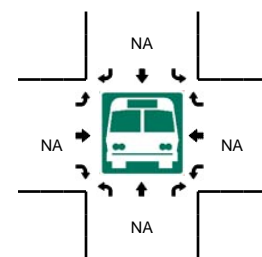
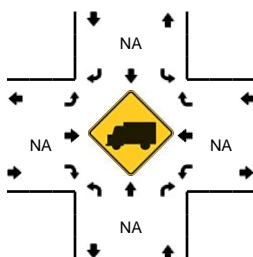
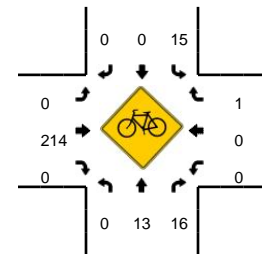
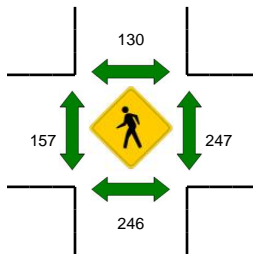
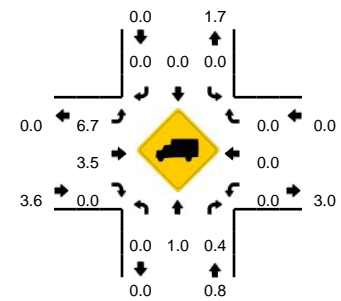
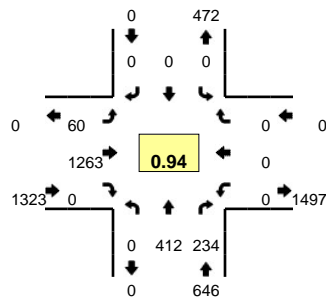
3/6/2015

E-W ID	Synchro ID	Intersection	Direction	Movement	Int ID	4:00 PM	4:15 PM	4:30 PM	4:45 PM	5:00 PM	5:15 PM	5:30 PM	5:45 PM	Max	Hour	Delta	USE	Bikes	Peds
6	60	SW 2nd Ave @SW Columbia St 2 hr PM Turning Movement Count Count Date: 2/26/2015 2015 PM Peak Hour: 4:45 PM-5:45 PM PM Peak Hour Used: 4:45 PM-5:45 PM Volume Difference: 0 PHF: 0.98	EB	EBL	60	23	32	23	36	29	37	30	37				132	4	
				EBT	60	110	113	112	134	130	134	137	102				535	31	North
				EBR	60	0	0	0	0	0	0	0	0				0	0	117
			WB	WBL	60	0	0	0	0	0	0	0	0				0	0	
				WBT	60	0	0	0	0	0	0	0	0				0	0	South
				WBR	60	0	0	0	0	0	0	0	0				0	1	114
			NB	NBL	60	0	0	0	0	0	0	0	0				0	0	
				NBT	60	86	85	95	84	91	80	91	83				346	23	East
				NBR	60	21	14	15	22	17	17	16	10				72	10	116
			SB	SBL	60	0	0	0	0	0	0	0	0				0	0	
				SBT	60	0	0	0	0	0	0	0	0				0	0	West
				SBR	60	0	0	0	0	0	0	0	0				0	0	97
			TEV			240	484	729	1005	1032	1056	1085	1041	1085	5:30 PM	0	1085	69	444
7	70	SW 1st Ave @SW Columbia St 2 hr PM Turning Movement Count Count Date: 2/26/2015 2015 PM Peak Hour: 4:45 PM-5:45 PM PM Peak Hour Used: 4:45 PM-5:45 PM Volume Difference: 0 PHF: 0.95	EB	EBL	70	0	0	0	0	0	0	0	0				0	0	
				EBT	70	106	97	97	113	101	117	115	80				446	39	North
				EBR	70	25	28	33	43	49	35	38	30				165	0	119
			WB	WBL	70	0	0	0	0	0	0	0	0				0	0	
				WBT	70	0	0	0	0	0	0	0	0				0	2	South
				WBR	70	0	0	0	0	0	0	0	0				0	0	116
			NB	NBL	70	0	0	0	0	0	0	0	0				0	0	
				NBT	70	0	0	0	0	0	0	0	0				0	0	East
				NBR	70	0	0	0	0	0	0	0	0				0	0	143
			SB	SBL	70	26	33	36	28	38	34	23	24				123	5	
				SBT	70	92	91	93	106	119	112	101	94				438	13	West
				SBR	70	0	0	0	0	0	0	0	0				0	0	168
			TEV			249	498	757	1047	1105	1154	1172	1110	1172	5:30 PM	0	1172	59	546
8	80	SW 2nd Ave @SW Clay St 2 hr PM Turning Movement Count Count Date: 2/26/2015 2015 PM Peak Hour: 4:15 PM-5:15 PM PM Peak Hour Used: 4:45 PM-5:45 PM Volume Difference: 39 PHF: 0.93	EB	EBL	80	0	0	0	0	0	0	0	0				0	0	
				EBT	80	0	0	0	0	0	0	0	0				0	0	North
				EBR	80	0	0	0	0	0	0	0	0				0	0	57
			WB	WBL	80	0	0	0	0	0	0	0	0				0	0	
				WBT	80	96	110	101	89	89	78	91	85				347	4	South
				WBR	80	64	60	72	63	63	55	49	60				230	4	70
			NB	NBL	80	17	16	14	10	26	12	16	6				64	1	East
				NBT	80	37	32	35	40	43	52	48	38				183	29	
				NBR	80	0	0	0	0	0	0	0	0				0	0	93
			SB	SBL	80	0	0	0	0	0	0	0	0				0	0	
				SBT	80	0	0	0	0	0	0	0	0				0	0	West
				SBR	80	0	0	0	0	0	0	0	0				0	0	98
			TEV			214	432	654	856	863	842	824	811	863	5:00 PM	39	824	39	318
9	90	SW 1st Ave @SW Clay St 2 hr PM Turning Movement Count Count Date: 2/26/2015 2015 PM Peak Hour: 4:45 PM-5:45 PM PM Peak Hour Used: 4:45 PM-5:45 PM Volume Difference: 0 PHF: 0.96	EB	EBL	90	0	0	0	0	0	0	0	0				0	0	
				EBT	90	0	0	0	0	0	0	0	0				0	0	North
				EBR	90	0	0	0	0	0	0	0	0				0	0	69
			WB	WBL	90	9	14	17	11	16	9	8	7				44	2	
				WBT	90	110	113	94	98	83	85	96	105				362	1	South
				WBR	90	0	0	0	0	0	0	0	0				0	0	105
			NB	NBL	90	0	0	0	0	0	0	0	0				0	0	
				NBT	90	0	0	0	0	0	0	0	0				0	0	East
				NBR	90	0	0	0	0	0	0	0	0				0	0	132
			SB	SBL	90	0	0	0	0	0	0	0	0				0	0	
				SBT	90	89	95	98	117	133	133	142	106				525	13	West
				SBR	90	26	26	35	21	30	16	19	20				86	3	143
			TEV			234	482	726	973	1001	996	1017	1017	1008	1017	5:30 PM	0	1017	21
10	100	SW 1st Ave @SW Market St 2 hr PM Turning Movement Count Count Date: 2/26/2015 2015 PM Peak Hour: 4:45 PM-5:45 PM PM Peak Hour Used: 4:45 PM-5:45 PM Volume Difference: 0 PHF: 0.94	EB	EBL	100	0	0	0	0	0	0	0	0				0	0	
				EBT	100	232	204	196	193	221	225	191	156				830	25	North
				EBR	100	98	86	80	89	100	94	94	69				377	1	35
			WB	WBL	100	0	0	0	0	0	0	0	0				0	0	
				WBT	100	0	0	0	0	0	0	0	0				0	0	South
				WBR	100	0	0	0	0	0	0	0	0				0	0	34
			NB	NBL	100	0	0	0	0	0	0	0	0				0	0	
				NBT	100	0	0	0	0	0	0	0	0				0	1	East
				NBR	100	0	0	0	0	0	0	0	0				0	9	90
			SB	SBL	100	47	50	43	41	61	50	52	47				204	1	
				SBT	100	44	62	67	91	90	92	99	65				372	14	West
				SBR	100	0	0	0	0	0	0	0	0				0	0	81
			TEV			421	823	1209	1623	1674	1733	1783	1706	1783	5:30 PM	0	1783	51	240
11	110	SW Naito Pkwy @SW Market St 2 hr PM Turning Movement Count Count Date: 2/26/2015 2015 PM Peak Hour: 4:00 PM-5:00 PM PM Peak Hour Used: 4:45 PM-5:45 PM Volume Difference: 145 PHF: 0.96	EB	EBL	110	69	65	67	80	87	94	80	51				341	30	
				EBT	110	131	114	117	101	133	120	119	102				473	0	North
				EBR	110	75	84	56	62	65	55	43	52				225	0	20
			WB	WBL	110	0	0	0	0	0	0	0	0				0	0	
				WBT	110	0	0	0	0	0	0	0	0				0	0	South
				WBR	110	0	0	0	0	0	0	0	0				0	0	21
			NB	NBL	110	0	0	0	0	0	0	0	0				0	0	
				NBT	110	161	167	185	143	129	134	115	134				521	18	East
				NBR	110	6	3	3	4	6	1	1	4				12	0	35
			SB	SBL	110	210	176	178	196	202	183	188	171				769	0	
				SBT	110	187	213	226	192	192	216	185	171				785	0	West
				SBR	110	0	0	0	0	0	0	0	0				0	0	7
			TEV			839	1661	2493	3271	3246	3227	3126	3033	3271	4:45 PM	145	3126	48	83
Intersection Totals			EB	Approach		1411	1437	1421	1494	1606	1646	1593	1350						
			WB	Approach		501	501	541	482	518	462	422	425						
			NB	Approach		964	787	826	821	830	818	808	686						
			SB	Approach		1421	993	989	962	1053	1005	955							
			TEV	1 hr		4297	7915	11692	15451	15161	15474	15476	15068	15476	5:30 PM	0	12:00 AM		

**LOCATION:** SW 2nd Ave -- SW Madison St  
**CITY/STATE:** Portland, OR

**QC JOB #:** 13214704  
**DATE:** Thu, Feb 26 2015

**Peak-Hour: 4:45 PM -- 5:45 PM**  
**Peak 15-Min: 5:10 PM -- 5:25 PM**



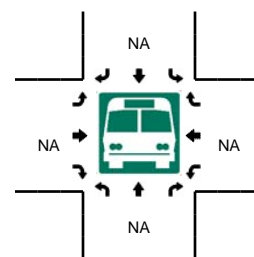
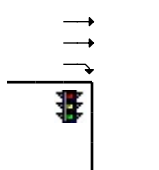
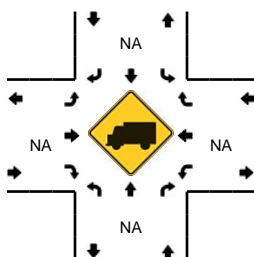
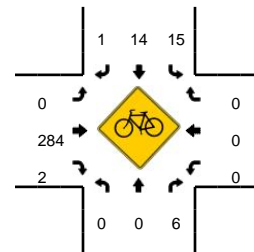
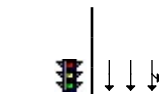
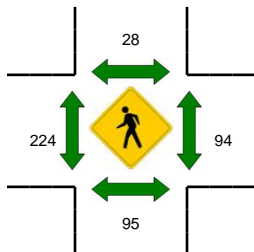
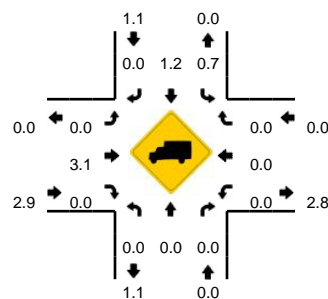
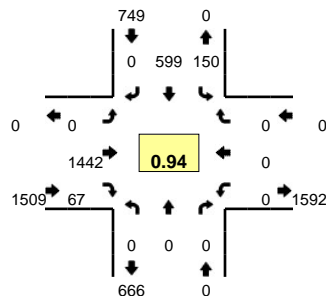
5-Min Count Period Beginning At	SW 2nd Ave (Northbound)				SW 2nd Ave (Southbound)				SW Madison St (Eastbound)				SW Madison St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	23	17	0	0	0	0	0	7	77	0	0	0	0	0	0	124	
4:05 PM	0	25	22	0	0	0	0	0	5	73	0	0	0	0	0	0	125	
4:10 PM	0	39	23	0	0	0	0	0	12	83	0	0	0	0	0	0	157	
4:15 PM	0	31	17	0	0	0	0	0	5	92	0	0	0	0	0	0	145	
4:20 PM	0	28	21	0	0	0	0	0	5	93	0	0	0	0	0	0	147	
4:25 PM	0	17	18	0	0	0	0	0	9	85	0	0	0	0	0	0	129	
4:30 PM	0	34	18	0	0	0	0	0	6	94	0	0	0	0	0	0	152	
4:35 PM	0	37	18	0	0	0	0	0	5	94	0	0	0	0	0	0	154	
4:40 PM	0	31	15	0	0	0	0	0	9	97	0	0	0	0	0	0	152	
4:45 PM	0	32	17	0	0	0	0	0	10	98	0	0	0	0	0	0	157	
4:50 PM	0	32	21	0	0	0	0	0	4	92	0	0	0	0	0	0	149	
4:55 PM	0	42	20	0	0	0	0	0	8	89	0	0	0	0	0	0	159	1750
5:00 PM	0	37	13	0	0	0	0	0	8	91	0	0	0	0	0	0	149	1775
5:05 PM	0	30	14	0	0	0	0	0	2	113	0	0	0	0	0	0	159	1809
5:10 PM	0	31	22	0	0	0	0	0	7	113	0	0	0	0	0	0	173	1825
5:15 PM	0	40	19	0	0	0	0	0	7	113	0	0	0	0	0	0	179	1859
5:20 PM	0	33	21	0	0	0	0	0	4	111	0	0	0	0	0	0	169	1881
5:25 PM	0	30	23	0	0	0	0	0	0	106	0	0	0	0	0	0	159	1911
5:30 PM	0	35	30	0	0	0	0	0	5	106	0	0	0	0	0	0	176	1935
5:35 PM	0	37	14	0	0	0	0	0	2	118	0	0	0	0	0	0	171	1952
5:40 PM	0	33	20	0	0	0	0	0	3	113	0	0	0	0	0	0	169	1969
5:45 PM	0	21	16	0	0	0	0	0	7	110	0	0	0	0	0	0	154	1966
5:50 PM	0	26	23	0	0	0	0	0	5	87	0	0	0	0	0	0	141	1958
5:55 PM	0	26	21	0	0	0	0	0	3	100	0	0	0	0	0	0	150	1949
<b>Peak 15-Min Flowrates</b>	<b>Northbound</b>				<b>Southbound</b>				<b>Eastbound</b>				<b>Westbound</b>				<b>Total</b>	
All Vehicles	0	416	248	0	0	0	0	0	72	1348	0	0	0	0	0	0	2084	
Heavy Trucks	0	0	0	0	0	0	0	0	0	28	0	0	0	0	0	0	28	
Pedestrians	236				152				124				232				744	
Bicycles	0	3	2	0	5	0	0	0	0	46	0	0	0	0	0	0	56	
Railroad																		
Stopped Buses																		

**Comments:**

**LOCATION:** SW 1st Ave -- SW Madison St  
**CITY/STATE:** Portland, OR

**QC JOB #:** 13214709  
**DATE:** Thu, Feb 26 2015

**Peak-Hour: 5:00 PM -- 6:00 PM**  
**Peak 15-Min: 5:10 PM -- 5:25 PM**

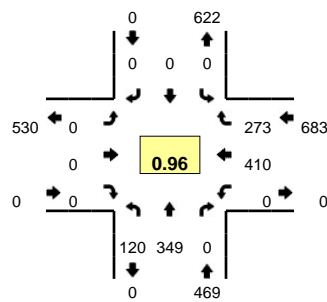


5-Min Count Period Beginning At	SW 1st Ave (Northbound)				SW 1st Ave (Southbound)				SW Madison St (Eastbound)				SW Madison St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	8	33	0	0	0	82	4	0	0	0	0	0	127	
4:05 PM	0	0	0	0	10	48	0	0	0	93	6	0	0	0	0	0	157	
4:10 PM	0	0	0	0	8	55	0	0	0	88	12	0	0	0	0	0	163	
4:15 PM	0	0	0	0	9	51	0	0	0	106	8	0	0	0	0	0	174	
4:20 PM	0	0	0	0	9	39	0	0	0	104	8	0	0	0	0	0	160	
4:25 PM	0	0	0	0	9	40	0	0	0	93	6	0	0	0	0	0	148	
4:30 PM	0	0	0	0	6	45	0	0	0	108	9	0	0	0	0	0	168	
4:35 PM	0	0	0	0	15	47	0	0	0	102	7	0	0	0	0	0	171	
4:40 PM	0	0	0	0	12	63	0	0	0	104	5	0	0	0	0	0	184	
4:45 PM	0	0	0	0	5	56	0	0	0	111	7	0	0	0	0	0	179	
4:50 PM	0	0	0	0	13	53	0	0	0	108	7	0	0	0	0	0	181	
4:55 PM	0	0	0	0	12	40	0	0	0	101	8	0	0	0	0	0	161	1973
5:00 PM	0	0	0	0	7	49	0	0	0	98	4	0	0	0	0	0	158	2004
5:05 PM	0	0	0	0	8	54	0	0	0	113	8	0	0	0	0	0	183	2030
5:10 PM	0	0	0	0	10	63	0	0	0	129	5	0	0	0	0	0	207	2074
5:15 PM	0	0	0	0	9	42	0	0	0	130	2	0	0	0	0	0	183	2083
5:20 PM	0	0	0	0	17	61	0	0	0	126	7	0	0	0	0	0	211	2134
5:25 PM	0	0	0	0	16	48	0	0	0	122	7	0	0	0	0	0	193	2179
5:30 PM	0	0	0	0	11	50	0	0	0	130	6	0	0	0	0	0	197	2208
5:35 PM	0	0	0	0	16	42	0	0	0	127	5	0	0	0	0	0	190	2227
5:40 PM	0	0	0	0	13	48	0	0	0	123	8	0	0	0	0	0	192	2235
5:45 PM	0	0	0	0	12	58	0	0	0	122	6	0	0	0	0	0	198	2254
5:50 PM	0	0	0	0	16	45	0	0	0	108	4	0	0	0	0	0	173	2246
5:55 PM	0	0	0	0	15	39	0	0	0	114	5	0	0	0	0	0	173	2258
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	0	0	144	664	0	0	0	1540	56	0	0	0	0	0	2404	
Heavy Trucks	0	0	0	0	0	4	0	0	0	28	0	0	0	0	0	0	32	
Pedestrians	120				16				264				120				520	
Bicycles	0	0	1		2	1	1		0	58	1		0	0	0		64	
Railroad																		
Stopped Buses																		

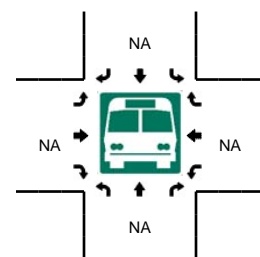
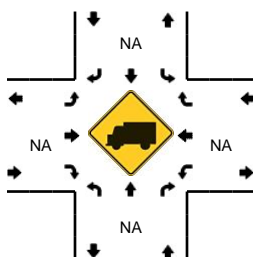
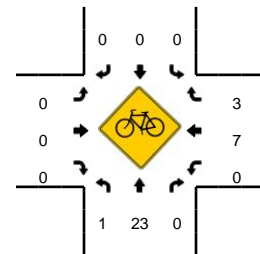
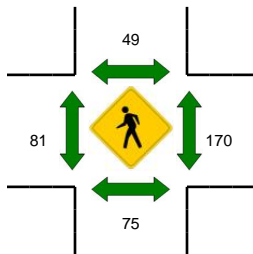
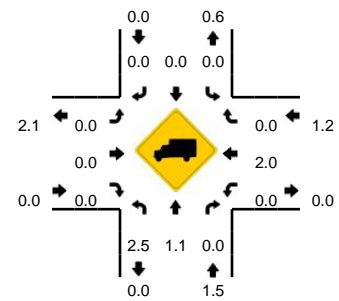
**Comments:**

**LOCATION:** SW 2nd Ave -- SW Jefferson St  
**CITY/STATE:** Portland, OR

**QC JOB #:** 13214703  
**DATE:** Thu, Feb 26 2015



**Peak-Hour: 4:25 PM -- 5:25 PM**  
**Peak 15-Min: 4:55 PM -- 5:10 PM**



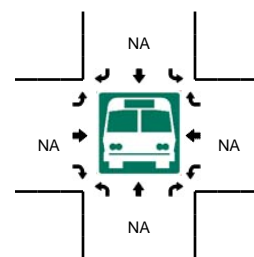
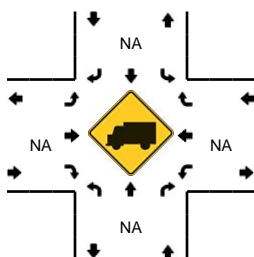
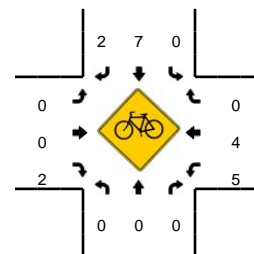
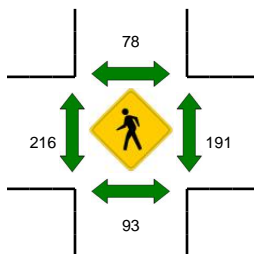
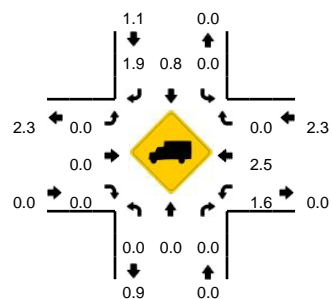
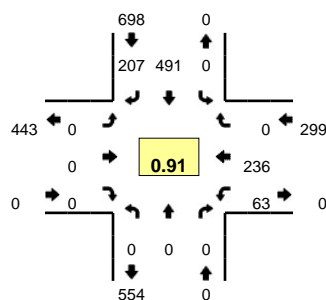
5-Min Count Period Beginning At	SW 2nd Ave (Northbound)				SW 2nd Ave (Southbound)				SW Jefferson St (Eastbound)				SW Jefferson St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	5	28	0	0	0	0	0	0	0	0	0	0	0	35	18	0	86	
4:05 PM	9	26	0	0	0	0	0	0	0	0	0	0	0	29	25	0	89	
4:10 PM	5	33	0	0	0	0	0	0	0	0	0	0	0	33	23	0	94	
4:15 PM	8	31	0	0	0	0	0	0	0	0	0	0	0	32	21	0	92	
4:20 PM	8	31	0	0	0	0	0	0	0	0	0	0	0	30	11	0	80	
4:25 PM	8	29	0	0	0	0	0	0	0	0	0	0	0	35	15	0	87	
4:30 PM	12	29	0	0	0	0	0	0	0	0	0	0	0	33	23	0	97	
4:35 PM	16	27	0	0	0	0	0	0	0	0	0	0	0	39	28	0	110	
4:40 PM	5	27	0	0	0	0	0	0	0	0	0	0	0	30	24	0	86	
4:45 PM	7	26	0	0	0	0	0	0	0	0	0	0	0	38	17	0	88	
4:50 PM	13	32	0	0	0	0	0	0	0	0	0	0	0	32	22	0	99	
4:55 PM	15	34	0	0	0	0	0	0	0	0	0	0	0	28	28	0	105	1113
5:00 PM	7	27	0	0	0	0	0	0	0	0	0	0	0	38	19	0	91	1118
5:05 PM	13	32	0	0	0	0	0	0	0	0	0	0	0	40	19	0	104	1133
5:10 PM	7	29	0	0	0	0	0	0	0	0	0	0	0	39	25	0	100	1139
5:15 PM	10	28	0	0	0	0	0	0	0	0	0	0	0	23	26	0	87	1134
5:20 PM	7	29	0	0	0	0	0	0	0	0	0	0	0	35	27	0	98	1152
5:25 PM	11	24	0	0	0	0	0	0	0	0	0	0	0	22	26	0	83	1148
5:30 PM	6	40	0	0	0	0	0	0	0	0	0	0	0	27	20	0	93	1144
5:35 PM	11	39	0	0	0	0	0	0	0	0	0	0	0	32	14	0	96	1130
5:40 PM	6	36	0	0	0	0	0	0	0	0	0	0	0	18	15	0	75	1119
5:45 PM	3	30	0	0	0	0	0	0	0	0	0	0	0	27	9	0	69	1100
5:50 PM	6	35	0	0	0	0	0	0	0	0	0	0	0	31	16	0	88	1089
5:55 PM	9	35	0	0	0	0	0	0	0	0	0	0	0	25	8	0	77	1061
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	140	372	0	0	0	0	0	0	0	0	0	0	0	424	264	0	1200	
Heavy Trucks	8	4	0	0	0	0	0	0	0	0	0	0	0	12	0	0	24	
Pedestrians		80				80				84				212			456	
Bicycles	1	8	0		0	0	0		0	0	0		0	1	2		12	
Railroad																		
Stopped Buses																		

**Comments:**

**LOCATION:** SW 1st Ave -- SW Jefferson St  
**CITY/STATE:** Portland, OR

**QC JOB #:** 13214708  
**DATE:** Thu, Feb 26 2015

**Peak-Hour: 4:30 PM -- 5:30 PM**  
**Peak 15-Min: 5:00 PM -- 5:15 PM**



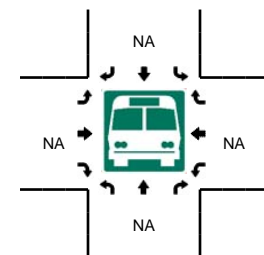
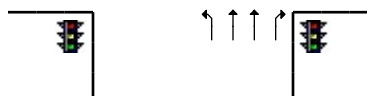
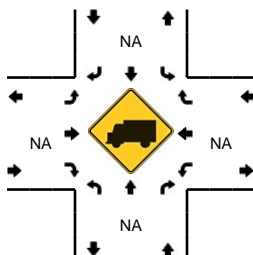
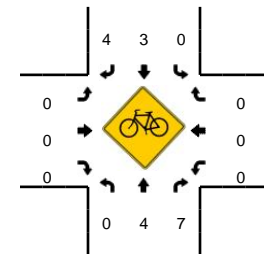
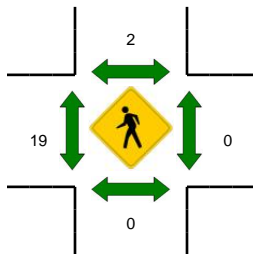
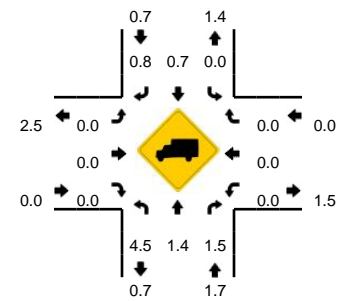
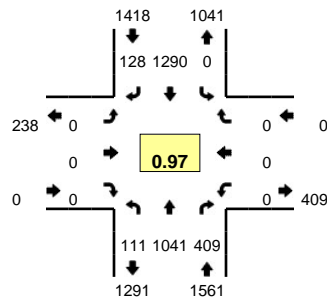
5-Min Count Period Beginning At	SW 1st Ave (Northbound)				SW 1st Ave (Southbound)				SW Jefferson St (Eastbound)				SW Jefferson St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	0	24	20	0	0	0	0	0	4	16	0	0	64	
4:05 PM	0	0	0	0	0	37	19	0	0	0	0	0	2	14	0	0	72	
4:10 PM	0	0	0	0	0	45	20	0	0	0	0	0	5	18	0	0	88	
4:15 PM	0	0	0	0	0	43	17	0	0	0	0	0	2	15	0	0	77	
4:20 PM	0	0	0	0	0	39	8	0	0	0	0	0	7	19	0	0	73	
4:25 PM	0	0	0	0	0	31	17	0	0	0	0	0	2	15	0	0	65	
4:30 PM	0	0	0	0	0	35	20	0	0	0	0	0	2	29	0	0	86	
4:35 PM	0	0	0	0	0	36	19	0	0	0	0	0	8	17	0	0	80	
4:40 PM	0	0	0	0	0	48	18	0	0	0	0	0	3	21	0	0	90	
4:45 PM	0	0	0	0	0	43	17	0	0	0	0	0	5	15	0	0	80	
4:50 PM	0	0	0	0	0	37	24	0	0	0	0	0	4	13	0	0	78	
4:55 PM	0	0	0	0	0	29	17	0	0	0	0	0	3	16	0	0	65	918
5:00 PM	0	0	0	0	0	40	16	0	0	0	0	0	8	21	0	0	85	939
5:05 PM	0	0	0	0	0	45	18	0	0	0	0	0	5	20	0	0	88	955
5:10 PM	0	0	0	0	0	48	20	0	0	0	0	0	8	25	0	0	101	968
5:15 PM	0	0	0	0	0	39	7	0	0	0	0	0	3	14	0	0	63	954
5:20 PM	0	0	0	0	0	52	15	0	0	0	0	0	5	20	0	0	92	973
5:25 PM	0	0	0	0	0	39	16	0	0	0	0	0	9	25	0	0	89	997
5:30 PM	0	0	0	0	0	48	9	0	0	0	0	0	4	7	0	0	68	979
5:35 PM	0	0	0	0	0	35	8	0	0	0	0	0	6	21	0	0	70	969
5:40 PM	0	0	0	0	0	41	11	0	0	0	0	0	2	12	0	0	66	945
5:45 PM	0	0	0	0	0	45	16	0	0	0	0	0	1	13	0	0	75	940
5:50 PM	0	0	0	0	0	29	20	0	0	0	0	0	3	16	0	0	68	930
5:55 PM	0	0	0	0	0	33	10	0	0	0	0	0	8	11	0	0	62	927
<b>Peak 15-Min Flowrates</b>																		
	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	0	0	0	532	216	0	0	0	0	0	84	264	0	0	1096	
Heavy Trucks	0	0	0	0	0	4	4	0	0	0	0	0	0	4	0	0	12	
Pedestrians	116				108				308				216				748	
Bicycles	0	0	0	0	0	0	0	0	0	0	1	0	1	2	0	0	4	
Railroad																		
Stopped Buses																		

Comments:

**LOCATION:** SW Naito Pkwy -- SW Jefferson St  
**CITY/STATE:** Portland, OR

**QC JOB #:** 13214711  
**DATE:** Thu, Feb 26 2015

**Peak-Hour: 4:10 PM -- 5:10 PM**  
**Peak 15-Min: 4:10 PM -- 4:25 PM**

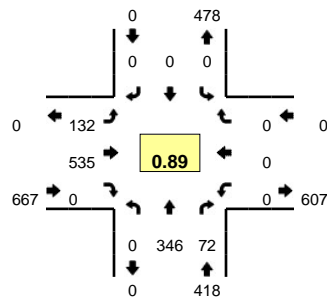


5-Min Count Period Beginning At	SW Naito Pkwy (Northbound)				SW Naito Pkwy (Southbound)				SW Jefferson St (Eastbound)				SW Jefferson St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	8	77	40	0	0	116	12	0	0	0	0	0	0	0	0	0	253	
4:05 PM	6	71	38	1	0	109	8	0	0	0	0	0	0	0	0	0	233	
4:10 PM	6	94	41	1	0	114	14	0	0	0	0	0	0	0	0	0	270	
4:15 PM	13	93	37	0	0	98	5	0	0	0	0	0	0	0	0	0	246	
4:20 PM	9	93	32	0	0	111	10	0	0	0	0	0	0	0	0	0	255	
4:25 PM	11	70	35	0	0	106	6	0	0	0	0	0	0	0	0	0	228	
4:30 PM	13	85	32	0	0	111	16	0	0	0	0	0	0	0	0	0	257	
4:35 PM	5	93	40	0	0	108	14	0	0	0	0	0	0	0	0	0	260	
4:40 PM	9	89	32	0	0	101	13	0	0	0	0	0	0	0	0	0	244	
4:45 PM	7	92	30	0	0	108	11	0	0	0	0	0	0	0	0	0	248	
4:50 PM	6	84	33	0	0	108	9	0	0	0	0	0	0	0	0	0	240	
4:55 PM	14	77	31	0	0	102	6	0	0	0	0	0	0	0	0	0	230	2964
5:00 PM	12	77	32	0	0	109	14	0	0	0	0	0	0	0	0	0	244	2955
5:05 PM	5	94	34	0	0	114	10	0	0	0	0	0	0	0	0	0	257	2979
5:10 PM	14	90	33	0	0	96	12	0	0	0	0	0	0	0	0	0	245	2954
5:15 PM	7	90	29	0	0	116	9	0	0	0	0	0	0	0	0	0	251	2959
5:20 PM	3	98	32	0	0	109	13	0	0	0	0	0	0	0	0	0	255	2959
5:25 PM	11	78	34	1	0	88	14	0	0	0	0	0	0	0	0	0	226	2957
5:30 PM	8	83	25	0	0	108	4	0	0	0	0	0	0	0	0	0	228	2928
5:35 PM	5	77	25	0	0	109	19	0	0	0	0	0	0	0	0	0	235	2903
5:40 PM	1	85	21	1	0	92	7	0	0	0	0	0	0	0	0	0	207	2866
5:45 PM	1	76	28	0	0	103	13	0	0	0	0	0	0	0	0	0	221	2839
5:50 PM	7	67	22	0	0	92	9	0	0	0	0	0	0	0	0	0	197	2796
5:55 PM	8	63	26	0	0	85	6	0	0	0	0	0	0	0	0	0	188	2754
<b>Peak 15-Min Flowrates</b>	<b>Northbound</b>				<b>Southbound</b>				<b>Eastbound</b>				<b>Westbound</b>				<b>Total</b>	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	112	1120	440	4	0	1292	116	0	0	0	0	0	0	0	0	0	3084	
Heavy Trucks	8	12	0		0	4	0		0	0	0		0	0	0		24	
Pedestrians		0				0				4				0			4	
Bicycles	0	1	0		0	1	1		0	0	0		0	0	0		3	
Railroad																		
Stopped Buses																		

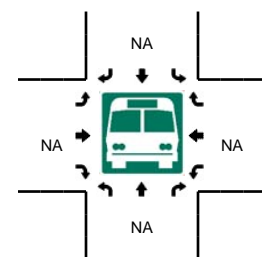
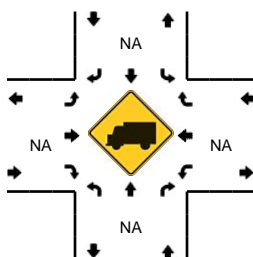
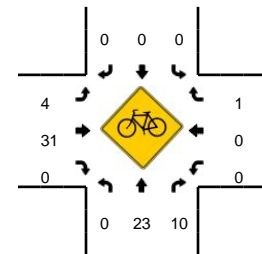
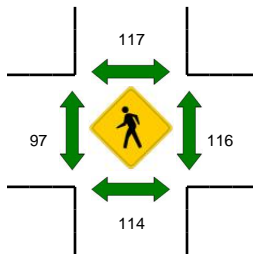
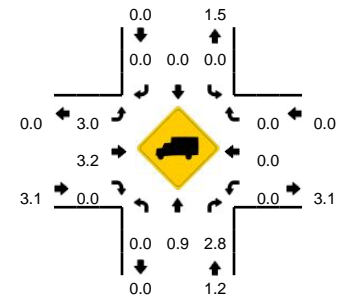
**Comments:**

**LOCATION:** SW 2nd Ave -- SW Columbia St  
**CITY/STATE:** Portland, OR

**QC JOB #:** 13214702  
**DATE:** Thu, Feb 26 2015



**Peak-Hour: 4:45 PM -- 5:45 PM**  
**Peak 15-Min: 5:05 PM -- 5:20 PM**



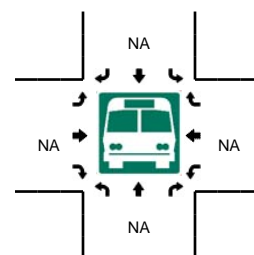
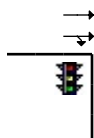
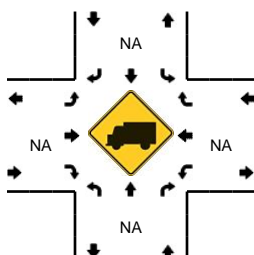
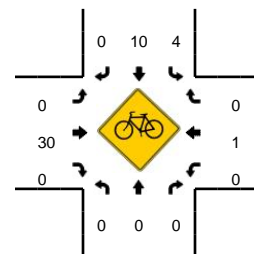
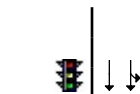
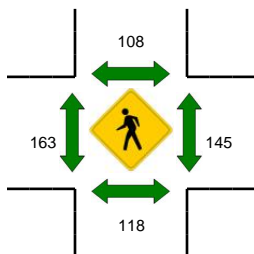
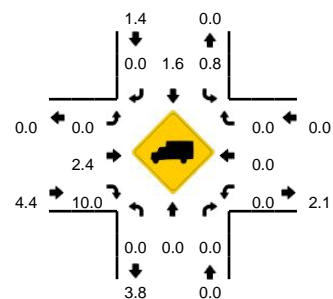
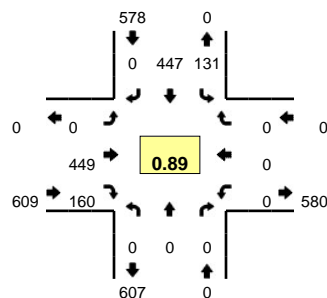
5-Min Count Period Beginning At	SW 2nd Ave (Northbound)				SW 2nd Ave (Southbound)				SW Columbia St (Eastbound)				SW Columbia St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	30	5	0	0	0	0	0	8	36	0	0	0	0	0	0	79	
4:05 PM	0	25	9	0	0	0	0	0	5	41	0	0	0	0	0	0	80	
4:10 PM	0	31	7	0	0	0	0	0	10	33	0	0	0	0	0	0	81	
4:15 PM	0	31	5	0	0	0	0	0	9	49	0	0	0	0	0	0	94	
4:20 PM	0	25	1	0	0	0	0	0	11	31	0	0	0	0	0	0	68	
4:25 PM	0	29	8	0	0	0	0	0	12	33	0	0	0	0	0	0	82	
4:30 PM	0	33	3	0	0	0	0	0	10	40	0	0	0	0	0	0	86	
4:35 PM	0	33	6	0	0	0	0	0	7	41	0	0	0	0	0	0	87	
4:40 PM	0	29	6	0	0	0	0	0	6	31	0	0	0	0	0	0	72	
4:45 PM	0	23	8	0	0	0	0	0	7	48	0	0	0	0	0	0	86	
4:50 PM	0	31	5	0	0	0	0	0	15	45	0	0	0	0	0	0	96	
4:55 PM	0	30	9	0	0	0	0	0	14	41	0	0	0	0	0	0	94	1005
5:00 PM	0	23	3	0	0	0	0	0	8	37	0	0	0	0	0	0	71	997
5:05 PM	0	34	11	0	0	0	0	0	12	43	0	0	0	0	0	0	100	1017
5:10 PM	0	34	3	0	0	0	0	0	9	50	0	0	0	0	0	0	96	1032
5:15 PM	0	26	11	0	0	0	0	0	15	57	0	0	0	0	0	0	109	1047
5:20 PM	0	32	3	0	0	0	0	0	7	44	0	0	0	0	0	0	86	1065
5:25 PM	0	22	3	0	0	0	0	0	15	33	0	0	0	0	0	0	73	1056
5:30 PM	0	28	9	0	0	0	0	0	13	64	0	0	0	0	0	0	114	1084
5:35 PM	0	34	3	0	0	0	0	0	10	37	0	0	0	0	0	0	84	1081
5:40 PM	0	29	4	0	0	0	0	0	7	36	0	0	0	0	0	0	76	1085
5:45 PM	0	27	4	0	0	0	0	0	11	27	0	0	0	0	0	0	69	1068
5:50 PM	0	31	3	0	0	0	0	0	13	40	0	0	0	0	0	0	87	1059
5:55 PM	0	25	3	0	0	0	0	0	13	35	0	0	0	0	0	0	76	1041
<b>Peak 15-Min Flowrates</b>	<b>Northbound</b>				<b>Southbound</b>				<b>Eastbound</b>				<b>Westbound</b>				<b>Total</b>	
All Vehicles	0	376	100	0	0	0	0	0	144	600	0	0	0	0	0	0	1220	
Heavy Trucks	0	0	0	0	0	0	0	0	4	16	0	0	0	0	0	0	20	
Pedestrians		168				140				124				100			532	
Bicycles	0	4	4		0	0	0		2	9	0		0	0	1		20	
Railroad																		
Stopped Buses																		

**Comments:**

**LOCATION:** SW 1st Ave -- SW Columbia St  
**CITY/STATE:** Portland, OR

**QC JOB #:** 13214707  
**DATE:** Thu, Feb 26 2015

**Peak-Hour: 4:35 PM -- 5:35 PM**  
**Peak 15-Min: 5:05 PM -- 5:20 PM**



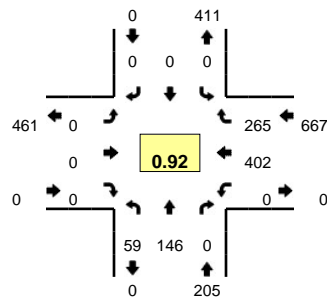
5-Min Count Period Beginning At	SW 1st Ave (Northbound)				SW 1st Ave (Southbound)				SW Columbia St (Eastbound)				SW Columbia St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	7	20	0	0	0	37	5	0	0	0	0	0	69	
4:05 PM	0	0	0	0	8	29	0	0	0	36	10	0	0	0	0	0	83	
4:10 PM	0	0	0	0	11	43	0	0	0	33	10	0	0	0	0	0	97	
4:15 PM	0	0	0	0	10	35	0	0	0	48	6	0	0	0	0	0	99	
4:20 PM	0	0	0	0	12	31	0	0	0	20	12	0	0	0	0	0	75	
4:25 PM	0	0	0	0	11	25	0	0	0	29	10	0	0	0	0	0	75	
4:30 PM	0	0	0	0	12	30	0	0	0	35	14	0	0	0	0	0	91	
4:35 PM	0	0	0	0	14	24	0	0	0	35	11	0	0	0	0	0	84	
4:40 PM	0	0	0	0	10	39	0	0	0	27	8	0	0	0	0	0	84	
4:45 PM	0	0	0	0	11	39	0	0	0	39	14	0	0	0	0	0	103	
4:50 PM	0	0	0	0	8	42	0	0	0	39	14	0	0	0	0	0	103	
4:55 PM	0	0	0	0	9	25	0	0	0	35	15	0	0	0	0	0	84	1047
5:00 PM	0	0	0	0	11	35	0	0	0	31	7	0	0	0	0	0	84	1062
5:05 PM	0	0	0	0	17	37	0	0	0	32	24	0	0	0	0	0	110	1089
5:10 PM	0	0	0	0	10	47	0	0	0	38	18	0	0	0	0	0	113	1105
5:15 PM	0	0	0	0	8	39	0	0	0	47	15	0	0	0	0	0	109	1115
5:20 PM	0	0	0	0	17	33	0	0	0	42	11	0	0	0	0	0	103	1143
5:25 PM	0	0	0	0	9	40	0	0	0	28	9	0	0	0	0	0	86	1154
5:30 PM	0	0	0	0	7	47	0	0	0	56	14	0	0	0	0	0	124	1187
5:35 PM	0	0	0	0	7	24	0	0	0	31	13	0	0	0	0	0	75	1178
5:40 PM	0	0	0	0	9	30	0	0	0	28	11	0	0	0	0	0	78	1172
5:45 PM	0	0	0	0	9	34	0	0	0	24	5	0	0	0	0	0	72	1141
5:50 PM	0	0	0	0	6	24	0	0	0	28	13	0	0	0	0	0	71	1109
5:55 PM	0	0	0	0	9	36	0	0	0	28	12	0	0	0	0	0	85	1110
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
	0	0	0	0	140	492	0	0	0	468	228	0	0	0	0	0	1328	
	0	0	0	0	0	12	0	0	0	8	20	0	0	0	0	0	40	
	0	168	0	0	0	100	0	0	0	216	0	0	0	156	0	0	640	
	0	0	0	0	3	1	0	0	0	12	0	0	0	1	0	0	17	
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Comments:

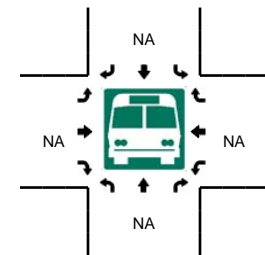
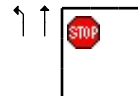
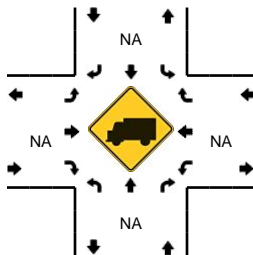
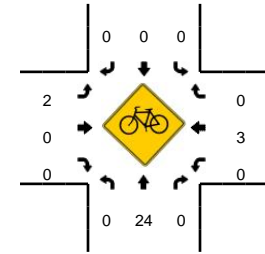
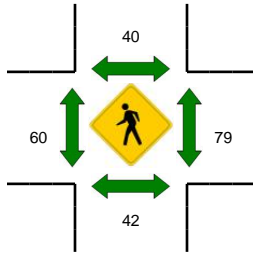
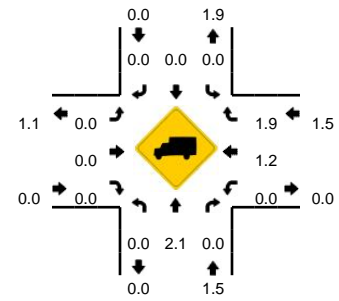


**LOCATION:** SW 2nd Ave -- SW Clay St  
**CITY/STATE:** Portland, OR

**QC JOB #:** 13214701  
**DATE:** Thu, Feb 26 2015



**Peak-Hour: 4:10 PM -- 5:10 PM**  
**Peak 15-Min: 4:55 PM -- 5:10 PM**



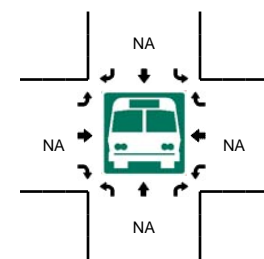
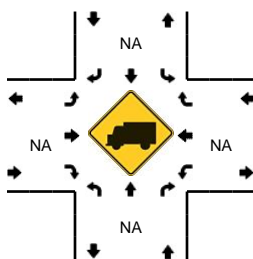
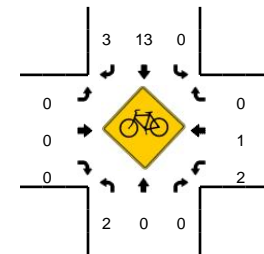
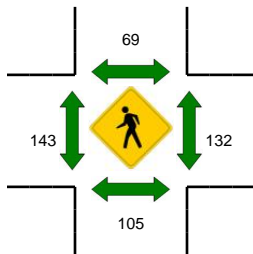
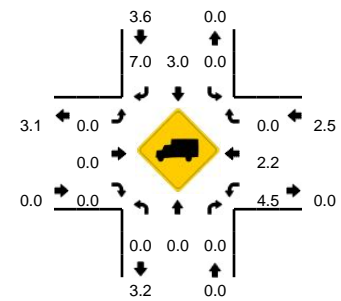
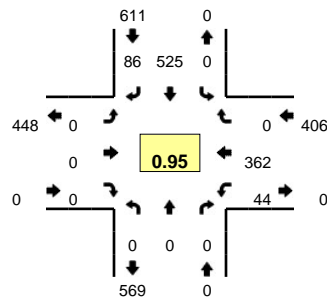
5-Min Count Period Beginning At	SW 2nd Ave (Northbound)				SW 2nd Ave (Southbound)				SW Clay St (Eastbound)				SW Clay St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	7	13	0	0	0	0	0	0	0	0	0	0	0	32	19	0	71	
4:05 PM	6	12	0	0	0	0	0	0	0	0	0	0	0	26	21	0	65	
4:10 PM	4	12	0	0	0	0	0	0	0	0	0	0	0	38	24	0	78	
4:15 PM	6	13	0	0	0	0	0	0	0	0	0	0	0	39	21	0	79	
4:20 PM	8	7	0	0	0	0	0	0	0	0	0	0	0	27	15	0	57	
4:25 PM	2	12	0	0	0	0	0	0	0	0	0	0	0	44	24	0	82	
4:30 PM	3	16	0	0	0	0	0	0	0	0	0	0	0	25	21	0	65	
4:35 PM	3	5	0	0	0	0	0	0	0	0	0	0	0	31	34	0	73	
4:40 PM	8	14	0	0	0	0	0	0	0	0	0	0	0	45	17	0	84	
4:45 PM	4	15	0	0	0	0	0	0	0	0	0	0	0	19	14	0	52	
4:50 PM	0	15	0	0	0	0	0	0	0	0	0	0	0	25	26	0	66	
4:55 PM	6	10	0	0	0	0	0	0	0	0	0	0	0	45	23	0	84	856
5:00 PM	10	12	0	0	0	0	0	0	0	0	0	0	0	29	15	0	66	851
5:05 PM	5	15	0	0	0	0	0	0	0	0	0	0	0	35	31	0	86	872
5:10 PM	11	16	0	0	0	0	0	0	0	0	0	0	0	25	17	0	69	863
5:15 PM	2	17	0	0	0	0	0	0	0	0	0	0	0	14	19	0	52	836
5:20 PM	5	18	0	0	0	0	0	0	0	0	0	0	0	28	24	0	75	854
5:25 PM	5	17	0	0	0	0	0	0	0	0	0	0	0	36	12	0	70	842
5:30 PM	10	18	0	0	0	0	0	0	0	0	0	0	0	22	11	0	61	838
5:35 PM	5	14	0	0	0	0	0	0	0	0	0	0	0	31	22	0	72	837
5:40 PM	1	16	0	0	0	0	0	0	0	0	0	0	0	38	16	0	71	824
5:45 PM	0	10	0	0	0	0	0	0	0	0	0	0	0	27	22	0	59	831
5:50 PM	3	17	0	0	0	0	0	0	0	0	0	0	0	30	20	0	70	835
5:55 PM	3	11	0	0	0	0	0	0	0	0	0	0	0	28	18	0	60	811
<b>Peak 15-Min Flowrates</b>																		
	Northbound				Southbound				Eastbound				Westbound				Total	
All Vehicles	84	148	0	0	0	0	0	0	0	0	0	0	0	436	276	0	944	
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	12	4	0	16	
Pedestrians		52				44				92				112			300	
Bicycles	0	9	0	0	0	0	0	0	1	0	0	0	0	1	0	0	11	
Railroad																		
Stopped Buses																		

**Comments:**

**LOCATION:** SW 1st Ave -- SW Clay St  
**CITY/STATE:** Portland, OR

**QC JOB #:** 13214706  
**DATE:** Thu, Feb 26 2015

**Peak-Hour: 4:45 PM -- 5:45 PM**  
**Peak 15-Min: 5:05 PM -- 5:20 PM**

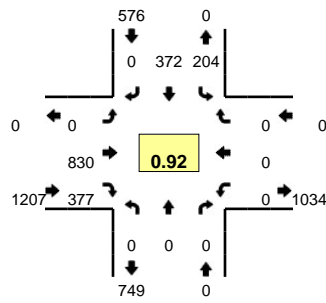


5-Min Count Period Beginning At	SW 1st Ave (Northbound)				SW 1st Ave (Southbound)				SW Clay St (Eastbound)				SW Clay St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	0	14	4	0	0	0	0	0	4	43	0	0	65	
4:05 PM	0	0	0	0	0	34	9	0	0	0	0	0	1	24	0	0	68	
4:10 PM	0	0	0	0	0	41	13	0	0	0	0	0	4	43	0	0	101	
4:15 PM	0	0	0	0	0	32	9	0	0	0	0	0	4	35	0	0	80	
4:20 PM	0	0	0	0	0	38	7	0	0	0	0	0	6	28	0	0	79	
4:25 PM	0	0	0	0	0	25	10	0	0	0	0	0	4	50	0	0	89	
4:30 PM	0	0	0	0	0	37	7	0	0	0	0	0	6	32	0	0	82	
4:35 PM	0	0	0	0	0	32	9	0	0	0	0	0	4	27	0	0	72	
4:40 PM	0	0	0	0	0	29	19	0	0	0	0	0	7	35	0	0	90	
4:45 PM	0	0	0	0	0	45	5	0	0	0	0	0	4	31	0	0	85	
4:50 PM	0	0	0	0	0	44	6	0	0	0	0	0	4	27	0	0	81	
4:55 PM	0	0	0	0	0	28	10	0	0	0	0	0	3	40	0	0	81	973
5:00 PM	0	0	0	0	0	33	5	0	0	0	0	0	8	26	0	0	72	980
5:05 PM	0	0	0	0	0	42	12	0	0	0	0	0	4	35	0	0	93	1005
5:10 PM	0	0	0	0	0	58	13	0	0	0	0	0	4	22	0	0	97	1001
5:15 PM	0	0	0	0	0	48	3	0	0	0	0	0	4	24	0	0	79	1000
5:20 PM	0	0	0	0	0	42	5	0	0	0	0	0	4	30	0	0	81	1002
5:25 PM	0	0	0	0	0	43	8	0	0	0	0	0	1	31	0	0	83	996
5:30 PM	0	0	0	0	0	60	8	0	0	0	0	0	4	19	0	0	91	1005
5:35 PM	0	0	0	0	0	42	4	0	0	0	0	0	3	32	0	0	81	1014
5:40 PM	0	0	0	0	0	40	7	0	0	0	0	0	1	45	0	0	93	1017
5:45 PM	0	0	0	0	0	35	6	0	0	0	0	0	3	36	0	0	80	1012
5:50 PM	0	0	0	0	0	32	5	0	0	0	0	0	2	36	0	0	75	1006
5:55 PM	0	0	0	0	0	39	9	0	0	0	0	0	2	33	0	0	83	1008
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	0	0	0	592	112	0	0	0	0	0	48	324	0	0	1076	
Heavy Trucks	0	0	0	0	0	20	12	0	0	0	0	0	4	4	0	0	40	
Pedestrians		136				60				188				164			548	
Bicycles	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	
Railroad																		
Stopped Buses																		

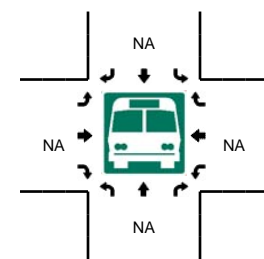
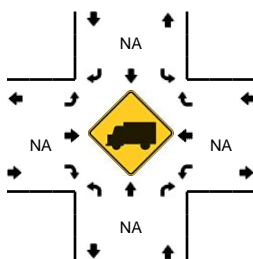
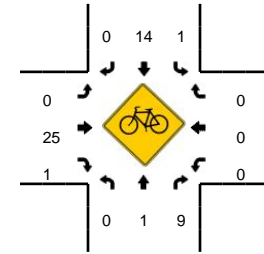
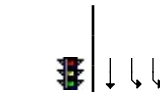
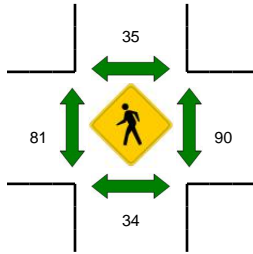
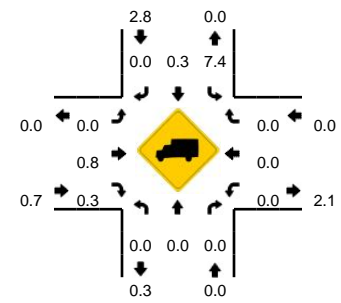
**Comments:**

**LOCATION:** SW 1st Ave -- SW Market St  
**CITY/STATE:** Portland, OR

**QC JOB #:** 13214705  
**DATE:** Thu, Feb 26 2015



**Peak-Hour: 4:45 PM -- 5:45 PM**  
**Peak 15-Min: 5:10 PM -- 5:25 PM**



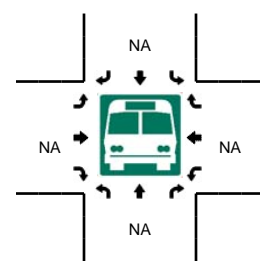
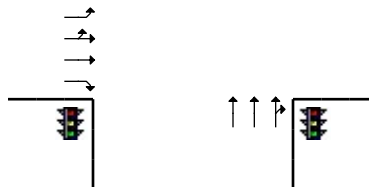
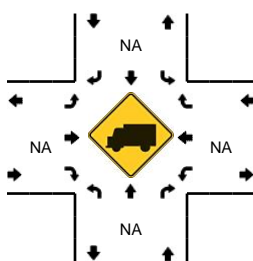
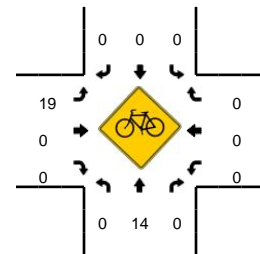
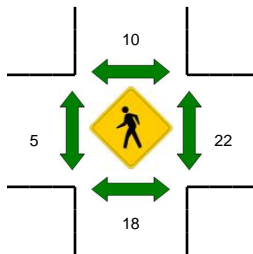
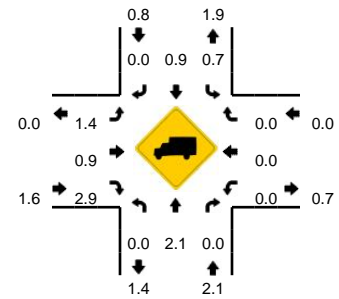
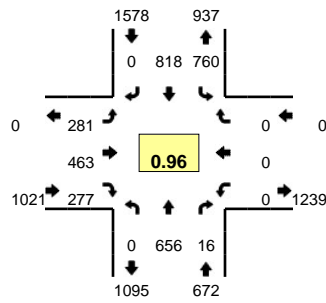
5-Min Count Period Beginning At	SW 1st Ave (Northbound)				SW 1st Ave (Southbound)				SW Market St (Eastbound)				SW Market St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	8	9	0	0	0	91	38	0	0	0	0	0	146	
4:05 PM	0	0	0	0	15	16	0	0	0	69	30	0	0	0	0	0	130	
4:10 PM	0	0	0	0	24	19	0	0	0	72	30	0	0	0	0	0	145	
4:15 PM	0	0	0	0	20	18	0	0	0	81	25	0	0	0	0	0	144	
4:20 PM	0	0	0	0	15	29	0	0	0	59	30	0	0	0	0	0	133	
4:25 PM	0	0	0	0	15	15	0	0	0	64	31	0	0	0	0	0	125	
4:30 PM	0	0	0	0	18	22	0	0	0	71	29	0	0	0	0	0	140	
4:35 PM	0	0	0	0	11	24	0	0	0	66	17	0	0	0	0	0	118	
4:40 PM	0	0	0	0	14	21	0	0	0	59	34	0	0	0	0	0	128	
4:45 PM	0	0	0	0	18	32	0	0	0	71	32	0	0	0	0	0	153	
4:50 PM	0	0	0	0	16	36	0	0	0	57	27	0	0	0	0	0	136	
4:55 PM	0	0	0	0	7	23	0	0	0	65	30	0	0	0	0	0	125	1623
5:00 PM	0	0	0	0	19	22	0	0	0	78	34	0	0	0	0	0	153	1630
5:05 PM	0	0	0	0	20	30	0	0	0	70	29	0	0	0	0	0	149	1649
5:10 PM	0	0	0	0	22	38	0	0	0	73	37	0	0	0	0	0	170	1674
5:15 PM	0	0	0	0	23	31	0	0	0	79	34	0	0	0	0	0	167	1697
5:20 PM	0	0	0	0	16	29	0	0	0	74	31	0	0	0	0	0	150	1714
5:25 PM	0	0	0	0	11	32	0	0	0	72	29	0	0	0	0	0	144	1733
5:30 PM	0	0	0	0	19	45	0	0	0	63	38	0	0	0	0	0	165	1758
5:35 PM	0	0	0	0	13	30	0	0	0	66	33	0	0	0	0	0	142	1782
5:40 PM	0	0	0	0	20	24	0	0	0	62	23	0	0	0	0	0	129	1783
5:45 PM	0	0	0	0	19	18	0	0	0	54	33	0	0	0	0	0	124	1754
5:50 PM	0	0	0	0	13	21	0	0	0	52	21	0	0	0	0	0	107	1725
5:55 PM	0	0	0	0	15	26	0	0	0	50	15	0	0	0	0	0	106	1706
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	0	0	244	392	0	0	0	904	408	0	0	0	0	0	1948	
Heavy Trucks	0	0	0	0	20	0	0	0	0	8	0	0	0	0	0	0	28	
Pedestrians		48				36				92				100			276	
Bicycles	0	1	4		0	1	0		0	8	0		0	0	0		14	
Railroad																		
Stopped Buses																		

**Comments:**

**LOCATION:** SW Naito Pkwy -- SW Market St  
**CITY/STATE:** Portland, OR

**QC JOB #:** 13214710  
**DATE:** Thu, Feb 26 2015

**Peak-Hour: 4:00 PM -- 5:00 PM**  
**Peak 15-Min: 4:10 PM -- 4:25 PM**



5-Min Count Period Beginning At	SW Naito Pkwy (Northbound)				SW Naito Pkwy (Southbound)				SW Market St (Eastbound)				SW Market St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	60	1	0	64	63	0	0	21	44	27	0	0	0	0	0	280	
4:05 PM	0	46	3	0	77	62	0	0	20	29	23	0	0	0	0	0	260	
4:10 PM	0	55	2	0	69	62	0	0	28	58	25	0	0	0	0	0	299	
4:15 PM	0	59	0	0	54	79	0	0	26	36	29	0	0	0	0	0	283	
4:20 PM	0	49	2	0	72	72	0	0	19	34	22	0	0	0	0	0	270	
4:25 PM	0	59	1	0	50	62	0	0	20	44	33	0	0	0	0	0	269	
4:30 PM	0	72	3	0	64	73	0	0	27	32	19	0	0	0	0	0	290	
4:35 PM	0	51	0	0	68	80	0	0	22	36	21	0	0	0	0	0	278	
4:40 PM	0	62	0	0	46	73	0	0	18	49	16	0	0	0	0	0	264	
4:45 PM	0	56	0	0	68	65	0	0	33	34	21	0	0	0	0	0	277	
4:50 PM	0	44	1	0	66	66	0	0	21	29	17	0	0	0	0	0	244	
4:55 PM	0	43	3	0	62	61	0	0	26	38	24	0	0	0	0	0	257	3271
5:00 PM	0	45	3	0	80	66	0	0	29	38	18	0	0	0	0	0	279	3270
5:05 PM	0	43	1	0	65	58	0	0	26	41	22	0	0	0	0	0	256	3266
5:10 PM	0	41	2	0	57	68	0	0	32	54	25	0	0	0	0	0	279	3246
5:15 PM	0	50	0	0	63	78	0	0	27	41	21	0	0	0	0	0	280	3243
5:20 PM	0	40	0	0	74	65	0	0	28	39	17	0	0	0	0	0	263	3236
5:25 PM	0	44	1	0	46	73	0	0	39	40	17	0	0	0	0	0	260	3227
5:30 PM	0	35	1	0	68	68	0	0	30	32	20	0	0	0	0	0	254	3191
5:35 PM	0	35	0	0	64	47	0	0	20	39	8	0	0	0	0	0	213	3126
5:40 PM	0	45	0	0	56	70	0	0	30	48	15	0	0	0	0	0	264	3126
5:45 PM	0	47	2	0	69	66	0	0	20	39	19	0	0	0	0	0	262	3111
5:50 PM	0	50	0	0	48	61	0	0	14	25	15	0	0	0	0	0	213	3080
5:55 PM	0	37	2	0	54	44	0	0	17	38	18	0	0	0	0	0	210	3033
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	652	16	0	780	852	0	0	292	512	304	0	0	0	0	0	3408	
Heavy Trucks	0	8	0	0	4	4	0	0	0	8	8	0	0	0	0	0	32	
Pedestrians	4				20				0				20				44	
Bicycles	0	6	0	0	0	0	0	0	4	0	0	0	0	0	0	0	10	
Railroad																		
Stopped Buses																		

Comments:



## **APPENDIX B – Volume Development**



Project: Multnomah County Courthouse  
 Job #: MULT0000-0072  
 Subject: **PM Turning Movement Volumes**  
 Created: 3/2/2015  
 Rev. Date: 3/6/2015

3/6/2015

Updated - 3/3/2015

Growth Rate =

N-S ID	Synchro ID	Intersection	Direction	Movement	Int ID	Existing Counts	Existing	Existing	1%	Volume Balancing	2020
						2015 1-Hr Volume PM Peak	2015 Heavy Vehicle Count	2015 Heavy Vehicle Percentage	Unbalanced Volumes PM Peak		
1	10	SW 2nd Ave @SW Madison St	EB	EBL	10	60	4	7%	65	0	65
	10	2 hr PM Turning Movement Count		EBT	10	1263	44	3%	1325	0	1325
	10	Count Date: 2/26/2015		EBR	10	0	0	0%	0	0	0
	10	2015	WB	WBL	10	0	0	0%	0	0	0
	10	Signalized		WBT	10	0	0	0%	0	0	0
	10			WBR	10	0	0	0%	0	0	0
	10	PM Peak Hour: 4:45 PM-5:45 PM	NB	NBL	10	0	0	0%	0	0	0
	10	PM Peak Hour Used: 4:45 PM-5:45 PM		NBT	10	412	4	1%	435	0	435
	10			NBR	10	234	1	0%	245	0	245
	10	PHF:	SB	SBL	10	0	0	0%	0	0	0
	10	0.95		SBT	10	0	0	0%	0	0	0
	10			SBR	10	0	0	0%	0	0	0
			TEV	TEV	10	1969	53		2070	0	2070
2	20	SW 1st Ave @SW Madison St	EB	EBL	20	0	0	0%	0	0	0
	20	2 hr PM Turning Movement Count		EBT	20	1418	44	3%	1490	0	1490
	20	Count Date: 2/26/2015		EBR	20	74	0	0%	80	0	80
	20	2015	WB	WBL	20	0	0	0%	0	0	0
	20	Signalized		WBT	20	0	0	0%	0	0	0
	20			WBR	20	0	0	0%	0	0	0
	20	PM Peak Hour: 5:00 PM-6:00 PM	NB	NBL	20	0	0	0%	0	0	0
	20	PM Peak Hour Used: 4:45 PM-5:45 PM		NBT	20	0	0	0%	0	0	0
	20			NBR	20	0	0	0%	0	0	0
	20	PHF:	SB	SBL	20	137	2	1%	145	0	145
	20	0.95		SBT	20	606	7	1%	635	0	635
	20			SBR	20	0	0	0%	0	0	0
			TEV	TEV	20	2235	53		2350	0	2350
3	30	SW 2nd Ave @SW Jefferson St	EB	EBL	30	0	0	0%	0	0	0
	30	2 hr PM Turning Movement Count		EBT	30	0	0	0%	0	0	0
	30	Count Date: 2/26/2015		EBR	30	0	0	0%	0	0	0
	30	2015	WB	WBL	30	0	0	0%	0	0	0
	30	Signalized		WBT	30	372	7	2%	390	0	390
	30			WBR	30	258	0	0%	270	0	270
	30	PM Peak Hour: 4:30 PM-5:30 PM	NB	NBL	30	113	2	2%	120	0	120
	30	PM Peak Hour Used: 4:45 PM-5:45 PM		NBT	30	376	4	1%	395	10	405
	30			NBR	30	0	0	0%	0	0	0
	30	PHF:	SB	SBL	30	0	0	0%	0	0	0
	30	0.95		SBT	30	0	0	0%	0	0	0
	30			SBR	30	0	0	0%	0	0	0
			TEV	TEV	30	1119	13		1175	10	1185
4	40	SW 1st Ave @SW Jefferson St	EB	EBL	40	0	0	0%	0	0	0
	40	2 hr PM Turning Movement Count		EBT	40	0	0	0%	0	0	0
	40	Count Date: 2/26/2015		EBR	40	0	0	0%	0	0	0
	40	2015	WB	WBL	40	62	2	3%	65	0	65
	40	Signalized		WBT	40	209	5	2%	220	0	220
	40			WBR	40	0	0	0%	0	0	0
	40	PM Peak Hour: 4:30 PM-5:30 PM	NB	NBL	40	0	0	0%	0	0	0
	40	PM Peak Hour Used: 4:45 PM-5:45 PM		NBT	40	0	0	0%	0	0	0
	40			NBR	40	0	0	0%	0	0	0
	40	PHF:	SB	SBL	40	0	0	0%	0	0	0
	40	0.86		SBT	40	496	5	1%	520	0	520
	40	0		SBR	40	178	2	1%	185	0	185
			TEV	TEV	40	945	14		990	0	990
5	50	SW Naito Pkwy @SW Jefferson St	EB	EBL	50	0	0	0%	0	0	0
	50	2 hr PM Turning Movement Count		EBT	50	0	0	0%	0	0	0
	50	Count Date: 2/26/2015		EBR	50	0	0	0%	0	0	0
	50	2015	WB	WBL	50	0	0	0%	0	0	0
	50	Signalized		WBT	50	0	0	0%	0	0	0
	50			WBR	50	0	0	0%	0	0	0
	50	PM Peak Hour: 4:00 PM-5:00 PM	NB	NBL	50	93	8	9%	100	0	100
	50	PM Peak Hour Used: 4:45 PM-5:45 PM		NBT	50	1025	13	1%	1075	0	1075
	50			NBR	50	359	4	1%	375	0	375
	50	PHF:	SB	SBL	50	0	0	0%	0	0	0
	50	0.96		SBT	50	1259	7	1%	1325	0	1325
	50			SBR	50	128	1	1%	135	0	135
			TEV	TEV	50	2864	33		3010	0	3010



Project: Multnomah County Courthouse  
 Job #: MULT0000-0072  
 Subject: **PM Turning Movement Volumes**  
 Created: 3/2/2015  
 Rev. Date: 3/6/2015

3/6/2015

Updated - 3/3/2015

Growth Rate =

Created: 3/2/2015						Existing Counts 2015 1-Hr Volume PM Peak		Existing 2015 Heavy Vehicle Count		Existing 2015 Heavy Vehicle Percentage		1% 2020 Unbalanced Volumes PM Peak		Volume Balancing Adjustments		2020 Balanced Volumes PM Peak	
Rev. Date: 3/6/2015																	
N-S ID		Synchro ID		Intersection		Direction		Movement		Int ID							
6		60	SW 2nd Ave @SW Columbia St				EB		EBL	60	132	4	3%	140	0	140	
		60	2 hr PM Turning Movement Count						EBT	60	535	17	3%	560	10	570	
		60	Count Date: 2/26/2015						EBR	60	0	0	0%	0	0	0	
		60	2015				WB		WBL	60	0	0	0%	0	0	0	
		60	Signalized						WBT	60	0	0	0%	0	0	0	
		60							WBR	60	0	0	0%	0	0	0	
		60	PM Peak Hour: 4:45 PM-5:45 PM				NB		NBL	60	0	0	0%	0	0	0	
		60	PM Peak Hour Used: 4:45 PM-5:45 PM						NBT	60	346	3	1%	365	15	380	
		60							NBR	60	72	2	3%	75	0	75	
		60					SB		SBL	60	0	0	0%	0	0	0	
		60	PHF:						SBT	60	0	0	0%	0	0	0	
		60	0.98						SBR	60	0	0	0%	0	0	0	
							TEV		TEV	60	1085	26		1140	25	1165	
7		70	SW 1st Ave @SW Columbia St				EB		EBL	70	0	0	0%	0	0	0	
		70	2 hr PM Turning Movement Count						EBT	70	446	8	2%	470	0	470	
		70	Count Date: 2/26/2015						EBR	70	165	16	10%	175	0	175	
		70	2015				WB		WBL	70	0	0	0%	0	0	0	
		70	Signalized						WBT	70	0	0	0%	0	0	0	
		70							WBR	70	0	0	0%	0	0	0	
		70	PM Peak Hour: 4:45 PM-5:45 PM				NB		NBL	70	0	0	0%	0	0	0	
		70	PM Peak Hour Used: 4:45 PM-5:45 PM						NBT	70	0	0	0%	0	0	0	
		70							NBR	70	0	0	0%	0	0	0	
		70					SB		SBL	70	123	1	1%	130	0	130	
		70	PHF:						SBT	70	438	7	2%	460	0	460	
		70	0.95						SBR	70	0	0	0%	0	0	0	
							TEV		TEV	70	1172	32		1235	0	1235	
8		80	SW 2nd Ave @SW Clay St				EB		EBL	80	0	0	0%	0	0	0	
		80	2 hr PM Turning Movement Count						EBT	80	0	0	0%	0	0	0	
		80	Count Date: 2/26/2015						EBR	80	0	0	0%	0	0	0	
		80	2015				WB		WBL	80	0	0	0%	0	0	0	
		80							WBT	80	347	8	2%	365	0	365	
		80							WBR	80	230	3	1%	240	15	255	
		80	PM Peak Hour: 4:15 PM-5:15 PM				NB		NBL	80	64	0	0%	65	0	65	
		80	PM Peak Hour Used: 4:45 PM-5:45 PM						NBT	80	183	1	1%	190	0	190	
		80							NBR	80	0	0	0%	0	0	0	
		80					SB		SBL	80	0	0	0%	0	0	0	
		80	PHF:						SBT	80	0	0	0%	0	0	0	
		80	0.93						SBR	80	0	0	0%	0	0	0	
							TEV		TEV	80	824	12		860	15	875	
9		90	SW 1st Ave @SW Clay St				EB		EBL	90	0	0	0%	0	0	0	
		90	2 hr PM Turning Movement Count						EBT	90	0	0	0%	0	0	0	
		90	Count Date: 2/26/2015						EBR	90	0	0	0%	0	0	0	
		90	2015				WB		WBL	90	44	2	5%	45	5	50	
		90	Signalized						WBT	90	362	8	2%	380	0	380	
		90							WBR	90	0	0	0%	0	0	0	
		90	PM Peak Hour: 4:45 PM-5:45 PM				NB		NBL	90	0	0	0%	0	0	0	
		90	PM Peak Hour Used: 4:45 PM-5:45 PM						NBT	90	0	0	0%	0	0	0	
		90							NBR	90	0	0	0%	0	0	0	
		90					SB		SBL	90	0	0	0%	0	0	0	
		90	PHF:						SBT	90	525	16	3%	550	0	550	
		90	0.96						SBR	90	86	6	7%	90	0	90	
							TEV		TEV	90	1017	32		1065	5	1070	
10		100	SW 1st Ave @SW Market St				EB		EBL	100	0	0	0%	0	0	0	
		100	2 hr PM Turning Movement Count						EBT	100	830	7	1%	870	5	875	
		100	Count Date: 2/26/2015						EBR	100	377	1	0%	395	0	395	
		100	2015				WB		WBL	100	0	0	0%	0	0	0	
		100	Signalized						WBT	100	0	0	0%	0	0	0	
		100							WBR	100	0	0	0%	0	0	0	
		100	PM Peak Hour: 4:45 PM-5:45 PM				NB		NBL	100	0	0	0%	0	0	0	
		100	PM Peak Hour Used: 4:45 PM-5:45 PM						NBT	100	0	0	0%	0	0	0	
		100							NBR	100	0	0	0%	0	0	0	
		100					SB		SBL	100	204	15	7%	215	0	215	
		100	PHF:						SBT	100	372	1	0%	390	-5	385	
		100	0.94						SBR	100	0	0	0%	0	0	0	
							TEV		TEV	100	1783	24		1870	0	1870	
11		110	SW Naito Pkwy @SW Market St				EB		EBL	110	341	5	1%	360	0	360	
		110	2 hr PM Turning Movement Count						EBT	110	473	7	1%	495	0	495	
		110	Count Date: 2/26/2015						EBR	110	225	9	4%	235	0	235	
		110	2015				WB		WBL	110	0	0	0%	0	0	0	
		110	Signalized						WBT	110	0	0	0%	0	0	0	
		110							WBR	110	0	0	0%	0	0	0	
		110	PM Peak Hour: 4:00 PM-5:00 PM				NB		NBL	110	0	0	0%	0	0	0	
		110	PM Peak Hour Used: 4:45 PM-5:45 PM						NBT	110	521	9	2%	550	0	550	
		110							NBR	110	12	0	0%	15	0	15	
		110					SB		SBL	110	769	2	0%	810	0	810	
		110	PHF:						SBT	110	785	5	1%	825	0	825	
		110	0.96						SBR	110	0	0	0%	0	0	0	
							TEV		TEV	110	3126	37		3290	0	3290	

















## **APPENDIX C – Traffic Operations**



# HCM Signalized Intersection Capacity Analysis

## 10: SW 2nd Ave & SW Madison St













3/5/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 						 				
Volume (vph)	65	1325	0	0	0	0	0	435	245	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0						4.0				
Lane Util. Factor		0.95						0.95				
Frpb, ped/bikes		1.00						0.90				
Flpb, ped/bikes		1.00						1.00				
Frt		1.00						0.95				
Flt Protected		1.00						1.00				
Satd. Flow (prot)		2967						2591				
Flt Permitted		1.00						1.00				
Satd. Flow (perm)		2967						2591				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	68	1395	0	0	0	0	0	458	258	0	0	0
RTOR Reduction (vph)	0	8	0	0	0	0	0	32	0	0	0	0
Lane Group Flow (vph)	0	1456	0	0	0	0	0	684	0	0	0	0
Confl. Peds. (#/hr)	130								247			
Confl. Bikes (#/hr)									29			
Heavy Vehicles (%)	7%	3%	0%	0%	0%	0%	0%	1%	1%	0%	0%	0%
Turn Type	Perm	NA						NA				
Protected Phases		4						2				
Permitted Phases	4											
Actuated Green, G (s)		35.0						17.0				
Effective Green, g (s)		35.0						17.0				
Actuated g/C Ratio		0.58						0.28				
Clearance Time (s)		4.0						4.0				
Lane Grp Cap (vph)		1730						734				
v/s Ratio Prot								c0.26				
v/s Ratio Perm		0.49										
v/c Ratio		0.84						0.93				
Uniform Delay, d1		10.2						20.9				
Progression Factor		1.00						0.57				
Incremental Delay, d2		5.1						19.2				
Delay (s)		15.4						31.2				
Level of Service		B						C				
Approach Delay (s)		15.4			0.0			31.2			0.0	
Approach LOS		B			A			C			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			20.6					HCM 2000 Level of Service		C		
HCM 2000 Volume to Capacity ratio			0.87									
Actuated Cycle Length (s)			60.0					Sum of lost time (s)		8.0		
Intersection Capacity Utilization			87.0%					ICU Level of Service		E		
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 20: SW 1st Avenue & SW Madison St

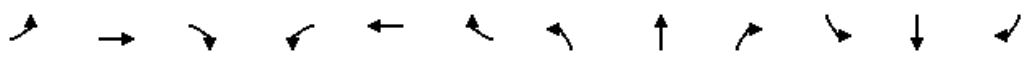
3/5/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑								↑↑↑	
Volume (vph)	0	1490	80	0	0	0	0	0	0	145	635	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.2	4.2								4.5	
Lane Util. Factor		0.95	1.00								0.91	
Frpb, ped/bikes		1.00	0.94								1.00	
Flpb, ped/bikes		1.00	1.00								0.98	
Frt		1.00	0.85								1.00	
Flt Protected		1.00	1.00								0.99	
Satd. Flow (prot)		2988	1296								4232	
Flt Permitted		1.00	1.00								0.99	
Satd. Flow (perm)		2988	1296								4232	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1568	84	0	0	0	0	0	0	153	668	0
RTOR Reduction (vph)	0	0	10	0	0	0	0	0	0	0	33	0
Lane Group Flow (vph)	0	1568	74	0	0	0	0	0	0	0	788	0
Confl. Peds. (#/hr)			103								91	
Heavy Vehicles (%)	0%	3%	0%	0%	0%	0%	0%	0%	0%	1%	1%	0%
Turn Type		NA	Perm								Perm	NA
Protected Phases		4									2	
Permitted Phases			4								2	
Actuated Green, G (s)		38.8	38.8								12.5	
Effective Green, g (s)		38.8	38.8								12.5	
Actuated g/C Ratio		0.65	0.65								0.21	
Clearance Time (s)		4.2	4.2								4.5	
Lane Grp Cap (vph)		1932	838								881	
v/s Ratio Prot		c0.52										
v/s Ratio Perm			0.06								0.19	
v/c Ratio		0.81	0.09								0.89	
Uniform Delay, d1		7.9	4.0								23.1	
Progression Factor		0.30	0.29								1.00	
Incremental Delay, d2		1.9	0.1								13.5	
Delay (s)		4.3	1.3								36.6	
Level of Service		A	A								D	
Approach Delay (s)		4.1			0.0			0.0			36.6	
Approach LOS		A			A			A			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			14.9									
HCM 2000 Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			60.0									
Intersection Capacity Utilization			97.0%									
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

30: SW 2nd Ave & SW Jefferson St

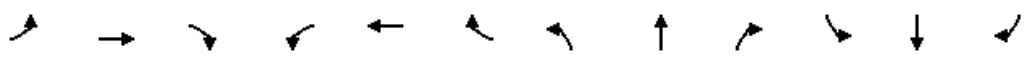
3/5/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑	↑		↑↑				
Volume (vph)	0	0	0	0	390	270	120	405	0	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.0	4.0		4.0				
Lane Util. Factor					0.95	1.00		0.95				
Frpb, ped/bikes					1.00	0.96		1.00				
Flpb, ped/bikes					1.00	1.00		0.99				
Frt					1.00	0.85		1.00				
Flt Protected					1.00	1.00		0.99				
Satd. Flow (prot)					3018	1327		2967				
Flt Permitted					1.00	1.00		0.99				
Satd. Flow (perm)					3018	1327		2967				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	0	411	284	126	426	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	146	0	46	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	411	138	0	506	0	0	0	0
Confl. Peds. (#/hr)						39	77					
Heavy Vehicles (%)	0%	0%	0%	0%	2%	0%	2%	1%	0%	0%	0%	0%
Turn Type					NA	Perm	Perm	NA				
Protected Phases					4			2				
Permitted Phases						4	2					
Actuated Green, G (s)					28.0	28.0		24.0				
Effective Green, g (s)					28.0	28.0		24.0				
Actuated g/C Ratio					0.47	0.47		0.40				
Clearance Time (s)					4.0	4.0		4.0				
Lane Grp Cap (vph)					1408	619		1186				
v/s Ratio Prot					c0.14							
v/s Ratio Perm						0.10		0.17				
v/c Ratio					0.29	0.22		0.43				
Uniform Delay, d1					9.9	9.5		13.0				
Progression Factor					1.10	1.49		0.76				
Incremental Delay, d2					0.5	0.8		1.0				
Delay (s)					11.4	15.0		10.9				
Level of Service					B	B		B				
Approach Delay (s)		0.0			12.9			10.9			0.0	
Approach LOS		A			B			B			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			12.0		HCM 2000 Level of Service					B		
HCM 2000 Volume to Capacity ratio			0.35									
Actuated Cycle Length (s)			60.0		Sum of lost time (s)					8.0		
Intersection Capacity Utilization			77.2%		ICU Level of Service					D		
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

40: SW 1st Avenue & SW Jefferson St





3/5/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕↕						↕↕	↗
Volume (vph)	0	0	0	65	220	0	0	0	0	0	520	185
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.0						4.0	4.0
Lane Util. Factor					0.95						0.95	1.00
Frpb, ped/bikes					1.00						1.00	0.88
Flpb, ped/bikes					0.99						1.00	1.00
Frt					1.00						1.00	0.85
Flt Protected					0.99						1.00	1.00
Satd. Flow (prot)					2936						3048	1194
Flt Permitted					0.99						1.00	1.00
Satd. Flow (perm)					2936						3048	1194
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	0	0	0	76	256	0	0	0	0	0	605	215
RTOR Reduction (vph)	0	0	0	0	46	0	0	0	0	0	0	111
Lane Group Flow (vph)	0	0	0	0	286	0	0	0	0	0	605	104
Confl. Peds. (#/hr)				76								185
Heavy Vehicles (%)	0%	0%	0%	3%	2%	0%	0%	0%	0%	0%	1%	1%
Turn Type				Perm	NA						NA	Perm
Protected Phases					4						2	
Permitted Phases				4								2
Actuated Green, G (s)					23.0						29.0	29.0
Effective Green, g (s)					23.0						29.0	29.0
Actuated g/C Ratio					0.38						0.48	0.48
Clearance Time (s)					4.0						4.0	4.0
Lane Grp Cap (vph)					1125						1473	577
v/s Ratio Prot											c0.20	
v/s Ratio Perm					0.10							0.09
v/c Ratio					0.25						0.41	0.18
Uniform Delay, d1					12.6						10.0	8.8
Progression Factor					1.00						0.65	1.47
Incremental Delay, d2					0.5						0.6	0.4
Delay (s)					13.2						7.1	13.3
Level of Service					B						A	B
Approach Delay (s)		0.0			13.2			0.0			8.7	
Approach LOS		A			B			A			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			10.0		HCM 2000 Level of Service					B		
HCM 2000 Volume to Capacity ratio			0.34									
Actuated Cycle Length (s)			60.0		Sum of lost time (s)				8.0			
Intersection Capacity Utilization			71.0%		ICU Level of Service				C			
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 50: SW Naito Pkwy & SW Jefferson St

3/5/2015

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	0	100	1450	1325	135
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)			4.0	4.5	4.5	
Lane Util. Factor			1.00	0.95	0.95	
Frpb, ped/bikes			1.00	1.00	1.00	
Flpb, ped/bikes			1.00	1.00	1.00	
Frt			1.00	1.00	0.99	
Flt Protected			0.95	1.00	1.00	
Satd. Flow (prot)			1563	3386	3325	
Flt Permitted			0.17	1.00	1.00	
Satd. Flow (perm)			279	3386	3325	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	104	1510	1380	141
RTOR Reduction (vph)	0	0	0	0	9	0
Lane Group Flow (vph)	0	0	104	1510	1512	0
Confl. Peds. (#/hr)			16			16
Confl. Bikes (#/hr)						15
Heavy Vehicles (%)	0%	0%	9%	1%	1%	1%
Turn Type			custom	NA	NA	
Protected Phases				2 4	2	
Permitted Phases			4			
Actuated Green, G (s)			30.5	90.0	51.0	
Effective Green, g (s)			30.5	86.0	51.0	
Actuated g/C Ratio			0.34	0.96	0.57	
Clearance Time (s)			4.0		4.5	
Vehicle Extension (s)			1.0		0.2	
Lane Grp Cap (vph)			94	3235	1884	
v/s Ratio Prot				0.45	c0.45	
v/s Ratio Perm			c0.37			
v/c Ratio			1.11	0.47	0.80	
Uniform Delay, d1			29.8	0.2	15.5	
Progression Factor			1.00	1.00	1.00	
Incremental Delay, d2			124.5	0.0	3.7	
Delay (s)			154.2	0.2	19.2	
Level of Service			F	A	B	
Approach Delay (s)	0.0			10.1	19.2	
Approach LOS	A			B	B	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			14.5	HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			0.91			
Actuated Cycle Length (s)			90.0	Sum of lost time (s)		8.5
Intersection Capacity Utilization			51.4%	ICU Level of Service		A
Analysis Period (min)			15			

















c Critical Lane Group



# HCM Signalized Intersection Capacity Analysis

60: SW 2nd Ave & SW Columbia St

















3/5/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 						 				
Volume (vph)	140	570	0	0	0	0	0	380	75	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0						4.0				
Lane Util. Factor		0.95						0.95				
Frpb, ped/bikes		1.00						0.98				
Flpb, ped/bikes		0.99						1.00				
Frt		1.00						0.98				
Flt Protected		0.99						1.00				
Satd. Flow (prot)		2915						2907				
Flt Permitted		0.99						1.00				
Satd. Flow (perm)		2915						2907				
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	143	582	0	0	0	0	0	388	77	0	0	0
RTOR Reduction (vph)	0	36	0	0	0	0	0	28	0	0	0	0
Lane Group Flow (vph)	0	689	0	0	0	0	0	437	0	0	0	0
Confl. Peds. (#/hr)	117								116			
Confl. Bikes (#/hr)									33			
Heavy Vehicles (%)	3%	3%	0%	0%	0%	0%	0%	1%	3%	0%	0%	0%
Turn Type	Perm	NA						NA				
Protected Phases		4						2				
Permitted Phases	4											
Actuated Green, G (s)		28.0						24.0				
Effective Green, g (s)		28.0						24.0				
Actuated g/C Ratio		0.47						0.40				
Clearance Time (s)		4.0						4.0				
Lane Grp Cap (vph)		1360						1162				
v/s Ratio Prot								c0.15				
v/s Ratio Perm		0.24										
v/c Ratio		0.51						0.38				
Uniform Delay, d1		11.2						12.7				
Progression Factor		1.00						1.40				
Incremental Delay, d2		1.4						0.9				
Delay (s)		12.5						18.7				
Level of Service		B						B				
Approach Delay (s)		12.5			0.0			18.7			0.0	
Approach LOS		B			A			B			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay		14.9						HCM 2000 Level of Service		B		
HCM 2000 Volume to Capacity ratio		0.45										
Actuated Cycle Length (s)		60.0						Sum of lost time (s)		8.0		
Intersection Capacity Utilization		76.6%						ICU Level of Service		D		
Analysis Period (min)		15										
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 70: SW 1st Avenue & SW Columbia St
















3/5/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 									 	
Volume (vph)	0	470	175	0	0	0	0	0	0	130	460	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0									4.0	
Lane Util. Factor		0.95									0.95	
Frpb, ped/bikes		0.97									1.00	
Flpb, ped/bikes		1.00									0.98	
Frt		0.96									1.00	
Flt Protected		1.00									0.99	
Satd. Flow (prot)		2752									2926	
Flt Permitted		1.00									0.99	
Satd. Flow (perm)		2752									2926	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	495	184	0	0	0	0	0	0	137	484	0
RTOR Reduction (vph)	0	64	0	0	0	0	0	0	0	0	43	0
Lane Group Flow (vph)	0	615	0	0	0	0	0	0	0	0	578	0
Confl. Peds. (#/hr)			116							143		
Confl. Bikes (#/hr)			39									
Heavy Vehicles (%)	0%	2%	10%	0%	0%	0%	0%	0%	0%	1%	2%	0%
Turn Type		NA								Perm		NA
Protected Phases		4									2	
Permitted Phases										2		
Actuated Green, G (s)		26.0									26.0	
Effective Green, g (s)		26.0									26.0	
Actuated g/C Ratio		0.43									0.43	
Clearance Time (s)		4.0									4.0	
Lane Grp Cap (vph)		1192									1267	
v/s Ratio Prot		0.22										
v/s Ratio Perm											0.20	
v/c Ratio		0.52									0.46	
Uniform Delay, d1		12.4									12.0	
Progression Factor		0.31									0.73	
Incremental Delay, d2		1.4									1.1	
Delay (s)		5.3									9.8	
Level of Service		A									A	
Approach Delay (s)		5.3			0.0			0.0			9.8	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM 2000 Control Delay			7.5		HCM 2000 Level of Service					A		
HCM 2000 Volume to Capacity ratio			0.49									
Actuated Cycle Length (s)			60.0		Sum of lost time (s)					8.0		
Intersection Capacity Utilization			76.0%		ICU Level of Service					D		
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Unsignalized Intersection Capacity Analysis

80: SW 2nd Ave & SW Clay St

















3/5/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	0	365	255	65	190	0	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	0	0	0	0	392	274	70	204	0	0	0	0
Pedestrians		98									57	
Lane Width (ft)		0.0									0.0	
Walking Speed (ft/s)		4.0									4.0	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					272							
pX, platoon unblocked												
vC, conflicting volume	724			0			294	724	0	689	587	488
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	724			0			294	724	0	689	587	488
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			89	42	100	100	100	100
cM capacity (veh/h)	888			1636			641	353	1091	181	425	531
Direction, Lane #	WB 1	WB 2	NB 1	NB 2								
Volume Total	262	405	70	204								
Volume Left	0	0	70	0								
Volume Right	0	274	0	0								
cSH	1700	1700	641	353								
Volume to Capacity	0.15	0.24	0.11	0.58								
Queue Length 95th (ft)	0	0	9	87								
Control Delay (s)	0.0	0.0	11.3	28.4								
Lane LOS			B	D								
Approach Delay (s)	0.0		24.0									
Approach LOS			C									
Intersection Summary												
Average Delay			7.0									
Intersection Capacity Utilization			50.5%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Signalized Intersection Capacity Analysis

90: SW 1st Avenue & SW Clay St
















3/5/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					 						 	
Volume (vph)	0	0	0	50	380	0	0	0	0	0	550	90
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.0						4.0	
Lane Util. Factor					0.95						0.95	
Frpb, ped/bikes					1.00						0.98	
Flpb, ped/bikes					0.99						1.00	
Frt					1.00						0.98	
Flt Protected					0.99						1.00	
Satd. Flow (prot)					2963						2865	
Flt Permitted					0.99						1.00	
Satd. Flow (perm)					2963						2865	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	0	52	396	0	0	0	0	0	573	94
RTOR Reduction (vph)	0	0	0	0	17	0	0	0	0	0	22	0
Lane Group Flow (vph)	0	0	0	0	431	0	0	0	0	0	645	0
Confl. Peds. (#/hr)				105								143
Confl. Bikes (#/hr)												16
Heavy Vehicles (%)	0%	0%	0%	5%	2%	0%	0%	0%	0%	0%	3%	7%
Turn Type				Perm	NA						NA	
Protected Phases					4						2	
Permitted Phases				4								
Actuated Green, G (s)					24.0						28.0	
Effective Green, g (s)					24.0						28.0	
Actuated g/C Ratio					0.40						0.47	
Clearance Time (s)					4.0						4.0	
Lane Grp Cap (vph)					1185						1337	
v/s Ratio Prot											c0.23	
v/s Ratio Perm					0.15							
v/c Ratio					0.36						0.48	
Uniform Delay, d1					12.6						11.0	
Progression Factor					1.00						0.91	
Incremental Delay, d2					0.9						1.1	
Delay (s)					13.5						11.2	
Level of Service					B						B	
Approach Delay (s)		0.0			13.5			0.0			11.2	
Approach LOS		A			B			A			B	
Intersection Summary												
HCM 2000 Control Delay			12.1		HCM 2000 Level of Service					B		
HCM 2000 Volume to Capacity ratio			0.43									
Actuated Cycle Length (s)			60.0		Sum of lost time (s)					8.0		
Intersection Capacity Utilization			78.3%		ICU Level of Service					D		
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 100: SW 1st Avenue & SW Market St





















3/5/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	875	395	0	0	0	0	0	0	215	385	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		5.4								4.5	4.5	
Lane Util. Factor		0.86								0.97	1.00	
Frpb, ped/bikes		0.97								1.00	1.00	
Flpb, ped/bikes		1.00								0.94	1.00	
Frt		0.95								1.00	1.00	
Flt Protected		1.00								0.95	1.00	
Satd. Flow (prot)		5132								2625	1604	
Flt Permitted		1.00								0.95	1.00	
Satd. Flow (perm)		5132								2625	1604	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	931	420	0	0	0	0	0	0	229	410	0
RTOR Reduction (vph)	0	136	0	0	0	0	0	0	0	43	0	0
Lane Group Flow (vph)	0	1215	0	0	0	0	0	0	0	186	410	0
Confl. Peds. (#/hr)			34							90		
Confl. Bikes (#/hr)			26									
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	0%	0%	7%	1%	0%
Turn Type		NA								Perm	NA	
Protected Phases		4									2	
Permitted Phases										2		
Actuated Green, G (s)		22.8								27.3	27.3	
Effective Green, g (s)		22.8								27.3	27.3	
Actuated g/C Ratio		0.38								0.46	0.46	
Clearance Time (s)		5.4								4.5	4.5	
Lane Grp Cap (vph)		1950								1194	729	
v/s Ratio Prot		c0.24									c0.26	
v/s Ratio Perm										0.07		
v/c Ratio		0.62								0.16	0.56	
Uniform Delay, d1		15.1								9.6	12.0	
Progression Factor		1.00								0.06	0.38	
Incremental Delay, d2		1.5								0.3	2.8	
Delay (s)		16.6								0.8	7.4	
Level of Service		B								A	A	
Approach Delay (s)		16.6			0.0			0.0			5.0	
Approach LOS		B			A			A			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			12.9				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			60.0				Sum of lost time (s)			9.9		
Intersection Capacity Utilization			78.3%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

110: SW Naito Pkwy & SW Market St

3/5/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	360	495	235	0	0	0	0	550	15	810	825	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.9	4.9	4.9					4.5		4.5	4.5	
Lane Util. Factor	0.91	0.91	1.00					0.91		0.97	0.95	
Frpb, ped/bikes	1.00	1.00	0.96					1.00		1.00	1.00	
Flpb, ped/bikes	0.97	1.00	1.00					1.00		1.00	1.00	
Frt	1.00	1.00	0.85					1.00		1.00	1.00	
Flt Protected	0.95	0.99	1.00					1.00		0.95	1.00	
Satd. Flow (prot)	1501	3209	1415					4786		3285	3386	
Flt Permitted	0.95	0.99	1.00					1.00		0.95	1.00	
Satd. Flow (perm)	1501	3209	1415					4786		3285	3386	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	375	516	245	0	0	0	0	573	16	844	859	0
RTOR Reduction (vph)	0	0	155	0	0	0	0	3	0	0	0	0
Lane Group Flow (vph)	289	602	90	0	0	0	0	586	0	844	859	0
Confl. Peds. (#/hr)	20		21						35	35		
Confl. Bikes (#/hr)									18			
Heavy Vehicles (%)	1%	1%	4%	0%	0%	0%	0%	2%	0%	1%	1%	0%
Turn Type	Perm	NA	Perm					NA		Prot	NA	
Protected Phases		4						6		5	2	
Permitted Phases	4		4									
Actuated Green, G (s)	20.4	20.4	20.4					14.0		41.7	60.2	
Effective Green, g (s)	20.4	20.4	20.4					14.0		41.7	60.2	
Actuated g/C Ratio	0.23	0.23	0.23					0.16		0.46	0.67	
Clearance Time (s)	4.9	4.9	4.9					4.5		4.5	4.5	
Vehicle Extension (s)	1.5	1.5	1.5					2.5		0.2	0.2	
Lane Grp Cap (vph)	340	727	320					744		1522	2264	
v/s Ratio Prot								c0.12		c0.26	0.25	
v/s Ratio Perm	c0.19	0.19	0.06									
v/c Ratio	0.85	0.83	0.28					0.79		0.55	0.38	
Uniform Delay, d1	33.3	33.1	28.8					36.6		17.4	6.6	
Progression Factor	1.00	1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2	17.1	7.4	0.2					5.3		1.5	0.5	
Delay (s)	50.4	40.5	28.9					41.9		18.9	7.1	
Level of Service	D	D	C					D		B	A	
Approach Delay (s)		40.5			0.0			41.9			12.9	
Approach LOS		D			A			D			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			27.1					HCM 2000 Level of Service		C		
HCM 2000 Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			90.0					Sum of lost time (s)		13.9		
Intersection Capacity Utilization			88.0%					ICU Level of Service		E		
Analysis Period (min)			15									

c Critical Lane Group

