## Traffic Impact Study

# Broad & Washington Redevelopment

## City of Falls Church, VA

**December 9, 2015**

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# INTRODUCTION AND SUMMARY

## *Purpose and Study Objective*

This report presents the findings of a traffic impact analysis for the proposed redevelopment of the property located on the northeast corner of the Broad Street and Washington Street intersection in the City of Falls Church. The site is bound by Park Place on the north, E. Broad Street (Route 7) on the south, Lawton Street on the east, and N. Washington Street on the west. The development, which is planned to consist of up to 72,000 square feet of retail (supermarket, restaurant, and specialty retail), 330 apartments, and 36,000 square feet of office, is anticipated to be complete in 2020.

The following tasks were completed as part of this study:

- A scoping meeting was held on June 22, 2015 with City of Falls Church staff, which included discussions about the parameters of the study and relevant background information. A scoping letter stating the parameters and assumptions used in the analysis herein is included in Appendix A. Updates to the study have been incorporated to address staff comments of September 28, 2015.
- Field reconnaissance in the vicinity of the site was performed to collect information related to existing traffic controls, roadway geometry, and traffic flow characteristics.
- Saturday peak period traffic counts were conducted on Saturday, January 31, 2015. Weekday AM and PM peak period traffic counts were conducted at the study intersections on Tuesday, February 3, 2015.
- Future without development traffic conditions were projected based on existing traffic and trip generated by approved but incomplete development in the vicinity.
- Proposed site traffic volumes were generated based on the methodology outlined in the Institute of Transportation Engineers' (ITE) Trip Generation, 9th Edition publication.
- Future with development traffic conditions were projected based on existing regional and site traffic patterns and the proposed development plan.
- Intersection capacity analyses were performed for the existing conditions (2015) and future conditions with development (2020) during the weekday and Saturday peak hours at the intersections located within the study area. Alternative intersection configurations for key access points were analyzed for future conditions.

Sources of data for this study include the City of Falls Church, VDOT, Insight Property Group, MV+A Architects and the office files and field reconnaissance efforts by Gorove/Slade Associates, Inc.

## *Executive Summary*

### *Site Location and Study Area*

The subject development is located in the City of Falls Church, on the north side of E. Broad Street between N. Washington Street and Lawton Street. It is in the vicinity to four major commuter corridors: I-66, Route 7, Route 29, and Route 50. The site is currently occupied by an Applebee's restaurant, a physical therapy clinic, and a combined office/retail building. The study area consists of nine intersections, both local and regional in nature, two of which are the driveways for the existing uses. The proposed development will continue to be served by these two site driveways with an additional garage entrance off of Park Place to the north.

## *Description of Proposed Development*

The 3.22-acre Broad & Washington development site is currently zoned Central Business (B-2) and Transitional 1 (T-1). The project is a special exception application to construct a multi-use building featuring up to 47,200 square feet of supermarket, 12,400 square feet of sit-down restaurant (ground floor), 12,400 square feet of specialty retail (ground floor), 330 apartments, and 36,000 square feet of office use. A multi-level garage will be constructed with access off of E. Broad Street to the south of the property and off of Park Place to the north of the property. A right-in/right-out driveway will be located along the west side of the property off of N. Washington Street. The site will be served by retail and public parking spaces at the Broad Street level, grocery parking spaces at the Park Place level, and below-grade office and residential parking. The development is anticipated to be complete in 2020.

## *Principal Findings, Conclusions and Recommendations*

The analysis presented in this report supports the following major conclusions:

***Existing Conditions (2015)***

Weekday traffic counts were conducted at the study intersections during the AM and PM peak periods on Tuesday, February 3, 2015 and Saturday peak period traffic counts were conducted on January 31, 2015. The existing volumes were balanced across proximate intersections to reflect a consistent baseline for the volume projections within this report.

Intersection capacity analyses were performed for the existing conditions at the study area intersections during the weekday morning and afternoon peak hours, as well as the Saturday peak hour. *Synchro, version 8.0* was used to analyze the study intersections with results based on the Highway Capacity Manual (HCM) methodology. For the purpose of this analysis, it is desirable to achieve a LOS D or better for each approach of an intersection. Most of the study intersections' approaches currently operate at acceptable levels of service and most queue lengths can be accommodated during the weekday morning, afternoon, and Saturday peak hours, with the following exceptions:

- N. Washington Street/Great Falls Street (LOS)
- Broad Street and Washington Street (queues)
- N. Washington Street and Park Avenue (queues)

***Future Conditions without Development (2020)***

Traffic volumes were projected for the year 2020 without the proposed Broad & Washington redevelopment. The traffic associated with the 301 W. Broad Street project was added to the existing traffic volumes obtain the future conditions without development.

Most of the study intersections' approaches will continue to operate at acceptable levels of service with manageable queues during the weekday morning, afternoon, and Saturday peak hours, with the following exceptions:

- N. Washington Street/Great Falls Street (LOS)
- Broad Street and Washington Street (LOS and queues)
- N. Washington Street and Park Avenue (queues)

***Future Conditions with Development (2020)***

The proposed mixed-use redevelopment will generate approximately 186 new external trips during the weekday morning peak hour, 429 new external trips during the weekday afternoon peak hour, 456 new external trips during the Saturday peak hour, and 4,377 new external weekday daily trips, accounting for existing or potential trips associated with the existing buildings. Access to the proposed development will be provided via full-movements driveways on E. Broad Street and Park Place and a right-in/right-out access on N. Washington Street. Future conditions with the development were derived from the future without development scenario and the site generated trips.

As under the existing and future without development conditions, most of the study intersections' approaches will continue to operate at acceptable levels of service with manageable queues during the weekday morning, afternoon, and Saturday peak hours, with the following exceptions:

- N. Washington Street/Great Falls Street (LOS)
- Broad Street and Washington Street (LOS and queues)
- N. Washington Street and Park Avenue (LOS and queues)
- E. Broad Street and Site Driveway (LOS and queues)

Alternative intersection configurations were evaluated at the major site access points to determine potential traffic operations improvements. Signalization of the Proposed Site Entrance on E. Broad Street was found to have the most benefit of the alternatives studied. Under any of the access alternatives, some delays and queues will remain at the study intersections.

In summary, traffic operations within the study area will be similar with or without the proposed Broad & Washington redevelopment.

## BACKGROUND INFORMATION: PROPOSED DEVELOPMENT (SITE AND NEARBY)

### *Description of On-Site Development*

This study is being performed to examine the potential traffic impact of the proposed Broad & Washington redevelopment on the area's future roadway network. The project site is bounded by E. Broad Street to the south and Park Place to the north, N. Washington Street to the west and Lawton Street to the east. A site location map is shown in Figure 1. Portions of the site's development plan showing access points and a typical upper level are shown in Figure 2. The subject parcel is currently zoned Central Business (B-2). The development is anticipated to be complete in 2020.

The project is a special exception application to construct up to approximately 47,200 square feet of supermarket, 12,400 square feet high of turnover sit-down restaurant space, 12,400 square feet of specialty retail space, 330 apartments, and 36,000 square feet of office space to be located in a multi-use building. The restaurant, specialty retail, and a portion of the supermarket will be located on the ground floor.

Access to the proposed development will be provided by two full-entrances into a multi-level garage with full-access off of both E. Broad Street and off of Park Place. An additional right-in/right-out driveway will be located along N. Washington Street. The garage will be constructed to provide public parking spaces in addition to parking for the grocery, retail,

restaurant, office and residential uses. Loading operations, trash collection, and service vehicle access will be off of Park Place on the north side of the property and west of the full-access driveway into the garage.

### *Planned Transportation Improvements*

Neither the City of Falls Church's Comprehensive Plan, Five-Year Capital Improvements Program, or VDOT's Six-Year Improvement Program (SYIP) propose any major long-term transportation improvements within the study area.

### *Scope of Study*

The study area consists of nine intersections, three of which will allow traffic to enter and exit the site. The study area was determined based on the scoping meeting held with City of Falls Church staff on June 22, 2015. A copy of the agreed-upon scoping document is included in Appendix A. The following intersections were identified for inclusion in this study:

1. Broad Street and Washington Street;
2. E. Broad Street and Applebee's entrance/proposed site entrance;
3. E. Broad Street and Lawton Street;
4. Lawton Street and E. Columbia Street;
5. N. Washington Street and Columbia Street;
6. N. Washington Street and Great Falls Street;
7. N. Washington Street and Park Avenue;
8. N. Washington Street and Park Place;
9. N. Washington Street and existing driveway/proposed driveway;

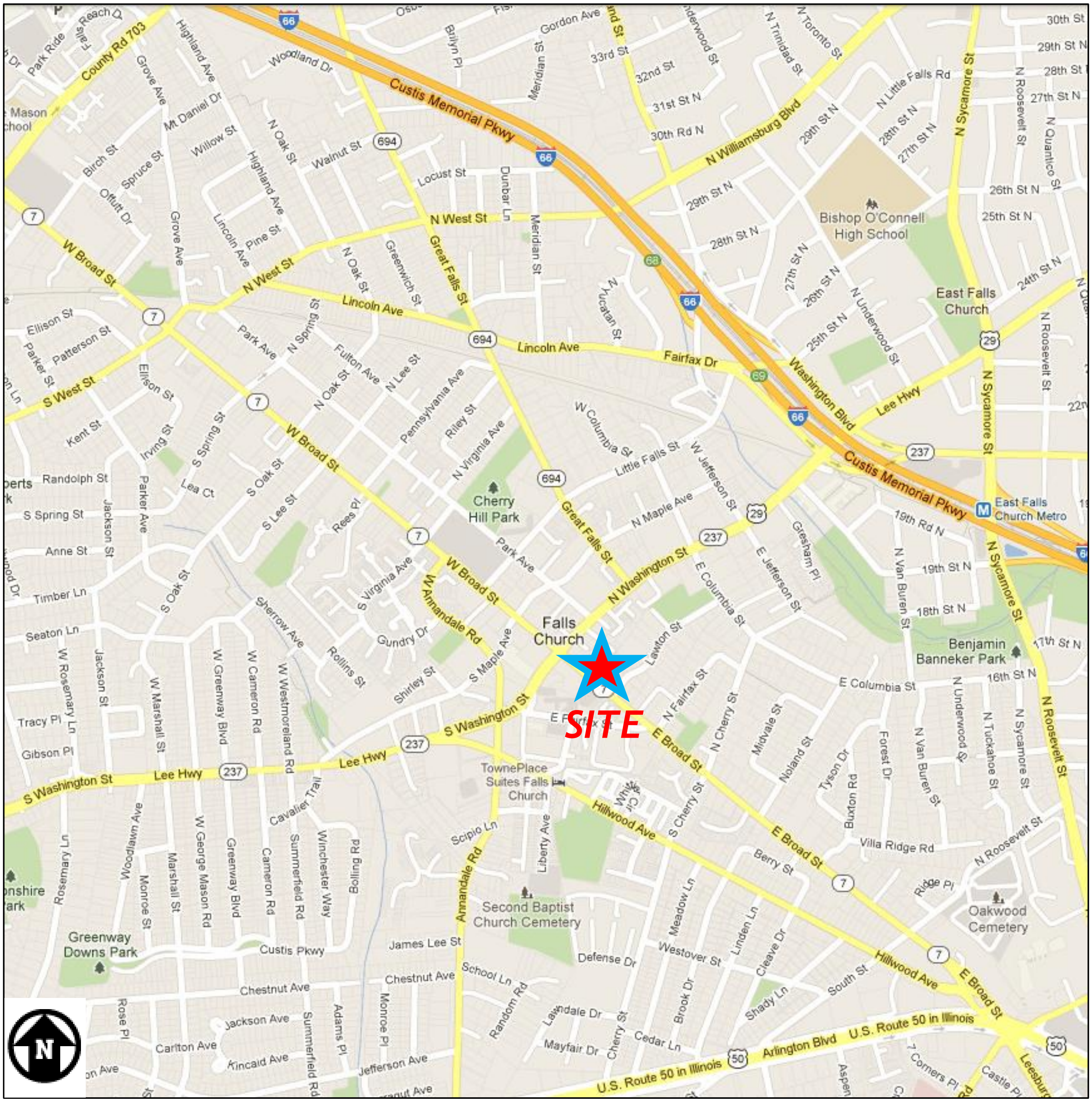



**Figure 1: Site Location**

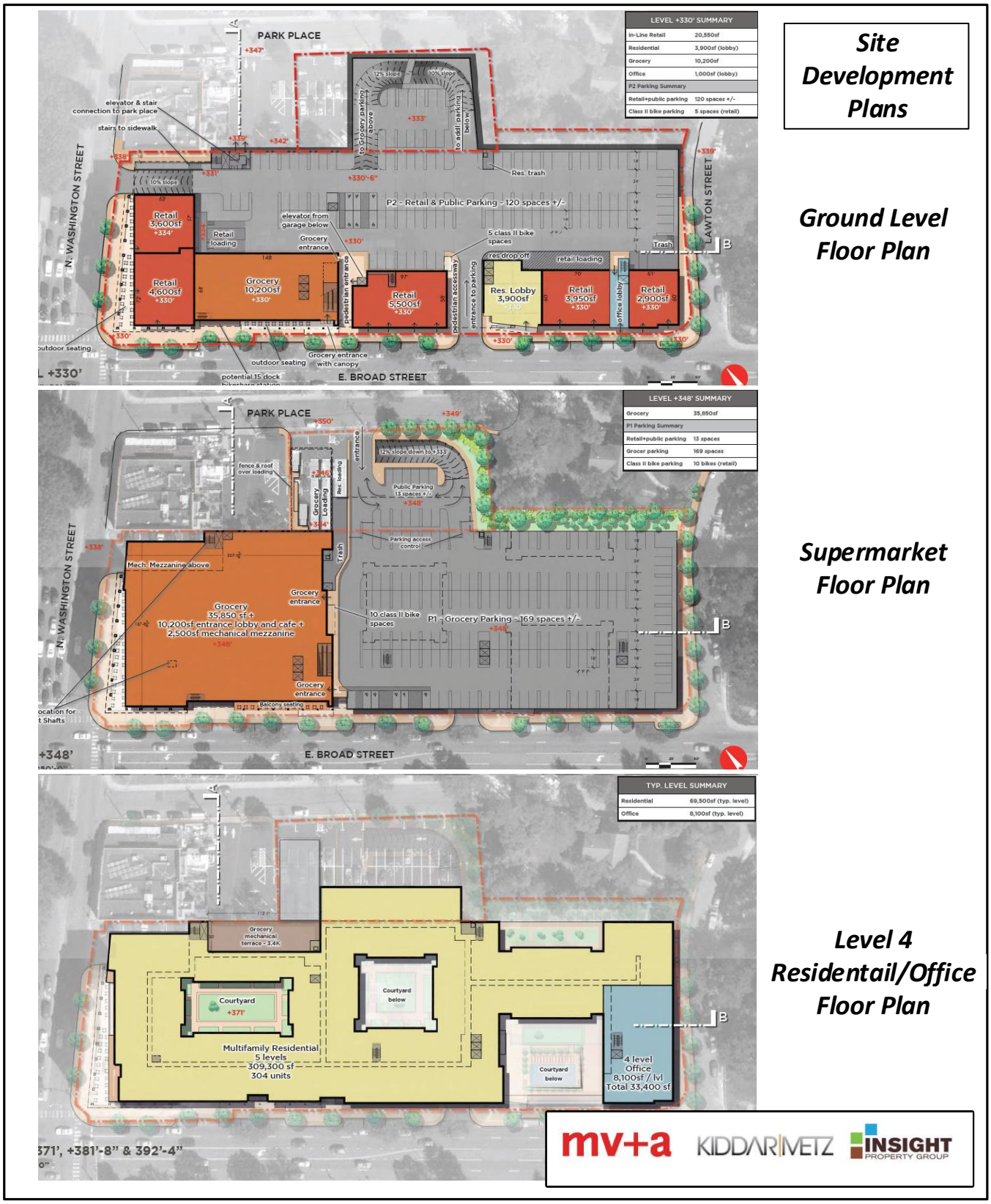



**Figure 2: Proposed Development Plan**

This report presents the findings of analyses performed for the following conditions:

- **Existing Conditions (2015):** Considers existing traffic volumes and existing roadway configurations.
- **Future Conditions without Development (2020):** Considers future traffic conditions for the year 2020 with the other development traffic, but without the proposed development.
- **Future Conditions with Development (2020):** Considers future traffic conditions for the year 2020 (build-out year) with the other development traffic and the proposed Broad & Washington development.

The results of the analysis and the traffic impacts associated with the proposed development plan are presented in the Conclusion section of this report.

## *Roadway Network*

A description of the major roadways within the immediate vicinity of the site is presented below. The existing lane configuration and traffic control in the study area is shown in Figure 3.

Broad Street (Route 7) is a four-lane undivided major arterial with left turn bays at its signalized intersections with Washington Street. The posted speed limit is 25 mph within the study area. Published historical traffic count data from VDOT shows that in 2014, W. Broad Street carried approximately 25,000 vehicles per day while E. Broad Street carried approximately 21,000 vehicles per day.

Washington Street (Route 29) is a four-lane divided major arterial with left turn bays at its signalized intersection with Broad Street. The posted speed limit is 30 mph within the study area. VDOT traffic count data from 2014 shows that N. Washington Street carried approximately 22,000 vehicles per day while S. Washington Street carried approximately 13,000 vehicles per day.

Great Falls Street is a two-lane minor arterial extending west from N. Washington Street. The posted speed limit is 25 mph within the study area. 2014 traffic count data from VDOT shows that Great Falls Street carried approximately 3,400 vehicles per day.

Columbia Street is a two-lane undivided collector street. The posted speed limit is 25 mph within the study area. Published historical traffic count data from VDOT shows that west of N. Washington Street, Columbia Street carried 2,900 vehicles and east of Washington Street carried 3,300 vehicles in 2014.

Park Avenue is a two-lane undivided collector street. On-street parking exists along both sides west of Little Falls Street and on the south side of the street along the section of Park Avenue between N. Washington Street and N. Maple Avenue. The posted speed limit is 25 mph within the study area. There is no published historical traffic count data from VDOT available on this roadway.

Park Place is a two-lane undivided local street. Park Avenue is only about 350 feet in length and extends east from N. Washington Street to its terminus at a cluster of single family homes. On-street parking exists along both sides and the statutory speed limit is 25 mph. There is no published historical traffic count data from VDOT available on this roadway.

Lawton Street is a two-lane undivided local street with a statutory speed limit of 25 mph that spans from E. Broad Street to the south and E. Columbia Street to the north. No published historical traffic count data for this roadway is available from VDOT.

## *Bicycle/Pedestrian Facilities*

Dedicated on-street bike lanes are absent within the study area and the entire City of Falls Church. The site is located approximately one mile from the Washington & Old Dominion (W&OD) Trail, which extends 45 miles from Shirlington to Purcellville. To improve future bicycling conditions within the study area, the City's Draft Bicycle Master Plan recommends the implementation of on-street bicycle facilities in the study area along Columbia Street and Great Falls Street to complement the shared use pavement markings (sharrows) recently installed along Park Avenue. Washington Street, W. Broad Street, and Park Avenue are designated as future bike-share corridors within the study area. There is one Capital Bikeshare station proposed in the study area, located in the northeast property corner of the Broad & Washington site.

The roadways in the vicinity of the proposed development provide pedestrian facilities and connectivity throughout the area. Continuous 4 to 8 foot wide sidewalks line all of the study area's roadways on both sides of each street. Continental crosswalk markings link sidewalk segments at all of the study area's signalized intersections with the exception of the southern east/west crossing movement at the N. Washington Street/Park Avenue intersection.

Pedestrian countdown signals are present for all crossing movements at the Broad Street and Washington Street intersection. Countdown pedestrian indications are only installed for the crossing of N. Washington Street at Columbia Street; the remaining crossings do not have pedestrian signals. At the N. Washington Street/Park Avenue intersection, there are pedestrian signals serving both marked crossing movements; however, the pedestrian signals are an older model without the countdown display. Currently, these are in compliance with the Manual on Uniform Traffic Control Devices (MUTCD) until they reach the end of their serviceable life, when they will need to be replaced with pedestrian countdown signals since the pedestrian change interval for these crossings is longer than 7 seconds. The City's guidelines recommend the installation of pedestrian countdown signals for the crossing movements that either lack the countdown displays or lack pedestrian signals altogether.

To aid the movement of pedestrians and cyclists across E. Broad Street, the City is planning a new enhanced crossing at E. Fairfax Street between the widely-spaced existing crossings at Washington Street and Cherry Street. This crossing would improve connectivity in the area, enhancing mobility and encouraging non-motorized travel. The benefits of the new crossing would be supportive of, and complimentary to, the proposed mixed-use Broad & Washington redevelopment.

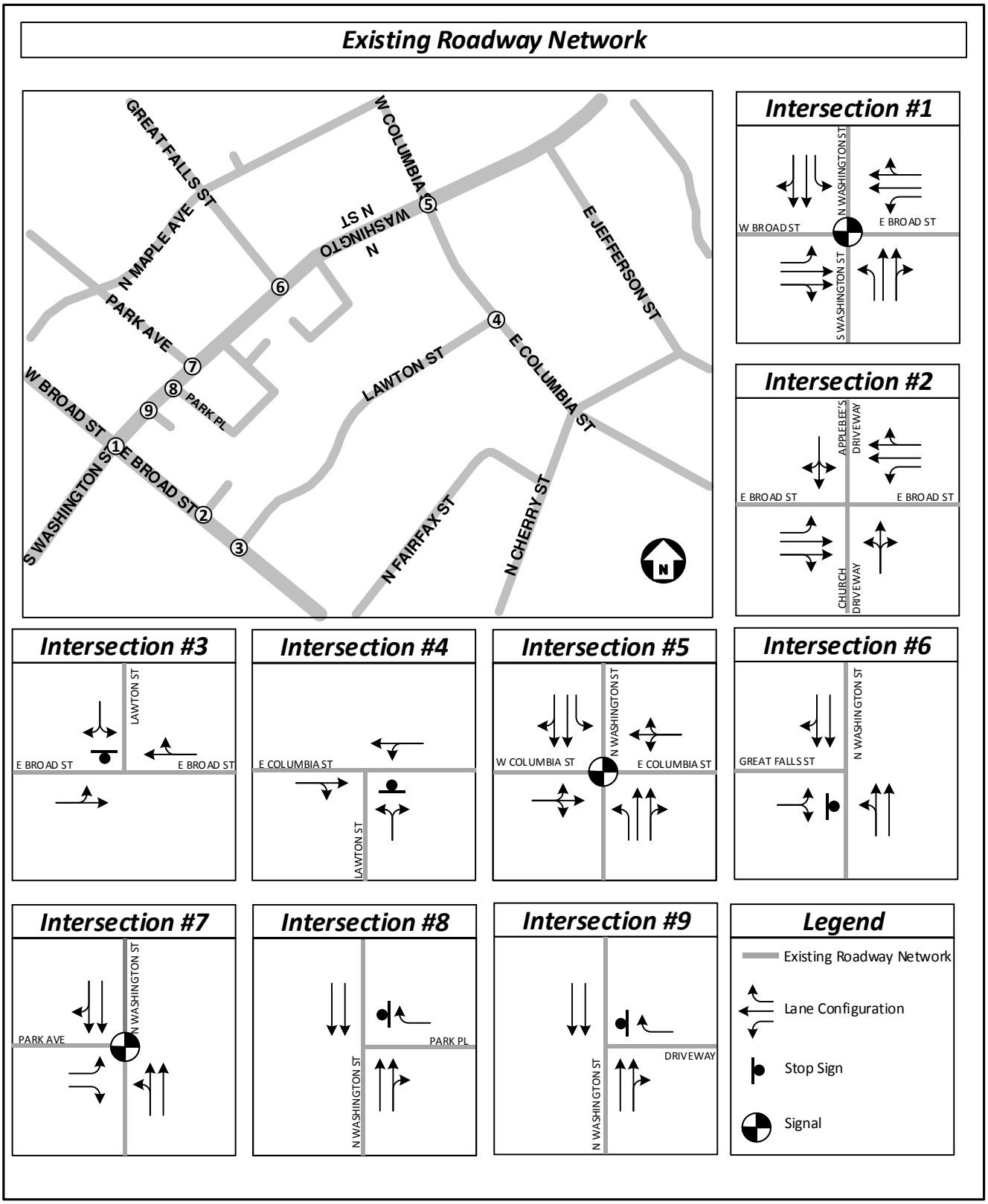



**Figure 3: Existing (2015) Roadway Network**

## *Transit*

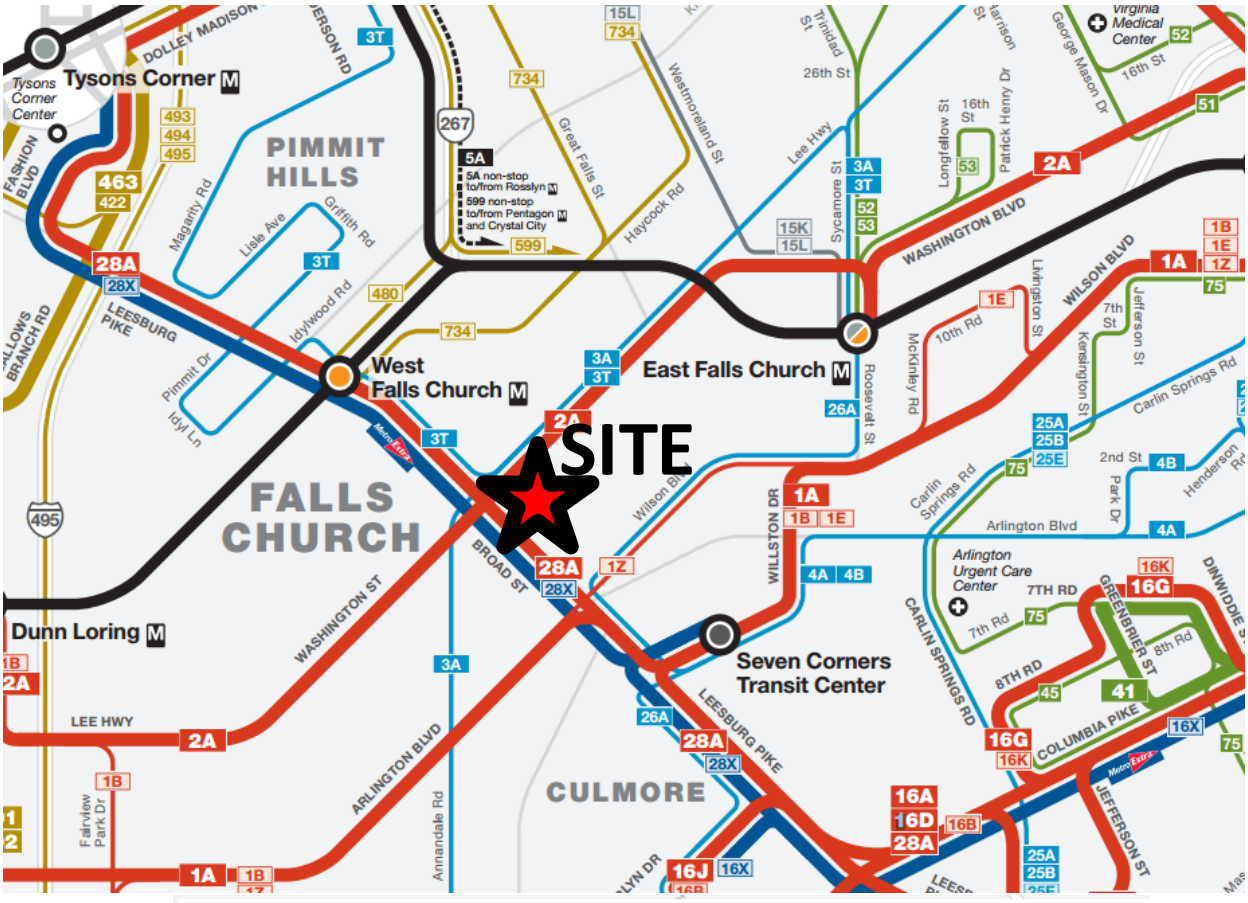
Transit service to the study area is provided by Metrorail. The East Falls Church Metrorail station is located at the I-66/ Sycamore Street interchange, approximately ¾ mile to the east, and operates on Metrorail's Orange and Silver Lines. Metro trains run on each line every six minutes during the morning and afternoon peak periods and every 12 to 20 minutes during the weekday off-peak periods and on weekends. Riders traveling to or from the east as far as the Stadium-Armory station may opt for either Orange or Silver Line trains, increasing the practical frequency of the service. From the station, it is approximately a 0.9-mile walk to the site's northern property line, or an 18-23 minute walk depending on walking speed.

The Washington Transit Metropolitan Authority (WMATA) Metrobus provides bus services to the study area. Table 1 shows a summary of the bus route information for the existing bus route lines that serve the site during weekdays with stops in the study area and Figure 4 illustrates the existing bus service. A bus stop serving westbound trips on the 28A,X Metrobus lines is located on the property along E. Broad Street. Stops for the 2A and 3A are located along S. Washington Boulevard within 250 feet of the site, and the nearest stop for eastbound 28 A,X trips is approximately 400 feet west of the site. The 3T line can be access via stops located north of Park Avenue, approximately 375 feet north of the site.

**Table 1: Weekday Bus Route Information**

| Route Number | Route Name | Destination | Service Hours | Peak Period Headway |
|---|---|---|---|---|
| WMATA 2A | Washington Boulevard Line | Ballston, Dunn Loring | Weekdays 4:45 am-12:55 am | 15-30 min |
| WMATA 3A,T | Lee Highway Line | Annandale, McLean, Rosslyn | Weekdays 5:00 am-12:57 am | 15-30 min |
| WMATA 28A | Leesburg Pike Line | Tysons Corner, King Street Metro | Weekdays 4:18 am-1:42 am | 20 min |
| WMATA 28X | Leesburg Pike Limited Stop | Tysons Corner, Mark Center | Weekdays 5:45am-9:05am & 3:35pm-7:26pm | 15-20 min |

## *WMATA Bus Routes*



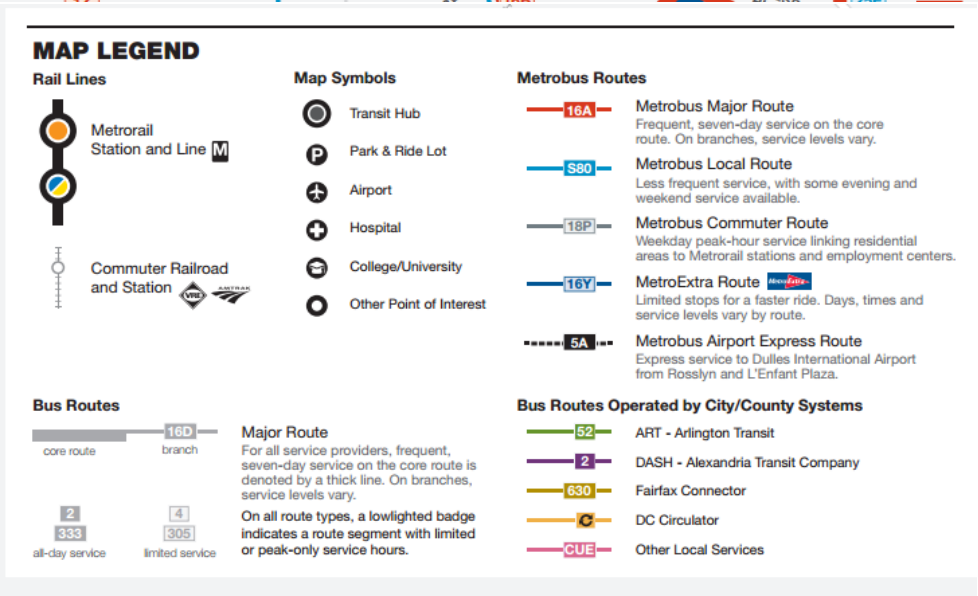




**Figure 4: Existing Transit Service**

# EXISTING CONDITIONS (2015)

## *Existing Traffic Volumes*

In order to determine the weekday and Saturday peak hour turning movement traffic volumes, traffic counts were conducted at the study intersections on Saturday, January 31, 2015 during the midday peak period and on Tuesday, February 3, 2015 during the morning and afternoon peak periods. Analysis of the traffic data found the following peak hours:

- AM Peak Hour: 8:30 AM to 9:30 AM
- PM Peak Hour: 4:45 PM to 5:45 PM
- Saturday Peak Hour: 12:30 PM to 1:30 PM

The counts were balanced at two locations in the study area. The first area is between the E. Broad Street/Site Driveway and the E. Broad Street/Lawton Street intersections. The second area that was balanced was the series of four intersections along N. Washington Street from Broad Street up to and including the intersection with Great Falls Street. The existing balanced peak hour traffic volumes for the intersections contained within the study area are shown in Figure 5. The existing traffic counts are contained in Appendix B.

## *Existing Conditions Capacity Analysis*

Intersection capacity analyses were performed for the existing conditions at the study area intersections during the weekday morning and afternoon peak hours and the Saturday peak hour. *Synchro 8.0, build 806, revision 61 (8.0.806.61)* was used to analyze the study intersections with the results based on the Highway Capacity Manual (HCM) methodology. The existing peak hour factors acquired from the traffic counts and restricted to within the range of 0.85 to 1.00, were used in the analysis along with the default heavy vehicle percentage of 2%. Synchro files were created based on current lane configurations and traffic signal timing information obtained from the City of Falls Church.

The results of the intersection capacity analyses are presented in Table 2, and are expressed in level of service (LOS) and delay (seconds per vehicle) per lane group. The intersections, approaches, and lane groups that operate at LOS E or F are shown in red. Lane groups where the queue length exceeds storage are also shown in red. The 95$^{th}$ and 50$^{th}$ percentile queue lengths are expressed in feet. The detailed analysis worksheets are contained in Appendix D.

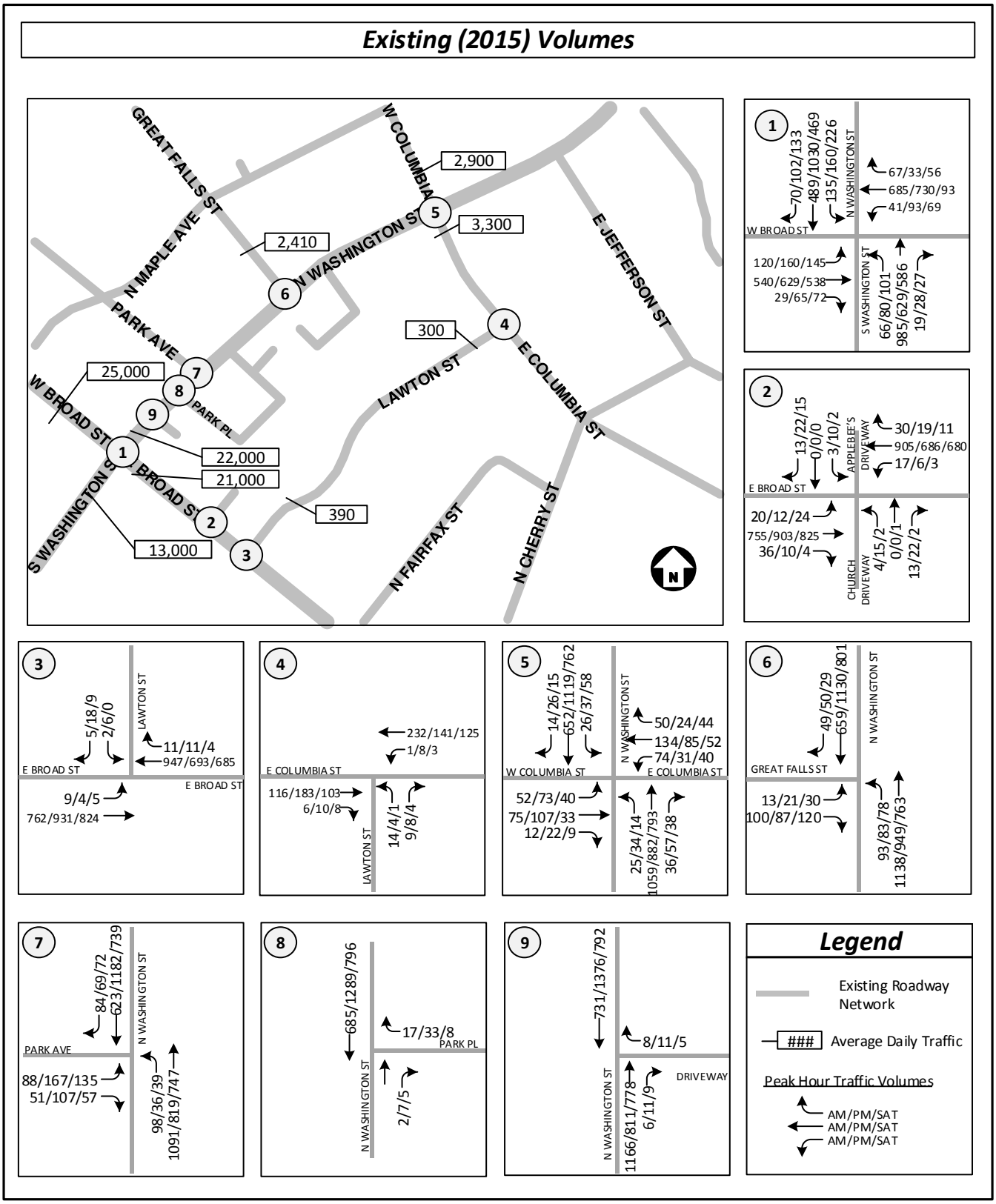



**Figure 5: Existing (2015) Traffic Volumes**

## Table 2: Existing (2015) Intersection Capacity Analysis

| No. | Intersection (Movement) | Bay/ Link Length (feet) | AM Peak | | | | PM Peak | | | | SAT Peak | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 50th Queue | 95th Queue | LOS | Delay | 50th Queue | 95th Queue | LOS | Delay | 50th Queue | 95th Queue | LOS | Delay |
| 1 | Broad St & Washington St | | | | | | | | | | | | | |
| | **Overall Intersection (Signalized)** | | | | **C** | **34.3** | | | **C** | **32.9** | | | **C** | **34.6** |
| | *Eastbound Approach* | | | | *D* | *38.3* | | | *C* | *23.1* | | | *C* | *31.4* |
| | Eastbound Left | 275 | 69 | m#135 | *D* | *53.5* | 34 | #140 | *D* | *35.3* | 64 | 137 | *C* | *21.4* |
| | Eastbound Thru/Right | 435 | 203 | 180 | *D* | *35.1* | 191 | 198 | *C* | *20.3* | 211 | 346 | *C* | *33.7* |
| | *Westbound Approach* | | | | *C* | *30.2* | | | *C* | *29.5* | | | *D* | *38.0* |
| | Westbound Left | 255 | 9 | 21 | B | 13.3 | 27 | 49 | B | 16.8 | 31 | 72 | C | 25.3 |
| | Westbound Thru/Right | 400 | 271 | 311 | C | 31.1 | 252 | #312 | C | 31.1 | 209 | 354 | D | 39.6 |
| | *Northbound Approach* | | | | *D* | *42.5* | | | *C* | *34.9* | | | *D* | *37.4* |
| | Northbound Left | 345 | 22 | 50 | B | 19.9 | 40 | m60 | C | 27.1 | 43 | 98 | C | 24.2 |
| | Northbound Thru/Right | 580 | 215 | #485 | D | 44.1 | 253 | 314 | D | 35.9 | 224 | 370 | D | 39.5 |
| | *Southbound Approach* | | | | C | 22.2 | | | D | 40.8 | | | C | 32.4 |
| | Southbound Left | 190 | 56 | 117 | C | 29.0 | 58 | 99 | C | 20.2 | 103 | 211 | C | 29.6 |
| | Southbound Thru/Right | 370 | 150 | 184 | C | 20.4 | 367 | #506 | D | 43.6 | 208 | 343 | C | 33.4 |
| 2 | E. Broad Street & Driveway | | | | | | | | | | | | | |
| | **Overall Intersection (Unsignalized)** | | | | **n/a** | **n/a** | | | **n/a** | **n/a** | | | **n/a** | **n/a** |
| | *Eastbound Approach* | | | | *A* | *0.3* | | | *A* | *0.1* | | | *A* | *0.3* |
| | Eastbound Left | 90 | *n/a* | 3 | B | 10.4 | *n/a* | 1 | A | 9.4 | *n/a* | 3 | A | 9.3 |
| | Eastbound Thru/Right | 385 | *n/a* | 0 | A | 0.0 | *n/a* | 0 | A | 0.0 | *n/a* | 0 | A | 0.0 |
| | *Westbound Approach* | | | | *A* | *0.2* | | | *A* | *0.1* | | | *A* | *0.0* |
| | Westbound Left | 165 | *n/a* | 2 | A | 9.4 | *n/a* | 1 | A | 9.5 | *n/a* | 0 | A | 9.3 |
| | Westbound Thru/Right | 165 | *n/a* | 0 | A | 0.0 | *n/a* | 0 | A | 0.0 | *n/a* | 0 | A | 0.0 |
| | *Northbound Approach* | | | | *C* | *16.9* | | | *C* | *22.2* | | | *D* | *25.3* |
| | Northbound Left/Thru/Right | 25 | *n/a* | 5 | C | 16.9 | *n/a* | 15 | C | 22.2 | *n/a* | 2 | D | 25.3 |
| | *Southbound Approach* | | | | *C* | *18.3* | | | *C* | *17.4* | | | *B* | *12.8* |
| | Southbound Left/Thru/Right | 25 | *n/a* | 5 | C | 18.3 | *n/a* | 10 | C | 17.4 | *n/a* | 3 | B | 12.8 |
| 3 | Broad St & Lawton St | | | | | | | | | | | | | |
| | **Overall Intersection (Unsignalized)** | | | | **n/a** | **n/a** | | | **n/a** | **n/a** | | | **n/a** | **n/a** |
| | *Eastbound Approach* | | | | *A* | *0.2* | | | *A* | *0.1* | | | *A* | *0.1* |
| | Eastbound Left/Thru | 165 | *n/a* | 1 | A | 0.6 | *n/a* | 0 | A | 0.2 | *n/a* | 1 | A | 0.2 |
| | *Westbound Approach* | | | | *A* | *0.0* | | | *A* | *0.0* | | | *A* | *0.0* |
| | Westbound Thru/Right | 505 | *n/a* | 0 | A | 0.0 | *n/a* | 0 | A | 0.0 | *n/a* | 0 | A | 0.0 |
| | *Southbound Approach* | | | | *B* | *14.7* | | | *B* | *14.1* | | | *B* | *10.7* |
| | Southbound Left/Right | 790 | *n/a* | 2 | B | 14.7 | *n/a* | 5 | B | 14.1 | *n/a* | 1 | B | 10.7 |
| 4 | Lawton St & Columbia St | | | | | | | | | | | | | |
| | **Overall Intersection (Unsignalized)** | | | | **n/a** | **n/a** | | | **n/a** | **n/a** | | | **n/a** | **n/a** |
| | *Eastbound Approach* | *485* | *n/a* | *0* | *A* | *0.0* | *n/a* | *0* | *A* | *0.0* | *n/a* | *0* | *A* | *0.0* |
| | *Westbound Approach* | *440* | *n/a* | *0* | *A* | *0.0* | *n/a* | *1* | *A* | *0.5* | *n/a* | *0* | *A* | *0.2* |
| | *Northbound Approach* | | | | *B* | *10.5* | | | *B* | *10.2* | | | *A* | *9.2* |
| | Northbound Left/Right | 550 | *n/a* | 3 | B | 10.5 | *n/a* | 2 | B | 10.2 | *n/a* | 1 | A | 9.2 |
| 5 | N Washington St & Columbia St | | | | | | | | | | | | | |
| | **Overall Intersection (Signalized)** | | | | **B** | **18.4** | | | **C** | **21.9** | | | **C** | **22.4** |
| | *Eastbound Approach* | | | | *C* | *30.1* | | | *C* | *34.2* | | | *B* | *19.0* |
| | Eastbound Left/Thru/Right | 370 | 79 | 129 | C | 30.1 | 124 | 188 | C | 34.2 | 31 | 71 | B | 19.0 |
| | *Westbound Approach* | | | | *D* | *37.0* | | | *C* | *29.8* | | | *C* | *20.1* |
| | Westbound Left/Thru/Right | 485 | 160 | 236 | D | 37.0 | 77 | 126 | C | 29.8 | 51 | 106 | C | 20.1 |
| | *Northbound Approach* | | | | *B* | *12.9* | | | *B* | *17.0* | | | *C* | *25.9* |
| | Northbound Left | 70 | 4 | m9 | A | 8.1 | 7 | m16 | B | 10.2 | 4 | 12 | B | 16.8 |
| | Northbound Thru/Right | 640 | 187 | 303 | B | 13.0 | 283 | 324 | B | 17.3 | 230 | 300 | C | 26.0 |
| | *Southbound Approach* | | | | *B* | *17.3* | | | *C* | *22.7* | | | *B* | *19.6* |
| | Southbound Left | 125 | 8 | 19 | B | 14.6 | 11 | 24 | B | 13.1 | 18 | 35 | B | 14.9 |
| | Southbound Thru/Right | 475 | 162 | 211 | B | 17.5 | 334 | 422 | C | 23.0 | 147 | 256 | B | 19.9 |
| 6 | N Washington St & Great Falls St | | | | | | | | | | | | | |
| | **Overall Intersection (Unsignalized)** | | | | **n/a** | **n/a** | | | **n/a** | **n/a** | | | **n/a** | **n/a** |
| | *Eastbound Approach* | | | | *E* | *47.4* | | | *F* | *54.2* | | | *C* | *18.8* |
| | Eastbound Left/Right | 440 | n/a | 164 | E | 47.4 | n/a | 231 | F | 54.2 | n/a | 50 | C | 18.8 |
| | *Northbound Approach* | | | | *A* | *0.9* | | | *A* | *1.0* | | | *A* | *1.0* |
| | Northbound Thru/Left | 425 | n/a | 7 | A | 2.4 | *n/a* | 7 | A | 2.6 | *n/a* | 6 | A | 2.6 |
| 7 | N Washington St & Park Ave | | | | | | | | | | | | | |
| | **Overall Intersection (Signalized)** | | | | **A** | **6.9** | | | **A** | **7.9** | | | **A** | **9.3** |
| | *Eastbound Approach* | | | | *D* | *42.5* | | | *D* | *39.7* | | | *B* | *18.0* |
| | Eastbound Left | 150 | 64 | 105 | D | 44.4 | 112 | 169 | D | 42.9 | 25 | 56 | B | 18.5 |
| | Eastbound Right | 410 | 0 | 34 | D | 39.7 | 0 | 39 | C | 34.8 | 0 | 21 | B | 17.4 |
| | *Northbound Approach* | | | | *A* | *4.9* | | | *A* | *5.6* | | | *A* | *5.2* |
| | Northbound Thru/Left | 370 | 89 | m96 | A | 4.9 | 58 | 111 | A | 5.6 | 48 | 146 | A | 5.2 |
| | *Southbound Approach* | | | | *A* | *2.8* | | | *A* | *2.2* | | | *B* | *11.8* |
| | Southbound Thru/Right | 425 | 46 | 92 | A | 2.8 | 44 | 58 | A | 2.2 | 88 | 203 | B | 11.8 |
| 8 | N Washington St & Park Pl | | | | | | | | | | | | | |
| | **Overall Intersection (Unsignalized)** | | | | **n/a** | **n/a** | | | **n/a** | **n/a** | | | **n/a** | **n/a** |
| | *Westbound Approach* | | | | *A* | *9.9* | | | *A* | *9.3* | | | *A* | *9.0* |
| | Westbound Right | 315 | *n/a* | 2 | A | 9.9 | *n/a* | 3 | A | 9.3 | *n/a* | 1 | A | 9.0 |
| 9 | N Washington St & Driveway | | | | | | | | | | | | | |
| | **Overall Intersection (Unsignalized)** | | | | **n/a** | **n/a** | | | **n/a** | **n/a** | | | **n/a** | **n/a** |
| | *Westbound Approach* | | | | *A* | *9.9* | | | *A* | *9.2* | | | *A* | *9.1* |
| | Westbound Right | 105 | *n/a* | 1 | A | 9.9 | *n/a* | 1 | A | 9.2 | *n/a* | 1 | A | 9.1 |

*Notes:* *N/A – Not Applicable*
*# – 95th percentile volume exceeds capacity, queue may be longer. Queue shown is the maximum after two cycles.*
*m – Volume for 95th percentile queue is metered by upstream signal.*
*~ – Volume exceeds capacity, queue can be longer. Queue shown is maximum after two cycles.*

Consistent with the scoping agreement, it is desirable to achieve a LOS D or better for each approach of an intersection. If an acceptable level of service cannot be achieved, then it is desirable for the future with development conditions to be no worse than the network without the new development. A description of the various levels of service is included in Appendix C.

All of the study intersections' approaches currently operate at acceptable levels of service during the weekday morning, afternoon, and Saturday peak hours with the exception of the eastbound Great Falls Street approach at N. Washington Street during the weekday AM and PM peak hours.

Based on the queuing analysis, peak hour queue lengths currently exceed the storage lengths in one or more of the lane groups at the following intersections during one or more of the peak periods:

- Broad Street and Washington Street (PM and Saturday)
- N. Washington Street and Park Avenue (PM only)

The results of the intersection capacity analyses for the existing conditions are shown in Figure 6.

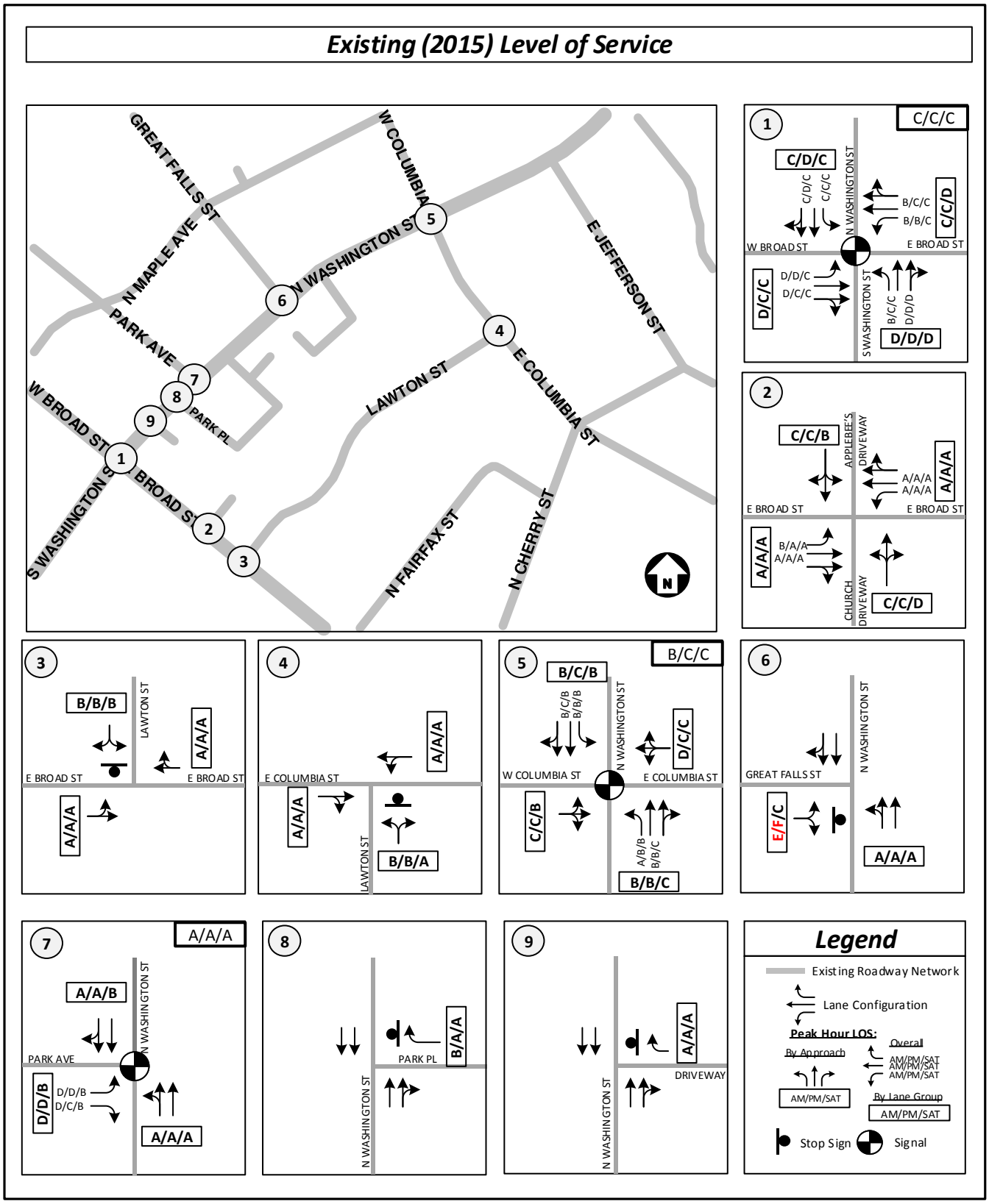



**Figure 6: Existing (2015) Level of Service**

# FUTURE CONDITIONS WITHOUT DEVELOPMENT (2020)

## *Future without Development Traffic Volumes*

The proposed Washington Street and Broad Street redevelopment is anticipated to be complete in 2020. Based on historic traffic counts published by VDOT, area traffic volumes have decreased steadily in recent years. Thus, no regional traffic growth was applied for future conditions.

Background developments include the 301 W. Broad Street redevelopment which is already under construction and is scheduled to be complete in 2016. This redevelopment is planned to consist of one multi-use building featuring a 60,000 square foot supermarket, 282 apartments, and 3,470 square feet of ground floor retail. The associated Traffic Impact Study, prepared by Gorove/Slade and dated January 23, 2013, the analysis was conducted assuming a 60,883 square foot supermarket, 297 apartments, and 4,011 square feet of ground floor retail. The traffic assignments from the 301. W. Broad Street study are included in all future conditions as a background development. As there are currently no road improvements being constructed at the study intersections, no changes to the lane configurations were assumed in the analysis of future scenarios. Additionally, there are no planned funded road improvements within the study area.

The volumes for Future without Development conditions are illustrated in Figure 7.

## *Future without Development Capacity Analysis*

Intersection capacity analyses were performed for the future conditions without the proposed development at the intersections contained within the study area during the weekday morning and afternoon peak hours, as well as the Saturday peak hour. *Synchro 8.0, build 806, revision 61 (8.0.806.61)* was used to analyze the study intersections with the results based on the Highway Capacity Manual (HCM) methodology. The default peak hour factor of 0.92 has been used in the analysis. Heavy vehicle percentages, lane widths, road grades, and number of bus blockages per hour were kept the same as the existing conditions. The capacity and queuing analysis results are shown in Table 3. The detailed analysis worksheets are contained in Appendix E.

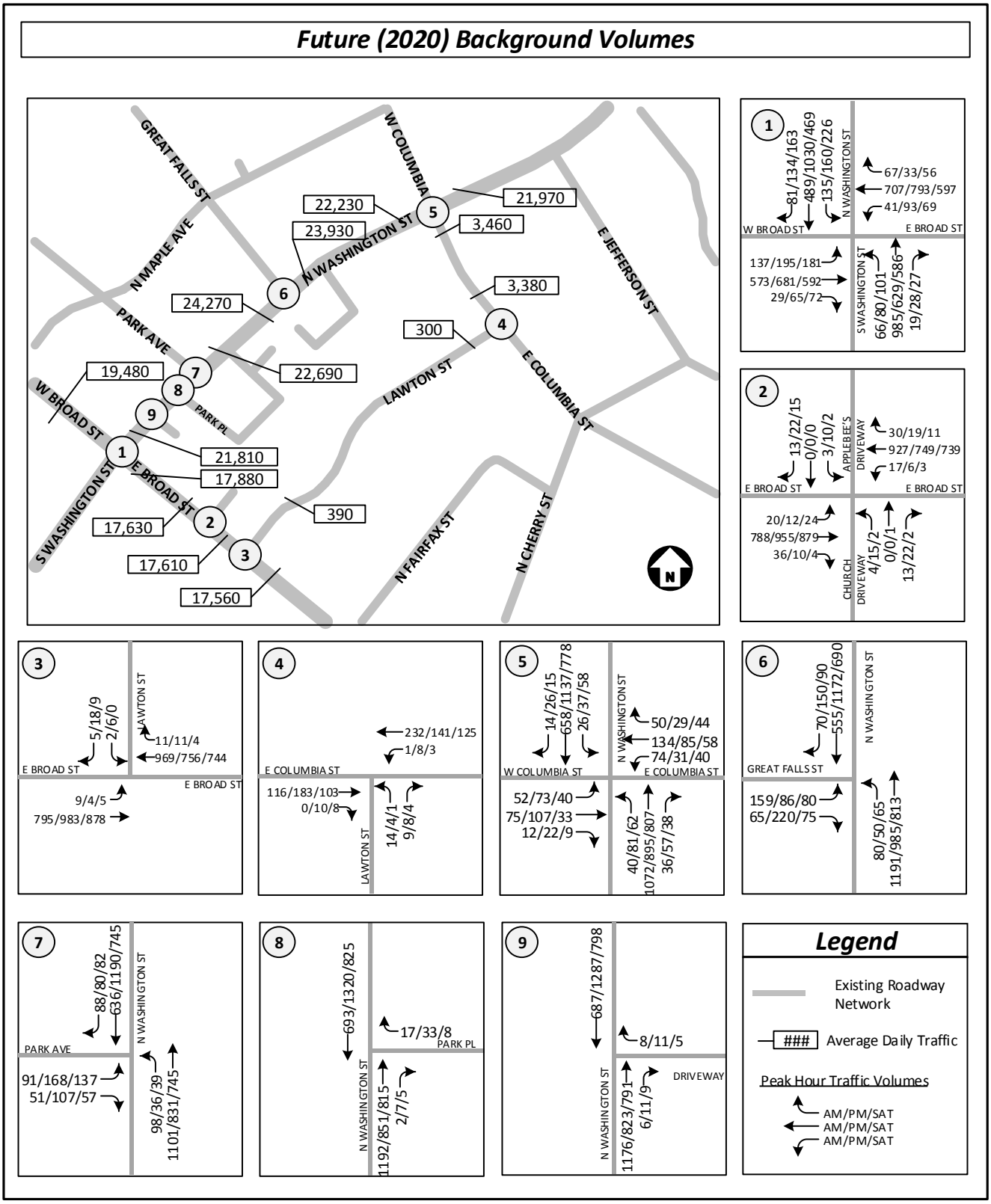



**Figure 7: Future without Development (2020) Traffic Volumes**

## Table 3: Future without Development (2020) Intersection Capacity Analysis

| No. | Intersection (Movement) | Bay/ Link Length (feet) | AM Peak | | | | PM Peak | | | | SAT Peak | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 50th Queue | 95th Queue | LOS | Delay | 50th Queue | 95th Queue | LOS | Delay | 50th Queue | 95th Queue | LOS | Delay |
| 1 | Broad St & Washington St | | | | | | | | | | | | | |
| | **Overall Intersection (Signalized)** | | | | **C** | **34.2** | | | **D** | **39.0** | | | **D** | **36.5** |
| | *Eastbound Approach* | | | | *D* | *42.6* | | | *C* | *31.1* | | | *C* | *30.4* |
| | Eastbound Left | 275 | 82 | m#157 | *E* | *61.4* | 72 | #227 | *E* | *68.5* | 84 | 169 | *C* | *23.5* |
| | Eastbound Thru/Right | 435 | 204 | 205 | *D* | *38.3* | 209 | 226 | *C* | *21.4* | 227 | 365 | *C* | *32.3* |
| | *Westbound Approach* | | | | *C* | *29.0* | | | *D* | *37.4* | | | *D* | *40.7* |
| | Westbound Left | 255 | 9 | m20 | B | 13.1 | 28 | 51 | B | 17.6 | 30 | 71 | C | 26.1 |
| | Westbound Thru/Right | 400 | 263 | #320 | C | 29.9 | 298 | #424 | D | 39.6 | 251 | 395 | D | 42.3 |
| | *Northbound Approach* | | | | *D* | *41.0* | | | *C* | *34.7* | | | *D* | *40.4* |
| | Northbound Left | 345 | 20 | m50 | B | 19.9 | 39 | m59 | C | 27.0 | 47 | 101 | C | 26.9 |
| | Northbound Thru/Right | 580 | 213 | #480 | D | 42.4 | 244 | 308 | D | 35.7 | 235 | 374 | D | 42.6 |
| | *Southbound Approach* | | | | C | 21.1 | | | D | 48.0 | | | D | 35.8 |
| | Southbound Left | 190 | 45 | 112 | C | 25.1 | 34 | 106 | C | 21.4 | 114 | 220 | D | 32.8 |
| | Southbound Thru/Right | 370 | 158 | 191 | C | 20.2 | ~313 | #574 | D | 51.7 | 231 | 365 | D | 36.8 |
| 2 | E. Broad Street & Driveway | | | | | | | | | | | | | |
| | **Overall Intersection (Unsignalized)** | | | | **n/a** | **n/a** | | | **n/a** | **n/a** | | | **n/a** | **n/a** |
| | *Eastbound Approach* | | | | *A* | *0.3* | | | *A* | *0.1* | | | *A* | *0.3* |
| | Eastbound Left | 90 | *n/a* | 3 | B | 10.6 | *n/a* | 1 | A | 9.7 | *n/a* | 3 | A | 9.7 |
| | Eastbound Thru/Right | 385 | *n/a* | 0 | A | 0.0 | *n/a* | 0 | A | 0.0 | *n/a* | 0 | A | 0.0 |
| | *Westbound Approach* | | | | *A* | *0.2* | | | *A* | *0.1* | | | *A* | *0.0* |
| | Westbound Left | 165 | *n/a* | 2 | A | 9.2 | *n/a* | 1 | A | 9.6 | *n/a* | 0 | A | 9.3 |
| | Westbound Thru/Right | 165 | *n/a* | 0 | A | 0.0 | *n/a* | 0 | A | 0.0 | *n/a* | 0 | A | 0.0 |
| | *Northbound Approach* | | | | *C* | *16.6* | | | *C* | *23.7* | | | *D* | *28.0* |
| | Northbound Left/Thru/Right | 25 | *n/a* | 4 | C | 16.6 | *n/a* | 15 | C | 23.7 | *n/a* | 3 | D | 28.0 |
| | *Southbound Approach* | | | | *C* | *18.9* | | | *C* | *19.0* | | | *B* | *13.7* |
| | Southbound Left/Thru/Right | 25 | *n/a* | 5 | C | 18.9 | *n/a* | 10 | C | 19.0 | *n/a* | 3 | B | 13.7 |
| 3 | Broad St & Lawton St | | | | | | | | | | | | | |
| | **Overall Intersection (Unsignalized)** | | | | **n/a** | **n/a** | | | **n/a** | **n/a** | | | **n/a** | **n/a** |
| | *Eastbound Approach* | | | | *A* | *0.2* | | | *A* | *0.1* | | | *A* | *0.1* |
| | Eastbound Left/Thru | 165 | *n/a* | 1 | A | 0.5 | *n/a* | 0 | A | 0.2 | *n/a* | 0 | A | 0.2 |
| | *Westbound Approach* | | | | *A* | *0.0* | | | *A* | *0.0* | | | *A* | *0.0* |
| | Westbound Thru/Right | 505 | *n/a* | 0 | A | 0.0 | *n/a* | 0 | A | 0.0 | *n/a* | 0 | A | 0.0 |
| | *Southbound Approach* | | | | *B* | *14.8* | | | *C* | *15.1* | | | *B* | *10.4* |
| | Southbound Left/Right | 790 | *n/a* | 2 | B | 14.8 | *n/a* | 5 | C | 15.1 | *n/a* | 1 | B | 10.4 |
| 4 | Lawton St & Columbia St | | | | | | | | | | | | | |
| | **Overall Intersection (Unsignalized)** | | | | **n/a** | **n/a** | | | **n/a** | **n/a** | | | **n/a** | **n/a** |
| | *Eastbound Approach* | *485* | *n/a* | *0* | *A* | *0.0* | *n/a* | *0* | *A* | *0.0* | *n/a* | *0* | *A* | *0.0* |
| | *Westbound Approach* | *440* | *n/a* | *0* | *A* | *0.0* | *n/a* | *0* | *A* | *0.5* | *n/a* | *0* | *A* | *0.2* |
| | *Northbound Approach* | | | | *B* | *10.3* | | | *B* | *10.0* | | | *A* | *9.1* |
| | Northbound Left/Right | 550 | *n/a* | 3 | B | 10.3 | *n/a* | 1 | B | 10.0 | *n/a* | 0 | A | 9.1 |
| 5 | N Washington St & Columbia Street | | | | | | | | | | | | | |
| | **Overall Intersection (Signalized)** | | | | **B** | **17.5** | | | **C** | **22.2** | | | **C** | **26.3** |
| | *Eastbound Approach* | | | | *C* | *29.4* | | | *C* | *32.8* | | | *B* | *16.5* |
| | Eastbound Left/Thru/Right | 370 | 73 | 129 | C | 29.4 | 111 | 185 | C | 32.8 | 27 | 69 | B | 16.5 |
| | *Westbound Approach* | | | | *C* | *34.9* | | | *C* | *29.5* | | | *B* | *17.5* |
| | Westbound Left/Thru/Right | 485 | 145 | 232 | C | 34.9 | 72 | 128 | C | 29.5 | 44 | 105 | B | 17.5 |
| | *Northbound Approach* | | | | *B* | *12.2* | | | *B* | *16.5* | | | *C* | *28.2* |
| | Northbound Left | 70 | 0 | m14 | A | 7.2 | 17 | 40 | B | 14.9 | 17 | 37 | B | 16.7 |
| | Northbound Thru/Right | 640 | 182 | 290 | B | 12.4 | 281 | 321 | B | 16.7 | 220 | 297 | C | 29.1 |
| | *Southbound Approach* | | | | *B* | *17.3* | | | *C* | *24.5* | | | *C* | *26.7* |
| | Southbound Left | 125 | 7 | 19 | B | 14.8 | 10 | 24 | B | 13.5 | 16 | 36 | B | 17.1 |
| | Southbound Thru/Right | 475 | 158 | 208 | B | 17.4 | 344 | 434 | C | 24.8 | 203 | 276 | C | 27.4 |
| 6 | N Washington St & Great Falls St | | | | | | | | | | | | | |
| | **Overall Intersection (Unsignalized)** | | | | **n/a** | **n/a** | | | **n/a** | **n/a** | | | **n/a** | **n/a** |
| | *Eastbound Approach* | | | | *F* | *51.1* | | | *F* | *72.4* | | | *C* | *15.7* |
| | *Eastbound Left/Right* | *440* | *n/a* | *162* | *F* | *51.1* | *n/a* | *255* | *F* | *72.4* | *n/a* | *36* | *C* | *15.7* |
| | *Northbound Approach* | | | | *A* | *0.9* | | | *A* | *1.0* | | | *A* | *0.9* |
| | Northbound Thru/Left | 425 | *n/a* | 7 | A | 2.3 | *n/a* | 7 | A | 2.7 | *n/a* | 6 | A | 2.3 |
| 7 | N Washington St & Park Ave | | | | | | | | | | | | | |
| | **Overall Intersection (Signalized)** | | | | **A** | **6.4** | | | **A** | **7.4** | | | **A** | **9.9** |
| | *Eastbound Approach* | | | | *D* | *45.8* | | | *D* | *39.6* | | | *B* | *18.5* |
| | Eastbound Left | 150 | 61 | 108 | D | 48.4 | 106 | 170 | D | 42.5 | 38 | 85 | B | 19.1 |
| | Eastbound Right | 410 | 0 | 34 | D | 41.1 | 0 | 44 | D | 35.0 | 0 | 23 | B | 17.3 |
| | *Northbound Approach* | | | | *A* | *4.2* | | | *A* | *4.8* | | | *A* | *5.4* |
| | Northbound Thru/Left | 370 | 87 | m97 | A | 4.2 | 69 | m103 | A | 4.8 | 53 | 145 | A | 5.4 |
| | *Southbound Approach* | | | | *A* | *2.3* | | | *A* | *2.2* | | | *B* | *12.3* |
| | Southbound Thru/Right | 425 | 41 | 89 | A | 2.3 | 47 | 60 | A | 2.2 | 97 | 208 | B | 12.3 |
| 8 | N Washington St & Park Pl | | | | | | | | | | | | | |
| | **Overall Intersection (Unsignalized)** | | | | **n/a** | **n/a** | | | **n/a** | **n/a** | | | **n/a** | **n/a** |
| | *Westbound Approach* | | | | *A* | *10.0* | | | *A* | *9.3* | | | *A* | *9.0* |
| | Westbound Right | 315 | *n/a* | 2 | A | 10.0 | *n/a* | 3 | A | 9.3 | *n/a* | 1 | A | 9.0 |
| 9 | N Washington St & Driveway | | | | | | | | | | | | | |
| | **Overall Intersection (Unsignalized)** | | | | **n/a** | **n/a** | | | **n/a** | **n/a** | | | **n/a** | **n/a** |
| | *Westbound Approach* | | | | *A* | *9.9* | | | *A* | *9.2* | | | *A* | *9.1* |
| | Westbound Right | 105 | *n/a* | 1 | A | 9.9 | *n/a* | 1 | A | 9.2 | *n/a* | 0 | A | 9.1 |

*Notes:* *N/A – Not Applicable*
*# – 95th percentile volume exceeds capacity, queue may be longer. Queue shown is the maximum after two cycles.*
*m – Volume for 95th percentile queue is metered by upstream signal.*
*~ – Volume exceeds capacity, queue can be longer. Queue shown is maximum after two cycles.*

Most of the study intersections' approaches will continue to operate at acceptable levels of service during the weekday morning, weekday afternoon, and Saturday peak hours. Similar to existing conditions, the eastbound approach of Great Falls Street with N. Washington Street will continue to operate at LOS F conditions during the AM and PM peak hours. The eastbound left turn movement at the Broad Street/Washington Street intersection would operate at LOS E conditions during the AM and PM peak hours.

Based on the queuing analysis, peak hour queue lengths will continue to exceed the storage length in one or more of the lane groups at the following intersections during one or more of the peak periods:

- Broad Street and Washington Street (AM, PM and Saturday)
- N. Washington Street and Park Avenue (PM only)

The minimal improvements that occurred in the delay results at some of the study intersections' approaches and lane groups, when compared to the delay results of the existing conditions, are attributed to the use of existing peak hour factors (by approach) in the existing conditions; whereas the default peak hour factor of 0.92 was used in both future scenarios. The use of the peak hour factor in this way was agreed upon in the scoping document and is standard industry practice.

The results of the intersection capacity analyses for the future without development conditions are shown in Figure 8.

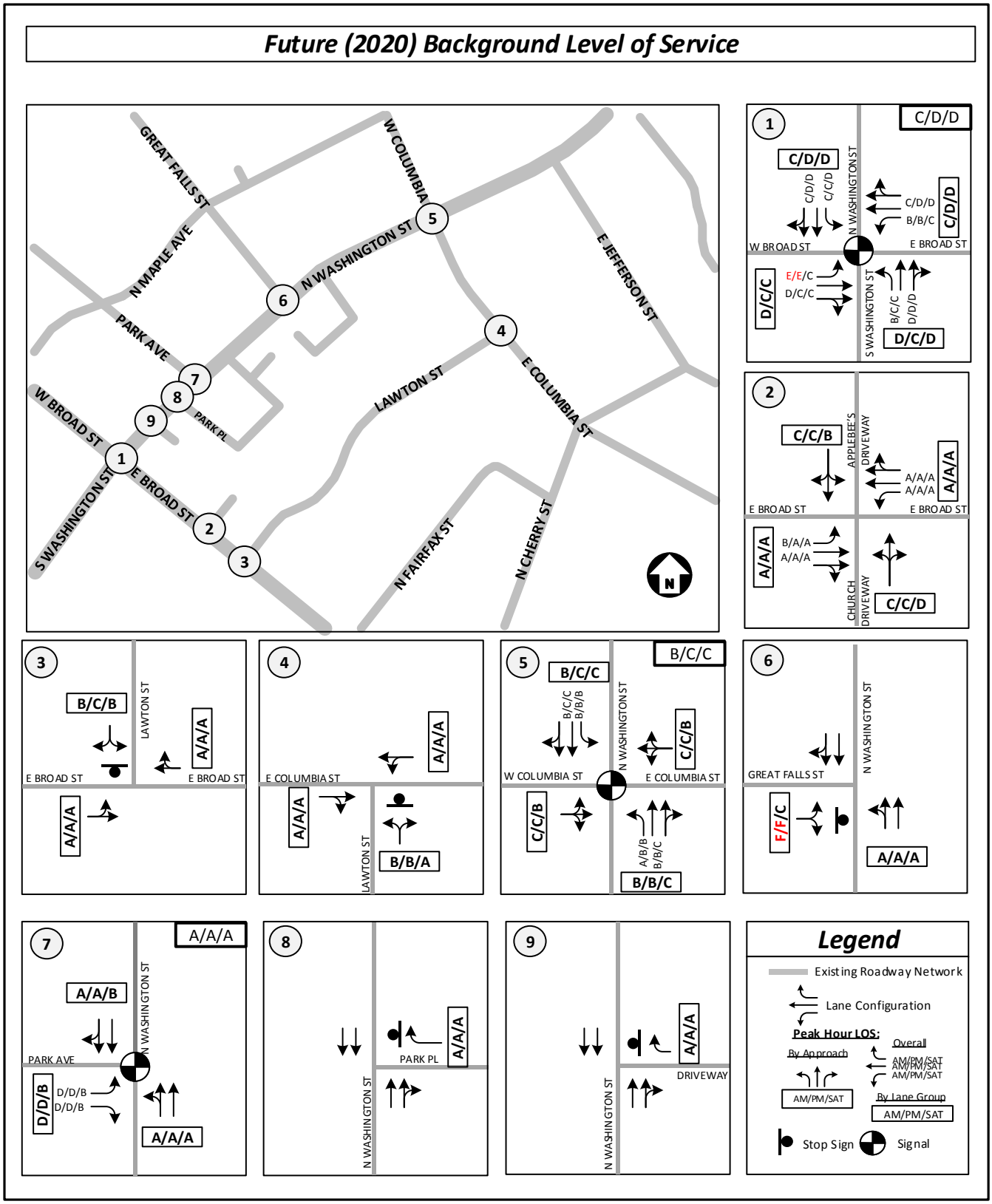



**Figure 8: Future without Development (2020) Level of Service**

## TRIP GENERATION

In order to calculate the trip generation for the proposed redevelopment, the Institute of Transportation Engineers' (ITE) Trip Generation Manual, 9th Edition was used to determine the trips into and out of the Broad & Washington site for the weekday morning, afternoon, and Saturday peak hours, as well as the typical weekday daily and Saturday (24-hour) trips to the site. To account for the synergy between the residential and retail land uses, a 5%, 10%, 15%, 10% internal capture reduction was applied to the weekday AM, PM, Daily, and Saturday site generated trips, respectively, as allowed per VDOT Chapter 870 guidelines. This reduction was calculated based on the site's residential trips, rather than the retail, because it is lesser trip generator of the two land uses. As agreed upon at the scoping meeting with City of Falls Church staff and as allowed per VDOT Chapter 870 guidelines, 36% of the new retail trips generated were assumed to be pass-by trips in order to recognize drivers already on the adjacent streets that will enter from the existing stream of traffic, and then continue in their original path after exiting the site. This rate represents the average pass-by trip percentage for the supermarket land use according to the ITE Trip Generation Manual, 9th Edition. The proposed Broad & Washington redevelopment's trip generation is shown in Table 4.

**Table 4: Site Trip Generation**

| Land Use | ITE Code | Size | ------ Weekday ------ | | | | | | | ------ Saturday ------ | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | AM Peak Hour | | | PM Peak Hour | | | Daily | SAT Peak Hour | | | Daily |
| | | | *In* | *Out* | *Total* | *In* | *Out* | *Total* | *Total* | *In* | *Out* | *Total* | *Total* |
| **Proposed Retail** | | | | | | | | | | | | | |
| Grocery | 850 | 47.2 kSF | 99 | 61 | 160 | 228 | 219 | 447 | 4,552 | 300 | 288 | 588 | 8,382 |
| High Turnover Sit Down Restaurant | 932 | 12.4 kSF | 74 | 60 | 134 | 73 | 49 | 122 | 1,577 | 92 | 82 | 174 | 1,964 |
| Specialty retail | 826 | 12.4 kSF | 84 | 92 | 176 | 22 | 29 | 51 | 568 | 117 | 108 | 225 | 521 |
| *Subtotal (Retail without reductions)* | | | *257* | *213* | *470* | *323* | *297* | *620* | *6,697* | *509* | *478* | *987* | *10,867* |
| *Internal Trips Reduction (Retail)* | | | *-7* | *-2* | *-8* | *-7* | *-13* | *-20* | *-318* | *-8* | *-8* | *-16* | *-350* |
| *Subtotal (Retail with internal reduction)* | | | *250* | *211* | *462* | *316* | *284* | *600* | *6,379* | *501* | *470* | *972* | *10,517* |
| *Transit/Walk Reduction - 2% (Retail Only)* | | | *-5* | *-4* | *-9* | *-6* | *-6* | *-12* | *-128* | *-10* | *-9* | *-19* | *-210* |
| *Subtotal (w/ Transit/Walk Reduction)* | | | *245* | *207* | *453* | *310* | *278* | *588* | *6,251* | *491* | *461* | *952* | *10,307* |
| *Pass by Trips Reduction - 36% (Retail Only)* | | | *-88* | *-75* | *-163* | *-111* | *-100* | *-212* | *-2,250* | *-177* | *-166* | *-343* | *-3,710* |
| *Existing Restaurant to be removed* | *932* | *4.3 kSF* | *-25* | *-21* | *-46* | *-25* | *-17* | *-42* | *-541* | *-32* | *-28* | *-60* | *-674* |
| *Existing Retail to be removed* | *826* | *11.4 kSF* | *-83* | *-89* | *-172* | *-22* | *-27* | *-49* | *-526* | *-111* | *-102* | *-213* | *-480* |
| *Total Proposed New External Retail Trips* | | | *49* | *23* | *72* | *151* | *134* | *285* | *2,934* | *171* | *165* | *336* | *5,442* |
| **Proposed Residential** | | | | | | | | | | | | | |
| Apartment | 220 | 330 DU | 33 | 132 | 165 | 129 | 70 | 199 | 2,123 | 78 | 77 | 155 | 2,334 |
| Internal Trips Reduction (Residential) 5% (AM), 10% (PM & SAT), 15% (Weekday/Weekend Daily) | | - | -2 | -7 | -8 | -13 | -7 | -20 | -318 | -8 | -8 | -16 | -350 |
| *Subtotal (Residential with internal reduction)* | | | *31* | *125* | *157* | *116* | *63* | *179* | *1,805* | *70* | *69* | *140* | *1,984* |
| *Transit Reduction - 10% (Residential Only)* | | | *-3* | *-13* | *-16* | *-12* | *-6* | *-18* | *-180* | *-7* | *-7* | *-14* | *-198* |
| *Subtotal (w/ Transit Reduction)* | | | *28* | *113* | *141* | *104* | *57* | *161* | *1,624* | *63* | *62* | *126* | *1,786* |
| *Total Residential Trips* | | | *28* | *113* | *141* | *104* | *57* | *161* | *1,624* | *63* | *62* | *126* | *1,786* |
| **Proposed Office** | | | | | | | | | | | | | |
| Office | 710 | 36.0 kSF | 75 | 10 | 85 | 20 | 99 | 119 | 604 | 8 | 7 | 15 | 105 |
| *Transit/Walk Reduction - 2% (Office Only)* | | | *-2* | *0* | *-2* | *0* | *-2* | *-2* | *-12* | *0* | *0* | *0* | *-2* |
| *Subtotal (w/ Transit/Walk Reduction)* | | | *73* | *10* | *83* | *20* | *97* | *117* | *592* | *8* | *7* | *15* | *103* |
| *Office to be removed* | *710* | *49.8 kSF* | *-97* | *-13* | *-110* | *-23* | *-111* | *-134* | *-773* | *-11* | *-10* | *-21* | *-133* |
| *Total Office Trips* | | | *-24* | *-3* | *-27* | *-3* | *-14* | *-17* | *-181* | *-3* | *-3* | *-6* | *-30* |
| ***Proposed Site Trips without Reductions*** | | | ***365*** | ***355*** | ***720*** | ***472*** | ***466*** | ***938*** | ***9,424*** | ***595*** | ***562*** | ***1,157*** | ***13,306*** |
| ***Proposed Site Trips with Reductions*** | | | ***53*** | ***132*** | ***186*** | ***252*** | ***177*** | ***429*** | ***4,377*** | ***231*** | ***224*** | ***456*** | ***7,198*** |

In the context of the trip generation table and discussion, "reductions" refer to deductions from the numbers of vehicle trips generated by a use due to the use of another mode or sharing of trip purpose. The reduction is relative to the raw numbers of trips published by ITE, rather than reflecting the removal of trips currently on the road network. The ITE trip rates represent the number of vehicles expected to enter and exit a site in a location with high auto availability and few travel mode choices and are appropriately modified in environments like the City of Falls Church.

The trips currently associated with the partially-occupied site uses were then removed from the trip generation to account for the demolition of the existing buildings. Given the suburban nature of the buildings with surface parking lots, no reductions for transit use or internal capture, beyond those inherent in the ITE data, were applied. Thus, the proposed redevelopment will generate approximately 186 new external trips during the weekday morning peak hour, 429 new external trips during the weekday afternoon peak hour, 456 new external trips during the Saturday peak hour, and 4,377 new external weekday daily trips.

### *VDOT Mixed-Use Trip Generation Model*

The results of the ITE trip generation analysis were compared with the VDOT Mixed-Use Trip Generation Model to evaluate the similarities and differences in the resulting trip generation. The model was developed for the San Diego Association of Governments (SANDAG) based on data collected at existing "smart growth" sites. Parameters included in the computation of internal and non-auto trip reductions include population, network connectivity, employment, and land area. While the model computes a larger share of non-auto trips than utilized in the ITE calculations above, no breakdown by lane use or trip direction (inbound vs. outbound) is provided. Additionally, the number of land use categories is limited in the Mixed-Use Trip Generation Model and leads to an overestimation of the retail trips in this case. It is unclear whether simply modifying the "raw" trip estimates would lead to an accurate representation of the interaction of the land uses, as the underlying computations are not available to the user of the model.

The resulting trip reduction estimates from the model are shown in Table 4, without the adjustments for existing uses to be removed. Accounting for the existing trips, the model would yield 103 AM peak hour trips, 532 PM peak hour trips, and 5,441 daily trips; no estimates for Saturday are computed. These figures represent 45% fewer AM peak hour trips, 24% more PM peak hour trips, and 24% more daily trips than the net trips in Table 3. Thus, the ITE trip estimates with reductions consistent with VDOT guidelines are within the range of trips estimated by the Mixed-Use Trip Generation Model. Due to the more complete information provided by the ITE calculations, that methodology was used to derive the site traffic assignments and future with development traffic forecasts.

**Table 5: Mixed-Use Trip Generation Model Results**

| | Daily | | | | AM Peak Hour | | | | PM Peak Hour | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | HBW | HBO | NHB | Total | HBW | HBO | NHB | Total | HBW | HBO | NHB | Total |
| **Number of "Raw" ITE Trips Subject to Model** | 3076 | 4979 | 2827 | 10882 | 351 | 220 | 34 | 606 | 405 | 409 | 296 | 1109 |
| **Predicted Probabilities:** | | | | | | | | | | | | |
| Internal Capture | 4.42% | 3.59% | 6.43% | 4.56% | 4.42% | 3.59% | 6.43% | 4.23% | 4.42% | 3.59% | 6.43% | 4.65% |
| Walking External | 3.00% | 35.11% | 30.03% | 24.72% | 3.00% | 35.11% | 30.03% | 16.24% | 3.00% | 35.11% | 30.03% | 22.04% |
| Transit External | 15.64% | 0.84% | 1.37% | 5.16% | 15.64% | 0.84% | 1.37% | 9.44% | 15.64% | 0.84% | 1.37% | 6.39% |
| **Number of Trips:** | | | | | | | | | | | | |
| Internal Capture | 136 | 179 | 182 | 497 | 16 | 8 | 2 | 26 | 18 | 15 | 19 | 52 |
| Walking External | 88 | 1685 | 794 | 2568 | 10 | 74 | 10 | 94 | 12 | 138 | 83 | 233 |
| Transit External | 460 | 40 | 36 | 536 | 52 | 2 | 0 | 55 | 60 | 3 | 4 | 68 |
| **Net Number of IXXI Vehicle Trips** | **2392** | **3075** | **1814** | **7281** | **273** | **136** | **22** | **431** | **315** | **253** | **190** | **757** |

| | External Vehicle Trips | | | VMT | | |
|---|---|---|---|---|---|---|
| **Results** | Raw | Net | Reduction % | Raw | Net | Reduction % |
| Daily | 10,882 | 7,281 | 33% | 45,791 | 31,816 | 31% |
| AM Peak Hour | 606 | 431 | 29% | 3,108 | 2,292 | 26% |
| PM Peak Hour | 1,109 | 757 | 32% | 4,957 | 3,517 | 29% |

## SITE TRAFFIC DISTRIBUTION AND ASSIGNMENT

### *Site Access*

Vehicular access to the subject property is currently provided via:

- Three driveways along E. Broad Street
- Two driveways along Park Place
- One driveway on N. Washington Street (about 140 feet south of Park Place)

Access to the proposed development will be consolidated to the following:

- One driveway along E. Broad Street (current Applebee's driveway location)
- One driveway along Park Place (midway between existing locations)
- One driveway on N. Washington Street (current location)

### *Distribution and Assignment*

The distribution of site trips was based on previous studies performed in the area, existing traffic patterns, the City's TDM plan and the nature of the proposed development. Trips generated from the site were assigned based on the abovementioned factors. The inbound and outbound trips calculated for the weekday morning, afternoon, and Saturday peak hours were routed through the roadway network to the site. The site direction of approach and trip distribution for the weekday and Saturday peak hours is illustrated in Figure 7. The site traffic assignment for the weekday and Saturday peak hours is illustrated in Figure 8. The trip assignments for each of the site land uses, as well as the pass-by trips, are included in Appendix F.

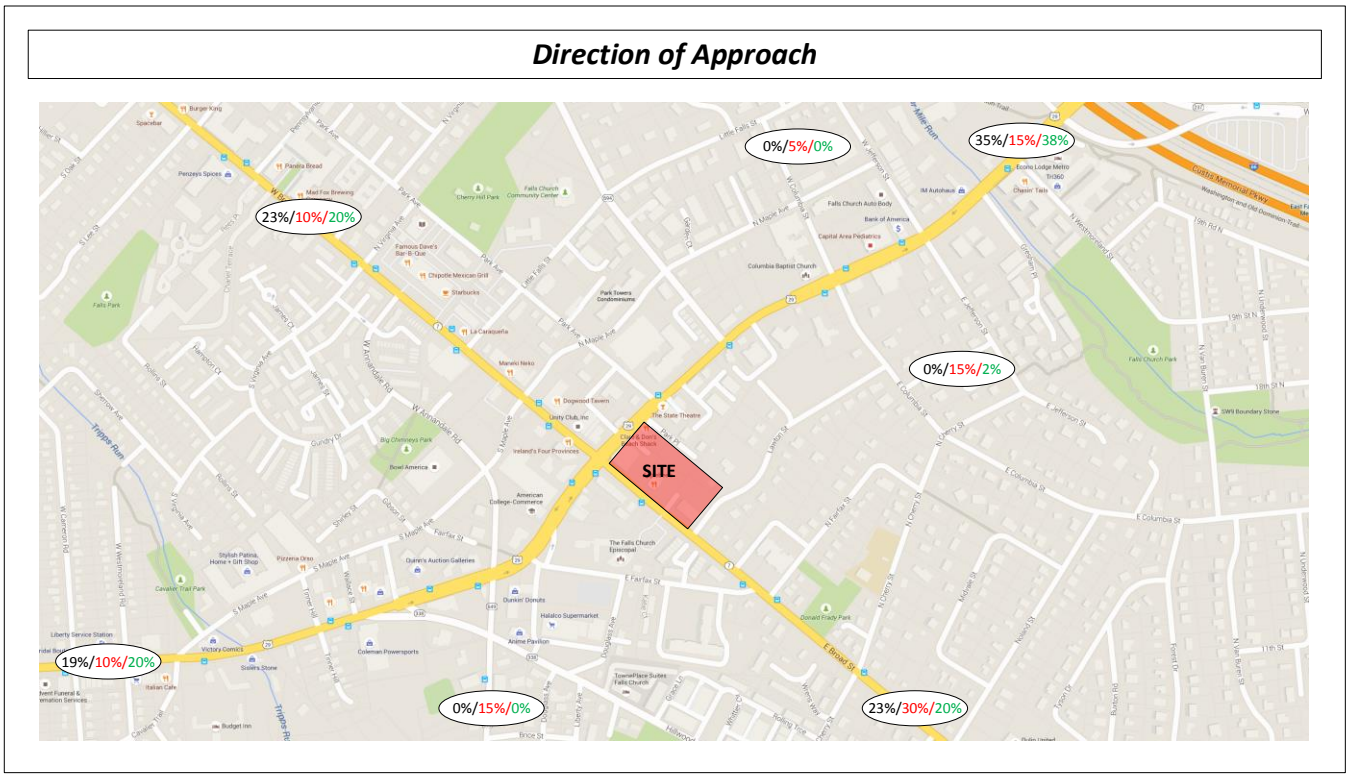



**Figure 9: Directions of Approach**

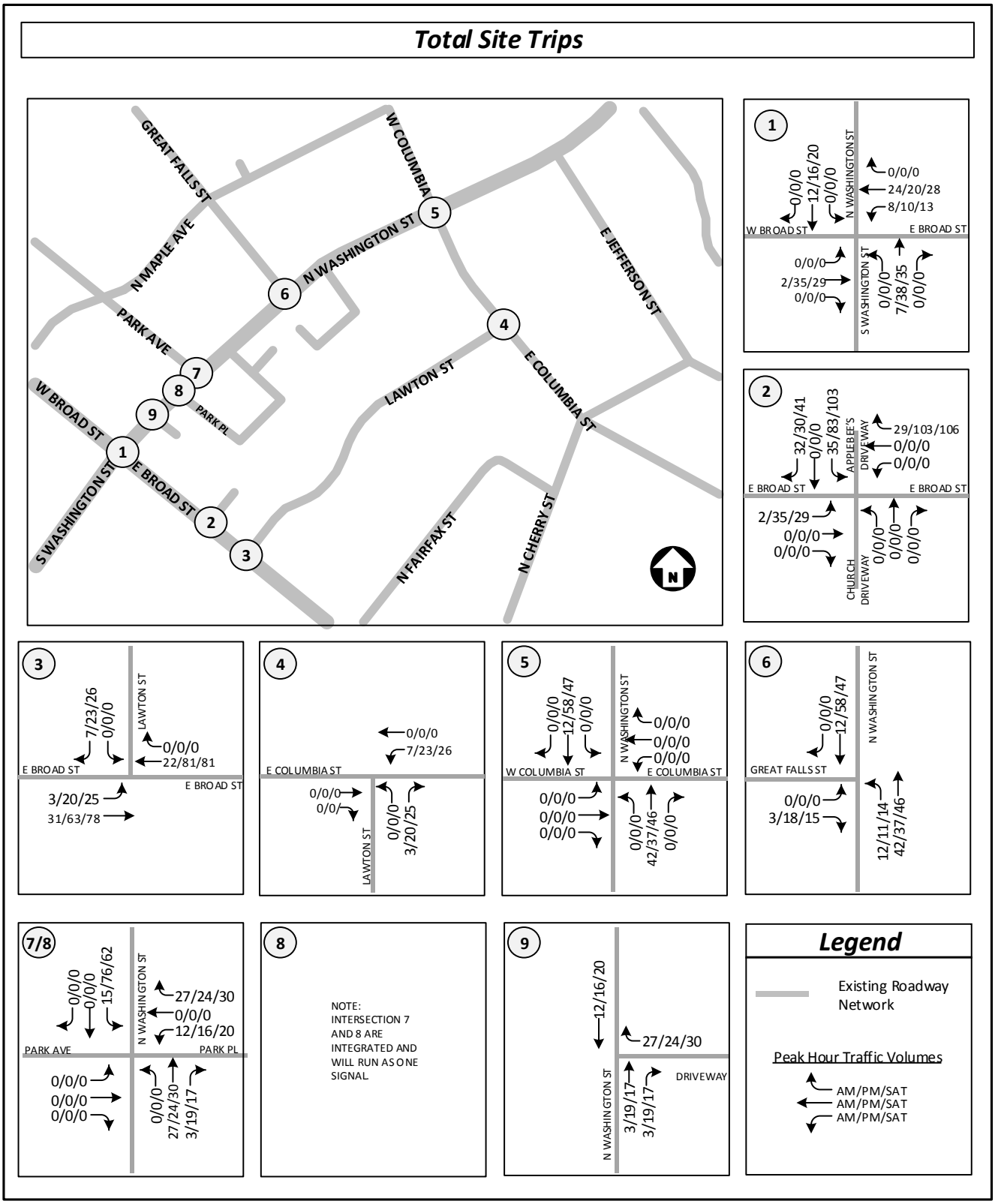



**Figure 10: Site Generated Trips**

## FUTURE CONDITIONS WITH DEVELOPMENT (2020)

### *Future with Development Traffic Volumes*

The proposed site generated development traffic volumes were added to the future without development traffic volumes to forecast the 2020 future with development conditions. The traffic volumes for the future with development traffic conditions are shown in Figure 11.

### *Future with Development Capacity Analysis*

Intersection capacity analyses were performed for the future conditions with the proposed development at the intersections contained within the study area during the weekday morning and afternoon peak hours, as well as the Saturday peak hour. *Synchro 8.0, build 806, revision 61 (8.0.806.61)* was used to analyze the study intersections with results based on the Highway Capacity Manual (HCM) methodology. The default peak hour factor of 0.92 has been used in the analysis. Heavy vehicle percentages, lane widths, road grades, and number of bus blockages per hour were kept the same as the existing conditions. The capacity and queuing analysis results are presented in Table 6 and shown in Figure 12. The detailed analysis worksheets are contained in Appendix G.

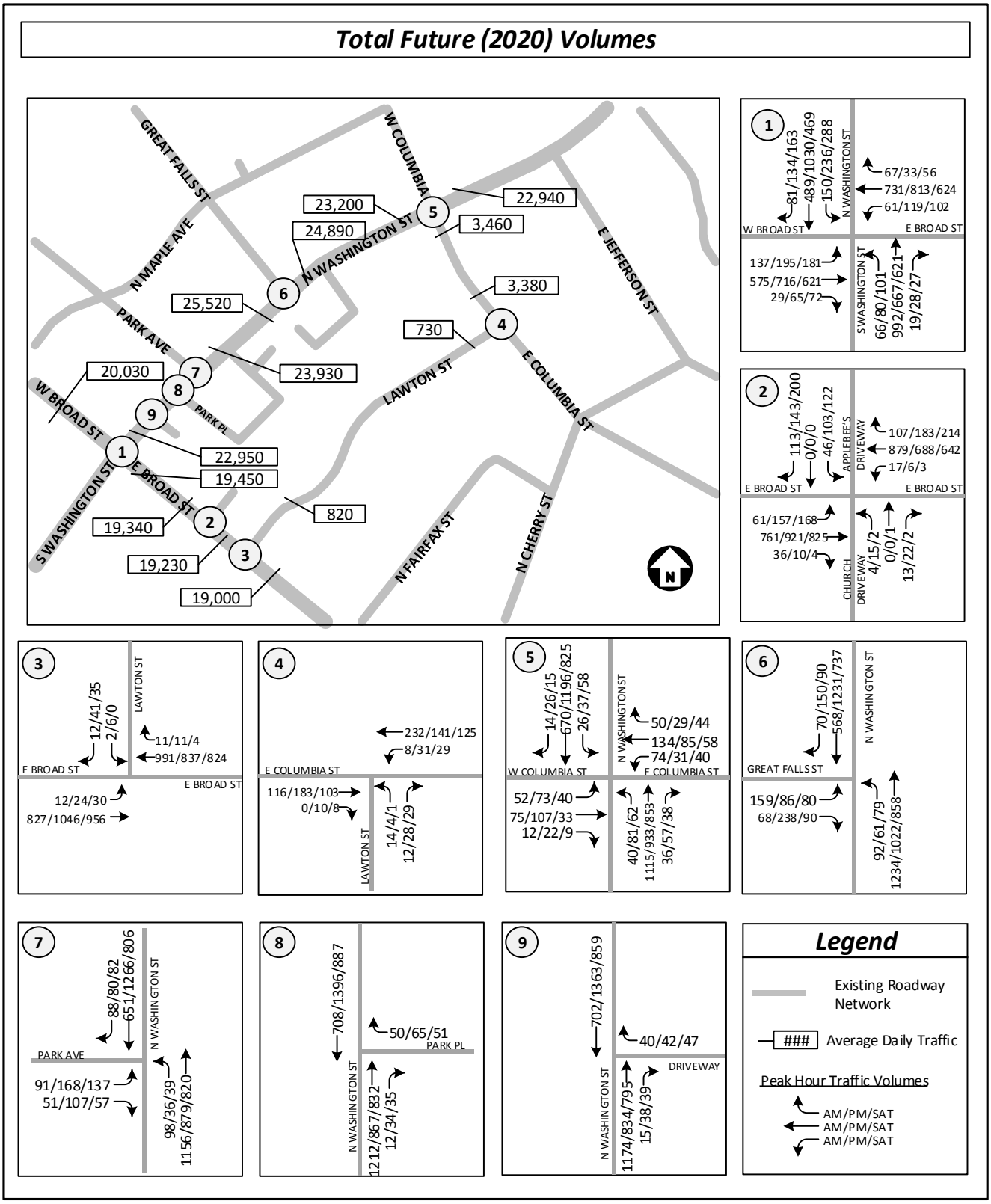



**Figure 11: Future with Development (2020) Traffic Volumes**

## Table 6: Future with Development (2020) Intersection Capacity Analysis

| No. | Intersection (Movement) | Bay/ Link Length (feet) | AM Peak | | | | PM Peak | | | | SAT Peak | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 50th Queue | 95th Queue | LOS | Delay | 50th Queue | 95th Queue | LOS | Delay | 50th Queue | 95th Queue | LOS | Delay |
| 1 | Broad St & Washington St | | | | | | | | | | | | | |
| | **Overall Intersection (Signalized)** | | | | **D** | **35.9** | | | **D** | **41.7** | | | **D** | **41.6** |
| | *Eastbound Approach* | | | | *D* | *45.4* | | | *C* | *34.2* | | | *D* | *37.2* |
| | Eastbound Left | *275* | *83* | *m#166* | *E* | *73.1* | *68* | *#221* | *E* | *69.9* | *97* | *188* | *C* | *30.0* |
| | Eastbound Thru/Right | *435* | *205* | *205* | *D* | *39.1* | *225* | *253* | *C* | *25.3* | *278* | *410* | *D* | *39.1* |
| | *Westbound Approach* | | | | *C* | *32.1* | | | *D* | *45.3* | | | *D* | *45.7* |
| | Westbound Left | 255 | 15 | 31 | B | 14.4 | 38 | #103 | C | 28.0 | 52 | 102 | C | 29.3 |
| | Westbound Thru/Right | 400 | 276 | #379 | C | 33.4 | 308 | #440 | D | 47.7 | 294 | 426 | D | 48.1 |
| | *Northbound Approach* | | | | *D* | *42.0* | | | *D* | *38.6* | | | *D* | *46.0* |
| | Northbound Left | 345 | 20 | m50 | B | 19.9 | 38 | m59 | C | 27.6 | 50 | 105 | C | 29.7 |
| | Northbound Thru/Right | 580 | 214 | #485 | D | 43.4 | 266 | 327 | D | 39.9 | 281 | 411 | D | 48.5 |
| | *Southbound Approach* | | | | *C* | *21.6* | | | *D* | *46.1* | | | *D* | *38.9* |
| | Southbound Left | 190 | 55 | #135 | C | 28.6 | 110 | #219 | D | 45.3 | 177 | #431 | D | 47.0 |
| | Southbound Thru/Right | 270 | 157 | 190 | B | 22.0 | ~331 | #574 | D | 46.3 | 241 | 377 | D | 35.2 |
| 2 | E. Broad St & Driveway | | | | | | | | | | | | | |
| | **Overall Intersection (Unsignalized)** | | | | **n/a** | **n/a** | | | **n/a** | **n/a** | | | **n/a** | **n/a** |
| | *Eastbound Approach* | | | | *A* | *0.8* | | | *A* | *1.7* | | | *A* | *2.0* |
| | Eastbound Left | 90 | *n/a* | 9 | B | 11.3 | *n/a* | 23 | B | 11.7 | *n/a* | 25 | B | 11.7 |
| | Eastbound Thru/Right | 385 | *n/a* | 0 | A | 0.0 | *n/a* | 0 | A | 0.0 | *n/a* | 0 | A | 0.0 |
| | *Westbound Approach* | | | | *A* | *0.2* | | | *A* | *0.1* | | | *A* | *0.0* |
| | Westbound Left | 165 | *n/a* | 2 | A | 9.1 | *n/a* | 1 | A | 9.4 | *n/a* | 0 | A | 9.1 |
| | Westbound Thru/Right | 165 | *n/a* | 0 | A | 0.0 | *n/a* | 0 | A | 0.0 | *n/a* | 0 | A | 0.0 |
| | *Northbound Approach* | | | | *C* | *24.5* | | | *F* | *107.0* | | | *F* | *91.0* |
| | Northbound Left/Thru/Right | 25 | *n/a* | 7 | C | 24.5 | *n/a* | 60 | F | 107.0 | *n/a* | 9 | F | 91.0 |
| | *Southbound Approach* | | | | *F* | *92.8* | | | *F* | *619.4* | | | *F* | *703.0* |
| | Southbound Left/Thru/Right | 100 | *n/a* | 175 | F | 92.8 | *n/a* | 565 | F | 619.4 | *n/a* | 749 | F | 703.0 |
| 3 | Broad St & Lawton St | | | | | | | | | | | | | |
| | **Overall Intersection (Unsignalized)** | | | | **n/a** | **n/a** | | | **n/a** | **n/a** | | | **n/a** | **n/a** |
| | *Eastbound Approach* | | | | *A* | *0.2* | | | *A* | *0.4* | | | *A* | *0.5* |
| | Eastbound Left/Thru | 165 | *n/a* | 2 | A | 0.7 | *n/a* | 3 | A | 1.1 | *n/a* | 3 | A | 1.3 |
| | *Westbound Approach* | | | | *A* | *0.0* | | | *A* | *0.0* | | | *A* | *0.0* |
| | Westbound Thru/Right | 505 | *n/a* | 0 | A | 0.0 | *n/a* | 0 | A | 0.0 | *n/a* | 0 | A | 0.0 |
| | *Southbound Approach* | | | | *B* | *13.2* | | | *B* | *13.9* | | | *B* | *11.0* |
| | Southbound Left/Right | 790 | *n/a* | 3 | B | 13.2 | *n/a* | 9 | B | 13.9 | *n/a* | 5 | B | 11.0 |
| 4 | Lawton St & Columbia St | | | | | | | | | | | | | |
| | **Overall Intersection (Unsignalized)** | | | | **n/a** | **n/a** | | | **n/a** | **n/a** | | | **n/a** | **n/a** |
| | *Eastbound Approach* | *485* | *n/a* | *0* | *A* | *0.0* | *n/a* | *0* | *A* | *0.0* | *n/a* | *0* | *A* | *0.0* |
| | *Westbound Approach* | *440* | *n/a* | *0* | *A* | *0.3* | *n/a* | *2* | *A* | *1.6* | *n/a* | *2* | *A* | *1.6* |
| | *Northbound Approach* | | | | *B* | *10.4* | | | *A* | *9.9* | | | *A* | *9.1* |
| | Northbound Left/Right | 550 | *n/a* | 3 | B | 10.4 | *n/a* | 4 | A | 9.9 | *n/a* | 3 | A | 9.1 |
| 5 | N Washington Street & Columbia St | | | | | | | | | | | | | |
| | **Overall Intersection (Signalized)** | | | | **B** | **18.0** | | | **C** | **23.0** | | | **C** | **25.9** |
| | *Eastbound Approach* | | | | *C* | *29.4* | | | *C* | *32.8* | | | *B* | *17.3* |
| | Eastbound Left/Thru/Right | 370 | 73 | 129 | C | 29.4 | 111 | 185 | C | 32.8 | 28 | 71 | B | 17.3 |
| | *Westbound Approach* | | | | *C* | *34.9* | | | *C* | *29.5* | | | *B* | *18.3* |
| | Westbound Left/Thru/Right | 485 | 145 | 232 | C | 34.9 | 72 | 128 | C | 29.5 | 47 | 108 | B | 18.3 |
| | *Northbound Approach* | | | | *B* | *13.4* | | | *B* | *16.7* | | | *C* | *28.8* |
| | Northbound Left | 70 | 6 | m14 | A | 7.7 | 13 | 47 | B | 17.2 | 17 | 37 | B | 16.7 |
| | Northbound Thru/Right | 640 | 196 | 332 | B | 13.6 | 296 | 347 | B | 16.7 | 236 | 317 | C | 29.6 |
| | *Southbound Approach* | | | | *B* | *17.4* | | | *C* | *26.0* | | | *C* | *27.0* |
| | Southbound Left | 125 | 7 | 19 | B | 15.3 | 10 | 24 | B | 13.8 | 16 | 35 | B | 17.2 |
| | Southbound Thru/Right | 475 | 162 | 212 | B | 17.5 | 373 | 470 | C | 26.3 | 219 | 296 | C | 27.7 |
| 6 | N Washington St & Great Falls St | | | | | | | | | | | | | |
| | **Overall Intersection (Unsignalized)** | | | | **n/a** | **n/a** | | | **n/a** | **n/a** | | | **n/a** | **n/a** |
| | *Eastbound Approach* | | | | *F* | *60.6* | | | *F* | *102.8* | | | *C* | *16.3* |
| | *Eastbound Left/Right* | *440* | *n/a* | *182* | *F* | *60.6* | *n/a* | *321* | *F* | *102.8* | *n/a* | *42* | *C* | *16.3* |
| | *Northbound Approach* | | | | *A* | *1.0* | | | *A* | *1.2* | | | *A* | *1.1* |
| | Northbound Thru/Left | 425 | *n/a* | 8 | A | 2.6 | *n/a* | 10 | A | 3.4 | *n/a* | 7 | A | 2.7 |
| 7 | N Washington St & Park Ave | | | | | | | | | | | | | |
| | **Overall Intersection (Signalized)** | | | | **A** | **6.4** | | | **A** | **7.4** | | | **B** | **10.1** |
| | *Eastbound Approach* | | | | *D* | *45.8* | | | *D* | *39.6* | | | *B* | *19.1* |
| | Eastbound Left | 150 | 61 | 108 | D | 48.4 | 106 | 170 | D | 42.5 | 39 | 91 | B | 19.7 |
| | Eastbound Right | 410 | 0 | 34 | D | 41.1 | 0 | 44 | D | 35.0 | 0 | 24 | B | 17.8 |
| | *Northbound Approach* | | | | *A* | *4.4* | | | *A* | *5.1* | | | *A* | *5.4* |
| | Northbound Thru/Left | 370 | 91 | m104 | A | 4.4 | 73 | m119 | A | 5.1 | 60 | 158 | A | 5.4 |
| | *Southbound Approach* | | | | *A* | *2.4* | | | *A* | *2.3* | | | *B* | *12.6* |
| | Southbound Thru/Right | 425 | 42 | 95 | A | 2.4 | 49 | 63 | A | 2.3 | 108 | 227 | B | 12.6 |
| 8 | N Washington St & Park Pl | | | | | | | | | | | | | |
| | **Overall Intersection (Unsignalized)** | | | | **n/a** | **n/a** | | | **n/a** | **n/a** | | | **n/a** | **n/a** |
| | *Westbound Approach* | | | | *B* | *10.2* | | | *A* | *9.5* | | | *A* | *9.3* |
| | Westbound Right | 315 | *n/a* | 6 | B | 10.2 | *n/a* | 7 | A | 9.5 | *n/a* | 5 | A | 9.3 |
| 9 | N Washington St & Driveway | | | | | | | | | | | | | |
| | **Overall Intersection (Unsignalized)** | | | | **n/a** | **n/a** | | | **n/a** | **n/a** | | | **n/a** | **n/a** |
| | *Westbound Approach* | | | | *B* | *10.2* | | | *A* | *9.4* | | | *A* | *9.4* |
| | Westbound Right | 105 | n/a | 5 | B | 10.2 | n/a | 4 | A | 9.4 | n/a | 5 | A | 9.4 |

*Notes:* *N/A – Not Applicable*
*# – 95th percentile volume exceeds capacity, queue may be longer. Queue shown is the maximum after two cycles.*
*m – Volume for 95th percentile queue is metered by upstream signal.*
*~ – Volume exceeds capacity, queue can be longer. Queue shown is maximum after two cycles.*

As mentioned previously, it is desirable to achieve a LOS D or better per approach. Similar to the existing and future without development conditions, most of the study intersections' approaches will continue to operate at acceptable levels of service during the weekday morning, afternoon, and Saturday peak hours. The eastbound approach of Great Falls Street with N. Washington Street will continue to operate at LOS F conditions during the AM and PM peak hours. The eastbound left turn movement at the Broad Street and Washington Street intersection would operate at LOS E conditions during the AM and PM peak hours.

The side-street approaches at the site driveway on E. Broad Street will operate at LOS F conditions during peak hours.

Based on the queuing analysis, peak hour queue lengths will continue to exceed the storage length in one or more of the lane groups at the following intersections during one or more of the peak periods:

- Broad Street and Washington Street (AM, PM and Saturday)
- E. Broad Street and Site Driveway (AM, PM and Saturday)

In summary, some approach delays at signalized intersections, and some stop-controlled side-street delays, will occur within the study area with or without the proposed Broad & Washington redevelopment. These conditions are consistent with an urban street network, particularly one with existing development that frames the streets and constrains the right-of-way. Traffic moving through the street grid "pulses" between closely spaces traffic signals, providing mobility for non-motorized travel as well as transit and private automobile traffic.

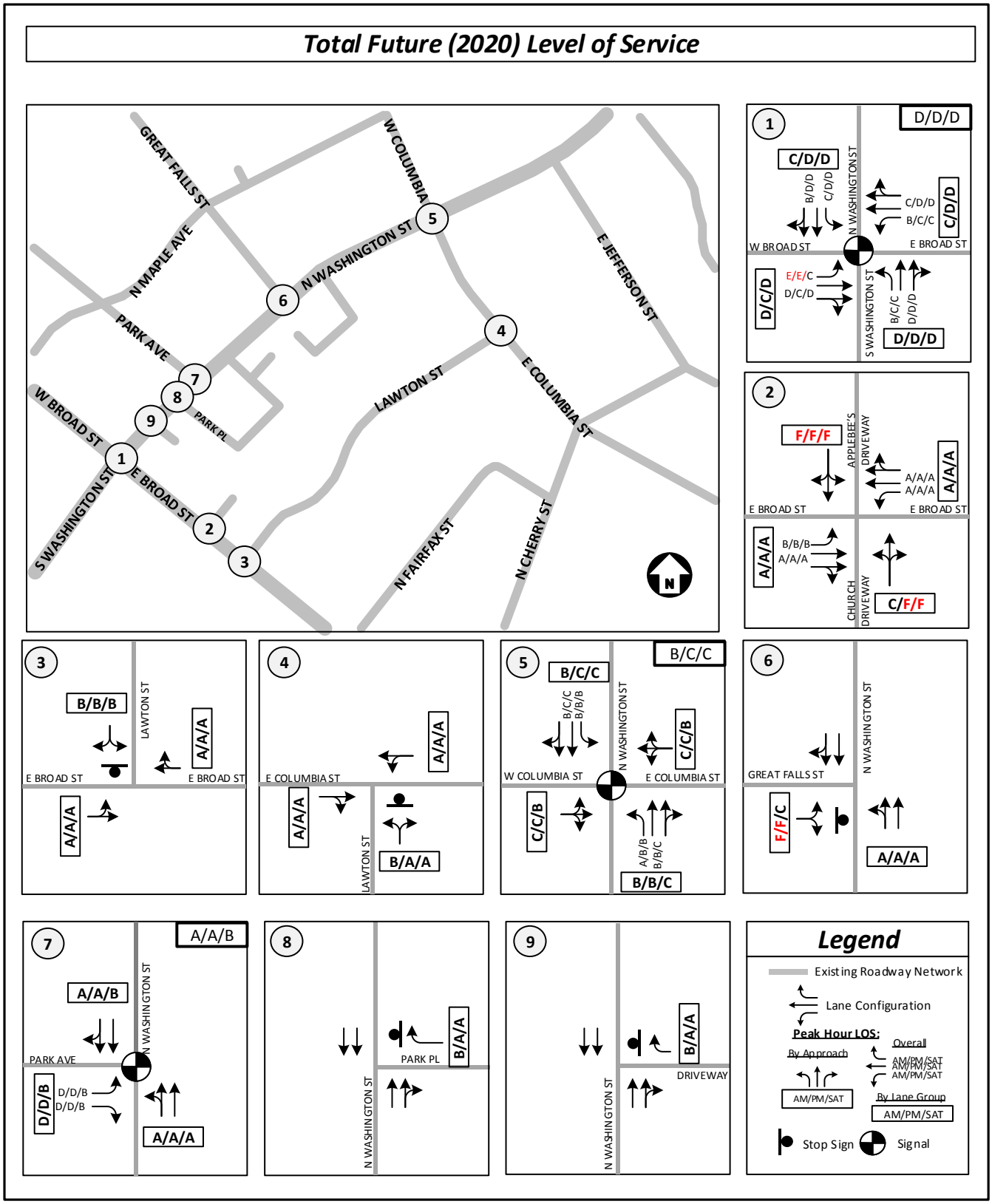



**Figure 12: Future with Development (2020) Level of Service**

## ADDITIONAL SCENARIOS

In order to identify access alternatives with improved traffic operations, six scenarios were analyzed for the four intersections that are adjacent to the property:

- Intersection #1: Washington Street and Broad Street;
- Intersection #2: E. Broad Street and Proposed Site Entrance;
- Intersection #7: N. Washington Street and Park Avenue; and
- Intersection #8: N. Washington Street and Park Place/Proposed Site Entrance.

The following is a brief description of the access variations at the Proposed Site Entrance on E. Broad Street:

- Scenario 1: Proposed Site Entrance at E. Broad Street as a full-access, unsignalized intersection and the Park Place/Proposed Site Entrance at N. Washington Street as a Right-in/Right-out limited access intersection (this is consistent with the existing geometry and is replicated from the above future with development analysis);
- Scenario 2: Proposed Site Entrance at E. Broad Street as a signalized intersection and the Park Place/Proposed Site Entrance at N. Washington Street as a Right-in/Right-out limited access intersection;
- Scenario 3: Proposed Site Entrance at E. Broad Street as a full-access, unsignalized intersection with rerouting of 75% of southbound left-turns that would exit at E. Broad Street to the Park Place Proposed Entrance location to account for the difficulty turning left without a signal and the Park Place/Proposed Site Entrance at N. Washington Street as a signalized intersection with the Park Avenue/N. Washington Street intersection;

The following is a brief description of the access variations at the Proposed Site Entrance/Park Place on N. Washington Street:

- Scenario 4: Park Place/Proposed Site Entrance at N. Washington Street as a full-access, unsignalized intersection and the Proposed Site Entrance at E. Broad Street as full-access, unsignalized intersection;
- Scenario 5: Park Place/Proposed Site Entrance at N. Washington Street as a signalized intersection with the Park Avenue/N. Washington Street intersection and the Proposed Site Entrance at E. Broad Street as a full-access, unsignalized intersection; and
- Scenario 6: Park Place/Proposed Site Entrance at N. Washington Street as a signalized intersection with the Park Avenue/N. Washington Street intersection and the Proposed Site Entrance at E. Broad Street as a signalized intersection.

The capacity analysis results are presented in the Table 7. The detailed analysis worksheet are located in Appendix H through Appendix M.

The results of the analysis of the alternative scenarios yields the following results relative to the base case represented by Scenario 1:

- Signalization of the Proposed Site Entrance at E. Broad Street (Scenario 2) would significantly improve operations at that intersection and not materially impact delays and queues at the remaining study intersections.
- Reallocating left turning traffic from the Proposed Site Entrance on E. Broad Street to a signalized access at Park Place and N. Washington Street (Scenario 3) would significantly improve operations at the E. Broad Street entrance, while increasing delays and queues at other intersections bordering the site. The increase in delays would be most pronounced at the Park Place intersection.
- Permitting left turn access to and from the site via Park Place (Scenario 4) would permit more site traffic to utilize that access point, significantly improving operations at the Proposed Site Entrance on E. Broad Street, while not materially impact delays and queues at the remaining study intersections.
- Incorporating Park Place at the fourth leg of the signalized intersection of N. Washington Street with Park Avenue (Scenario 5) would permit more site traffic to utilize that access point, significantly improving operations at the Proposed Site Entrance on E. Broad Street. Delays and queues would be increased somewhat at the N. Washington Street/Park Avenue/Park Place intersection, relative to the base condition, with the largest impact on eastbound Park Avenue during the PM peak hour.
- Signalization of both major access points (Scenario 6) would dramatically improve operations at the Proposed Site Entrance on E. Broad Street while not materially impacting overall delays and queues at the remaining study intersections. Delays would increase up to 40 seconds on some side street movements at the N. Washington Street/Park Avenue/Park Place intersection, but be reduced by up to 650 seconds at the Proposed Site Entrance on E. Broad Street. Of note, this is the only scenario analyzed that yields acceptable levels of service on each turning movement during all peak hours at the Proposed Site Entrance and E. Broad Street intersection.

Of the alternatives presented above, Scenario 6 provides the most benefit to the operation of the road network, while Scenario 3 results in the most impacts surrounding the site. Thus, signalization of the Proposed Site Entrance on E. Broad Street would improve the road network most in conjunction with signalization of Park Avenue, but would also improve operations by itself. A configuration that encourages a large proportion of the site traffic to divert to Park Place in order to access Broad Street via N. Washington Street would create the most significant impact in the area. It is noted that under the scenarios with a full-movement unsignalized access on E. Broad Street (Scenarios 1, 4, and 5), delays of 200 to 700 seconds per vehicle and queues of 300 to 750 feet are computed for vehicles exiting the site driveway. This condition would be expected to encourage a redistribution of traffic to the Park Place access and result in conditions more similar to Scenario 3.

As under the base condition with the existing road geometry, some approach delays at signalized intersections, and some stop-controlled side-street delays, will occur within the study area with or without the proposed Broad & Washington redevelopment.

## Table 7: Comparison of Scenarios

| No. | Intersection (Movement) | Bay/ Link Length (feet) | AM Peak 50th Queue | AM Peak 95th Queue | AM Peak LOS | AM Peak Delay | PM Peak 50th Queue | PM Peak 95th Queue | PM Peak LOS | PM Peak Delay | SAT Peak 50th Queue | SAT Peak 95th Queue | SAT Peak LOS | SAT Peak Delay |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **SCENARIO 1** | | | | | | | | | | | | | |
| 1 | Broad St & Washington St | | | | | | | | | | | | | |
| | **Overall Intersection (Signalized)** | | | | **D** | **35.9** | | | **D** | **41.7** | | | **D** | **41.6** |
| | *Eastbound Approach* | | | | *D* | *45.4* | | | *C* | *34.2* | | | *D* | *37.2* |
| | Eastbound Left | *275* | *83* | *m#166* | *E* | *73.1* | *68* | *#221* | *E* | *69.9* | *97* | *188* | *C* | *30.0* |
| | Eastbound Thru/Right | *435* | *205* | *205* | *D* | *39.1* | *225* | *253* | *C* | *25.3* | *278* | *410* | *D* | *39.1* |
| | *Westbound Approach* | | | | *C* | *32.1* | | | *D* | *45.3* | | | *D* | *45.7* |
| | Westbound Left | 255 | 15 | 31 | B | 14.4 | 38 | #103 | C | 28.0 | 52 | 102 | C | 29.3 |
| | Westbound Thru/Right | 400 | 276 | #379 | C | 33.4 | 308 | #440 | D | 47.7 | 294 | 426 | D | 48.1 |
| | *Northbound Approach* | | | | *D* | *42.0* | | | *D* | *38.6* | | | *D* | *46.0* |
| | Northbound Left | 345 | 20 | m50 | B | 19.9 | 38 | m59 | C | 27.6 | 50 | 105 | C | 29.7 |
| | Northbound Thru/Right | 580 | 214 | #485 | D | 43.4 | 266 | 327 | D | 39.9 | 281 | 411 | D | 48.5 |
| | *Southbound Approach* | | | | C | 21.6 | | | D | 46.1 | | | D | 38.9 |
| | Southbound Left | 190 | 55 | #135 | C | 28.6 | 110 | #219 | D | 45.3 | 177 | #431 | D | 47.0 |
| | Southbound Thru/Right | 270 | 157 | 190 | B | 22.0 | ~331 | #574 | D | 46.3 | 241 | 377 | D | 35.2 |
| 2 | E. Broad St & Driveway | | | | | | | | | | | | | |
| | **Overall Intersection (Unsignalized)** | | | | **n/a** | **n/a** | | | **n/a** | **n/a** | | | **n/a** | **n/a** |
| | *Eastbound Approach* | | | | *A* | *0.8* | | | *A* | *1.7* | | | *A* | *2.0* |
| | Eastbound Left | 90 | *n/a* | 9 | B | 11.3 | *n/a* | 23 | B | 11.7 | *n/a* | 25 | B | 11.7 |
| | Eastbound Thru/Right | 385 | *n/a* | 0 | A | 0.0 | *n/a* | 0 | A | 0.0 | *n/a* | 0 | A | 0.0 |
| | *Westbound Approach* | | | | *A* | *0.2* | | | *A* | *0.1* | | | *A* | *0.0* |
| | Westbound Left | 165 | *n/a* | 2 | A | 9.1 | *n/a* | 1 | A | 9.4 | *n/a* | 0 | A | 9.1 |
| | Westbound Thru/Right | 165 | *n/a* | 0 | A | 0.0 | *n/a* | 0 | A | 0.0 | *n/a* | 0 | A | 0.0 |
| | *Northbound Approach* | | | | *C* | *24.5* | | | *F* | *107.0* | | | *F* | *91.0* |
| | Northbound Lt/Thru/Right | 25 | *n/a* | 7 | C | 24.5 | *n/a* | 60 | F | 107.0 | *n/a* | 9 | F | 91.0 |
| | *Southbound Approach* | | | | *F* | *92.8* | | | *F* | *619.4* | | | *F* | *703.0* |
| | Southbound Lt/Thru/Right | 100 | *n/a* | 175 | F | 92.8 | *n/a* | 565 | F | 619.4 | *n/a* | 749 | F | 703.0 |
| 7 | N Washington St & Park Ave | | | | | | | | | | | | | |
| | **Overall Intersection (Signalized)** | | | | **A** | **6.4** | | | **A** | **7.4** | | | **B** | **10.1** |
| | *Eastbound Approach* | | | | *D* | *45.8* | | | *D* | *39.6* | | | *B* | *19.1* |
| | Eastbound Left | 150 | 61 | 108 | D | 48.4 | 106 | 170 | D | 42.5 | 39 | 91 | B | 19.7 |
| | Eastbound Right | 410 | 0 | 34 | D | 41.1 | 0 | 44 | D | 35.0 | 0 | 24 | B | 17.8 |
| | *Northbound Approach* | | | | *A* | *4.4* | | | *A* | *5.1* | | | *A* | *5.4* |
| | Northbound Thru/Left | 370 | 91 | m104 | A | 4.4 | 73 | m119 | A | 5.1 | 60 | 158 | A | 5.4 |
| | *Southbound Approach* | | | | *A* | *2.4* | | | *A* | *2.3* | | | *B* | *12.6* |
| | Southbound Thru/Right | 425 | 42 | 95 | A | 2.4 | 49 | 63 | A | 2.3 | 108 | 227 | B | 12.6 |
| 8 | N Washington St & Park Pl | | | | | | | | | | | | | |
| | **Overall Intersection (Unsignalized)** | | | | **n/a** | **n/a** | | | **n/a** | **n/a** | | | **n/a** | **n/a** |
| | *Westbound Approach* | | | | *B* | *10.2* | | | *A* | *9.5* | | | *A* | *9.3* |
| | Westbound Right | 315 | *n/a* | 6 | B | 10.2 | *n/a* | 7 | A | 9.5 | *n/a* | 5 | A | 9.3 |
| | **SCENARIO 2** | | | | | | | | | | | | | |
| 1 | Broad St & Washington St | | | | | | | | | | | | | |
| | **Overall Intersection (Signalized)** | | **C** | **34.0** | | | **D** | **40.5** | | | **D** | **41.6** | | |
| | *Eastbound Approach* | | | | *D* | *45.4* | | | *C* | *34.2* | | | *D* | *37.2* |
| | Eastbound Left | *275* | *83* | *m#166* | *E* | *73.1* | *68* | *#221* | *E* | *69.9* | *97* | *188* | *C* | *30.0* |
| | Eastbound Thru/Right | *435* | *205* | *205* | *D* | *39.1* | *225* | *253* | *C* | *25.3* | *278* | *410* | *D* | *39.1* |
| | *Westbound Approach* | | | | *C* | *24.4* | | | *D* | *40.1* | | | *D* | *45.7* |
| | Westbound Left | 255 | 10 | m21 | B | 12.3 | 27 | #102 | C | 34.3 | 52 | 102 | C | 29.3 |
| | Westbound Thru/Right | 400 | 103 | #261 | C | 25.4 | 312 | #442 | D | 40.9 | 294 | 426 | D | 48.1 |
| | *Northbound Approach* | | | | *D* | *42.0* | | | *D* | *38.6* | | | *D* | *46.0* |
| | Northbound Left | 345 | 20 | m50 | B | 19.9 | 38 | m59 | C | 27.6 | 50 | 105 | C | 29.7 |
| | Northbound Thru/Right | 580 | 214 | #485 | D | 43.4 | 266 | 327 | D | 39.9 | 281 | 411 | D | 48.5 |
| | *Southbound Approach* | | | | C | 21.6 | | | D | 46.1 | | | D | 38.9 |
| | Southbound Left | 190 | 55 | #135 | C | 28.6 | 110 | #219 | D | 45.3 | 177 | #431 | D | 47.0 |
| | Southbound Thru/Right | 270 | 157 | 190 | B | 19.8 | ~331 | #574 | D | 46.3 | 241 | 377 | D | 35.2 |
| 2 | E. Broad St & Driveway | | | | | | | | | | | | | |
| | **Overall Intersection (Signalized)** | | **B** | **11.0** | | | **B** | **15.1** | | | **C** | **27.8** | | |
| | *Eastbound Approach* | | | | *A* | *7.3* | | | *B* | *13.2* | | | *B* | *19.1* |
| | Eastbound Left | 90 | *8* | m16 | A | 6.7 | *43* | m79 | B | 19.9 | *82* | 120 | B | 17.4 |
| | Eastbound Thru/Right | 385 | *61* | m93 | A | 7.4 | *111* | 204 | B | 12.0 | *261* | 354 | B | 19.5 |
| | *Westbound Approach* | | | | *B* | *10.8* | | | *B* | *12.0* | | | *C* | *26.2* |
| | Westbound Left | 165 | *2* | m4 | A | 3.1 | *1* | m1 | A | 4.5 | *1* | 6 | B | 18.6 |
| | Westbound Thru/Right | 165 | *103* | 122 | B | 10.9 | *230* | 146 | B | 12.0 | *342* | 421 | C | 26.2 |
| | *Northbound Approach* | | | | *C* | *29.0* | | | *C* | *27.7* | | | *D* | *44.5* |
| | Northbound Lt/Thru/Rt | 25 | *0* | 0 | C | 29.0 | *0* | 2 | C | 27.7 | *2* | 15 | D | 44.5 |
| | *Southbound Approach* | | | | *C* | *30.7* | | | *C* | *32.7* | | | *E* | *58.5* |
| | Southbound Lt/Thru/Rt | 100 | *28* | 86 | C | 30.7 | *100* | 187 | C | 32.7 | *278* | 435 | E | 58.5 |
| 7 | N Washington St & Park Ave | | | | | | | | | | | | | |
| | **Overall Intersection (Signalized)** | | | **A** | **6.4** | | | **A** | **7.4** | | | **B** | **10.1** | |
| | *Eastbound Approach* | | | | *D* | *45.8* | | | *D* | *39.6* | | | *B* | *19.1* |
| | Eastbound Left | 150 | 61 | 108 | D | 48.4 | 106 | 170 | D | 42.5 | 39 | 91 | B | 19.7 |
| | Eastbound Right | 410 | 0 | 34 | D | 41.1 | 0 | 44 | D | 35.0 | 0 | 24 | B | 17.8 |

| No. | Intersection (Movement) | Bay/ Link Length (feet) | AM Peak 50th Queue | AM Peak 95th Queue | AM Peak LOS | AM Peak Delay | PM Peak 50th Queue | PM Peak 95th Queue | PM Peak LOS | PM Peak Delay | SAT Peak 50th Queue | SAT Peak 95th Queue | SAT Peak LOS | SAT Peak Delay |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Northbound Approach* | | | | *A* | *4.4* | | | *A* | *5.1* | | | *A* | *5.4* |
| | Northbound Thru/Left | 370 | 91 | m104 | A | 4.4 | 73 | m119 | A | 5.1 | 60 | 158 | A | 5.4 |
| | *Southbound Approach* | | | | *A* | *2.4* | | | *A* | *2.3* | | | *B* | *12.6* |
| | Southbound Thru/Right | 425 | 42 | 95 | A | 2.4 | 49 | 63 | A | 2.3 | 108 | 227 | B | 12.6 |
| 8 | N Washington St & Park Pl | | | | | | | | | | | | | |
| | **Overall Intersection (Unsignalized)** | | | **n/a** | **n/a** | | | **n/a** | **n/a** | | | **n/a** | **n/a** | |
| | *Westbound Approach* | | | | *B* | *10.2* | | | *A* | *9.5* | | | *A* | *9.3* |
| | Westbound Right | 315 | *n/a* | 6 | B | 10.2 | *n/a* | 7 | A | 9.5 | *n/a* | 5 | A | 9.3 |
| | **SCENARIO 3** | | | | | | | | | | | | | |
| 1 | Broad St & Washington St | | | | | | | | | | | | | |
| | **Overall Intersection (Signalized)** | | | **D** | **39.1** | | | **D** | **45.9** | | | **D** | **40.8** | |
| | *Eastbound Approach* | | | | *D* | *44.5* | | | *C* | *33.6* | | | *D* | *35.7* |
| | Eastbound Left | *275* | *82* | *m#160* | *E* | *67.9* | *69* | *#223* | *E* | *69.5* | *97* | *183* | *C* | *28.6* |
| | Eastbound Thru/Right | *435* | *205* | *205* | *D* | *39.2* | *225* | *253* | *C* | *24.6* | *273* | *398* | *D* | *37.5* |
| | *Westbound Approach* | | | | *C* | *31.2* | | | *D* | *40.8* | | | *D* | *45.6* |
| | Westbound Left | 255 | 11 | m23 | B | 13.7 | 32 | 66 | C | 22.0 | 38 | 80 | C | 29.3 |
| | Westbound Thru/Right | 400 | 269 | #335 | C | 32.2 | 301 | #427 | D | 43.0 | 283 | 410 | D | 47.5 |
| | *Northbound Approach* | | | | *D* | *42.4* | | | *D* | *37.6* | | | *D* | *45.2* |
| | Northbound Left | 345 | 19 | m50 | B | 20.0 | 38 | m59 | C | 27.4 | 49 | 103 | C | 29.3 |
| | Northbound Thru/Right | 580 | 213 | #485 | D | 43.9 | 265 | 327 | D | 38.8 | 277 | 403 | D | 47.7 |
| | *Southbound Approach* | | | | D | 37.7 | | | E | 62.5 | | | D | 38.4 |
| | Southbound Left | 190 | 97 | m#148 | D | 39.5 | 92 | m118 | D | 38.2 | 170 | #408 | D | 44.8 |
| | Southbound Thru/Right | 270 | 195 | m254 | D | 37.3 | ~461 | m#570 | E | 66.7 | 260 | 401 | D | 35.7 |
| 2 | E. Broad St & Driveway | | | | | | | | | | | | | |
| | **Overall Intersection (Unsignalized)** | | | **n/a** | **n/a** | | | **n/a** | **n/a** | | | **n/a** | **n/a** | |
| | *Eastbound Approach* | | | | *A* | *0.4* | | | *A* | *0.6* | | | *A* | *0.8* |
| | Eastbound Left | 90 | *n/a* | 4 | B | 10.9 | *n/a* | 7 | B | 10.6 | *n/a* | 9 | B | 10.6 |
| | Eastbound Thru/Right | 385 | *n/a* | 0 | A | 0.0 | *n/a* | 0 | A | 0.0 | *n/a* | 0 | A | 0.0 |
| | *Westbound Approach* | | | | *A* | *0.2* | | | *A* | *0.1* | | | *A* | *0.0* |
| | Westbound Left | 165 | *n/a* | 2 | A | 9.3 | *n/a* | 1 | A | 9.7 | *n/a* | 0 | A | 9.5 |
| | Westbound Thru/Right | 165 | *n/a* | 0 | A | 0.0 | *n/a* | 0 | A | 0.0 | *n/a* | 0 | A | 0.0 |
| | *Northbound Approach* | | | | *C* | *19.5* | | | *E* | *40.2* | | | *E* | *48.1* |
| | Northbound Lt/Thru/Rt | 25 | *n/a* | 6 | C | 19.5 | *n/a* | 27 | E | 40.2 | *n/a* | 5 | E | 48.1 |
| | *Southbound Approach* | | | | *F* | *29.5* | | | *E* | *43.7* | | | *E* | *45.6* |
| | Southbound Lt/Thru/Rt | 100 | *n/a* | 44 | F | 29.5 | *n/a* | 91 | E | 43..7 | *n/a* | 117 | E | 45.6 |
| 7 | N Washington St & Park Ave | | | | | | | | | | | | | |
| | **Overall Intersection (Signalized)** | | | **B** | **14.1** | | | **C** | **21.6** | | | **B** | **14.6** | |
| | *Eastbound Approach* | | | | *D* | *41.7* | | | *E* | *59.6* | | | *D* | *48.9* |
| | Eastbound Left | 150 | 60 | 112 | D | 43.2 | 116 | #239 | E | 72.4 | 93 | #181 | D | 53.1 |
| | Eastbound Right | 410 | 0 | 36 | D | 39.0 | 0 | 51 | D | 39.3 | 0 | 38 | D | 39.0 |
| | *Northbound Approach* | | | | *A* | *7.4* | | | *A* | *2.9* | | | *A* | *2.0* |
| | Northbound Thru/Left | 370 | 162 | m228 | A | 7.4 | 34 | m12 | A | 2.9 | 16 | m10 | A | 2.0 |
| | *Southbound Approach* | | | | *C* | *20.2* | | | *C* | *26.7* | | | *B* | *19.5* |
| | Southbound Thru/Right | 425 | 157 | 222 | C | 20.2 | 501 | 584 | C | 26.7 | 217 | 278 | B | 19.5 |
| 8 | N Washington St & Park Pl | | | | | | | | | | | | | |
| | **Overall Intersection (Signalized)** | | **C** | **33.0** | | | **D** | **44.5** | | | **E** | **67.4** | | |
| | *Westbound Approach* | *315* | *~75* | *#197* | *F* | *152.1* | *~159* | *#302* | *F* | *388.3* | *~209* | *#360* | *F* | *530.4* |
| | *Northbound Approach* | *144* | *473* | *m488* | *D* | *38.7* | *297* | *m386* | *C* | *20.5* | *235* | *301* | *C* | *23.4* |
| | *Southbound Approach* | *61* | *27* | *24* | *A* | *2.3* | *136* | *195* | *B* | *15.3* | *15* | *38* | *A* | *2.4* |
| | **SCENARIO 4** | | | | | | | | | | | | | |
| 1 | Broad St & Washington St | | | | | | | | | | | | | |
| | **Overall Intersection (Signalized)** | | | | **D** | **35.9** | | | **D** | **41.7** | | | **D** | **38.2** |
| | *Eastbound Approach* | | | | *D* | *44.6* | | | *C* | *34.2* | | | *C* | *32.5* |
| | Eastbound Left | *275* | *83* | *m#164* | *E* | *70.5* | *70* | *#224* | *E* | *69.9* | *88* | *181* | *C* | *25.4* |
| | Eastbound Thru/Right | *435* | *205* | *205* | *D* | *38.7* | *225* | *253* | *C* | *25.3* | *253* | *402* | *C* | *34.4* |
| | *Westbound Approach* | | | | *C* | *31.2* | | | *D* | *45.3* | | | *D* | *42.1* |
| | Westbound Left | 255 | 11 | m25 | B | 13.8 | 33 | 68 | C | 28.0 | 37 | 84 | C | 26.9 |
| | Westbound Thru/Right | 400 | 273 | #380 | C | 32.3 | 308 | #440 | D | 47.7 | 273 | 426 | D | 43.9 |
| | *Northbound Approach* | | | | *D* | *41.9* | | | *D* | *38.6* | | | *D* | *42.2* |
| | Northbound Left | 345 | 20 | m50 | B | 19.9 | 38 | m59 | C | 27.6 | 49 | 105 | C | 27.6 |
| | Northbound Thru/Right | 580 | 215 | #485 | D | 43.4 | 261 | 327 | D | 39.9 | 261 | 411 | D | 44.4 |
| | *Southbound Approach* | | | | C | 23.3 | | | D | 46.1 | | | D | 37.2 |
| | Southbound Left | 190 | 56 | 109 | C | 26.3 | 63 | 105 | D | 45.3 | 118 | #254 | D | 36.1 |
| | Southbound Thru/Right | 270 | 176 | 242 | C | 22.6 | ~465 | #598 | D | 46.3 | 247 | 392 | D | 37.6 |
| 2 | E. Broad St & Driveway | | | | | | | | | | | | | |
| | **Overall Intersection (Unsignalized)** | | | | **n/a** | **n/a** | | | **n/a** | **n/a** | | | **n/a** | **n/a** |
| | *Eastbound Approach* | | | | *A* | *0.4* | | | *A* | *0.6* | | | *A* | *0.8* |
| | Eastbound Left | 90 | *n/a* | 4 | B | 10.9 | *n/a* | 7 | B | 10.6 | *n/a* | 9 | B | 10.6 |
| | Eastbound Thru/Right | 385 | *n/a* | 0 | A | 0.0 | *n/a* | 0 | A | 0.0 | *n/a* | 0 | A | 0.0 |
| | *Westbound Approach* | | | | *A* | *0.2* | | | *A* | *0.1* | | | *A* | *0.0* |
| | Westbound Left | 165 | *n/a* | 2 | A | 9.2 | *n/a* | 1 | A | 9.5 | *n/a* | 0 | A | 9.2 |
| | Westbound Thru/Right | 165 | *n/a* | 0 | A | 0.0 | *n/a* | 0 | A | 0.0 | *n/a* | 0 | A | 0.0 |
| | *Northbound Approach* | | | | *C* | *20.1* | | | *E* | *39.6* | | | *E* | *46.7* |
| | Northbound Lt/Thru/Right | 25 | *n/a* | 6 | C | 20.1 | *n/a* | 27 | E | 39.6 | *n/a* | 9 | E | 46.7 |
| | *Southbound Approach* | | | | *F* | *62.8* | | | *F* | *206.6* | | | *F* | *275.2* |

| No. | Intersection (Movement) | Bay/ Link Length (feet) | AM Peak 50th Queue | AM Peak 95th Queue | AM Peak LOS | AM Peak Delay | PM Peak 50th Queue | PM Peak 95th Queue | PM Peak LOS | PM Peak Delay | SAT Peak 50th Queue | SAT Peak 95th Queue | SAT Peak LOS | SAT Peak Delay |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Southbound Lt/Thru/Right | 100 | *n/a* | 120 | F | 62.8 | *n/a* | 318 | F | 206.6 | *n/a* | 749 | F | 275.2 |
| 7 | N Washington St & Park Ave | | | | | | | | | | | | | |
| | **Overall Intersection (Signalized)** | | | | **A** | **9.3** | | | **B** | **11.8** | | | **A** | **7.9** |
| | *Eastbound Approach* | | | | *D* | *45.8* | | | *D* | *46.4* | | | *B* | *15.6* |
| | Eastbound Left | 150 | 61 | 108 | D | 48.4 | 123 | 186 | D | 49.5 | 29 | 78 | B | 16.1 |
| | Eastbound Right | 410 | 0 | 34 | D | 41.1 | 32 | 81 | D | 41.4 | 0 | 22 | B | 14.5 |
| | *Northbound Approach* | | | | *A* | *9.0* | | | *A* | *7.1* | | | *A* | *7.4* |
| | Northbound Thru/Left | 370 | 442 | m460 | A | 9.0 | 134 | 214 | A | 7.1 | 70 | 137 | A | 7.4 |
| | *Southbound Approach* | | | | *A* | *2.7* | | | *A* | *7.9* | | | *A* | *6.7* |
| | Southbound Thru/Right | 425 | 54 | 70 | A | 2.7 | 217 | 332 | A | 7.9 | 67 | 127 | A | 6.7 |
| 8 | N Washington St & Park Pl | | | | | | | | | | | | | |
| | **Overall Intersection (Unsignalized)** | | | | **n/a** | **n/a** | | | **n/a** | **n/a** | | | **n/a** | **n/a** |
| | *Westbound Approach* | | | | *C* | *17.5* | | | *B* | *13.3* | | | *B* | *13.8* |
| | Westbound Left/Right | 315 | *n/a* | 21 | C | 17.5 | *n/a* | 17 | B | 13.3 | *n/a* | 21 | B | 13.8 |
| | **SCENARIO 5** | | | | | | | | | | | | | |
| 1 | Broad St & Washington St | | | | | | | | | | | | | |
| | **Overall Intersection (Signalized)** | | | | **C** | **34.5** | | | **D** | **44.4** | | | **D** | **38.2** |
| | *Eastbound Approach* | | | | *D* | *44.6* | | | *C* | *33.2* | | | *C* | *32.5* |
| | Eastbound Left | *275* | *83* | *m#164* | *E* | *70.5* | *70* | *#224* | *E* | *69.4* | *88* | *181* | *C* | *25.4* |
| | Eastbound Thru/Right | *435* | *205* | *205* | *D* | *38.7* | *225* | *253* | *C* | *24.1* | *253* | *402* | *C* | *34.4* |
| | *Westbound Approach* | | | | *C* | *31.2* | | | *D* | *41.6* | | | *D* | *42.1* |
| | Westbound Left | 255 | 11 | m25 | B | 13.8 | 33 | 68 | C | 22.1 | 37 | 84 | C | 26.9 |
| | Westbound Thru/Right | 400 | 273 | #380 | C | 32.3 | 308 | #440 | D | 44.0 | 273 | 426 | D | 43.9 |
| | *Northbound Approach* | | | | *D* | *41.9* | | | *D* | *35.7* | | | *D* | *42.2* |
| | Northbound Left | 345 | 20 | m50 | B | 19.9 | 38 | m59 | C | 27.0 | 49 | 105 | C | 27.6 |
| | Northbound Thru/Right | 580 | 215 | #485 | D | 43.4 | 261 | 327 | D | 36.7 | 261 | 411 | D | 44.4 |
| | *Southbound Approach* | | | | B | 16.6 | | | E | 59.7 | | | D | 37.2 |
| | Southbound Left | 190 | 35 | m62 | B | 12.5 | 68 | m82 | D | 37.0 | 118 | #254 | D | 36.1 |
| | Southbound Thru/Right | 270 | 205 | 272 | B | 17.5 | ~427 | m#537 | E | 62.7 | 247 | 392 | D | 37.6 |
| 2 | E. Broad St & Driveway | | | | | | | | | | | | | |
| | **Overall Intersection (Unsignalized)** | | | | **n/a** | **n/a** | | | **n/a** | **n/a** | | | **n/a** | **n/a** |
| | *Eastbound Approach* | | | | *A* | *0.4* | | | *A* | *0.6* | | | *A* | *0.8* |
| | Eastbound Left | 90 | *n/a* | 4 | B | 10.9 | *n/a* | 7 | B | 10.6 | *n/a* | 9 | B | 10.6 |
| | Eastbound Thru/Right | 385 | *n/a* | 0 | A | 0.0 | *n/a* | 0 | A | 0.0 | *n/a* | 0 | A | 0.0 |
| | *Westbound Approach* | | | | *A* | *0.2* | | | *A* | *0.1* | | | *A* | *0.0* |
| | Westbound Left | 165 | *n/a* | 2 | A | 9.2 | *n/a* | 1 | A | 9.5 | *n/a* | 0 | A | 9.2 |
| | Westbound Thru/Right | 165 | *n/a* | 0 | A | 0.0 | *n/a* | 0 | A | 0.0 | *n/a* | 0 | A | 0.0 |
| | *Northbound Approach* | | | | *C* | *20.1* | | | *E* | *39.6* | | | *E* | *46.7* |
| | Northbound Lt/Thru/Right | 25 | *n/a* | 6 | C | 20.1 | *n/a* | 27 | E | 39.6 | *n/a* | 5 | E | 46.7 |
| | *Southbound Approach* | | | | *F* | *62.8* | | | *F* | *206.6* | | | *F* | *275.2* |
| | Southbound Lt/Thru/Right | 100 | *n/a* | 120 | F | 62.8 | *n/a* | 318 | F | 206.6 | *n/a* | 442 | F | 275.2 |
| 7 | N Washington St & Park Ave | | | | | | | | | | | | | |
| | **Overall Intersection (Signalized)** | | | | **B** | **11.4** | | | **D** | **40.7** | | | **B** | **14.6** |
| | *Eastbound Approach* | | | | *E* | *65.5* | | | *F* | *116.2* | | | *D* | *48.9* |
| | Eastbound Left | 150 | 63 | #154 | E | 77.7 | ~138 | #274 | F | 163.2 | 93 | #181 | D | 53.1 |
| | Eastbound Right | 410 | 0 | 38 | D | 43.5 | 0 | 53 | D | 42.1 | 0 | 38 | D | 39.0 |
| | *Northbound Approach* | | | | *A* | *4.3* | | | *A* | *2.2* | | | *A* | *1.8* |
| | Northbound Thru/Left | 370 | 19 | 54 | A | 4.3 | 16 | 12 | A | 2.2 | 16 | 11 | A | 1.8 |
| | *Southbound Approach* | | | | *B* | *13.1* | | | *D* | *51.4* | | | *B* | *19.5* |
| | Southbound Thru/Right | 425 | 65 | 98 | A | 13.1 | ~535 | #673 | D | 51.4 | 217 | 278 | B | 19.5 |
| 8 | N Washington St & Park Pl | | | | | | | | | | | | | |
| | **Overall Intersection (Signalized)** | | | | **B** | **12.5** | | | **C** | **25.6** | | | **B** | **16.6** |
| | *Westbound Approach* | *315* | *18* | *#83* | *D* | *50.0* | *26* | *#114* | *E* | *55.3* | *49* | *#149* | *E* | *79.7* |
| | *Northbound Approach* | *144* | *142* | *m164* | *B* | *16.3* | *324* | *m385* | *C* | *28.4* | *235* | *301* | *C* | *23.4* |
| | *Southbound Approach* | *61* | *16* | *14* | *A* | *1.8* | *174* | *m177* | *C* | *21.7* | *17* | *40* | *A* | *2.6* |
| | **SCENARIO 6** | | | | | | | | | | | | | |
| 1 | Broad St & Washington St | | | | | | | | | | | | | |
| | **Overall Intersection (Signalized)** | | | | **C** | **32.1** | | | **D** | **39.1** | | | **D** | **38.2** |
| | *Eastbound Approach* | | | | *D* | *44.6* | | | *C* | *33.2* | | | *C* | *32.5* |
| | Eastbound Left | *275* | *83* | *m#164* | *E* | *70.5* | *70* | *#224* | *E* | *69.4* | *88* | *181* | *C* | *25.4* |
| | Eastbound Thru/Right | *435* | *205* | *205* | *D* | *38.7* | *225* | *253* | *C* | *24.1* | *253* | *402* | *C* | *34.4* |
| | *Westbound Approach* | | | | *C* | *24.7* | | | *C* | *34.8* | | | *D* | *42.1* |
| | Westbound Left | 255 | 8 | m16 | B | 11.9 | 22 | 69 | C | 25.2 | 37 | 84 | C | 26.9 |
| | Westbound Thru/Rt | 400 | 73 | #247 | C | 25.5 | 311 | #425 | D | 35.9 | 273 | 426 | D | 43.9 |
| | *Northbound Approach* | | | | *D* | *41.9* | | | *D* | *35.7* | | | *D* | *42.2* |
| | Northbound Left | 345 | 20 | m50 | B | 19.9 | 38 | m59 | C | 27.0 | 49 | 105 | C | 27.6 |
| | Northbound Thru/Rt | 580 | 215 | #485 | D | 43.4 | 261 | 327 | D | 36.7 | 261 | 411 | D | 44.4 |
| | *Southbound Approach* | | | | B | 12.9 | | | D | 48.5 | | | D | 37.2 |
| | Southbound Left | 190 | 10 | m59 | C | 21.9 | 44 | m53 | B | 16.4 | 118 | #254 | D | 36.1 |
| | Southbound Thru/Rt | 270 | 191 | 255 | B | 10.8 | ~456 | m#596 | D | 52.9 | 247 | 392 | D | 37.6 |
| 2 | E. Broad St & Driveway | | | | | | | | | | | | | |
| | **Overall Intersection (Signalized)** | | | | **A** | **9.7** | | | **B** | **14.4** | | | **C** | **30.8** |

| No. | Intersection (Movement) | Bay/ Link Length (feet) | AM Peak | | | | PM Peak | | | | SAT Peak | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 50th Queue | 95th Queue | LOS | Delay | 50th Queue | 95th Queue | LOS | Delay | 50th Queue | 95th Queue | LOS | Delay |
| | *Eastbound Approach* | | | | *A* | *6.2* | | | *B* | *11.8* | | | *C* | *26.1* |
| | Eastbound Left | 90 | *4* | m7 | A | 5.3 | *10* | m21 | B | 10.1 | *39* | 66 | C | 20.8 |
| | Eastbound Thru/Right | 385 | *55* | m90 | A | 6.3 | *100* | 195 | B | 11.9 | *327* | 440 | C | 26.5 |
| | *Westbound Approach* | | | | *A* | *9.3* | | | *B* | *13.3* | | | *C* | *31.3* |
| | Westbound Left | 165 | *1* | m3 | A | 2.4 | *1* | m2 | A | 5.9 | *1* | 7 | C | 22.9 |
| | Westbound Thru/Rt | 165 | *103* | 122 | A | 9.5 | *241* | 218 | B | 13.3 | *379* | 456 | C | 31.4 |
| | *Northbound Approach* | | | | *C* | *30.6* | | | *C* | *25.5* | | | *D* | *37.1* |
| | Northbound Lt/Th/Rt | 25 | *0* | 0 | C | 30.6 | *0* | 2 | C | 25.5 | *2* | 14 | D | 37.1 |
| | *Southbound Approach* | | | | *C* | *32.4* | | | *C* | *29.2* | | | *D* | *45.0* |
| | Southbound Lt/Th/Rt | 100 | *29* | 83 | C | 32.4 | *72* | 145 | C | 29.2 | *189* | 314 | D | 45.0 |
| 7 | N Washington St & Park Ave | | | | | | | | | | | | | |
| | **Overall Intersection (Signalized)** | | | | **B** | **12.4** | | | **B** | **13.8** | | | **B** | **15.3** |
| | *Eastbound Approach* | | | | *D* | *48.4* | | | *E* | *72.4* | | | *D* | *45.2* |
| | Eastbound Left | 150 | 62 | #130 | D | 52.2 | 118 | #250 | F | 92.8 | 92 | #169 | D | 48.2 |
| | Eastbound Right | 410 | 0 | 37 | D | 41.7 | 0 | 51 | D | 40.2 | 0 | 38 | D | 38.1 |
| | *Northbound Approach* | | | | *A* | *5.7* | | | *A* | *1.4* | | | *A* | *1.6* |
| | Northbound Thru/Lt | 370 | 5 | m51 | A | 5.7 | 10 | 11 | A | 1.4 | 17 | 10 | A | 1.6 |
| | *Southbound Approach* | | | | *B* | *16.8* | | | *B* | *10.2* | | | *C* | *22.0* |
| | Southbound Thru/Rt | 425 | 213 | 275 | B | 16.8 | 91 | 124 | B | 10.2 | 232 | 298 | C | 22.0 |
| 8 | N Washington St & Park Pl | | | | | | | | | | | | | |
| | **Overall Intersection (Signalized)** | | | | **B** | **12.5** | | | **B** | **12.9** | | | **B** | **16.9** |
| | *Westbound Approach* | *315* | *18* | *#83* | *D* | *50.0* | *26* | *#114* | *E* | *55.3* | *48* | *#125* | *D* | *51.8* |
| | *Northbound Approach* | *144* | *91* | *m94* | *B* | *16.3* | *79* | *m90* | *A* | *7.9* | *249* | *320* | *C* | *26.3* |
| | *Southbound Approach* | *61* | *12* | *9* | *A* | *1.8* | *97* | *195* | *B* | *13.1* | *18* | *52* | *A* | *3.6* |

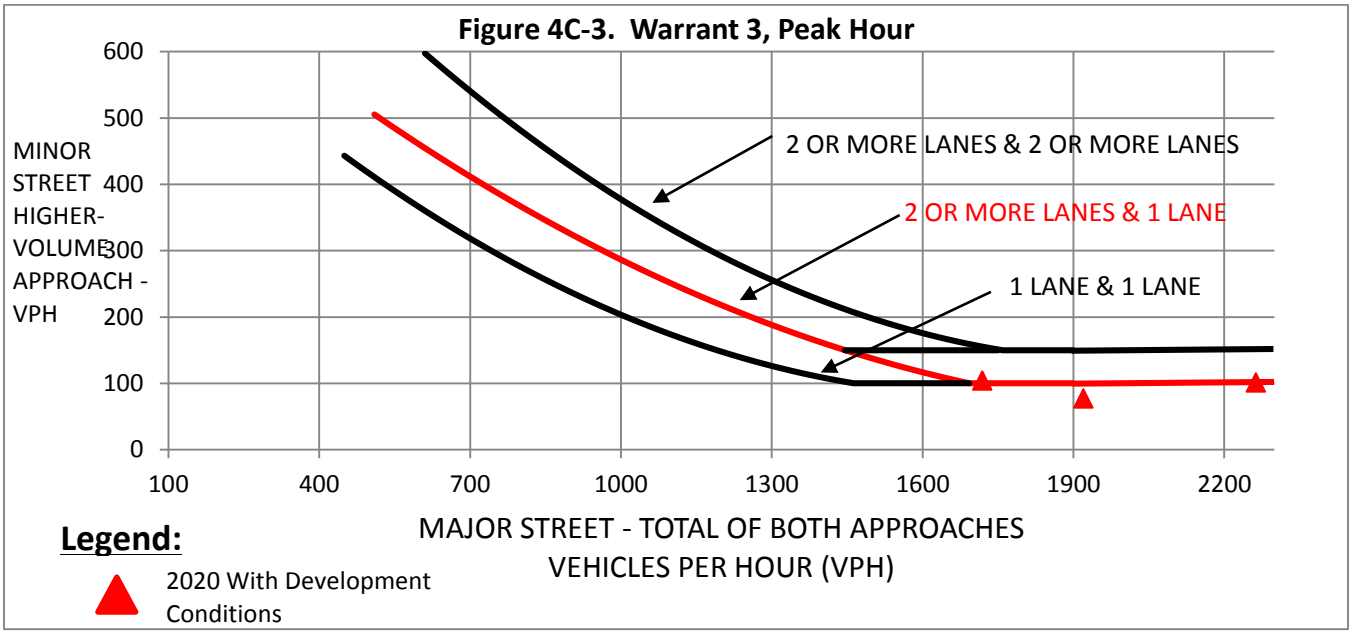
*Notes:* *N/A – Not Applicable*
*# – 95th percentile volume exceeds capacity, queue may be longer. Queue shown is the maximum after two cycles.*
*m – Volume for 95th percentile queue is metered by upstream signal.*
*~ – Volume exceeds capacity, queue can be longer. Queue shown is maximum after two cycles.*

## PEAK HOUR SIGNAL WARRANT ANALYSIS

A peak hour signal warrant analysis was conducted for Park Place at N. Washington Street. Table 8 shows the volumes used in Figure 13 which utilizes the Warrant 3 graph provided in the MUTCD. The traffic volumes assume a full-movement intersection consistent with the configuration analyzed with a signal. As indicated in Figure 13, the peak hour warrant is met during the PM and Saturday peak hours.

**Table 8: Volumes used for Peak Hour Warrant Analysis**

| Condition | | Major Street - Total of Both Approaches (VPH) | Minor Street – Park Place (VPH) |
|---|---|---|---|
| 1 | 2020 AM Peak | 1920 | 77 |
| 2 | 2020 PM Peak | 2263 | 101 |
| 3 | 2020 SAT Peak | 1719 | 104 |




*Note: 150 vph applies as the lower threshold volume for a minor –street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

**Figure 13: Warrant 3, Peak Hour Signal Warrant Analysis Results**

## TRANSPORTATION DEMAND MANAGEMENT

The proposed Broad & Washington development is located approximately ¾ mile away from the East Falls Church Metrorail Station as the crow flies. The walking distance from the Metro station to the subject site is approximately 1.0 miles along the Washington & Old Dominion Trail and N. Washington Street. The Broad & Washington site is also situated at the crossroads of major roadways and is served by four existing local bus routes, all of which stop within 400 feet of the site.

Transportation Demand Management (TDM) measures have many components that are specifically tailored to promote travel modes that have the least impact on the transportation network and other resources, such as the environment, and discourage those that have the greatest impact. Management measures taken by the Broad & Washington development can be monitored and adjusted as needed to continually create opportunities to reduce the amount of traffic generated by the site. The TDM measures proposed for the redevelopment of the site may consist of the following strategies:

- *Parking Management Plan*
  The proposed plan will provide parking for residents, office workers, and retail patrons and employees. The parking management plan will consist of the following strategies:
  - Provide effective directional signage to direct residents and visitors to the appropriate locations in the parking garage; and
  - Residential parking spaces will not be bundled with units and leases. Unbundling parking from units and leases reduces parking demand because individuals are less likely to pay for and use parking when they know the cost and there are alternative travel options;
- *Appoint Transportation Management Plan Coordinator*
  Designate a member(s) of building management or leasing office to serve in the unofficial position of the Transportation Management Plan Coordinator. The TMP Coordinator would have duties such as the following:
  - Distribute literature and promotional materials concerning regional transit services five times per year to the tenants and residents at the site. Display information regarding transit routes, schedules, fares, etc. in common areas;
  - Encourage participation in the region-wide Air Quality Action Days via providing Air Quality Code Red Day alert notifications on both the property management website or other communications systems;
  - Provide links on the property management's website to sites such as http://www.commuterconnections.org, which will serve as the platform in which the residents can interact for the purpose of setting up carpools. The property management's website may also act as a central carpooling organizer for residents in the building, where residents can login to post destination inquiries and carpool requests. Links to websites for the local transit opportunities, such as Metro (http://www.wmata.com) will also be provided; and
  - Conduct annual transportation surveys and adjust the TDM plan accordingly.

- *Marketing/Promotion*
  - Install real-time transit information displays in the lobby, or provide information for mobile device users, to promote transit ridership;
  - Conduct a targeted marketing program for residential leases that encourages and attracts transit-oriented residents, such as bicyclists, one- or no-car individuals/families and employees of nearby worksites to live in the residential units; provided, however, that such marketing shall be completed on a non-discriminatory basis in conformance with the Fair Housing Act and all other applicable laws and regulations;
- *Bicycle Accommodations*

  The following considerations should be made to encourage more bicycling amongst the building's residents and to enhance the bicycling conditions in the area surrounding the site:
  - Provide ample secure bicycle parking/storage facilities on-site in the parking garage (112 secure spaces are proposed on parking level P3); and
  - Install bicycle racks along the sidewalk adjacent to the site's property frontage along E. Broad Street (18 spaces are proposed to be distributed along E. Broad Street, with another 8 spaces at bus shelters).
- *Pedestrian/Transit Considerations*

  The following considerations for improved access to transit are to enhance safety and convenience for transit users:
  - Construct a bus stop with appropriate signage, shelter, and landing pad amenities, such as bus schedule, in the location of the existing bus stop situated in the along E. Broad Street at N. Washington Street;
  - Relocated the bus stop from northbound S. Washington Street to the N. Washington Street site frontage and construct appropriate signage, shelter, and landing pad amenities, such as bus schedule;
  - Upgrade the pedestrian indications at the N. Washington Street/Park Avenue intersection to countdown signal heads as part of the incorporation of the Park Place approach;
  - Provide *SmarTrip* cards with $50 on each card to each resident at initial occupancy only in order to promote and make residents more accustomed to using transit. Inform the residents that the cards can be refilled online at http://www.wmata.com; and
  - Explore a coordinated approach to transit opportunities with other projects/developments/apartment buildings located in the vicinity of the site to potentially create a bus service providing direct access between each participating building and the East Falls Church Metrorail station.
- *Trip Reduction Goals*

  The following trip reduction goals, relative to the standard ITE trip generation estimates for each use, will be formalized as part of the final TDM Program:

| Use | Residential | Office | Retail |
|---|---|---|---|
| Trip Reduction Goal | 20% | 10% | 5% |

## CONCLUSIONS

This report presents the findings of a traffic impact analysis for the proposed Broad & Washington redevelopment located in the City of Falls Church. The site is bounded by E. Broad Street to the south, N. Washington Street to the west, Lawton Street to the east and Park Place to the north. The development, which is planned to consist of a multi-use building containing retail, restaurant, grocery, office, and residential space, is anticipated to be complete in 2020.

The analysis presented in this report supports the following major conclusions:

***Existing Conditions (2015)***

Weekday traffic counts were conducted at the study intersections during the AM and PM peak periods on Tuesday, February 3, 2015 and Saturday peak period traffic counts were conducted on January 31, 2015. The existing volumes were balanced across proximate intersections to reflect a consistent baseline for the volume projections within this report.

Intersection capacity analyses were performed for the existing conditions at the study area intersections during the weekday morning and afternoon peak hours, as well as the Saturday peak hour. *Synchro, version 8.0* was used to analyze the study intersections with results based on the Highway Capacity Manual (HCM) methodology. For the purpose of this analysis, it is desirable to achieve a LOS D or better for each approach of an intersection. Most of the study intersections' approaches currently operate at acceptable levels of service and most queue lengths can be accommodated during the weekday morning, afternoon, and Saturday peak hours, with the following exceptions:

- N. Washington Street/Great Falls Street (LOS)
- Broad Street and Washington Street (queues)
- N. Washington Street and Park Avenue (queues)

***Future Conditions without Development (2020)***

Traffic volumes were projected for the year 2020 without the proposed Broad & Washington redevelopment. The traffic associated with the 301 W. Broad Street project was added to the existing traffic volumes obtain the future conditions without development.

Most of the study intersections' approaches will continue to operate at acceptable levels of service with manageable queues during the weekday morning, afternoon, and Saturday peak hours, with the following exceptions:

- N. Washington Street/Great Falls Street (LOS)
- Broad Street and Washington Street (LOS and queues)
- N. Washington Street and Park Avenue (queues)

***Future Conditions with Development (2020)***

The proposed mixed-use redevelopment will generate approximately 186 new external trips during the weekday morning peak hour, 429 new external trips during the weekday afternoon peak hour, 456 new external trips during the Saturday peak hour, and 4,377 new external weekday daily trips, accounting for existing or potential trips associated with the existing buildings. Access to the proposed development will be provided via full-movements driveways on E. Broad Street and Park Place and a right-in/right-out access on N. Washington Street. Future conditions with the development were derived from the future without development scenario and the site generated trips.

As under the existing and future without development conditions, most of the study intersections' approaches will continue to operate at acceptable levels of service with manageable queues during the weekday morning, afternoon, and Saturday peak hours, with the following exceptions:

- N. Washington Street/Great Falls Street (LOS)
- Broad Street and Washington Street (LOS and queues)
- N. Washington Street and Park Avenue (LOS and queues)
- E. Broad Street and Site Driveway (LOS and queues)

Alternative intersection configurations were evaluated at the major site access points to determine potential traffic operations improvements. Signalization of the Proposed Site Entrance on E. Broad Street was found to have the most benefit of the alternatives studied. Under any of the access alternatives, some delays and queues will remain at the study intersections.

In summary, traffic operations within the study area will be similar with or without the proposed Broad & Washington redevelopment.

# TECHNICAL APPENDIX

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# APPENDIX A

SCOPING DOCUMENT

# PRE-SCOPE OF WORK MEETING FORM

## Information on the Project
## Traffic Impact Analysis Base Assumptions

The applicant is responsible for entering the relevant information and submitting the form to VDOT and the locality no less than three (3) business days prior to the meeting. If a form is not received by this deadline, the scope of work meeting may be postponed.

| **Contact Information** | | | | |
|---|---|---|---|---|
| Consultant Name:<br>Tele:<br>E-mail: | Chad Baird, Gorove/Slade Associates, Inc.<br>571-248-0992<br>chad.baird@goroveslade.com | | | |
| Developer/Owner Name:<br>Tele:<br>E-mail: | Maury Stern<br>Insight Property Group, LLC<br>mstern@insightpropertygroupllc.com | | | |
| **Project Information** | | | | |
| Project Name: | Broad and Washington Street Redevelopment – Traffic Study | Locality/County: | City of Falls Church | |
| Project Location:<br>(Attach regional and site specific location map) | The proposed development is located north of Broad Street, east of Washington Street, south of Park Place, and west of Lawton Street in the City of Falls Church, Virginia. | | | |
| Submission Type | Comp Plan ☐ | Rezoning ☒ | Site Plan ☐ | Subd Plat ☐ |
| Project Description:<br>(Including details on the land use, acreage, phasing, access location, etc. Attach additional sheet if necessary) | This project is part of a planning and redevelopment of the project site. According the City of Falls Church Official Zoning District Map (2007), the site is zoned as B-2, Central Business. | | | |
| Proposed Use(s):<br>(Check all that apply; attach additional pages as necessary) | Residential ☐ | Commercial ☐ | Mixed Use ☒ | Other ☐ |
| | **Residential Uses(s)**<br>Number of Units: 303<br>ITE LU Code(s): 220<br>**Commercial Use(s)**<br>ITE LU Code(s): 850 – 47,200 SF<br>826 – 12,400 SF<br>932 – 12,400 SF<br>710 – 36,000 SF | | **Other Use(s)**<br>ITE LU Code(s): | |
| Total Peak Hour Trip Projection: | Less than 100 ☐ | 100 – 499 ☐ | 500 – 999 ☒ | 1,000 or more ☐ |

## Traffic Impact Analysis Assumptions

| | | | |
|---|---|---|---|
| Study Period | Existing Year: 2015 | Build-out Year: 2020 | Design Year: N/A |
| Study Area Boundaries (Attach map) | North: Park Place | South: E Broad Street | |
| | East: Lawton Street | West: N Washington Street | |
| External Factors That Could Affect Project (Planned road improvements, other nearby developments) | Review the City Small Area Plan, Comp Plan (transportation multimodal), Parking (how does it become shared as a district) | | |
| Consistency With Comprehensive Plan (Land use, transportation plan) | Consistent | | |
| Available Traffic Data (Historical, forecasts) | VDOT Historical AADT Data | | |

| Trip Distribution (Please refer to attached Figure 1) | Residential: | Retail: | Office: |
|---|---|---|---|
| - to/from the north on Washington | 35% | 15% | 20% |
| - to/from the south on Washington | 15% | 15% | 20% |
| - to/from the west on W Broad | 20% | 10% | 35% |
| - to/from the east on E Broad | 20% | 40% | 15% |
| - to/from the west from Great Falls | 10% | 5% | 10% |
| - to/from the east from neighborhood (Include information on market and trade areas in report) | 0% | 15% | 0% |

| | | | |
|---|---|---|---|
| Annual Vehicle Trip Growth Rate: | 1.0% (based on previous studies in the area) | Peak Period for Study (check all that apply) | ☒ AM ☒ PM ☒ SAT |
| | | Peak Hour of the Generator | without reductions: 572 AM; 799 PM; 7,779 Daily; 1,079 Sat after reductions: 414 AM; 582 PM; 5,307 Daily; 716 Sat |

| | | |
|---|---|---|
| Study Intersections and/or Road Segments (Attach additional sheets as necessary) Please refer to attached Figure 1 | 1. Broad and Washington (Route 29) | 6. Washington (Route 29) and Great Falls |
| | 2. Broad and Proposed Site Entrance | 7. Washington (Route 29) and Park Avenue |
| | 3. Broad and Lawton | 8. Washington (Route 29) and Park Place/Proposed Entrance -North |
| | 4. Lawton and Columbia | 9. Washington (Route 29) and Existing Driveway/Proposed Entrance - South |
| | 5. Washington (Route 29) and Columbia | |

| | | |
|---|---|---|
| Trip Adjustment Factors | Internal allowance: ☒ Yes ☐ No<br>Reduction: 5% (AM), 10% (PM, SAT), 15% (Weekday Daily) | Pass-by allowance: ☒ Yes ☐ No<br>Reduction: 36% |
| Software Methodology | ☒ Synchro ☐ HCS (v.2000/+) ☐ aaSIDRA ☐ CORSIM ☐ Other _____ | |
| Traffic Signal Proposed or Affected (Analysis software to be used, progression speed, cycle length) | 1. Broad and Washington<br>2. Washington (Route 29)and Park Avenue<br>3. Route 29 and Columbia<br><br>Analysis Software: Synchro version 8 Results: HCM methodology | |

| | |
|---|---|
| Improvement(s) Assumed or to be Considered | Bus Shelters, Ped/Bike facility at East Fairfax |
| Background Traffic Studies Considered | 301 West Broad |
| Plan Submission | ☐ Master Development Plan (MDP) ☒ Generalized Development Plan (GDP)<br>☐ Preliminary/Sketch Plan ☐ Other Plan type (Final Site, Subd. Plan) |
| Additional Issues to be Addressed | ☒ Queuing analysis ☐ Actuation/Coordination ☐ Weaving analysis<br>☐ Merge analysis ☒ Bike/Ped Accommodations ☐ Intersection(s)<br>☒ TDM Measures ☒ Other Parking Management Plan, Site Access |

NOTES on ASSUMPTIONS:

1. Synchro files/signal timings will be obtained from the City of Falls Church.
2. The scenarios to be included in the study are Existing (2015), Future without Development (2020), and Future with Development (2020).
3. Existing peak hour factors in the range of 0.85 to 1.00 will be used for existing scenarios. The default peak hour factor of 0.92 will be used for all future scenarios.
4. Default heavy vehicle percentage of 2% will be used for all movements.
5. The VDOT-approved Mixed Use Trip Generation Model 4.0 will be investigated, in addition to the ITE Trip Generation model. A discussion regarding which model is selected, and why, will be included in the study.
6. Trip reductions and the interaction of the TDM and Parking Management Plan will be included in the report. Describe "reductions" in the report. What is pass by, what is internal capture, what is transit?
7. For any approach LOS D or better would be considered as acceptable/desirable traffic operation condition. For all approaches, the projected future conditions without development LOS and delay will be maintained in the future with development condition. Will show intersection, approach, and movement LOS.
8. Evaluate alternative access configurations for the driveways and the intersection of North Washington Street and Park Place.
9. Signal timing adjustments would be considered as an acceptable mitigation measure.
10. Will provide both 95th and 50th percentile queues.
11. Include definitions/examples in the report about Level of Service.

SIGNED: _____ DATE: 8/11/2015
Applicant or Consultant

PRINT NAME: Chad Baird
Applicant or Consultant

SIGNED: Stephanie Rogers DATE: 8·14·15
Local Government Representative

PRINT NAME: Stephanie Rogers
Local Government Representative

## Table 1: Trip Generation

| Land Use | ITE Code | Size | | ------ Weekday ------ | | | | | | | ------ Saturday ------ | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | AM Peak Hour | | | PM Peak Hour | | | Daily | SAT Peak Hour | | | Daily |
| | | | | *In* | *Out* | *Total* | *In* | *Out* | *Total* | *Total* | *In* | *Out* | *Total* | *Total* |
| **Proposed Retail** | | | | | | | | | | | | | | |
| grocery | 850 | 47.2 | kSF | 99 | 61 | 160 | 228 | 219 | 447 | 4,552 | 300 | 288 | 588 | 8,382 |
| High Turnover Sit Down Restaurant | 932 | 12.4 | kSF | 74 | 60 | 134 | 73 | 49 | 122 | 1,577 | 92 | 82 | 174 | 1,964 |
| specialty retail | 826 | 12.4 | kSF | 84 | 92 | 176 | 22 | 29 | 51 | 568 | 117 | 108 | 225 | 521 |
| *Subtotal (Retail without reductions)* | | | | *257* | *213* | *470* | *323* | *297* | *620* | *6,697* | *509* | *478* | *987* | *10,867* |
| *Internal Trips Reduction (Retail)* | | | | *-7* | *-2* | *-8* | *-7* | *-13* | *-20* | *-318* | *-8* | *-8* | *-16* | *-350* |
| *Subtotal (Retail with internal reduction)* | | | | *250* | *211* | *462* | *316* | *284* | *600* | *6,379* | *501* | *470* | *972* | *10,517* |
| *Transit/Walk Reduction - 2% (Retail Only)* | | | | *-5* | *-4* | *-9* | *-6* | *-6* | *-12* | *-128* | *-10* | *-9* | *-19* | *-210* |
| *Subtotal (w/ Transit/Walk Reduction)* | | | | *245* | *207* | *453* | *310* | *278* | *588* | *6,251* | *491* | *461* | *952* | *10,307* |
| *Pass by Trips Reduction - 36% (Retail Only)* | | | | *-88* | *-75* | *-163* | *-111* | *-100* | *-212* | *-2,250* | *-177* | *-166* | *-343* | *-3,710* |
| *Total Proposed New External Retail Trips* | | | | *157* | *133* | *290* | *198* | *178* | *376* | *4,001* | *314* | *295* | *609* | *6,596* |
| **Proposed Residential** | | | | | | | | | | | | | | |
| apartment | 220 | 330 | DU | 33 | 132 | 165 | 129 | 70 | 199 | 2,123 | 78 | 77 | 155 | 2,334 |
| Internal Trips Reduction (Residential) -5% (AM), 10% (PM & SAT), 15% (Weekday/Weekend Daily) | | | | -2 | -7 | -8 | -13 | -7 | -20 | -318 | -8 | -8 | -16 | -350 |
| *Subtotal (Residential with internal reduction)* | | | | *31* | *125* | *157* | *116* | *63* | *179* | *1,805* | *70* | *69* | *140* | *1,984* |
| *Transit Reduction - 10% (Residential Only)* | | | | *-3* | *-13* | *-16* | *-12* | *-6* | *-18* | *-180* | *-7* | *-7* | *-14* | *-198* |
| *Subtotal (w/ Transit Reduction)* | | | | *28* | *113* | *141* | *104* | *57* | *161* | *1,624* | *63* | *62* | *126* | *1,786* |
| *Total Residential Trips* | | | | *28* | *113* | *141* | *104* | *57* | *161* | *1,624* | *63* | *62* | *126* | *1,786* |
| **Proposed Office** | | | | | | | | | | | | | | |
| Office | 710 | 36.0 | kSF | 75 | 10 | 85 | 20 | 99 | 119 | 604 | 8 | 7 | 15 | 105 |
| *Transit/Walk Reduction - 2% (Office Only)* | | | | *-2* | *0* | *-2* | *0* | *-2* | *-2* | *-12* | *0* | *0* | *0* | *-2* |
| *Subtotal (w/ Transit/Walk Reduction)* | | | | *73* | *10* | *83* | *20* | *97* | *117* | *592* | *8* | *7* | *15* | *103* |
| *Total Office Trips* | | | | *73* | *10* | *83* | *20* | *97* | *117* | *592* | *8* | *7* | *15* | *103* |
| ***Proposed Site Trips without Reductions*** | | | | ***365*** | ***355*** | ***720*** | ***472*** | ***466*** | ***938*** | ***9,424*** | ***595*** | ***562*** | ***1,157*** | ***13,306*** |
| ***Proposed Site Trips with Reductions*** | | | | ***258*** | ***255*** | ***514*** | ***322*** | ***332*** | ***654*** | ***6,217*** | ***385*** | ***364*** | ***750*** | ***8,485*** |

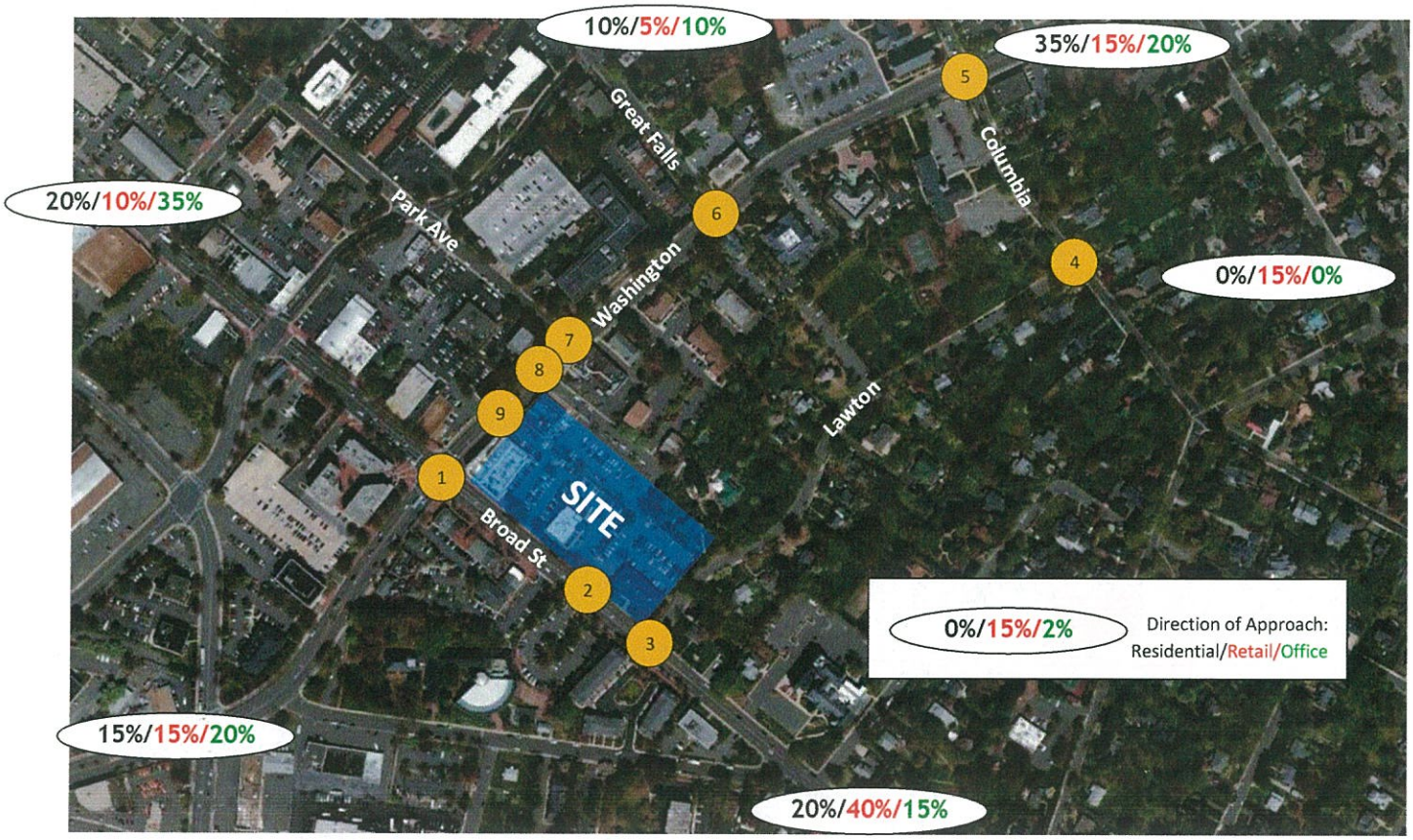



**Figure 1: Area Map, Study Intersections, and Direction of Approach**

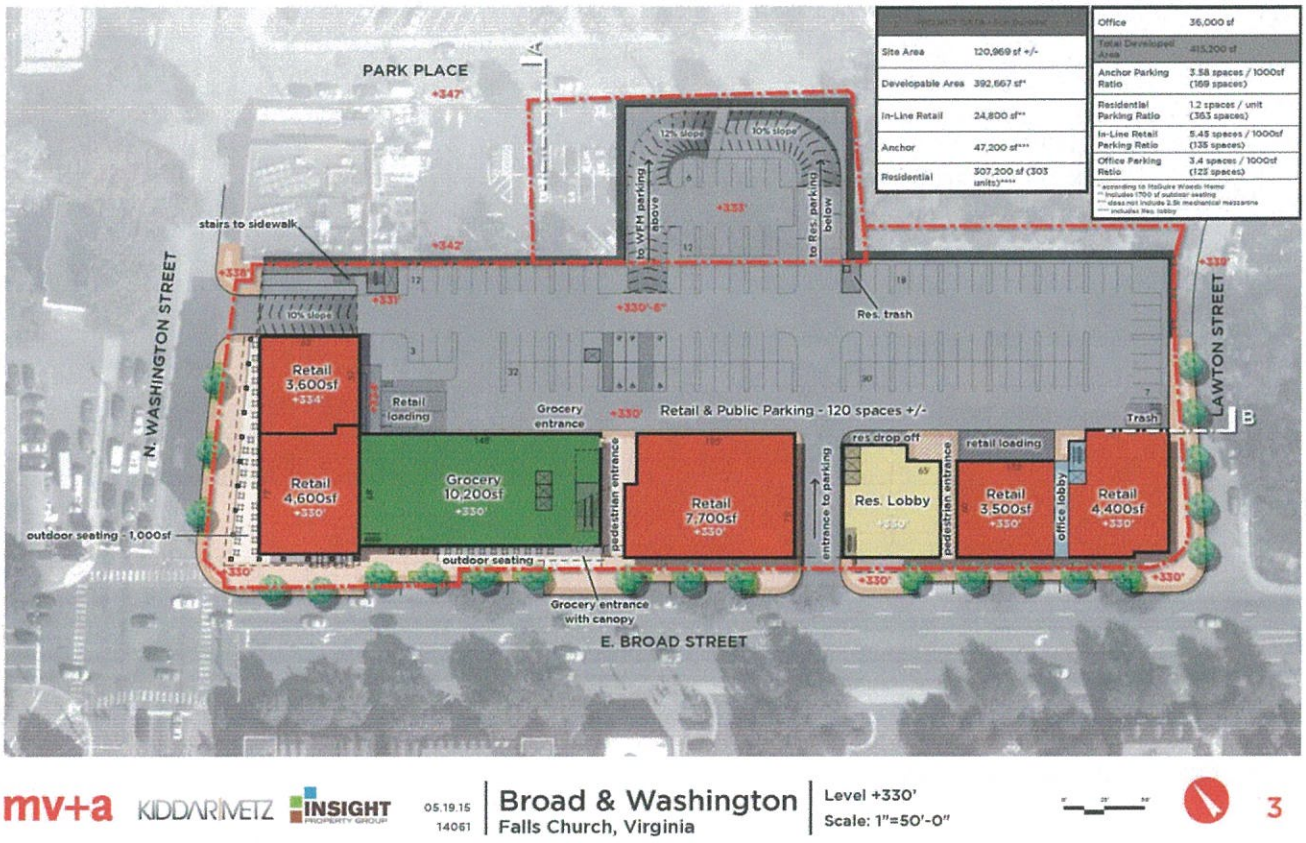



**Figure 2: Ground Floor Site Plan**

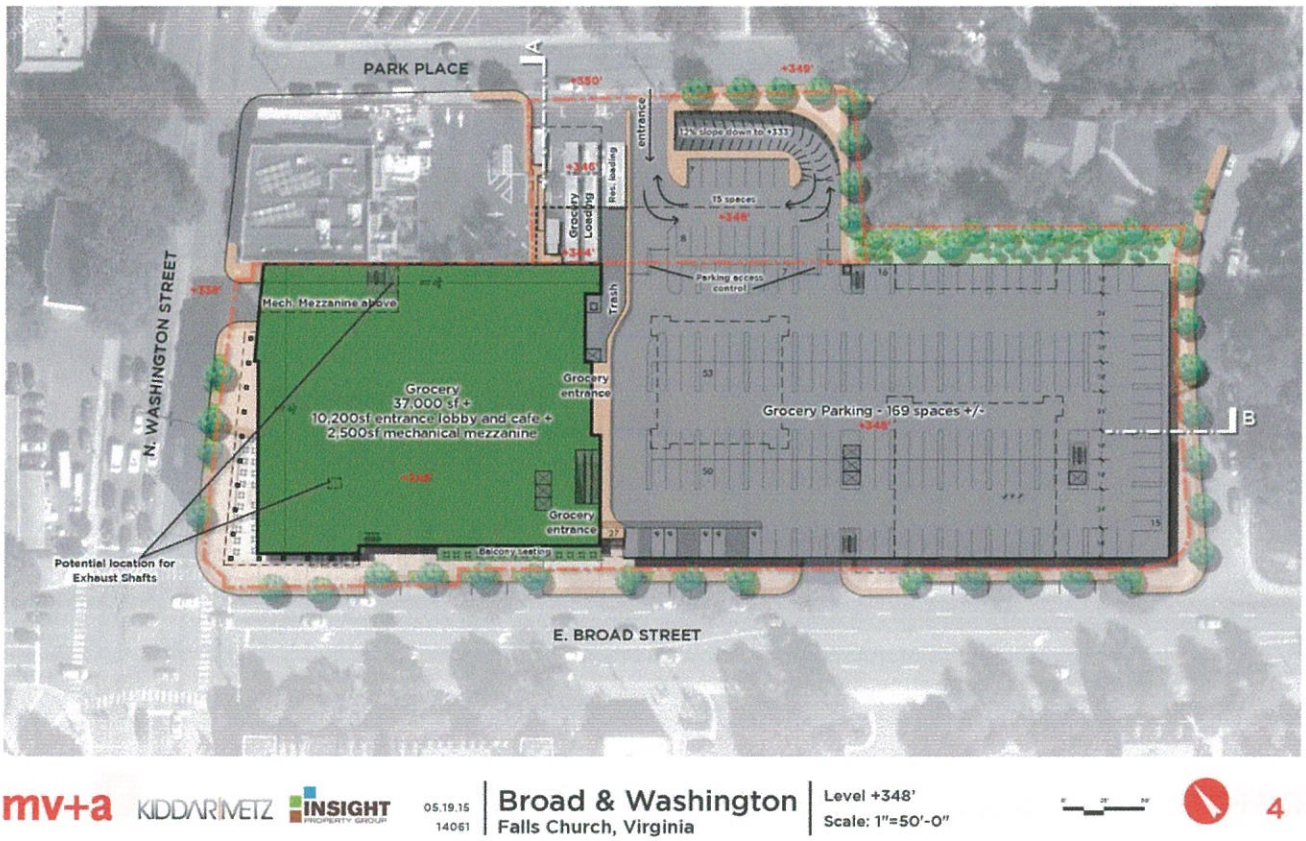



**Figure 3: Site Plan (grocery and parking)**

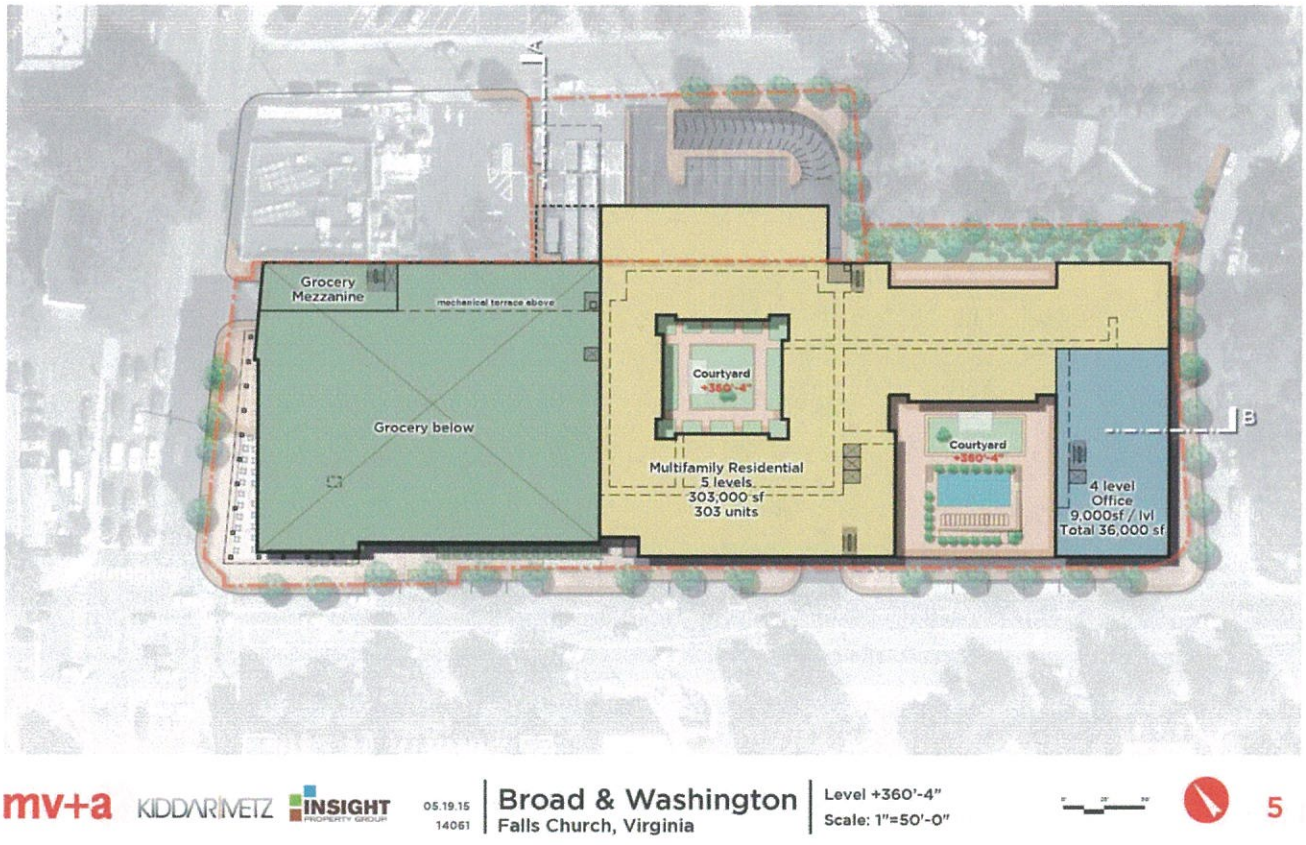



**Figure 4: Site Plan (residential. grocery, office)**

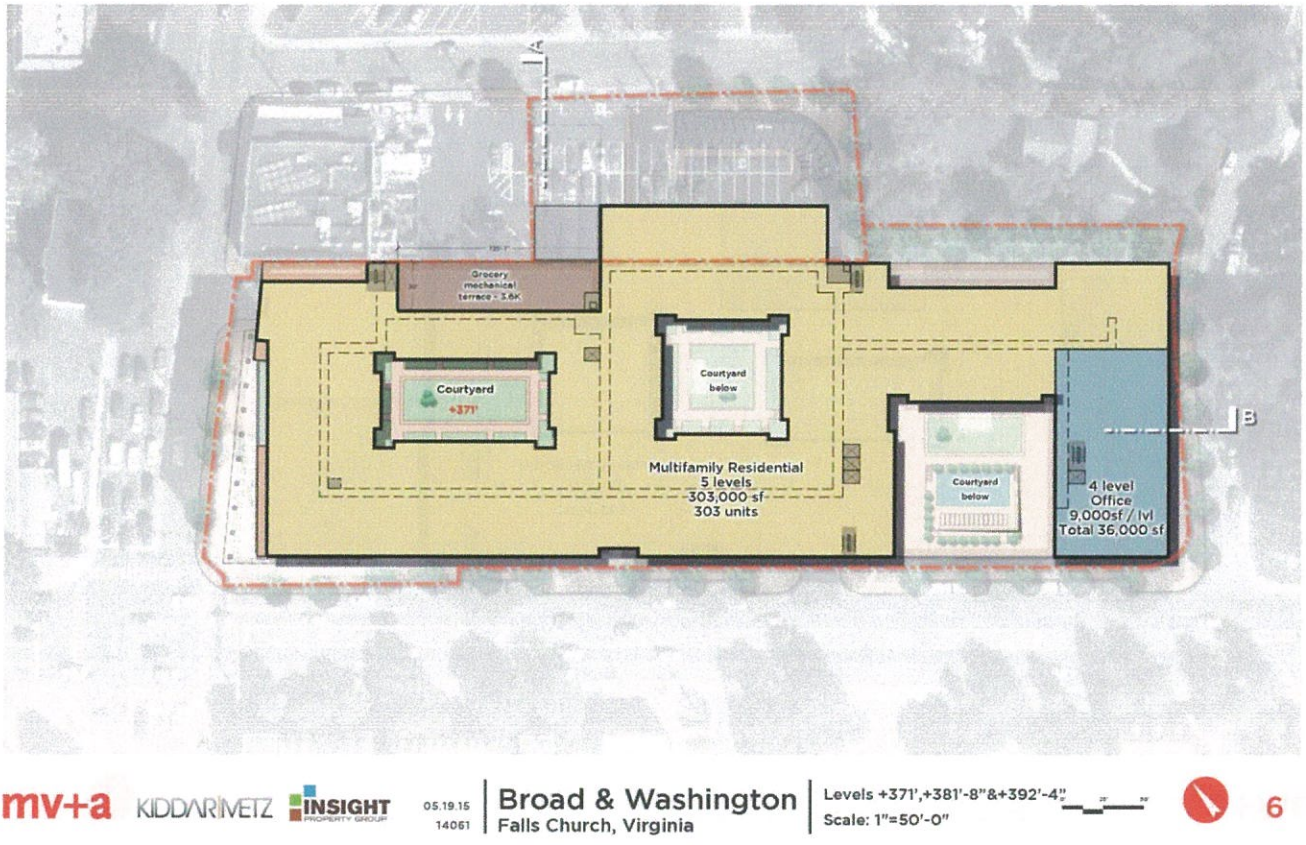



**Figure 5: Site Plan (residential, office)**

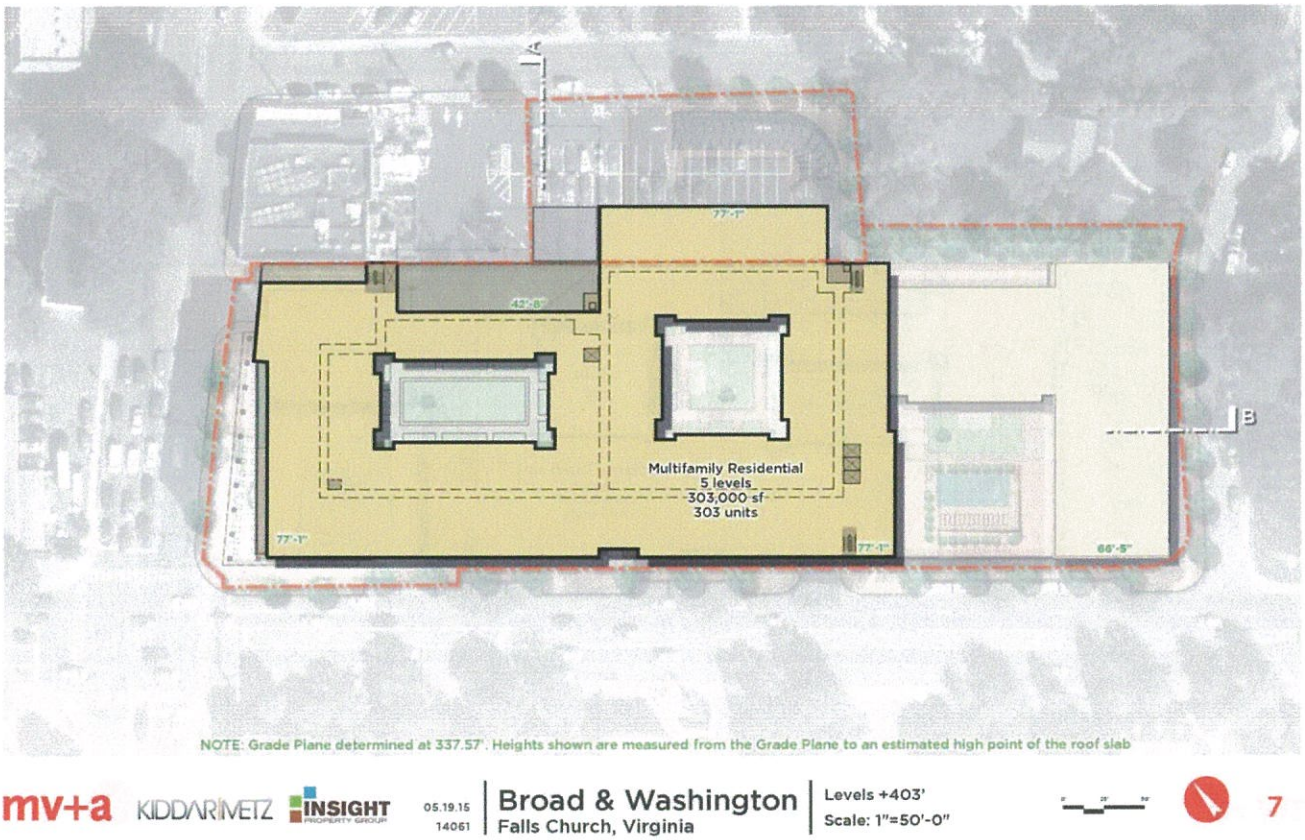



**Figure 6: Site Plan (residential only)**

# APPENDIX B

EXISTING (2015) TRAFFIC VOLUMES & COUNT SHEETS

| | |
|---|---|
| Project Name : | Washington and Broad Street Redevlopment |
| Project # : | 7301-1353 |
| Location | City of Falls Church, Virginia |
| Data Source: | Gorove/Slade Associates, Inc. |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Intersection:*** | | | **Broad Street at Site Entrance** | | | | | | | | | | | | | | |
| **AM PEAK** | | | | | | | | | | | | | | | | | |
| | | ***Direction:*** | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
| | | ***Roadway:*** | **Parking** | | | | **Broad St.** | | | | **Parking** | | | | **Broad St.** | | | |
| | | ***Movement:*** | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| 6:30 AM | to | 6:45 AM | 0 | 0 | 0 | 0 | 0 | 55 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 51 | 0 | 0 |
| 6:45 AM | to | 7:00 AM | 0 | 0 | 1 | 0 | 0 | 71 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 73 | 2 | 0 |
| 7:00 AM | to | 7:15 AM | 0 | 0 | 0 | 0 | 1 | 85 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 93 | 4 | 1 |
| 7:15 AM | to | 7:30 AM | 0 | 0 | 0 | 0 | 0 | 105 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 112 | 0 | 0 |
| 7:30 AM | to | 7:45 AM | 2 | 0 | 0 | 0 | 3 | 137 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 129 | 5 | 1 |
| 7:45 AM | to | 8:00 AM | 1 | 0 | 0 | 0 | 4 | 163 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 152 | 4 | 0 |
| 8:00 AM | to | 8:15 AM | 0 | 0 | 0 | 0 | 2 | 213 | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 214 | 4 | 2 |
| 8:15 AM | to | 8:30 AM | 7 | 0 | 1 | 0 | 8 | 231 | 0 | 1 | 0 | 0 | 1 | 0 | 3 | 183 | 2 | 2 |
| 8:30 AM | to | 8:45 AM | 4 | 0 | 0 | 0 | 4 | 223 | 2 | 1 | 1 | 0 | 0 | 0 | 3 | 214 | 3 | 1 |
| 8:45 AM | to | 9:00 AM | 1 | 0 | 0 | 0 | 10 | 235 | 0 | 1 | 0 | 0 | 0 | 0 | 5 | 219 | 6 | 1 |
| 9:00 AM | to | 9:15 AM | 1 | 0 | 2 | 0 | 8 | 232 | 2 | 1 | 4 | 0 | 0 | 0 | 6 | 168 | 4 | 1 |
| 9:15 AM | to | 9:30 AM | 7 | 0 | 1 | 0 | 8 | 207 | 13 | 1 | 8 | 0 | 4 | 0 | 22 | 154 | 7 | 1 |
| **PM PEAK** | | | | | | | | | | | | | | | | | | |
| | | ***Direction:*** | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
| | | ***Roadway:*** | **Parking** | | | | **Broad St.** | | | | **Parking** | | | | **Broad St.** | | | |
| | | ***Movement:*** | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| 4:00 PM | to | 4:15 PM | 5 | 0 | 1 | 0 | 7 | 205 | 2 | 0 | 6 | 0 | 2 | 0 | 2 | 174 | 3 | 0 |
| 4:15 PM | to | 4:30 PM | 4 | 0 | 1 | 0 | 5 | 183 | 3 | 0 | 7 | 0 | 4 | 0 | 2 | 197 | 4 | 1 |
| 4:30 PM | to | 4:45 PM | 8 | 0 | 4 | 0 | 3 | 172 | 3 | 0 | 3 | 0 | 3 | 0 | 3 | 211 | 2 | 0 |
| 4:45 PM | to | 5:00 PM | 6 | 0 | 2 | 0 | 7 | 181 | 1 | 3 | 5 | 0 | 2 | 0 | 5 | 252 | 2 | 1 |
| 5:00 PM | to | 5:15 PM | 8 | 0 | 3 | 0 | 4 | 163 | 2 | 2 | 4 | 0 | 4 | 0 | 2 | 224 | 6 | 2 |
| 5:15 PM | to | 5:30 PM | 4 | 0 | 3 | 1 | 5 | 164 | 0 | 4 | 11 | 0 | 2 | 0 | 2 | 207 | 0 | 2 |
| 5:30 PM | to | 5:45 PM | 4 | 0 | 2 | 0 | 3 | 173 | 3 | 0 | 2 | 0 | 7 | 0 | 1 | 220 | 4 | 0 |
| 5:45 PM | to | 6:00 PM | 4 | 2 | 0 | 0 | 6 | 172 | 2 | 2 | 4 | 0 | 6 | 0 | 4 | 198 | 4 | 4 |
| 6:00 PM | to | 6:15 PM | 6 | 2 | 1 | 1 | 0 | 197 | 3 | 3 | 6 | 1 | 3 | 0 | 3 | 200 | 8 | 0 |
| 6:15 PM | to | 6:30 PM | 4 | 0 | 0 | 0 | 4 | 136 | 2 | 2 | 6 | 0 | 4 | 0 | 4 | 223 | 1 | 0 |
| 6:30 PM | to | 6:45 PM | 7 | 0 | 2 | 0 | 3 | 139 | 0 | 0 | 0 | 1 | 4 | 0 | 4 | 200 | 3 | 1 |
| 6:45 PM | to | 7:00 PM | 6 | 0 | 4 | 0 | 4 | 110 | 3 | 0 | 1 | 0 | 1 | 0 | 5 | 193 | 2 | 0 |
| **PEAK HOURS** | | | | | | | | | | | | | | | | | | |
| | | ***Direction:*** | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
| | | ***Roadway:*** | **Parking** | | | | **Broad St.** | | | | **Parking** | | | | **Broad St.** | | | |
| | | ***Movement:*** | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| ***AM INTERSECTION PEAK HOUR*** | | | | | | | | | | | | | | | | | | |
| 8:00 AM | to | 9:00 AM | 12 | 0 | 1 | 0 | 24 | 902 | 3 | 5 | 2 | 0 | 1 | 0 | 11 | 830 | 15 | 6 |
| ***PM INTERSECTION PEAK HOUR*** | | | | | | | | | | | | | | | | | | |
| 4:15 PM | to | 5:15 PM | 26 | 0 | 10 | 0 | 19 | 699 | 9 | 5 | 19 | 0 | 13 | 0 | 12 | 884 | 14 | 4 |
| ***AM SYSTEM PEAK HOUR*** | | | | | | | | | | | | | | | | | | |
| 8:15 AM | to | 9:15 AM | 13 | 0 | 3 | 0 | 30 | 921 | 4 | 4 | 5 | 0 | 1 | 0 | 17 | 784 | 15 | 5 |
| ***PM SYSTEM PEAK HOUR*** | | | | | | | | | | | | | | | | | | |
| 4:45 PM | to | 5:45 PM | 22 | 0 | 10 | 1 | 19 | 681 | 6 | 9 | 22 | 0 | 15 | 0 | 10 | 903 | 12 | 5 |

| **PEAK HOUR FACTORS** | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Parking** | | | | **Broad St.** | | | | **Parking** | | | | **Broad St.** | | | |
| ***AM Peak Hour*** | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach |
| **AM PEAK HOUR** | 0.46 | 0.00 | 0.38 | **0.50** | 0.75 | 0.98 | 0.50 | **0.97** | 0.31 | 0.00 | 0.25 | **0.38** | 0.71 | 0.89 | 0.63 | **0.89** |
| | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach |
| ***PM PEAK HOUR*** | 0.69 | 0.00 | 0.83 | **0.73** | 0.68 | 0.94 | 0.50 | **0.93** | 0.50 | 0.00 | 0.54 | **0.71** | 0.50 | 0.90 | 0.50 | **0.89** |

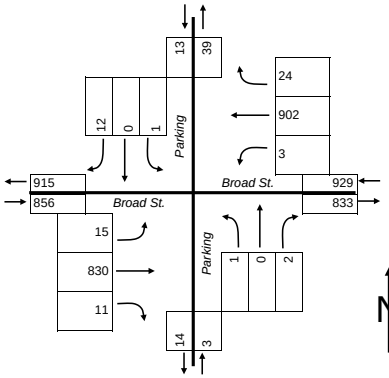
**Overall AM PEAK HOUR FACTOR** = **0.94** **Overall PM PEAK HOUR FACTOR** = **0.92**

**AM Period Intersection Volume:** 3916 **PM Period Intersection Volume:** 4837

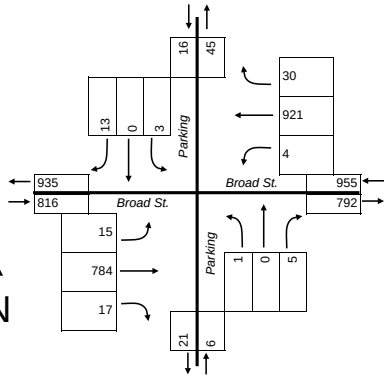
**Date of Counts:** Thursday, January 29, 2015

**AM Weather Conditions:** Clear **PM Weather Conditions:** Clear

**AM INTERSECTION PEAK VOLUMES**

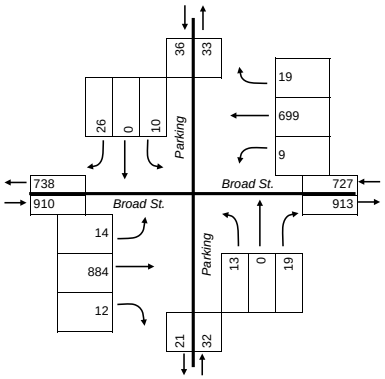



**AM SYSTEM PEAK VOLUMES**

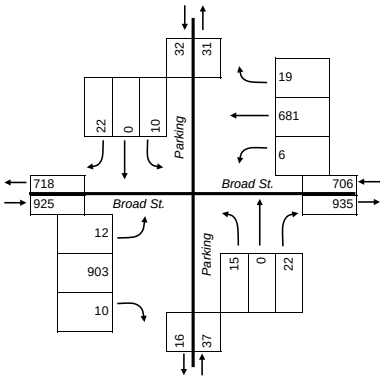



N

**PM INTERSECTION PEAK VOLUMES**




**PM SYSTEM PEAK VOLUMES**



| | |
|---|---|
| Project Name : | Washington and Broad Street Redevlopment |
| Project # : | 7301-1353 |
| Location | City of Falls Church, Virginia |
| Data Source: | Gorove/Slade Associates, Inc. |

**Intersection:** Broad Street at Lawton Street

| | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AM PEAK** | | | | | | | | | | | | | | | | |
| *Roadway:* | Lawton St. | | | | Broad St. | | | | Lawton St. | | | | Broad St. | | | |
| *Movement:* | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| 6:30 AM to 6:45 AM | 0 | 0 | 0 | 0 | 1 | 51 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 53 | 0 | 0 |
| 6:45 AM to 7:00 AM | 0 | 0 | 0 | 0 | 0 | 71 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 66 | 0 | 0 |
| 7:00 AM to 7:15 AM | 1 | 0 | 0 | 0 | 0 | 83 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 87 | 0 | 0 |
| 7:15 AM to 7:30 AM | 0 | 0 | 0 | 0 | 0 | 101 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 112 | 0 | 0 |
| 7:30 AM to 7:45 AM | 0 | 0 | 0 | 0 | 0 | 137 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 134 | 0 | 0 |
| 7:45 AM to 8:00 AM | 0 | 0 | 0 | 0 | 3 | 161 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 149 | 0 | 0 |
| 8:00 AM to 8:15 AM | 4 | 0 | 1 | 0 | 3 | 213 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 204 | 0 | 0 |
| 8:15 AM to 8:30 AM | 1 | 0 | 0 | 0 | 2 | 238 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 175 | 1 | 0 |
| 8:30 AM to 8:45 AM | 1 | 0 | 0 | 0 | 2 | 229 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 211 | 1 | 0 |
| 8:45 AM to 9:00 AM | 1 | 0 | 0 | 0 | 6 | 268 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 206 | 2 | 0 |
| 9:00 AM to 9:15 AM | 1 | 0 | 0 | 0 | 1 | 227 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 173 | 1 | 0 |
| 9:15 AM to 9:30 AM | 2 | 0 | 2 | 0 | 2 | 223 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 165 | 5 | 0 |
| **PM PEAK** | | | | | | | | | | | | | | | | |
| *Roadway:* | Lawton St. | | | | Broad St. | | | | Lawton St. | | | | Broad St. | | | |
| *Movement:* | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| 4:00 PM to 4:15 PM | 2 | 0 | 1 | 0 | 1 | 212 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 174 | 2 | 0 |
| 4:15 PM to 4:30 PM | 3 | 0 | 1 | 0 | 5 | 180 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 202 | 0 | 1 |
| 4:30 PM to 4:45 PM | 1 | 0 | 0 | 0 | 1 | 182 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 222 | 0 | 0 |
| 4:45 PM to 5:00 PM | 4 | 0 | 2 | 0 | 2 | 175 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 251 | 1 | 0 |
| 5:00 PM to 5:15 PM | 1 | 0 | 2 | 0 | 4 | 170 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 229 | 1 | 0 |
| 5:15 PM to 5:30 PM | 7 | 0 | 2 | 0 | 2 | 177 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 216 | 2 | 0 |
| 5:30 PM to 5:45 PM | 6 | 0 | 0 | 0 | 3 | 171 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 224 | 0 | 0 |
| 5:45 PM to 6:00 PM | 2 | 0 | 1 | 0 | 0 | 170 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 204 | 1 | 1 |
| 6:00 PM to 6:15 PM | 6 | 0 | 2 | 0 | 2 | 195 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 200 | 4 | 0 |
| 6:15 PM to 6:30 PM | 3 | 0 | 2 | 2 | 0 | 137 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 227 | 1 | 0 |
| 6:30 PM to 6:45 PM | 0 | 0 | 1 | 0 | 0 | 147 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 226 | 0 | 0 |
| 6:45 PM to 7:00 PM | 0 | 0 | 2 | 0 | 0 | 138 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 201 | 0 | 0 |
| **PEAK HOURS** | | | | | | | | | | | | | | | | |
| *Roadway:* | Lawton St. | | | | Broad St. | | | | Lawton St. | | | | Broad St. | | | |
| *Movement:* | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| *AM INTERSECTION PEAK HOUR* | | | | | | | | | | | | | | | | |
| 8:00 AM to 9:00 AM | 7 | 0 | 1 | 0 | 13 | 948 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 796 | 4 | 0 |
| *PM INTERSECTION PEAK HOUR* | | | | | | | | | | | | | | | | |
| 4:30 PM to 5:30 PM | 13 | 0 | 6 | 0 | 9 | 704 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 918 | 4 | 0 |
| *AM SYSTEM PEAK HOUR* | | | | | | | | | | | | | | | | |
| 8:15 AM to 9:15 AM | 4 | 0 | 0 | 0 | 11 | 962 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 765 | 5 | 0 |
| *PM SYSTEM PEAK HOUR* | | | | | | | | | | | | | | | | |
| 4:45 PM to 5:45 PM | 18 | 0 | 6 | 0 | 11 | 693 | 0 | 8 | 0 | 0 | 0 | 1 | 0 | 920 | 4 | 0 |

**PEAK HOUR FACTORS**

| | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Lawton St. | | | | Broad St. | | | | Lawton St. | | | | Broad St. | | | |
| *AM Peak Hour* | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach |
| **AM PEAK HOUR** | 1.00 | 0.00 | 0.00 | **1.00** | 0.46 | 0.90 | 0.00 | **0.89** | 0.00 | 0.00 | 0.00 | **#DIV/0!** | 0.00 | 0.91 | 0.63 | **0.91** |
| | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach |
| ***PM PEAK HOUR*** | 0.64 | 0.00 | 0.75 | **0.67** | 0.69 | 0.98 | 0.00 | **0.98** | 0.00 | 0.00 | 0.00 | **#DIV/0!** | 0.00 | 0.92 | 0.50 | **0.92** |

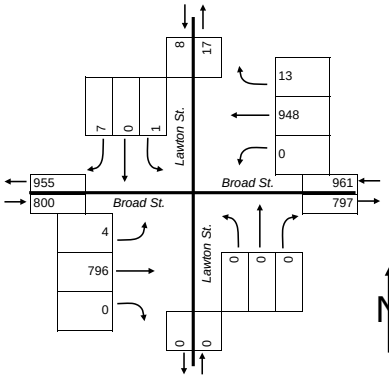
**Overall AM PEAK HOUR FACTOR** = **0.90** **Overall PM PEAK HOUR FACTOR** = **0.95**

**AM Period Intersection Volume:** 3782 **PM Period Intersection Volume:** 4717

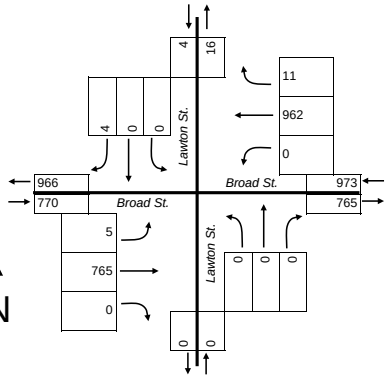
**Date of Counts:** Thursday, January 29, 2015

**AM Weather Conditions:** Clear **PM Weather Conditions:** Clear

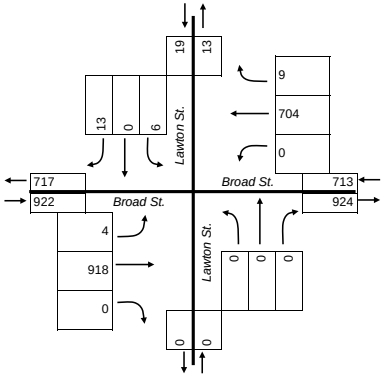
**AM INTERSECTION PEAK VOLUMES**



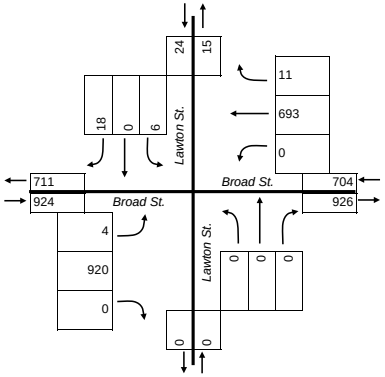

**AM SYSTEM PEAK VOLUMES**




**PM INTERSECTION PEAK VOLUMES**




**PM SYSTEM PEAK VOLUMES**



| | |
|---|---|
| Project Name : | Washington and Broad Street Redevlopment |
| Project # : | 7301-1353 |
| Location | City of Falls Church, Virginia |
| Data Source: | Gorove/Slade Associates, Inc. |

**Date of Counts:** Tuesday, February 03, 2015

**AM Weather Conditions:** Clear

**PM Weather Conditions:** Clear

***Intersection:*** **Lawton Street at Columbia Street**

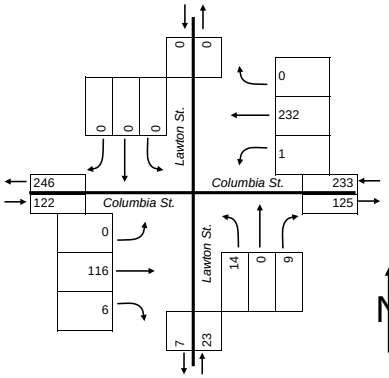
| **AM PEAK** | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Direction:*** | | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
| ***Roadway:*** | | **Lawton St.** | | | | **Columbia St.** | | | | **Lawton St.** | | | | **Columbia St.** | | | |
| ***Movement:*** | | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| 6:30 AM | to 6:45 AM | 0 | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 4 | 0 | 0 |
| 6:45 AM | to 7:00 AM | 0 | 0 | 0 | 0 | 0 | 11 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 1 |
| 7:00 AM | to 7:15 AM | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 1 |
| 7:15 AM | to 7:30 AM | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 3 | 0 | 1 |
| 7:30 AM | to 7:45 AM | 0 | 0 | 0 | 0 | 0 | 31 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 14 | 0 | 2 |
| 7:45 AM | to 8:00 AM | 0 | 0 | 0 | 0 | 0 | 37 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 16 | 0 | 2 |
| 8:00 AM | to 8:15 AM | 0 | 0 | 0 | 0 | 0 | 45 | 1 | 0 | 0 | 0 | 3 | 2 | 1 | 18 | 0 | 0 |
| 8:15 AM | to 8:30 AM | 0 | 0 | 0 | 1 | 0 | 53 | 4 | 0 | 2 | 0 | 1 | 0 | 2 | 44 | 0 | 1 |
| 8:30 AM | to 8:45 AM | 0 | 0 | 0 | 0 | 0 | 40 | 0 | 0 | 1 | 0 | 2 | 3 | 0 | 33 | 0 | 0 |
| 8:45 AM | to 9:00 AM | 0 | 0 | 0 | 0 | 0 | 74 | 1 | 0 | 4 | 0 | 4 | 0 | 1 | 20 | 0 | 2 |
| 9:00 AM | to 9:15 AM | 0 | 0 | 0 | 0 | 0 | 53 | 0 | 0 | 0 | 0 | 5 | 0 | 1 | 25 | 0 | 2 |
| 9:15 AM | to 9:30 AM | 0 | 0 | 0 | 0 | 0 | 65 | 0 | 0 | 4 | 0 | 3 | 0 | 4 | 38 | 0 | 0 |
| **PM PEAK** | | | | | | | | | | | | | | | | | |
| ***Direction:*** | | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
| ***Roadway:*** | | **Lawton St.** | | | | **Columbia St.** | | | | **Lawton St.** | | | | **Columbia St.** | | | |
| ***Movement:*** | | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| 4:00 PM | to 4:15 PM | 0 | 0 | 0 | 0 | 0 | 32 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 41 | 0 | 5 |
| 4:15 PM | to 4:30 PM | 0 | 0 | 0 | 0 | 0 | 29 | 1 | 0 | 1 | 0 | 1 | 0 | 5 | 45 | 0 | 1 |
| 4:30 PM | to 4:45 PM | 0 | 0 | 0 | 0 | 0 | 27 | 0 | 0 | 1 | 0 | 1 | 0 | 2 | 34 | 0 | 3 |
| 4:45 PM | to 5:00 PM | 0 | 0 | 0 | 0 | 0 | 34 | 0 | 0 | 3 | 0 | 1 | 0 | 0 | 34 | 0 | 2 |
| 5:00 PM | to 5:15 PM | 0 | 0 | 0 | 0 | 0 | 30 | 1 | 0 | 2 | 0 | 2 | 0 | 3 | 58 | 0 | 4 |
| 5:15 PM | to 5:30 PM | 0 | 0 | 0 | 0 | 0 | 29 | 2 | 0 | 2 | 0 | 0 | 0 | 4 | 43 | 0 | 1 |
| 5:30 PM | to 5:45 PM | 0 | 0 | 0 | 0 | 0 | 48 | 5 | 0 | 1 | 0 | 1 | 0 | 3 | 48 | 0 | 1 |
| 5:45 PM | to 6:00 PM | 0 | 0 | 0 | 0 | 0 | 34 | 1 | 0 | 1 | 0 | 4 | 0 | 0 | 57 | 0 | 2 |
| 6:00 PM | to 6:15 PM | 0 | 0 | 0 | 0 | 0 | 36 | 1 | 0 | 0 | 0 | 1 | 0 | 3 | 61 | 0 | 2 |
| 6:15 PM | to 6:30 PM | 0 | 0 | 0 | 0 | 0 | 30 | 1 | 0 | 2 | 0 | 1 | 0 | 1 | 47 | 0 | 1 |
| 6:30 PM | to 6:45 PM | 0 | 0 | 0 | 0 | 0 | 20 | 1 | 0 | 0 | 0 | 1 | 0 | 4 | 47 | 0 | 2 |
| 6:45 PM | to 7:00 PM | 0 | 0 | 0 | 0 | 0 | 26 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 29 | 0 | 1 |
| **PEAK HOURS** | | | | | | | | | | | | | | | | | |
| ***Direction:*** | | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
| ***Roadway:*** | | **Lawton St.** | | | | **Columbia St.** | | | | **Lawton St.** | | | | **Columbia St.** | | | |
| ***Movement:*** | | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| ***AM INTERSECTION PEAK HOUR*** | | | | | | | | | | | | | | | | | |
| 8:30 AM | to 9:30 AM | 0 | 0 | 0 | 0 | 0 | 232 | 1 | 0 | 9 | 0 | 14 | 3 | 6 | 116 | 0 | 4 |
| ***PM INTERSECTION PEAK HOUR*** | | | | | | | | | | | | | | | | | |
| 5:30 PM | to 6:30 PM | 0 | 0 | 0 | 0 | 0 | 148 | 8 | 0 | 4 | 0 | 7 | 0 | 7 | 213 | 0 | 6 |
| ***AM SYSTEM PEAK HOUR*** | | | | | | | | | | | | | | | | | |
| 8:15 AM | to 9:15 AM | 0 | 0 | 0 | 1 | 0 | 220 | 5 | 0 | 7 | 0 | 12 | 3 | 4 | 122 | 0 | 5 |
| ***PM SYSTEM PEAK HOUR*** | | | | | | | | | | | | | | | | | |
| 4:45 PM | to 5:45 PM | 0 | 0 | 0 | 0 | 0 | 141 | 8 | 0 | 8 | 0 | 4 | 7 | 10 | 183 | 0 | 8 |

| **PEAK HOUR FACTORS** | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Lawton St.** | | | | **Columbia St.** | | | | **Lawton St.** | | | | **Columbia St.** | | | |
| ***AM Peak Hour*** | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach |
| **AM PEAK HOUR** | 0.00 | 0.00 | 0.00 | **#DIV/0!** | 0.00 | 0.74 | 0.31 | **0.75** | 0.44 | 0.00 | 0.60 | **0.59** | 0.50 | 0.69 | 0.00 | **0.68** |
| | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach |
| ***PM PEAK HOUR*** | 0.00 | 0.00 | 0.00 | **#DIV/0!** | 0.00 | 0.73 | 0.40 | **0.70** | 0.67 | 0.00 | 0.50 | **0.75** | 0.63 | 0.79 | 0.00 | **0.79** |

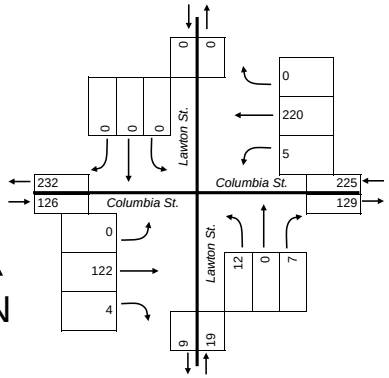
**Overall AM PEAK HOUR FACTOR** = **0.87** **Overall PM PEAK HOUR FACTOR** = **0.83**

**AM Period Intersection Volume:** 718 **PM Period Intersection Volume:** 990

**AM INTERSECTION PEAK VOLUMES**

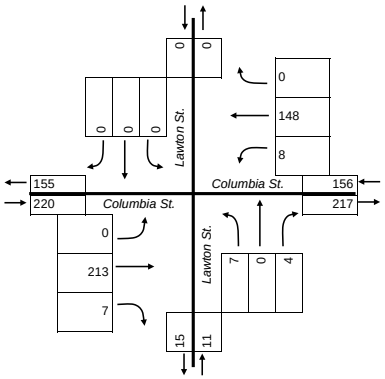



**AM SYSTEM PEAK VOLUMES**

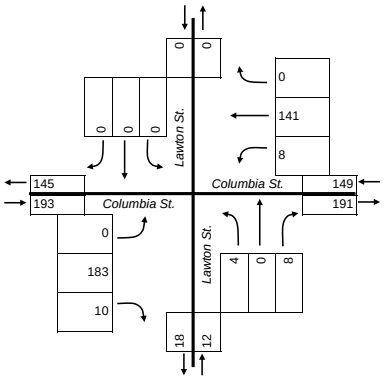



N

**PM INTERSECTION PEAK VOLUMES**




**PM SYSTEM PEAK VOLUMES**



| | |
|---|---|
| Project Name : | Washington and Broad Street Redevlopment |
| Project # : | 7301-1353 |
| Location | City of Falls Church, Virginia |
| Data Source: | Gorove/Slade Associates, Inc. |

| Date of Counts: | Tuesday, February 03, 2015 | | |
|---|---|---|---|
| AM Weather Conditions: | Clear | PM Weather Conditions: | Clear |

**Intersection:** Washington Street and Columbia Street

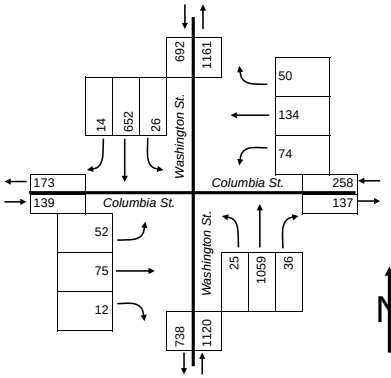
| AM PEAK | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Direction: | | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
| Roadway: | | Washington St. | | | | Columbia St. | | | | Washington St. | | | | Columbia St. | | | |
| Movement: | | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| 6:30 AM | to 6:45 AM | 0 | 49 | 1 | 0 | 5 | 4 | 2 | 0 | 3 | 72 | 2 | 0 | 0 | 1 | 2 | 0 |
| 6:45 AM | to 7:00 AM | 0 | 40 | 3 | 1 | 11 | 1 | 1 | 0 | 1 | 114 | 1 | 2 | 0 | 3 | 3 | 1 |
| 7:00 AM | to 7:15 AM | 0 | 59 | 5 | 0 | 5 | 2 | 1 | 0 | 2 | 179 | 2 | 2 | 3 | 4 | 4 | 1 |
| 7:15 AM | to 7:30 AM | 0 | 65 | 0 | 1 | 4 | 3 | 2 | 1 | 3 | 236 | 3 | 0 | 0 | 1 | 5 | 1 |
| 7:30 AM | to 7:45 AM | 0 | 74 | 3 | 1 | 16 | 5 | 6 | 0 | 5 | 262 | 4 | 2 | 1 | 7 | 7 | 1 |
| 7:45 AM | to 8:00 AM | 1 | 93 | 3 | 2 | 13 | 15 | 8 | 0 | 3 | 315 | 3 | 1 | 2 | 10 | 12 | 3 |
| 8:00 AM | to 8:15 AM | 3 | 114 | 6 | 1 | 19 | 20 | 11 | 0 | 2 | 291 | 4 | 1 | 2 | 13 | 14 | 0 |
| 8:15 AM | to 8:30 AM | 3 | 172 | 10 | 0 | 11 | 29 | 15 | 1 | 8 | 228 | 5 | 1 | 2 | 28 | 14 | 1 |
| 8:30 AM | to 8:45 AM | 1 | 131 | 9 | 1 | 8 | 23 | 19 | 1 | 10 | 269 | 5 | 0 | 1 | 22 | 8 | 1 |
| 8:45 AM | to 9:00 AM | 2 | 167 | 2 | 0 | 17 | 40 | 17 | 2 | 8 | 286 | 5 | 2 | 5 | 13 | 15 | 1 |
| 9:00 AM | to 9:15 AM | 4 | 173 | 4 | 2 | 11 | 40 | 17 | 1 | 9 | 273 | 9 | 4 | 1 | 17 | 15 | 1 |
| 9:15 AM | to 9:30 AM | 7 | 181 | 11 | 3 | 14 | 31 | 21 | 0 | 9 | 231 | 6 | 2 | 5 | 23 | 14 | 1 |
| **PM PEAK** | | | | | | | | | | | | | | | | | |
| Direction: | | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
| Roadway: | | Washington St. | | | | Columbia St. | | | | Washington St. | | | | Columbia St. | | | |
| Movement: | | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| 4:00 PM | to 4:15 PM | 8 | 248 | 9 | 1 | 11 | 18 | 8 | 1 | 13 | 148 | 5 | 1 | 6 | 49 | 11 | 1 |
| 4:15 PM | to 4:30 PM | 4 | 287 | 18 | 1 | 11 | 23 | 6 | 0 | 8 | 176 | 7 | 2 | 4 | 21 | 13 | 1 |
| 4:30 PM | to 4:45 PM | 4 | 284 | 12 | 0 | 9 | 9 | 9 | 3 | 15 | 196 | 5 | 1 | 0 | 19 | 15 | 0 |
| 4:45 PM | to 5:00 PM | 10 | 274 | 12 | 0 | 3 | 15 | 7 | 2 | 9 | 202 | 7 | 2 | 3 | 21 | 12 | 0 |
| 5:00 PM | to 5:15 PM | 3 | 241 | 5 | 0 | 7 | 26 | 9 | 0 | 16 | 237 | 5 | 2 | 9 | 26 | 17 | 0 |
| 5:15 PM | to 5:30 PM | 3 | 301 | 8 | 2 | 8 | 16 | 9 | 0 | 20 | 212 | 11 | 0 | 2 | 32 | 22 | 0 |
| 5:30 PM | to 5:45 PM | 10 | 303 | 12 | 3 | 6 | 28 | 6 | 3 | 12 | 231 | 11 | 1 | 8 | 28 | 22 | 2 |
| 5:45 PM | to 6:00 PM | 22 | 303 | 10 | 3 | 7 | 23 | 13 | 2 | 20 | 232 | 1 | 1 | 1 | 29 | 21 | 0 |
| 6:00 PM | to 6:15 PM | 5 | 257 | 17 | 3 | 8 | 27 | 12 | 0 | 14 | 209 | 6 | 2 | 4 | 43 | 23 | 1 |
| 6:15 PM | to 6:30 PM | 4 | 247 | 8 | 4 | 4 | 23 | 5 | 1 | 17 | 181 | 4 | 2 | 1 | 26 | 11 | 3 |
| 6:30 PM | to 6:45 PM | 4 | 215 | 9 | 1 | 5 | 12 | 11 | 1 | 12 | 208 | 12 | 3 | 2 | 38 | 14 | 0 |
| 6:45 PM | to 7:00 PM | 2 | 179 | 34 | 1 | 2 | 15 | 10 | 0 | 11 | 166 | 4 | 3 | 6 | 15 | 15 | 2 |
| **PEAK HOURS** | | | | | | | | | | | | | | | | | |
| Direction: | | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
| Roadway: | | Washington St. | | | | Columbia St. | | | | Washington St. | | | | Columbia St. | | | |
| Movement: | | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| *AM INTERSECTION PEAK HOUR* | | | | | | | | | | | | | | | | | |
| 8:30 AM | to 9:30 AM | 14 | 652 | 26 | 6 | 50 | 134 | 74 | 4 | 36 | 1059 | 25 | 8 | 12 | 75 | 52 | 4 |
| *PM INTERSECTION PEAK HOUR* | | | | | | | | | | | | | | | | | |
| 5:15 PM | to 6:15 PM | 40 | 1164 | 47 | 11 | 29 | 94 | 40 | 5 | 66 | 884 | 29 | 4 | 15 | 132 | 88 | 3 |
| *AM SYSTEM PEAK HOUR* | | | | | | | | | | | | | | | | | |
| 8:15 AM | to 9:15 AM | 10 | 643 | 25 | 3 | 47 | 132 | 68 | 5 | 35 | 1056 | 24 | 7 | 9 | 80 | 52 | 4 |
| *PM SYSTEM PEAK HOUR* | | | | | | | | | | | | | | | | | |
| 4:45 PM | to 5:45 PM | 26 | 1119 | 37 | 5 | 24 | 85 | 31 | 5 | 57 | 882 | 34 | 21 | 22 | 107 | 73 | 2 |

| PEAK HOUR FACTORS | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Washington St. | | | | Columbia St. | | | | Washington St. | | | | Columbia St. | | | |
| *AM Peak Hour* | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach |
| AM PEAK HOUR | 0.63 | 0.93 | 0.63 | **0.92** | 0.69 | 0.83 | 0.89 | **0.83** | 0.88 | 0.92 | 0.67 | **0.93** | 0.45 | 0.71 | 0.87 | **0.80** |
| | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach |
| *PM PEAK HOUR* | 0.65 | 0.92 | 0.77 | **0.91** | 0.75 | 0.76 | 0.86 | **0.83** | 0.71 | 0.93 | 0.77 | **0.94** | 0.61 | 0.84 | 0.83 | **0.87** |

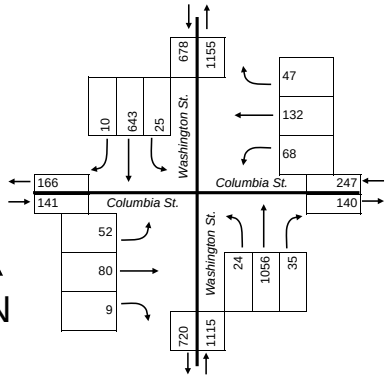
**Overall AM PEAK HOUR FACTOR** = **0.94** **Overall PM PEAK HOUR FACTOR** = **0.92**

**AM Period Intersection Volume:** 5008 **PM Period Intersection Volume:** 7025

**AM INTERSECTION PEAK VOLUMES**

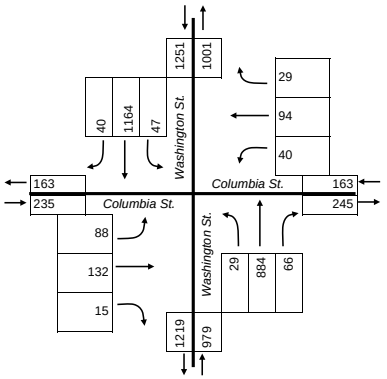



**AM SYSTEM PEAK VOLUMES**

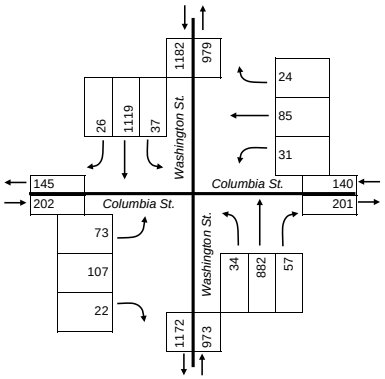



N

**PM INTERSECTION PEAK VOLUMES**




**PM SYSTEM PEAK VOLUMES**



| | |
|---|---|
| Project Name : | Washington and Broad Street Redevlopment |
| Project # : | 7301-1353 |
| Location | City of Falls Church, Virginia |
| Data Source: | Gorove/Slade Associates, Inc. |

| ***Intersection:*** | | | **Washington Street at Great Falls Street** | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AM PEAK** | | | | | | | | | | | | | | | | | | |
| | | ***Direction:*** | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
| | | ***Roadway:*** | **Washington St.** | | | | **Great Falls St.** | | | | **Washington St.** | | | | **Great Falls St.** | | | |
| | | ***Movement:*** | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| 6:30 AM | to | 6:45 AM | 2 | 52 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 79 | 8 | 0 | 3 | 0 | 2 | 0 |
| 6:45 AM | to | 7:00 AM | 1 | 35 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 114 | 5 | 0 | 6 | 0 | 1 | 0 |
| 7:00 AM | to | 7:15 AM | 0 | 62 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 188 | 10 | 0 | 5 | 0 | 6 | 0 |
| 7:15 AM | to | 7:30 AM | 1 | 66 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 242 | 23 | 0 | 7 | 0 | 6 | 1 |
| 7:30 AM | to | 7:45 AM | 2 | 76 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 287 | 20 | 0 | 10 | 0 | 7 | 0 |
| 7:45 AM | to | 8:00 AM | 6 | 95 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 317 | 17 | 0 | 22 | 0 | 2 | 1 |
| 8:00 AM | to | 8:15 AM | 9 | 114 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 307 | 15 | 0 | 16 | 0 | 8 | 1 |
| 8:15 AM | to | 8:30 AM | 21 | 175 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 255 | 24 | 0 | 25 | 0 | 3 | 0 |
| 8:30 AM | to | 8:45 AM | 8 | 165 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 301 | 26 | 0 | 19 | 0 | 1 | 0 |
| 8:45 AM | to | 9:00 AM | 16 | 151 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 303 | 22 | 0 | 25 | 0 | 2 | 0 |
| 9:00 AM | to | 9:15 AM | 14 | 168 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 298 | 25 | 0 | 25 | 0 | 6 | 0 |
| 9:15 AM | to | 9:30 AM | 11 | 175 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 236 | 20 | 0 | 31 | 3 | 4 | 0 |
| **PM PEAK** | | | | | | | | | | | | | | | | | | |
| | | ***Direction:*** | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
| | | ***Roadway:*** | **Washington St.** | | | | **Great Falls St.** | | | | **Washington St.** | | | | **Great Falls St.** | | | |
| | | ***Movement:*** | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| 4:00 PM | to | 4:15 PM | 10 | 263 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 166 | 17 | 0 | 20 | 0 | 4 | 0 |
| 4:15 PM | to | 4:30 PM | 17 | 281 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 185 | 21 | 0 | 24 | 0 | 3 | 0 |
| 4:30 PM | to | 4:45 PM | 15 | 280 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 214 | 16 | 0 | 17 | 0 | 4 | 0 |
| 4:45 PM | to | 5:00 PM | 8 | 268 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 217 | 31 | 0 | 20 | 0 | 4 | 0 |
| 5:00 PM | to | 5:15 PM | 8 | 271 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 251 | 19 | 0 | 15 | 0 | 8 | 0 |
| 5:15 PM | to | 5:30 PM | 10 | 293 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 241 | 14 | 0 | 32 | 0 | 7 | 0 |
| 5:30 PM | to | 5:45 PM | 24 | 298 | 0 | 2 | 0 | 0 | 0 | 2 | 0 | 240 | 19 | 0 | 20 | 0 | 2 | 0 |
| 5:45 PM | to | 6:00 PM | 25 | 284 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 233 | 29 | 0 | 27 | 0 | 5 | 0 |
| 6:00 PM | to | 6:15 PM | 11 | 272 | 0 | 5 | 0 | 0 | 0 | 0 | 1 | 222 | 21 | 0 | 22 | 0 | 6 | 0 |
| 6:15 PM | to | 6:30 PM | 10 | 243 | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 202 | 14 | 0 | 36 | 0 | 7 | 0 |
| 6:30 PM | to | 6:45 PM | 5 | 229 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 216 | 10 | 0 | 33 | 0 | 5 | 0 |
| 6:45 PM | to | 7:00 PM | 1 | 223 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 173 | 16 | 0 | 19 | 0 | 6 | 0 |
| **PEAK HOURS** | | | | | | | | | | | | | | | | | | |
| | | ***Direction:*** | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
| | | ***Roadway:*** | **Washington St.** | | | | **Great Falls St.** | | | | **Washington St.** | | | | **Great Falls St.** | | | |
| | | ***Movement:*** | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| ***AM INTERSECTION PEAK HOUR*** | | | | | | | | | | | | | | | | | | |
| 8:15 AM | to | 9:15 AM | 59 | 659 | 0 | 5 | 0 | 1 | 0 | 3 | 0 | 1157 | 97 | 0 | 94 | 0 | 12 | 0 |
| ***PM INTERSECTION PEAK HOUR*** | | | | | | | | | | | | | | | | | | |
| 5:00 PM | to | 6:00 PM | 67 | 1146 | 0 | 5 | 0 | 0 | 3 | 2 | 0 | 965 | 81 | 0 | 94 | 0 | 22 | 0 |
| ***AM SYSTEM PEAK HOUR*** | | | | | | | | | | | | | | | | | | |
| 8:15 AM | to | 9:15 AM | 59 | 659 | 0 | 5 | 0 | 1 | 0 | 3 | 0 | 1157 | 97 | 0 | 94 | 0 | 12 | 0 |
| ***PM SYSTEM PEAK HOUR*** | | | | | | | | | | | | | | | | | | |
| 4:45 PM | to | 5:45 PM | 50 | 1130 | 0 | 5 | 0 | 0 | 3 | 2 | 0 | 949 | 83 | 0 | 87 | 0 | 21 | 0 |

| **PEAK HOUR FACTORS** | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Washington St.** | | | | **Great Falls St.** | | | | **Washington St.** | | | | **Great Falls St.** | | | |
| ***AM Peak Hour*** | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach |
| **AM PEAK HOUR** | 0.70 | 0.94 | 0.00 | **0.92** | 0.00 | 0.25 | 0.00 | **0.25** | 0.00 | 0.95 | 0.93 | **0.96** | 0.94 | 0.00 | 0.50 | **0.85** |
| | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach |
| ***PM PEAK HOUR*** | 0.52 | 0.95 | 0.00 | **0.92** | 0.00 | 0.00 | 0.25 | **0.25** | 0.00 | 0.95 | 0.67 | **0.96** | 0.68 | 0.00 | 0.66 | **0.69** |

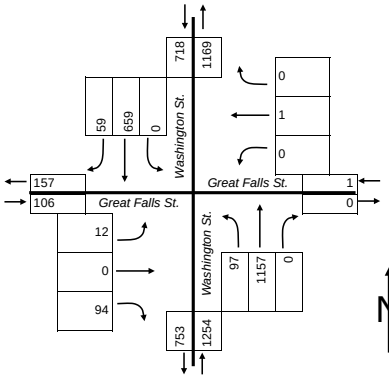
**Overall AM PEAK HOUR FACTOR** = **0.97** **Overall PM PEAK HOUR FACTOR** = **0.96**

**AM Period Intersection Volume:** 4813 **PM Period Intersection Volume:** 6487

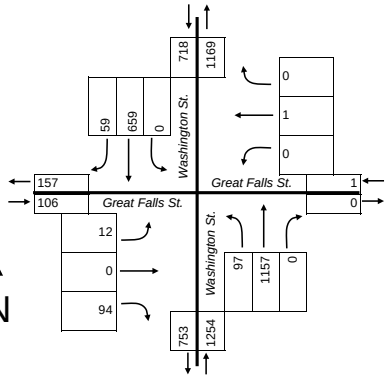
**Date of Counts:** Tuesday, February 03, 2015

**AM Weather Conditions:** Clear **PM Weather Conditions:** Clear

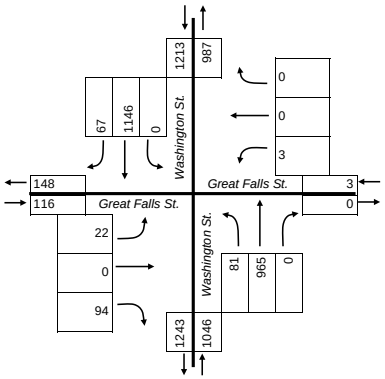
**AM INTERSECTION PEAK VOLUMES**



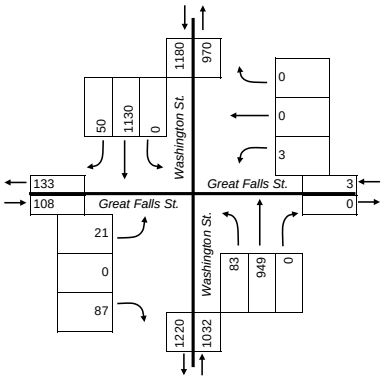

**AM SYSTEM PEAK VOLUMES**




**PM INTERSECTION PEAK VOLUMES**




**PM SYSTEM PEAK VOLUMES**

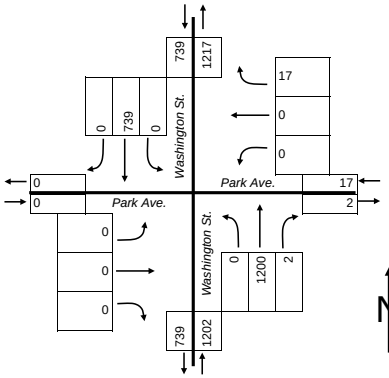


| | |
|---|---|
| Project Name : | Washington and Broad Street Redevlopment |
| Project # : | 7301-1353 |
| Location | City of Falls Church, Virginia |
| Data Source: | Gorove/Slade Associates, Inc. |

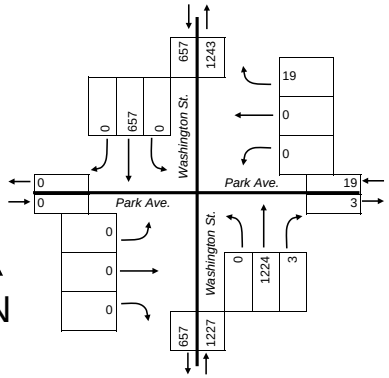
| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Intersection:*** | | | **Washington Street and Park Avenue** | | | | | | | | | | | | | | |
| **AM PEAK** | | | | | | | | | | | | | | | | | |
| | | ***Direction:*** | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
| | | ***Roadway:*** | **Washington St.** | | | | **Park Ave.** | | | | **Washington St.** | | | | **Park Ave.** | | | |
| | | ***Movement:*** | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| 6:30 AM | to | 6:45 AM | 1 | 47 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 79 | 3 | 3 | 1 | 0 | 1 | 0 |
| 6:45 AM | to | 7:00 AM | 1 | 52 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 133 | 0 | 1 | 0 | 0 | 0 | 0 |
| 7:00 AM | to | 7:15 AM | 0 | 61 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 185 | 0 | 1 | 0 | 0 | 0 | 0 |
| 7:15 AM | to | 7:30 AM | 0 | 61 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 233 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | to | 7:45 AM | 0 | 73 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 290 | 0 | 1 | 0 | 0 | 0 | 0 |
| 7:45 AM | to | 8:00 AM | 0 | 91 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 321 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | to | 8:15 AM | 0 | 132 | 0 | 1 | 3 | 0 | 0 | 0 | 1 | 336 | 0 | 2 | 0 | 0 | 0 | 0 |
| 8:15 AM | to | 8:30 AM | 0 | 162 | 0 | 0 | 5 | 0 | 0 | 0 | 1 | 333 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | to | 8:45 AM | 0 | 164 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 305 | 0 | 4 | 0 | 0 | 0 | 0 |
| 8:45 AM | to | 9:00 AM | 0 | 146 | 0 | 1 | 5 | 0 | 0 | 0 | 1 | 288 | 0 | 5 | 0 | 0 | 0 | 0 |
| 9:00 AM | to | 9:15 AM | 0 | 185 | 0 | 0 | 7 | 0 | 0 | 0 | 1 | 298 | 0 | 1 | 0 | 0 | 0 | 0 |
| 9:15 AM | to | 9:30 AM | 0 | 244 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 309 | 0 | 2 | 0 | 0 | 0 | 0 |
| **PM PEAK** | | | | | | | | | | | | | | | | | | |
| | | ***Direction:*** | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
| | | ***Roadway:*** | **Washington St.** | | | | **Park Ave.** | | | | **Washington St.** | | | | **Park Ave.** | | | |
| | | ***Movement:*** | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| 4:00 PM | to | 4:15 PM | 0 | 300 | 0 | 0 | 8 | 0 | 0 | 0 | 3 | 154 | 0 | 2 | 0 | 0 | 0 | 0 |
| 4:15 PM | to | 4:30 PM | 0 | 301 | 0 | 0 | 8 | 0 | 0 | 0 | 4 | 156 | 0 | 2 | 0 | 0 | 0 | 0 |
| 4:30 PM | to | 4:45 PM | 0 | 338 | 0 | 0 | 7 | 0 | 0 | 0 | 1 | 206 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | to | 5:00 PM | 0 | 343 | 0 | 0 | 8 | 0 | 0 | 0 | 1 | 209 | 0 | 1 | 0 | 0 | 0 | 0 |
| 5:00 PM | to | 5:15 PM | 0 | 341 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 205 | 0 | 3 | 0 | 0 | 0 | 0 |
| 5:15 PM | to | 5:30 PM | 0 | 301 | 0 | 0 | 11 | 0 | 0 | 0 | 3 | 283 | 0 | 1 | 0 | 0 | 0 | 0 |
| 5:30 PM | to | 5:45 PM | 0 | 308 | 0 | 0 | 10 | 0 | 0 | 1 | 3 | 206 | 0 | 3 | 0 | 0 | 0 | 0 |
| 5:45 PM | to | 6:00 PM | 0 | 283 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 205 | 0 | 5 | 0 | 0 | 0 | 0 |
| 6:00 PM | to | 6:15 PM | 0 | 314 | 0 | 0 | 4 | 0 | 0 | 0 | 1 | 213 | 0 | 2 | 0 | 0 | 0 | 0 |
| 6:15 PM | to | 6:30 PM | 0 | 273 | 0 | 0 | 9 | 0 | 0 | 0 | 1 | 215 | 0 | 13 | 0 | 0 | 0 | 0 |
| 6:30 PM | to | 6:45 PM | 0 | 220 | 0 | 0 | 8 | 0 | 0 | 0 | 4 | 175 | 0 | 8 | 0 | 0 | 0 | 0 |
| 6:45 PM | to | 7:00 PM | 2 | 167 | 0 | 0 | 8 | 32 | 0 | 4 | 1 | 129 | 0 | 0 | 0 | 51 | 0 | 0 |
| **PEAK HOURS** | | | | | | | | | | | | | | | | | | |
| | | ***Direction:*** | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
| | | ***Roadway:*** | **Washington St.** | | | | **Park Ave.** | | | | **Washington St.** | | | | **Park Ave.** | | | |
| | | ***Movement:*** | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| ***AM INTERSECTION PEAK HOUR*** | | | | | | | | | | | | | | | | | | |
| 8:30 AM | to | 9:30 AM | 0 | 739 | 0 | 1 | 17 | 0 | 0 | 0 | 2 | 1200 | 0 | 12 | 0 | 0 | 0 | 0 |
| ***PM INTERSECTION PEAK HOUR*** | | | | | | | | | | | | | | | | | | |
| 4:30 PM | to | 5:30 PM | 0 | 1323 | 0 | 0 | 30 | 0 | 0 | 0 | 5 | 903 | 0 | 5 | 0 | 0 | 0 | 0 |
| ***AM SYSTEM PEAK HOUR*** | | | | | | | | | | | | | | | | | | |
| 8:15 AM | to | 9:15 AM | 0 | 657 | 0 | 1 | 19 | 0 | 0 | 0 | 3 | 1224 | 0 | 10 | 0 | 0 | 0 | 0 |
| ***PM SYSTEM PEAK HOUR*** | | | | | | | | | | | | | | | | | | |
| 4:45 PM | to | 5:45 PM | 0 | 1293 | 0 | 0 | 33 | 0 | 0 | 1 | 7 | 903 | 0 | 21 | 0 | 0 | 0 | 0 |
| **PEAK HOUR FACTORS** | | | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
| | | | **Washington St.** | | | | **Park Ave.** | | | | **Washington St.** | | | | **Park Ave.** | | | |
| ***AM Peak Hour*** | | | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach |
| **AM PEAK HOUR** | | | 0.00 | 0.89 | 0.00 | **0.89** | 0.68 | 0.00 | 0.00 | **0.68** | 0.75 | 0.92 | 0.00 | **0.92** | 0.00 | 0.00 | 0.00 | **#DIV/0!** |
| | | | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach |
| ***PM PEAK HOUR*** | | | 0.00 | 0.94 | 0.00 | **0.94** | 0.75 | 0.00 | 0.00 | **0.75** | 0.58 | 0.80 | 0.00 | **0.80** | 0.00 | 0.00 | 0.00 | **#DIV/0!** |
| **Overall AM PEAK HOUR FACTOR** | | | | | | = | **0.95** | | | | **Overall PM PEAK HOUR FACTOR** | | | | | | = | **0.93** |
| **AM Period Intersection Volume:** | | | 4572 | | | | **PM Period Intersection Volume:** | | | | 6046 | | | | | | | |

| | | | |
|---|---|---|---|
| **Date of Counts:** | Thursday, January 29, 2015 | | |
| **AM Weather Conditions:** | Clear | **PM Weather Conditions:** | Clear |

**AM INTERSECTION PEAK VOLUMES**

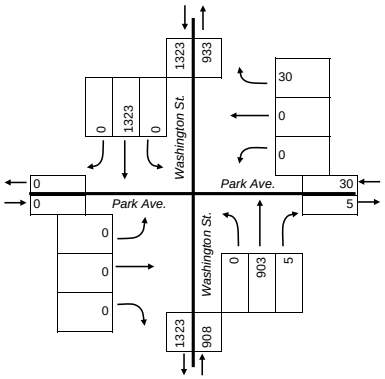



**AM SYSTEM PEAK VOLUMES**

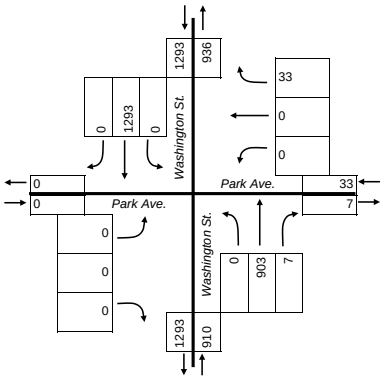



N

**PM INTERSECTION PEAK VOLUMES**




**PM SYSTEM PEAK VOLUMES**



| | |
|---|---|
| Project Name : | Washington and Broad Street Redevlopment |
| Project # : | 7301-1353 |
| Location | City of Falls Church, Virginia |
| Data Source: | Gorove/Slade Associates, Inc. |

| Date of Counts: | Thursday, January 29, 2015 | | |
|---|---|---|---|
| AM Weather Conditions: | Clear | PM Weather Conditions: | Clear |

**Intersection:** Washington Street and Site Entrance North

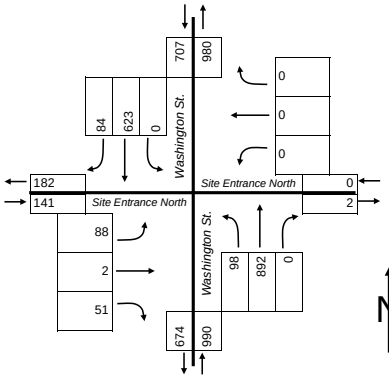
| AM PEAK | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Direction: | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
| | | Roadway: | Washington St. | | | | Site Entrance North | | | | Washington St. | | | | Site Entrance North | | | |
| | | Movement: | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| 6:30 AM | to | 6:45 AM | 1 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 75 | 3 | 0 | 2 | 0 | 2 | 0 |
| 6:45 AM | to | 7:00 AM | 5 | 53 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 124 | 6 | 0 | 1 | 0 | 5 | 0 |
| 7:00 AM | to | 7:15 AM | 5 | 59 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 185 | 1 | 0 | 2 | 0 | 7 | 0 |
| 7:15 AM | to | 7:30 AM | 10 | 59 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 223 | 8 | 0 | 1 | 0 | 11 | 0 |
| 7:30 AM | to | 7:45 AM | 9 | 68 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 270 | 6 | 0 | 5 | 0 | 20 | 0 |
| 7:45 AM | to | 8:00 AM | 13 | 77 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 283 | 14 | 0 | 3 | 0 | 11 | 0 |
| 8:00 AM | to | 8:15 AM | 17 | 118 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 285 | 17 | 0 | 7 | 0 | 18 | 1 |
| 8:15 AM | to | 8:30 AM | 21 | 122 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 229 | 17 | 0 | 14 | 0 | 20 | 0 |
| 8:30 AM | to | 8:45 AM | 8 | 126 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 179 | 25 | 0 | 3 | 0 | 16 | 0 |
| 8:45 AM | to | 9:00 AM | 26 | 135 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 227 | 27 | 0 | 9 | 1 | 25 | 2 |
| 9:00 AM | to | 9:15 AM | 29 | 148 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 227 | 28 | 0 | 15 | 1 | 31 | 0 |
| 9:15 AM | to | 9:30 AM | 21 | 214 | 0 | 4 | 0 | 0 | 0 | 1 | 0 | 259 | 18 | 0 | 24 | 0 | 16 | 0 |
| **PM PEAK** | | | | | | | | | | | | | | | | | | |
| | | Direction: | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
| | | Roadway: | Washington St. | | | | Site Entrance North | | | | Washington St. | | | | Site Entrance North | | | |
| | | Movement: | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| 4:00 PM | to | 4:15 PM | 12 | 152 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 70 | 8 | 0 | 18 | 0 | 17 | 0 |
| 4:15 PM | to | 4:30 PM | 15 | 226 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 123 | 7 | 0 | 26 | 0 | 26 | 0 |
| 4:30 PM | to | 4:45 PM | 31 | 279 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 169 | 16 | 0 | 30 | 0 | 53 | 2 |
| 4:45 PM | to | 5:00 PM | 17 | 270 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 171 | 9 | 0 | 29 | 0 | 35 | 4 |
| 5:00 PM | to | 5:15 PM | 13 | 255 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 172 | 12 | 0 | 32 | 0 | 48 | 5 |
| 5:15 PM | to | 5:30 PM | 22 | 248 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 212 | 11 | 0 | 28 | 0 | 44 | 5 |
| 5:30 PM | to | 5:45 PM | 17 | 233 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 170 | 4 | 0 | 18 | 0 | 40 | 3 |
| 5:45 PM | to | 6:00 PM | 25 | 245 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 159 | 11 | 0 | 22 | 0 | 29 | 1 |
| 6:00 PM | to | 6:15 PM | 10 | 250 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 187 | 6 | 0 | 20 | 0 | 37 | 3 |
| 6:15 PM | to | 6:30 PM | 16 | 214 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 176 | 13 | 0 | 7 | 2 | 32 | 3 |
| 6:30 PM | to | 6:45 PM | 9 | 160 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 129 | 5 | 0 | 12 | 0 | 26 | 3 |
| 6:45 PM | to | 7:00 PM | 10 | 162 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 130 | 8 | 0 | 11 | 0 | 23 | 1 |
| **PEAK HOURS** | | | | | | | | | | | | | | | | | | |
| | | Direction: | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
| | | Roadway: | Washington St. | | | | Site Entrance North | | | | Washington St. | | | | Site Entrance North | | | |
| | | Movement: | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| ***AM INTERSECTION PEAK HOUR*** | | | | | | | | | | | | | | | | | | |
| 8:30 AM | to | 9:30 AM | 84 | 623 | 0 | 9 | 0 | 0 | 0 | 2 | 0 | 892 | 98 | 0 | 51 | 2 | 88 | 2 |
| ***PM INTERSECTION PEAK HOUR*** | | | | | | | | | | | | | | | | | | |
| 4:30 PM | to | 5:30 PM | 83 | 1052 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 724 | 48 | 0 | 119 | 0 | 180 | 16 |
| ***AM SYSTEM PEAK HOUR*** | | | | | | | | | | | | | | | | | | |
| 8:15 AM | to | 9:15 AM | 84 | 531 | 0 | 7 | 0 | 0 | 0 | 1 | 0 | 862 | 97 | 0 | 41 | 2 | 92 | 2 |
| ***PM SYSTEM PEAK HOUR*** | | | | | | | | | | | | | | | | | | |
| 4:45 PM | to | 5:45 PM | 69 | 1006 | 0 | 33 | 0 | 0 | 0 | 0 | 0 | 725 | 36 | 0 | 107 | 0 | 167 | 17 |

| PEAK HOUR FACTORS | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Washington St. | | | | Site Entrance North | | | | Washington St. | | | | Site Entrance North | | | |
| ***AM Peak Hour*** | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach |
| **AM PEAK HOUR** | 0.72 | 0.90 | 0.00 | **0.87** | 0.00 | 0.00 | 0.00 | **#DIV/0!** | 0.00 | 0.94 | 0.87 | **0.94** | 0.68 | 0.50 | 0.74 | **0.72** |
| | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach |
| ***PM PEAK HOUR*** | 0.78 | 0.93 | 0.00 | **0.94** | 0.00 | 0.00 | 0.00 | **#DIV/0!** | 0.00 | 0.85 | 0.75 | **0.85** | 0.84 | 0.00 | 0.87 | **0.86** |

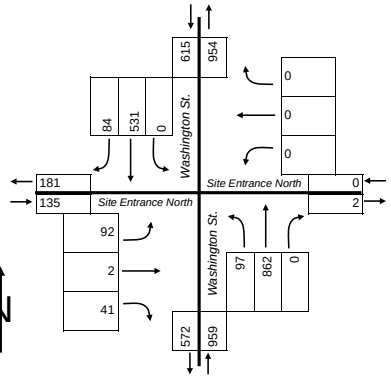
**Overall AM PEAK HOUR FACTOR** = **0.89** **Overall PM PEAK HOUR FACTOR** = **0.93**

**AM Period Intersection Volume:** 4395 **PM Period Intersection Volume:** 5534

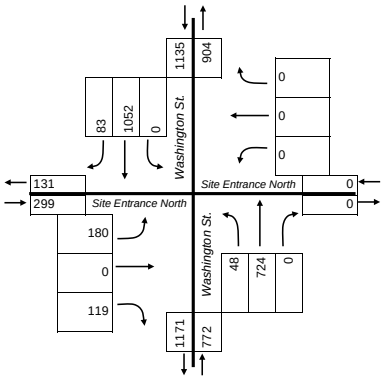
**AM INTERSECTION PEAK VOLUMES**



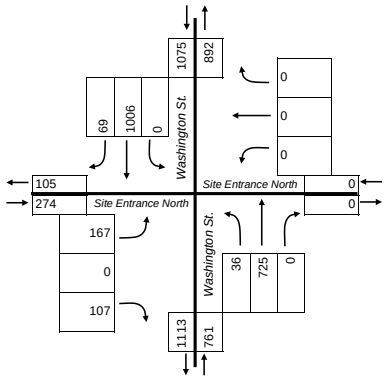

**AM SYSTEM PEAK VOLUMES**




**PM INTERSECTION PEAK VOLUMES**




**PM SYSTEM PEAK VOLUMES**



| | |
|---|---|
| Project Name : | Washington and Broad Street Redevlopment |
| Project # : | 7301-1353 |
| Location | City of Falls Church, Virginia |
| Data Source: | Gorove/Slade Associates, Inc. |

**Intersection:** Washington Street and Site Entrance South

| | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Roadway:** | Washington St. | | | | Site Entrance South | | | | Washington St. | | | | Site Entrance South | | | |
| **AM PEAK** Movement: | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| 6:30 AM to 6:45 AM | 1 | 52 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 76 | 0 | 3 | 0 | 1 | 0 | 0 |
| 6:45 AM to 7:00 AM | 0 | 50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 121 | 0 | 1 | 0 | 0 | 0 | 0 |
| 7:00 AM to 7:15 AM | 0 | 66 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 189 | 0 | 1 | 0 | 0 | 0 | 0 |
| 7:15 AM to 7:30 AM | 0 | 54 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 213 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM to 7:45 AM | 3 | 58 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 264 | 0 | 0 | 2 | 0 | 0 | 0 |
| 7:45 AM to 8:00 AM | 0 | 95 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 317 | 0 | 0 | 3 | 0 | 0 | 0 |
| 8:00 AM to 8:15 AM | 0 | 127 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 340 | 0 | 2 | 0 | 0 | 0 | 0 |
| 8:15 AM to 8:30 AM | 2 | 157 | 0 | 0 | 4 | 0 | 0 | 0 | 1 | 321 | 0 | 0 | 4 | 0 | 0 | 0 |
| 8:30 AM to 8:45 AM | 0 | 164 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 267 | 0 | 3 | 0 | 0 | 0 | 0 |
| 8:45 AM to 9:00 AM | 0 | 149 | 0 | 3 | 3 | 0 | 0 | 0 | 2 | 284 | 0 | 5 | 4 | 0 | 0 | 0 |
| 9:00 AM to 9:15 AM | 0 | 174 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 286 | 0 | 2 | 3 | 0 | 0 | 0 |
| 9:15 AM to 9:30 AM | 0 | 170 | 0 | 0 | 2 | 0 | 0 | 0 | 2 | 282 | 0 | 0 | 2 | 0 | 0 | 0 |
| **PM PEAK** Movement: | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| 4:00 PM to 4:15 PM | 4 | 281 | 0 | 0 | 5 | 0 | 0 | 0 | 6 | 146 | 0 | 3 | 3 | 0 | 0 | 0 |
| 4:15 PM to 4:30 PM | 1 | 276 | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 141 | 0 | 4 | 6 | 0 | 0 | 0 |
| 4:30 PM to 4:45 PM | 0 | 308 | 0 | 0 | 3 | 0 | 0 | 0 | 2 | 184 | 0 | 2 | 1 | 0 | 0 | 0 |
| 4:45 PM to 5:00 PM | 4 | 282 | 0 | 3 | 2 | 0 | 0 | 0 | 1 | 201 | 0 | 1 | 4 | 0 | 0 | 0 |
| 5:00 PM to 5:15 PM | 1 | 306 | 0 | 1 | 2 | 0 | 0 | 0 | 3 | 192 | 0 | 1 | 5 | 0 | 0 | 0 |
| 5:15 PM to 5:30 PM | 1 | 271 | 0 | 2 | 5 | 0 | 0 | 0 | 4 | 229 | 0 | 3 | 2 | 0 | 0 | 0 |
| 5:30 PM to 5:45 PM | 4 | 277 | 0 | 0 | 2 | 0 | 0 | 0 | 3 | 189 | 0 | 0 | 2 | 0 | 0 | 0 |
| 5:45 PM to 6:00 PM | 1 | 273 | 0 | 0 | 3 | 0 | 0 | 0 | 6 | 169 | 0 | 3 | 2 | 0 | 0 | 0 |
| 6:00 PM to 6:15 PM | 0 | 231 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 170 | 0 | 2 | 0 | 0 | 0 | 0 |
| 6:15 PM to 6:30 PM | 4 | 271 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 180 | 0 | 5 | 3 | 0 | 0 | 0 |
| 6:30 PM to 6:45 PM | 2 | 163 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 163 | 0 | 6 | 9 | 0 | 0 | 0 |
| 6:45 PM to 7:00 PM | 1 | 189 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 137 | 0 | 1 | 4 | 0 | 0 | 0 |
| **PEAK HOURS** Movement: | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| ***AM INTERSECTION PEAK HOUR*** | | | | | | | | | | | | | | | | |
| 8:00 AM to 9:00 AM | 2 | 597 | 0 | 4 | 9 | 0 | 0 | 0 | 4 | 1212 | 0 | 10 | 8 | 0 | 0 | 0 |
| ***PM INTERSECTION PEAK HOUR*** | | | | | | | | | | | | | | | | |
| 4:30 PM to 5:30 PM | 6 | 1167 | 0 | 6 | 12 | 0 | 0 | 0 | 10 | 806 | 0 | 7 | 12 | 0 | 0 | 0 |
| ***AM SYSTEM PEAK HOUR*** | | | | | | | | | | | | | | | | |
| 8:15 AM to 9:15 AM | 2 | 644 | 0 | 3 | 10 | 0 | 0 | 0 | 5 | 1158 | 0 | 10 | 11 | 0 | 0 | 0 |
| ***PM SYSTEM PEAK HOUR*** | | | | | | | | | | | | | | | | |
| 4:45 PM to 5:45 PM | 10 | 1136 | 0 | 6 | 11 | 0 | 0 | 0 | 11 | 811 | 0 | 23 | 13 | 0 | 0 | 0 |

| **PEAK HOUR FACTORS** | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Washington St. | | | | Site Entrance South | | | | Washington St. | | | | Site Entrance South | | | |
| ***AM Peak Hour*** | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach |
| **AM PEAK HOUR** | 0.25 | 0.93 | 0.00 | **0.93** | 0.63 | 0.00 | 0.00 | **0.63** | 0.63 | 0.90 | 0.00 | **0.90** | 0.69 | 0.00 | 0.00 | **0.69** |
| | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach |
| ***PM PEAK HOUR*** | 0.63 | 0.93 | 0.00 | **0.93** | 0.55 | 0.00 | 0.00 | **0.55** | 0.69 | 0.89 | 0.00 | **0.88** | 0.65 | 0.00 | 0.00 | **0.65** |

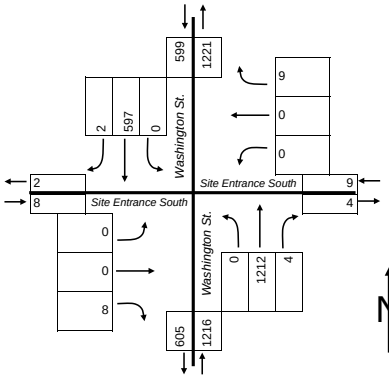
**Overall AM PEAK HOUR FACTOR** = **0.94** **Overall PM PEAK HOUR FACTOR** = **0.97**

**AM Period Intersection Volume:** 4326 **PM Period Intersection Volume:** 5354

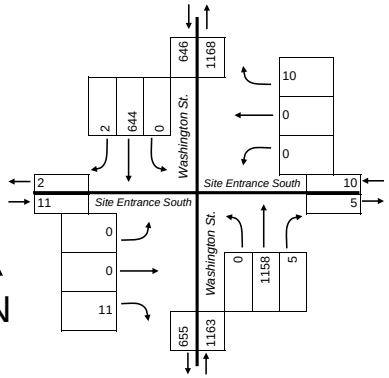
**Date of Counts:** Thursday, January 29, 2015

**AM Weather Conditions:** Clear **PM Weather Conditions:** Clear

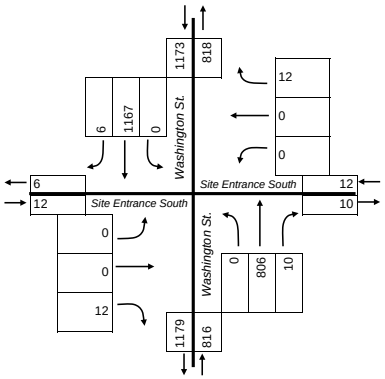
**AM INTERSECTION PEAK VOLUMES**



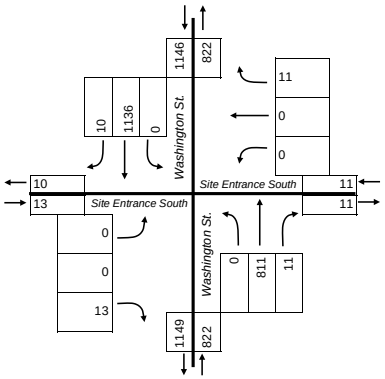

**AM SYSTEM PEAK VOLUMES**




**PM INTERSECTION PEAK VOLUMES**




**PM SYSTEM PEAK VOLUMES**



| | |
|---|---|
| Project Name : | Washington and Broad Street Redevlopment |
| Project # : | 7301-1353 |
| Location | City of Falls Church, Virginia |
| Data Source: | Gorove/Slade Associates, Inc. |

**Intersection:** Broad Street and Washington Street

| | Date of Counts: | Saturday, January 31, 2015 | | |
|---|---|---|---|---|
| | AM Weather Conditions: | Clear | PM Weather Conditions: | Clear |

**AM PEAK**

| Time | Southbound Right | Southbound Thru | Southbound Left | Southbound Peds | Westbound Right | Westbound Thru | Westbound Left | Westbound Peds | Northbound Right | Northbound Thru | Northbound Left | Northbound Peds | Eastbound Right | Eastbound Thru | Eastbound Left | Eastbound Peds |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Washington St. | | | | Broad St. | | | | Washington St. | | | | Broad St. | | | |
| 11:00 AM to 11:15 AM | 27 | 106 | 32 | 3 | 19 | 79 | 10 | 3 | 7 | 80 | 20 | 0 | 11 | 98 | 24 | 2 |
| 11:15 AM to 11:30 AM | 33 | 122 | 39 | 1 | 17 | 124 | 9 | 7 | 5 | 103 | 26 | 0 | 21 | 137 | 40 | 3 |
| 11:30 AM to 11:45 AM | 52 | 127 | 25 | 3 | 16 | 129 | 17 | 6 | 10 | 116 | 38 | 1 | 24 | 107 | 34 | 3 |
| 11:45 AM to 12:00 PM | 41 | 123 | 26 | 1 | 10 | 163 | 17 | 2 | 6 | 108 | 21 | 2 | 18 | 134 | 36 | 5 |
| 12:00 PM to 12:15 PM | 25 | 139 | 53 | 4 | 4 | 193 | 13 | 1 | 6 | 123 | 35 | 2 | 18 | 131 | 34 | 4 |
| 12:15 PM to 12:30 PM | 28 | 106 | 45 | 1 | 11 | 127 | 22 | 3 | 8 | 137 | 27 | 3 | 18 | 137 | 40 | 6 |
| 12:30 PM to 12:45 PM | 25 | 120 | 62 | 0 | 20 | 139 | 9 | 1 | 6 | 151 | 25 | 2 | 17 | 120 | 31 | 2 |
| 12:45 PM to 1:00 PM | 44 | 132 | 62 | 0 | 4 | 130 | 20 | 2 | 7 | 164 | 21 | 0 | 15 | 140 | 34 | 1 |
| 1:00 PM to 1:15 PM | 36 | 111 | 57 | 3 | 21 | 142 | 18 | 5 | 6 | 134 | 28 | 0 | 22 | 141 | 40 | 2 |
| 1:15 PM to 1:30 PM | 38 | 123 | 33 | 2 | 9 | 137 | 12 | 2 | 10 | 120 | 29 | 3 | 19 | 156 | 48 | 5 |
| 1:30 PM to 1:45 PM | 46 | 72 | 31 | 0 | 1 | 124 | 8 | 0 | 9 | 125 | 20 | 3 | 17 | 137 | 37 | 4 |
| 1:45 PM to 2:00 PM | 36 | 126 | 50 | 3 | 8 | 132 | 27 | 4 | 14 | 123 | 21 | 1 | 22 | 136 | 38 | 5 |

**PM PEAK**

| Time | Southbound Right | Southbound Thru | Southbound Left | Southbound Peds | Westbound Right | Westbound Thru | Westbound Left | Westbound Peds | Northbound Right | Northbound Thru | Northbound Left | Northbound Peds | Eastbound Right | Eastbound Thru | Eastbound Left | Eastbound Peds |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Washington St. | | | | Broad St. | | | | Washington St. | | | | Broad St. | | | |
| 4:00 PM to 4:15 PM | | | | | | | | | | | | | | | | |
| 4:15 PM to 4:30 PM | | | | | | | | | | | | | | | | |
| 4:30 PM to 4:45 PM | | | | | | | | | | | | | | | | |
| 4:45 PM to 5:00 PM | | | | | | | | | | | | | | | | |
| 5:00 PM to 5:15 PM | | | | | | | | | | | | | | | | |
| 5:15 PM to 5:30 PM | | | | | | | | | | | | | | | | |
| 5:30 PM to 5:45 PM | | | | | | | | | | | | | | | | |
| 5:45 PM to 6:00 PM | | | | | | | | | | | | | | | | |
| 6:00 PM to 6:15 PM | | | | | | | | | | | | | | | | |
| 6:15 PM to 6:30 PM | | | | | | | | | | | | | | | | |
| 6:30 PM to 6:45 PM | | | | | | | | | | | | | | | | |
| 6:45 PM to 7:00 PM | | | | | | | | | | | | | | | | |

**PEAK HOURS**

| Time | Southbound Right | Southbound Thru | Southbound Left | Southbound Peds | Westbound Right | Westbound Thru | Westbound Left | Westbound Peds | Northbound Right | Northbound Thru | Northbound Left | Northbound Peds | Eastbound Right | Eastbound Thru | Eastbound Left | Eastbound Peds |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Washington St. | | | | Broad St. | | | | Washington St. | | | | Broad St. | | | |
| ***AM INTERSECTION PEAK HOUR*** | | | | | | | | | | | | | | | | |
| 12:30 PM to 1:30 PM | 143 | 486 | 214 | 5 | 54 | 548 | 59 | 10 | 29 | 569 | 103 | 5 | 73 | 557 | 153 | 10 |
| ***PM INTERSECTION PEAK HOUR*** | | | | | | | | | | | | | | | | |
| 4:00 PM to 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***AM SYSTEM PEAK HOUR*** | | | | | | | | | | | | | | | | |
| 12:15 PM to 1:15 PM | 133 | 469 | 226 | 4 | 56 | 538 | 69 | 11 | 27 | 586 | 101 | 5 | 72 | 538 | 145 | 11 |
| ***PM SYSTEM PEAK HOUR*** | | | | | | | | | | | | | | | | |
| 4:00 PM to 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

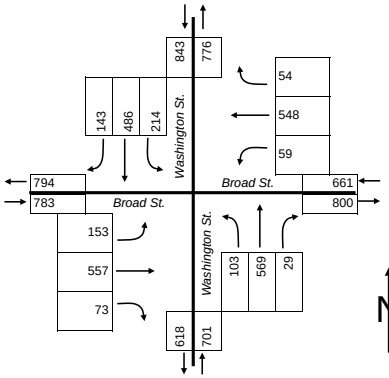
**PEAK HOUR FACTORS**

| | Southbound Right | Southbound Thru | Southbound Left | Southbound Approach | Westbound Right | Westbound Thru | Westbound Left | Westbound Approach | Northbound Right | Northbound Thru | Northbound Left | Northbound Approach | Eastbound Right | Eastbound Thru | Eastbound Left | Eastbound Approach |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Washington St. | | | | Broad St. | | | | Washington St. | | | | Broad St. | | | |
| ***AM PEAK HOUR*** | 0.76 | 0.89 | 0.91 | **0.87** | 0.67 | 0.95 | 0.78 | **0.92** | 0.84 | 0.89 | 0.90 | **0.93** | 0.82 | 0.95 | 0.91 | **0.93** |
| | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach |
| ***PM PEAK HOUR*** | 0.00 | 0.00 | 0.00 | **#DIV/0!** | 0.00 | 0.00 | 0.00 | **#DIV/0!** | 0.00 | 0.00 | 0.00 | **#DIV/0!** | 0.00 | 0.00 | 0.00 | **#DIV/0!** |

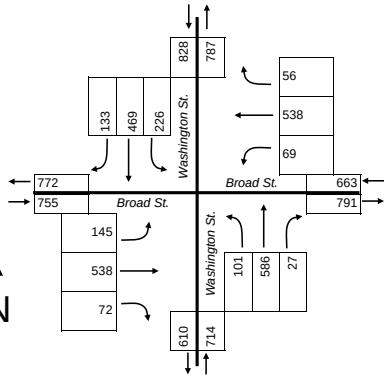
**Overall AM PEAK HOUR FACTOR** = **0.96** **Overall PM PEAK HOUR FACTOR** = **#DIV/0!**

**AM Period Intersection Volume:** 8415 **PM Period Intersection Volume:** 0

**AM INTERSECTION PEAK VOLUMES**

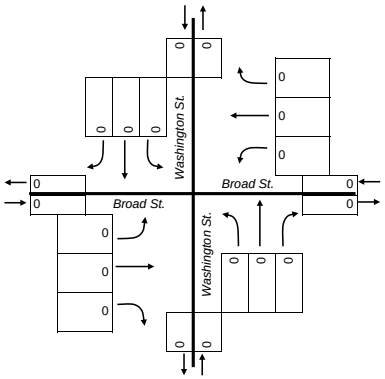



**AM SYSTEM PEAK VOLUMES**

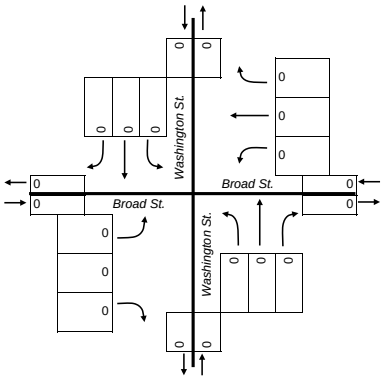



N

**PM INTERSECTION PEAK VOLUMES**




**PM SYSTEM PEAK VOLUMES**



| | |
|---|---|
| Project Name : | Washington and Broad Street Redevlopment |
| Project # : | 7301-1353 |
| Location | City of Falls Church, Virginia |
| Data Source: | Gorove/Slade Associates, Inc. |

**Intersection:** Broad Street at Site Entrance

| AM PEAK | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Direction:*** | | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
| ***Roadway:*** | | **Parking** | | | | **Broad St.** | | | | **Parking** | | | | **Broad St.** | | | |
| ***Movement:*** | | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| 11:00 AM | to 11:15 AM | 3 | 0 | 2 | 0 | 3 | 159 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 185 | 3 | 0 |
| 11:15 AM | to 11:30 AM | 3 | 0 | 0 | 0 | 1 | 153 | 2 | 5 | 0 | 0 | 1 | 0 | 0 | 168 | 1 | 3 |
| 11:30 AM | to 11:45 AM | 3 | 0 | 0 | 0 | 3 | 198 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 179 | 2 | 1 |
| 11:45 AM | to 12:00 PM | 2 | 0 | 0 | 1 | 1 | 213 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 177 | 4 | 0 |
| 12:00 PM | to 12:15 PM | 1 | 0 | 2 | 0 | 2 | 179 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 193 | 3 | 3 |
| 12:15 PM | to 12:30 PM | 5 | 0 | 1 | 0 | 3 | 160 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 195 | 7 | 1 |
| 12:30 PM | to 12:45 PM | 1 | 0 | 0 | 0 | 4 | 178 | 0 | 4 | 1 | 0 | 1 | 0 | 1 | 188 | 2 | 4 |
| 12:45 PM | to 1:00 PM | 5 | 0 | 0 | 0 | 3 | 163 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 204 | 6 | 2 |
| 1:00 PM | to 1:15 PM | 4 | 0 | 1 | 0 | 1 | 173 | 1 | 0 | 0 | 1 | 1 | 0 | 3 | 233 | 9 | 0 |
| 1:15 PM | to 1:30 PM | 3 | 0 | 2 | 0 | 2 | 167 | 0 | 4 | 1 | 0 | 1 | 0 | 4 | 196 | 0 | 1 |
| 1:30 PM | to 1:45 PM | 4 | 0 | 0 | 0 | 2 | 175 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 182 | 1 | 0 |
| 1:45 PM | to 2:00 PM | 5 | 0 | 1 | 0 | 2 | 182 | 3 | 2 | 2 | 0 | 0 | 0 | 12 | 170 | 4 | 0 |
| **PM PEAK** | | | | | | | | | | | | | | | | | |
| ***Direction:*** | | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
| ***Roadway:*** | | **Parking** | | | | **Broad St.** | | | | **Parking** | | | | **Broad St.** | | | |
| ***Movement:*** | | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| 4:00 PM | to 4:15 PM | | | | | | | | | | | | | | | | |
| 4:15 PM | to 4:30 PM | | | | | | | | | | | | | | | | |
| 4:30 PM | to 4:45 PM | | | | | | | | | | | | | | | | |
| 4:45 PM | to 5:00 PM | | | | | | | | | | | | | | | | |
| 5:00 PM | to 5:15 PM | | | | | | | | | | | | | | | | |
| 5:15 PM | to 5:30 PM | | | | | | | | | | | | | | | | |
| 5:30 PM | to 5:45 PM | | | | | | | | | | | | | | | | |
| 5:45 PM | to 6:00 PM | | | | | | | | | | | | | | | | |
| 6:00 PM | to 6:15 PM | | | | | | | | | | | | | | | | |
| 6:15 PM | to 6:30 PM | | | | | | | | | | | | | | | | |
| 6:30 PM | to 6:45 PM | | | | | | | | | | | | | | | | |
| 6:45 PM | to 7:00 PM | | | | | | | | | | | | | | | | |
| **PEAK HOURS** | | | | | | | | | | | | | | | | | |
| ***Direction:*** | | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
| ***Roadway:*** | | **Parking** | | | | **Broad St.** | | | | **Parking** | | | | **Broad St.** | | | |
| ***Movement:*** | | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| ***AM INTERSECTION PEAK HOUR*** | | | | | | | | | | | | | | | | | |
| 12:30 PM | to 1:30 PM | 13 | 0 | 3 | 0 | 10 | 681 | 2 | 8 | 3 | 1 | 3 | 0 | 8 | 821 | 17 | 7 |
| ***PM INTERSECTION PEAK HOUR*** | | | | | | | | | | | | | | | | | |
| 4:00 PM | to 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***AM SYSTEM PEAK HOUR*** | | | | | | | | | | | | | | | | | |
| 12:15 PM | to 1:15 PM | 15 | 0 | 2 | 0 | 11 | 674 | 3 | 4 | 2 | 1 | 2 | 0 | 4 | 820 | 24 | 7 |
| ***PM SYSTEM PEAK HOUR*** | | | | | | | | | | | | | | | | | |
| 4:00 PM | to 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| PEAK HOUR FACTORS | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Parking** | | | | **Broad St.** | | | | **Parking** | | | | **Broad St.** | | | |
| ***AM Peak Hour*** | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach |
| **AM PEAK HOUR** | 0.75 | 0.00 | 0.50 | **0.71** | 0.69 | 0.95 | 0.75 | **0.95** | 0.50 | 0.25 | 0.50 | **0.63** | 0.33 | 0.88 | 0.67 | **0.87** |
| | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach |
| ***PM PEAK HOUR*** | 0.00 | 0.00 | 0.00 | **#DIV/0!** | 0.00 | 0.00 | 0.00 | **#DIV/0!** | 0.00 | 0.00 | 0.00 | **#DIV/0!** | 0.00 | 0.00 | 0.00 | **#DIV/0!** |

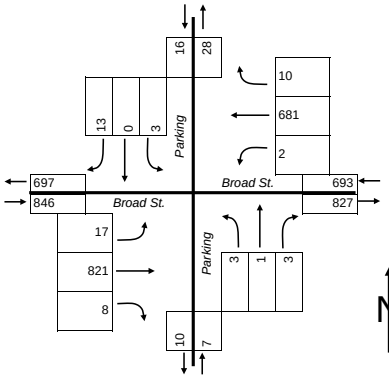
**Overall AM PEAK HOUR FACTOR** = **0.91** **Overall PM PEAK HOUR FACTOR** = **#DIV/0!**

**AM Period Intersection Volume:** 4529 **PM Period Intersection Volume:** 0

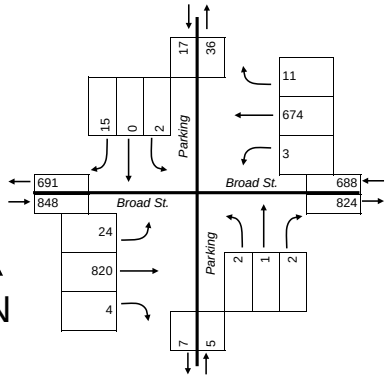
**Date of Counts:**

**AM Weather Conditions:** Clear **PM Weather Conditions:** Clear

**AM INTERSECTION PEAK VOLUMES**

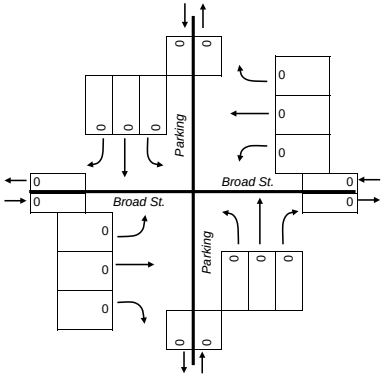



**AM SYSTEM PEAK VOLUMES**

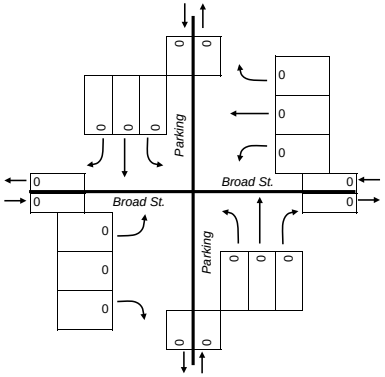



N

**PM INTERSECTION PEAK VOLUMES**




**PM SYSTEM PEAK VOLUMES**



| | |
|---|---|
| Project Name : | Washington and Broad Street Redevlopment |
| Project # : | 7301-1353 |
| Location | City of Falls Church, Virginia |
| Data Source: | Gorove/Slade Associates, Inc. |

**Date of Counts:** Saturday, January 31, 2015

**AM Weather Conditions:** Clear

**PM Weather Conditions:** Clear

***Intersection:*** **Broad Street at Lawton Street**

**AM PEAK**

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ***Direction:*** | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
| | | ***Roadway:*** | **Lawton St.** | | | | **Broad St.** | | | | **Lawton St.** | | | | **Broad St.** | | | |
| | | ***Movement:*** | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| 11:00 AM | to | 11:15 AM | 1 | 0 | 0 | 0 | 1 | 164 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 190 | 3 | 0 |
| 11:15 AM | to | 11:30 AM | 1 | 0 | 0 | 0 | 2 | 162 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 176 | 0 | 2 |
| 11:30 AM | to | 11:45 AM | 2 | 0 | 0 | 0 | 1 | 203 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 178 | 1 | 2 |
| 11:45 AM | to | 12:00 PM | 0 | 0 | 0 | 0 | 0 | 219 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 181 | 0 | 0 |
| 12:00 PM | to | 12:15 PM | 2 | 0 | 0 | 0 | 1 | 184 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 193 | 2 | 3 |
| 12:15 PM | to | 12:30 PM | 2 | 0 | 0 | 0 | 1 | 168 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 191 | 1 | 1 |
| 12:30 PM | to | 12:45 PM | 2 | 0 | 0 | 0 | 2 | 183 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 194 | 0 | 0 |
| 12:45 PM | to | 1:00 PM | 2 | 0 | 0 | 0 | 0 | 171 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 202 | 0 | 0 |
| 1:00 PM | to | 1:15 PM | 3 | 0 | 0 | 0 | 1 | 169 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 237 | 4 | 0 |
| 1:15 PM | to | 1:30 PM | 1 | 0 | 1 | 0 | 1 | 170 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 212 | 0 | 0 |
| 1:30 PM | to | 1:45 PM | 1 | 0 | 1 | 0 | 1 | 181 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 187 | 1 | 1 |
| 1:45 PM | to | 2:00 PM | 2 | 0 | 1 | 0 | 1 | 195 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 179 | 6 | 0 |

**PM PEAK**

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ***Direction:*** | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
| | | ***Roadway:*** | **Lawton St.** | | | | **Broad St.** | | | | **Lawton St.** | | | | **Broad St.** | | | |
| | | ***Movement:*** | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| 4:00 PM | to | 4:15 PM | | | | | | | | | | | | | | | | |
| 4:15 PM | to | 4:30 PM | | | | | | | | | | | | | | | | |
| 4:30 PM | to | 4:45 PM | | | | | | | | | | | | | | | | |
| 4:45 PM | to | 5:00 PM | | | | | | | | | | | | | | | | |
| 5:00 PM | to | 5:15 PM | | | | | | | | | | | | | | | | |
| 5:15 PM | to | 5:30 PM | | | | | | | | | | | | | | | | |
| 5:30 PM | to | 5:45 PM | | | | | | | | | | | | | | | | |
| 5:45 PM | to | 6:00 PM | | | | | | | | | | | | | | | | |
| 6:00 PM | to | 6:15 PM | | | | | | | | | | | | | | | | |
| 6:15 PM | to | 6:30 PM | | | | | | | | | | | | | | | | |
| 6:30 PM | to | 6:45 PM | | | | | | | | | | | | | | | | |
| 6:45 PM | to | 7:00 PM | | | | | | | | | | | | | | | | |

**PEAK HOURS**

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ***Direction:*** | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
| | | ***Roadway:*** | **Lawton St.** | | | | **Broad St.** | | | | **Lawton St.** | | | | **Broad St.** | | | |
| | | ***Movement:*** | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| ***AM INTERSECTION PEAK HOUR*** | | | | | | | | | | | | | | | | | | |
| 12:30 PM | to | 1:30 PM | 8 | 0 | 1 | 0 | 4 | 693 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 845 | 4 | 0 |
| ***PM INTERSECTION PEAK HOUR*** | | | | | | | | | | | | | | | | | | |
| 4:00 PM | to | 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***AM SYSTEM PEAK HOUR*** | | | | | | | | | | | | | | | | | | |
| 12:15 PM | to | 1:15 PM | 9 | 0 | 0 | 0 | 4 | 691 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 824 | 5 | 1 |
| ***PM SYSTEM PEAK HOUR*** | | | | | | | | | | | | | | | | | | |
| 4:00 PM | to | 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

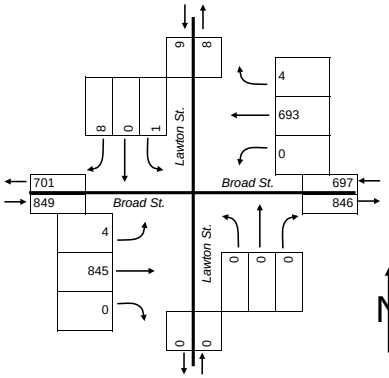
**PEAK HOUR FACTORS**

| | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Lawton St.** | | | | **Broad St.** | | | | **Lawton St.** | | | | **Broad St.** | | | |
| ***AM Peak Hour*** | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach |
| **AM PEAK HOUR** | 0.75 | 0.00 | 0.00 | **0.75** | 0.50 | 0.94 | 0.00 | **0.94** | 0.00 | 0.00 | 0.00 | **#DIV/0!** | 0.00 | 0.87 | 0.31 | **0.86** |
| | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach |
| ***PM PEAK HOUR*** | 0.00 | 0.00 | 0.00 | **#DIV/0!** | 0.00 | 0.00 | 0.00 | **#DIV/0!** | 0.00 | 0.00 | 0.00 | **#DIV/0!** | 0.00 | 0.00 | 0.00 | **#DIV/0!** |

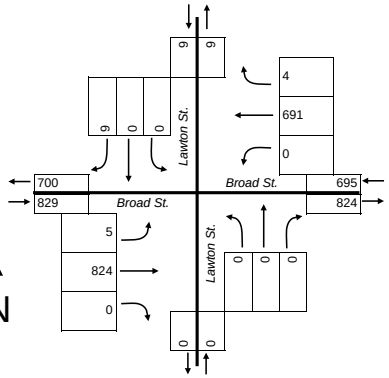
**Overall AM PEAK HOUR FACTOR** = **0.93** **Overall PM PEAK HOUR FACTOR** = **#DIV/0!**

**AM Period Intersection Volume:** 4541 **PM Period Intersection Volume:** 0

**AM INTERSECTION PEAK VOLUMES**

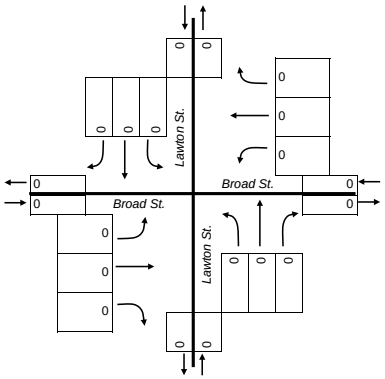



**AM SYSTEM PEAK VOLUMES**

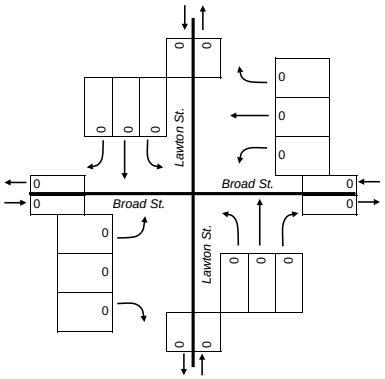



N

**PM INTERSECTION PEAK VOLUMES**




**PM SYSTEM PEAK VOLUMES**



| | |
|---|---|
| Project Name : | Washington and Broad Street Redevlopment |
| Project # : | 7301-1353 |
| Location | City of Falls Church, Virginia |
| Data Source: | Gorove/Slade Associates, Inc. |

**Date of Counts:** Saturday, February 07, 2015

**AM Weather Conditions:** Clear

**PM Weather Conditions:** Clear

***Intersection:*** **Lawton Street at Columbia Street**

**AM PEAK**

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ***Direction:*** | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
| | | ***Roadway:*** | **Lawton St.** | | | | **Columbia St.** | | | | **Lawton St.** | | | | **Columbia St.** | | | |
| | | ***Movement:*** | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| 11:00 AM | to | 11:15 AM | 0 | 0 | 0 | 0 | 0 | 26 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 33 | 0 | 7 |
| 11:15 AM | to | 11:30 AM | 0 | 0 | 0 | 0 | 0 | 31 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 34 | 0 | 1 |
| 11:30 AM | to | 11:45 AM | 0 | 0 | 0 | 0 | 0 | 30 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 26 | 1 | 2 |
| 11:45 AM | to | 12:00 PM | 0 | 0 | 0 | 0 | 0 | 26 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 21 | 0 | 1 |
| 12:00 PM | to | 12:15 PM | 0 | 0 | 0 | 0 | 2 | 31 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 25 | 0 | 1 |
| 12:15 PM | to | 12:30 PM | 0 | 0 | 0 | 1 | 0 | 34 | 1 | 0 | 0 | 0 | 1 | 0 | 3 | 25 | 0 | 1 |
| 12:30 PM | to | 12:45 PM | 0 | 0 | 0 | 0 | 0 | 31 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 21 | 0 | 1 |
| 12:45 PM | to | 1:00 PM | 0 | 0 | 0 | 1 | 0 | 30 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 27 | 0 | 2 |
| 1:00 PM | to | 1:15 PM | 1 | 0 | 0 | 0 | 0 | 30 | 1 | 0 | 2 | 0 | 0 | 0 | 2 | 30 | 0 | 0 |
| 1:15 PM | to | 1:30 PM | 1 | 0 | 0 | 1 | 0 | 20 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 25 | 0 | 3 |
| 1:30 PM | to | 1:45 PM | 0 | 0 | 0 | 0 | 0 | 17 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 27 | 0 | 0 |
| 1:45 PM | to | 2:00 PM | 1 | 0 | 0 | 0 | 0 | 22 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 41 | 0 | 0 |

**PM PEAK**

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ***Direction:*** | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
| | | ***Roadway:*** | **Lawton St.** | | | | **Columbia St.** | | | | **Lawton St.** | | | | **Columbia St.** | | | |
| | | ***Movement:*** | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| 4:00 PM | to | 4:15 PM | | | | | | | | | | | | | | | | |
| 4:15 PM | to | 4:30 PM | | | | | | | | | | | | | | | | |
| 4:30 PM | to | 4:45 PM | | | | | | | | | | | | | | | | |
| 4:45 PM | to | 5:00 PM | | | | | | | | | | | | | | | | |
| 5:00 PM | to | 5:15 PM | | | | | | | | | | | | | | | | |
| 5:15 PM | to | 5:30 PM | | | | | | | | | | | | | | | | |
| 5:30 PM | to | 5:45 PM | | | | | | | | | | | | | | | | |
| 5:45 PM | to | 6:00 PM | | | | | | | | | | | | | | | | |
| 6:00 PM | to | 6:15 PM | | | | | | | | | | | | | | | | |
| 6:15 PM | to | 6:30 PM | | | | | | | | | | | | | | | | |
| 6:30 PM | to | 6:45 PM | | | | | | | | | | | | | | | | |
| 6:45 PM | to | 7:00 PM | | | | | | | | | | | | | | | | |

**PEAK HOURS**

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ***Direction:*** | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
| | | ***Roadway:*** | **Lawton St.** | | | | **Columbia St.** | | | | **Lawton St.** | | | | **Columbia St.** | | | |
| | | ***Movement:*** | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| ***AM INTERSECTION PEAK HOUR*** | | | | | | | | | | | | | | | | | | |
| 12:15 PM | to | 1:15 PM | 1 | 0 | 0 | 2 | 0 | 125 | 3 | 0 | 4 | 0 | 1 | 0 | 8 | 103 | 0 | 4 |
| ***PM INTERSECTION PEAK HOUR*** | | | | | | | | | | | | | | | | | | |
| 4:00 PM | to | 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***AM SYSTEM PEAK HOUR*** | | | | | | | | | | | | | | | | | | |
| 12:15 PM | to | 1:15 PM | 1 | 0 | 0 | 2 | 0 | 125 | 3 | 0 | 4 | 0 | 1 | 0 | 8 | 103 | 0 | 4 |
| ***PM SYSTEM PEAK HOUR*** | | | | | | | | | | | | | | | | | | |
| 4:00 PM | to | 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

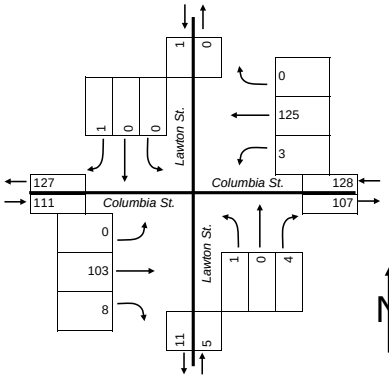
**PEAK HOUR FACTORS**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
| | **Lawton St.** | | | | **Columbia St.** | | | | **Lawton St.** | | | | **Columbia St.** | | | |
| ***AM Peak Hour*** | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach |
| **AM PEAK HOUR** | 0.25 | 0.00 | 0.00 | **0.25** | 0.00 | 0.92 | 0.75 | **0.91** | 0.50 | 0.00 | 0.25 | **0.63** | 0.67 | 0.86 | 0.00 | **0.87** |
| | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach |
| ***PM PEAK HOUR*** | 0.00 | 0.00 | 0.00 | **#DIV/0!** | 0.00 | 0.00 | 0.00 | **#DIV/0!** | 0.00 | 0.00 | 0.00 | **#DIV/0!** | 0.00 | 0.00 | 0.00 | **#DIV/0!** |

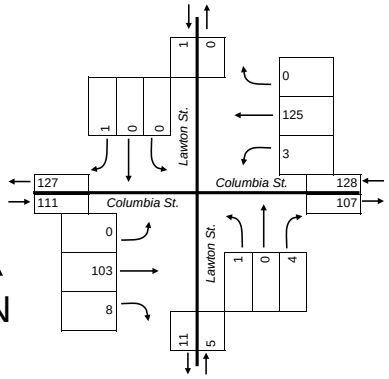
**Overall AM PEAK HOUR FACTOR** = **0.93** **Overall PM PEAK HOUR FACTOR** = **#DIV/0!**

**AM Period Intersection Volume:** 704 **PM Period Intersection Volume:** 0

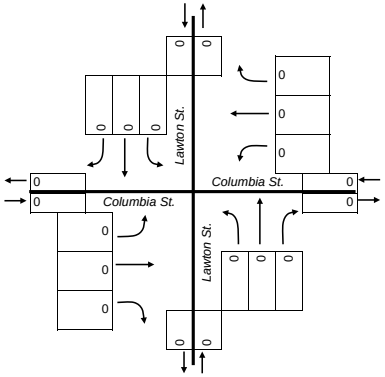
**AM INTERSECTION PEAK VOLUMES**



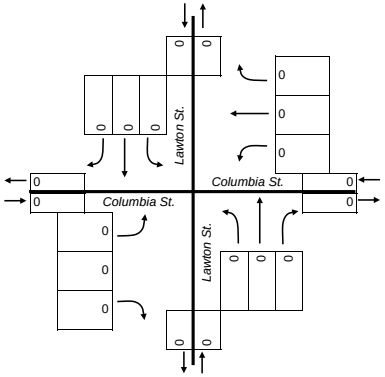

**AM SYSTEM PEAK VOLUMES**




**PM INTERSECTION PEAK VOLUMES**




**PM SYSTEM PEAK VOLUMES**



| | |
|---|---|
| Project Name : | Washington and Broad Street Redevlopment |
| Project # : | 7301-1353 |
| Location | City of Falls Church, Virginia |
| Data Source: | Gorove/Slade Associates, Inc. |

**Intersection:** Washington Street and Columbia Street

**Date of Counts:** Saturday, February 07, 2015

**AM Weather Conditions:** Clear

**PM Weather Conditions:** Clear

**AM PEAK**

| Direction: | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Roadway: | Washington St. | | | | Columbia St. | | | | Washington St. | | | | Columbia St. | | | |
| Movement: | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| 11:00 AM to 11:15 AM | 3 | 135 | 9 | 3 | 9 | 12 | 8 | 6 | 9 | 153 | 4 | 2 | 1 | 15 | 11 | 0 |
| 11:15 AM to 11:30 AM | 4 | 166 | 15 | 2 | 10 | 16 | 10 | 2 | 10 | 157 | 4 | 1 | 2 | 19 | 6 | 4 |
| 11:30 AM to 11:45 AM | 12 | 189 | 8 | 0 | 13 | 21 | 10 | 1 | 9 | 146 | 5 | 1 | 1 | 13 | 10 | 0 |
| 11:45 AM to 12:00 PM | 4 | 187 | 3 | 0 | 13 | 13 | 7 | 4 | 6 | 163 | 6 | 1 | 3 | 14 | 22 | 2 |
| 12:00 PM to 12:15 PM | 4 | 189 | 12 | 2 | 6 | 16 | 16 | 3 | 7 | 184 | 0 | 0 | 1 | 9 | 8 | 3 |
| 12:15 PM to 12:30 PM | 3 | 187 | 21 | 2 | 10 | 15 | 11 | 2 | 13 | 198 | 2 | 6 | 3 | 8 | 11 | 3 |
| 12:30 PM to 12:45 PM | 8 | 198 | 11 | 0 | 9 | 19 | 9 | 4 | 7 | 182 | 3 | 1 | 0 | 6 | 13 | 0 |
| 12:45 PM to 1:00 PM | 4 | 207 | 12 | 2 | 11 | 13 | 9 | 2 | 10 | 225 | 5 | 4 | 4 | 10 | 9 | 2 |
| 1:00 PM to 1:15 PM | 0 | 170 | 14 | 1 | 14 | 11 | 11 | 3 | 8 | 188 | 4 | 1 | 2 | 9 | 7 | 1 |
| 1:15 PM to 1:30 PM | 3 | 184 | 10 | 1 | 11 | 10 | 6 | 4 | 10 | 174 | 4 | 2 | 1 | 6 | 10 | 1 |
| 1:30 PM to 1:45 PM | 2 | 173 | 7 | 0 | 4 | 6 | 6 | 1 | 11 | 171 | 1 | 2 | 1 | 10 | 10 | 0 |
| 1:45 PM to 2:00 PM | 2 | 173 | 13 | 2 | 11 | 8 | 4 | 0 | 23 | 150 | 2 | 2 | 2 | 29 | 15 | 0 |

**PM PEAK**

| Direction: | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Roadway: | Washington St. | | | | Columbia St. | | | | Washington St. | | | | Columbia St. | | | |
| Movement: | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| 4:00 PM to 4:15 PM | | | | | | | | | | | | | | | | |
| 4:15 PM to 4:30 PM | | | | | | | | | | | | | | | | |
| 4:30 PM to 4:45 PM | | | | | | | | | | | | | | | | |
| 4:45 PM to 5:00 PM | | | | | | | | | | | | | | | | |
| 5:00 PM to 5:15 PM | | | | | | | | | | | | | | | | |
| 5:15 PM to 5:30 PM | | | | | | | | | | | | | | | | |
| 5:30 PM to 5:45 PM | | | | | | | | | | | | | | | | |
| 5:45 PM to 6:00 PM | | | | | | | | | | | | | | | | |
| 6:00 PM to 6:15 PM | | | | | | | | | | | | | | | | |
| 6:15 PM to 6:30 PM | | | | | | | | | | | | | | | | |
| 6:30 PM to 6:45 PM | | | | | | | | | | | | | | | | |
| 6:45 PM to 7:00 PM | | | | | | | | | | | | | | | | |

**PEAK HOURS**

| Direction: | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Roadway: | Washington St. | | | | Columbia St. | | | | Washington St. | | | | Columbia St. | | | |
| Movement: | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| *AM INTERSECTION PEAK HOUR* | | | | | | | | | | | | | | | | |
| 12:00 PM to 1:00 PM | 19 | 781 | 56 | 6 | 36 | 63 | 45 | 11 | 37 | 789 | 10 | 11 | 8 | 33 | 41 | 8 |
| *PM INTERSECTION PEAK HOUR* | | | | | | | | | | | | | | | | |
| 4:00 PM to 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *AM SYSTEM PEAK HOUR* | | | | | | | | | | | | | | | | |
| 12:15 PM to 1:15 PM | 15 | 762 | 58 | 5 | 44 | 58 | 40 | 11 | 38 | 793 | 14 | 12 | 9 | 33 | 40 | 6 |
| *PM SYSTEM PEAK HOUR* | | | | | | | | | | | | | | | | |
| 4:00 PM to 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

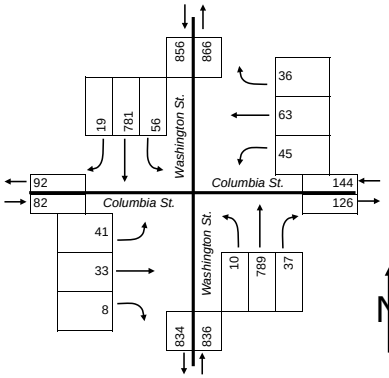
**PEAK HOUR FACTORS**

| | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Washington St. | | | | Columbia St. | | | | Washington St. | | | | Columbia St. | | | |
| *AM Peak Hour* | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach |
| **AM PEAK HOUR** | 0.47 | 0.92 | 0.69 | **0.94** | 0.79 | 0.76 | 0.91 | **0.96** | 0.73 | 0.88 | 0.70 | **0.88** | 0.56 | 0.83 | 0.77 | **0.89** |
| | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach |
| ***PM PEAK HOUR*** | 0.00 | 0.00 | 0.00 | **#DIV/0!** | 0.00 | 0.00 | 0.00 | **#DIV/0!** | 0.00 | 0.00 | 0.00 | **#DIV/0!** | 0.00 | 0.00 | 0.00 | **#DIV/0!** |

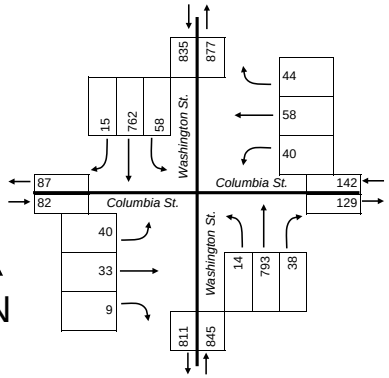
**Overall AM PEAK HOUR FACTOR** = **0.92** **Overall PM PEAK HOUR FACTOR** = **#DIV/0!**

**AM Period Intersection Volume:** 5285 **PM Period Intersection Volume:** 0

**AM INTERSECTION PEAK VOLUMES**

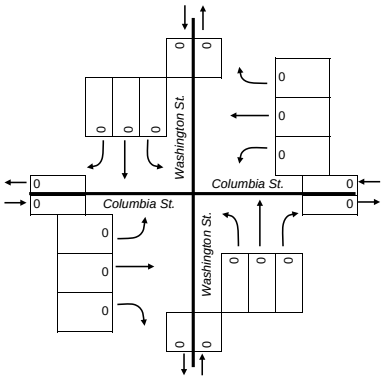



**AM SYSTEM PEAK VOLUMES**

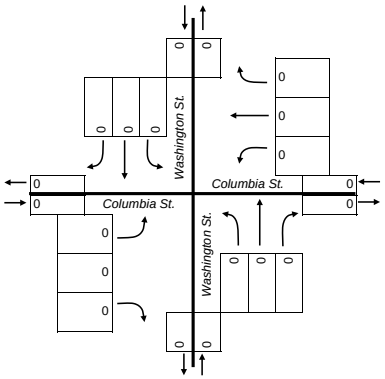



N

**PM INTERSECTION PEAK VOLUMES**




**PM SYSTEM PEAK VOLUMES**



| | |
|---|---|
| Project Name : | Washington and Broad Street Redevlopment |
| Project # : | 7301-1353 |
| Location | City of Falls Church, Virginia |
| Data Source: | Gorove/Slade Associates, Inc. |

**Intersection:** Washington Street at Great Falls Street

| | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AM PEAK** | | | | | | | | | | | | | | | | |
| **Roadway:** | Washington St. | | | | Great Falls St. | | | | Washington St. | | | | Great Falls St. | | | |
| **Movement:** | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| 11:00 AM to 11:15 AM | 7 | 200 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 212 | 33 | 0 | 25 | 0 | 6 | 0 |
| 11:15 AM to 11:30 AM | 8 | 209 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 183 | 19 | 12 | 26 | 0 | 11 | 0 |
| 11:30 AM to 11:45 AM | 11 | 197 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 192 | 22 | 1 | 27 | 0 | 16 | 0 |
| 11:45 AM to 12:00 PM | 4 | 205 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 172 | 20 | 2 | 29 | 0 | 6 | 0 |
| 12:00 PM to 12:15 PM | 7 | 187 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 185 | 29 | 2 | 32 | 0 | 11 | 0 |
| 12:15 PM to 12:30 PM | 8 | 196 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 171 | 13 | 0 | 42 | 0 | 11 | 0 |
| 12:30 PM to 12:45 PM | 10 | 199 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 209 | 20 | 4 | 27 | 0 | 5 | 0 |
| 12:45 PM to 1:00 PM | 8 | 219 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 190 | 18 | 6 | 24 | 0 | 5 | 2 |
| 1:00 PM to 1:15 PM | 3 | 187 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 193 | 27 | 3 | 27 | 0 | 9 | 0 |
| 1:15 PM to 1:30 PM | 4 | 180 | 0 | 5 | 0 | 0 | 0 | 0 | 1 | 194 | 19 | 2 | 19 | 0 | 7 | 0 |
| 1:30 PM to 1:45 PM | 4 | 191 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 160 | 17 | 0 | 26 | 0 | 9 | 0 |
| 1:45 PM to 2:00 PM | 4 | 191 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 197 | 26 | 0 | 15 | 0 | 8 | 1 |
| **PM PEAK** | | | | | | | | | | | | | | | | |
| **Roadway:** | Washington St. | | | | Great Falls St. | | | | Washington St. | | | | Great Falls St. | | | |
| **Movement:** | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| 4:00 PM to 4:15 PM | | | | | | | | | | | | | | | | |
| 4:15 PM to 4:30 PM | | | | | | | | | | | | | | | | |
| 4:30 PM to 4:45 PM | | | | | | | | | | | | | | | | |
| 4:45 PM to 5:00 PM | | | | | | | | | | | | | | | | |
| 5:00 PM to 5:15 PM | | | | | | | | | | | | | | | | |
| 5:15 PM to 5:30 PM | | | | | | | | | | | | | | | | |
| 5:30 PM to 5:45 PM | | | | | | | | | | | | | | | | |
| 5:45 PM to 6:00 PM | | | | | | | | | | | | | | | | |
| 6:00 PM to 6:15 PM | | | | | | | | | | | | | | | | |
| 6:15 PM to 6:30 PM | | | | | | | | | | | | | | | | |
| 6:30 PM to 6:45 PM | | | | | | | | | | | | | | | | |
| 6:45 PM to 7:00 PM | | | | | | | | | | | | | | | | |
| **PEAK HOURS** | | | | | | | | | | | | | | | | |
| **Roadway:** | Washington St. | | | | Great Falls St. | | | | Washington St. | | | | Great Falls St. | | | |
| **Movement:** | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| ***AM INTERSECTION PEAK HOUR*** | | | | | | | | | | | | | | | | |
| 11:00 AM to 12:00 PM | 30 | 811 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 759 | 94 | 15 | 107 | 0 | 39 | 0 |
| ***PM INTERSECTION PEAK HOUR*** | | | | | | | | | | | | | | | | |
| 4:00 PM to 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***AM SYSTEM PEAK HOUR*** | | | | | | | | | | | | | | | | |
| 12:15 PM to 1:15 PM | 29 | 801 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 763 | 78 | 13 | 120 | 0 | 30 | 2 |
| ***PM SYSTEM PEAK HOUR*** | | | | | | | | | | | | | | | | |
| 4:00 PM to 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| **PEAK HOUR FACTORS** | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Washington St. | | | | Great Falls St. | | | | Washington St. | | | | Great Falls St. | | | |
| ***AM Peak Hour*** | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach |
| **AM PEAK HOUR** | 0.73 | 0.91 | 0.00 | **0.91** | 0.00 | 0.00 | 0.00 | **#DIV/0!** | 0.00 | 0.91 | 0.72 | **0.92** | 0.71 | 0.00 | 0.68 | **0.71** |
| | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach |
| ***PM PEAK HOUR*** | 0.00 | 0.00 | 0.00 | **#DIV/0!** | 0.00 | 0.00 | 0.00 | **#DIV/0!** | 0.00 | 0.00 | 0.00 | **#DIV/0!** | 0.00 | 0.00 | 0.00 | **#DIV/0!** |

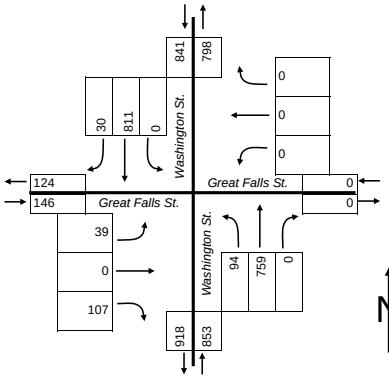
**Overall AM PEAK HOUR FACTOR** = **0.97** **Overall PM PEAK HOUR FACTOR** = **#DIV/0!**

**AM Period Intersection Volume:** 5384 **PM Period Intersection Volume:** 0

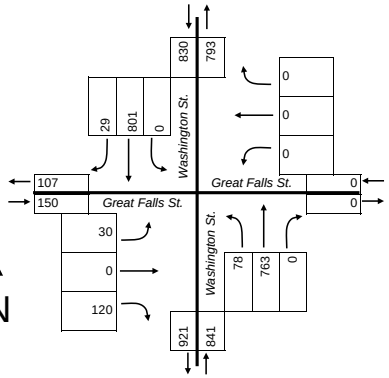
**Date of Counts:** Saturday, May 30, 2015

**AM Weather Conditions:** Clear **PM Weather Conditions:** Clear

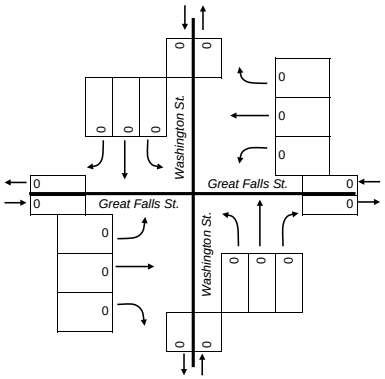
**AM INTERSECTION PEAK VOLUMES**



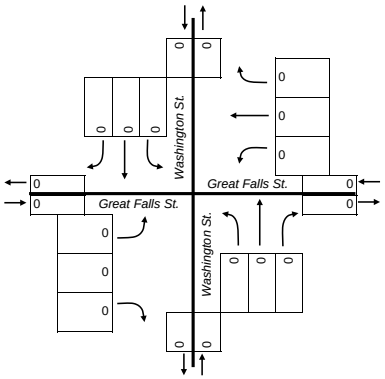

**AM SYSTEM PEAK VOLUMES**




**PM INTERSECTION PEAK VOLUMES**




**PM SYSTEM PEAK VOLUMES**



| | |
|---|---|
| Project Name : | Washington and Broad Street Redevlopment |
| Project # : | 7301-1353 |
| Location | City of Falls Church, Virginia |
| Data Source: | Gorove/Slade Associates, Inc. |

**Intersection:** Washington Street and Park Avenue

| | Date of Counts: | Saturday, January 31, 2015 | | |
|---|---|---|---|---|
| | AM Weather Conditions: | Clear | PM Weather Conditions: | Clear |

**AM PEAK**

| Direction: | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Roadway: | Washington St. | | | | Park Ave. | | | | Washington St. | | | | Park Ave. | | | |
| Movement: | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| 11:00 AM to 11:15 AM | 29 | 158 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 143 | 14 | 0 | 14 | 0 | 33 | 0 |
| 11:15 AM to 11:30 AM | 24 | 192 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 155 | 10 | 0 | 12 | 0 | 28 | 1 |
| 11:30 AM to 11:45 AM | 29 | 198 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 147 | 14 | 0 | 14 | 0 | 18 | 1 |
| 11:45 AM to 12:00 PM | 34 | 194 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 152 | 18 | 2 | 15 | 0 | 31 | 1 |
| 12:00 PM to 12:15 PM | 12 | 155 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 163 | 8 | 0 | 16 | 0 | 27 | 1 |
| 12:15 PM to 12:30 PM | 23 | 162 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 169 | 12 | 1 | 13 | 0 | 39 | 2 |
| 12:30 PM to 12:45 PM | 20 | 182 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 165 | 7 | 0 | 18 | 0 | 27 | 0 |
| 12:45 PM to 1:00 PM | 14 | 158 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 159 | 9 | 0 | 13 | 0 | 32 | 0 |
| 1:00 PM to 1:15 PM | 15 | 177 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 196 | 8 | 0 | 13 | 0 | 37 | 1 |
| 1:15 PM to 1:30 PM | 13 | 169 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 181 | 5 | 0 | 13 | 0 | 41 | 1 |
| 1:30 PM to 1:45 PM | 17 | 153 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 143 | 7 | 0 | 14 | 0 | 37 | 0 |
| 1:45 PM to 2:00 PM | 13 | 157 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 141 | 6 | 0 | 6 | 0 | 29 | 0 |

**PM PEAK**

| Direction: | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Roadway: | Washington St. | | | | Park Ave. | | | | Washington St. | | | | Park Ave. | | | |
| Movement: | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| 4:00 PM to 4:15 PM | | | | | | | | | | | | | | | | |
| 4:15 PM to 4:30 PM | | | | | | | | | | | | | | | | |
| 4:30 PM to 4:45 PM | | | | | | | | | | | | | | | | |
| 4:45 PM to 5:00 PM | | | | | | | | | | | | | | | | |
| 5:00 PM to 5:15 PM | | | | | | | | | | | | | | | | |
| 5:15 PM to 5:30 PM | | | | | | | | | | | | | | | | |
| 5:30 PM to 5:45 PM | | | | | | | | | | | | | | | | |
| 5:45 PM to 6:00 PM | | | | | | | | | | | | | | | | |
| 6:00 PM to 6:15 PM | | | | | | | | | | | | | | | | |
| 6:15 PM to 6:30 PM | | | | | | | | | | | | | | | | |
| 6:30 PM to 6:45 PM | | | | | | | | | | | | | | | | |
| 6:45 PM to 7:00 PM | | | | | | | | | | | | | | | | |

**PEAK HOURS**

| Direction: | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Roadway: | Washington St. | | | | Park Ave. | | | | Washington St. | | | | Park Ave. | | | |
| Movement: | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| ***AM INTERSECTION PEAK HOUR*** | | | | | | | | | | | | | | | | |
| 11:00 AM to 12:00 PM | 116 | 742 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 597 | 56 | 2 | 55 | 0 | 110 | 3 |
| ***PM INTERSECTION PEAK HOUR*** | | | | | | | | | | | | | | | | |
| 4:00 PM to 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***AM SYSTEM PEAK HOUR*** | | | | | | | | | | | | | | | | |
| 12:15 PM to 1:15 PM | 72 | 679 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 689 | 36 | 1 | 57 | 0 | 135 | 3 |
| ***PM SYSTEM PEAK HOUR*** | | | | | | | | | | | | | | | | |
| 4:00 PM to 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

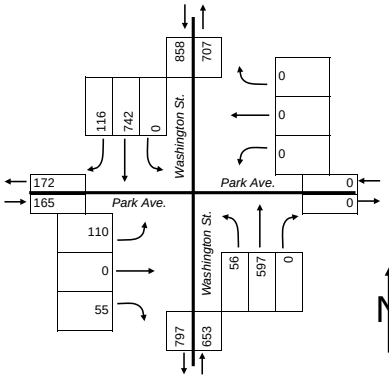
**PEAK HOUR FACTORS**

| | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Washington St. | | | | Park Ave. | | | | Washington St. | | | | Park Ave. | | | |
| ***AM Peak Hour*** | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach |
| **AM PEAK HOUR** | 0.78 | 0.93 | 0.00 | **0.93** | 0.00 | 0.00 | 0.00 | **#DIV/0!** | 0.00 | 0.88 | 0.75 | **0.89** | 0.79 | 0.00 | 0.87 | **0.92** |
| | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach |
| ***PM PEAK HOUR*** | 0.00 | 0.00 | 0.00 | **#DIV/0!** | 0.00 | 0.00 | 0.00 | **#DIV/0!** | 0.00 | 0.00 | 0.00 | **#DIV/0!** | 0.00 | 0.00 | 0.00 | **#DIV/0!** |

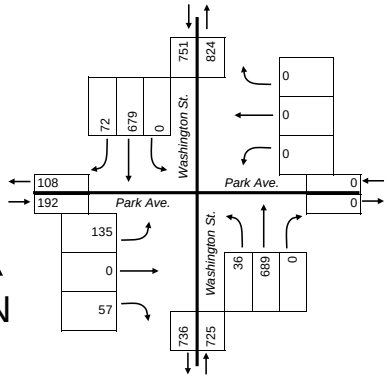
**Overall AM PEAK HOUR FACTOR** = **0.93** **Overall PM PEAK HOUR FACTOR** = **#DIV/0!**

**AM Period Intersection Volume:** 4870 **PM Period Intersection Volume:** 0

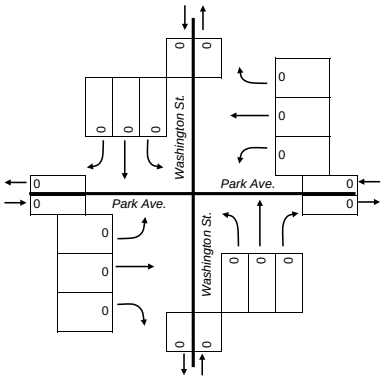
**AM INTERSECTION PEAK VOLUMES**



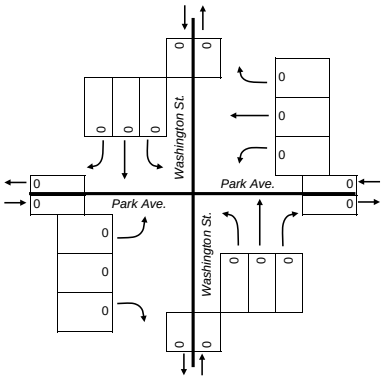

**AM SYSTEM PEAK VOLUMES**




**PM INTERSECTION PEAK VOLUMES**




**PM SYSTEM PEAK VOLUMES**



| | |
|---|---|
| Project Name : | Washington and Broad Street Redevlopment |
| Project # : | 7301-1353 |
| Location | City of Falls Church, Virginia |
| Data Source: | Gorove/Slade Associates, Inc. |

**Date of Counts:** Saturday, January 31, 2015

**AM Weather Conditions:** Clear

**PM Weather Conditions:** Clear

***Intersection:*** **Washington Street and Site Entrance North**

**AM PEAK**

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ***Direction:*** | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
| | | ***Roadway:*** | **Washington St.** | | | | **Site Entrance North** | | | | **Washington St.** | | | | **Site Entrance North** | | | |
| | | ***Movement:*** | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| 11:00 AM | to | 11:15 AM | 0 | 189 | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 186 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11:15 AM | to | 11:30 AM | 0 | 218 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 170 | 0 | 1 | 0 | 0 | 0 | 0 |
| 11:30 AM | to | 11:45 AM | 1 | 215 | 0 | 0 | 1 | 0 | 0 | 0 | 3 | 170 | 0 | 2 | 0 | 0 | 0 | 0 |
| 11:45 AM | to | 12:00 PM | 0 | 212 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 176 | 0 | 2 | 0 | 0 | 0 | 0 |
| 12:00 PM | to | 12:15 PM | 0 | 200 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 181 | 0 | 1 | 0 | 0 | 0 | 0 |
| 12:15 PM | to | 12:30 PM | 0 | 202 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 193 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12:30 PM | to | 12:45 PM | 0 | 212 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 204 | 0 | 2 | 0 | 0 | 0 | 0 |
| 12:45 PM | to | 1:00 PM | 0 | 234 | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 208 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1:00 PM | to | 1:15 PM | 0 | 209 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 214 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1:15 PM | to | 1:30 PM | 0 | 193 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 186 | 0 | 3 | 0 | 0 | 0 | 0 |
| 1:30 PM | to | 1:45 PM | 0 | 174 | 0 | 0 | 5 | 0 | 0 | 0 | 3 | 178 | 0 | 3 | 0 | 0 | 0 | 0 |
| 1:45 PM | to | 2:00 PM | 0 | 189 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 193 | 0 | 1 | 0 | 0 | 0 | 0 |

**PM PEAK**

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ***Direction:*** | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
| | | ***Roadway:*** | **Washington St.** | | | | **Site Entrance North** | | | | **Washington St.** | | | | **Site Entrance North** | | | |
| | | ***Movement:*** | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| 4:00 PM | to | 4:15 PM | | | | | | | | | | | | | | | | |
| 4:15 PM | to | 4:30 PM | | | | | | | | | | | | | | | | |
| 4:30 PM | to | 4:45 PM | | | | | | | | | | | | | | | | |
| 4:45 PM | to | 5:00 PM | | | | | | | | | | | | | | | | |
| 5:00 PM | to | 5:15 PM | | | | | | | | | | | | | | | | |
| 5:15 PM | to | 5:30 PM | | | | | | | | | | | | | | | | |
| 5:30 PM | to | 5:45 PM | | | | | | | | | | | | | | | | |
| 5:45 PM | to | 6:00 PM | | | | | | | | | | | | | | | | |
| 6:00 PM | to | 6:15 PM | | | | | | | | | | | | | | | | |
| 6:15 PM | to | 6:30 PM | | | | | | | | | | | | | | | | |
| 6:30 PM | to | 6:45 PM | | | | | | | | | | | | | | | | |
| 6:45 PM | to | 7:00 PM | | | | | | | | | | | | | | | | |

**PEAK HOURS**

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ***Direction:*** | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
| | | ***Roadway:*** | **Washington St.** | | | | **Site Entrance North** | | | | **Washington St.** | | | | **Site Entrance North** | | | |
| | | ***Movement:*** | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| ***AM INTERSECTION PEAK HOUR*** | | | | | | | | | | | | | | | | | | |
| 12:15 PM | to | 1:15 PM | 0 | 857 | 0 | 0 | 8 | 0 | 0 | 0 | 5 | 819 | 0 | 2 | 0 | 0 | 0 | 0 |
| ***PM INTERSECTION PEAK HOUR*** | | | | | | | | | | | | | | | | | | |
| 4:00 PM | to | 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***AM SYSTEM PEAK HOUR*** | | | | | | | | | | | | | | | | | | |
| 12:15 PM | to | 1:15 PM | 0 | 857 | 0 | 0 | 8 | 0 | 0 | 0 | 5 | 819 | 0 | 2 | 0 | 0 | 0 | 0 |
| ***PM SYSTEM PEAK HOUR*** | | | | | | | | | | | | | | | | | | |
| 4:00 PM | to | 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

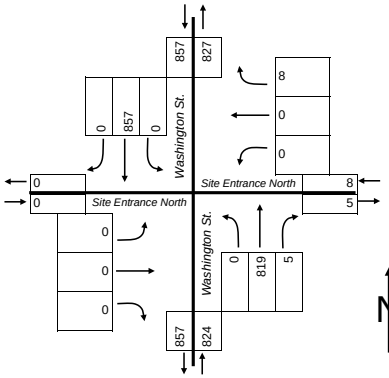
**PEAK HOUR FACTORS**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
| | **Washington St.** | | | | **Site Entrance North** | | | | **Washington St.** | | | | **Site Entrance North** | | | |
| ***AM Peak Hour*** | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach |
| **AM PEAK HOUR** | 0.00 | 0.92 | 0.00 | **0.92** | 0.40 | 0.00 | 0.00 | **0.40** | 0.63 | 0.96 | 0.00 | **0.95** | 0.00 | 0.00 | 0.00 | **#DIV/0!** |
| | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach |
| ***PM PEAK HOUR*** | 0.00 | 0.00 | 0.00 | **#DIV/0!** | 0.00 | 0.00 | 0.00 | **#DIV/0!** | 0.00 | 0.00 | 0.00 | **#DIV/0!** | 0.00 | 0.00 | 0.00 | **#DIV/0!** |

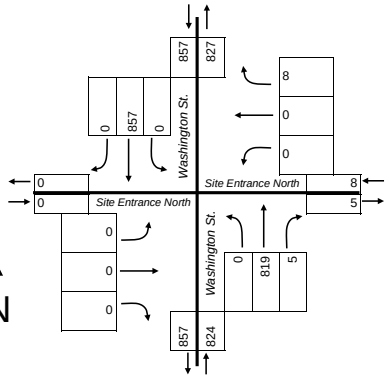
**Overall AM PEAK HOUR FACTOR** = **0.95** **Overall PM PEAK HOUR FACTOR** = **#DIV/0!**

**AM Period Intersection Volume:** 4747 **PM Period Intersection Volume:** 0

**AM INTERSECTION PEAK VOLUMES**

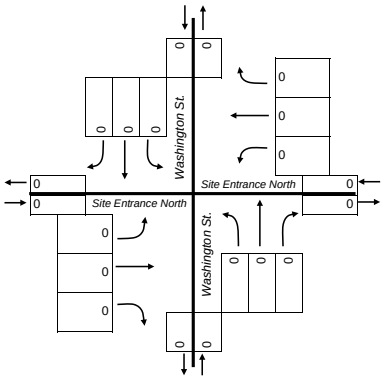



**AM SYSTEM PEAK VOLUMES**

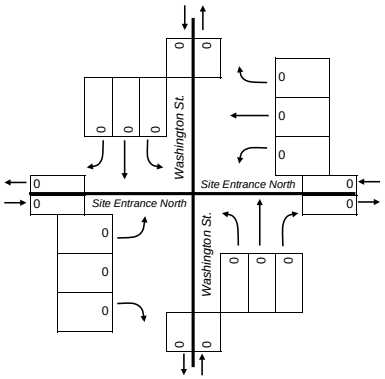



N

**PM INTERSECTION PEAK VOLUMES**




**PM SYSTEM PEAK VOLUMES**



| | |
|---|---|
| Project Name : | Washington and Broad Street Redevlopment |
| Project # : | 7301-1353 |
| Location | City of Falls Church, Virginia |
| Data Source: | Gorove/Slade Associates, Inc. |

**Date of Counts:** Saturday, January 31, 2015

**AM Weather Conditions:** Clear

**PM Weather Conditions:** Clear

***Intersection:*** **Washington Street and Site Entrance South**

**AM PEAK**

| | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Roadway:*** | **Washington St.** | | | | **Site Entrance South** | | | | **Washington St.** | | | | **Site Entrance South** | | | |
| ***Movement:*** | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| 11:00 AM to 11:15 AM | 6 | 161 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 132 | 0 | 0 | 9 | 1 | 0 | 0 |
| 11:15 AM to 11:30 AM | 3 | 182 | 0 | 2 | 2 | 0 | 0 | 0 | 4 | 147 | 0 | 1 | 10 | 0 | 0 | 0 |
| 11:30 AM to 11:45 AM | 0 | 192 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 153 | 0 | 1 | 10 | 0 | 0 | 0 |
| 11:45 AM to 12:00 PM | 0 | 157 | 0 | 1 | 3 | 0 | 0 | 0 | 6 | 91 | 0 | 0 | 8 | 0 | 0 | 0 |
| 12:00 PM to 12:15 PM | 0 | 169 | 0 | 1 | 1 | 0 | 0 | 0 | 4 | 151 | 0 | 0 | 5 | 0 | 0 | 0 |
| 12:15 PM to 12:30 PM | 3 | 193 | 0 | 2 | 4 | 0 | 0 | 0 | 2 | 180 | 0 | 0 | 13 | 0 | 0 | 0 |
| 12:30 PM to 12:45 PM | 1 | 190 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 174 | 0 | 5 | 14 | 0 | 0 | 0 |
| 12:45 PM to 1:00 PM | 0 | 167 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 192 | 0 | 1 | 2 | 0 | 0 | 0 |
| 1:00 PM to 1:15 PM | 0 | 134 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 125 | 0 | 0 | 3 | 0 | 0 | 0 |
| 1:15 PM to 1:30 PM | 1 | 181 | 0 | 3 | 4 | 0 | 0 | 0 | 2 | 171 | 0 | 0 | 10 | 0 | 0 | 0 |
| 1:30 PM to 1:45 PM | 1 | 149 | 0 | 1 | 2 | 0 | 0 | 0 | 2 | 175 | 0 | 0 | 8 | 0 | 0 | 0 |
| 1:45 PM to 2:00 PM | 0 | 150 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 149 | 0 | 0 | 8 | 0 | 0 | 0 |

**PM PEAK**

| | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Roadway:*** | **Washington St.** | | | | **Site Entrance South** | | | | **Washington St.** | | | | **Site Entrance South** | | | |
| ***Movement:*** | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| 4:00 PM to 4:15 PM | | | | | | | | | | | | | | | | |
| 4:15 PM to 4:30 PM | | | | | | | | | | | | | | | | |
| 4:30 PM to 4:45 PM | | | | | | | | | | | | | | | | |
| 4:45 PM to 5:00 PM | | | | | | | | | | | | | | | | |
| 5:00 PM to 5:15 PM | | | | | | | | | | | | | | | | |
| 5:15 PM to 5:30 PM | | | | | | | | | | | | | | | | |
| 5:30 PM to 5:45 PM | | | | | | | | | | | | | | | | |
| 5:45 PM to 6:00 PM | | | | | | | | | | | | | | | | |
| 6:00 PM to 6:15 PM | | | | | | | | | | | | | | | | |
| 6:15 PM to 6:30 PM | | | | | | | | | | | | | | | | |
| 6:30 PM to 6:45 PM | | | | | | | | | | | | | | | | |
| 6:45 PM to 7:00 PM | | | | | | | | | | | | | | | | |

**PEAK HOURS**

| | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Roadway:*** | **Washington St.** | | | | **Site Entrance South** | | | | **Washington St.** | | | | **Site Entrance South** | | | |
| ***Movement:*** | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds | Right | Thru | Left | Peds |
| ***AM INTERSECTION PEAK HOUR*** | | | | | | | | | | | | | | | | |
| 12:00 PM to 1:00 PM | 4 | 719 | 0 | 3 | 6 | 0 | 0 | 0 | 11 | 697 | 0 | 6 | 34 | 0 | 0 | 0 |
| ***PM INTERSECTION PEAK HOUR*** | | | | | | | | | | | | | | | | |
| 4:00 PM to 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***AM SYSTEM PEAK HOUR*** | | | | | | | | | | | | | | | | |
| 12:15 PM to 1:15 PM | 4 | 684 | 0 | 3 | 5 | 0 | 0 | 0 | 9 | 671 | 0 | 6 | 32 | 0 | 0 | 0 |
| ***PM SYSTEM PEAK HOUR*** | | | | | | | | | | | | | | | | |
| 4:00 PM to 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

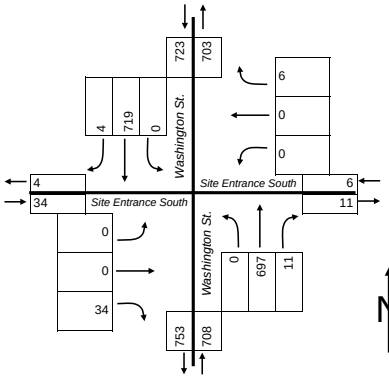
**PEAK HOUR FACTORS**

| | Southbound | | | | Westbound | | | | Northbound | | | | Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Washington St.** | | | | **Site Entrance South** | | | | **Washington St.** | | | | **Site Entrance South** | | | |
| ***AM Peak Hour*** | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach |
| **AM PEAK HOUR** | 0.33 | 0.89 | 0.00 | **0.88** | 0.31 | 0.00 | 0.00 | **0.31** | 0.75 | 0.87 | 0.00 | **0.88** | 0.57 | 0.00 | 0.00 | **0.57** |
| | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach |
| ***PM PEAK HOUR*** | 0.00 | 0.00 | 0.00 | **#DIV/0!** | 0.00 | 0.00 | 0.00 | **#DIV/0!** | 0.00 | 0.00 | 0.00 | **#DIV/0!** | 0.00 | 0.00 | 0.00 | **#DIV/0!** |

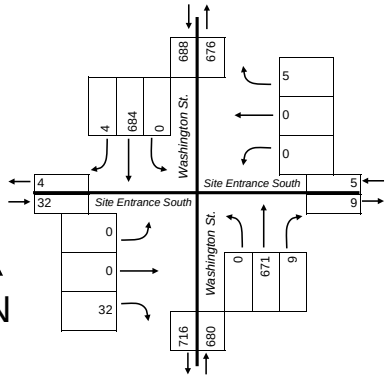
**Overall AM PEAK HOUR FACTOR** = **0.89** **Overall PM PEAK HOUR FACTOR** = **#DIV/0!**

**AM Period Intersection Volume:** 4035 **PM Period Intersection Volume:** 0

**AM INTERSECTION PEAK VOLUMES**

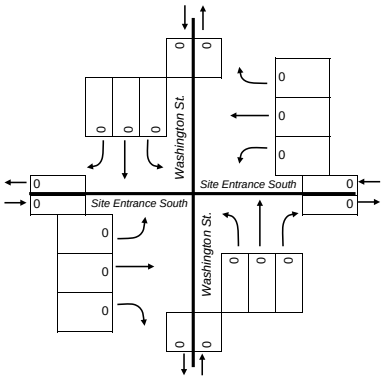



**AM SYSTEM PEAK VOLUMES**

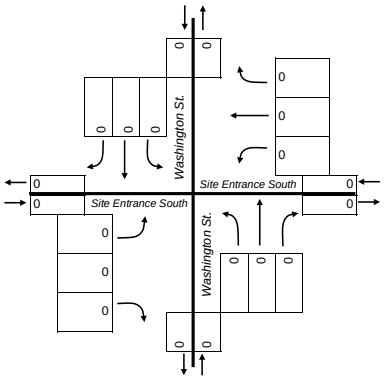



N

**PM INTERSECTION PEAK VOLUMES**




**PM SYSTEM PEAK VOLUMES**



**Gorove/Slade Associates**

| | |
|---|---|
| Project Name : | Gum Spring Village |
| Project # : | 0 |
| Location | Loudoun County |
| Data Source: | Gorove/Slade Associates, Inc. |

**Intersection:** Great Falls Street at Washington Street

**AM PEAK**

| Time | Southbound Washington St. Right | Thru | Left | Peds | Westbound No Approach Right | Thru | Left | Peds | Northbound Washington St. Right | Thru | Left | Peds | Eastbound Great Falls St. Right | Thru | Left | Peds |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11:00 AM to 11:15 AM | 7 | 200 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 212 | 33 | 0 | 25 | 0 | 6 | 0 |
| 11:15 AM to 11:30 AM | 8 | 209 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 183 | 19 | 12 | 26 | 0 | 11 | 0 |
| 11:30 AM to 11:45 AM | 11 | 197 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 192 | 22 | 1 | 27 | 0 | 16 | 0 |
| 11:45 AM to 12:00 PM | 4 | 205 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 172 | 20 | 2 | 29 | 0 | 6 | 0 |
| 12:00 PM to 12:15 PM | 7 | 187 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 185 | 29 | 2 | 32 | 0 | 11 | 0 |
| 12:15 PM to 12:30 PM | 8 | 196 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 171 | 13 | 0 | 42 | 0 | 11 | 0 |
| 12:30 PM to 12:45 PM | 10 | 199 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 209 | 20 | 4 | 27 | 0 | 5 | 0 |
| 12:45 PM to 1:00 PM | 8 | 219 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 190 | 18 | 6 | 24 | 0 | 5 | 2 |
| 1:00 PM to 1:15 PM | 3 | 187 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 193 | 27 | 3 | 27 | 0 | 9 | 0 |
| 1:15 PM to 1:30 PM | 4 | 180 | 0 | 5 | 0 | 0 | 0 | 0 | 1 | 194 | 19 | 2 | 19 | 0 | 7 | 0 |
| 1:30 PM to 1:45 PM | 4 | 191 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 160 | 17 | 0 | 26 | 0 | 9 | 0 |
| 1:45 PM to 2:00 PM | 4 | 191 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 197 | 26 | 0 | 15 | 0 | 8 | 1 |

**PM PEAK**

| Time | Southbound Washington St. Right | Thru | Left | Peds | Westbound No Approach Right | Thru | Left | Peds | Northbound Washington St. Right | Thru | Left | Peds | Eastbound Great Falls St. Right | Thru | Left | Peds |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4:00 PM to 4:15 PM | | | | | | | | | | | | | | | | |
| 4:15 PM to 4:30 PM | | | | | | | | | | | | | | | | |
| 4:30 PM to 4:45 PM | | | | | | | | | | | | | | | | |
| 4:45 PM to 5:00 PM | | | | | | | | | | | | | | | | |
| 5:00 PM to 5:15 PM | | | | | | | | | | | | | | | | |
| 5:15 PM to 5:30 PM | | | | | | | | | | | | | | | | |
| 5:30 PM to 5:45 PM | | | | | | | | | | | | | | | | |
| 5:45 PM to 6:00 PM | | | | | | | | | | | | | | | | |
| 6:00 PM to 6:15 PM | | | | | | | | | | | | | | | | |
| 6:15 PM to 6:30 PM | | | | | | | | | | | | | | | | |
| 6:30 PM to 6:45 PM | | | | | | | | | | | | | | | | |
| 6:45 PM to 7:00 PM | | | | | | | | | | | | | | | | |

**PEAK HOURS**

| Time | Southbound Washington St. Right | Thru | Left | Peds | Westbound No Approach Right | Thru | Left | Peds | Northbound Washington St. Right | Thru | Left | Peds | Eastbound Great Falls St. Right | Thru | Left | Peds |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***AM INTERSECTION PEAK HOUR*** | | | | | | | | | | | | | | | | |
| 11:00 AM to 12:00 PM | 30 | 811 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 759 | 94 | 15 | 107 | 0 | 39 | 0 |
| ***PM INTERSECTION PEAK HOUR*** | | | | | | | | | | | | | | | | |
| 4:00 PM to 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***AM SYSTEM PEAK HOUR*** | | | | | | | | | | | 13 | | | | | |
| 7:15 AM to 8:15 AM | 15 | 749 | 0 | 14 | 0 | 0 | 0 | 0 | 1 | 744 | 89 | 5 | 87 | 0 | 33 | 1 |
| ***PM SYSTEM PEAK HOUR*** | | | | | | | | | | | | | | | | |
| #REF! to #REF! | #REF! | #REF! | #REF! | #REF! | #REF! | #REF! | #REF! | #REF! | #REF! | #REF! | #REF! | #REF! | #REF! | #REF! | #REF! | #REF! |

**PEAK HOUR FACTORS**

| | Southbound Washington St. Right | Thru | Left | Approach | Westbound No Approach Right | Thru | Left | Approach | Northbound Washington St. Right | Thru | Left | Approach | Eastbound Great Falls St. Right | Thru | Left | Approach |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***AM Peak Hour*** | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach |
| **AM PEAK HOUR** | 0.00 | 0.00 | 0.00 | **#DIV/0!** | 0.00 | 0.00 | 0.00 | **#DIV/0!** | 0.00 | 0.00 | 0.00 | **#DIV/0!** | 0.00 | 0.00 | 0.00 | **#DIV/0!** |
| | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach | Right | Thru | Left | Approach |
| ***PM PEAK HOUR*** | #REF! | #REF! | #REF! | **#REF!** | #REF! | #REF! | #REF! | **#REF!** | #REF! | #REF! | #REF! | **#REF!** | #REF! | #REF! | #REF! | **#REF!** |

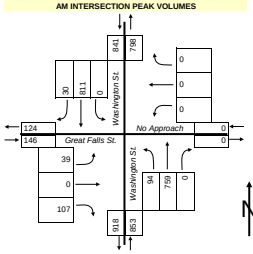
**Overall AM PEAK HOUR FACTOR** = **#DIV/0!** **Overall PM PEAK HOUR FACTOR** = **#REF!**

**AM Period Intersection Volume:** 5384 **PM Period Intersection Volume:** 0

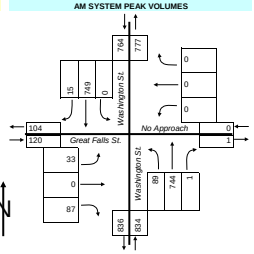
**DATA COLLECTION NOTES :**

**Date of Counts:** Saturday, May 30, 2015
**AM Weather Conditions:** Clear
**PM Weather Conditions:** Clear

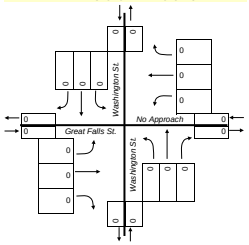
**AM INTERSECTION PEAK VOLUMES**



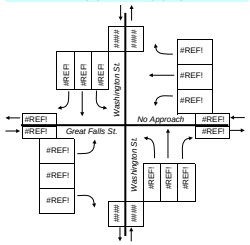

**AM SYSTEM PEAK VOLUMES**




**PM INTERSECTION PEAK VOLUMES**




**PM SYSTEM PEAK VOLUMES**

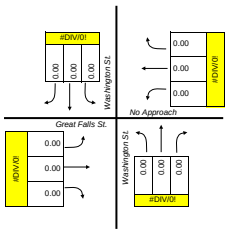



**Gorove/Slade Associates**

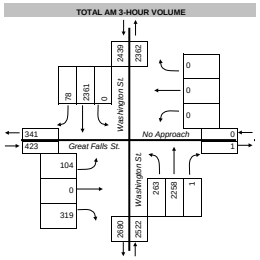
| | |
|---|---|
| Project Name | Gum Spring Village |
| Project Number | 0 |
| Project Location | Loudoun County |
| Data Source: | Gorove/Slade Associates, I |

**Intersection:** Great Falls Street at Washington Street

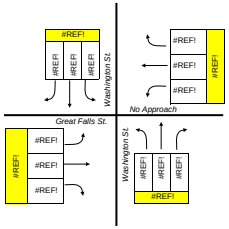
**AM PHF FOR SYSTEM PEAK HOUR**



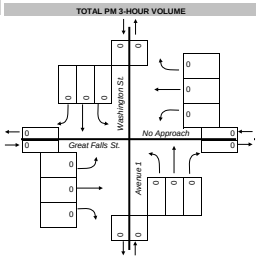

**TOTAL AM 3-HOUR VOLUME**




**PM PHF FOR SYSTEM PEAK HOUR**




**TOTAL PM 3-HOUR VOLUME**




**Traffic Volume Departing Intersection (By Approach)**

| | Southbound Washington St. Totals Interval | Hourly | Westbound No Approach Totals Interval | Hourly | Northbound Washington St. Totals Interval | Hourly | Eastbound Great Falls St. Totals Interval | Hourly |
|---|---|---|---|---|---|---|---|---|
| 11:00 AM | 218 | 798 | 0 | 0 | 225 | 918 | 40 | 124 |
| 11:15 AM | 194 | | 0 | | 235 | | 27 | |
| 11:30 AM | 208 | | 0 | | 224 | | 33 | |
| 11:45 AM | 178 | | 0 | | 234 | | 24 | |
| 12:00 PM | 196 | 787 | 0 | 0 | 219 | 926 | 36 | 113 |
| 12:15 PM | 182 | | 0 | | 238 | | 21 | |
| 12:30 PM | 214 | | 0 | | 226 | | 30 | |
| 12:45 PM | 195 | | 0 | | 243 | | 26 | |
| 1:00 PM | 202 | 777 | 0 | 1 | 214 | 836 | 30 | 104 |
| 1:15 PM | 201 | | 1 | | 199 | | 23 | |
| 1:30 PM | 169 | | 0 | | 217 | | 21 | |
| 1:45 PM | 205 | | 0 | | 206 | | 30 | |
| | Southbound Interval | Hourly | Westbound Interval | Hourly | Northbound Interval | Hourly | Eastbound Interval | Hourly |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | | 0 | | 0 | | 0 | |
| 4:30 PM | 0 | | 0 | | 0 | | 0 | |
| 4:45 PM | 0 | | 0 | | 0 | | 0 | |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | | 0 | | 0 | | 0 | |
| 5:30 PM | 0 | | 0 | | 0 | | 0 | |
| 5:45 PM | 0 | | 0 | | 0 | | 0 | |
| 6:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:15 PM | 0 | | 0 | | 0 | | 0 | |
| 6:30 PM | 0 | | 0 | | 0 | | 0 | |
| 6:45 PM | 0 | | 0 | | 0 | | 0 | |

| | | | | |
|---|---|---|---|---|
| 1 | 6 | 11 | 16 | 21 |
| 2 | 7 | 12 | 17 | 22 |
| 3 | 8 | 13 | 18 | 23 |
| 4 | 9 | 14 | 19 | 24 |
| 5 | 10 | 15 | 20 | 25 |

# APPENDIX C

LEVEL OF SERVICE DEFINITIONS

## APPENDIX C: LEVEL OF SERVICE DEFINITIONS

All capacity analyses are based on the procedures specified by the Transportation Research Board, Special Report 209: *Highway Capacity Manual (HCM)*, 2000. Levels of service (LOS) range from A to F. A brief description of each level of service for signalized and unsignalized intersections is provided below.

**Signalized Intersections:** Level of service is based upon the traffic volume present in each lane on the roadway, the capacity of each lane at the intersection and the delay associated with each directional movement. The levels of service for signalized intersections are defined below:

- Level of Service A describes operations with very low average delay per vehicle, i.e., less than 10.0 seconds. This occurs when progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop. Short signal cycle lengths may also contribute to low delay.
- Level of Service B describes operations with average delay in the range of 10.1 to 20.0 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.
- Level of Service C describes operations with delay in the range of 20.1 to 35.0 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level although many still pass through the intersection without stopping. This is generally considered the lower end of the range of the acceptable level of service in rural areas.
- Level of Service D describes operations with delay in the range of 35.1 to 55.0 seconds per vehicle. At LOS D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, and/or high traffic volumes as compared to the roadway capacity. Many vehicles are required to stop and the number of vehicles that do not have to stop declines. Individual signal cycle failures, where all waiting vehicles do not clear the intersection during a single green time, are noticeable. This is generally considered the lower end of the range of the acceptable level of service in urban areas.
- Level of Service E describes operations with delay in the range of 55.1 to 80.0 seconds per vehicle. These higher delay values generally indicate poor progression, long cycle lengths, and high traffic volumes. Individual cycle failures are frequent occurrences. LOS E has been set as the limit of acceptable conditions.
- Level of Service F describes operations with average delay in excess of 80.0 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with over-saturation, i.e., when traffic arrives at a flow rate that exceeds the capacity of the intersection. It may also occur at high volumes with many individual cycle failures. Poor progression and long cycle lengths may also contribute to such delays.

**Unsignalized Intersections:** At an unsignalized intersection, the major street through traffic and right-turns are assumed to operate unimpeded and therefore receive no level of service rating. The level of service for the minor street and the major street left-turn traffic is dependent on the volume and capacity of the available lanes, and, the number and frequency of acceptable gaps in the major street traffic to make a conflicting turn. The level of service grade is provided for each conflicting movement at an unsignalized intersection and is based on the total average delay experienced by each vehicle. The delay includes the time it takes a vehicle to move from the back of a queue through the intersection.

The unsignalized intersection level of service analysis does not account for variations in driver behavior or the effects of nearby traffic signals. Therefore, the results from this analysis usually indicate worse levels of service than may be experienced in the field. The unsignalized intersection level of service descriptions are provided below:

- Level of Service A. Describes operations where there is very little to no conflicting traffic for a minor side street movement, i.e., an average total delay of less than 10.0 seconds per vehicle.
- Level of Service B. Describes operations with average total delay in the range of 10.1 to 15.0 seconds per vehicle.
- Level of Service C. Describes operations with average total delay in the range of 15.1 to 25.0 second per vehicle.
- Level of Service D. Describes operations with average total delay in the range of 25.1 to 35.0 seconds per vehicle.
- Level of Service E. Describes operations with average total delay in the range of 35.1 to 50.0 seconds per vehicle.
- Level of Service F. Describes operations with average total delay of 50 seconds per vehicle. LOS F exists when there are insufficient gaps of suitable size to allow a side street demand to cross safely through or enter a major street traffic stream. This level of service is generally evident from extremely long total delays experienced by side street traffic and by queuing on the minor approaches. It is important to note that LOS F may not always result in long queues but may result in adjustments to normal driver behavior.

# APPENDIX D

INTERSECTION CAPACITY ANALYSIS – EXISTING CONDITIONS (2015)

## 4: S. Washington St/N. Washington St & W. Broad St/E. Broad St

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 136 | 648 | 48 | 857 | 78 | 1099 | 159 | 597 |
| v/c Ratio | 0.75 | 0.54 | 0.18 | 0.82 | 0.23 | 0.99 | 0.68 | 0.46 |
| Control Delay | 57.1 | 33.8 | 11.4 | 30.1 | 16.2 | 53.0 | 33.5 | 21.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 37.7 | 0.0 | 0.0 |
| Total Delay | 57.1 | 33.8 | 11.4 | 30.1 | 16.2 | 90.8 | 33.5 | 21.5 |
| Queue Length 50th (ft) | 69 | 203 | 9 | 271 | 22 | 215 | 56 | 150 |
| Queue Length 95th (ft) | m#135 | 180 | 21 | 311 | 50 | #485 | 117 | 184 |
| Internal Link Dist (ft) | | 453 | | 375 | | 503 | | 144 |
| Turn Bay Length (ft) | 275 | | 255 | | 345 | | 190 | |
| Base Capacity (vph) | 182 | 1205 | 279 | 1048 | 336 | 1110 | 254 | 1321 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 126 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.75 | 0.54 | 0.17 | 0.82 | 0.23 | 1.12 | 0.63 | 0.45 |

### Intersection Summary

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

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 120 | 540 | 29 | 41 | 685 | 67 | 66 | 985 | 19 | 135 | 489 | 70 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 11 | 11 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | | 0% | | | 0% | | | 3% | | | -4% | |
| Total Lost time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 1.00 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1710 | 3389 | | 1708 | 3365 | | 1742 | 3470 | | 1805 | 3528 | |
| Flt Permitted | 0.13 | 1.00 | | 0.31 | 1.00 | | 0.38 | 1.00 | | 0.11 | 1.00 | |
| Satd. Flow (perm) | 235 | 3389 | | 552 | 3365 | | 703 | 3470 | | 205 | 3528 | |
| Peak-hour factor, PHF | 0.88 | 0.88 | 0.85 | 0.85 | 0.88 | 0.85 | 0.85 | 0.92 | 0.68 | 0.85 | 0.95 | 0.85 |
| Adj. Flow (vph) | 136 | 614 | 34 | 48 | 778 | 79 | 78 | 1071 | 28 | 159 | 515 | 82 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 136 | 648 | 0 | 48 | 857 | 0 | 78 | 1099 | 0 | 159 | 597 | 0 |
| Confl. Peds. (#/hr) | 13 | | 12 | 12 | | 13 | 3 | | 16 | 16 | | 3 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 |
| Turn Type | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Actuated Green, G (s) | 38.6 | 32.6 | | 33.8 | 30.2 | | 37.8 | 33.0 | | 45.8 | 37.0 | |
| Effective Green, g (s) | 38.6 | 32.6 | | 33.8 | 30.2 | | 37.8 | 33.0 | | 45.8 | 37.0 | |
| Actuated g/C Ratio | 0.39 | 0.33 | | 0.34 | 0.30 | | 0.38 | 0.33 | | 0.46 | 0.37 | |
| Clearance Time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | |
| Vehicle Extension (s) | 2.0 | 5.0 | | 2.0 | 5.0 | | 2.0 | 5.0 | | 2.0 | 5.0 | |
| Lane Grp Cap (vph) | 179 | 1104 | | 228 | 1016 | | 315 | 1145 | | 234 | 1305 | |
| v/s Ratio Prot | c0.05 | 0.19 | | 0.01 | c0.25 | | 0.01 | c0.32 | | c0.06 | 0.17 | |
| v/s Ratio Perm | 0.25 | | | 0.06 | | | 0.08 | | | 0.25 | | |
| v/c Ratio | 0.76 | 0.59 | | 0.21 | 0.84 | | 0.25 | 0.96 | | 0.68 | 0.46 | |
| Uniform Delay, d1 | 23.0 | 28.1 | | 22.8 | 32.7 | | 20.3 | 32.8 | | 21.3 | 23.9 | |
| Progression Factor | 1.73 | 1.18 | | 0.58 | 0.71 | | 0.97 | 0.81 | | 1.09 | 0.83 | |
| Incremental Delay, d2 | 13.6 | 2.0 | | 0.2 | 7.8 | | 0.1 | 17.3 | | 5.9 | 0.5 | |
| Delay (s) | 53.5 | 35.1 | | 13.3 | 31.1 | | 19.9 | 44.1 | | 29.0 | 20.4 | |
| Level of Service | D | D | | B | C | | B | D | | C | C | |
| Approach Delay (s) | | 38.3 | | | 30.2 | | | 42.5 | | | 22.2 | |
| Approach LOS | | D | | | C | | | D | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 34.3 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.87 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 22.0 |
| Intersection Capacity Utilization | 81.5% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 104 | 73 | 1395 | 845 |
| v/c Ratio | 0.53 | 0.31 | 0.66 | 0.31 |
| Control Delay | 50.8 | 12.9 | 6.2 | 2.9 |
| Queue Delay | 0.0 | 0.0 | 30.9 | 0.0 |
| Total Delay | 50.8 | 12.9 | 37.0 | 2.9 |
| Queue Length 50th (ft) | 64 | 0 | 89 | 46 |
| Queue Length 95th (ft) | 105 | 34 | m96 | 92 |
| Internal Link Dist (ft) | 437 | | 1 | 403 |
| Turn Bay Length (ft) | 150 | | | |
| Base Capacity (vph) | 336 | 355 | 2098 | 2745 |
| Starvation Cap Reductn | 0 | 0 | 777 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.31 | 0.21 | 1.06 | 0.31 |

Intersection Summary

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 88 | 62 | 98 | 1091 | 634 | 84 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 12 | 12 | 11 | 11 | 11 | 11 |
| Grade (%) | 0% | | | 3% | -3% | |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 0.98 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1559 | | 3328 | 3393 | |
| Flt Permitted | 0.95 | 1.00 | | 0.78 | 1.00 | |
| Satd. Flow (perm) | 1770 | 1559 | | 2595 | 3393 | |
| Peak-hour factor, PHF | 0.85 | 0.85 | 0.88 | 0.85 | 0.85 | 0.85 |
| Adj. Flow (vph) | 104 | 73 | 111 | 1284 | 746 | 99 |
| RTOR Reduction (vph) | 0 | 65 | 0 | 0 | 5 | 0 |
| Lane Group Flow (vph) | 104 | 8 | 0 | 1395 | 840 | 0 |
| Confl. Peds. (#/hr) | 2 | 2 | 9 | | | 9 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 4 | 0 | 4 |
| Turn Type | Prot | Perm | custom | NA | NA | |
| Protected Phases | 4 | | 1 | 6 | 2 | |
| Permitted Phases | | 4 | 1 | | | |
| Actuated Green, G (s) | 11.2 | 11.2 | | 80.8 | 80.8 | |
| Effective Green, g (s) | 11.2 | 11.2 | | 80.8 | 80.8 | |
| Actuated g/C Ratio | 0.11 | 0.11 | | 0.81 | 0.81 | |
| Clearance Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 198 | 174 | | 2096 | 2741 | |
| v/s Ratio Prot | c0.06 | | | | 0.25 | |
| v/s Ratio Perm | | 0.01 | | c0.54 | | |
| v/c Ratio | 0.53 | 0.05 | | 0.67 | 0.31 | |
| Uniform Delay, d1 | 41.9 | 39.6 | | 4.0 | 2.4 | |
| Progression Factor | 1.00 | 1.00 | | 1.12 | 1.01 | |
| Incremental Delay, d2 | 2.5 | 0.1 | | 0.5 | 0.3 | |
| Delay (s) | 44.4 | 39.7 | | 4.9 | 2.8 | |
| Level of Service | D | D | | A | A | |
| Approach Delay (s) | 42.5 | | | 4.9 | 2.8 | |
| Approach LOS | D | | | A | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 6.9 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.68 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 68.7% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 159 | 65 | 80 | 1127 | 540 | 70 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.85 | 0.85 | 0.89 | 0.94 | 0.94 | 0.85 |
| Hourly flow rate (vph) | 187 | 76 | 90 | 1199 | 574 | 82 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | 483 | 711 | |
| pX, platoon unblocked | 0.92 | 0.91 | 0.91 | | | |
| vC, conflicting volume | 1395 | 328 | 657 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 822 | 62 | 423 | | | |
| tC, single (s) | 6.8 | 6.9 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 29 | 92 | 91 | | | |
| cM capacity (veh/h) | 263 | 900 | 1030 | | | |

| Direction, Lane # | EB 1 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 264 | 490 | 799 | 383 | 274 |
| Volume Left | 187 | 90 | 0 | 0 | 0 |
| Volume Right | 76 | 0 | 0 | 0 | 82 |
| cSH | 331 | 1030 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.80 | 0.09 | 0.47 | 0.23 | 0.16 |
| Queue Length 95th (ft) | 164 | 7 | 0 | 0 | 0 |
| Control Delay (s) | 47.4 | 2.4 | 0.0 | 0.0 | 0.0 |
| Lane LOS | E | A | | | |
| Approach Delay (s) | 47.4 | 0.9 | | 0.0 | |
| Approach LOS | E | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 6.2 | | |
| Intersection Capacity Utilization | 73.4% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 20 | 755 | 36 | 17 | 905 | 30 | 4 | 0 | 13 | 3 | 0 | 13 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.85 | 0.86 | 0.85 | 0.85 | 0.95 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |
| Hourly flow rate (vph) | 24 | 878 | 42 | 20 | 953 | 35 | 5 | 0 | 15 | 4 | 0 | 15 |
| Pedestrians | | | | | | | | 4 | | | 4 | |
| Lane Width (ft) | | | | | | | | 12.0 | | | 12.0 | |
| 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) | | 460 | | | | | | | | | | |
| pX, platoon unblocked | | | | 0.86 | | | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | |
| vC, conflicting volume | 992 | | | 924 | | | 1482 | 1982 | 464 | 1516 | 1986 | 498 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 992 | | | 579 | | | 1229 | 1813 | 42 | 1268 | 1817 | 498 |
| 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 % | 97 | | | 98 | | | 96 | 100 | 98 | 96 | 100 | 97 |
| cM capacity (veh/h) | 691 | | | 847 | | | 106 | 62 | 871 | 100 | 62 | 516 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 24 | 585 | 335 | 20 | 635 | 353 | 20 | 19 |
| Volume Left | 24 | 0 | 0 | 20 | 0 | 0 | 5 | 4 |
| Volume Right | 0 | 0 | 42 | 0 | 0 | 35 | 15 | 15 |
| cSH | 691 | 1700 | 1700 | 847 | 1700 | 1700 | 322 | 290 |
| Volume to Capacity | 0.03 | 0.34 | 0.20 | 0.02 | 0.37 | 0.21 | 0.06 | 0.06 |
| Queue Length 95th (ft) | 3 | 0 | 0 | 2 | 0 | 0 | 5 | 5 |
| Control Delay (s) | 10.4 | 0.0 | 0.0 | 9.4 | 0.0 | 0.0 | 16.9 | 18.3 |
| Lane LOS | B | | | A | | | C | C |
| Approach Delay (s) | 0.3 | | | 0.2 | | | 16.9 | 18.3 |
| Approach LOS | | | | | | | C | C |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 0.6 | | | |
| Intersection Capacity Utilization | 36.0% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 9 | 762 | 947 | 11 | 2 | 5 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.85 | 0.89 | 0.86 | 0.85 | 0.85 | 0.85 |
| Hourly flow rate (vph) | 11 | 856 | 1101 | 13 | 2 | 6 |
| Pedestrians | | | 1 | | 8 | |
| Lane Width (ft) | | | 12.0 | | 12.0 | |
| Walking Speed (ft/s) | | | 4.0 | | 4.0 | |
| Percent Blockage | | | 0 | | 1 | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | 668 | 1202 | | | |
| pX, platoon unblocked | 0.92 | | | | 0.92 | 0.92 |
| vC, conflicting volume | 1122 | | | | 1566 | 565 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 956 | | | | 1045 | 349 |
| tC, single (s) | 4.1 | | | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 98 | | | | 99 | 99 |
| cM capacity (veh/h) | 652 | | | | 201 | 590 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 296 | 571 | 734 | 380 | 8 |
| Volume Left | 11 | 0 | 0 | 0 | 2 |
| Volume Right | 0 | 0 | 0 | 13 | 6 |
| cSH | 652 | 1700 | 1700 | 1700 | 380 |
| Volume to Capacity | 0.02 | 0.34 | 0.43 | 0.22 | 0.02 |
| Queue Length 95th (ft) | 1 | 0 | 0 | 0 | 2 |
| Control Delay (s) | 0.6 | 0.0 | 0.0 | 0.0 | 14.7 |
| Lane LOS | A | | | | B |
| Approach Delay (s) | 0.2 | | 0.0 | | 14.7 |
| Approach LOS | | | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.1 | | |
| Intersection Capacity Utilization | 37.4% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

## 34: N. Washington St & W. Columbia St./E. Columbia St

| Lane Group | EBT | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 162 | 303 | 29 | 1179 | 31 | 740 |
| v/c Ratio | 0.38 | 0.65 | 0.08 | 0.67 | 0.15 | 0.42 |
| Control Delay | 29.9 | 36.6 | 6.6 | 12.3 | 11.0 | 16.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 29.9 | 36.6 | 6.6 | 12.3 | 11.0 | 16.8 |
| Queue Length 50th (ft) | 79 | 160 | 4 | 187 | 8 | 162 |
| Queue Length 95th (ft) | 129 | 236 | m9 | 303 | 19 | 211 |
| Internal Link Dist (ft) | 910 | 204 | | 631 | | 475 |
| Turn Bay Length (ft) | | | 70 | | 125 | |
| Base Capacity (vph) | 428 | 469 | 346 | 1749 | 201 | 1753 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.38 | 0.65 | 0.08 | 0.67 | 0.15 | 0.42 |

### Intersection Summary

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 52 | 75 | 12 | 74 | 134 | 50 | 25 | 1059 | 36 | 26 | 652 | 14 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 13 | 13 | 13 | 12 | 12 | 12 | 10 | 11 | 11 | 10 | 11 | 11 |
| Total Lost time (s) | | 6.0 | | | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | | 1.00 | | | 0.99 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | | 0.99 | | | 0.97 | | 1.00 | 0.99 | | 1.00 | 1.00 | |
| Flt Protected | | 0.98 | | | 0.99 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1863 | | | 1777 | | 1649 | 3398 | | 1652 | 3407 | |
| Flt Permitted | | 0.75 | | | 0.85 | | 0.31 | 1.00 | | 0.14 | 1.00 | |
| Satd. Flow (perm) | | 1415 | | | 1537 | | 537 | 3398 | | 240 | 3407 | |
| Peak-hour factor, PHF | 0.87 | 0.85 | 0.85 | 0.86 | 0.85 | 0.85 | 0.85 | 0.93 | 0.90 | 0.85 | 0.90 | 0.85 |
| Adj. Flow (vph) | 60 | 88 | 14 | 86 | 158 | 59 | 29 | 1139 | 40 | 31 | 724 | 16 |
| RTOR Reduction (vph) | 0 | 4 | 0 | 0 | 8 | 0 | 0 | 3 | 0 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 0 | 159 | 0 | 0 | 295 | 0 | 29 | 1176 | 0 | 31 | 738 | 0 |
| Confl. Peds. (#/hr) | 4 | | 4 | 4 | | 8 | 6 | | 8 | 8 | | 6 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 4 |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 4 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 4 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | | 30.0 | | | 30.0 | | 52.0 | 49.0 | | 52.0 | 49.0 | |
| Effective Green, g (s) | | 30.0 | | | 30.0 | | 52.0 | 49.0 | | 52.0 | 49.0 | |
| Actuated g/C Ratio | | 0.30 | | | 0.30 | | 0.52 | 0.49 | | 0.52 | 0.49 | |
| Clearance Time (s) | | 6.0 | | | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 424 | | | 461 | | 312 | 1665 | | 167 | 1669 | |
| v/s Ratio Prot | | | | | | | 0.00 | c0.35 | | c0.01 | 0.22 | |
| v/s Ratio Perm | | 0.11 | | | c0.19 | | 0.05 | | | 0.09 | | |
| v/c Ratio | | 0.37 | | | 0.64 | | 0.09 | 0.71 | | 0.19 | 0.44 | |
| Uniform Delay, d1 | | 27.6 | | | 30.3 | | 12.1 | 19.9 | | 14.1 | 16.6 | |
| Progression Factor | | 1.00 | | | 1.00 | | 0.66 | 0.54 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 2.5 | | | 6.6 | | 0.1 | 2.2 | | 0.5 | 0.9 | |
| Delay (s) | | 30.1 | | | 37.0 | | 8.1 | 13.0 | | 14.6 | 17.5 | |
| Level of Service | | C | | | D | | A | B | | B | B | |
| Approach Delay (s) | | 30.1 | | | 37.0 | | | 12.9 | | | 17.3 | |
| Approach LOS | | C | | | D | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 18.4 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.66 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 18.0 |
| Intersection Capacity Utilization | 57.6% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 116 | 6 | 1 | 232 | 14 | 9 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |
| Hourly flow rate (vph) | 136 | 7 | 1 | 273 | 16 | 11 |
| Pedestrians | | | | 3 | 4 | |
| Lane Width (ft) | | | | 12.0 | 12.0 | |
| 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) | 507 | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 148 | | 419 | 147 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 148 | | 419 | 147 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 97 | 99 |
| cM capacity (veh/h) | | | 1429 | | 588 | 895 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 144 | 274 | 27 |
| Volume Left | 0 | 1 | 16 |
| Volume Right | 7 | 0 | 11 |
| cSH | 1700 | 1429 | 679 |
| Volume to Capacity | 0.08 | 0.00 | 0.04 |
| Queue Length 95th (ft) | 0 | 0 | 3 |
| Control Delay (s) | 0.0 | 0.0 | 10.5 |
| Lane LOS | | A | B |
| Approach Delay (s) | 0.0 | 0.0 | 10.5 |
| Approach LOS | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.7 | | |
| Intersection Capacity Utilization | 24.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 0 | 17 | 1172 | 2 | 0 | 685 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 3% | | | -4% |
| Peak Hour Factor | 0.85 | 0.85 | 0.97 | 0.85 | 0.85 | 0.85 |
| Hourly flow rate (vph) | 0 | 20 | 1208 | 2 | 0 | 806 |
| Pedestrians | 12 | | | | | |
| Lane Width (ft) | 12.0 | | | | | |
| Walking Speed (ft/s) | 4.0 | | | | | |
| Percent Blockage | 1 | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | 368 | | | 61 |
| pX, platoon unblocked | 0.73 | 0.70 | | | 0.70 | |
| vC, conflicting volume | 1624 | 617 | | | 1223 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 738 | 0 | | | 449 | |
| tC, single (s) | 6.8 | 6.9 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 97 | | | 100 | |
| cM capacity (veh/h) | 254 | 748 | | | 764 | |

| Direction, Lane # | WB 1 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 20 | 805 | 405 | 403 | 403 |
| Volume Left | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 20 | 0 | 2 | 0 | 0 |
| cSH | 748 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.03 | 0.47 | 0.24 | 0.24 | 0.24 |
| Queue Length 95th (ft) | 2 | 0 | 0 | 0 | 0 |
| Control Delay (s) | 9.9 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | A | | | | |
| Approach Delay (s) | 9.9 | 0.0 | | 0.0 | |
| Approach LOS | A | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.1 | | |
| Intersection Capacity Utilization | 42.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 0 | 8 | 1166 | 6 | 0 | 685 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 3% | | | -4% |
| Peak Hour Factor | 0.85 | 0.85 | 0.98 | 0.85 | 0.85 | 0.94 |
| Hourly flow rate (vph) | 0 | 9 | 1190 | 7 | 0 | 729 |
| Pedestrians | 10 | | | | | |
| Lane Width (ft) | 12.0 | | | | | |
| Walking Speed (ft/s) | 4.0 | | | | | |
| Percent Blockage | 1 | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | 224 | | | 206 |
| pX, platoon unblocked | 0.72 | 0.69 | | | 0.69 | |
| vC, conflicting volume | 1568 | 608 | | | 1207 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 709 | 0 | | | 415 | |
| tC, single (s) | 6.8 | 6.9 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 99 | | | 100 | |
| cM capacity (veh/h) | 262 | 746 | | | 784 | |

| Direction, Lane # | WB 1 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 9 | 793 | 404 | 364 | 364 |
| Volume Left | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 9 | 0 | 7 | 0 | 0 |
| cSH | 746 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.01 | 0.47 | 0.24 | 0.21 | 0.21 |
| Queue Length 95th (ft) | 1 | 0 | 0 | 0 | 0 |
| Control Delay (s) | 9.9 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | A | | | | |
| Approach Delay (s) | 9.9 | 0.0 | | 0.0 | |
| Approach LOS | A | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.0 | | |
| Intersection Capacity Utilization | 42.4% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

## 4: S. Washington St/N. Washington St & W. Broad St/E. Broad St

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 176 | 762 | 96 | 787 | 90 | 738 | 163 | 1155 |
| v/c Ratio | 0.72 | 0.64 | 0.40 | 0.76 | 0.52 | 0.74 | 0.56 | 0.93 |
| Control Delay | 38.5 | 19.9 | 17.2 | 30.8 | 25.9 | 39.0 | 23.9 | 35.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 |
| Total Delay | 38.5 | 19.9 | 17.2 | 30.8 | 25.9 | 39.0 | 23.9 | 38.6 |
| Queue Length 50th (ft) | 34 | 191 | 27 | 252 | 40 | 253 | 31 | 202 |
| Queue Length 95th (ft) | #140 | 198 | 49 | #312 | m60 | 314 | 95 | #492 |
| Internal Link Dist (ft) | | 453 | | 381 | | 503 | | 197 |
| Turn Bay Length (ft) | 275 | | 255 | | 345 | | 190 | |
| Base Capacity (vph) | 249 | 1188 | 242 | 1037 | 177 | 1034 | 340 | 1243 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 44 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.71 | 0.64 | 0.40 | 0.76 | 0.51 | 0.71 | 0.48 | 0.96 |

### Intersection Summary

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 160 | 629 | 65 | 93 | 730 | 33 | 80 | 629 | 28 | 160 | 1030 | 102 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 11 | 11 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | | 0% | | | 0% | | | 3% | | | -4% | |
| Total Lost time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1710 | 3357 | | 1707 | 3394 | | 1743 | 3450 | | 1801 | 3556 | |
| Flt Permitted | 0.15 | 1.00 | | 0.25 | 1.00 | | 0.13 | 1.00 | | 0.18 | 1.00 | |
| Satd. Flow (perm) | 278 | 3357 | | 447 | 3394 | | 245 | 3450 | | 337 | 3556 | |
| Peak-hour factor, PHF | 0.91 | 0.91 | 0.91 | 0.97 | 0.97 | 0.97 | 0.89 | 0.89 | 0.89 | 0.98 | 0.98 | 0.98 |
| Adj. Flow (vph) | 176 | 691 | 71 | 96 | 753 | 34 | 90 | 707 | 31 | 163 | 1051 | 104 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 176 | 762 | 0 | 96 | 787 | 0 | 90 | 738 | 0 | 163 | 1155 | 0 |
| Confl. Peds. (#/hr) | 18 | | 30 | 30 | | 18 | 3 | | 64 | 64 | | 3 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 |
| Turn Type | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Actuated Green, G (s) | 42.0 | 33.4 | | 34.4 | 29.6 | | 34.8 | 30.0 | | 44.8 | 35.0 | |
| Effective Green, g (s) | 42.0 | 33.4 | | 34.4 | 29.6 | | 34.8 | 30.0 | | 44.8 | 35.0 | |
| Actuated g/C Ratio | 0.42 | 0.33 | | 0.34 | 0.30 | | 0.35 | 0.30 | | 0.45 | 0.35 | |
| Clearance Time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | |
| Vehicle Extension (s) | 2.0 | 5.0 | | 2.0 | 5.0 | | 2.0 | 5.0 | | 2.0 | 5.0 | |
| Lane Grp Cap (vph) | 239 | 1121 | | 214 | 1004 | | 157 | 1035 | | 294 | 1244 | |
| v/s Ratio Prot | c0.06 | 0.23 | | 0.02 | 0.23 | | 0.03 | 0.21 | | c0.05 | c0.32 | |
| v/s Ratio Perm | c0.25 | | | 0.13 | | | 0.17 | | | 0.19 | | |
| v/c Ratio | 0.74 | 0.68 | | 0.45 | 0.78 | | 0.57 | 0.71 | | 0.55 | 0.93 | |
| Uniform Delay, d1 | 21.2 | 28.7 | | 23.3 | 32.3 | | 25.1 | 31.2 | | 18.9 | 31.3 | |
| Progression Factor | 1.29 | 0.61 | | 0.70 | 0.78 | | 0.96 | 1.06 | | 1.05 | 0.71 | |
| Incremental Delay, d2 | 7.9 | 2.7 | | 0.5 | 5.9 | | 3.0 | 2.8 | | 1.2 | 11.4 | |
| Delay (s) | 35.3 | 20.3 | | 16.8 | 31.1 | | 27.1 | 35.9 | | 21.0 | 33.6 | |
| Level of Service | D | C | | B | C | | C | D | | C | C | |
| Approach Delay (s) | | 23.1 | | | 29.5 | | | 34.9 | | | 32.0 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 30.0 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.85 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 22.0 |
| Intersection Capacity Utilization | 84.7% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 192 | 126 | 1006 | 1352 |
| v/c Ratio | 0.63 | 0.33 | 0.50 | 0.54 |
| Control Delay | 46.9 | 8.5 | 6.8 | 2.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 46.9 | 8.6 | 6.9 | 2.4 |
| Queue Length 50th (ft) | 112 | 0 | 58 | 44 |
| Queue Length 95th (ft) | 169 | 39 | 111 | 58 |
| Internal Link Dist (ft) | 437 | | 1 | 403 |
| Turn Bay Length (ft) | 150 | | | |
| Base Capacity (vph) | 407 | 461 | 2008 | 2484 |
| Starvation Cap Reductn | 0 | 0 | 55 | 0 |
| Spillback Cap Reductn | 0 | 3 | 0 | 105 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.47 | 0.28 | 0.52 | 0.57 |

Intersection Summary

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 167 | 107 | 36 | 819 | 1182 | 69 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 12 | 12 | 11 | 11 | 11 | 11 |
| Grade (%) | 0% | | | 3% | -3% | |
| Total Lost time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1583 | | 3335 | 3415 | |
| Flt Permitted | 0.95 | 1.00 | | 0.83 | 1.00 | |
| Satd. Flow (perm) | 1770 | 1583 | | 2764 | 3415 | |
| Peak-hour factor, PHF | 0.87 | 0.85 | 0.85 | 0.85 | 0.93 | 0.85 |
| Adj. Flow (vph) | 192 | 126 | 42 | 964 | 1271 | 81 |
| RTOR Reduction (vph) | 0 | 104 | 0 | 0 | 3 | 0 |
| Lane Group Flow (vph) | 192 | 22 | 0 | 1006 | 1349 | 0 |
| Confl. Peds. (#/hr) | | 17 | 33 | | | 33 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 4 | 0 | 4 |
| Turn Type | Prot | Prot | pm+pt | NA | NA | |
| Protected Phases | 4 | 4 | 1 | 6 | 2 | |
| Permitted Phases | | 4 | 6 | | | |
| Actuated Green, G (s) | 17.3 | 17.3 | | 72.7 | 72.7 | |
| Effective Green, g (s) | 17.3 | 17.3 | | 72.7 | 72.7 | |
| Actuated g/C Ratio | 0.17 | 0.17 | | 0.73 | 0.73 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | 4.0 | 4.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 306 | 273 | | 2009 | 2482 | |
| v/s Ratio Prot | c0.11 | 0.01 | | | c0.40 | |
| v/s Ratio Perm | | | | 0.36 | | |
| v/c Ratio | 0.63 | 0.08 | | 0.50 | 0.54 | |
| Uniform Delay, d1 | 38.4 | 34.7 | | 5.9 | 6.2 | |
| Progression Factor | 1.00 | 1.00 | | 0.93 | 0.24 | |
| Incremental Delay, d2 | 4.5 | 0.2 | | 0.2 | 0.7 | |
| Delay (s) | 42.9 | 34.8 | | 5.6 | 2.2 | |
| Level of Service | D | C | | A | A | |
| Approach Delay (s) | 39.7 | | | 5.6 | 2.2 | |
| Approach LOS | D | | | A | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 7.9 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.59 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 14.0 |
| Intersection Capacity Utilization | 69.5% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 88 | 220 | 50 | 1005 | 1102 | 150 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.85 | 0.85 | 0.85 | 0.95 | 0.95 | 0.85 |
| Hourly flow rate (vph) | 104 | 259 | 59 | 1058 | 1160 | 176 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | 483 | 711 | |
| pX, platoon unblocked | 0.76 | 0.71 | 0.71 | | | |
| vC, conflicting volume | 1895 | 668 | 1336 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 921 | 0 | 645 | | | |
| tC, single (s) | 6.8 | 6.9 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 44 | 66 | 91 | | | |
| cM capacity (veh/h) | 187 | 766 | 661 | | | |

| Direction, Lane # | EB 1 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 362 | 411 | 705 | 773 | 563 |
| Volume Left | 104 | 59 | 0 | 0 | 0 |
| Volume Right | 259 | 0 | 0 | 0 | 176 |
| cSH | 406 | 661 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.89 | 0.09 | 0.41 | 0.45 | 0.33 |
| Queue Length 95th (ft) | 231 | 7 | 0 | 0 | 0 |
| Control Delay (s) | 54.2 | 2.6 | 0.0 | 0.0 | 0.0 |
| Lane LOS | F | A | | | |
| Approach Delay (s) | 54.2 | 1.0 | | 0.0 | |
| Approach LOS | F | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 7.4 | | |
| Intersection Capacity Utilization | 89.9% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 12 | 903 | 10 | 6 | 686 | 19 | 15 | 0 | 22 | 10 | 0 | 22 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.85 | 0.90 | 0.85 | 0.85 | 0.94 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |
| Hourly flow rate (vph) | 14 | 1003 | 12 | 7 | 730 | 22 | 18 | 0 | 26 | 12 | 0 | 26 |
| Pedestrians | | 1 | | | | | | 5 | | | 9 | |
| Lane Width (ft) | | 12.0 | | | | | | 12.0 | | | 12.0 | |
| Walking Speed (ft/s) | | 4.0 | | | | | | 4.0 | | | 4.0 | |
| Percent Blockage | | 0 | | | | | | 0 | | | 1 | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | 461 | | | | | | | | | | |
| pX, platoon unblocked | | | | 0.82 | | | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | |
| vC, conflicting volume | 761 | | | 1020 | | | 1448 | 1818 | 513 | 1320 | 1812 | 386 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 761 | | | 599 | | | 1118 | 1566 | 0 | 962 | 1560 | 386 |
| 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 % | 98 | | | 99 | | | 86 | 100 | 97 | 93 | 100 | 96 |
| cM capacity (veh/h) | 840 | | | 800 | | | 123 | 88 | 890 | 162 | 88 | 607 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 14 | 669 | 346 | 7 | 487 | 266 | 44 | 38 |
| Volume Left | 14 | 0 | 0 | 7 | 0 | 0 | 18 | 12 |
| Volume Right | 0 | 0 | 12 | 0 | 0 | 22 | 26 | 26 |
| cSH | 840 | 1700 | 1700 | 800 | 1700 | 1700 | 253 | 327 |
| Volume to Capacity | 0.02 | 0.39 | 0.20 | 0.01 | 0.29 | 0.16 | 0.17 | 0.12 |
| Queue Length 95th (ft) | 1 | 0 | 0 | 1 | 0 | 0 | 15 | 10 |
| Control Delay (s) | 9.4 | 0.0 | 0.0 | 9.5 | 0.0 | 0.0 | 22.2 | 17.4 |
| Lane LOS | A | | | A | | | C | C |
| Approach Delay (s) | 0.1 | | | 0.1 | | | 22.2 | 17.4 |
| Approach LOS | | | | | | | C | C |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 1.0 | | | |
| Intersection Capacity Utilization | 35.6% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 4 | 931 | 693 | 11 | 6 | 18 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.92 | 0.85 | 0.98 | 0.85 | 0.85 | 0.85 |
| Hourly flow rate (vph) | 4 | 1095 | 707 | 13 | 7 | 21 |
| Pedestrians | | 1 | | | 9 | |
| Lane Width (ft) | | 12.0 | | | 12.0 | |
| Walking Speed (ft/s) | | 4.0 | | | 4.0 | |
| Percent Blockage | | 0 | | | 1 | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | 682 | 1182 | | | |
| pX, platoon unblocked | | | | | 0.84 | |
| vC, conflicting volume | 729 | | | | 1279 | 370 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 729 | | | | 943 | 370 |
| tC, single (s) | 4.1 | | | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 99 | | | | 97 | 97 |
| cM capacity (veh/h) | 864 | | | | 216 | 622 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 369 | 730 | 471 | 249 | 28 |
| Volume Left | 4 | 0 | 0 | 0 | 7 |
| Volume Right | 0 | 0 | 0 | 13 | 21 |
| cSH | 864 | 1700 | 1700 | 1700 | 423 |
| Volume to Capacity | 0.01 | 0.43 | 0.28 | 0.15 | 0.07 |
| Queue Length 95th (ft) | 0 | 0 | 0 | 0 | 5 |
| Control Delay (s) | 0.2 | 0.0 | 0.0 | 0.0 | 14.1 |
| Lane LOS | A | | | | B |
| Approach Delay (s) | 0.1 | | 0.0 | | 14.1 |
| Approach LOS | | | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.2 | | |
| Intersection Capacity Utilization | 38.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

## 34: N. Washington St & W. Columbia St./E. Columbia St

| Lane Group | EBT | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 238 | 164 | 40 | 1015 | 44 | 1242 |
| v/c Ratio | 0.53 | 0.34 | 0.20 | 0.58 | 0.17 | 0.70 |
| Control Delay | 34.2 | 28.7 | 8.0 | 16.5 | 10.3 | 22.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 34.2 | 28.7 | 8.0 | 16.5 | 10.3 | 22.1 |
| Queue Length 50th (ft) | 124 | 77 | 7 | 283 | 11 | 334 |
| Queue Length 95th (ft) | 188 | 126 | m16 | 324 | 24 | 422 |
| Internal Link Dist (ft) | 910 | 204 | | 631 | | 475 |
| Turn Bay Length (ft) | | | 70 | | 125 | |
| Base Capacity (vph) | 448 | 480 | 202 | 1759 | 266 | 1768 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.53 | 0.34 | 0.20 | 0.58 | 0.17 | 0.70 |

### Intersection Summary

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 73 | 107 | 22 | 31 | 85 | 24 | 34 | 882 | 57 | 37 | 1119 | 26 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 13 | 13 | 13 | 12 | 12 | 12 | 10 | 11 | 11 | 10 | 11 | 11 |
| Total Lost time (s) | | 6.0 | | | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | | 0.99 | | | 0.98 | | 1.00 | 0.99 | | 1.00 | 1.00 | |
| Flt Protected | | 0.98 | | | 0.99 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1863 | | | 1800 | | 1652 | 3387 | | 1652 | 3410 | |
| Flt Permitted | | 0.81 | | | 0.90 | | 0.12 | 1.00 | | 0.19 | 1.00 | |
| Satd. Flow (perm) | | 1532 | | | 1632 | | 210 | 3387 | | 338 | 3410 | |
| Peak-hour factor, PHF | 0.85 | 0.85 | 0.85 | 0.86 | 0.85 | 0.85 | 0.85 | 0.93 | 0.85 | 0.85 | 0.92 | 1.00 |
| Adj. Flow (vph) | 86 | 126 | 26 | 36 | 100 | 28 | 40 | 948 | 67 | 44 | 1216 | 26 |
| RTOR Reduction (vph) | 0 | 4 | 0 | 0 | 7 | 0 | 0 | 5 | 0 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 0 | 234 | 0 | 0 | 157 | 0 | 40 | 1010 | 0 | 44 | 1240 | 0 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 4 |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 4 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 4 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | | 29.0 | | | 29.0 | | 53.0 | 49.4 | | 53.0 | 49.4 | |
| Effective Green, g (s) | | 29.0 | | | 29.0 | | 53.0 | 49.4 | | 53.0 | 49.4 | |
| Actuated g/C Ratio | | 0.29 | | | 0.29 | | 0.53 | 0.49 | | 0.53 | 0.49 | |
| Clearance Time (s) | | 6.0 | | | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 444 | | | 473 | | 163 | 1673 | | 226 | 1684 | |
| v/s Ratio Prot | | | | | | | c0.01 | 0.30 | | 0.01 | c0.36 | |
| v/s Ratio Perm | | c0.15 | | | 0.10 | | 0.12 | | | 0.10 | | |
| v/c Ratio | | 0.53 | | | 0.33 | | 0.25 | 0.60 | | 0.19 | 0.74 | |
| Uniform Delay, d1 | | 29.7 | | | 27.9 | | 14.2 | 18.2 | | 12.6 | 20.1 | |
| Progression Factor | | 1.00 | | | 1.00 | | 0.66 | 0.86 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 4.4 | | | 1.9 | | 0.7 | 1.5 | | 0.4 | 2.9 | |
| Delay (s) | | 34.2 | | | 29.8 | | 10.2 | 17.3 | | 13.1 | 23.0 | |
| Level of Service | | C | | | C | | B | B | | B | C | |
| Approach Delay (s) | | 34.2 | | | 29.8 | | | 17.0 | | | 22.7 | |
| Approach LOS | | C | | | C | | | B | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 21.9 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.64 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 18.0 |
| Intersection Capacity Utilization | 59.4% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 183 | 10 | 8 | 141 | 4 | 8 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |
| Hourly flow rate (vph) | 215 | 12 | 9 | 166 | 5 | 9 |
| Pedestrians | | | | 7 | 8 | |
| Lane Width (ft) | | | | 12.0 | 12.0 | |
| Walking Speed (ft/s) | | | | 4.0 | 4.0 | |
| Percent Blockage | | | | 1 | 1 | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | 498 | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 235 | | 414 | 236 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 235 | | 414 | 236 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 99 | | 99 | 99 |
| cM capacity (veh/h) | | | 1323 | | 587 | 793 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 227 | 175 | 14 |
| Volume Left | 0 | 9 | 5 |
| Volume Right | 12 | 0 | 9 |
| cSH | 1700 | 1323 | 710 |
| Volume to Capacity | 0.13 | 0.01 | 0.02 |
| Queue Length 95th (ft) | 0 | 1 | 2 |
| Control Delay (s) | 0.0 | 0.5 | 10.2 |
| Lane LOS | | A | B |
| Approach Delay (s) | 0.0 | 0.5 | 10.2 |
| Approach LOS | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.5 | | |
| Intersection Capacity Utilization | 26.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 0 | 33 | 815 | 7 | 0 | 1289 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 3% | | | -4% |
| Peak Hour Factor | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.94 |
| Hourly flow rate (vph) | 0 | 39 | 959 | 8 | 0 | 1371 |
| Pedestrians | 21 | | | | | 1 |
| Lane Width (ft) | 12.0 | | | | | 12.0 |
| Walking Speed (ft/s) | 4.0 | | | | | 4.0 |
| Percent Blockage | 2 | | | | | 0 |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | 398 | | | 61 |
| pX, platoon unblocked | 0.91 | 0.82 | | | 0.82 | |
| vC, conflicting volume | 1670 | 506 | | | 988 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 647 | 0 | | | 538 | |
| tC, single (s) | 6.8 | 6.9 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 96 | | | 100 | |
| cM capacity (veh/h) | 360 | 870 | | | 824 | |

| Direction, Lane # | WB 1 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 39 | 639 | 328 | 686 | 686 |
| Volume Left | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 39 | 0 | 8 | 0 | 0 |
| cSH | 870 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.04 | 0.38 | 0.19 | 0.40 | 0.40 |
| Queue Length 95th (ft) | 3 | 0 | 0 | 0 | 0 |
| Control Delay (s) | 9.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | A | | | | |
| Approach Delay (s) | 9.3 | 0.0 | | 0.0 | |
| Approach LOS | A | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.2 | | |
| Intersection Capacity Utilization | 46.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 0 | 11 | 811 | 11 | 0 | 1279 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 3% | | | -4% |
| Peak Hour Factor | 0.25 | 0.85 | 0.89 | 1.00 | 1.00 | 0.85 |
| Hourly flow rate (vph) | 0 | 13 | 911 | 11 | 0 | 1505 |
| Pedestrians | 23 | | | | | |
| Lane Width (ft) | 12.0 | | | | | |
| Walking Speed (ft/s) | 4.0 | | | | | |
| Percent Blockage | 2 | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | 277 | | | 182 |
| pX, platoon unblocked | 0.90 | 0.81 | | | 0.81 | |
| vC, conflicting volume | 1692 | 484 | | | 945 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 667 | 0 | | | 477 | |
| tC, single (s) | 6.8 | 6.9 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 99 | | | 100 | |
| cM capacity (veh/h) | 347 | 866 | | | 864 | |

| Direction, Lane # | WB 1 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 13 | 607 | 315 | 752 | 752 |
| Volume Left | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 13 | 0 | 11 | 0 | 0 |
| cSH | 866 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.01 | 0.36 | 0.19 | 0.44 | 0.44 |
| Queue Length 95th (ft) | 1 | 0 | 0 | 0 | 0 |
| Control Delay (s) | 9.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | A | | | | |
| Approach Delay (s) | 9.2 | 0.0 | | 0.0 | |
| Approach LOS | A | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.0 | | |
| Intersection Capacity Utilization | 38.7% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

## 4: S. Washington St/N. Washington St & W. Broad St/E. Broad St

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 159 | 689 | 81 | 644 | 112 | 690 | 248 | 683 |
| v/c Ratio | 0.51 | 0.69 | 0.32 | 0.76 | 0.38 | 0.77 | 0.75 | 0.67 |
| Control Delay | 26.3 | 37.8 | 23.9 | 45.0 | 23.6 | 44.5 | 35.7 | 37.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 26.3 | 37.8 | 23.9 | 45.0 | 23.6 | 44.5 | 35.7 | 37.5 |
| Queue Length 50th (ft) | 64 | 211 | 31 | 209 | 43 | 224 | 103 | 208 |
| Queue Length 95th (ft) | 137 | 346 | 72 | 354 | 98 | 370 | 211 | 343 |
| Internal Link Dist (ft) | | 453 | | 381 | | 503 | | 175 |
| Turn Bay Length (ft) | 275 | | 255 | | 345 | | 190 | |
| Base Capacity (vph) | 416 | 2128 | 377 | 1962 | 460 | 2033 | 435 | 2040 |
| Starvation Cap Reductn | 0 | 46 | 0 | 0 | 0 | 0 | 0 | 90 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.38 | 0.33 | 0.21 | 0.33 | 0.24 | 0.34 | 0.57 | 0.35 |

Intersection Summary

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 145 | 538 | 72 | 69 | 538 | 56 | 101 | 586 | 27 | 226 | 469 | 133 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 11 | 11 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | | 0% | | | 0% | | | 3% | | | -4% | |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.98 | | 1.00 | 0.98 | | 1.00 | 0.99 | | 1.00 | 0.97 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1710 | 3347 | | 1709 | 3342 | | 1742 | 3458 | | 1805 | 3471 | |
| Flt Permitted | 0.19 | 1.00 | | 0.28 | 1.00 | | 0.27 | 1.00 | | 0.17 | 1.00 | |
| Satd. Flow (perm) | 338 | 3347 | | 504 | 3342 | | 498 | 3458 | | 325 | 3471 | |
| Peak-hour factor, PHF | 0.91 | 0.89 | 0.85 | 0.85 | 0.96 | 0.67 | 0.90 | 0.89 | 0.84 | 0.91 | 0.89 | 0.85 |
| Adj. Flow (vph) | 159 | 604 | 85 | 81 | 560 | 84 | 112 | 658 | 32 | 248 | 527 | 156 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 159 | 689 | 0 | 81 | 644 | 0 | 112 | 690 | 0 | 248 | 683 | 0 |
| Confl. Peds. (#/hr) | 11 | | 11 | 11 | | 11 | 4 | | 5 | 5 | | 4 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 |
| Turn Type | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Actuated Green, G (s) | 45.1 | 32.0 | | 35.1 | 27.0 | | 37.5 | 27.6 | | 45.5 | 31.6 | |
| Effective Green, g (s) | 45.1 | 32.0 | | 35.1 | 27.0 | | 37.5 | 27.6 | | 45.5 | 31.6 | |
| Actuated g/C Ratio | 0.43 | 0.30 | | 0.33 | 0.26 | | 0.36 | 0.26 | | 0.43 | 0.30 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lane Grp Cap (vph) | 314 | 1014 | | 259 | 854 | | 293 | 903 | | 334 | 1038 | |
| v/s Ratio Prot | c0.06 | c0.21 | | 0.02 | c0.19 | | 0.04 | 0.20 | | c0.10 | c0.20 | |
| v/s Ratio Perm | 0.15 | | | 0.08 | | | 0.10 | | | c0.22 | | |
| v/c Ratio | 0.51 | 0.68 | | 0.31 | 0.75 | | 0.38 | 0.76 | | 0.74 | 0.66 | |
| Uniform Delay, d1 | 20.9 | 32.3 | | 25.0 | 36.2 | | 23.9 | 36.0 | | 22.1 | 32.3 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.5 | 1.4 | | 0.3 | 3.4 | | 0.3 | 3.5 | | 7.6 | 1.2 | |
| Delay (s) | 21.4 | 33.7 | | 25.3 | 39.6 | | 24.2 | 39.5 | | 29.6 | 33.4 | |
| Level of Service | C | C | | C | D | | C | D | | C | C | |
| Approach Delay (s) | | 31.4 | | | 38.0 | | | 37.4 | | | 32.4 | |
| Approach LOS | | C | | | D | | | D | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 34.6 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.75 | | |
| Actuated Cycle Length (s) | 105.6 | Sum of lost time (s) | 24.0 |
| Intersection Capacity Utilization | 74.9% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 98 | 67 | 895 | 880 |
| v/c Ratio | 0.26 | 0.17 | 0.46 | 0.60 |
| Control Delay | 18.3 | 6.0 | 7.9 | 15.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 18.3 | 6.0 | 7.9 | 15.1 |
| Queue Length 50th (ft) | 25 | 0 | 48 | 88 |
| Queue Length 95th (ft) | 56 | 21 | 146 | 203 |
| Internal Link Dist (ft) | 437 | | 1 | 403 |
| Turn Bay Length (ft) | 150 | | | |
| Base Capacity (vph) | 734 | 696 | 3015 | 3367 |
| Starvation Cap Reductn | 0 | 0 | 14 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.13 | 0.10 | 0.30 | 0.26 |

Intersection Summary

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 85 | 57 | 39 | 747 | 739 | 72 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 12 | 12 | 11 | 11 | 11 | 11 |
| Grade (%) | 0% | | | 3% | -3% | |
| Total Lost time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1583 | | 3334 | 3414 | |
| Flt Permitted | 0.95 | 1.00 | | 0.89 | 1.00 | |
| Satd. Flow (perm) | 1770 | 1583 | | 2977 | 3414 | |
| Peak-hour factor, PHF | 0.87 | 0.85 | 0.85 | 0.88 | 0.93 | 0.85 |
| Adj. Flow (vph) | 98 | 67 | 46 | 849 | 795 | 85 |
| RTOR Reduction (vph) | 0 | 55 | 0 | 0 | 10 | 0 |
| Lane Group Flow (vph) | 98 | 12 | 0 | 895 | 870 | 0 |
| Confl. Peds. (#/hr) | 3 | | 3 | | | 3 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 4 | 0 | 4 |
| Turn Type | Prot | Perm | pm+pt | NA | NA | |
| Protected Phases | 4 | | 1 | 6 | 2 | |
| Permitted Phases | | 4 | 6 | | | |
| Actuated Green, G (s) | 9.3 | 9.3 | | 32.1 | 21.9 | |
| Effective Green, g (s) | 9.3 | 9.3 | | 32.1 | 21.9 | |
| Actuated g/C Ratio | 0.18 | 0.18 | | 0.62 | 0.43 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | 2.0 | 2.0 | | 1.5 | 1.5 | |
| Lane Grp Cap (vph) | 320 | 286 | | 1895 | 1454 | |
| v/s Ratio Prot | c0.06 | | | c0.05 | c0.25 | |
| v/s Ratio Perm | | 0.01 | | 0.25 | | |
| v/c Ratio | 0.31 | 0.04 | | 0.47 | 0.60 | |
| Uniform Delay, d1 | 18.3 | 17.4 | | 5.1 | 11.4 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.2 | 0.0 | | 0.1 | 0.4 | |
| Delay (s) | 18.5 | 17.4 | | 5.2 | 11.8 | |
| Level of Service | B | B | | A | B | |
| Approach Delay (s) | 18.0 | | | 5.2 | 11.8 | |
| Approach LOS | B | | | A | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 9.3 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.53 | | |
| Actuated Cycle Length (s) | 51.4 | Sum of lost time (s) | 15.0 |
| Intersection Capacity Utilization | 61.7% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 80 | 75 | 65 | 775 | 650 | 90 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.85 | 0.85 | 0.85 | 0.91 | 0.91 | 0.85 |
| Hourly flow rate (vph) | 94 | 88 | 76 | 852 | 714 | 106 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | 483 | 711 | |
| pX, platoon unblocked | 0.88 | 0.83 | 0.83 | | | |
| vC, conflicting volume | 1346 | 410 | 820 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 603 | 0 | 376 | | | |
| tC, single (s) | 6.8 | 6.9 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 73 | 90 | 92 | | | |
| cM capacity (veh/h) | 350 | 901 | 980 | | | |

| Direction, Lane # | EB 1 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 182 | 360 | 568 | 476 | 344 |
| Volume Left | 94 | 76 | 0 | 0 | 0 |
| Volume Right | 88 | 0 | 0 | 0 | 106 |
| cSH | 497 | 980 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.37 | 0.08 | 0.33 | 0.28 | 0.20 |
| Queue Length 95th (ft) | 42 | 6 | 0 | 0 | 0 |
| Control Delay (s) | 16.4 | 2.6 | 0.0 | 0.0 | 0.0 |
| Lane LOS | C | A | | | |
| Approach Delay (s) | 16.4 | 1.0 | | 0.0 | |
| Approach LOS | C | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.0 | | |
| Intersection Capacity Utilization | 63.2% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 24 | 825 | 4 | 3 | 680 | 2 | 2 | 1 | 2 | 2 | 0 | 15 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.85 | 0.88 | 0.85 | 0.85 | 0.95 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |
| Hourly flow rate (vph) | 28 | 938 | 5 | 4 | 716 | 2 | 2 | 1 | 2 | 2 | 0 | 18 |
| Pedestrians | | | | | | | | 4 | | | 7 | |
| Lane Width (ft) | | | | | | | | 12.0 | | | 12.0 | |
| Walking Speed (ft/s) | | | | | | | | 4.0 | | | 4.0 | |
| Percent Blockage | | | | | | | | 0 | | | 1 | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | 461 | | | | | | | | | | |
| pX, platoon unblocked | | | | 0.85 | | | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | |
| vC, conflicting volume | 725 | | | 946 | | | 1383 | 1733 | 475 | 1259 | 1734 | 366 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 725 | | | 571 | | | 1088 | 1501 | 14 | 941 | 1503 | 366 |
| 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 % | 97 | | | 100 | | | 98 | 99 | 100 | 99 | 100 | 97 |
| cM capacity (veh/h) | 868 | | | 841 | | | 135 | 98 | 895 | 175 | 97 | 627 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 28 | 625 | 317 | 4 | 477 | 241 | 6 | 20 |
| Volume Left | 28 | 0 | 0 | 4 | 0 | 0 | 2 | 2 |
| Volume Right | 0 | 0 | 5 | 0 | 0 | 2 | 2 | 18 |
| cSH | 868 | 1700 | 1700 | 841 | 1700 | 1700 | 183 | 481 |
| Volume to Capacity | 0.03 | 0.37 | 0.19 | 0.00 | 0.28 | 0.14 | 0.03 | 0.04 |
| Queue Length 95th (ft) | 3 | 0 | 0 | 0 | 0 | 0 | 2 | 3 |
| Control Delay (s) | 9.3 | 0.0 | 0.0 | 9.3 | 0.0 | 0.0 | 25.3 | 12.8 |
| Lane LOS | A | | | A | | | D | B |
| Approach Delay (s) | 0.3 | | | 0.0 | | | 25.3 | 12.8 |
| Approach LOS | | | | | | | D | B |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 0.4 | | | |
| Intersection Capacity Utilization | 32.9% | ICU Level of Service | | A |
| Analysis Period (min) | 15 | | | |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 5 | 824 | 685 | 4 | 0 | 9 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.85 | 0.87 | 0.94 | 0.85 | 0.85 | 0.85 |
| Hourly flow rate (vph) | 6 | 947 | 729 | 5 | 0 | 11 |
| Pedestrians | | | | | 6 | |
| Lane Width (ft) | | | | | 12.0 | |
| Walking Speed (ft/s) | | | | | 4.0 | |
| Percent Blockage | | | | | 1 | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | 681 | 1184 | | | |
| pX, platoon unblocked | 0.99 | | | | 0.86 | 0.99 |
| vC, conflicting volume | 739 | | | | 1222 | 373 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 719 | | | | 895 | 349 |
| tC, single (s) | 4.1 | | | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 99 | | | | 100 | 98 |
| cM capacity (veh/h) | 866 | | | | 239 | 638 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 322 | 631 | 486 | 248 | 11 |
| Volume Left | 6 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 0 | 5 | 11 |
| cSH | 866 | 1700 | 1700 | 1700 | 638 |
| Volume to Capacity | 0.01 | 0.37 | 0.29 | 0.15 | 0.02 |
| Queue Length 95th (ft) | 1 | 0 | 0 | 0 | 1 |
| Control Delay (s) | 0.2 | 0.0 | 0.0 | 0.0 | 10.7 |
| Lane LOS | A | | | | B |
| Approach Delay (s) | 0.1 | | 0.0 | | 10.7 |
| Approach LOS | | | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.1 | | |
| Intersection Capacity Utilization | 36.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Lane Group | EBT | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 97 | 164 | 16 | 946 | 68 | 846 |
| v/c Ratio | 0.16 | 0.26 | 0.06 | 0.81 | 0.30 | 0.57 |
| Control Delay | 19.7 | 19.0 | 11.1 | 30.5 | 14.4 | 18.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 19.7 | 19.0 | 11.1 | 30.5 | 14.4 | 18.4 |
| Queue Length 50th (ft) | 31 | 51 | 4 | 230 | 18 | 147 |
| Queue Length 95th (ft) | 71 | 106 | 12 | 300 | 35 | 256 |
| Internal Link Dist (ft) | 910 | 204 | | 631 | | 475 |
| Turn Bay Length (ft) | | | 70 | | 125 | |
| Base Capacity (vph) | 590 | 622 | 354 | 2601 | 293 | 2617 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.16 | 0.26 | 0.05 | 0.36 | 0.23 | 0.32 |

Intersection Summary

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 40 | 33 | 9 | 40 | 58 | 44 | 14 | 793 | 38 | 58 | 762 | 15 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 13 | 13 | 13 | 12 | 12 | 12 | 10 | 11 | 11 | 10 | 11 | 11 |
| Total Lost time (s) | | 6.0 | | | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | | 1.00 | | | 0.99 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | | 0.98 | | | 0.96 | | 1.00 | 0.99 | | 1.00 | 1.00 | |
| Flt Protected | | 0.98 | | | 0.99 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1838 | | | 1740 | | 1650 | 3389 | | 1652 | 3408 | |
| Flt Permitted | | 0.81 | | | 0.90 | | 0.27 | 1.00 | | 0.14 | 1.00 | |
| Satd. Flow (perm) | | 1530 | | | 1594 | | 462 | 3389 | | 247 | 3408 | |
| Peak-hour factor, PHF | 0.85 | 0.85 | 0.85 | 0.91 | 0.85 | 0.85 | 0.85 | 0.88 | 0.85 | 0.85 | 0.92 | 0.85 |
| Adj. Flow (vph) | 47 | 39 | 11 | 44 | 68 | 52 | 16 | 901 | 45 | 68 | 828 | 18 |
| RTOR Reduction (vph) | 0 | 3 | 0 | 0 | 12 | 0 | 0 | 4 | 0 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 0 | 94 | 0 | 0 | 152 | 0 | 16 | 942 | 0 | 68 | 844 | 0 |
| Confl. Peds. (#/hr) | 6 | | 11 | 11 | | 6 | 5 | | 12 | 12 | | 5 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 4 |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 4 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 4 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | | 30.5 | | | 30.5 | | 31.8 | 30.8 | | 39.8 | 34.8 | |
| Effective Green, g (s) | | 30.5 | | | 30.5 | | 31.8 | 30.8 | | 39.8 | 34.8 | |
| Actuated g/C Ratio | | 0.36 | | | 0.36 | | 0.38 | 0.37 | | 0.47 | 0.41 | |
| Clearance Time (s) | | 6.0 | | | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | | 2.0 | | | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.5 | |
| Lane Grp Cap (vph) | | 553 | | | 576 | | 188 | 1238 | | 199 | 1406 | |
| v/s Ratio Prot | | | | | | | 0.00 | c0.28 | | c0.02 | c0.25 | |
| v/s Ratio Perm | | 0.06 | | | c0.10 | | 0.03 | | | 0.14 | | |
| v/c Ratio | | 0.17 | | | 0.26 | | 0.09 | 0.76 | | 0.34 | 0.60 | |
| Uniform Delay, d1 | | 18.3 | | | 19.0 | | 16.7 | 23.5 | | 14.6 | 19.3 | |
| Progression Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 0.7 | | | 1.1 | | 0.1 | 2.5 | | 0.4 | 0.6 | |
| Delay (s) | | 19.0 | | | 20.1 | | 16.8 | 26.0 | | 14.9 | 19.9 | |
| Level of Service | | B | | | C | | B | C | | B | B | |
| Approach Delay (s) | | 19.0 | | | 20.1 | | | 25.9 | | | 19.6 | |
| Approach LOS | | B | | | C | | | C | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 22.4 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.51 | | |
| Actuated Cycle Length (s) | 84.3 | Sum of lost time (s) | 18.0 |
| Intersection Capacity Utilization | 55.7% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 103 | 8 | 3 | 125 | 1 | 4 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.86 | 0.85 | 0.85 | 0.92 | 0.85 | 0.85 |
| Hourly flow rate (vph) | 120 | 9 | 4 | 136 | 1 | 5 |
| Pedestrians | 2 | | | | 4 | |
| Lane Width (ft) | 12.0 | | | | 12.0 | |
| 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) | 535 | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 133 | | 273 | 128 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 133 | | 273 | 128 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 100 | 99 |
| cM capacity (veh/h) | | | 1447 | | 711 | 918 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 129 | 139 | 6 |
| Volume Left | 0 | 4 | 1 |
| Volume Right | 9 | 0 | 5 |
| cSH | 1700 | 1447 | 868 |
| Volume to Capacity | 0.08 | 0.00 | 0.01 |
| Queue Length 95th (ft) | 0 | 0 | 1 |
| Control Delay (s) | 0.0 | 0.2 | 9.2 |
| Lane LOS | | A | A |
| Approach Delay (s) | 0.0 | 0.2 | 9.2 |
| Approach LOS | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.3 | | |
| Intersection Capacity Utilization | 19.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 0 | 8 | 778 | 5 | 0 | 796 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 3% | | | -4% |
| Peak Hour Factor | 0.85 | 0.85 | 0.96 | 0.63 | 0.85 | 0.92 |
| Hourly flow rate (vph) | 0 | 9 | 810 | 8 | 0 | 865 |
| Pedestrians | 2 | | | | | |
| Lane Width (ft) | 12.0 | | | | | |
| Walking Speed (ft/s) | 4.0 | | | | | |
| Percent Blockage | 0 | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | 402 | | | 61 |
| pX, platoon unblocked | 0.89 | 0.83 | | | 0.83 | |
| vC, conflicting volume | 1249 | 411 | | | 820 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 185 | 0 | | | 381 | |
| tC, single (s) | 6.8 | 6.9 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 99 | | | 100 | |
| cM capacity (veh/h) | 699 | 901 | | | 976 | |

| Direction, Lane # | WB 1 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 9 | 540 | 278 | 433 | 433 |
| Volume Left | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 9 | 0 | 8 | 0 | 0 |
| cSH | 901 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.01 | 0.32 | 0.16 | 0.25 | 0.25 |
| Queue Length 95th (ft) | 1 | 0 | 0 | 0 | 0 |
| Control Delay (s) | 9.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | A | | | | |
| Approach Delay (s) | 9.0 | 0.0 | | 0.0 | |
| Approach LOS | A | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.1 | | |
| Intersection Capacity Utilization | 31.7% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 0 | 5 | 778 | 9 | 0 | 792 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 3% | | | -4% |
| Peak Hour Factor | 0.85 | 0.85 | 0.87 | 0.85 | 0.25 | 0.89 |
| Hourly flow rate (vph) | 0 | 6 | 894 | 11 | 0 | 890 |
| Pedestrians | 6 | | | | | |
| Lane Width (ft) | 12.0 | | | | | |
| Walking Speed (ft/s) | 4.0 | | | | | |
| Percent Blockage | 1 | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | 255 | | | 206 |
| pX, platoon unblocked | 0.90 | 0.82 | | | 0.82 | |
| vC, conflicting volume | 1350 | 458 | | | 911 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 281 | 0 | | | 454 | |
| tC, single (s) | 6.8 | 6.9 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 99 | | | 100 | |
| cM capacity (veh/h) | 617 | 885 | | | 901 | |

| Direction, Lane # | WB 1 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 6 | 596 | 309 | 445 | 445 |
| Volume Left | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 6 | 0 | 11 | 0 | 0 |
| cSH | 885 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.01 | 0.35 | 0.18 | 0.26 | 0.26 |
| Queue Length 95th (ft) | 1 | 0 | 0 | 0 | 0 |
| Control Delay (s) | 9.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | A | | | | |
| Approach Delay (s) | 9.1 | 0.0 | | 0.0 | |
| Approach LOS | A | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.0 | | |
| Intersection Capacity Utilization | 31.8% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

# APPENDIX E

INTERSECTION CAPACITY ANALYSIS –

FUTURE WITHOUT DEVELOPMENT CONDITION (2020)

## 4: S. Washington St/N. Washington St & W. Broad St/E. Broad St

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 149 | 655 | 45 | 841 | 72 | 1092 | 147 | 620 |
| v/c Ratio | 0.79 | 0.54 | 0.17 | 0.80 | 0.23 | 0.98 | 0.64 | 0.48 |
| Control Delay | 63.3 | 36.8 | 11.1 | 28.8 | 16.3 | 51.3 | 29.5 | 21.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 63.3 | 36.8 | 11.1 | 28.8 | 16.3 | 51.3 | 29.5 | 21.4 |
| Queue Length 50th (ft) | 82 | 204 | 9 | 263 | 20 | 213 | 45 | 158 |
| Queue Length 95th (ft) | m#157 | 205 | m20 | #320 | m50 | #480 | 112 | 191 |
| Internal Link Dist (ft) | | 453 | | 375 | | 503 | | 144 |
| Turn Bay Length (ft) | 275 | | 255 | | 345 | | 190 | |
| Base Capacity (vph) | 188 | 1213 | 278 | 1056 | 324 | 1111 | 254 | 1320 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.79 | 0.54 | 0.16 | 0.80 | 0.22 | 0.98 | 0.58 | 0.47 |

### Intersection Summary

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 137 | 573 | 29 | 41 | 707 | 67 | 66 | 985 | 19 | 135 | 489 | 81 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 11 | 11 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | | 0% | | | 0% | | | 3% | | | -4% | |
| Total Lost time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 1.00 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1710 | 3392 | | 1708 | 3368 | | 1742 | 3474 | | 1805 | 3525 | |
| Flt Permitted | 0.14 | 1.00 | | 0.30 | 1.00 | | 0.36 | 1.00 | | 0.11 | 1.00 | |
| Satd. Flow (perm) | 251 | 3392 | | 544 | 3368 | | 668 | 3474 | | 206 | 3525 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 149 | 623 | 32 | 45 | 768 | 73 | 72 | 1071 | 21 | 147 | 532 | 88 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 149 | 655 | 0 | 45 | 841 | 0 | 72 | 1092 | 0 | 147 | 620 | 0 |
| Confl. Peds. (#/hr) | 13 | | 12 | 12 | | 13 | 3 | | 16 | 16 | | 3 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 |
| Turn Type | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Actuated Green, G (s) | 38.7 | 32.7 | | 33.9 | 30.3 | | 37.9 | 33.1 | | 45.5 | 36.9 | |
| Effective Green, g (s) | 38.7 | 32.7 | | 33.9 | 30.3 | | 37.9 | 33.1 | | 45.5 | 36.9 | |
| Actuated g/C Ratio | 0.39 | 0.33 | | 0.34 | 0.30 | | 0.38 | 0.33 | | 0.46 | 0.37 | |
| Clearance Time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | |
| Vehicle Extension (s) | 2.0 | 5.0 | | 2.0 | 5.0 | | 2.0 | 5.0 | | 2.0 | 5.0 | |
| Lane Grp Cap (vph) | 184 | 1109 | | 226 | 1020 | | 304 | 1149 | | 231 | 1300 | |
| v/s Ratio Prot | c0.05 | 0.19 | | 0.01 | 0.25 | | 0.01 | c0.31 | | c0.05 | 0.18 | |
| v/s Ratio Perm | c0.26 | | | 0.06 | | | 0.08 | | | 0.23 | | |
| v/c Ratio | 0.81 | 0.59 | | 0.20 | 0.82 | | 0.24 | 0.95 | | 0.64 | 0.48 | |
| Uniform Delay, d1 | 23.0 | 28.1 | | 22.7 | 32.4 | | 20.2 | 32.6 | | 21.2 | 24.2 | |
| Progression Factor | 1.82 | 1.29 | | 0.57 | 0.71 | | 0.98 | 0.81 | | 0.99 | 0.81 | |
| Incremental Delay, d2 | 19.5 | 2.1 | | 0.1 | 6.9 | | 0.1 | 15.8 | | 4.1 | 0.6 | |
| Delay (s) | 61.4 | 38.3 | | 13.1 | 29.9 | | 19.9 | 42.4 | | 25.1 | 20.2 | |
| Level of Service | E | D | | B | C | | B | D | | C | C | |
| Approach Delay (s) | | 42.6 | | | 29.0 | | | 41.0 | | | 21.1 | |
| Approach LOS | | D | | | C | | | D | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 34.2 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.87 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 22.0 |
| Intersection Capacity Utilization | 83.1% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 99 | 55 | 1304 | 787 |
| v/c Ratio | 0.52 | 0.25 | 0.59 | 0.28 |
| Control Delay | 50.8 | 13.7 | 5.4 | 2.6 |
| Queue Delay | 0.0 | 0.0 | 7.6 | 0.0 |
| Total Delay | 50.8 | 13.7 | 13.0 | 2.6 |
| Queue Length 50th (ft) | 61 | 0 | 87 | 41 |
| Queue Length 95th (ft) | 108 | 34 | m97 | 89 |
| Internal Link Dist (ft) | 437 | | 1 | 403 |
| Turn Bay Length (ft) | 150 | | | |
| Base Capacity (vph) | 336 | 340 | 2212 | 2853 |
| Starvation Cap Reductn | 0 | 0 | 866 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.29 | 0.16 | 0.97 | 0.28 |

Intersection Summary

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 91 | 51 | 98 | 1101 | 636 | 88 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 12 | 12 | 11 | 11 | 11 | 11 |
| Grade (%) | 0% | | | 3% | -3% | |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 0.98 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1559 | | 3327 | 3389 | |
| Flt Permitted | 0.95 | 1.00 | | 0.79 | 1.00 | |
| Satd. Flow (perm) | 1770 | 1559 | | 2632 | 3389 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 99 | 55 | 107 | 1197 | 691 | 96 |
| RTOR Reduction (vph) | 0 | 50 | 0 | 0 | 5 | 0 |
| Lane Group Flow (vph) | 99 | 5 | 0 | 1304 | 782 | 0 |
| Confl. Peds. (#/hr) | 2 | 2 | 9 | | | 9 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 4 | 0 | 4 |
| Turn Type | Prot | Perm | custom | NA | NA | |
| Protected Phases | 4 | | 1 | 6 | 2 | |
| Permitted Phases | | 4 | 1 | | | |
| Actuated Green, G (s) | 9.6 | 9.6 | | 82.4 | 82.4 | |
| Effective Green, g (s) | 9.6 | 9.6 | | 82.4 | 82.4 | |
| Actuated g/C Ratio | 0.10 | 0.10 | | 0.82 | 0.82 | |
| Clearance Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 169 | 149 | | 2168 | 2792 | |
| v/s Ratio Prot | c0.06 | | | | 0.23 | |
| v/s Ratio Perm | | 0.00 | | c0.50 | | |
| v/c Ratio | 0.59 | 0.04 | | 0.60 | 0.28 | |
| Uniform Delay, d1 | 43.3 | 41.0 | | 3.1 | 2.0 | |
| Progression Factor | 1.00 | 1.00 | | 1.31 | 1.02 | |
| Incremental Delay, d2 | 5.1 | 0.1 | | 0.2 | 0.2 | |
| Delay (s) | 48.4 | 41.1 | | 4.2 | 2.3 | |
| Level of Service | D | D | | A | A | |
| Approach Delay (s) | 45.8 | | | 4.2 | 2.3 | |
| Approach LOS | D | | | A | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 6.4 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.63 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 69.4% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 159 | 65 | 80 | 1191 | 555 | 70 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 173 | 71 | 87 | 1295 | 603 | 76 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | 483 | 711 | |
| pX, platoon unblocked | 0.95 | 0.90 | 0.90 | | | |
| vC, conflicting volume | 1462 | 340 | 679 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 904 | 48 | 425 | | | |
| tC, single (s) | 6.8 | 6.9 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 28 | 92 | 91 | | | |
| cM capacity (veh/h) | 239 | 910 | 1019 | | | |

| Direction, Lane # | EB 1 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 243 | 518 | 863 | 402 | 277 |
| Volume Left | 173 | 87 | 0 | 0 | 0 |
| Volume Right | 71 | 0 | 0 | 0 | 76 |
| cSH | 304 | 1019 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.80 | 0.09 | 0.51 | 0.24 | 0.16 |
| Queue Length 95th (ft) | 162 | 7 | 0 | 0 | 0 |
| Control Delay (s) | 51.1 | 2.3 | 0.0 | 0.0 | 0.0 |
| Lane LOS | F | A | | | |
| Approach Delay (s) | 51.1 | 0.9 | | 0.0 | |
| Approach LOS | F | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 5.9 | | |
| Intersection Capacity Utilization | 75.6% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 20 | 788 | 36 | 17 | 927 | 30 | 4 | 0 | 13 | 3 | 0 | 13 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 22 | 857 | 39 | 18 | 1008 | 33 | 4 | 0 | 14 | 3 | 0 | 14 |
| Pedestrians | | | | | | | | 4 | | | 4 | |
| Lane Width (ft) | | | | | | | | 12.0 | | | 12.0 | |
| 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) | | 460 | | | | | | | | | | |
| pX, platoon unblocked | | | | 0.85 | | | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | |
| vC, conflicting volume | 1044 | | | 900 | | | 1478 | 2005 | 452 | 1551 | 2008 | 524 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 1044 | | | 543 | | | 1220 | 1836 | 19 | 1304 | 1839 | 524 |
| 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 % | 97 | | | 98 | | | 96 | 100 | 98 | 97 | 100 | 97 |
| cM capacity (veh/h) | 660 | | | 871 | | | 107 | 60 | 899 | 94 | 60 | 496 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 22 | 571 | 325 | 18 | 672 | 368 | 18 | 17 |
| Volume Left | 22 | 0 | 0 | 18 | 0 | 0 | 4 | 3 |
| Volume Right | 0 | 0 | 39 | 0 | 0 | 33 | 14 | 14 |
| cSH | 660 | 1700 | 1700 | 871 | 1700 | 1700 | 329 | 276 |
| Volume to Capacity | 0.03 | 0.34 | 0.19 | 0.02 | 0.40 | 0.22 | 0.06 | 0.06 |
| Queue Length 95th (ft) | 3 | 0 | 0 | 2 | 0 | 0 | 4 | 5 |
| Control Delay (s) | 10.6 | 0.0 | 0.0 | 9.2 | 0.0 | 0.0 | 16.6 | 18.9 |
| Lane LOS | B | | | A | | | C | C |
| Approach Delay (s) | 0.3 | | | 0.2 | | | 16.6 | 18.9 |
| Approach LOS | | | | | | | C | C |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.5 | | |
| Intersection Capacity Utilization | 36.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 9 | 795 | 969 | 11 | 2 | 5 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 10 | 864 | 1053 | 12 | 2 | 5 |
| Pedestrians | | | 1 | | 8 | |
| Lane Width (ft) | | | 12.0 | | 12.0 | |
| Walking Speed (ft/s) | | | 4.0 | | 4.0 | |
| Percent Blockage | | | 0 | | 1 | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | 668 | 1202 | | | |
| pX, platoon unblocked | 0.94 | | | | 0.90 | 0.94 |
| vC, conflicting volume | 1073 | | | | 1520 | 541 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 940 | | | | 1038 | 370 |
| tC, single (s) | 4.1 | | | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 99 | | | | 99 | 99 |
| cM capacity (veh/h) | 674 | | | | 200 | 582 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 298 | 576 | 702 | 363 | 8 |
| Volume Left | 10 | 0 | 0 | 0 | 2 |
| Volume Right | 0 | 0 | 0 | 12 | 5 |
| cSH | 674 | 1700 | 1700 | 1700 | 377 |
| Volume to Capacity | 0.01 | 0.34 | 0.41 | 0.21 | 0.02 |
| Queue Length 95th (ft) | 1 | 0 | 0 | 0 | 2 |
| Control Delay (s) | 0.5 | 0.0 | 0.0 | 0.0 | 14.8 |
| Lane LOS | A | | | | B |
| Approach Delay (s) | 0.2 | | 0.0 | | 14.8 |
| Approach LOS | | | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.1 | | |
| Intersection Capacity Utilization | 38.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Lane Group | EBT | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 152 | 280 | 43 | 1204 | 28 | 730 |
| v/c Ratio | 0.35 | 0.59 | 0.12 | 0.69 | 0.14 | 0.42 |
| Control Delay | 29.2 | 34.4 | 6.1 | 11.7 | 10.9 | 16.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 29.2 | 34.4 | 6.1 | 11.7 | 10.9 | 16.7 |
| Queue Length 50th (ft) | 73 | 145 | 0 | 182 | 7 | 158 |
| Queue Length 95th (ft) | 129 | 232 | m14 | 290 | 19 | 208 |
| Internal Link Dist (ft) | 910 | 204 | | 631 | | 475 |
| Turn Bay Length (ft) | | | 70 | | 125 | |
| Base Capacity (vph) | 439 | 475 | 350 | 1749 | 194 | 1753 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.35 | 0.59 | 0.12 | 0.69 | 0.14 | 0.42 |

Intersection Summary

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 52 | 75 | 12 | 74 | 134 | 50 | 40 | 1072 | 36 | 26 | 658 | 14 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 13 | 13 | 13 | 12 | 12 | 12 | 10 | 11 | 11 | 10 | 11 | 11 |
| Total Lost time (s) | | 6.0 | | | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | | 0.99 | | | 0.97 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flt Protected | | 0.98 | | | 0.99 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1862 | | | 1777 | | 1649 | 3399 | | 1652 | 3408 | |
| Flt Permitted | | 0.77 | | | 0.86 | | 0.31 | 1.00 | | 0.13 | 1.00 | |
| Satd. Flow (perm) | | 1454 | | | 1556 | | 546 | 3399 | | 226 | 3408 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 57 | 82 | 13 | 80 | 146 | 54 | 43 | 1165 | 39 | 28 | 715 | 15 |
| RTOR Reduction (vph) | 0 | 4 | 0 | 0 | 8 | 0 | 0 | 2 | 0 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 0 | 149 | 0 | 0 | 272 | 0 | 43 | 1202 | 0 | 28 | 728 | 0 |
| Confl. Peds. (#/hr) | 4 | | 4 | 4 | | 8 | 6 | | 8 | 8 | | 6 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 4 |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 4 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 4 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | | 30.0 | | | 30.0 | | 52.0 | 49.0 | | 52.0 | 49.0 | |
| Effective Green, g (s) | | 30.0 | | | 30.0 | | 52.0 | 49.0 | | 52.0 | 49.0 | |
| Actuated g/C Ratio | | 0.30 | | | 0.30 | | 0.52 | 0.49 | | 0.52 | 0.49 | |
| Clearance Time (s) | | 6.0 | | | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 436 | | | 466 | | 317 | 1665 | | 160 | 1669 | |
| v/s Ratio Prot | | | | | | | 0.00 | c0.35 | | c0.01 | 0.21 | |
| v/s Ratio Perm | | 0.10 | | | c0.17 | | 0.07 | | | 0.09 | | |
| v/c Ratio | | 0.34 | | | 0.58 | | 0.14 | 0.72 | | 0.17 | 0.44 | |
| Uniform Delay, d1 | | 27.3 | | | 29.7 | | 12.2 | 20.1 | | 14.2 | 16.5 | |
| Progression Factor | | 1.00 | | | 1.00 | | 0.58 | 0.49 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 2.1 | | | 5.2 | | 0.2 | 2.5 | | 0.5 | 0.8 | |
| Delay (s) | | 29.4 | | | 34.9 | | 7.2 | 12.4 | | 14.8 | 17.4 | |
| Level of Service | | C | | | C | | A | B | | B | B | |
| Approach Delay (s) | | 29.4 | | | 34.9 | | | 12.2 | | | 17.3 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 17.5 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.65 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 18.0 |
| Intersection Capacity Utilization | 60.4% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 116 | 0 | 1 | 232 | 14 | 9 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 126 | 0 | 1 | 252 | 15 | 10 |
| Pedestrians | | | | 3 | 4 | |
| Lane Width (ft) | | | | 12.0 | 12.0 | |
| 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) | 507 | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 130 | | 384 | 133 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 130 | | 384 | 133 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 98 | 99 |
| cM capacity (veh/h) | | | 1451 | | 616 | 911 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 126 | 253 | 25 |
| Volume Left | 0 | 1 | 15 |
| Volume Right | 0 | 0 | 10 |
| cSH | 1700 | 1451 | 705 |
| Volume to Capacity | 0.07 | 0.00 | 0.04 |
| Queue Length 95th (ft) | 0 | 0 | 3 |
| Control Delay (s) | 0.0 | 0.0 | 10.3 |
| Lane LOS | | A | B |
| Approach Delay (s) | 0.0 | 0.0 | 10.3 |
| Approach LOS | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.7 | | |
| Intersection Capacity Utilization | 24.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 0 | 17 | 1192 | 2 | 0 | 693 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 3% | | | -4% |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 0 | 18 | 1296 | 2 | 0 | 753 |
| Pedestrians | 12 | | | | | |
| Lane Width (ft) | 12.0 | | | | | |
| Walking Speed (ft/s) | 4.0 | | | | | |
| Percent Blockage | 1 | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | 368 | | | 61 |
| pX, platoon unblocked | 0.72 | 0.69 | | | 0.69 | |
| vC, conflicting volume | 1685 | 661 | | | 1310 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 861 | 0 | | | 562 | |
| tC, single (s) | 6.8 | 6.9 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 98 | | | 100 | |
| cM capacity (veh/h) | 209 | 744 | | | 690 | |

| Direction, Lane # | WB 1 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 18 | 864 | 434 | 377 | 377 |
| Volume Left | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 18 | 0 | 2 | 0 | 0 |
| cSH | 744 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.02 | 0.51 | 0.26 | 0.22 | 0.22 |
| Queue Length 95th (ft) | 2 | 0 | 0 | 0 | 0 |
| Control Delay (s) | 10.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | A | | | | |
| Approach Delay (s) | 10.0 | 0.0 | | 0.0 | |
| Approach LOS | A | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.1 | | |
| Intersection Capacity Utilization | 43.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 0 | 8 | 1176 | 6 | 0 | 687 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 3% | | | -4% |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 0 | 9 | 1278 | 7 | 0 | 747 |
| Pedestrians | 10 | | | | | |
| Lane Width (ft) | 12.0 | | | | | |
| Walking Speed (ft/s) | 4.0 | | | | | |
| Percent Blockage | 1 | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | 224 | | | 206 |
| pX, platoon unblocked | 0.71 | 0.69 | | | 0.69 | |
| vC, conflicting volume | 1665 | 652 | | | 1295 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 863 | 0 | | | 539 | |
| tC, single (s) | 6.8 | 6.9 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 99 | | | 100 | |
| cM capacity (veh/h) | 208 | 745 | | | 705 | |

| Direction, Lane # | WB 1 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 9 | 852 | 433 | 373 | 373 |
| Volume Left | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 9 | 0 | 7 | 0 | 0 |
| cSH | 745 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.01 | 0.50 | 0.25 | 0.22 | 0.22 |
| Queue Length 95th (ft) | 1 | 0 | 0 | 0 | 0 |
| Control Delay (s) | 9.9 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | A | | | | |
| Approach Delay (s) | 9.9 | 0.0 | | 0.0 | |
| Approach LOS | A | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.0 | | |
| Intersection Capacity Utilization | 42.7% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 212 | 811 | 101 | 898 | 87 | 714 | 174 | 1266 |
| v/c Ratio | 0.93 | 0.68 | 0.45 | 0.88 | 0.50 | 0.72 | 0.58 | 1.02 |
| Control Delay | 68.8 | 20.9 | 19.1 | 38.0 | 25.0 | 38.6 | 24.3 | 53.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.7 |
| Total Delay | 68.8 | 20.9 | 19.1 | 38.0 | 25.0 | 38.6 | 24.3 | 62.2 |
| Queue Length 50th (ft) | 72 | 209 | 28 | 298 | 39 | 244 | 34 | ~313 |
| Queue Length 95th (ft) | #227 | 226 | 51 | #424 | m59 | 308 | 106 | #574 |
| Internal Link Dist (ft) | | 453 | | 381 | | 503 | | 197 |
| Turn Bay Length (ft) | 275 | | 255 | | 345 | | 190 | |
| Base Capacity (vph) | 229 | 1189 | 225 | 1025 | 178 | 1025 | 345 | 1239 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.93 | 0.68 | 0.45 | 0.88 | 0.49 | 0.70 | 0.50 | 1.05 |

Intersection Summary

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

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

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 195 | 681 | 65 | 93 | 793 | 33 | 80 | 629 | 28 | 160 | 1030 | 134 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 11 | 11 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | | 0% | | | 0% | | | 3% | | | -4% | |
| Total Lost time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1711 | 3361 | | 1708 | 3396 | | 1743 | 3450 | | 1800 | 3541 | |
| Flt Permitted | 0.12 | 1.00 | | 0.22 | 1.00 | | 0.13 | 1.00 | | 0.19 | 1.00 | |
| Satd. Flow (perm) | 216 | 3361 | | 398 | 3396 | | 247 | 3450 | | 356 | 3541 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 212 | 740 | 71 | 101 | 862 | 36 | 87 | 684 | 30 | 174 | 1120 | 146 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 212 | 811 | 0 | 101 | 898 | 0 | 87 | 714 | 0 | 174 | 1266 | 0 |
| Confl. Peds. (#/hr) | 18 | | 30 | 30 | | 18 | 3 | | 64 | 64 | | 3 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 |
| Turn Type | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Actuated Green, G (s) | 42.4 | 33.4 | | 34.0 | 29.2 | | 34.5 | 29.7 | | 44.8 | 35.0 | |
| Effective Green, g (s) | 42.4 | 33.4 | | 34.0 | 29.2 | | 34.5 | 29.7 | | 44.8 | 35.0 | |
| Actuated g/C Ratio | 0.42 | 0.33 | | 0.34 | 0.29 | | 0.34 | 0.30 | | 0.45 | 0.35 | |
| Clearance Time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | |
| Vehicle Extension (s) | 2.0 | 5.0 | | 2.0 | 5.0 | | 2.0 | 5.0 | | 2.0 | 5.0 | |
| Lane Grp Cap (vph) | 226 | 1122 | | 198 | 991 | | 157 | 1024 | | 305 | 1239 | |
| v/s Ratio Prot | c0.08 | 0.24 | | 0.02 | 0.26 | | 0.03 | 0.21 | | c0.06 | c0.36 | |
| v/s Ratio Perm | c0.31 | | | 0.15 | | | 0.16 | | | 0.20 | | |
| v/c Ratio | 0.94 | 0.72 | | 0.51 | 0.91 | | 0.55 | 0.70 | | 0.57 | 1.02 | |
| Uniform Delay, d1 | 22.8 | 29.2 | | 23.8 | 34.1 | | 26.0 | 31.2 | | 18.9 | 32.5 | |
| Progression Factor | 1.41 | 0.62 | | 0.70 | 0.78 | | 0.95 | 1.06 | | 1.06 | 0.68 | |
| Incremental Delay, d2 | 36.4 | 3.2 | | 0.9 | 12.9 | | 2.3 | 2.5 | | 1.4 | 29.6 | |
| Delay (s) | 68.5 | 21.4 | | 17.6 | 39.6 | | 27.0 | 35.7 | | 21.4 | 51.7 | |
| Level of Service | E | C | | B | D | | C | D | | C | D | |
| Approach Delay (s) | | 31.1 | | | 37.4 | | | 34.7 | | | 48.0 | |
| Approach LOS | | C | | | D | | | C | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 39.0 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 1.00 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 22.0 |
| Intersection Capacity Utilization | 89.4% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 183 | 116 | 942 | 1380 |
| v/c Ratio | 0.61 | 0.32 | 0.47 | 0.55 |
| Control Delay | 46.5 | 8.9 | 5.8 | 2.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.1 |
| Total Delay | 46.5 | 8.9 | 5.8 | 2.5 |
| Queue Length 50th (ft) | 106 | 0 | 69 | 47 |
| Queue Length 95th (ft) | 170 | 44 | m103 | 60 |
| Internal Link Dist (ft) | 437 | | 1 | 403 |
| Turn Bay Length (ft) | 150 | | | |
| Base Capacity (vph) | 407 | 453 | 2025 | 2494 |
| Starvation Cap Reductn | 0 | 0 | 73 | 0 |
| Spillback Cap Reductn | 0 | 6 | 0 | 205 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.45 | 0.26 | 0.48 | 0.60 |

Intersection Summary

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 168 | 107 | 36 | 831 | 1190 | 80 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 12 | 12 | 11 | 11 | 11 | 11 |
| Grade (%) | 0% | | | 3% | -3% | |
| Total Lost time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1583 | | 3335 | 3412 | |
| Flt Permitted | 0.95 | 1.00 | | 0.83 | 1.00 | |
| Satd. Flow (perm) | 1770 | 1583 | | 2774 | 3412 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 183 | 116 | 39 | 903 | 1293 | 87 |
| RTOR Reduction (vph) | 0 | 96 | 0 | 0 | 3 | 0 |
| Lane Group Flow (vph) | 183 | 20 | 0 | 942 | 1377 | 0 |
| Confl. Peds. (#/hr) | | 17 | 33 | | | 33 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 4 | 0 | 4 |
| Turn Type | Prot | Prot | pm+pt | NA | NA | |
| Protected Phases | 4 | 4 | 1 | 6 | 2 | |
| Permitted Phases | | 4 | 6 | | | |
| Actuated Green, G (s) | 17.0 | 17.0 | | 73.0 | 73.0 | |
| Effective Green, g (s) | 17.0 | 17.0 | | 73.0 | 73.0 | |
| Actuated g/C Ratio | 0.17 | 0.17 | | 0.73 | 0.73 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | 4.0 | 4.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 300 | 269 | | 2025 | 2490 | |
| v/s Ratio Prot | c0.10 | 0.01 | | | c0.40 | |
| v/s Ratio Perm | | | | 0.34 | | |
| v/c Ratio | 0.61 | 0.07 | | 0.47 | 0.55 | |
| Uniform Delay, d1 | 38.4 | 34.9 | | 5.5 | 6.1 | |
| Progression Factor | 1.00 | 1.00 | | 0.86 | 0.25 | |
| Incremental Delay, d2 | 4.0 | 0.2 | | 0.1 | 0.7 | |
| Delay (s) | 42.5 | 35.0 | | 4.8 | 2.2 | |
| Level of Service | D | D | | A | A | |
| Approach Delay (s) | 39.6 | | | 4.8 | 2.2 | |
| Approach LOS | D | | | A | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 7.4 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.59 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 14.0 |
| Intersection Capacity Utilization | 69.9% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 86 | 220 | 50 | 985 | 1172 | 150 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 93 | 239 | 54 | 1071 | 1274 | 163 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | 483 | 711 | |
| pX, platoon unblocked | 0.74 | 0.69 | 0.69 | | | |
| vC, conflicting volume | 1999 | 718 | 1437 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 1060 | 0 | 737 | | | |
| tC, single (s) | 6.8 | 6.9 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 37 | 68 | 91 | | | |
| cM capacity (veh/h) | 147 | 749 | 597 | | | |

| Direction, Lane # | EB 1 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 333 | 411 | 714 | 849 | 588 |
| Volume Left | 93 | 54 | 0 | 0 | 0 |
| Volume Right | 239 | 0 | 0 | 0 | 163 |
| cSH | 349 | 597 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.95 | 0.09 | 0.42 | 0.50 | 0.35 |
| Queue Length 95th (ft) | 255 | 7 | 0 | 0 | 0 |
| Control Delay (s) | 72.4 | 2.7 | 0.0 | 0.0 | 0.0 |
| Lane LOS | F | A | | | |
| Approach Delay (s) | 72.4 | 1.0 | | 0.0 | |
| Approach LOS | F | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 8.7 | | |
| Intersection Capacity Utilization | 89.3% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 12 | 955 | 10 | 6 | 749 | 19 | 15 | 0 | 22 | 10 | 0 | 22 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 13 | 1038 | 11 | 7 | 814 | 21 | 16 | 0 | 24 | 11 | 0 | 24 |
| Pedestrians | | 1 | | | | | | 5 | | | 9 | |
| Lane Width (ft) | | 12.0 | | | | | | 12.0 | | | 12.0 | |
| Walking Speed (ft/s) | | 4.0 | | | | | | 4.0 | | | 4.0 | |
| Percent Blockage | | 0 | | | | | | 0 | | | 1 | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | 461 | | | | | | | | | | |
| pX, platoon unblocked | | | | 0.81 | | | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | |
| vC, conflicting volume | 844 | | | 1054 | | | 1520 | 1931 | 529 | 1416 | 1926 | 427 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 844 | | | 587 | | | 1164 | 1675 | 0 | 1035 | 1669 | 427 |
| 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 % | 98 | | | 99 | | | 85 | 100 | 97 | 92 | 100 | 96 |
| cM capacity (veh/h) | 782 | | | 790 | | | 112 | 73 | 871 | 141 | 74 | 571 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 13 | 692 | 357 | 7 | 543 | 292 | 40 | 35 |
| Volume Left | 13 | 0 | 0 | 7 | 0 | 0 | 16 | 11 |
| Volume Right | 0 | 0 | 11 | 0 | 0 | 21 | 24 | 24 |
| cSH | 782 | 1700 | 1700 | 790 | 1700 | 1700 | 232 | 292 |
| Volume to Capacity | 0.02 | 0.41 | 0.21 | 0.01 | 0.32 | 0.17 | 0.17 | 0.12 |
| Queue Length 95th (ft) | 1 | 0 | 0 | 1 | 0 | 0 | 15 | 10 |
| Control Delay (s) | 9.7 | 0.0 | 0.0 | 9.6 | 0.0 | 0.0 | 23.7 | 19.0 |
| Lane LOS | A | | | A | | | C | C |
| Approach Delay (s) | 0.1 | | | 0.1 | | | 23.7 | 19.0 |
| Approach LOS | | | | | | | C | C |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.9 | | |
| Intersection Capacity Utilization | 37.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 4 | 983 | 756 | 11 | 6 | 18 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 4 | 1068 | 822 | 12 | 7 | 20 |
| Pedestrians | | 1 | | | 9 | |
| Lane Width (ft) | | 12.0 | | | 12.0 | |
| Walking Speed (ft/s) | | 4.0 | | | 4.0 | |
| Percent Blockage | | 0 | | | 1 | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | 682 | 1182 | | | |
| pX, platoon unblocked | 1.00 | | | | 0.82 | 1.00 |
| vC, conflicting volume | 843 | | | | 1380 | 427 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 837 | | | | 1007 | 420 |
| tC, single (s) | 4.1 | | | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 99 | | | | 97 | 97 |
| cM capacity (veh/h) | 785 | | | | 192 | 575 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 361 | 712 | 548 | 286 | 26 |
| Volume Left | 4 | 0 | 0 | 0 | 7 |
| Volume Right | 0 | 0 | 0 | 12 | 20 |
| cSH | 785 | 1700 | 1700 | 1700 | 383 |
| Volume to Capacity | 0.01 | 0.42 | 0.32 | 0.17 | 0.07 |
| Queue Length 95th (ft) | 0 | 0 | 0 | 0 | 5 |
| Control Delay (s) | 0.2 | 0.0 | 0.0 | 0.0 | 15.1 |
| Lane LOS | A | | | | C |
| Approach Delay (s) | 0.1 | | 0.0 | | 15.1 |
| Approach LOS | | | | | C |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.2 | | |
| Intersection Capacity Utilization | 40.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

## 34: N. Washington St & W. Columbia St./E. Columbia St

| Lane Group | EBT | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 219 | 158 | 88 | 1035 | 40 | 1264 |
| v/c Ratio | 0.48 | 0.33 | 0.47 | 0.59 | 0.15 | 0.75 |
| Control Delay | 32.7 | 27.8 | 15.4 | 16.0 | 10.2 | 24.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 32.7 | 27.8 | 15.4 | 16.0 | 10.2 | 24.6 |
| Queue Length 50th (ft) | 111 | 72 | 17 | 281 | 10 | 344 |
| Queue Length 95th (ft) | 185 | 128 | 40 | 321 | 24 | 434 |
| Internal Link Dist (ft) | 910 | 204 | | 631 | | 475 |
| Turn Bay Length (ft) | | | 70 | | 125 | |
| Base Capacity (vph) | 456 | 483 | 189 | 1760 | 260 | 1686 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.48 | 0.33 | 0.47 | 0.59 | 0.15 | 0.75 |

Intersection Summary

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 73 | 107 | 22 | 31 | 85 | 29 | 81 | 895 | 57 | 37 | 1137 | 26 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 13 | 13 | 13 | 12 | 12 | 12 | 10 | 11 | 11 | 10 | 11 | 11 |
| Total Lost time (s) | | 6.0 | | | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | | 0.99 | | | 0.97 | | 1.00 | 0.99 | | 1.00 | 1.00 | |
| Flt Protected | | 0.98 | | | 0.99 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1863 | | | 1793 | | 1652 | 3391 | | 1652 | 3410 | |
| Flt Permitted | | 0.82 | | | 0.90 | | 0.11 | 1.00 | | 0.19 | 1.00 | |
| Satd. Flow (perm) | | 1561 | | | 1637 | | 185 | 3391 | | 334 | 3410 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 79 | 116 | 24 | 34 | 92 | 32 | 88 | 973 | 62 | 40 | 1236 | 28 |
| RTOR Reduction (vph) | 0 | 4 | 0 | 0 | 9 | 0 | 0 | 5 | 0 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 0 | 215 | 0 | 0 | 149 | 0 | 88 | 1030 | 0 | 40 | 1262 | 0 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 4 |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 4 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 4 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | | 29.0 | | | 29.0 | | 54.2 | 49.4 | | 51.8 | 48.2 | |
| Effective Green, g (s) | | 29.0 | | | 29.0 | | 54.2 | 49.4 | | 51.8 | 48.2 | |
| Actuated g/C Ratio | | 0.29 | | | 0.29 | | 0.54 | 0.49 | | 0.52 | 0.48 | |
| Clearance Time (s) | | 6.0 | | | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 452 | | | 474 | | 170 | 1675 | | 220 | 1643 | |
| v/s Ratio Prot | | | | | | | c0.02 | 0.30 | | 0.01 | c0.37 | |
| v/s Ratio Perm | | c0.14 | | | 0.09 | | 0.26 | | | 0.09 | | |
| v/c Ratio | | 0.48 | | | 0.31 | | 0.52 | 0.62 | | 0.18 | 0.77 | |
| Uniform Delay, d1 | | 29.2 | | | 27.7 | | 15.3 | 18.4 | | 13.1 | 21.3 | |
| Progression Factor | | 1.00 | | | 1.00 | | 0.81 | 0.82 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 3.6 | | | 1.7 | | 2.5 | 1.6 | | 0.4 | 3.5 | |
| Delay (s) | | 32.8 | | | 29.5 | | 14.9 | 16.7 | | 13.5 | 24.8 | |
| Level of Service | | C | | | C | | B | B | | B | C | |
| Approach Delay (s) | | 32.8 | | | 29.5 | | | 16.5 | | | 24.5 | |
| Approach LOS | | C | | | C | | | B | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 22.2 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.65 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 18.0 |
| Intersection Capacity Utilization | 69.4% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 183 | 10 | 8 | 141 | 4 | 8 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 199 | 11 | 9 | 153 | 4 | 9 |
| Pedestrians | | | | 7 | 8 | |
| Lane Width (ft) | | | | 12.0 | 12.0 | |
| Walking Speed (ft/s) | | | | 4.0 | 4.0 | |
| Percent Blockage | | | | 1 | 1 | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | 498 | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 218 | | 383 | 219 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 218 | | 383 | 219 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 99 | | 99 | 99 |
| cM capacity (veh/h) | | | 1343 | | 611 | 810 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 210 | 162 | 13 |
| Volume Left | 0 | 9 | 4 |
| Volume Right | 11 | 0 | 9 |
| cSH | 1700 | 1343 | 731 |
| Volume to Capacity | 0.12 | 0.01 | 0.02 |
| Queue Length 95th (ft) | 0 | 0 | 1 |
| Control Delay (s) | 0.0 | 0.5 | 10.0 |
| Lane LOS | | A | B |
| Approach Delay (s) | 0.0 | 0.5 | 10.0 |
| Approach LOS | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.5 | | |
| Intersection Capacity Utilization | 26.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 0 | 33 | 851 | 7 | 0 | 1320 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 3% | | | -4% |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 0 | 36 | 925 | 8 | 0 | 1435 |
| Pedestrians | 21 | | | | | 1 |
| Lane Width (ft) | 12.0 | | | | | 12.0 |
| Walking Speed (ft/s) | 4.0 | | | | | 4.0 |
| Percent Blockage | 2 | | | | | 0 |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | 398 | | | 61 |
| pX, platoon unblocked | 0.90 | 0.83 | | | 0.83 | |
| vC, conflicting volume | 1667 | 488 | | | 954 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 663 | 0 | | | 526 | |
| tC, single (s) | 6.8 | 6.9 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 96 | | | 100 | |
| cM capacity (veh/h) | 350 | 880 | | | 843 | |

| Direction, Lane # | WB 1 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 36 | 617 | 316 | 717 | 717 |
| Volume Left | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 36 | 0 | 8 | 0 | 0 |
| cSH | 880 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.04 | 0.36 | 0.19 | 0.42 | 0.42 |
| Queue Length 95th (ft) | 3 | 0 | 0 | 0 | 0 |
| Control Delay (s) | 9.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | A | | | | |
| Approach Delay (s) | 9.3 | 0.0 | | 0.0 | |
| Approach LOS | A | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.1 | | |
| Intersection Capacity Utilization | 46.8% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 0 | 11 | 823 | 11 | 0 | 1287 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 3% | | | -4% |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 0 | 12 | 895 | 12 | 0 | 1399 |
| Pedestrians | 23 | | | | | |
| Lane Width (ft) | 12.0 | | | | | |
| Walking Speed (ft/s) | 4.0 | | | | | |
| Percent Blockage | 2 | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | 277 | | | 182 |
| pX, platoon unblocked | 0.91 | 0.82 | | | 0.82 | |
| vC, conflicting volume | 1623 | 476 | | | 930 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 605 | 0 | | | 485 | |
| tC, single (s) | 6.8 | 6.9 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 99 | | | 100 | |
| cM capacity (veh/h) | 382 | 876 | | | 867 | |

| Direction, Lane # | WB 1 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 12 | 596 | 310 | 699 | 699 |
| Volume Left | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 12 | 0 | 12 | 0 | 0 |
| cSH | 876 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.01 | 0.35 | 0.18 | 0.41 | 0.41 |
| Queue Length 95th (ft) | 1 | 0 | 0 | 0 | 0 |
| Control Delay (s) | 9.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | A | | | | |
| Approach Delay (s) | 9.2 | 0.0 | | 0.0 | |
| Approach LOS | A | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.0 | | |
| Intersection Capacity Utilization | 38.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 197 | 721 | 75 | 710 | 110 | 666 | 246 | 687 |
| v/c Ratio | 0.61 | 0.65 | 0.29 | 0.80 | 0.41 | 0.78 | 0.76 | 0.69 |
| Control Delay | 29.0 | 35.9 | 23.2 | 47.4 | 26.4 | 47.8 | 39.2 | 41.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 29.0 | 35.9 | 23.2 | 47.4 | 26.4 | 47.8 | 39.2 | 41.0 |
| Queue Length 50th (ft) | 84 | 227 | 30 | 251 | 47 | 235 | 114 | 231 |
| Queue Length 95th (ft) | 169 | 365 | 71 | 395 | 101 | 374 | 220 | 365 |
| Internal Link Dist (ft) | | 453 | | 381 | | 503 | | 175 |
| Turn Bay Length (ft) | 275 | | 255 | | 345 | | 190 | |
| Base Capacity (vph) | 392 | 2015 | 379 | 1867 | 431 | 1919 | 412 | 1913 |
| Starvation Cap Reductn | 0 | 71 | 0 | 0 | 0 | 0 | 0 | 100 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.50 | 0.37 | 0.20 | 0.38 | 0.26 | 0.35 | 0.60 | 0.38 |

Intersection Summary

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 181 | 592 | 72 | 69 | 597 | 56 | 101 | 586 | 27 | 226 | 469 | 163 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 11 | 11 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | | 0% | | | 0% | | | 3% | | | -4% | |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.98 | | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.96 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1710 | 3355 | | 1708 | 3369 | | 1742 | 3460 | | 1805 | 3453 | |
| Flt Permitted | 0.15 | 1.00 | | 0.30 | 1.00 | | 0.26 | 1.00 | | 0.17 | 1.00 | |
| Satd. Flow (perm) | 277 | 3355 | | 540 | 3369 | | 472 | 3460 | | 322 | 3453 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 197 | 643 | 78 | 75 | 649 | 61 | 110 | 637 | 29 | 246 | 510 | 177 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 197 | 721 | 0 | 75 | 710 | 0 | 110 | 666 | 0 | 246 | 687 | 0 |
| Confl. Peds. (#/hr) | 11 | | 11 | 11 | | 11 | 4 | | 5 | 5 | | 4 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 |
| Turn Type | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Actuated Green, G (s) | 51.5 | 37.7 | | 37.8 | 30.0 | | 38.1 | 28.1 | | 46.9 | 32.5 | |
| Effective Green, g (s) | 51.5 | 37.7 | | 37.8 | 30.0 | | 38.1 | 28.1 | | 46.9 | 32.5 | |
| Actuated g/C Ratio | 0.46 | 0.34 | | 0.34 | 0.27 | | 0.34 | 0.25 | | 0.42 | 0.29 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lane Grp Cap (vph) | 325 | 1129 | | 263 | 902 | | 273 | 868 | | 325 | 1001 | |
| v/s Ratio Prot | c0.08 | c0.21 | | 0.02 | c0.21 | | 0.04 | 0.19 | | c0.10 | c0.20 | |
| v/s Ratio Perm | 0.19 | | | 0.08 | | | 0.10 | | | c0.22 | | |
| v/c Ratio | 0.61 | 0.64 | | 0.29 | 0.79 | | 0.40 | 0.77 | | 0.76 | 0.69 | |
| Uniform Delay, d1 | 21.4 | 31.4 | | 25.9 | 38.0 | | 26.5 | 38.9 | | 24.2 | 35.2 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 2.2 | 0.9 | | 0.2 | 4.2 | | 0.4 | 3.7 | | 8.6 | 1.6 | |
| Delay (s) | 23.5 | 32.3 | | 26.1 | 42.3 | | 26.9 | 42.6 | | 32.8 | 36.8 | |
| Level of Service | C | C | | C | D | | C | D | | C | D | |
| Approach Delay (s) | | 30.4 | | | 40.7 | | | 40.4 | | | 35.8 | |
| Approach LOS | | C | | | D | | | D | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 36.5 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.78 | | |
| Actuated Cycle Length (s) | 112.0 | Sum of lost time (s) | 24.0 |
| Intersection Capacity Utilization | 78.0% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 149 | 62 | 868 | 899 |
| v/c Ratio | 0.37 | 0.15 | 0.45 | 0.61 |
| Control Delay | 19.9 | 6.0 | 7.9 | 15.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 19.9 | 6.0 | 7.9 | 15.6 |
| Queue Length 50th (ft) | 38 | 0 | 53 | 97 |
| Queue Length 95th (ft) | 85 | 23 | 145 | 208 |
| Internal Link Dist (ft) | 437 | | 1 | 403 |
| Turn Bay Length (ft) | 150 | | | |
| Base Capacity (vph) | 724 | 684 | 3027 | 3351 |
| Starvation Cap Reductn | 0 | 0 | 20 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.21 | 0.09 | 0.29 | 0.27 |

Intersection Summary

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 137 | 57 | 39 | 760 | 745 | 82 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 12 | 12 | 11 | 11 | 11 | 11 |
| Grade (%) | 0% | | | 3% | -3% | |
| Total Lost time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1583 | | 3335 | 3412 | |
| Flt Permitted | 0.95 | 1.00 | | 0.90 | 1.00 | |
| Satd. Flow (perm) | 1770 | 1583 | | 2992 | 3412 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 149 | 62 | 42 | 826 | 810 | 89 |
| RTOR Reduction (vph) | 0 | 50 | 0 | 0 | 11 | 0 |
| Lane Group Flow (vph) | 149 | 12 | 0 | 868 | 888 | 0 |
| Confl. Peds. (#/hr) | 3 | | 3 | | | 3 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 4 | 0 | 4 |
| Turn Type | Prot | Perm | pm+pt | NA | NA | |
| Protected Phases | 4 | | 1 | 6 | 2 | |
| Permitted Phases | | 4 | 6 | | | |
| Actuated Green, G (s) | 9.9 | 9.9 | | 32.3 | 22.1 | |
| Effective Green, g (s) | 9.9 | 9.9 | | 32.3 | 22.1 | |
| Actuated g/C Ratio | 0.19 | 0.19 | | 0.62 | 0.42 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | 2.0 | 2.0 | | 1.5 | 1.5 | |
| Lane Grp Cap (vph) | 335 | 300 | | 1885 | 1444 | |
| v/s Ratio Prot | c0.08 | | | c0.05 | c0.26 | |
| v/s Ratio Perm | | 0.01 | | 0.24 | | |
| v/c Ratio | 0.44 | 0.04 | | 0.46 | 0.61 | |
| Uniform Delay, d1 | 18.7 | 17.3 | | 5.3 | 11.7 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.3 | 0.0 | | 0.1 | 0.6 | |
| Delay (s) | 19.1 | 17.3 | | 5.4 | 12.3 | |
| Level of Service | B | B | | A | B | |
| Approach Delay (s) | 18.5 | | | 5.4 | 12.3 | |
| Approach LOS | B | | | A | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 9.9 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.58 | | |
| Actuated Cycle Length (s) | 52.2 | Sum of lost time (s) | 15.0 |
| Intersection Capacity Utilization | 65.5% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 80 | 75 | 65 | 813 | 690 | 90 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 87 | 82 | 71 | 884 | 750 | 98 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | 483 | 711 | |
| pX, platoon unblocked | 0.84 | 0.79 | 0.79 | | | |
| vC, conflicting volume | 1382 | 424 | 848 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 552 | 0 | 287 | | | |
| tC, single (s) | 6.8 | 6.9 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 76 | 91 | 93 | | | |
| cM capacity (veh/h) | 363 | 860 | 1009 | | | |

| Direction, Lane # | EB 1 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 168 | 365 | 589 | 500 | 348 |
| Volume Left | 87 | 71 | 0 | 0 | 0 |
| Volume Right | 82 | 0 | 0 | 0 | 98 |
| cSH | 504 | 1009 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.33 | 0.07 | 0.35 | 0.29 | 0.20 |
| Queue Length 95th (ft) | 36 | 6 | 0 | 0 | 0 |
| Control Delay (s) | 15.7 | 2.3 | 0.0 | 0.0 | 0.0 |
| Lane LOS | C | A | | | |
| Approach Delay (s) | 15.7 | 0.9 | | 0.0 | |
| Approach LOS | C | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.8 | | |
| Intersection Capacity Utilization | 65.3% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 24 | 879 | 4 | 3 | 739 | 11 | 2 | 1 | 2 | 2 | 0 | 15 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 26 | 955 | 4 | 3 | 803 | 12 | 2 | 1 | 2 | 2 | 0 | 16 |
| Pedestrians | | | | | | | | 4 | | | 7 | |
| Lane Width (ft) | | | | | | | | 12.0 | | | 12.0 | |
| Walking Speed (ft/s) | | | | | | | | 4.0 | | | 4.0 | |
| Percent Blockage | | | | | | | | 0 | | | 1 | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | 461 | | | | | | | | | | |
| pX, platoon unblocked | | | | 0.84 | | | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | |
| vC, conflicting volume | 822 | | | 964 | | | 1438 | 1843 | 484 | 1355 | 1839 | 415 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 822 | | | 577 | | | 1141 | 1622 | 5 | 1043 | 1618 | 415 |
| 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 % | 97 | | | 100 | | | 98 | 99 | 100 | 99 | 100 | 97 |
| cM capacity (veh/h) | 798 | | | 831 | | | 122 | 82 | 901 | 146 | 82 | 583 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 26 | 637 | 323 | 3 | 536 | 280 | 5 | 18 |
| Volume Left | 26 | 0 | 0 | 3 | 0 | 0 | 2 | 2 |
| Volume Right | 0 | 0 | 4 | 0 | 0 | 12 | 2 | 16 |
| cSH | 798 | 1700 | 1700 | 831 | 1700 | 1700 | 162 | 432 |
| Volume to Capacity | 0.03 | 0.37 | 0.19 | 0.00 | 0.32 | 0.16 | 0.03 | 0.04 |
| Queue Length 95th (ft) | 3 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| Control Delay (s) | 9.7 | 0.0 | 0.0 | 9.3 | 0.0 | 0.0 | 28.0 | 13.7 |
| Lane LOS | A | | | A | | | D | B |
| Approach Delay (s) | 0.3 | | | 0.0 | | | 28.0 | 13.7 |
| Approach LOS | | | | | | | D | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.4 | | |
| Intersection Capacity Utilization | 34.4% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 5 | 878 | 744 | 4 | 0 | 9 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 954 | 809 | 4 | 0 | 10 |
| Pedestrians | | | | | 6 | |
| Lane Width (ft) | | | | | 12.0 | |
| Walking Speed (ft/s) | | | | | 4.0 | |
| Percent Blockage | | | | | 1 | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | 681 | 1184 | | | |
| pX, platoon unblocked | 0.95 | | | | 0.88 | 0.95 |
| vC, conflicting volume | 819 | | | | 1305 | 413 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 708 | | | | 814 | 280 |
| tC, single (s) | 4.1 | | | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 99 | | | | 100 | 99 |
| cM capacity (veh/h) | 840 | | | | 273 | 679 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 324 | 636 | 539 | 274 | 10 |
| Volume Left | 5 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 0 | 4 | 10 |
| cSH | 840 | 1700 | 1700 | 1700 | 679 |
| Volume to Capacity | 0.01 | 0.37 | 0.32 | 0.16 | 0.01 |
| Queue Length 95th (ft) | 0 | 0 | 0 | 0 | 1 |
| Control Delay (s) | 0.2 | 0.0 | 0.0 | 0.0 | 10.4 |
| Lane LOS | A | | | | B |
| Approach Delay (s) | 0.1 | | 0.0 | | 10.4 |
| Approach LOS | | | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.1 | | |
| Intersection Capacity Utilization | 37.8% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

## 34: N. Washington St & W. Columbia St./E. Columbia St

| Lane Group | EBT | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 89 | 154 | 67 | 918 | 63 | 862 |
| v/c Ratio | 0.15 | 0.24 | 0.29 | 0.81 | 0.29 | 0.76 |
| Control Delay | 18.8 | 18.0 | 14.6 | 30.4 | 14.9 | 28.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 18.8 | 18.0 | 14.6 | 30.4 | 14.9 | 28.7 |
| Queue Length 50th (ft) | 27 | 44 | 17 | 220 | 16 | 203 |
| Queue Length 95th (ft) | 69 | 105 | 37 | 297 | 36 | 276 |
| Internal Link Dist (ft) | 910 | 204 | | 631 | | 475 |
| Turn Bay Length (ft) | | | 70 | | 125 | |
| Base Capacity (vph) | 606 | 631 | 305 | 2636 | 294 | 2651 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.15 | 0.24 | 0.22 | 0.35 | 0.21 | 0.33 |

Intersection Summary

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 40 | 33 | 9 | 40 | 58 | 44 | 62 | 807 | 38 | 58 | 778 | 15 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 13 | 13 | 13 | 12 | 12 | 12 | 10 | 11 | 11 | 10 | 11 | 11 |
| Total Lost time (s) | | 6.0 | | | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | | 1.00 | | | 0.99 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | | 0.98 | | | 0.96 | | 1.00 | 0.99 | | 1.00 | 1.00 | |
| Flt Protected | | 0.98 | | | 0.99 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1839 | | | 1741 | | 1651 | 3391 | | 1651 | 3410 | |
| Flt Permitted | | 0.82 | | | 0.90 | | 0.17 | 1.00 | | 0.15 | 1.00 | |
| Satd. Flow (perm) | | 1553 | | | 1597 | | 304 | 3391 | | 267 | 3410 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 43 | 36 | 10 | 43 | 63 | 48 | 67 | 877 | 41 | 63 | 846 | 16 |
| RTOR Reduction (vph) | 0 | 3 | 0 | 0 | 12 | 0 | 0 | 4 | 0 | 0 | 1 | 0 |
| Lane Group Flow (vph) | 0 | 86 | 0 | 0 | 142 | 0 | 67 | 914 | 0 | 63 | 861 | 0 |
| Confl. Peds. (#/hr) | 6 | | 11 | 11 | | 6 | 5 | | 12 | 12 | | 5 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 4 |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 4 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 4 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | | 30.5 | | | 30.5 | | 31.3 | 26.2 | | 30.9 | 26.0 | |
| Effective Green, g (s) | | 30.5 | | | 30.5 | | 31.3 | 26.2 | | 30.9 | 26.0 | |
| Actuated g/C Ratio | | 0.38 | | | 0.38 | | 0.39 | 0.33 | | 0.39 | 0.33 | |
| Clearance Time (s) | | 6.0 | | | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | | 2.0 | | | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.5 | |
| Lane Grp Cap (vph) | | 595 | | | 611 | | 205 | 1116 | | 188 | 1113 | |
| v/s Ratio Prot | | | | | | | c0.02 | c0.27 | | 0.02 | 0.25 | |
| v/s Ratio Perm | | 0.06 | | | c0.09 | | 0.11 | | | 0.11 | | |
| v/c Ratio | | 0.14 | | | 0.23 | | 0.33 | 0.82 | | 0.34 | 0.77 | |
| Uniform Delay, d1 | | 16.0 | | | 16.6 | | 16.3 | 24.5 | | 16.8 | 24.1 | |
| Progression Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 0.5 | | | 0.9 | | 0.3 | 4.5 | | 0.4 | 3.3 | |
| Delay (s) | | 16.5 | | | 17.5 | | 16.7 | 29.1 | | 17.1 | 27.4 | |
| Level of Service | | B | | | B | | B | C | | B | C | |
| Approach Delay (s) | | 16.5 | | | 17.5 | | | 28.2 | | | 26.7 | |
| Approach LOS | | B | | | B | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 26.3 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.49 | | |
| Actuated Cycle Length (s) | 79.6 | Sum of lost time (s) | 18.0 |
| Intersection Capacity Utilization | 56.1% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 103 | 8 | 3 | 125 | 1 | 4 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 112 | 9 | 3 | 136 | 1 | 4 |
| Pedestrians | 2 | | | | 4 | |
| Lane Width (ft) | 12.0 | | | | 12.0 | |
| 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) | 535 | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 125 | | 265 | 120 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 125 | | 265 | 120 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 100 | 100 |
| cM capacity (veh/h) | | | 1457 | | 719 | 928 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 121 | 139 | 5 |
| Volume Left | 0 | 3 | 1 |
| Volume Right | 9 | 0 | 4 |
| cSH | 1700 | 1457 | 877 |
| Volume to Capacity | 0.07 | 0.00 | 0.01 |
| Queue Length 95th (ft) | 0 | 0 | 0 |
| Control Delay (s) | 0.0 | 0.2 | 9.1 |
| Lane LOS | | A | A |
| Approach Delay (s) | 0.0 | 0.2 | 9.1 |
| Approach LOS | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.3 | | |
| Intersection Capacity Utilization | 19.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 0 | 8 | 815 | 5 | 0 | 825 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 3% | | | -4% |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 0 | 9 | 886 | 5 | 0 | 897 |
| Pedestrians | 2 | | | | | |
| Lane Width (ft) | 12.0 | | | | | |
| Walking Speed (ft/s) | 4.0 | | | | | |
| Percent Blockage | 0 | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | 402 | | | 61 |
| pX, platoon unblocked | 0.88 | 0.83 | | | 0.83 | |
| vC, conflicting volume | 1339 | 448 | | | 893 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 260 | 0 | | | 464 | |
| tC, single (s) | 6.8 | 6.9 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 99 | | | 100 | |
| cM capacity (veh/h) | 624 | 899 | | | 907 | |

| Direction, Lane # | WB 1 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 9 | 591 | 301 | 448 | 448 |
| Volume Left | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 9 | 0 | 5 | 0 | 0 |
| cSH | 899 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.01 | 0.35 | 0.18 | 0.26 | 0.26 |
| Queue Length 95th (ft) | 1 | 0 | 0 | 0 | 0 |
| Control Delay (s) | 9.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | A | | | | |
| Approach Delay (s) | 9.0 | 0.0 | | 0.0 | |
| Approach LOS | A | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.0 | | |
| Intersection Capacity Utilization | 32.7% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 0 | 5 | 791 | 9 | 0 | 798 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 3% | | | -4% |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 0 | 5 | 860 | 10 | 0 | 867 |
| Pedestrians | 6 | | | | | |
| Lane Width (ft) | 12.0 | | | | | |
| Walking Speed (ft/s) | 4.0 | | | | | |
| Percent Blockage | 1 | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | 255 | | | 206 |
| pX, platoon unblocked | 0.90 | 0.83 | | | 0.83 | |
| vC, conflicting volume | 1304 | 441 | | | 876 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 243 | 0 | | | 432 | |
| tC, single (s) | 6.8 | 6.9 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 99 | | | 100 | |
| cM capacity (veh/h) | 646 | 893 | | | 925 | |

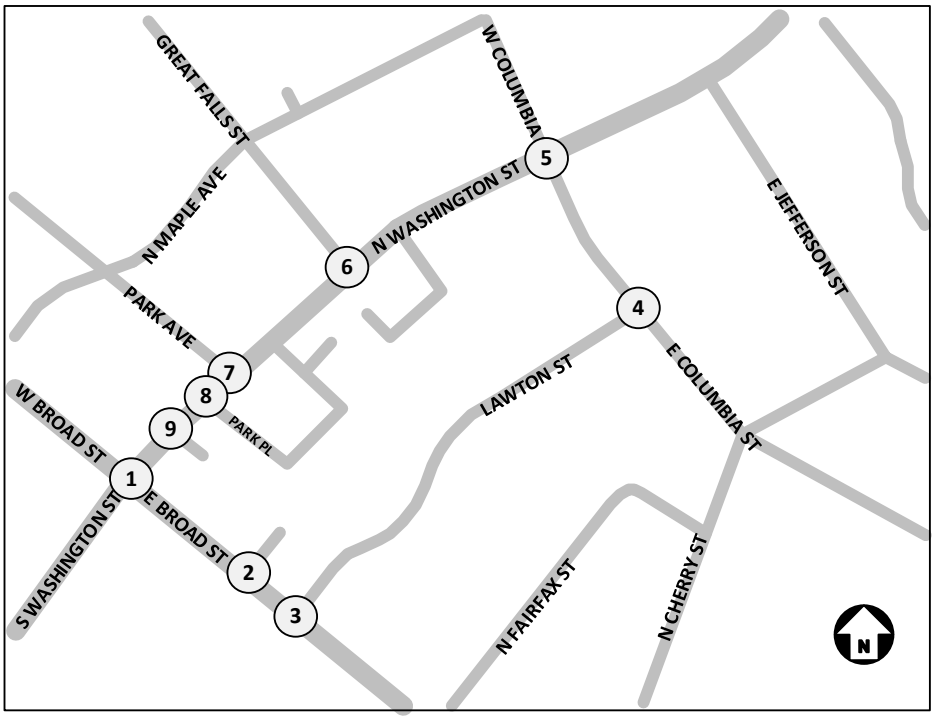
| Direction, Lane # | WB 1 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 5 | 573 | 296 | 434 | 434 |
| Volume Left | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 5 | 0 | 10 | 0 | 0 |
| cSH | 893 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.01 | 0.34 | 0.17 | 0.26 | 0.26 |
| Queue Length 95th (ft) | 0 | 0 | 0 | 0 | 0 |
| Control Delay (s) | 9.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | A | | | | |
| Approach Delay (s) | 9.1 | 0.0 | | 0.0 | |
| Approach LOS | A | | | | |

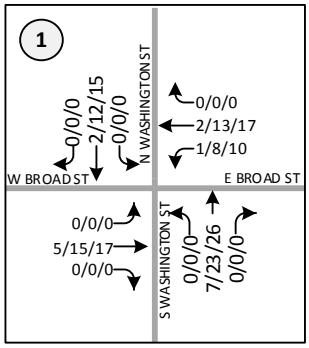
| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.0 | | |
| Intersection Capacity Utilization | 32.2% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

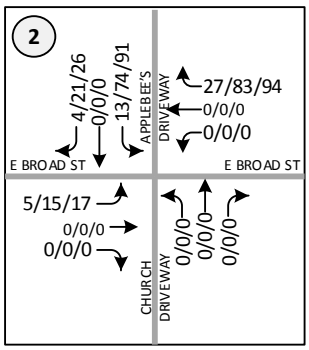
# APPENDIX F

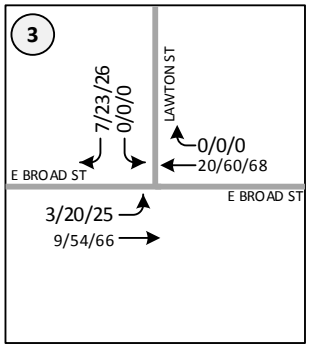
TRAFFIC VOLUMES FOR EACH USE AND PASS-BY TRIPS

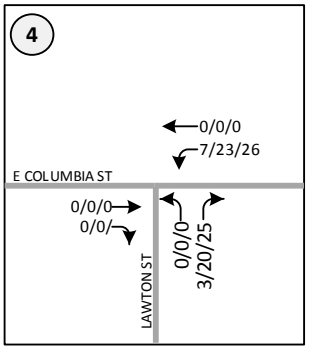
## *Retail Use Trips*

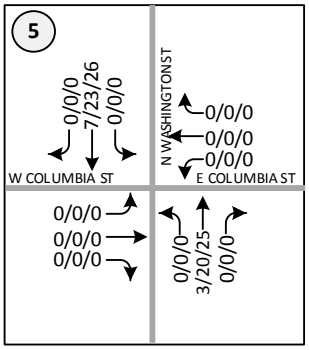


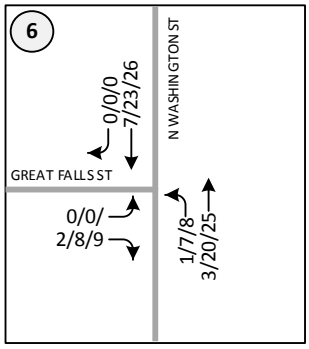



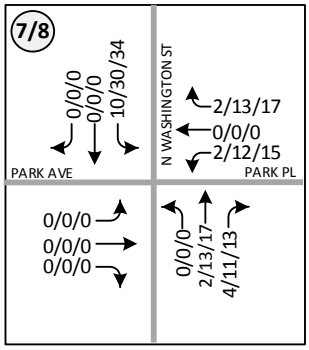



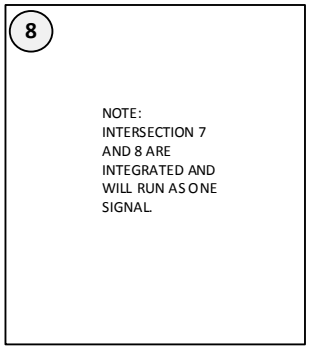



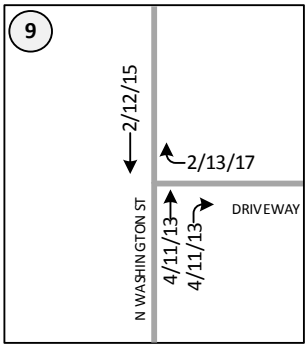



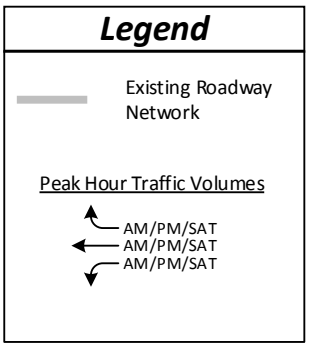



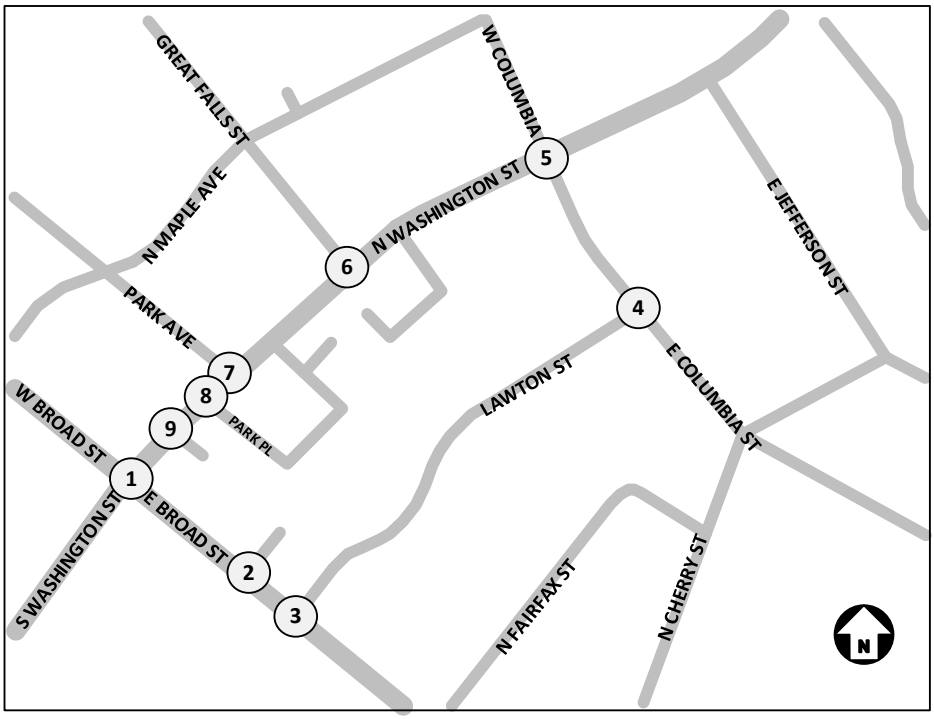



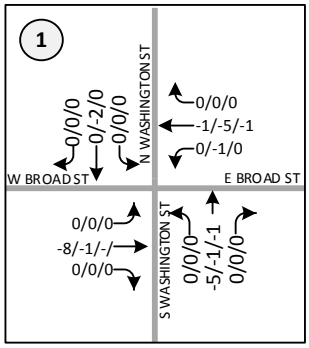



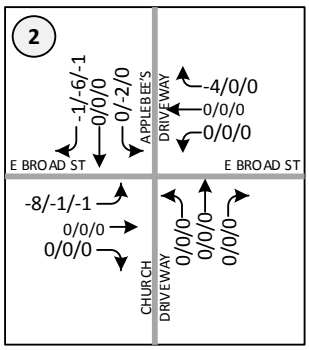



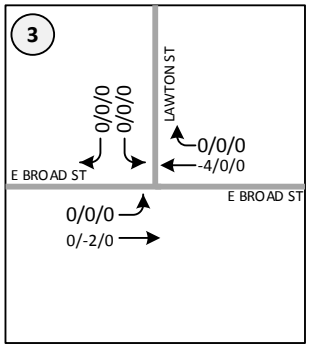



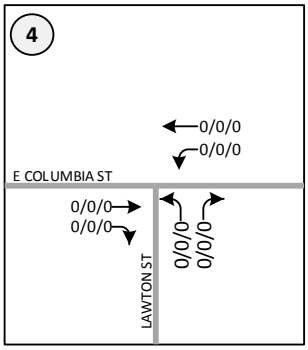
# *Office Use Trips*

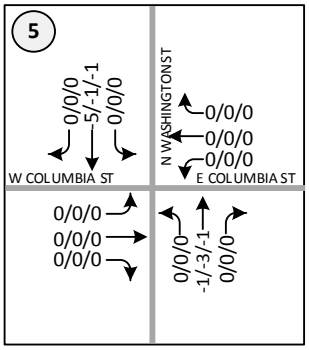


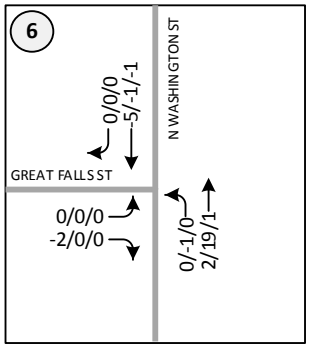



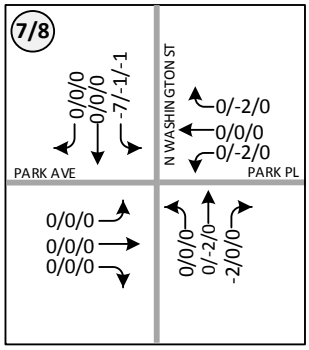



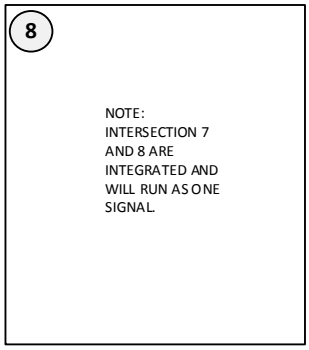



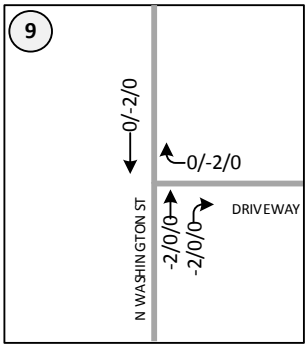



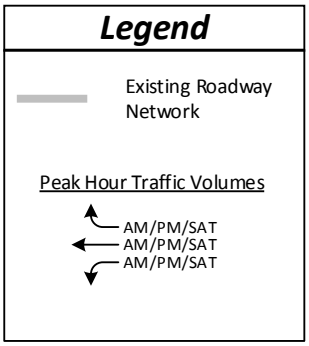



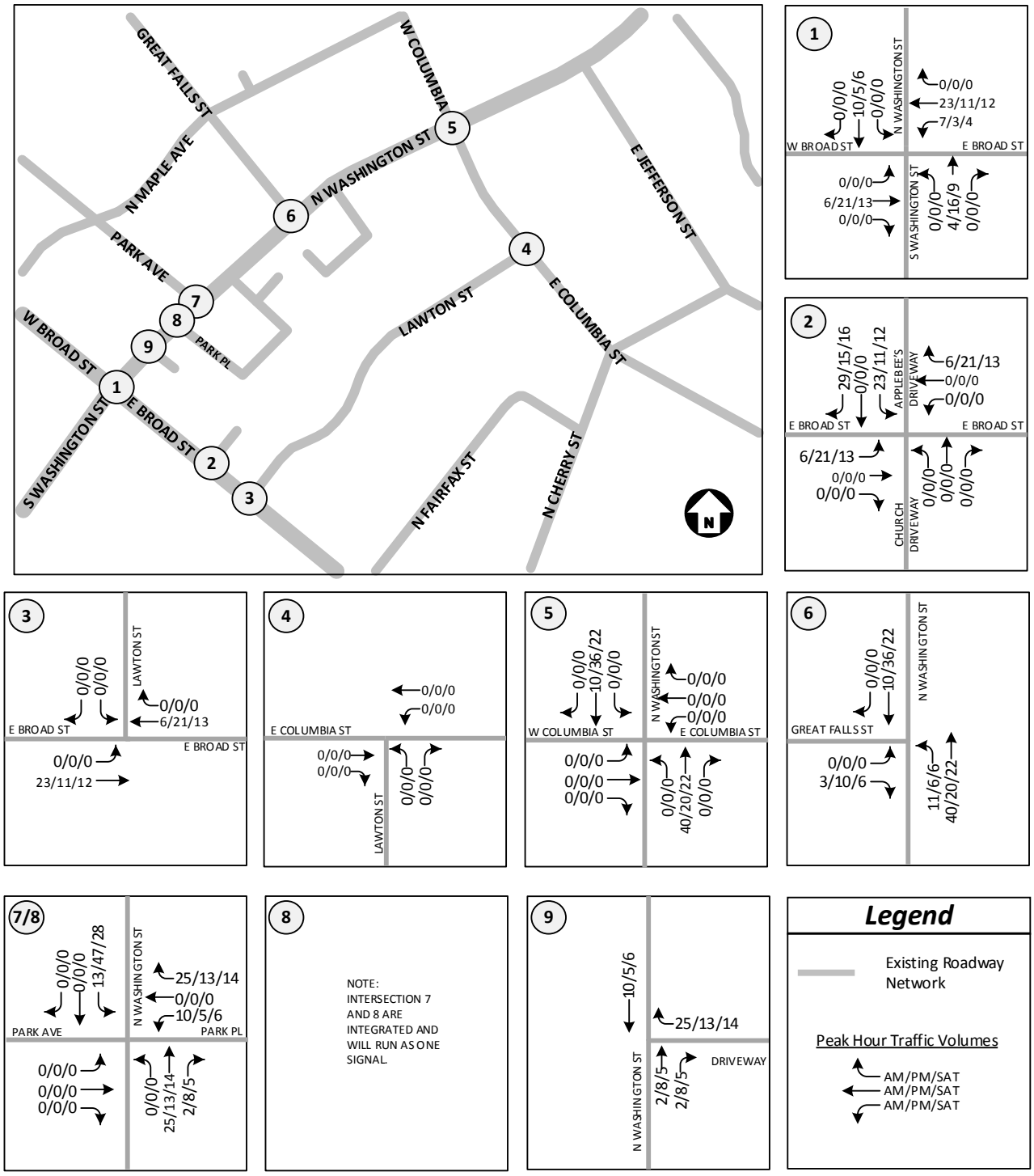



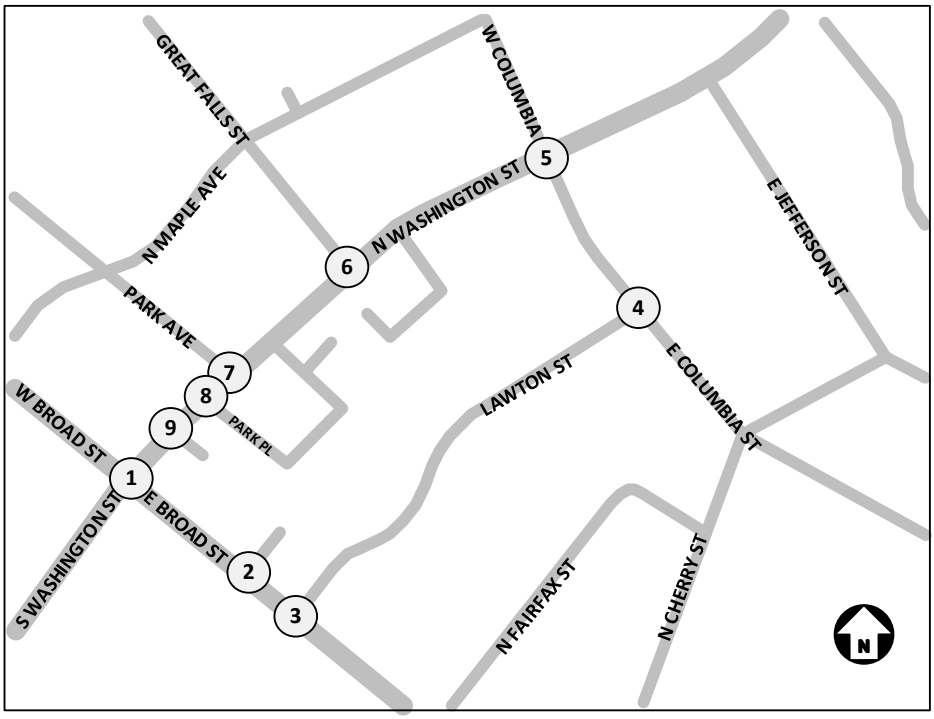



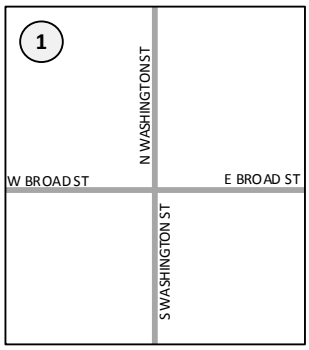



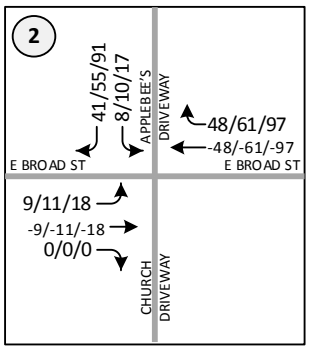
## *Residential Use Trips*

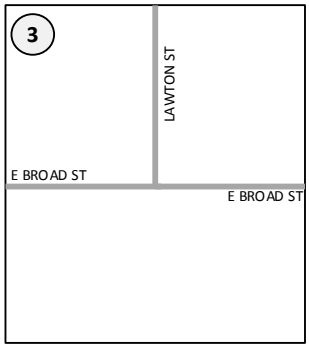


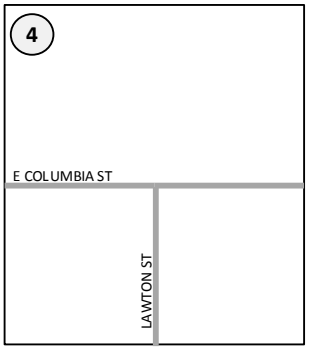
## *Pass-by Trips*

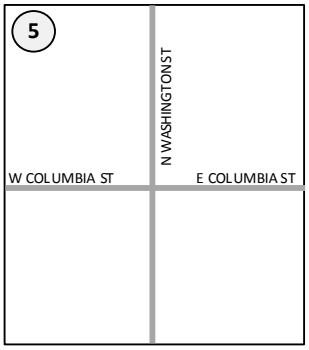


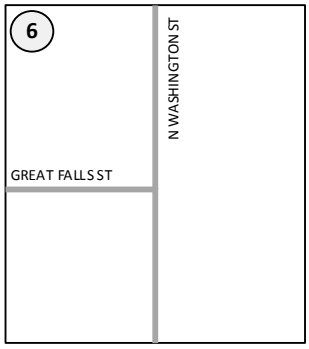



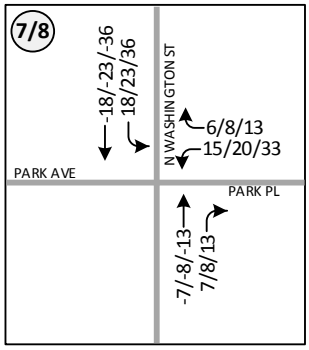



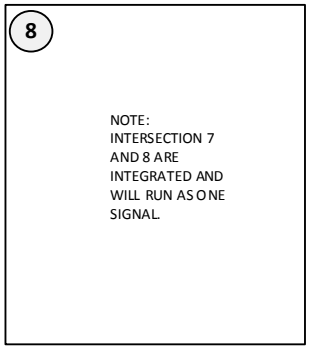



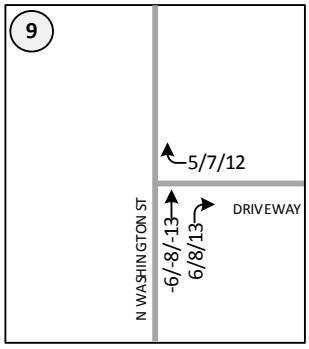



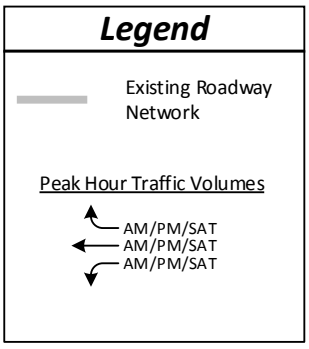



# APPENDIX G

INTERSECTION CAPACITY ANALYSIS –

FUTURE WITH DEVELOPMENT CONDITION (2020)

## 4: S. Washington St/N. Washington St & W. Broad St/E. Broad St

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 149 | 657 | 66 | 868 | 72 | 1099 | 163 | 620 |
| v/c Ratio | 0.84 | 0.58 | 0.26 | 0.83 | 0.22 | 0.99 | 0.69 | 0.47 |
| Control Delay | 70.7 | 38.1 | 13.3 | 32.0 | 16.1 | 52.8 | 33.5 | 21.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 70.7 | 38.1 | 13.3 | 32.0 | 16.1 | 52.8 | 33.5 | 21.0 |
| Queue Length 50th (ft) | 83 | 205 | 15 | 276 | 20 | 214 | 55 | 157 |
| Queue Length 95th (ft) | m#166 | 205 | 31 | #379 | m50 | #485 | #135 | 190 |
| Internal Link Dist (ft) | | 453 | | 375 | | 503 | | 144 |
| Turn Bay Length (ft) | 275 | | 255 | | 345 | | 190 | |
| Base Capacity (vph) | 178 | 1129 | 262 | 1046 | 327 | 1111 | 254 | 1323 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.84 | 0.58 | 0.25 | 0.83 | 0.22 | 0.99 | 0.64 | 0.47 |

### Intersection Summary

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

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 137 | 575 | 29 | 61 | 731 | 67 | 66 | 992 | 19 | 150 | 489 | 81 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 11 | 11 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | | 0% | | | 0% | | | 3% | | | -4% | |
| Total Lost time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 1.00 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1710 | 3392 | | 1708 | 3370 | | 1742 | 3474 | | 1805 | 3525 | |
| Flt Permitted | 0.13 | 1.00 | | 0.28 | 1.00 | | 0.37 | 1.00 | | 0.11 | 1.00 | |
| Satd. Flow (perm) | 231 | 3392 | | 502 | 3370 | | 677 | 3474 | | 204 | 3525 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 149 | 625 | 32 | 66 | 795 | 73 | 72 | 1078 | 21 | 163 | 532 | 88 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 149 | 657 | 0 | 66 | 868 | 0 | 72 | 1099 | 0 | 163 | 620 | 0 |
| Confl. Peds. (#/hr) | 13 | | 12 | 12 | | 13 | 3 | | 16 | 16 | | 3 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 |
| Turn Type | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Actuated Green, G (s) | 37.2 | 31.2 | | 34.8 | 30.0 | | 37.9 | 33.1 | | 46.1 | 37.2 | |
| Effective Green, g (s) | 37.2 | 31.2 | | 34.8 | 30.0 | | 37.9 | 33.1 | | 46.1 | 37.2 | |
| Actuated g/C Ratio | 0.37 | 0.31 | | 0.35 | 0.30 | | 0.38 | 0.33 | | 0.46 | 0.37 | |
| Clearance Time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | |
| Vehicle Extension (s) | 2.0 | 5.0 | | 2.0 | 5.0 | | 2.0 | 5.0 | | 2.0 | 5.0 | |
| Lane Grp Cap (vph) | 174 | 1058 | | 232 | 1011 | | 307 | 1149 | | 236 | 1311 | |
| v/s Ratio Prot | c0.05 | 0.19 | | 0.01 | 0.26 | | 0.01 | c0.32 | | c0.06 | 0.18 | |
| v/s Ratio Perm | c0.27 | | | 0.09 | | | 0.08 | | | 0.26 | | |
| v/c Ratio | 0.86 | 0.62 | | 0.28 | 0.86 | | 0.23 | 0.96 | | 0.69 | 0.47 | |
| Uniform Delay, d1 | 24.0 | 29.4 | | 22.6 | 33.0 | | 20.2 | 32.7 | | 21.2 | 23.9 | |
| Progression Factor | 1.87 | 1.25 | | 0.63 | 0.75 | | 0.98 | 0.81 | | 1.03 | 0.80 | |
| Incremental Delay, d2 | 28.2 | 2.5 | | 0.2 | 8.8 | | 0.1 | 16.8 | | 6.7 | 0.6 | |
| Delay (s) | 73.1 | 39.1 | | 14.4 | 33.4 | | 19.9 | 43.4 | | 28.6 | 19.8 | |
| Level of Service | E | D | | B | C | | B | D | | C | B | |
| Approach Delay (s) | | 45.4 | | | 32.1 | | | 42.0 | | | 21.6 | |
| Approach LOS | | D | | | C | | | D | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 35.9 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.89 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 22.0 |
| Intersection Capacity Utilization | 84.7% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 99 | 55 | 1364 | 804 |
| v/c Ratio | 0.52 | 0.25 | 0.62 | 0.28 |
| Control Delay | 50.8 | 13.7 | 5.8 | 2.7 |
| Queue Delay | 0.0 | 0.0 | 10.9 | 0.0 |
| Total Delay | 50.8 | 13.7 | 16.6 | 2.7 |
| Queue Length 50th (ft) | 61 | 0 | 91 | 42 |
| Queue Length 95th (ft) | 108 | 34 | m104 | 95 |
| Internal Link Dist (ft) | 437 | | 1 | 403 |
| Turn Bay Length (ft) | 150 | | | |
| Base Capacity (vph) | 336 | 340 | 2215 | 2854 |
| Starvation Cap Reductn | 0 | 0 | 838 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.29 | 0.16 | 0.99 | 0.28 |

Intersection Summary

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 91 | 51 | 98 | 1156 | 651 | 88 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 12 | 12 | 11 | 11 | 11 | 11 |
| Grade (%) | 0% | | | 3% | -3% | |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 0.98 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1559 | | 3328 | 3391 | |
| Flt Permitted | 0.95 | 1.00 | | 0.79 | 1.00 | |
| Satd. Flow (perm) | 1770 | 1559 | | 2636 | 3391 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 99 | 55 | 107 | 1257 | 708 | 96 |
| RTOR Reduction (vph) | 0 | 50 | 0 | 0 | 5 | 0 |
| Lane Group Flow (vph) | 99 | 5 | 0 | 1364 | 799 | 0 |
| Confl. Peds. (#/hr) | 2 | 2 | 9 | | | 9 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 4 | 0 | 4 |
| Turn Type | Prot | Perm | custom | NA | NA | |
| Protected Phases | 4 | | 1 | 6 | 2 | |
| Permitted Phases | | 4 | 1 | | | |
| Actuated Green, G (s) | 9.6 | 9.6 | | 82.4 | 82.4 | |
| Effective Green, g (s) | 9.6 | 9.6 | | 82.4 | 82.4 | |
| Actuated g/C Ratio | 0.10 | 0.10 | | 0.82 | 0.82 | |
| Clearance Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 169 | 149 | | 2172 | 2794 | |
| v/s Ratio Prot | c0.06 | | | | 0.24 | |
| v/s Ratio Perm | | 0.00 | | c0.52 | | |
| v/c Ratio | 0.59 | 0.04 | | 0.63 | 0.29 | |
| Uniform Delay, d1 | 43.3 | 41.0 | | 3.2 | 2.0 | |
| Progression Factor | 1.00 | 1.00 | | 1.29 | 1.05 | |
| Incremental Delay, d2 | 5.1 | 0.1 | | 0.3 | 0.2 | |
| Delay (s) | 48.4 | 41.1 | | 4.4 | 2.4 | |
| Level of Service | D | D | | A | A | |
| Approach Delay (s) | 45.8 | | | 4.4 | 2.4 | |
| Approach LOS | D | | | A | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 6.4 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.65 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 71.3% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 159 | 68 | 92 | 1234 | 568 | 70 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 173 | 74 | 100 | 1341 | 617 | 76 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | 483 | 711 | |
| pX, platoon unblocked | 0.94 | 0.90 | 0.90 | | | |
| vC, conflicting volume | 1526 | 347 | 693 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 931 | 42 | 428 | | | |
| tC, single (s) | 6.8 | 6.9 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 23 | 92 | 90 | | | |
| cM capacity (veh/h) | 224 | 915 | 1011 | | | |

| Direction, Lane # | EB 1 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 247 | 547 | 894 | 412 | 282 |
| Volume Left | 173 | 100 | 0 | 0 | 0 |
| Volume Right | 74 | 0 | 0 | 0 | 76 |
| cSH | 290 | 1011 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.85 | 0.10 | 0.53 | 0.24 | 0.17 |
| Queue Length 95th (ft) | 182 | 8 | 0 | 0 | 0 |
| Control Delay (s) | 60.6 | 2.6 | 0.0 | 0.0 | 0.0 |
| Lane LOS | F | A | | | |
| Approach Delay (s) | 60.6 | 1.0 | | 0.0 | |
| Approach LOS | F | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 6.9 | | |
| Intersection Capacity Utilization | 77.7% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 64 | 761 | 36 | 17 | 879 | 107 | 4 | 0 | 13 | 46 | 0 | 113 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 70 | 827 | 39 | 18 | 955 | 116 | 4 | 0 | 14 | 50 | 0 | 123 |
| Pedestrians | | | | | | | | 4 | | | 4 | |
| Lane Width (ft) | | | | | | | | 12.0 | | | 12.0 | |
| 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) | | 460 | | | | | | | | | | |
| pX, platoon unblocked | | | | 0.86 | | | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | |
| vC, conflicting volume | 1076 | | | 870 | | | 1627 | 2103 | 437 | 1621 | 2064 | 540 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 1076 | | | 515 | | | 1398 | 1953 | 9 | 1391 | 1908 | 540 |
| 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 % | 89 | | | 98 | | | 92 | 100 | 98 | 35 | 100 | 75 |
| cM capacity (veh/h) | 642 | | | 894 | | | 57 | 47 | 914 | 77 | 50 | 485 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 70 | 551 | 315 | 18 | 637 | 435 | 18 | 173 |
| Volume Left | 70 | 0 | 0 | 18 | 0 | 0 | 4 | 50 |
| Volume Right | 0 | 0 | 39 | 0 | 0 | 116 | 14 | 123 |
| cSH | 642 | 1700 | 1700 | 894 | 1700 | 1700 | 203 | 191 |
| Volume to Capacity | 0.11 | 0.32 | 0.19 | 0.02 | 0.37 | 0.26 | 0.09 | 0.91 |
| Queue Length 95th (ft) | 9 | 0 | 0 | 2 | 0 | 0 | 7 | 175 |
| Control Delay (s) | 11.3 | 0.0 | 0.0 | 9.1 | 0.0 | 0.0 | 24.5 | 92.8 |
| Lane LOS | B | | | A | | | C | F |
| Approach Delay (s) | 0.8 | | | 0.2 | | | 24.5 | 92.8 |
| Approach LOS | | | | | | | C | F |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 7.9 | | |
| Intersection Capacity Utilization | 55.0% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 12 | 827 | 991 | 11 | 2 | 12 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 13 | 899 | 1077 | 12 | 2 | 13 |
| Pedestrians | | | 1 | | 8 | |
| Lane Width (ft) | | | 12.0 | | 12.0 | |
| Walking Speed (ft/s) | | | 4.0 | | 4.0 | |
| Percent Blockage | | | 0 | | 1 | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | 668 | 1202 | | | |
| pX, platoon unblocked | 0.93 | | | | 0.91 | 0.93 |
| vC, conflicting volume | 1097 | | | | 1568 | 553 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 947 | | | | 1071 | 360 |
| tC, single (s) | 4.1 | | | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 98 | | | | 99 | 98 |
| cM capacity (veh/h) | 663 | | | | 192 | 586 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 313 | 599 | 718 | 371 | 15 |
| Volume Left | 13 | 0 | 0 | 0 | 2 |
| Volume Right | 0 | 0 | 0 | 12 | 13 |
| cSH | 663 | 1700 | 1700 | 1700 | 453 |
| Volume to Capacity | 0.02 | 0.35 | 0.42 | 0.22 | 0.03 |
| Queue Length 95th (ft) | 2 | 0 | 0 | 0 | 3 |
| Control Delay (s) | 0.7 | 0.0 | 0.0 | 0.0 | 13.2 |
| Lane LOS | A | | | | B |
| Approach Delay (s) | 0.2 | | 0.0 | | 13.2 |
| Approach LOS | | | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.2 | | |
| Intersection Capacity Utilization | 41.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Lane Group | EBT | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 152 | 280 | 43 | 1251 | 28 | 743 |
| v/c Ratio | 0.35 | 0.59 | 0.12 | 0.72 | 0.15 | 0.42 |
| Control Delay | 29.2 | 34.4 | 6.5 | 12.7 | 11.1 | 16.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 29.2 | 34.4 | 6.5 | 12.7 | 11.1 | 16.8 |
| Queue Length 50th (ft) | 73 | 145 | 6 | 196 | 7 | 162 |
| Queue Length 95th (ft) | 129 | 232 | m14 | 332 | 19 | 212 |
| Internal Link Dist (ft) | 910 | 204 | | 631 | | 475 |
| Turn Bay Length (ft) | | | 70 | | 125 | |
| Base Capacity (vph) | 439 | 475 | 346 | 1749 | 182 | 1753 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.35 | 0.59 | 0.12 | 0.72 | 0.15 | 0.42 |

Intersection Summary

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 52 | 75 | 12 | 74 | 134 | 50 | 40 | 1115 | 36 | 26 | 670 | 14 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 13 | 13 | 13 | 12 | 12 | 12 | 10 | 11 | 11 | 10 | 11 | 11 |
| Total Lost time (s) | | 6.0 | | | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | | 0.99 | | | 0.97 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flt Protected | | 0.98 | | | 0.99 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1862 | | | 1777 | | 1649 | 3400 | | 1652 | 3408 | |
| Flt Permitted | | 0.77 | | | 0.86 | | 0.31 | 1.00 | | 0.12 | 1.00 | |
| Satd. Flow (perm) | | 1454 | | | 1556 | | 535 | 3400 | | 202 | 3408 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 57 | 82 | 13 | 80 | 146 | 54 | 43 | 1212 | 39 | 28 | 728 | 15 |
| RTOR Reduction (vph) | 0 | 4 | 0 | 0 | 8 | 0 | 0 | 2 | 0 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 0 | 149 | 0 | 0 | 272 | 0 | 43 | 1249 | 0 | 28 | 741 | 0 |
| Confl. Peds. (#/hr) | 4 | | 4 | 4 | | 8 | 6 | | 8 | 8 | | 6 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 4 |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 4 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 4 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | | 30.0 | | | 30.0 | | 52.0 | 49.0 | | 52.0 | 49.0 | |
| Effective Green, g (s) | | 30.0 | | | 30.0 | | 52.0 | 49.0 | | 52.0 | 49.0 | |
| Actuated g/C Ratio | | 0.30 | | | 0.30 | | 0.52 | 0.49 | | 0.52 | 0.49 | |
| Clearance Time (s) | | 6.0 | | | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 436 | | | 466 | | 311 | 1666 | | 148 | 1669 | |
| v/s Ratio Prot | | | | | | | 0.00 | c0.37 | | c0.01 | 0.22 | |
| v/s Ratio Perm | | 0.10 | | | c0.17 | | 0.07 | | | 0.09 | | |
| v/c Ratio | | 0.34 | | | 0.58 | | 0.14 | 0.75 | | 0.19 | 0.44 | |
| Uniform Delay, d1 | | 27.3 | | | 29.7 | | 12.2 | 20.6 | | 14.7 | 16.6 | |
| Progression Factor | | 1.00 | | | 1.00 | | 0.62 | 0.52 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 2.1 | | | 5.2 | | 0.2 | 2.8 | | 0.6 | 0.9 | |
| Delay (s) | | 29.4 | | | 34.9 | | 7.7 | 13.6 | | 15.3 | 17.5 | |
| Level of Service | | C | | | C | | A | B | | B | B | |
| Approach Delay (s) | | 29.4 | | | 34.9 | | | 13.4 | | | 17.4 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 18.0 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.67 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 18.0 |
| Intersection Capacity Utilization | 60.4% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 116 | 0 | 8 | 232 | 14 | 12 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 126 | 0 | 9 | 252 | 15 | 13 |
| Pedestrians | | | | 3 | 4 | |
| Lane Width (ft) | | | | 12.0 | 12.0 | |
| 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) | 507 | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 130 | | 400 | 133 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 130 | | 400 | 133 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 99 | | 97 | 99 |
| cM capacity (veh/h) | | | 1451 | | 600 | 911 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 126 | 261 | 28 |
| Volume Left | 0 | 9 | 15 |
| Volume Right | 0 | 0 | 13 |
| cSH | 1700 | 1451 | 712 |
| Volume to Capacity | 0.07 | 0.01 | 0.04 |
| Queue Length 95th (ft) | 0 | 0 | 3 |
| Control Delay (s) | 0.0 | 0.3 | 10.3 |
| Lane LOS | | A | B |
| Approach Delay (s) | 0.0 | 0.3 | 10.3 |
| Approach LOS | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.9 | | |
| Intersection Capacity Utilization | 29.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 0 | 50 | 1212 | 12 | 0 | 708 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 3% | | | -4% |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 0 | 54 | 1317 | 13 | 0 | 770 |
| Pedestrians | 12 | | | | | |
| Lane Width (ft) | 12.0 | | | | | |
| Walking Speed (ft/s) | 4.0 | | | | | |
| Percent Blockage | 1 | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | 368 | | | 61 |
| pX, platoon unblocked | 0.72 | 0.69 | | | 0.69 | |
| vC, conflicting volume | 1721 | 677 | | | 1342 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 899 | 0 | | | 605 | |
| tC, single (s) | 6.8 | 6.9 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 93 | | | 100 | |
| cM capacity (veh/h) | 198 | 743 | | | 664 | |

| Direction, Lane # | WB 1 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 54 | 878 | 452 | 385 | 385 |
| Volume Left | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 54 | 0 | 13 | 0 | 0 |
| cSH | 743 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.07 | 0.52 | 0.27 | 0.23 | 0.23 |
| Queue Length 95th (ft) | 6 | 0 | 0 | 0 | 0 |
| Control Delay (s) | 10.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | B | | | | |
| Approach Delay (s) | 10.2 | 0.0 | | 0.0 | |
| Approach LOS | B | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.3 | | |
| Intersection Capacity Utilization | 43.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 0 | 40 | 1174 | 15 | 0 | 702 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 3% | | | -4% |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 0 | 43 | 1276 | 16 | 0 | 763 |
| Pedestrians | 10 | | | | | |
| Lane Width (ft) | 12.0 | | | | | |
| Walking Speed (ft/s) | 4.0 | | | | | |
| Percent Blockage | 1 | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | 224 | | | 206 |
| pX, platoon unblocked | 0.71 | 0.69 | | | 0.69 | |
| vC, conflicting volume | 1676 | 656 | | | 1302 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 861 | 0 | | | 540 | |
| tC, single (s) | 6.8 | 6.9 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 94 | | | 100 | |
| cM capacity (veh/h) | 208 | 742 | | | 701 | |

| Direction, Lane # | WB 1 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 43 | 851 | 442 | 382 | 382 |
| Volume Left | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 43 | 0 | 16 | 0 | 0 |
| cSH | 742 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.06 | 0.50 | 0.26 | 0.22 | 0.22 |
| Queue Length 95th (ft) | 5 | 0 | 0 | 0 | 0 |
| Control Delay (s) | 10.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | B | | | | |
| Approach Delay (s) | 10.2 | 0.0 | | 0.0 | |
| Approach LOS | B | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.2 | | |
| Intersection Capacity Utilization | 42.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

## 4: S. Washington St/N. Washington St & W. Broad St/E. Broad St

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 212 | 849 | 129 | 920 | 87 | 755 | 257 | 1266 |
| v/c Ratio | 0.92 | 0.78 | 0.65 | 0.92 | 0.50 | 0.80 | 0.82 | 1.00 |
| Control Delay | 66.4 | 24.8 | 33.4 | 44.1 | 25.1 | 43.5 | 49.3 | 48.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.5 |
| Total Delay | 66.4 | 24.8 | 33.4 | 44.1 | 25.1 | 43.5 | 49.3 | 56.8 |
| Queue Length 50th (ft) | 68 | 225 | 38 | 308 | 38 | 266 | 110 | ~331 |
| Queue Length 95th (ft) | #221 | 253 | #103 | #440 | m59 | 327 | #219 | #574 |
| Internal Link Dist (ft) | | 453 | | 381 | | 503 | | 197 |
| Turn Bay Length (ft) | 275 | | 255 | | 345 | | 190 | |
| Base Capacity (vph) | 230 | 1092 | 197 | 1000 | 178 | 972 | 327 | 1265 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 36 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.92 | 0.78 | 0.65 | 0.92 | 0.49 | 0.78 | 0.79 | 1.03 |

### Intersection Summary

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

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

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 195 | 716 | 65 | 119 | 813 | 33 | 80 | 667 | 28 | 236 | 1030 | 134 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 11 | 11 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | | 0% | | | 0% | | | 3% | | | -4% | |
| Total Lost time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1711 | 3364 | | 1709 | 3396 | | 1743 | 3452 | | 1802 | 3541 | |
| Flt Permitted | 0.13 | 1.00 | | 0.17 | 1.00 | | 0.14 | 1.00 | | 0.15 | 1.00 | |
| Satd. Flow (perm) | 229 | 3364 | | 313 | 3396 | | 260 | 3452 | | 289 | 3541 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 212 | 778 | 71 | 129 | 884 | 36 | 87 | 725 | 30 | 257 | 1120 | 146 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 212 | 849 | 0 | 129 | 920 | 0 | 87 | 755 | 0 | 257 | 1266 | 0 |
| Confl. Peds. (#/hr) | 18 | | 30 | 30 | | 18 | 3 | | 64 | 64 | | 3 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 |
| Turn Type | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Actuated Green, G (s) | 40.5 | 31.5 | | 34.5 | 28.5 | | 33.0 | 28.2 | | 45.5 | 35.7 | |
| Effective Green, g (s) | 40.5 | 31.5 | | 34.5 | 28.5 | | 33.0 | 28.2 | | 45.5 | 35.7 | |
| Actuated g/C Ratio | 0.40 | 0.32 | | 0.34 | 0.28 | | 0.33 | 0.28 | | 0.46 | 0.36 | |
| Clearance Time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | |
| Vehicle Extension (s) | 2.0 | 5.0 | | 2.0 | 5.0 | | 2.0 | 5.0 | | 2.0 | 5.0 | |
| Lane Grp Cap (vph) | 226 | 1059 | | 191 | 967 | | 156 | 973 | | 317 | 1264 | |
| v/s Ratio Prot | c0.08 | 0.25 | | 0.04 | 0.27 | | 0.03 | 0.22 | | c0.10 | c0.36 | |
| v/s Ratio Perm | c0.30 | | | 0.19 | | | 0.16 | | | 0.27 | | |
| v/c Ratio | 0.94 | 0.80 | | 0.68 | 0.95 | | 0.56 | 0.78 | | 0.81 | 1.00 | |
| Uniform Delay, d1 | 23.8 | 31.4 | | 24.4 | 35.1 | | 26.7 | 33.0 | | 20.3 | 32.1 | |
| Progression Factor | 1.41 | 0.64 | | 0.86 | 0.82 | | 0.95 | 1.08 | | 1.64 | 0.70 | |
| Incremental Delay, d2 | 36.4 | 5.2 | | 7.0 | 19.0 | | 2.3 | 4.4 | | 12.0 | 23.8 | |
| Delay (s) | 69.9 | 25.3 | | 28.0 | 47.7 | | 27.6 | 39.9 | | 45.3 | 46.3 | |
| Level of Service | E | C | | C | D | | C | D | | D | D | |
| Approach Delay (s) | | 34.2 | | | 45.3 | | | 38.6 | | | 46.1 | |
| Approach LOS | | C | | | D | | | D | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 41.7 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 1.02 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 22.0 |
| Intersection Capacity Utilization | 89.9% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 183 | 116 | 994 | 1463 |
| v/c Ratio | 0.61 | 0.32 | 0.49 | 0.59 |
| Control Delay | 46.5 | 8.9 | 6.2 | 2.5 |
| Queue Delay | 0.0 | 0.0 | 0.1 | 0.1 |
| Total Delay | 46.5 | 8.9 | 6.2 | 2.6 |
| Queue Length 50th (ft) | 106 | 0 | 73 | 49 |
| Queue Length 95th (ft) | 170 | 44 | m119 | 63 |
| Internal Link Dist (ft) | 437 | | 1 | 403 |
| Turn Bay Length (ft) | 150 | | | |
| Base Capacity (vph) | 407 | 453 | 2013 | 2495 |
| Starvation Cap Reductn | 0 | 0 | 114 | 0 |
| Spillback Cap Reductn | 0 | 7 | 0 | 219 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.45 | 0.26 | 0.52 | 0.64 |

Intersection Summary

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 168 | 107 | 36 | 879 | 1266 | 80 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 12 | 12 | 11 | 11 | 11 | 11 |
| Grade (%) | 0% | | | 3% | -3% | |
| Total Lost time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1583 | | 3336 | 3415 | |
| Flt Permitted | 0.95 | 1.00 | | 0.83 | 1.00 | |
| Satd. Flow (perm) | 1770 | 1583 | | 2759 | 3415 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 183 | 116 | 39 | 955 | 1376 | 87 |
| RTOR Reduction (vph) | 0 | 96 | 0 | 0 | 3 | 0 |
| Lane Group Flow (vph) | 183 | 20 | 0 | 994 | 1460 | 0 |
| Confl. Peds. (#/hr) | | 17 | 33 | | | 33 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 4 | 0 | 4 |
| Turn Type | Prot | Prot | pm+pt | NA | NA | |
| Protected Phases | 4 | 4 | 1 | 6 | 2 | |
| Permitted Phases | | 4 | 6 | | | |
| Actuated Green, G (s) | 17.0 | 17.0 | | 73.0 | 73.0 | |
| Effective Green, g (s) | 17.0 | 17.0 | | 73.0 | 73.0 | |
| Actuated g/C Ratio | 0.17 | 0.17 | | 0.73 | 0.73 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | 4.0 | 4.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 300 | 269 | | 2014 | 2492 | |
| v/s Ratio Prot | c0.10 | 0.01 | | | c0.43 | |
| v/s Ratio Perm | | | | 0.36 | | |
| v/c Ratio | 0.61 | 0.07 | | 0.49 | 0.59 | |
| Uniform Delay, d1 | 38.4 | 34.9 | | 5.7 | 6.4 | |
| Progression Factor | 1.00 | 1.00 | | 0.87 | 0.23 | |
| Incremental Delay, d2 | 4.0 | 0.2 | | 0.1 | 0.8 | |
| Delay (s) | 42.5 | 35.0 | | 5.1 | 2.3 | |
| Level of Service | D | D | | A | A | |
| Approach Delay (s) | 39.6 | | | 5.1 | 2.3 | |
| Approach LOS | D | | | A | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 7.4 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.62 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 14.0 |
| Intersection Capacity Utilization | 71.1% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 86 | 238 | 61 | 1022 | 1231 | 150 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 93 | 259 | 66 | 1111 | 1338 | 163 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | 483 | 711 | |
| pX, platoon unblocked | 0.72 | 0.66 | 0.66 | | | |
| vC, conflicting volume | 2108 | 751 | 1501 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 1086 | 0 | 738 | | | |
| tC, single (s) | 6.8 | 6.9 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 30 | 64 | 88 | | | |
| cM capacity (veh/h) | 133 | 718 | 573 | | | |

| Direction, Lane # | EB 1 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 352 | 437 | 741 | 892 | 609 |
| Volume Left | 93 | 66 | 0 | 0 | 0 |
| Volume Right | 259 | 0 | 0 | 0 | 163 |
| cSH | 332 | 573 | 1700 | 1700 | 1700 |
| Volume to Capacity | 1.06 | 0.12 | 0.44 | 0.52 | 0.36 |
| Queue Length 95th (ft) | 321 | 10 | 0 | 0 | 0 |
| Control Delay (s) | 102.8 | 3.4 | 0.0 | 0.0 | 0.0 |
| Lane LOS | F | A | | | |
| Approach Delay (s) | 102.8 | 1.2 | | 0.0 | |
| Approach LOS | F | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 12.4 | | |
| Intersection Capacity Utilization | 98.3% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 157 | 921 | 10 | 6 | 688 | 183 | 15 | 0 | 22 | 103 | 0 | 143 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 171 | 1001 | 11 | 7 | 748 | 199 | 16 | 0 | 24 | 112 | 0 | 155 |
| Pedestrians | | 1 | | | | | | 5 | | | 9 | |
| Lane Width (ft) | | 12.0 | | | | | | 12.0 | | | 12.0 | |
| Walking Speed (ft/s) | | 4.0 | | | | | | 4.0 | | | 4.0 | |
| Percent Blockage | | 0 | | | | | | 0 | | | 1 | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | 461 | | | | | | | | | | |
| pX, platoon unblocked | | | | 0.81 | | | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | |
| vC, conflicting volume | 956 | | | 1017 | | | 1896 | 2322 | 511 | 1735 | 2228 | 483 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 956 | | | 544 | | | 1633 | 2160 | 0 | 1433 | 2043 | 483 |
| 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 % | 76 | | | 99 | | | 46 | 100 | 97 | 0 | 100 | 70 |
| cM capacity (veh/h) | 710 | | | 821 | | | 30 | 28 | 872 | 59 | 33 | 525 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 171 | 667 | 345 | 7 | 499 | 448 | 40 | 267 |
| Volume Left | 171 | 0 | 0 | 7 | 0 | 0 | 16 | 112 |
| Volume Right | 0 | 0 | 11 | 0 | 0 | 199 | 24 | 155 |
| cSH | 710 | 1700 | 1700 | 821 | 1700 | 1700 | 71 | 122 |
| Volume to Capacity | 0.24 | 0.39 | 0.20 | 0.01 | 0.29 | 0.26 | 0.56 | 2.19 |
| Queue Length 95th (ft) | 23 | 0 | 0 | 1 | 0 | 0 | 60 | 565 |
| Control Delay (s) | 11.7 | 0.0 | 0.0 | 9.4 | 0.0 | 0.0 | 107.0 | 619.4 |
| Lane LOS | B | | | A | | | F | F |
| Approach Delay (s) | 1.7 | | | 0.1 | | | 107.0 | 619.4 |
| Approach LOS | | | | | | | F | F |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 70.4 | | |
| Intersection Capacity Utilization | 62.7% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 24 | 1046 | 837 | 11 | 6 | 41 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 26 | 1137 | 910 | 12 | 7 | 45 |
| Pedestrians | | 1 | | | 9 | |
| Lane Width (ft) | | 12.0 | | | 12.0 | |
| Walking Speed (ft/s) | | 4.0 | | | 4.0 | |
| Percent Blockage | | 0 | | | 1 | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | 682 | 1182 | | | |
| pX, platoon unblocked | 0.96 | | | | 0.85 | 0.96 |
| vC, conflicting volume | 931 | | | | 1545 | 471 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 851 | | | | 1082 | 373 |
| tC, single (s) | 4.1 | | | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 97 | | | | 96 | 93 |
| cM capacity (veh/h) | 749 | | | | 172 | 596 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 405 | 758 | 607 | 315 | 51 |
| Volume Left | 26 | 0 | 0 | 0 | 7 |
| Volume Right | 0 | 0 | 0 | 12 | 45 |
| cSH | 749 | 1700 | 1700 | 1700 | 453 |
| Volume to Capacity | 0.03 | 0.45 | 0.36 | 0.19 | 0.11 |
| Queue Length 95th (ft) | 3 | 0 | 0 | 0 | 9 |
| Control Delay (s) | 1.1 | 0.0 | 0.0 | 0.0 | 13.9 |
| Lane LOS | A | | | | B |
| Approach Delay (s) | 0.4 | | 0.0 | | 13.9 |
| Approach LOS | | | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.5 | | |
| Intersection Capacity Utilization | 56.4% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

## 34: N. Washington St & W. Columbia St./E. Columbia St

| Lane Group | EBT | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 219 | 158 | 88 | 1076 | 40 | 1328 |
| v/c Ratio | 0.48 | 0.33 | 0.50 | 0.61 | 0.16 | 0.79 |
| Control Delay | 32.7 | 27.8 | 18.5 | 16.0 | 10.4 | 26.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 32.7 | 27.8 | 18.5 | 16.0 | 10.4 | 26.0 |
| Queue Length 50th (ft) | 111 | 72 | 13 | 296 | 10 | 373 |
| Queue Length 95th (ft) | 185 | 128 | 47 | 347 | 24 | 470 |
| Internal Link Dist (ft) | 910 | 204 | | 631 | | 475 |
| Turn Bay Length (ft) | | | 70 | | 125 | |
| Base Capacity (vph) | 456 | 483 | 175 | 1759 | 247 | 1686 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.48 | 0.33 | 0.50 | 0.61 | 0.16 | 0.79 |

Intersection Summary

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 73 | 107 | 22 | 31 | 85 | 29 | 81 | 933 | 57 | 37 | 1196 | 26 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 13 | 13 | 13 | 12 | 12 | 12 | 10 | 11 | 11 | 10 | 11 | 11 |
| Total Lost time (s) | | 6.0 | | | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | | 0.99 | | | 0.97 | | 1.00 | 0.99 | | 1.00 | 1.00 | |
| Flt Protected | | 0.98 | | | 0.99 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1863 | | | 1793 | | 1652 | 3392 | | 1652 | 3410 | |
| Flt Permitted | | 0.82 | | | 0.90 | | 0.09 | 1.00 | | 0.18 | 1.00 | |
| Satd. Flow (perm) | | 1561 | | | 1637 | | 155 | 3392 | | 308 | 3410 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 79 | 116 | 24 | 34 | 92 | 32 | 88 | 1014 | 62 | 40 | 1300 | 28 |
| RTOR Reduction (vph) | 0 | 4 | 0 | 0 | 9 | 0 | 0 | 4 | 0 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 0 | 215 | 0 | 0 | 149 | 0 | 88 | 1072 | 0 | 40 | 1326 | 0 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 4 |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 4 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 4 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | | 29.0 | | | 29.0 | | 54.2 | 49.4 | | 51.8 | 48.2 | |
| Effective Green, g (s) | | 29.0 | | | 29.0 | | 54.2 | 49.4 | | 51.8 | 48.2 | |
| Actuated g/C Ratio | | 0.29 | | | 0.29 | | 0.54 | 0.49 | | 0.52 | 0.48 | |
| Clearance Time (s) | | 6.0 | | | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 452 | | | 474 | | 155 | 1675 | | 207 | 1643 | |
| v/s Ratio Prot | | | | | | | c0.03 | 0.32 | | 0.01 | c0.39 | |
| v/s Ratio Perm | | c0.14 | | | 0.09 | | 0.28 | | | 0.09 | | |
| v/c Ratio | | 0.48 | | | 0.31 | | 0.57 | 0.64 | | 0.19 | 0.81 | |
| Uniform Delay, d1 | | 29.2 | | | 27.7 | | 16.3 | 18.7 | | 13.3 | 22.0 | |
| Progression Factor | | 1.00 | | | 1.00 | | 0.79 | 0.80 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 3.6 | | | 1.7 | | 4.3 | 1.7 | | 0.5 | 4.4 | |
| Delay (s) | | 32.8 | | | 29.5 | | 17.2 | 16.7 | | 13.8 | 26.3 | |
| Level of Service | | C | | | C | | B | B | | B | C | |
| Approach Delay (s) | | 32.8 | | | 29.5 | | | 16.7 | | | 26.0 | |
| Approach LOS | | C | | | C | | | B | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 23.0 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.68 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 18.0 |
| Intersection Capacity Utilization | 71.0% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 183 | 10 | 31 | 141 | 4 | 28 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 199 | 11 | 34 | 153 | 4 | 30 |
| Pedestrians | | | | 7 | 8 | |
| Lane Width (ft) | | | | 12.0 | 12.0 | |
| Walking Speed (ft/s) | | | | 4.0 | 4.0 | |
| Percent Blockage | | | | 1 | 1 | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | 498 | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 218 | | 433 | 219 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 218 | | 433 | 219 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 97 | | 99 | 96 |
| cM capacity (veh/h) | | | 1343 | | 562 | 810 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 210 | 187 | 35 |
| Volume Left | 0 | 34 | 4 |
| Volume Right | 11 | 0 | 30 |
| cSH | 1700 | 1343 | 768 |
| Volume to Capacity | 0.12 | 0.03 | 0.05 |
| Queue Length 95th (ft) | 0 | 2 | 4 |
| Control Delay (s) | 0.0 | 1.6 | 9.9 |
| Lane LOS | | A | A |
| Approach Delay (s) | 0.0 | 1.6 | 9.9 |
| Approach LOS | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.5 | | |
| Intersection Capacity Utilization | 35.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 0 | 65 | 867 | 34 | 0 | 1396 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 3% | | | -4% |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 0 | 71 | 942 | 37 | 0 | 1517 |
| Pedestrians | 21 | | | | | 1 |
| Lane Width (ft) | 12.0 | | | | | 12.0 |
| Walking Speed (ft/s) | 4.0 | | | | | 4.0 |
| Percent Blockage | 2 | | | | | 0 |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | 398 | | | 61 |
| pX, platoon unblocked | 0.89 | 0.81 | | | 0.81 | |
| vC, conflicting volume | 1741 | 512 | | | 1000 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 635 | 0 | | | 536 | |
| tC, single (s) | 6.8 | 6.9 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 92 | | | 100 | |
| cM capacity (veh/h) | 360 | 864 | | | 820 | |

| Direction, Lane # | WB 1 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 71 | 628 | 351 | 759 | 759 |
| Volume Left | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 71 | 0 | 37 | 0 | 0 |
| cSH | 864 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.08 | 0.37 | 0.21 | 0.45 | 0.45 |
| Queue Length 95th (ft) | 7 | 0 | 0 | 0 | 0 |
| Control Delay (s) | 9.5 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | A | | | | |
| Approach Delay (s) | 9.5 | 0.0 | | 0.0 | |
| Approach LOS | A | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.3 | | |
| Intersection Capacity Utilization | 48.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 0 | 42 | 834 | 38 | 0 | 1363 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 3% | | | -4% |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 0 | 46 | 907 | 41 | 0 | 1482 |
| Pedestrians | 23 | | | | | |
| Lane Width (ft) | 12.0 | | | | | |
| Walking Speed (ft/s) | 4.0 | | | | | |
| Percent Blockage | 2 | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | 277 | | | 182 |
| pX, platoon unblocked | 0.90 | 0.81 | | | 0.81 | |
| vC, conflicting volume | 1691 | 497 | | | 971 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 559 | 0 | | | 480 | |
| tC, single (s) | 6.8 | 6.9 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 95 | | | 100 | |
| cM capacity (veh/h) | 403 | 856 | | | 852 | |

| Direction, Lane # | WB 1 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 46 | 604 | 343 | 741 | 741 |
| Volume Left | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 46 | 0 | 41 | 0 | 0 |
| cSH | 856 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.05 | 0.36 | 0.20 | 0.44 | 0.44 |
| Queue Length 95th (ft) | 4 | 0 | 0 | 0 | 0 |
| Control Delay (s) | 9.4 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | A | | | | |
| Approach Delay (s) | 9.4 | 0.0 | | 0.0 | |
| Approach LOS | A | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.2 | | |
| Intersection Capacity Utilization | 41.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

## 4: S. Washington St/N. Washington St & W. Broad St/E. Broad St

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 197 | 753 | 111 | 739 | 110 | 704 | 313 | 687 |
| v/c Ratio | 0.68 | 0.72 | 0.45 | 0.83 | 0.38 | 0.81 | 0.86 | 0.61 |
| Control Delay | 36.5 | 42.6 | 28.4 | 52.3 | 26.3 | 52.9 | 52.8 | 39.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 |
| Total Delay | 36.5 | 42.6 | 28.4 | 52.3 | 26.3 | 52.9 | 52.8 | 39.2 |
| Queue Length 50th (ft) | 97 | 278 | 52 | 294 | 50 | 281 | 177 | 241 |
| Queue Length 95th (ft) | 188 | 410 | 102 | 426 | 105 | 411 | #431 | 377 |
| Internal Link Dist (ft) | | 453 | | 381 | | 503 | | 175 |
| Turn Bay Length (ft) | 275 | | 255 | | 345 | | 190 | |
| Base Capacity (vph) | 350 | 1808 | 324 | 1676 | 438 | 1722 | 375 | 1715 |
| Starvation Cap Reductn | 0 | 80 | 0 | 0 | 0 | 0 | 0 | 243 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.56 | 0.44 | 0.34 | 0.44 | 0.25 | 0.41 | 0.83 | 0.47 |

### Intersection Summary

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 181 | 621 | 72 | 102 | 624 | 56 | 101 | 621 | 27 | 288 | 469 | 163 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 11 | 11 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | | 0% | | | 0% | | | 3% | | | -4% | |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.98 | | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.96 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1711 | 3358 | | 1709 | 3370 | | 1742 | 3461 | | 1805 | 3452 | |
| Flt Permitted | 0.13 | 1.00 | | 0.23 | 1.00 | | 0.33 | 1.00 | | 0.14 | 1.00 | |
| Satd. Flow (perm) | 242 | 3358 | | 420 | 3370 | | 597 | 3461 | | 260 | 3452 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 197 | 675 | 78 | 111 | 678 | 61 | 110 | 675 | 29 | 313 | 510 | 177 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 197 | 753 | 0 | 111 | 739 | 0 | 110 | 704 | 0 | 313 | 687 | 0 |
| Confl. Peds. (#/hr) | 11 | | 11 | 11 | | 11 | 4 | | 5 | 5 | | 4 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 |
| Turn Type | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Actuated Green, G (s) | 54.5 | 38.9 | | 42.7 | 33.0 | | 41.1 | 31.1 | | 56.7 | 40.7 | |
| Effective Green, g (s) | 54.5 | 38.9 | | 42.7 | 33.0 | | 41.1 | 31.1 | | 56.7 | 40.7 | |
| Actuated g/C Ratio | 0.44 | 0.32 | | 0.35 | 0.27 | | 0.33 | 0.25 | | 0.46 | 0.33 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lane Grp Cap (vph) | 292 | 1059 | | 246 | 901 | | 291 | 872 | | 365 | 1139 | |
| v/s Ratio Prot | c0.09 | c0.22 | | 0.04 | c0.22 | | 0.03 | 0.20 | | c0.14 | 0.20 | |
| v/s Ratio Perm | 0.21 | | | 0.12 | | | 0.10 | | | c0.26 | | |
| v/c Ratio | 0.67 | 0.71 | | 0.45 | 0.82 | | 0.38 | 0.81 | | 0.86 | 0.60 | |
| Uniform Delay, d1 | 25.2 | 37.2 | | 28.9 | 42.4 | | 29.4 | 43.3 | | 29.9 | 34.5 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 4.8 | 1.9 | | 0.5 | 5.8 | | 0.3 | 5.2 | | 17.1 | 0.6 | |
| Delay (s) | 30.0 | 39.1 | | 29.3 | 48.1 | | 29.7 | 48.5 | | 47.0 | 35.2 | |
| Level of Service | C | D | | C | D | | C | D | | D | D | |
| Approach Delay (s) | | 37.2 | | | 45.7 | | | 46.0 | | | 38.9 | |
| Approach LOS | | D | | | D | | | D | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 41.6 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.85 | | |
| Actuated Cycle Length (s) | 123.3 | Sum of lost time (s) | 24.0 |
| Intersection Capacity Utilization | 83.2% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 149 | 62 | 933 | 965 |
| v/c Ratio | 0.38 | 0.15 | 0.48 | 0.64 |
| Control Delay | 20.9 | 6.4 | 8.0 | 15.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 20.9 | 6.4 | 8.0 | 15.8 |
| Queue Length 50th (ft) | 39 | 0 | 60 | 108 |
| Queue Length 95th (ft) | 91 | 24 | 158 | 227 |
| Internal Link Dist (ft) | 437 | | 1 | 403 |
| Turn Bay Length (ft) | 150 | | | |
| Base Capacity (vph) | 713 | 675 | 3023 | 3307 |
| Starvation Cap Reductn | 0 | 0 | 45 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.21 | 0.09 | 0.31 | 0.29 |

Intersection Summary

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 137 | 57 | 39 | 820 | 806 | 82 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 12 | 12 | 11 | 11 | 11 | 11 |
| Grade (%) | 0% | | | 3% | -3% | |
| Total Lost time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1583 | | 3335 | 3417 | |
| Flt Permitted | 0.95 | 1.00 | | 0.89 | 1.00 | |
| Satd. Flow (perm) | 1770 | 1583 | | 2987 | 3417 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 149 | 62 | 42 | 891 | 876 | 89 |
| RTOR Reduction (vph) | 0 | 50 | 0 | 0 | 10 | 0 |
| Lane Group Flow (vph) | 149 | 12 | 0 | 933 | 955 | 0 |
| Confl. Peds. (#/hr) | 3 | | 3 | | | 3 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 4 | 0 | 4 |
| Turn Type | Prot | Perm | pm+pt | NA | NA | |
| Protected Phases | 4 | | 1 | 6 | 2 | |
| Permitted Phases | | 4 | 6 | | | |
| Actuated Green, G (s) | 9.9 | 9.9 | | 33.4 | 23.1 | |
| Effective Green, g (s) | 9.9 | 9.9 | | 33.4 | 23.1 | |
| Actuated g/C Ratio | 0.19 | 0.19 | | 0.63 | 0.43 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | 2.0 | 2.0 | | 1.5 | 1.5 | |
| Lane Grp Cap (vph) | 328 | 294 | | 1906 | 1480 | |
| v/s Ratio Prot | c0.08 | | | c0.05 | c0.28 | |
| v/s Ratio Perm | | 0.01 | | 0.26 | | |
| v/c Ratio | 0.45 | 0.04 | | 0.49 | 0.65 | |
| Uniform Delay, d1 | 19.3 | 17.8 | | 5.4 | 11.9 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.4 | 0.0 | | 0.1 | 0.7 | |
| Delay (s) | 19.7 | 17.8 | | 5.4 | 12.6 | |
| Level of Service | B | B | | A | B | |
| Approach Delay (s) | 19.1 | | | 5.4 | 12.6 | |
| Approach LOS | B | | | A | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 10.1 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.60 | | |
| Actuated Cycle Length (s) | 53.3 | Sum of lost time (s) | 15.0 |
| Intersection Capacity Utilization | 67.4% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 80 | 90 | 79 | 858 | 737 | 90 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 87 | 98 | 86 | 933 | 801 | 98 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | 483 | 711 | |
| pX, platoon unblocked | 0.83 | 0.78 | 0.78 | | | |
| vC, conflicting volume | 1488 | 449 | 899 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 567 | 0 | 295 | | | |
| tC, single (s) | 6.8 | 6.9 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 75 | 88 | 91 | | | |
| cM capacity (veh/h) | 345 | 842 | 981 | | | |

| Direction, Lane # | EB 1 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 185 | 397 | 622 | 534 | 365 |
| Volume Left | 87 | 86 | 0 | 0 | 0 |
| Volume Right | 98 | 0 | 0 | 0 | 98 |
| cSH | 502 | 981 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.37 | 0.09 | 0.37 | 0.31 | 0.21 |
| Queue Length 95th (ft) | 42 | 7 | 0 | 0 | 0 |
| Control Delay (s) | 16.3 | 2.7 | 0.0 | 0.0 | 0.0 |
| Lane LOS | C | A | | | |
| Approach Delay (s) | 16.3 | 1.1 | | 0.0 | |
| Approach LOS | C | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.9 | | |
| Intersection Capacity Utilization | 69.2% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 168 | 825 | 4 | 3 | 642 | 214 | 2 | 1 | 2 | 122 | 0 | 200 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 183 | 897 | 4 | 3 | 698 | 233 | 2 | 1 | 2 | 133 | 0 | 217 |
| Pedestrians | | | | | | | | 4 | | | 7 | |
| Lane Width (ft) | | | | | | | | 12.0 | | | 12.0 | |
| Walking Speed (ft/s) | | | | | | | | 4.0 | | | 4.0 | |
| Percent Blockage | | | | | | | | 0 | | | 1 | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | 461 | | | | | | | | | | |
| pX, platoon unblocked | | | | 0.84 | | | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | |
| vC, conflicting volume | 937 | | | 905 | | | 1841 | 2212 | 455 | 1644 | 2098 | 472 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 937 | | | 511 | | | 1623 | 2064 | 0 | 1389 | 1928 | 472 |
| 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 % | 75 | | | 100 | | | 92 | 97 | 100 | 0 | 100 | 59 |
| cM capacity (veh/h) | 722 | | | 881 | | | 27 | 33 | 910 | 66 | 41 | 535 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 183 | 598 | 303 | 3 | 465 | 465 | 5 | 350 |
| Volume Left | 183 | 0 | 0 | 3 | 0 | 0 | 2 | 133 |
| Volume Right | 0 | 0 | 4 | 0 | 0 | 233 | 2 | 217 |
| cSH | 722 | 1700 | 1700 | 881 | 1700 | 1700 | 47 | 145 |
| Volume to Capacity | 0.25 | 0.35 | 0.18 | 0.00 | 0.27 | 0.27 | 0.12 | 2.41 |
| Queue Length 95th (ft) | 25 | 0 | 0 | 0 | 0 | 0 | 9 | 749 |
| Control Delay (s) | 11.7 | 0.0 | 0.0 | 9.1 | 0.0 | 0.0 | 91.0 | 703.0 |
| Lane LOS | B | | | A | | | F | F |
| Approach Delay (s) | 2.0 | | | 0.0 | | | 91.0 | 703.0 |
| Approach LOS | | | | | | | F | F |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 104.8 | | |
| Intersection Capacity Utilization | 68.2% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 30 | 956 | 824 | 4 | 0 | 35 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 33 | 1039 | 896 | 4 | 0 | 38 |
| Pedestrians | | | | | 6 | |
| Lane Width (ft) | | | | | 12.0 | |
| Walking Speed (ft/s) | | | | | 4.0 | |
| Percent Blockage | | | | | 1 | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | 681 | 1184 | | | |
| pX, platoon unblocked | 0.95 | | | | 0.88 | 0.95 |
| vC, conflicting volume | 906 | | | | 1489 | 456 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 799 | | | | 1043 | 326 |
| tC, single (s) | 4.1 | | | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 96 | | | | 100 | 94 |
| cM capacity (veh/h) | 776 | | | | 189 | 634 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 379 | 693 | 597 | 303 | 38 |
| Volume Left | 33 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 0 | 4 | 38 |
| cSH | 776 | 1700 | 1700 | 1700 | 634 |
| Volume to Capacity | 0.04 | 0.41 | 0.35 | 0.18 | 0.06 |
| Queue Length 95th (ft) | 3 | 0 | 0 | 0 | 5 |
| Control Delay (s) | 1.3 | 0.0 | 0.0 | 0.0 | 11.0 |
| Lane LOS | A | | | | B |
| Approach Delay (s) | 0.5 | | 0.0 | | 11.0 |
| Approach LOS | | | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.5 | | |
| Intersection Capacity Utilization | 58.1% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

## 34: N. Washington St & W. Columbia St./E. Columbia St

| Lane Group | EBT | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 89 | 154 | 67 | 968 | 63 | 913 |
| v/c Ratio | 0.15 | 0.25 | 0.30 | 0.82 | 0.30 | 0.78 |
| Control Delay | 19.7 | 18.9 | 14.6 | 30.7 | 14.8 | 28.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 19.7 | 18.9 | 14.6 | 30.7 | 14.8 | 28.9 |
| Queue Length 50th (ft) | 28 | 47 | 17 | 236 | 16 | 219 |
| Queue Length 95th (ft) | 71 | 108 | 37 | 317 | 35 | 296 |
| Internal Link Dist (ft) | 910 | 204 | | 631 | | 475 |
| Turn Bay Length (ft) | | | 70 | | 125 | |
| Base Capacity (vph) | 595 | 620 | 296 | 2593 | 289 | 2605 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.15 | 0.25 | 0.23 | 0.37 | 0.22 | 0.35 |

Intersection Summary

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 40 | 33 | 9 | 40 | 58 | 44 | 62 | 853 | 38 | 58 | 825 | 15 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 13 | 13 | 13 | 12 | 12 | 12 | 10 | 11 | 11 | 10 | 11 | 11 |
| Total Lost time (s) | | 6.0 | | | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | | 1.00 | | | 0.99 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | | 0.98 | | | 0.96 | | 1.00 | 0.99 | | 1.00 | 1.00 | |
| Flt Protected | | 0.98 | | | 0.99 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1839 | | | 1741 | | 1651 | 3392 | | 1651 | 3410 | |
| Flt Permitted | | 0.82 | | | 0.90 | | 0.16 | 1.00 | | 0.14 | 1.00 | |
| Satd. Flow (perm) | | 1551 | | | 1596 | | 274 | 3392 | | 252 | 3410 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 43 | 36 | 10 | 43 | 63 | 48 | 67 | 927 | 41 | 63 | 897 | 16 |
| RTOR Reduction (vph) | 0 | 3 | 0 | 0 | 12 | 0 | 0 | 3 | 0 | 0 | 1 | 0 |
| Lane Group Flow (vph) | 0 | 86 | 0 | 0 | 142 | 0 | 67 | 965 | 0 | 63 | 912 | 0 |
| Confl. Peds. (#/hr) | 6 | | 11 | 11 | | 6 | 5 | | 12 | 12 | | 5 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 4 |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 4 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 4 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | | 30.6 | | | 30.6 | | 32.9 | 27.8 | | 32.5 | 27.6 | |
| Effective Green, g (s) | | 30.6 | | | 30.6 | | 32.9 | 27.8 | | 32.5 | 27.6 | |
| Actuated g/C Ratio | | 0.38 | | | 0.38 | | 0.40 | 0.34 | | 0.40 | 0.34 | |
| Clearance Time (s) | | 6.0 | | | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | | 2.0 | | | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.5 | |
| Lane Grp Cap (vph) | | 583 | | | 600 | | 197 | 1159 | | 185 | 1157 | |
| v/s Ratio Prot | | | | | | | c0.02 | c0.28 | | 0.02 | 0.27 | |
| v/s Ratio Perm | | 0.06 | | | c0.09 | | 0.12 | | | 0.12 | | |
| v/c Ratio | | 0.15 | | | 0.24 | | 0.34 | 0.83 | | 0.34 | 0.79 | |
| Uniform Delay, d1 | | 16.7 | | | 17.4 | | 16.3 | 24.6 | | 16.8 | 24.2 | |
| Progression Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 0.5 | | | 0.9 | | 0.4 | 5.0 | | 0.4 | 3.5 | |
| Delay (s) | | 17.3 | | | 18.3 | | 16.7 | 29.6 | | 17.2 | 27.7 | |
| Level of Service | | B | | | B | | B | C | | B | C | |
| Approach Delay (s) | | 17.3 | | | 18.3 | | | 28.8 | | | 27.0 | |
| Approach LOS | | B | | | B | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 26.9 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.51 | | |
| Actuated Cycle Length (s) | 81.3 | Sum of lost time (s) | 18.0 |
| Intersection Capacity Utilization | 57.3% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 103 | 8 | 29 | 125 | 1 | 29 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 112 | 9 | 32 | 136 | 1 | 32 |
| Pedestrians | 2 | | | | 4 | |
| Lane Width (ft) | 12.0 | | | | 12.0 | |
| 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) | 535 | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 125 | | 321 | 120 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 125 | | 321 | 120 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 98 | | 100 | 97 |
| cM capacity (veh/h) | | | 1457 | | 655 | 928 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 121 | 167 | 33 |
| Volume Left | 0 | 32 | 1 |
| Volume Right | 9 | 0 | 32 |
| cSH | 1700 | 1457 | 915 |
| Volume to Capacity | 0.07 | 0.02 | 0.04 |
| Queue Length 95th (ft) | 0 | 2 | 3 |
| Control Delay (s) | 0.0 | 1.6 | 9.1 |
| Lane LOS | | A | A |
| Approach Delay (s) | 0.0 | 1.6 | 9.1 |
| Approach LOS | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.7 | | |
| Intersection Capacity Utilization | 24.8% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 0 | 51 | 832 | 35 | 0 | 887 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 3% | | | -4% |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 0 | 55 | 904 | 38 | 0 | 964 |
| Pedestrians | 2 | | | | | |
| Lane Width (ft) | 12.0 | | | | | |
| Walking Speed (ft/s) | 4.0 | | | | | |
| Percent Blockage | 0 | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | 402 | | | 61 |
| pX, platoon unblocked | 0.87 | 0.82 | | | 0.82 | |
| vC, conflicting volume | 1407 | 473 | | | 944 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 244 | 0 | | | 493 | |
| tC, single (s) | 6.8 | 6.9 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 94 | | | 100 | |
| cM capacity (veh/h) | 629 | 888 | | | 873 | |

| Direction, Lane # | WB 1 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 55 | 603 | 339 | 482 | 482 |
| Volume Left | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 55 | 0 | 38 | 0 | 0 |
| cSH | 888 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.06 | 0.35 | 0.20 | 0.28 | 0.28 |
| Queue Length 95th (ft) | 5 | 0 | 0 | 0 | 0 |
| Control Delay (s) | 9.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | A | | | | |
| Approach Delay (s) | 9.3 | 0.0 | | 0.0 | |
| Approach LOS | A | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.3 | | |
| Intersection Capacity Utilization | 34.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 0 | 47 | 795 | 39 | 0 | 859 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 3% | | | -4% |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 0 | 51 | 864 | 42 | 0 | 934 |
| Pedestrians | 6 | | | | | |
| Lane Width (ft) | 12.0 | | | | | |
| Walking Speed (ft/s) | 4.0 | | | | | |
| Percent Blockage | 1 | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | 255 | | | 206 |
| pX, platoon unblocked | 0.88 | 0.81 | | | 0.81 | |
| vC, conflicting volume | 1358 | 459 | | | 913 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 198 | 0 | | | 436 | |
| tC, single (s) | 6.8 | 6.9 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 94 | | | 100 | |
| cM capacity (veh/h) | 679 | 878 | | | 907 | |

| Direction, Lane # | WB 1 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 51 | 576 | 330 | 467 | 467 |
| Volume Left | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 51 | 0 | 42 | 0 | 0 |
| cSH | 878 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.06 | 0.34 | 0.19 | 0.27 | 0.27 |
| Queue Length 95th (ft) | 5 | 0 | 0 | 0 | 0 |
| Control Delay (s) | 9.4 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | A | | | | |
| Approach Delay (s) | 9.4 | 0.0 | | 0.0 | |
| Approach LOS | A | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.3 | | |
| Intersection Capacity Utilization | 33.2% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

# APPENDIX H

INTERSECTION CAPACITY ANALYSIS –

FUTURE WITH DEVELOPMENT CONDITION (2020) SCENARIO 1

## 4: S. Washington St/N. Washington St & W. Broad St/E. Broad St

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 149 | 657 | 66 | 868 | 72 | 1099 | 163 | 620 |
| v/c Ratio | 0.84 | 0.58 | 0.26 | 0.83 | 0.22 | 0.99 | 0.69 | 0.47 |
| Control Delay | 70.7 | 38.1 | 13.3 | 32.0 | 16.1 | 52.8 | 33.5 | 21.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 70.7 | 38.1 | 13.3 | 32.0 | 16.1 | 52.8 | 33.5 | 21.0 |
| Queue Length 50th (ft) | 83 | 205 | 15 | 276 | 20 | 214 | 55 | 157 |
| Queue Length 95th (ft) | m#166 | 205 | 31 | #379 | m50 | #485 | #135 | 190 |
| Internal Link Dist (ft) | | 453 | | 375 | | 503 | | 144 |
| Turn Bay Length (ft) | 275 | | 255 | | 345 | | 190 | |
| Base Capacity (vph) | 178 | 1129 | 262 | 1046 | 327 | 1111 | 254 | 1323 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.84 | 0.58 | 0.25 | 0.83 | 0.22 | 0.99 | 0.64 | 0.47 |

### Intersection Summary

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

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 137 | 575 | 29 | 61 | 731 | 67 | 66 | 992 | 19 | 150 | 489 | 81 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 11 | 11 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | | 0% | | | 0% | | | 3% | | | -4% | |
| Total Lost time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 1.00 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1710 | 3392 | | 1708 | 3370 | | 1742 | 3474 | | 1805 | 3525 | |
| Flt Permitted | 0.13 | 1.00 | | 0.28 | 1.00 | | 0.37 | 1.00 | | 0.11 | 1.00 | |
| Satd. Flow (perm) | 231 | 3392 | | 502 | 3370 | | 677 | 3474 | | 204 | 3525 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 149 | 625 | 32 | 66 | 795 | 73 | 72 | 1078 | 21 | 163 | 532 | 88 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 149 | 657 | 0 | 66 | 868 | 0 | 72 | 1099 | 0 | 163 | 620 | 0 |
| Confl. Peds. (#/hr) | 13 | | 12 | 12 | | 13 | 3 | | 16 | 16 | | 3 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 |
| Turn Type | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Actuated Green, G (s) | 37.2 | 31.2 | | 34.8 | 30.0 | | 37.9 | 33.1 | | 46.1 | 37.2 | |
| Effective Green, g (s) | 37.2 | 31.2 | | 34.8 | 30.0 | | 37.9 | 33.1 | | 46.1 | 37.2 | |
| Actuated g/C Ratio | 0.37 | 0.31 | | 0.35 | 0.30 | | 0.38 | 0.33 | | 0.46 | 0.37 | |
| Clearance Time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | |
| Vehicle Extension (s) | 2.0 | 5.0 | | 2.0 | 5.0 | | 2.0 | 5.0 | | 2.0 | 5.0 | |
| Lane Grp Cap (vph) | 174 | 1058 | | 232 | 1011 | | 307 | 1149 | | 236 | 1311 | |
| v/s Ratio Prot | c0.05 | 0.19 | | 0.01 | 0.26 | | 0.01 | c0.32 | | c0.06 | 0.18 | |
| v/s Ratio Perm | c0.27 | | | 0.09 | | | 0.08 | | | 0.26 | | |
| v/c Ratio | 0.86 | 0.62 | | 0.28 | 0.86 | | 0.23 | 0.96 | | 0.69 | 0.47 | |
| Uniform Delay, d1 | 24.0 | 29.4 | | 22.6 | 33.0 | | 20.2 | 32.7 | | 21.2 | 23.9 | |
| Progression Factor | 1.87 | 1.25 | | 0.63 | 0.75 | | 0.98 | 0.81 | | 1.03 | 0.80 | |
| Incremental Delay, d2 | 28.2 | 2.5 | | 0.2 | 8.8 | | 0.1 | 16.8 | | 6.7 | 0.6 | |
| Delay (s) | 73.1 | 39.1 | | 14.4 | 33.4 | | 19.9 | 43.4 | | 28.6 | 19.8 | |
| Level of Service | E | D | | B | C | | B | D | | C | B | |
| Approach Delay (s) | | 45.4 | | | 32.1 | | | 42.0 | | | 21.6 | |
| Approach LOS | | D | | | C | | | D | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 35.9 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.89 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 22.0 |
| Intersection Capacity Utilization | 84.7% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 64 | 761 | 36 | 17 | 879 | 107 | 4 | 0 | 13 | 46 | 0 | 113 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 70 | 827 | 39 | 18 | 955 | 116 | 4 | 0 | 14 | 50 | 0 | 123 |
| Pedestrians | | | | | | | | 4 | | | 4 | |
| Lane Width (ft) | | | | | | | | 12.0 | | | 12.0 | |
| 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) | | 460 | | | | | | | | | | |
| pX, platoon unblocked | | | | 0.86 | | | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | |
| vC, conflicting volume | 1076 | | | 870 | | | 1627 | 2103 | 437 | 1621 | 2064 | 540 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 1076 | | | 515 | | | 1398 | 1953 | 9 | 1391 | 1908 | 540 |
| 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 % | 89 | | | 98 | | | 92 | 100 | 98 | 35 | 100 | 75 |
| cM capacity (veh/h) | 642 | | | 894 | | | 57 | 47 | 914 | 77 | 50 | 485 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 70 | 551 | 315 | 18 | 637 | 435 | 18 | 173 |
| Volume Left | 70 | 0 | 0 | 18 | 0 | 0 | 4 | 50 |
| Volume Right | 0 | 0 | 39 | 0 | 0 | 116 | 14 | 123 |
| cSH | 642 | 1700 | 1700 | 894 | 1700 | 1700 | 203 | 191 |
| Volume to Capacity | 0.11 | 0.32 | 0.19 | 0.02 | 0.37 | 0.26 | 0.09 | 0.91 |
| Queue Length 95th (ft) | 9 | 0 | 0 | 2 | 0 | 0 | 7 | 175 |
| Control Delay (s) | 11.3 | 0.0 | 0.0 | 9.1 | 0.0 | 0.0 | 24.5 | 92.8 |
| Lane LOS | B | | | A | | | C | F |
| Approach Delay (s) | 0.8 | | | 0.2 | | | 24.5 | 92.8 |
| Approach LOS | | | | | | | C | F |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 7.9 | | |
| Intersection Capacity Utilization | 55.0% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 99 | 55 | 1364 | 804 |
| v/c Ratio | 0.52 | 0.25 | 0.62 | 0.28 |
| Control Delay | 50.8 | 13.7 | 5.8 | 2.7 |
| Queue Delay | 0.0 | 0.0 | 10.9 | 0.0 |
| Total Delay | 50.8 | 13.7 | 16.6 | 2.7 |
| Queue Length 50th (ft) | 61 | 0 | 91 | 42 |
| Queue Length 95th (ft) | 108 | 34 | m104 | 95 |
| Internal Link Dist (ft) | 437 | | 1 | 403 |
| Turn Bay Length (ft) | 150 | | | |
| Base Capacity (vph) | 336 | 340 | 2215 | 2854 |
| Starvation Cap Reductn | 0 | 0 | 838 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.29 | 0.16 | 0.99 | 0.28 |

Intersection Summary

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 91 | 51 | 98 | 1156 | 651 | 88 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 12 | 12 | 11 | 11 | 11 | 11 |
| Grade (%) | 0% | | | 3% | -3% | |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 0.98 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1559 | | 3328 | 3391 | |
| Flt Permitted | 0.95 | 1.00 | | 0.79 | 1.00 | |
| Satd. Flow (perm) | 1770 | 1559 | | 2636 | 3391 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 99 | 55 | 107 | 1257 | 708 | 96 |
| RTOR Reduction (vph) | 0 | 50 | 0 | 0 | 5 | 0 |
| Lane Group Flow (vph) | 99 | 5 | 0 | 1364 | 799 | 0 |
| Confl. Peds. (#/hr) | 2 | 2 | 9 | | | 9 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 4 | 0 | 4 |
| Turn Type | Prot | Perm | custom | NA | NA | |
| Protected Phases | 4 | | 1 | 6 | 2 | |
| Permitted Phases | | 4 | 1 | | | |
| Actuated Green, G (s) | 9.6 | 9.6 | | 82.4 | 82.4 | |
| Effective Green, g (s) | 9.6 | 9.6 | | 82.4 | 82.4 | |
| Actuated g/C Ratio | 0.10 | 0.10 | | 0.82 | 0.82 | |
| Clearance Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 169 | 149 | | 2172 | 2794 | |
| v/s Ratio Prot | c0.06 | | | | 0.24 | |
| v/s Ratio Perm | | 0.00 | | c0.52 | | |
| v/c Ratio | 0.59 | 0.04 | | 0.63 | 0.29 | |
| Uniform Delay, d1 | 43.3 | 41.0 | | 3.2 | 2.0 | |
| Progression Factor | 1.00 | 1.00 | | 1.29 | 1.05 | |
| Incremental Delay, d2 | 5.1 | 0.1 | | 0.3 | 0.2 | |
| Delay (s) | 48.4 | 41.1 | | 4.4 | 2.4 | |
| Level of Service | D | D | | A | A | |
| Approach Delay (s) | 45.8 | | | 4.4 | 2.4 | |
| Approach LOS | D | | | A | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 6.4 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.65 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 71.3% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 0 | 50 | 1212 | 12 | 0 | 708 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 3% | | | -4% |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 0 | 54 | 1317 | 13 | 0 | 770 |
| Pedestrians | 12 | | | | | |
| Lane Width (ft) | 12.0 | | | | | |
| Walking Speed (ft/s) | 4.0 | | | | | |
| Percent Blockage | 1 | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | 368 | | | 61 |
| pX, platoon unblocked | 0.72 | 0.69 | | | 0.69 | |
| vC, conflicting volume | 1721 | 677 | | | 1342 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 899 | 0 | | | 605 | |
| tC, single (s) | 6.8 | 6.9 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 93 | | | 100 | |
| cM capacity (veh/h) | 198 | 743 | | | 664 | |

| Direction, Lane # | WB 1 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 54 | 878 | 452 | 385 | 385 |
| Volume Left | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 54 | 0 | 13 | 0 | 0 |
| cSH | 743 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.07 | 0.52 | 0.27 | 0.23 | 0.23 |
| Queue Length 95th (ft) | 6 | 0 | 0 | 0 | 0 |
| Control Delay (s) | 10.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | B | | | | |
| Approach Delay (s) | 10.2 | 0.0 | | 0.0 | |
| Approach LOS | B | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.3 | | |
| Intersection Capacity Utilization | 43.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

## 4: S. Washington St/N. Washington St & W. Broad St/E. Broad St

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 212 | 849 | 129 | 920 | 87 | 755 | 257 | 1266 |
| v/c Ratio | 0.92 | 0.78 | 0.65 | 0.92 | 0.50 | 0.80 | 0.82 | 1.00 |
| Control Delay | 66.4 | 24.8 | 33.4 | 44.1 | 25.1 | 43.5 | 49.3 | 48.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.5 |
| Total Delay | 66.4 | 24.8 | 33.4 | 44.1 | 25.1 | 43.5 | 49.3 | 56.8 |
| Queue Length 50th (ft) | 68 | 225 | 38 | 308 | 38 | 266 | 110 | ~331 |
| Queue Length 95th (ft) | #221 | 253 | #103 | #440 | m59 | 327 | #219 | #574 |
| Internal Link Dist (ft) | | 453 | | 381 | | 503 | | 197 |
| Turn Bay Length (ft) | 275 | | 255 | | 345 | | 190 | |
| Base Capacity (vph) | 230 | 1092 | 197 | 1000 | 178 | 972 | 327 | 1265 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 36 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.92 | 0.78 | 0.65 | 0.92 | 0.49 | 0.78 | 0.79 | 1.03 |

### Intersection Summary

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

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

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 195 | 716 | 65 | 119 | 813 | 33 | 80 | 667 | 28 | 236 | 1030 | 134 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 11 | 11 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | | 0% | | | 0% | | | 3% | | | -4% | |
| Total Lost time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1711 | 3364 | | 1709 | 3396 | | 1743 | 3452 | | 1802 | 3541 | |
| Flt Permitted | 0.13 | 1.00 | | 0.17 | 1.00 | | 0.14 | 1.00 | | 0.15 | 1.00 | |
| Satd. Flow (perm) | 229 | 3364 | | 313 | 3396 | | 260 | 3452 | | 289 | 3541 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 212 | 778 | 71 | 129 | 884 | 36 | 87 | 725 | 30 | 257 | 1120 | 146 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 212 | 849 | 0 | 129 | 920 | 0 | 87 | 755 | 0 | 257 | 1266 | 0 |
| Confl. Peds. (#/hr) | 18 | | 30 | 30 | | 18 | 3 | | 64 | 64 | | 3 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 |
| Turn Type | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Actuated Green, G (s) | 40.5 | 31.5 | | 34.5 | 28.5 | | 33.0 | 28.2 | | 45.5 | 35.7 | |
| Effective Green, g (s) | 40.5 | 31.5 | | 34.5 | 28.5 | | 33.0 | 28.2 | | 45.5 | 35.7 | |
| Actuated g/C Ratio | 0.40 | 0.32 | | 0.34 | 0.28 | | 0.33 | 0.28 | | 0.46 | 0.36 | |
| Clearance Time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | |
| Vehicle Extension (s) | 2.0 | 5.0 | | 2.0 | 5.0 | | 2.0 | 5.0 | | 2.0 | 5.0 | |
| Lane Grp Cap (vph) | 226 | 1059 | | 191 | 967 | | 156 | 973 | | 317 | 1264 | |
| v/s Ratio Prot | c0.08 | 0.25 | | 0.04 | 0.27 | | 0.03 | 0.22 | | c0.10 | c0.36 | |
| v/s Ratio Perm | c0.30 | | | 0.19 | | | 0.16 | | | 0.27 | | |
| v/c Ratio | 0.94 | 0.80 | | 0.68 | 0.95 | | 0.56 | 0.78 | | 0.81 | 1.00 | |
| Uniform Delay, d1 | 23.8 | 31.4 | | 24.4 | 35.1 | | 26.7 | 33.0 | | 20.3 | 32.1 | |
| Progression Factor | 1.41 | 0.64 | | 0.86 | 0.82 | | 0.95 | 1.08 | | 1.64 | 0.70 | |
| Incremental Delay, d2 | 36.4 | 5.2 | | 7.0 | 19.0 | | 2.3 | 4.4 | | 12.0 | 23.8 | |
| Delay (s) | 69.9 | 25.3 | | 28.0 | 47.7 | | 27.6 | 39.9 | | 45.3 | 46.3 | |
| Level of Service | E | C | | C | D | | C | D | | D | D | |
| Approach Delay (s) | | 34.2 | | | 45.3 | | | 38.6 | | | 46.1 | |
| Approach LOS | | C | | | D | | | D | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 41.7 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 1.02 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 22.0 |
| Intersection Capacity Utilization | 89.9% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 157 | 921 | 10 | 6 | 688 | 183 | 15 | 0 | 22 | 103 | 0 | 143 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 171 | 1001 | 11 | 7 | 748 | 199 | 16 | 0 | 24 | 112 | 0 | 155 |
| Pedestrians | | 1 | | | | | | 5 | | | 9 | |
| Lane Width (ft) | | 12.0 | | | | | | 12.0 | | | 12.0 | |
| Walking Speed (ft/s) | | 4.0 | | | | | | 4.0 | | | 4.0 | |
| Percent Blockage | | 0 | | | | | | 0 | | | 1 | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | 461 | | | | | | | | | | |
| pX, platoon unblocked | | | | 0.81 | | | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | |
| vC, conflicting volume | 956 | | | 1017 | | | 1896 | 2322 | 511 | 1735 | 2228 | 483 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 956 | | | 544 | | | 1633 | 2160 | 0 | 1433 | 2043 | 483 |
| 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 % | 76 | | | 99 | | | 46 | 100 | 97 | 0 | 100 | 70 |
| cM capacity (veh/h) | 710 | | | 821 | | | 30 | 28 | 872 | 59 | 33 | 525 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 171 | 667 | 345 | 7 | 499 | 448 | 40 | 267 |
| Volume Left | 171 | 0 | 0 | 7 | 0 | 0 | 16 | 112 |
| Volume Right | 0 | 0 | 11 | 0 | 0 | 199 | 24 | 155 |
| cSH | 710 | 1700 | 1700 | 821 | 1700 | 1700 | 71 | 122 |
| Volume to Capacity | 0.24 | 0.39 | 0.20 | 0.01 | 0.29 | 0.26 | 0.56 | 2.19 |
| Queue Length 95th (ft) | 23 | 0 | 0 | 1 | 0 | 0 | 60 | 565 |
| Control Delay (s) | 11.7 | 0.0 | 0.0 | 9.4 | 0.0 | 0.0 | 107.0 | 619.4 |
| Lane LOS | B | | | A | | | F | F |
| Approach Delay (s) | 1.7 | | | 0.1 | | | 107.0 | 619.4 |
| Approach LOS | | | | | | | F | F |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 70.4 | | |
| Intersection Capacity Utilization | 62.7% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 183 | 116 | 994 | 1463 |
| v/c Ratio | 0.61 | 0.32 | 0.49 | 0.59 |
| Control Delay | 46.5 | 8.9 | 6.2 | 2.5 |
| Queue Delay | 0.0 | 0.0 | 0.1 | 0.1 |
| Total Delay | 46.5 | 8.9 | 6.2 | 2.6 |
| Queue Length 50th (ft) | 106 | 0 | 73 | 49 |
| Queue Length 95th (ft) | 170 | 44 | m119 | 63 |
| Internal Link Dist (ft) | 437 | | 1 | 403 |
| Turn Bay Length (ft) | 150 | | | |
| Base Capacity (vph) | 407 | 453 | 2013 | 2495 |
| Starvation Cap Reductn | 0 | 0 | 114 | 0 |
| Spillback Cap Reductn | 0 | 7 | 0 | 219 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.45 | 0.26 | 0.52 | 0.64 |

Intersection Summary

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 168 | 107 | 36 | 879 | 1266 | 80 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 12 | 12 | 11 | 11 | 11 | 11 |
| Grade (%) | 0% | | | 3% | -3% | |
| Total Lost time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1583 | | 3336 | 3415 | |
| Flt Permitted | 0.95 | 1.00 | | 0.83 | 1.00 | |
| Satd. Flow (perm) | 1770 | 1583 | | 2759 | 3415 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 183 | 116 | 39 | 955 | 1376 | 87 |
| RTOR Reduction (vph) | 0 | 96 | 0 | 0 | 3 | 0 |
| Lane Group Flow (vph) | 183 | 20 | 0 | 994 | 1460 | 0 |
| Confl. Peds. (#/hr) | | 17 | 33 | | | 33 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 4 | 0 | 4 |
| Turn Type | Prot | Prot | pm+pt | NA | NA | |
| Protected Phases | 4 | 4 | 1 | 6 | 2 | |
| Permitted Phases | | 4 | 6 | | | |
| Actuated Green, G (s) | 17.0 | 17.0 | | 73.0 | 73.0 | |
| Effective Green, g (s) | 17.0 | 17.0 | | 73.0 | 73.0 | |
| Actuated g/C Ratio | 0.17 | 0.17 | | 0.73 | 0.73 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | 4.0 | 4.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 300 | 269 | | 2014 | 2492 | |
| v/s Ratio Prot | c0.10 | 0.01 | | | c0.43 | |
| v/s Ratio Perm | | | | 0.36 | | |
| v/c Ratio | 0.61 | 0.07 | | 0.49 | 0.59 | |
| Uniform Delay, d1 | 38.4 | 34.9 | | 5.7 | 6.4 | |
| Progression Factor | 1.00 | 1.00 | | 0.87 | 0.23 | |
| Incremental Delay, d2 | 4.0 | 0.2 | | 0.1 | 0.8 | |
| Delay (s) | 42.5 | 35.0 | | 5.1 | 2.3 | |
| Level of Service | D | D | | A | A | |
| Approach Delay (s) | 39.6 | | | 5.1 | 2.3 | |
| Approach LOS | D | | | A | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 7.4 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.62 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 14.0 |
| Intersection Capacity Utilization | 71.1% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 0 | 65 | 867 | 34 | 0 | 1396 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 3% | | | -4% |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 0 | 71 | 942 | 37 | 0 | 1517 |
| Pedestrians | 21 | | | | | 1 |
| Lane Width (ft) | 12.0 | | | | | 12.0 |
| Walking Speed (ft/s) | 4.0 | | | | | 4.0 |
| Percent Blockage | 2 | | | | | 0 |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | 398 | | | 61 |
| pX, platoon unblocked | 0.89 | 0.81 | | | 0.81 | |
| vC, conflicting volume | 1741 | 512 | | | 1000 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 635 | 0 | | | 536 | |
| tC, single (s) | 6.8 | 6.9 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 92 | | | 100 | |
| cM capacity (veh/h) | 360 | 864 | | | 820 | |

| Direction, Lane # | WB 1 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 71 | 628 | 351 | 759 | 759 |
| Volume Left | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 71 | 0 | 37 | 0 | 0 |
| cSH | 864 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.08 | 0.37 | 0.21 | 0.45 | 0.45 |
| Queue Length 95th (ft) | 7 | 0 | 0 | 0 | 0 |
| Control Delay (s) | 9.5 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | A | | | | |
| Approach Delay (s) | 9.5 | 0.0 | | 0.0 | |
| Approach LOS | A | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.3 | | |
| Intersection Capacity Utilization | 48.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

## 4: S. Washington St/N. Washington St & W. Broad St/E. Broad St

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 197 | 753 | 111 | 739 | 110 | 704 | 313 | 687 |
| v/c Ratio | 0.68 | 0.72 | 0.45 | 0.83 | 0.38 | 0.81 | 0.86 | 0.61 |
| Control Delay | 36.5 | 42.6 | 28.4 | 52.3 | 26.3 | 52.9 | 52.8 | 39.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 |
| Total Delay | 36.5 | 42.6 | 28.4 | 52.3 | 26.3 | 52.9 | 52.8 | 39.2 |
| Queue Length 50th (ft) | 97 | 278 | 52 | 294 | 50 | 281 | 177 | 241 |
| Queue Length 95th (ft) | 188 | 410 | 102 | 426 | 105 | 411 | #431 | 377 |
| Internal Link Dist (ft) | | 453 | | 381 | | 503 | | 175 |
| Turn Bay Length (ft) | 275 | | 255 | | 345 | | 190 | |
| Base Capacity (vph) | 350 | 1808 | 324 | 1676 | 438 | 1722 | 375 | 1715 |
| Starvation Cap Reductn | 0 | 80 | 0 | 0 | 0 | 0 | 0 | 243 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.56 | 0.44 | 0.34 | 0.44 | 0.25 | 0.41 | 0.83 | 0.47 |

### Intersection Summary

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 181 | 621 | 72 | 102 | 624 | 56 | 101 | 621 | 27 | 288 | 469 | 163 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 11 | 11 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | | 0% | | | 0% | | | 3% | | | -4% | |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.98 | | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.96 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1711 | 3358 | | 1709 | 3370 | | 1742 | 3461 | | 1805 | 3452 | |
| Flt Permitted | 0.13 | 1.00 | | 0.23 | 1.00 | | 0.33 | 1.00 | | 0.14 | 1.00 | |
| Satd. Flow (perm) | 242 | 3358 | | 420 | 3370 | | 597 | 3461 | | 260 | 3452 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 197 | 675 | 78 | 111 | 678 | 61 | 110 | 675 | 29 | 313 | 510 | 177 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 197 | 753 | 0 | 111 | 739 | 0 | 110 | 704 | 0 | 313 | 687 | 0 |
| Confl. Peds. (#/hr) | 11 | | 11 | 11 | | 11 | 4 | | 5 | 5 | | 4 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 |
| Turn Type | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Actuated Green, G (s) | 54.5 | 38.9 | | 42.7 | 33.0 | | 41.1 | 31.1 | | 56.7 | 40.7 | |
| Effective Green, g (s) | 54.5 | 38.9 | | 42.7 | 33.0 | | 41.1 | 31.1 | | 56.7 | 40.7 | |
| Actuated g/C Ratio | 0.44 | 0.32 | | 0.35 | 0.27 | | 0.33 | 0.25 | | 0.46 | 0.33 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lane Grp Cap (vph) | 292 | 1059 | | 246 | 901 | | 291 | 872 | | 365 | 1139 | |
| v/s Ratio Prot | c0.09 | c0.22 | | 0.04 | c0.22 | | 0.03 | 0.20 | | c0.14 | 0.20 | |
| v/s Ratio Perm | 0.21 | | | 0.12 | | | 0.10 | | | c0.26 | | |
| v/c Ratio | 0.67 | 0.71 | | 0.45 | 0.82 | | 0.38 | 0.81 | | 0.86 | 0.60 | |
| Uniform Delay, d1 | 25.2 | 37.2 | | 28.9 | 42.4 | | 29.4 | 43.3 | | 29.9 | 34.5 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 4.8 | 1.9 | | 0.5 | 5.8 | | 0.3 | 5.2 | | 17.1 | 0.6 | |
| Delay (s) | 30.0 | 39.1 | | 29.3 | 48.1 | | 29.7 | 48.5 | | 47.0 | 35.2 | |
| Level of Service | C | D | | C | D | | C | D | | D | D | |
| Approach Delay (s) | | 37.2 | | | 45.7 | | | 46.0 | | | 38.9 | |
| Approach LOS | | D | | | D | | | D | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 41.6 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.85 | | |
| Actuated Cycle Length (s) | 123.3 | Sum of lost time (s) | 24.0 |
| Intersection Capacity Utilization | 83.2% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 168 | 825 | 4 | 3 | 642 | 214 | 2 | 1 | 2 | 122 | 0 | 200 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 183 | 897 | 4 | 3 | 698 | 233 | 2 | 1 | 2 | 133 | 0 | 217 |
| Pedestrians | | | | | | | | 4 | | | 7 | |
| Lane Width (ft) | | | | | | | | 12.0 | | | 12.0 | |
| Walking Speed (ft/s) | | | | | | | | 4.0 | | | 4.0 | |
| Percent Blockage | | | | | | | | 0 | | | 1 | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | 461 | | | | | | | | | | |
| pX, platoon unblocked | | | | 0.84 | | | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | |
| vC, conflicting volume | 937 | | | 905 | | | 1841 | 2212 | 455 | 1644 | 2098 | 472 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 937 | | | 511 | | | 1623 | 2064 | 0 | 1389 | 1928 | 472 |
| 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 % | 75 | | | 100 | | | 92 | 97 | 100 | 0 | 100 | 59 |
| cM capacity (veh/h) | 722 | | | 881 | | | 27 | 33 | 910 | 66 | 41 | 535 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 183 | 598 | 303 | 3 | 465 | 465 | 5 | 350 |
| Volume Left | 183 | 0 | 0 | 3 | 0 | 0 | 2 | 133 |
| Volume Right | 0 | 0 | 4 | 0 | 0 | 233 | 2 | 217 |
| cSH | 722 | 1700 | 1700 | 881 | 1700 | 1700 | 47 | 145 |
| Volume to Capacity | 0.25 | 0.35 | 0.18 | 0.00 | 0.27 | 0.27 | 0.12 | 2.41 |
| Queue Length 95th (ft) | 25 | 0 | 0 | 0 | 0 | 0 | 9 | 749 |
| Control Delay (s) | 11.7 | 0.0 | 0.0 | 9.1 | 0.0 | 0.0 | 91.0 | 703.0 |
| Lane LOS | B | | | A | | | F | F |
| Approach Delay (s) | 2.0 | | | 0.0 | | | 91.0 | 703.0 |
| Approach LOS | | | | | | | F | F |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 104.8 | | |
| Intersection Capacity Utilization | 68.2% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 149 | 62 | 933 | 965 |
| v/c Ratio | 0.38 | 0.15 | 0.48 | 0.64 |
| Control Delay | 20.9 | 6.4 | 8.0 | 15.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 20.9 | 6.4 | 8.0 | 15.8 |
| Queue Length 50th (ft) | 39 | 0 | 60 | 108 |
| Queue Length 95th (ft) | 91 | 24 | 158 | 227 |
| Internal Link Dist (ft) | 437 | | 1 | 403 |
| Turn Bay Length (ft) | 150 | | | |
| Base Capacity (vph) | 713 | 675 | 3023 | 3307 |
| Starvation Cap Reductn | 0 | 0 | 45 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.21 | 0.09 | 0.31 | 0.29 |

Intersection Summary

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 137 | 57 | 39 | 820 | 806 | 82 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 12 | 12 | 11 | 11 | 11 | 11 |
| Grade (%) | 0% | | | 3% | -3% | |
| Total Lost time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1583 | | 3335 | 3417 | |
| Flt Permitted | 0.95 | 1.00 | | 0.89 | 1.00 | |
| Satd. Flow (perm) | 1770 | 1583 | | 2987 | 3417 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 149 | 62 | 42 | 891 | 876 | 89 |
| RTOR Reduction (vph) | 0 | 50 | 0 | 0 | 10 | 0 |
| Lane Group Flow (vph) | 149 | 12 | 0 | 933 | 955 | 0 |
| Confl. Peds. (#/hr) | 3 | | 3 | | | 3 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 4 | 0 | 4 |
| Turn Type | Prot | Perm | pm+pt | NA | NA | |
| Protected Phases | 4 | | 1 | 6 | 2 | |
| Permitted Phases | | 4 | 6 | | | |
| Actuated Green, G (s) | 9.9 | 9.9 | | 33.4 | 23.1 | |
| Effective Green, g (s) | 9.9 | 9.9 | | 33.4 | 23.1 | |
| Actuated g/C Ratio | 0.19 | 0.19 | | 0.63 | 0.43 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | 2.0 | 2.0 | | 1.5 | 1.5 | |
| Lane Grp Cap (vph) | 328 | 294 | | 1906 | 1480 | |
| v/s Ratio Prot | c0.08 | | | c0.05 | c0.28 | |
| v/s Ratio Perm | | 0.01 | | 0.26 | | |
| v/c Ratio | 0.45 | 0.04 | | 0.49 | 0.65 | |
| Uniform Delay, d1 | 19.3 | 17.8 | | 5.4 | 11.9 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.4 | 0.0 | | 0.1 | 0.7 | |
| Delay (s) | 19.7 | 17.8 | | 5.4 | 12.6 | |
| Level of Service | B | B | | A | B | |
| Approach Delay (s) | 19.1 | | | 5.4 | 12.6 | |
| Approach LOS | B | | | A | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 10.1 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.60 | | |
| Actuated Cycle Length (s) | 53.3 | Sum of lost time (s) | 15.0 |
| Intersection Capacity Utilization | 67.4% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 0 | 51 | 832 | 35 | 0 | 887 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 3% | | | -4% |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 0 | 55 | 904 | 38 | 0 | 964 |
| Pedestrians | 2 | | | | | |
| Lane Width (ft) | 12.0 | | | | | |
| Walking Speed (ft/s) | 4.0 | | | | | |
| Percent Blockage | 0 | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | 402 | | | 61 |
| pX, platoon unblocked | 0.87 | 0.82 | | | 0.82 | |
| vC, conflicting volume | 1407 | 473 | | | 944 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 244 | 0 | | | 493 | |
| tC, single (s) | 6.8 | 6.9 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 94 | | | 100 | |
| cM capacity (veh/h) | 629 | 888 | | | 873 | |

| Direction, Lane # | WB 1 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 55 | 603 | 339 | 482 | 482 |
| Volume Left | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 55 | 0 | 38 | 0 | 0 |
| cSH | 888 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.06 | 0.35 | 0.20 | 0.28 | 0.28 |
| Queue Length 95th (ft) | 5 | 0 | 0 | 0 | 0 |
| Control Delay (s) | 9.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | A | | | | |
| Approach Delay (s) | 9.3 | 0.0 | | 0.0 | |
| Approach LOS | A | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.3 | | |
| Intersection Capacity Utilization | 34.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

# APPENDIX I

INTERSECTION CAPACITY ANALYSIS –

FUTURE WITH DEVELOPMENT CONDITION (2020) SCENARIO 2

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 149 | 657 | 66 | 868 | 72 | 1099 | 163 | 620 |
| v/c Ratio | 0.84 | 0.58 | 0.26 | 0.83 | 0.22 | 0.99 | 0.69 | 0.47 |
| Control Delay | 70.7 | 38.1 | 11.6 | 24.3 | 16.1 | 52.8 | 33.5 | 21.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 70.7 | 38.1 | 11.6 | 24.3 | 16.1 | 52.8 | 33.5 | 21.0 |
| Queue Length 50th (ft) | 83 | 205 | 10 | 103 | 20 | 214 | 55 | 157 |
| Queue Length 95th (ft) | m#166 | 205 | m21 | #261 | m50 | #485 | #135 | 190 |
| Internal Link Dist (ft) | | 453 | | 375 | | 503 | | 144 |
| Turn Bay Length (ft) | 275 | | 255 | | 345 | | 190 | |
| Base Capacity (vph) | 178 | 1129 | 262 | 1046 | 327 | 1111 | 254 | 1323 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.84 | 0.58 | 0.25 | 0.83 | 0.22 | 0.99 | 0.64 | 0.47 |

Intersection Summary

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

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 137 | 575 | 29 | 61 | 731 | 67 | 66 | 992 | 19 | 150 | 489 | 81 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 11 | 11 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | | 0% | | | 0% | | | 3% | | | -4% | |
| Total Lost time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 1.00 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1710 | 3392 | | 1708 | 3370 | | 1742 | 3474 | | 1805 | 3525 | |
| Flt Permitted | 0.13 | 1.00 | | 0.28 | 1.00 | | 0.37 | 1.00 | | 0.11 | 1.00 | |
| Satd. Flow (perm) | 231 | 3392 | | 502 | 3370 | | 677 | 3474 | | 204 | 3525 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 149 | 625 | 32 | 66 | 795 | 73 | 72 | 1078 | 21 | 163 | 532 | 88 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 149 | 657 | 0 | 66 | 868 | 0 | 72 | 1099 | 0 | 163 | 620 | 0 |
| Confl. Peds. (#/hr) | 13 | | 12 | 12 | | 13 | 3 | | 16 | 16 | | 3 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 |
| Turn Type | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Actuated Green, G (s) | 37.2 | 31.2 | | 34.8 | 30.0 | | 37.9 | 33.1 | | 46.1 | 37.2 | |
| Effective Green, g (s) | 37.2 | 31.2 | | 34.8 | 30.0 | | 37.9 | 33.1 | | 46.1 | 37.2 | |
| Actuated g/C Ratio | 0.37 | 0.31 | | 0.35 | 0.30 | | 0.38 | 0.33 | | 0.46 | 0.37 | |
| Clearance Time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | |
| Vehicle Extension (s) | 2.0 | 5.0 | | 2.0 | 5.0 | | 2.0 | 5.0 | | 2.0 | 5.0 | |
| Lane Grp Cap (vph) | 174 | 1058 | | 232 | 1011 | | 307 | 1149 | | 236 | 1311 | |
| v/s Ratio Prot | c0.05 | 0.19 | | 0.01 | 0.26 | | 0.01 | c0.32 | | c0.06 | 0.18 | |
| v/s Ratio Perm | c0.27 | | | 0.09 | | | 0.08 | | | 0.26 | | |
| v/c Ratio | 0.86 | 0.62 | | 0.28 | 0.86 | | 0.23 | 0.96 | | 0.69 | 0.47 | |
| Uniform Delay, d1 | 24.0 | 29.4 | | 22.6 | 33.0 | | 20.2 | 32.7 | | 21.2 | 23.9 | |
| Progression Factor | 1.87 | 1.25 | | 0.53 | 0.52 | | 0.98 | 0.81 | | 1.03 | 0.80 | |
| Incremental Delay, d2 | 28.2 | 2.5 | | 0.2 | 8.3 | | 0.1 | 16.8 | | 6.7 | 0.6 | |
| Delay (s) | 73.1 | 39.1 | | 12.3 | 25.4 | | 19.9 | 43.4 | | 28.6 | 19.8 | |
| Level of Service | E | D | | B | C | | B | D | | C | B | |
| Approach Delay (s) | | 45.4 | | | 24.4 | | | 42.0 | | | 21.6 | |
| Approach LOS | | D | | | C | | | D | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 34.0 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.89 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 22.0 |
| Intersection Capacity Utilization | 84.7% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | EBL | EBT | WBL | WBT | NBT | SBT |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 70 | 866 | 18 | 1071 | 18 | 173 |
| v/c Ratio | 0.25 | 0.41 | 0.05 | 0.54 | 0.04 | 0.38 |
| Control Delay | 6.3 | 6.7 | 2.4 | 10.6 | 0.2 | 14.2 |
| Queue Delay | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 6.3 | 6.8 | 2.4 | 10.6 | 0.2 | 14.2 |
| Queue Length 50th (ft) | 8 | 61 | 2 | 103 | 0 | 28 |
| Queue Length 95th (ft) | m16 | m93 | m4 | 122 | 0 | 86 |
| Internal Link Dist (ft) | | 380 | | 128 | 137 | 115 |
| Turn Bay Length (ft) | | | 100 | | | |
| Base Capacity (vph) | 283 | 2122 | 374 | 1981 | 443 | 455 |
| Starvation Cap Reductn | 0 | 194 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 30 | 0 | 1 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.25 | 0.45 | 0.05 | 0.55 | 0.04 | 0.38 |

Intersection Summary

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 64 | 761 | 36 | 17 | 879 | 107 | 4 | 0 | 13 | 46 | 0 | 113 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | | 6.0 | | | 6.0 | |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | | 1.00 | | | 1.00 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | | 1.00 | | | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | | 1.00 | | | 1.00 | |
| Frt | 1.00 | 0.99 | | 1.00 | 0.98 | | | 0.90 | | | 0.90 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | | 0.99 | | | 0.99 | |
| Satd. Flow (prot) | 1769 | 3511 | | 1769 | 3471 | | | 1649 | | | 1660 | |
| Flt Permitted | 0.19 | 1.00 | | 0.29 | 1.00 | | | 0.94 | | | 0.91 | |
| Satd. Flow (perm) | 361 | 3511 | | 535 | 3471 | | | 1574 | | | 1526 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 70 | 827 | 39 | 18 | 955 | 116 | 4 | 0 | 14 | 50 | 0 | 123 |
| RTOR Reduction (vph) | 0 | 3 | 0 | 0 | 9 | 0 | 0 | 14 | 0 | 0 | 89 | 0 |
| Lane Group Flow (vph) | 70 | 863 | 0 | 18 | 1062 | 0 | 0 | 4 | 0 | 0 | 84 | 0 |
| Confl. Peds. (#/hr) | 4 | | 4 | 4 | | 4 | | | | | | |
| Turn Type | pm+pt | NA | | pm+pt | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | | 7 | | | 3 | |
| Permitted Phases | 2 | | | 6 | | | 7 | | | 3 | | |
| Actuated Green, G (s) | 60.6 | 57.4 | | 57.4 | 55.8 | | | 24.0 | | | 24.0 | |
| Effective Green, g (s) | 60.6 | 57.4 | | 57.4 | 55.8 | | | 24.0 | | | 24.0 | |
| Actuated g/C Ratio | 0.61 | 0.57 | | 0.57 | 0.56 | | | 0.24 | | | 0.24 | |
| Clearance Time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | | 6.0 | | | 6.0 | |
| Vehicle Extension (s) | 2.0 | 5.0 | | 2.0 | 5.0 | | | 2.0 | | | 2.0 | |
| Lane Grp Cap (vph) | 263 | 2015 | | 326 | 1936 | | | 377 | | | 366 | |
| v/s Ratio Prot | c0.01 | 0.25 | | 0.00 | c0.31 | | | | | | | |
| v/s Ratio Perm | 0.15 | | | 0.03 | | | | 0.00 | | | c0.06 | |
| v/c Ratio | 0.27 | 0.43 | | 0.06 | 0.55 | | | 0.01 | | | 0.23 | |
| Uniform Delay, d1 | 9.5 | 12.0 | | 9.4 | 14.1 | | | 29.0 | | | 30.6 | |
| Progression Factor | 0.68 | 0.56 | | 0.33 | 0.70 | | | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | 0.2 | 0.6 | | 0.0 | 1.0 | | | 0.1 | | | 0.1 | |
| Delay (s) | 6.7 | 7.4 | | 3.1 | 10.9 | | | 29.0 | | | 30.7 | |
| Level of Service | A | A | | A | B | | | C | | | C | |
| Approach Delay (s) | | 7.3 | | | 10.8 | | | 29.0 | | | 30.7 | |
| Approach LOS | | A | | | B | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 11.0 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.45 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 17.0 |
| Intersection Capacity Utilization | 59.2% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 99 | 55 | 1364 | 804 |
| v/c Ratio | 0.52 | 0.25 | 0.62 | 0.28 |
| Control Delay | 50.8 | 13.7 | 5.8 | 2.7 |
| Queue Delay | 0.0 | 0.0 | 10.9 | 0.0 |
| Total Delay | 50.8 | 13.7 | 16.6 | 2.7 |
| Queue Length 50th (ft) | 61 | 0 | 91 | 42 |
| Queue Length 95th (ft) | 108 | 34 | m104 | 95 |
| Internal Link Dist (ft) | 437 | | 1 | 403 |
| Turn Bay Length (ft) | 150 | | | |
| Base Capacity (vph) | 336 | 340 | 2215 | 2854 |
| Starvation Cap Reductn | 0 | 0 | 838 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.29 | 0.16 | 0.99 | 0.28 |

Intersection Summary

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 91 | 51 | 98 | 1156 | 651 | 88 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 12 | 12 | 11 | 11 | 11 | 11 |
| Grade (%) | 0% | | | 3% | -3% | |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 0.98 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1559 | | 3328 | 3391 | |
| Flt Permitted | 0.95 | 1.00 | | 0.79 | 1.00 | |
| Satd. Flow (perm) | 1770 | 1559 | | 2636 | 3391 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 99 | 55 | 107 | 1257 | 708 | 96 |
| RTOR Reduction (vph) | 0 | 50 | 0 | 0 | 5 | 0 |
| Lane Group Flow (vph) | 99 | 5 | 0 | 1364 | 799 | 0 |
| Confl. Peds. (#/hr) | 2 | 2 | 9 | | | 9 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 4 | 0 | 4 |
| Turn Type | Prot | Perm | custom | NA | NA | |
| Protected Phases | 4 | | 1 | 6 | 2 | |
| Permitted Phases | | 4 | 1 | | | |
| Actuated Green, G (s) | 9.6 | 9.6 | | 82.4 | 82.4 | |
| Effective Green, g (s) | 9.6 | 9.6 | | 82.4 | 82.4 | |
| Actuated g/C Ratio | 0.10 | 0.10 | | 0.82 | 0.82 | |
| Clearance Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 169 | 149 | | 2172 | 2794 | |
| v/s Ratio Prot | c0.06 | | | | 0.24 | |
| v/s Ratio Perm | | 0.00 | | c0.52 | | |
| v/c Ratio | 0.59 | 0.04 | | 0.63 | 0.29 | |
| Uniform Delay, d1 | 43.3 | 41.0 | | 3.2 | 2.0 | |
| Progression Factor | 1.00 | 1.00 | | 1.29 | 1.05 | |
| Incremental Delay, d2 | 5.1 | 0.1 | | 0.3 | 0.2 | |
| Delay (s) | 48.4 | 41.1 | | 4.4 | 2.4 | |
| Level of Service | D | D | | A | A | |
| Approach Delay (s) | 45.8 | | | 4.4 | 2.4 | |
| Approach LOS | D | | | A | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 6.4 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.65 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 71.3% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 0 | 50 | 1212 | 12 | 0 | 708 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 3% | | | -4% |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 0 | 54 | 1317 | 13 | 0 | 770 |
| Pedestrians | 12 | | | | | |
| Lane Width (ft) | 12.0 | | | | | |
| Walking Speed (ft/s) | 4.0 | | | | | |
| Percent Blockage | 1 | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | 368 | | | 61 |
| pX, platoon unblocked | 0.72 | 0.69 | | | 0.69 | |
| vC, conflicting volume | 1721 | 677 | | | 1342 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 899 | 0 | | | 605 | |
| tC, single (s) | 6.8 | 6.9 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 93 | | | 100 | |
| cM capacity (veh/h) | 198 | 743 | | | 664 | |

| Direction, Lane # | WB 1 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 54 | 878 | 452 | 385 | 385 |
| Volume Left | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 54 | 0 | 13 | 0 | 0 |
| cSH | 743 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.07 | 0.52 | 0.27 | 0.23 | 0.23 |
| Queue Length 95th (ft) | 6 | 0 | 0 | 0 | 0 |
| Control Delay (s) | 10.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | B | | | | |
| Approach Delay (s) | 10.2 | 0.0 | | 0.0 | |
| Approach LOS | B | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.3 | | |
| Intersection Capacity Utilization | 43.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 212 | 849 | 129 | 920 | 87 | 755 | 257 | 1266 |
| v/c Ratio | 0.92 | 0.78 | 0.65 | 0.92 | 0.50 | 0.80 | 0.82 | 1.00 |
| Control Delay | 66.4 | 24.8 | 37.3 | 37.9 | 25.1 | 43.5 | 49.3 | 48.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.5 |
| Total Delay | 66.4 | 24.8 | 37.3 | 37.9 | 25.1 | 43.5 | 49.3 | 56.8 |
| Queue Length 50th (ft) | 68 | 225 | 27 | 312 | 38 | 266 | 110 | ~331 |
| Queue Length 95th (ft) | #221 | 253 | m#102 | #442 | m59 | 327 | #219 | #574 |
| Internal Link Dist (ft) | | 453 | | 381 | | 503 | | 197 |
| Turn Bay Length (ft) | 275 | | 255 | | 345 | | 190 | |
| Base Capacity (vph) | 230 | 1092 | 197 | 1000 | 178 | 972 | 327 | 1265 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 36 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.92 | 0.78 | 0.65 | 0.92 | 0.49 | 0.78 | 0.79 | 1.03 |

Intersection Summary

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

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

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 195 | 716 | 65 | 119 | 813 | 33 | 80 | 667 | 28 | 236 | 1030 | 134 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 11 | 11 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | | 0% | | | 0% | | | 3% | | | -4% | |
| Total Lost time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1711 | 3364 | | 1709 | 3396 | | 1743 | 3452 | | 1802 | 3541 | |
| Flt Permitted | 0.13 | 1.00 | | 0.17 | 1.00 | | 0.14 | 1.00 | | 0.15 | 1.00 | |
| Satd. Flow (perm) | 229 | 3364 | | 313 | 3396 | | 260 | 3452 | | 289 | 3541 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 212 | 778 | 71 | 129 | 884 | 36 | 87 | 725 | 30 | 257 | 1120 | 146 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 212 | 849 | 0 | 129 | 920 | 0 | 87 | 755 | 0 | 257 | 1266 | 0 |
| Confl. Peds. (#/hr) | 18 | | 30 | 30 | | 18 | 3 | | 64 | 64 | | 3 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 |
| Turn Type | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Actuated Green, G (s) | 40.5 | 31.5 | | 34.5 | 28.5 | | 33.0 | 28.2 | | 45.5 | 35.7 | |
| Effective Green, g (s) | 40.5 | 31.5 | | 34.5 | 28.5 | | 33.0 | 28.2 | | 45.5 | 35.7 | |
| Actuated g/C Ratio | 0.40 | 0.32 | | 0.34 | 0.28 | | 0.33 | 0.28 | | 0.46 | 0.36 | |
| Clearance Time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | |
| Vehicle Extension (s) | 2.0 | 5.0 | | 2.0 | 5.0 | | 2.0 | 5.0 | | 2.0 | 5.0 | |
| Lane Grp Cap (vph) | 226 | 1059 | | 191 | 967 | | 156 | 973 | | 317 | 1264 | |
| v/s Ratio Prot | c0.08 | 0.25 | | 0.04 | 0.27 | | 0.03 | 0.22 | | c0.10 | c0.36 | |
| v/s Ratio Perm | c0.30 | | | 0.19 | | | 0.16 | | | 0.27 | | |
| v/c Ratio | 0.94 | 0.80 | | 0.68 | 0.95 | | 0.56 | 0.78 | | 0.81 | 1.00 | |
| Uniform Delay, d1 | 23.8 | 31.4 | | 24.4 | 35.1 | | 26.7 | 33.0 | | 20.3 | 32.1 | |
| Progression Factor | 1.41 | 0.64 | | 1.14 | 0.66 | | 0.95 | 1.08 | | 1.64 | 0.70 | |
| Incremental Delay, d2 | 36.4 | 5.2 | | 6.5 | 17.9 | | 2.3 | 4.4 | | 12.0 | 23.8 | |
| Delay (s) | 69.9 | 25.3 | | 34.3 | 40.9 | | 27.6 | 39.9 | | 45.3 | 46.3 | |
| Level of Service | E | C | | C | D | | C | D | | D | D | |
| Approach Delay (s) | | 34.2 | | | 40.1 | | | 38.6 | | | 46.1 | |
| Approach LOS | | C | | | D | | | D | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 40.5 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 1.02 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 22.0 |
| Intersection Capacity Utilization | 89.9% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | EBL | EBT | WBL | WBT | NBT | SBT |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 171 | 1012 | 7 | 947 | 40 | 267 |
| v/c Ratio | 0.52 | 0.48 | 0.02 | 0.55 | 0.09 | 0.61 |
| Control Delay | 18.5 | 10.4 | 2.8 | 11.6 | 0.6 | 28.3 |
| Queue Delay | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 18.5 | 10.6 | 2.8 | 11.6 | 0.6 | 28.3 |
| Queue Length 50th (ft) | 43 | 111 | 1 | 230 | 0 | 100 |
| Queue Length 95th (ft) | m79 | 204 | m1 | 146 | 2 | 187 |
| Internal Link Dist (ft) | | 381 | | 141 | 90 | 46 |
| Turn Bay Length (ft) | | | | | | |
| Base Capacity (vph) | 333 | 2126 | 305 | 1729 | 447 | 439 |
| Starvation Cap Reductn | 0 | 385 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.51 | 0.58 | 0.02 | 0.55 | 0.09 | 0.61 |

Intersection Summary

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 157 | 921 | 10 | 6 | 688 | 183 | 15 | 0 | 22 | 103 | 0 | 143 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | | 6.0 | | | 6.0 | |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | | 1.00 | | | 1.00 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 0.99 | | | 1.00 | | | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | | 1.00 | | | 1.00 | |
| Frt | 1.00 | 1.00 | | 1.00 | 0.97 | | | 0.92 | | | 0.92 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | | 0.98 | | | 0.98 | |
| Satd. Flow (prot) | 1769 | 3532 | | 1769 | 3399 | | | 1678 | | | 1668 | |
| Flt Permitted | 0.20 | 1.00 | | 0.25 | 1.00 | | | 0.86 | | | 0.85 | |
| Satd. Flow (perm) | 378 | 3532 | | 460 | 3399 | | | 1474 | | | 1440 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 171 | 1001 | 11 | 7 | 748 | 199 | 16 | 0 | 24 | 112 | 0 | 155 |
| RTOR Reduction (vph) | 0 | 1 | 0 | 0 | 24 | 0 | 0 | 30 | 0 | 0 | 64 | 0 |
| Lane Group Flow (vph) | 171 | 1011 | 0 | 7 | 923 | 0 | 0 | 10 | 0 | 0 | 203 | 0 |
| Confl. Peds. (#/hr) | 9 | | 5 | 5 | | 9 | 1 | | | | | 1 |
| Turn Type | pm+pt | NA | | pm+pt | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | | 7 | | | 3 | |
| Permitted Phases | 2 | | | 6 | | | 7 | | | 3 | | |
| Actuated Green, G (s) | 62.0 | 56.2 | | 51.0 | 50.2 | | | 26.0 | | | 26.0 | |
| Effective Green, g (s) | 62.0 | 56.2 | | 51.0 | 50.2 | | | 26.0 | | | 26.0 | |
| Actuated g/C Ratio | 0.62 | 0.56 | | 0.51 | 0.50 | | | 0.26 | | | 0.26 | |
| Clearance Time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | | 6.0 | | | 6.0 | |
| Vehicle Extension (s) | 2.0 | 5.0 | | 2.0 | 5.0 | | | 2.0 | | | 2.0 | |
| Lane Grp Cap (vph) | 328 | 1984 | | 245 | 1706 | | | 383 | | | 374 | |
| v/s Ratio Prot | c0.04 | 0.29 | | 0.00 | 0.27 | | | | | | | |
| v/s Ratio Perm | c0.29 | | | 0.01 | | | | 0.01 | | | c0.14 | |
| v/c Ratio | 0.52 | 0.51 | | 0.03 | 0.54 | | | 0.03 | | | 0.54 | |
| Uniform Delay, d1 | 10.3 | 13.4 | | 12.3 | 17.0 | | | 27.6 | | | 31.9 | |
| Progression Factor | 1.88 | 0.84 | | 0.37 | 0.64 | | | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | 0.5 | 0.7 | | 0.0 | 1.2 | | | 0.1 | | | 0.9 | |
| Delay (s) | 19.9 | 12.0 | | 4.5 | 12.0 | | | 27.7 | | | 32.7 | |
| Level of Service | B | B | | A | B | | | C | | | C | |
| Approach Delay (s) | | 13.2 | | | 12.0 | | | 27.7 | | | 32.7 | |
| Approach LOS | | B | | | B | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 15.1 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.55 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 17.0 |
| Intersection Capacity Utilization | 66.9% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 183 | 116 | 994 | 1463 |
| v/c Ratio | 0.61 | 0.32 | 0.49 | 0.59 |
| Control Delay | 46.5 | 8.9 | 6.2 | 2.5 |
| Queue Delay | 0.0 | 0.0 | 0.1 | 0.1 |
| Total Delay | 46.5 | 8.9 | 6.2 | 2.6 |
| Queue Length 50th (ft) | 106 | 0 | 73 | 49 |
| Queue Length 95th (ft) | 170 | 44 | m119 | 63 |
| Internal Link Dist (ft) | 437 | | 1 | 403 |
| Turn Bay Length (ft) | 150 | | | |
| Base Capacity (vph) | 407 | 453 | 2013 | 2495 |
| Starvation Cap Reductn | 0 | 0 | 114 | 0 |
| Spillback Cap Reductn | 0 | 7 | 0 | 219 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.45 | 0.26 | 0.52 | 0.64 |

Intersection Summary

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 168 | 107 | 36 | 879 | 1266 | 80 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 12 | 12 | 11 | 11 | 11 | 11 |
| Grade (%) | 0% | | | 3% | -3% | |
| Total Lost time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1583 | | 3336 | 3415 | |
| Flt Permitted | 0.95 | 1.00 | | 0.83 | 1.00 | |
| Satd. Flow (perm) | 1770 | 1583 | | 2759 | 3415 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 183 | 116 | 39 | 955 | 1376 | 87 |
| RTOR Reduction (vph) | 0 | 96 | 0 | 0 | 3 | 0 |
| Lane Group Flow (vph) | 183 | 20 | 0 | 994 | 1460 | 0 |
| Confl. Peds. (#/hr) | | 17 | 33 | | | 33 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 4 | 0 | 4 |
| Turn Type | Prot | Prot | pm+pt | NA | NA | |
| Protected Phases | 4 | 4 | 1 | 6 | 2 | |
| Permitted Phases | | 4 | 6 | | | |
| Actuated Green, G (s) | 17.0 | 17.0 | | 73.0 | 73.0 | |
| Effective Green, g (s) | 17.0 | 17.0 | | 73.0 | 73.0 | |
| Actuated g/C Ratio | 0.17 | 0.17 | | 0.73 | 0.73 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | 4.0 | 4.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 300 | 269 | | 2014 | 2492 | |
| v/s Ratio Prot | c0.10 | 0.01 | | | c0.43 | |
| v/s Ratio Perm | | | | 0.36 | | |
| v/c Ratio | 0.61 | 0.07 | | 0.49 | 0.59 | |
| Uniform Delay, d1 | 38.4 | 34.9 | | 5.7 | 6.4 | |
| Progression Factor | 1.00 | 1.00 | | 0.87 | 0.23 | |
| Incremental Delay, d2 | 4.0 | 0.2 | | 0.1 | 0.8 | |
| Delay (s) | 42.5 | 35.0 | | 5.1 | 2.3 | |
| Level of Service | D | D | | A | A | |
| Approach Delay (s) | 39.6 | | | 5.1 | 2.3 | |
| Approach LOS | D | | | A | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 7.4 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.62 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 14.0 |
| Intersection Capacity Utilization | 71.1% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 0 | 65 | 867 | 34 | 0 | 1396 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 3% | | | -4% |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 0 | 71 | 942 | 37 | 0 | 1517 |
| Pedestrians | 21 | | | | | 1 |
| Lane Width (ft) | 12.0 | | | | | 12.0 |
| Walking Speed (ft/s) | 4.0 | | | | | 4.0 |
| Percent Blockage | 2 | | | | | 0 |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | 398 | | | 61 |
| pX, platoon unblocked | 0.89 | 0.81 | | | 0.81 | |
| vC, conflicting volume | 1741 | 512 | | | 1000 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 635 | 0 | | | 536 | |
| tC, single (s) | 6.8 | 6.9 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 92 | | | 100 | |
| cM capacity (veh/h) | 360 | 864 | | | 820 | |

| Direction, Lane # | WB 1 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 71 | 628 | 351 | 759 | 759 |
| Volume Left | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 71 | 0 | 37 | 0 | 0 |
| cSH | 864 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.08 | 0.37 | 0.21 | 0.45 | 0.45 |
| Queue Length 95th (ft) | 7 | 0 | 0 | 0 | 0 |
| Control Delay (s) | 9.5 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | A | | | | |
| Approach Delay (s) | 9.5 | 0.0 | | 0.0 | |
| Approach LOS | A | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.3 | | |
| Intersection Capacity Utilization | 48.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

# Queues
## 4: S. Washington St/N. Washington St & W. Broad St/E. Broad St

12/9/2015

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 197 | 753 | 111 | 739 | 110 | 704 | 313 | 687 |
| v/c Ratio | 0.68 | 0.72 | 0.45 | 0.83 | 0.38 | 0.81 | 0.86 | 0.61 |
| Control Delay | 36.5 | 42.6 | 28.4 | 52.3 | 26.3 | 52.9 | 52.8 | 39.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 |
| Total Delay | 36.5 | 42.6 | 28.4 | 52.4 | 26.3 | 52.9 | 52.8 | 39.2 |
| Queue Length 50th (ft) | 97 | 278 | 52 | 294 | 50 | 281 | 177 | 241 |
| Queue Length 95th (ft) | 188 | 410 | 102 | 426 | 105 | 411 | #431 | 377 |
| Internal Link Dist (ft) | | 453 | | 381 | | 503 | | 175 |
| Turn Bay Length (ft) | 275 | | 255 | | 345 | | 190 | |
| Base Capacity (vph) | 350 | 1808 | 324 | 1676 | 438 | 1722 | 375 | 1715 |
| Starvation Cap Reductn | 0 | 80 | 0 | 83 | 0 | 0 | 0 | 243 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.56 | 0.44 | 0.34 | 0.46 | 0.25 | 0.41 | 0.83 | 0.47 |

### Intersection Summary

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 181 | 621 | 72 | 102 | 624 | 56 | 101 | 621 | 27 | 288 | 469 | 163 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 11 | 11 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | | 0% | | | 0% | | | 3% | | | -4% | |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.98 | | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.96 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1711 | 3358 | | 1709 | 3370 | | 1742 | 3461 | | 1805 | 3452 | |
| Flt Permitted | 0.13 | 1.00 | | 0.23 | 1.00 | | 0.33 | 1.00 | | 0.14 | 1.00 | |
| Satd. Flow (perm) | 242 | 3358 | | 420 | 3370 | | 597 | 3461 | | 260 | 3452 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 197 | 675 | 78 | 111 | 678 | 61 | 110 | 675 | 29 | 313 | 510 | 177 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 197 | 753 | 0 | 111 | 739 | 0 | 110 | 704 | 0 | 313 | 687 | 0 |
| Confl. Peds. (#/hr) | 11 | | 11 | 11 | | 11 | 4 | | 5 | 5 | | 4 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 |
| Turn Type | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Actuated Green, G (s) | 54.5 | 38.9 | | 42.7 | 33.0 | | 41.1 | 31.1 | | 56.7 | 40.7 | |
| Effective Green, g (s) | 54.5 | 38.9 | | 42.7 | 33.0 | | 41.1 | 31.1 | | 56.7 | 40.7 | |
| Actuated g/C Ratio | 0.44 | 0.32 | | 0.35 | 0.27 | | 0.33 | 0.25 | | 0.46 | 0.33 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lane Grp Cap (vph) | 292 | 1059 | | 246 | 901 | | 291 | 872 | | 365 | 1139 | |
| v/s Ratio Prot | c0.09 | c0.22 | | 0.04 | c0.22 | | 0.03 | 0.20 | | c0.14 | 0.20 | |
| v/s Ratio Perm | 0.21 | | | 0.12 | | | 0.10 | | | c0.26 | | |
| v/c Ratio | 0.67 | 0.71 | | 0.45 | 0.82 | | 0.38 | 0.81 | | 0.86 | 0.60 | |
| Uniform Delay, d1 | 25.2 | 37.2 | | 28.9 | 42.4 | | 29.4 | 43.3 | | 29.9 | 34.5 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 4.8 | 1.9 | | 0.5 | 5.8 | | 0.3 | 5.2 | | 17.1 | 0.6 | |
| Delay (s) | 30.0 | 39.1 | | 29.3 | 48.1 | | 29.7 | 48.5 | | 47.0 | 35.2 | |
| Level of Service | C | D | | C | D | | C | D | | D | D | |
| Approach Delay (s) | | 37.2 | | | 45.7 | | | 46.0 | | | 38.9 | |
| Approach LOS | | D | | | D | | | D | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 41.6 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.85 | | |
| Actuated Cycle Length (s) | 123.3 | Sum of lost time (s) | 24.0 |
| Intersection Capacity Utilization | 83.2% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

# Queues
## 32: E. Broad St & Driveway

12/9/2015

| Lane Group | EBL | EBT | WBL | WBT | NBT | SBT |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 183 | 901 | 3 | 931 | 5 | 350 |
| v/c Ratio | 0.52 | 0.41 | 0.01 | 0.52 | 0.01 | 0.69 |
| Control Delay | 18.6 | 18.1 | 12.3 | 26.7 | 36.6 | 50.1 |
| Queue Delay | 0.0 | 2.8 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 18.6 | 20.9 | 12.3 | 26.7 | 36.6 | 50.1 |
| Queue Length 50th (ft) | 82 | 261 | 1 | 342 | 2 | 278 |
| Queue Length 95th (ft) | 120 | 354 | 6 | 421 | 15 | 435 |
| Internal Link Dist (ft) | | 381 | | 140 | 62 | 28 |
| Turn Bay Length (ft) | | | | | | |
| Base Capacity (vph) | 413 | 2182 | 349 | 1833 | 491 | 504 |
| Starvation Cap Reductn | 0 | 1132 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.44 | 0.86 | 0.01 | 0.51 | 0.01 | 0.69 |

Intersection Summary

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 168 | 825 | 4 | 3 | 642 | 214 | 2 | 1 | 2 | 122 | 0 | 200 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | | 6.0 | | | 6.0 | |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | | 1.00 | | | 1.00 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 0.99 | | | 1.00 | | | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | | 1.00 | | | 1.00 | |
| Frt | 1.00 | 1.00 | | 1.00 | 0.96 | | | 0.95 | | | 0.92 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | | 0.98 | | | 0.98 | |
| Satd. Flow (prot) | 1770 | 3536 | | 1768 | 3357 | | | 1728 | | | 1675 | |
| Flt Permitted | 0.22 | 1.00 | | 0.29 | 1.00 | | | 0.92 | | | 0.87 | |
| Satd. Flow (perm) | 406 | 3536 | | 538 | 3357 | | | 1616 | | | 1490 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 183 | 897 | 4 | 3 | 698 | 233 | 2 | 1 | 2 | 133 | 0 | 217 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 16 | 0 | 0 | 1 | 0 | 0 | 54 | 0 |
| Lane Group Flow (vph) | 183 | 901 | 0 | 3 | 915 | 0 | 0 | 4 | 0 | 0 | 296 | 0 |
| Confl. Peds. (#/hr) | 7 | | 4 | 4 | | 7 | | | | | | |
| Turn Type | pm+pt | NA | | pm+pt | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | | 7 | | | 3 | |
| Permitted Phases | 2 | | | 6 | | | 7 | | | 3 | | |
| Actuated Green, G (s) | 114.0 | 108.1 | | 98.0 | 97.1 | | | 53.0 | | | 53.0 | |
| Effective Green, g (s) | 114.0 | 108.1 | | 98.0 | 97.1 | | | 53.0 | | | 53.0 | |
| Actuated g/C Ratio | 0.64 | 0.60 | | 0.55 | 0.54 | | | 0.30 | | | 0.30 | |
| Clearance Time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | | 6.0 | | | 6.0 | |
| Vehicle Extension (s) | 2.0 | 5.0 | | 2.0 | 5.0 | | | 2.0 | | | 2.0 | |
| Lane Grp Cap (vph) | 349 | 2135 | | 300 | 1821 | | | 478 | | | 441 | |
| v/s Ratio Prot | c0.03 | 0.25 | | 0.00 | 0.27 | | | | | | | |
| v/s Ratio Perm | c0.30 | | | 0.01 | | | | 0.00 | | | c0.20 | |
| v/c Ratio | 0.52 | 0.42 | | 0.01 | 0.50 | | | 0.01 | | | 0.67 | |
| Uniform Delay, d1 | 16.8 | 18.8 | | 18.6 | 25.8 | | | 44.4 | | | 55.3 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | 0.7 | 0.6 | | 0.0 | 0.5 | | | 0.0 | | | 3.1 | |
| Delay (s) | 17.4 | 19.5 | | 18.6 | 26.2 | | | 44.5 | | | 58.5 | |
| Level of Service | B | B | | B | C | | | D | | | E | |
| Approach Delay (s) | | 19.1 | | | 26.2 | | | 44.5 | | | 58.5 | |
| Approach LOS | | B | | | C | | | D | | | E | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 27.8 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.58 | | |
| Actuated Cycle Length (s) | 179.0 | Sum of lost time (s) | 17.0 |
| Intersection Capacity Utilization | 72.4% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

# Queues
## 23: N. Washington St & Park Ave

12/9/2015

| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 149 | 62 | 933 | 965 |
| v/c Ratio | 0.38 | 0.15 | 0.48 | 0.64 |
| Control Delay | 20.9 | 6.4 | 8.0 | 15.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 20.9 | 6.4 | 8.0 | 15.8 |
| Queue Length 50th (ft) | 39 | 0 | 60 | 108 |
| Queue Length 95th (ft) | 91 | 24 | 158 | 227 |
| Internal Link Dist (ft) | 437 | | 1 | 403 |
| Turn Bay Length (ft) | 150 | | | |
| Base Capacity (vph) | 713 | 675 | 3023 | 3307 |
| Starvation Cap Reductn | 0 | 0 | 45 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.21 | 0.09 | 0.31 | 0.29 |

Intersection Summary

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 137 | 57 | 39 | 820 | 806 | 82 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 12 | 12 | 11 | 11 | 11 | 11 |
| Grade (%) | 0% | | | 3% | -3% | |
| Total Lost time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1583 | | 3335 | 3417 | |
| Flt Permitted | 0.95 | 1.00 | | 0.89 | 1.00 | |
| Satd. Flow (perm) | 1770 | 1583 | | 2987 | 3417 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 149 | 62 | 42 | 891 | 876 | 89 |
| RTOR Reduction (vph) | 0 | 50 | 0 | 0 | 10 | 0 |
| Lane Group Flow (vph) | 149 | 12 | 0 | 933 | 955 | 0 |
| Confl. Peds. (#/hr) | 3 | | 3 | | | 3 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 4 | 0 | 4 |
| Turn Type | Prot | Perm | pm+pt | NA | NA | |
| Protected Phases | 4 | | 1 | 6 | 2 | |
| Permitted Phases | | 4 | 6 | | | |
| Actuated Green, G (s) | 9.9 | 9.9 | | 33.4 | 23.1 | |
| Effective Green, g (s) | 9.9 | 9.9 | | 33.4 | 23.1 | |
| Actuated g/C Ratio | 0.19 | 0.19 | | 0.63 | 0.43 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | 2.0 | 2.0 | | 1.5 | 1.5 | |
| Lane Grp Cap (vph) | 328 | 294 | | 1906 | 1480 | |
| v/s Ratio Prot | c0.08 | | | c0.05 | c0.28 | |
| v/s Ratio Perm | | 0.01 | | 0.26 | | |
| v/c Ratio | 0.45 | 0.04 | | 0.49 | 0.65 | |
| Uniform Delay, d1 | 19.3 | 17.8 | | 5.4 | 11.9 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.4 | 0.0 | | 0.1 | 0.7 | |
| Delay (s) | 19.7 | 17.8 | | 5.4 | 12.6 | |
| Level of Service | B | B | | A | B | |
| Approach Delay (s) | 19.1 | | | 5.4 | 12.6 | |
| Approach LOS | B | | | A | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 10.1 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.60 | | |
| Actuated Cycle Length (s) | 53.3 | Sum of lost time (s) | 15.0 |
| Intersection Capacity Utilization | 67.4% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

# HCM Unsignalized Intersection Capacity Analysis
## 36: N. Washington St & driveway

12/9/2015

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 0 | 51 | 832 | 35 | 0 | 887 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 3% | | | -4% |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 0 | 55 | 904 | 38 | 0 | 964 |
| Pedestrians | 2 | | | | | |
| Lane Width (ft) | 12.0 | | | | | |
| Walking Speed (ft/s) | 4.0 | | | | | |
| Percent Blockage | 0 | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | 402 | | | 61 |
| pX, platoon unblocked | 0.87 | 0.82 | | | 0.82 | |
| vC, conflicting volume | 1407 | 473 | | | 944 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 244 | 0 | | | 493 | |
| tC, single (s) | 6.8 | 6.9 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 94 | | | 100 | |
| cM capacity (veh/h) | 629 | 888 | | | 873 | |

| Direction, Lane # | WB 1 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 55 | 603 | 339 | 482 | 482 |
| Volume Left | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 55 | 0 | 38 | 0 | 0 |
| cSH | 888 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.06 | 0.35 | 0.20 | 0.28 | 0.28 |
| Queue Length 95th (ft) | 5 | 0 | 0 | 0 | 0 |
| Control Delay (s) | 9.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | A | | | | |
| Approach Delay (s) | 9.3 | 0.0 | | 0.0 | |
| Approach LOS | A | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.3 | | |
| Intersection Capacity Utilization | 34.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

# APPENDIX J

INTERSECTION CAPACITY ANALYSIS –

FUTURE WITH DEVELOPMENT CONDITION (2020) SCENARIO 3

# Queues
## 4: S. Washington St/N. Washington St & W. Broad St/E. Broad St

12/9/2015

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 149 | 657 | 50 | 848 | 72 | 1099 | 173 | 656 |
| v/c Ratio | 0.81 | 0.58 | 0.19 | 0.82 | 0.23 | 0.99 | 0.72 | 0.50 |
| Control Delay | 66.9 | 38.2 | 12.2 | 30.8 | 16.2 | 52.8 | 43.8 | 39.1 |
| Queue Delay | 86.9 | 0.0 | 0.0 | 20.2 | 0.0 | 39.4 | 0.0 | 0.3 |
| Total Delay | 153.8 | 38.2 | 12.2 | 51.1 | 16.2 | 92.2 | 43.8 | 39.4 |
| Queue Length 50th (ft) | 82 | 205 | 11 | 269 | 19 | 213 | 97 | 195 |
| Queue Length 95th (ft) | m#160 | 205 | m23 | #335 | m50 | #485 | m#148 | m254 |
| Internal Link Dist (ft) | | 453 | | 375 | | 503 | | 144 |
| Turn Bay Length (ft) | 275 | | 255 | | 345 | | 190 | |
| Base Capacity (vph) | 183 | 1124 | 262 | 1038 | 315 | 1111 | 254 | 1319 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 201 |
| Spillback Cap Reductn | 132 | 0 | 0 | 207 | 0 | 356 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 2.92 | 0.58 | 0.19 | 1.02 | 0.23 | 1.46 | 0.68 | 0.59 |

### Intersection Summary

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

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 137 | 575 | 29 | 46 | 713 | 67 | 66 | 992 | 19 | 159 | 504 | 99 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 11 | 11 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | | 0% | | | 0% | | | 3% | | | -4% | |
| Total Lost time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 1.00 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1710 | 3392 | | 1708 | 3369 | | 1742 | 3474 | | 1805 | 3512 | |
| Flt Permitted | 0.14 | 1.00 | | 0.28 | 1.00 | | 0.35 | 1.00 | | 0.11 | 1.00 | |
| Satd. Flow (perm) | 244 | 3392 | | 503 | 3369 | | 638 | 3474 | | 203 | 3512 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 149 | 625 | 32 | 50 | 775 | 73 | 72 | 1078 | 21 | 173 | 548 | 108 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 149 | 657 | 0 | 50 | 848 | 0 | 72 | 1099 | 0 | 173 | 656 | 0 |
| Confl. Peds. (#/hr) | 13 | | 12 | 12 | | 13 | 3 | | 16 | 16 | | 3 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 |
| Turn Type | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Actuated Green, G (s) | 37.1 | 31.1 | | 34.5 | 29.8 | | 37.8 | 33.0 | | 46.6 | 37.4 | |
| Effective Green, g (s) | 37.1 | 31.1 | | 34.5 | 29.8 | | 37.8 | 33.0 | | 46.6 | 37.4 | |
| Actuated g/C Ratio | 0.37 | 0.31 | | 0.34 | 0.30 | | 0.38 | 0.33 | | 0.47 | 0.37 | |
| Clearance Time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | |
| Vehicle Extension (s) | 2.0 | 5.0 | | 2.0 | 5.0 | | 2.0 | 5.0 | | 2.0 | 5.0 | |
| Lane Grp Cap (vph) | 178 | 1054 | | 230 | 1003 | | 294 | 1146 | | 241 | 1313 | |
| v/s Ratio Prot | c0.05 | 0.19 | | 0.01 | 0.25 | | 0.01 | c0.32 | | c0.07 | 0.19 | |
| v/s Ratio Perm | c0.26 | | | 0.06 | | | 0.08 | | | 0.27 | | |
| v/c Ratio | 0.84 | 0.62 | | 0.22 | 0.85 | | 0.24 | 0.96 | | 0.72 | 0.50 | |
| Uniform Delay, d1 | 23.9 | 29.4 | | 22.5 | 32.9 | | 20.3 | 32.8 | | 21.2 | 24.1 | |
| Progression Factor | 1.82 | 1.25 | | 0.60 | 0.73 | | 0.98 | 0.81 | | 1.50 | 1.52 | |
| Incremental Delay, d2 | 24.4 | 2.5 | | 0.2 | 8.1 | | 0.2 | 17.2 | | 7.6 | 0.6 | |
| Delay (s) | 67.9 | 39.2 | | 13.7 | 32.2 | | 20.0 | 43.9 | | 39.5 | 37.3 | |
| Level of Service | E | D | | B | C | | B | D | | D | D | |
| Approach Delay (s) | | 44.5 | | | 31.2 | | | 42.4 | | | 37.7 | |
| Approach LOS | | D | | | C | | | D | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 39.1 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.89 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 22.0 |
| Intersection Capacity Utilization | 84.7% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

# HCM Unsignalized Intersection Capacity Analysis
## 32: E. Broad St & Driveway

12/9/2015

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 31 | 803 | 36 | 17 | 879 | 107 | 4 | 0 | 13 | 20 | 0 | 65 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 34 | 873 | 39 | 18 | 955 | 116 | 4 | 0 | 14 | 22 | 0 | 71 |
| Pedestrians | | | | | | | | 4 | | | 4 | |
| Lane Width (ft) | | | | | | | | 12.0 | | | 12.0 | |
| 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) | | 460 | | | | | | | | | | |
| pX, platoon unblocked | | | | 0.85 | | | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | |
| vC, conflicting volume | 1076 | | | 916 | | | 1549 | 2076 | 460 | 1572 | 2038 | 540 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 1076 | | | 553 | | | 1296 | 1916 | 17 | 1324 | 1870 | 540 |
| 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 % | 95 | | | 98 | | | 95 | 100 | 98 | 76 | 100 | 85 |
| cM capacity (veh/h) | 642 | | | 860 | | | 81 | 52 | 897 | 89 | 56 | 485 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 34 | 582 | 330 | 18 | 637 | 435 | 18 | 92 |
| Volume Left | 34 | 0 | 0 | 18 | 0 | 0 | 4 | 22 |
| Volume Right | 0 | 0 | 39 | 0 | 0 | 116 | 14 | 71 |
| cSH | 642 | 1700 | 1700 | 860 | 1700 | 1700 | 267 | 238 |
| Volume to Capacity | 0.05 | 0.34 | 0.19 | 0.02 | 0.37 | 0.26 | 0.07 | 0.39 |
| Queue Length 95th (ft) | 4 | 0 | 0 | 2 | 0 | 0 | 6 | 44 |
| Control Delay (s) | 10.9 | 0.0 | 0.0 | 9.3 | 0.0 | 0.0 | 19.5 | 29.5 |
| Lane LOS | B | | | A | | | C | D |
| Approach Delay (s) | 0.4 | | | 0.2 | | | 19.5 | 29.5 |
| Approach LOS | | | | | | | C | D |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.7 | | |
| Intersection Capacity Utilization | 41.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

# Queues
## 23: N. Washington St & Park Ave

12/9/2015

| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 99 | 55 | 1367 | 804 |
| v/c Ratio | 0.47 | 0.23 | 0.84 | 0.48 |
| Control Delay | 48.9 | 13.9 | 8.7 | 20.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 48.9 | 13.9 | 8.7 | 20.0 |
| Queue Length 50th (ft) | 60 | 0 | 162 | 157 |
| Queue Length 95th (ft) | 112 | 36 | m228 | 222 |
| Internal Link Dist (ft) | 437 | | 15 | 403 |
| Turn Bay Length (ft) | 150 | | | |
| Base Capacity (vph) | 212 | 235 | 1622 | 1672 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 4 | 0 | 1 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.47 | 0.24 | 0.84 | 0.48 |

Intersection Summary

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 91 | 51 | 98 | 1159 | 651 | 88 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 12 | 12 | 11 | 11 | 11 | 11 |
| Grade (%) | 0% | | | 3% | -3% | |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 0.98 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1557 | | 3328 | 3391 | |
| Flt Permitted | 0.95 | 1.00 | | 0.79 | 1.00 | |
| Satd. Flow (perm) | 1770 | 1557 | | 2641 | 3391 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 99 | 55 | 107 | 1260 | 708 | 96 |
| RTOR Reduction (vph) | 0 | 48 | 0 | 0 | 11 | 0 |
| Lane Group Flow (vph) | 99 | 7 | 0 | 1367 | 793 | 0 |
| Confl. Peds. (#/hr) | 2 | 2 | 9 | | | 9 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 4 | 0 | 4 |
| Turn Type | Prot | Perm | pm+pt | NA | NA | |
| Protected Phases | 3 | | 5 4 | 2 4 | 6 | |
| Permitted Phases | | 3 | 2 4 | | | |
| Actuated Green, G (s) | 12.0 | 12.0 | | 56.0 | 49.0 | |
| Effective Green, g (s) | 12.0 | 12.0 | | 56.0 | 49.0 | |
| Actuated g/C Ratio | 0.12 | 0.12 | | 0.56 | 0.49 | |
| Clearance Time (s) | 6.0 | 6.0 | | | 6.0 | |
| Vehicle Extension (s) | 4.0 | 4.0 | | | 3.0 | |
| Lane Grp Cap (vph) | 212 | 186 | | 1623 | 1661 | |
| v/s Ratio Prot | c0.06 | | | c0.18 | c0.23 | |
| v/s Ratio Perm | | 0.00 | | c0.29 | | |
| v/c Ratio | 0.47 | 0.04 | | 0.84 | 0.48 | |
| Uniform Delay, d1 | 41.0 | 38.9 | | 18.3 | 17.0 | |
| Progression Factor | 1.00 | 1.00 | | 0.29 | 1.14 | |
| Incremental Delay, d2 | 2.2 | 0.1 | | 2.0 | 0.9 | |
| Delay (s) | 43.2 | 39.0 | | 7.4 | 20.2 | |
| Level of Service | D | D | | A | C | |
| Approach Delay (s) | 41.7 | | | 7.4 | 20.2 | |
| Approach LOS | D | | | A | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 14.1 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.80 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 24.0 |
| Intersection Capacity Utilization | 75.8% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | WBL | NBT | SBT |
|---|---|---|---|
| Lane Group Flow (vph) | 135 | 1330 | 770 |
| v/c Ratio | 1.05 | 0.87 | 0.36 |
| Control Delay | 129.9 | 39.2 | 2.5 |
| Queue Delay | 18.4 | 48.6 | 0.0 |
| Total Delay | 148.3 | 87.8 | 2.5 |
| Queue Length 50th (ft) | ~75 | 473 | 27 |
| Queue Length 95th (ft) | #197 | m488 | 24 |
| Internal Link Dist (ft) | 182 | 64 | 15 |
| Turn Bay Length (ft) | | | |
| Base Capacity (vph) | 129 | 1532 | 2119 |
| Starvation Cap Reductn | 0 | 635 | 0 |
| Spillback Cap Reductn | 7 | 282 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.11 | 1.48 | 0.36 |

Intersection Summary

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

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

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

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 71 | 53 | 1212 | 12 | 33 | 675 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Grade (%) | 0% | | 3% | | | -4% |
| Total Lost time (s) | 6.0 | | 6.0 | | | 6.0 |
| 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 | 0.94 | | 1.00 | | | 1.00 |
| Flt Protected | 0.97 | | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 1706 | | 3479 | | | 3602 |
| Flt Permitted | 0.97 | | 1.00 | | | 0.77 |
| Satd. Flow (perm) | 1706 | | 3479 | | | 2763 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 77 | 58 | 1317 | 13 | 36 | 734 |
| RTOR Reduction (vph) | 27 | 0 | 1 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 108 | 0 | 1329 | 0 | 0 | 770 |
| Confl. Peds. (#/hr) | | | | 12 | | |
| Turn Type | Prot | | NA | | pm+pt | NA |
| Protected Phases | 4 | | 2 | | 1 3 | 3 6 |
| Permitted Phases | | | | | 3 6 | |
| Actuated Green, G (s) | 6.0 | | 44.0 | | | 67.0 |
| Effective Green, g (s) | 6.0 | | 44.0 | | | 67.0 |
| Actuated g/C Ratio | 0.06 | | 0.44 | | | 0.67 |
| Clearance Time (s) | 6.0 | | 6.0 | | | |
| Vehicle Extension (s) | 4.0 | | 3.0 | | | |
| Lane Grp Cap (vph) | 102 | | 1530 | | | 2119 |
| v/s Ratio Prot | c0.06 | | c0.38 | | | c0.12 |
| v/s Ratio Perm | | | | | | 0.13 |
| v/c Ratio | 1.06 | | 0.87 | | | 0.36 |
| Uniform Delay, d1 | 47.0 | | 25.4 | | | 7.2 |
| Progression Factor | 1.00 | | 1.41 | | | 0.30 |
| Incremental Delay, d2 | 105.1 | | 2.8 | | | 0.1 |
| Delay (s) | 152.1 | | 38.7 | | | 2.3 |
| Level of Service | F | | D | | | A |
| Approach Delay (s) | 152.1 | | 38.7 | | | 2.3 |
| Approach LOS | F | | D | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 33.0 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.75 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 24.0 |
| Intersection Capacity Utilization | 60.2% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

# Queues
## 4: S. Washington St/N. Washington St & W. Broad St/E. Broad St

12/9/2015

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 212 | 849 | 108 | 903 | 87 | 755 | 225 | 1302 |
| v/c Ratio | 0.93 | 0.77 | 0.55 | 0.89 | 0.50 | 0.79 | 0.74 | 1.04 |
| Control Delay | 67.5 | 24.2 | 25.8 | 40.7 | 25.1 | 42.2 | 39.0 | 66.6 |
| Queue Delay | 52.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 | 0.0 | 23.5 |
| Total Delay | 120.0 | 24.2 | 25.8 | 40.7 | 25.1 | 42.6 | 39.0 | 90.1 |
| Queue Length 50th (ft) | 69 | 225 | 32 | 301 | 38 | 265 | 92 | ~461 |
| Queue Length 95th (ft) | #223 | 253 | 66 | #427 | m59 | 327 | m118 | m#570 |
| Internal Link Dist (ft) | | 453 | | 381 | | 503 | | 197 |
| Turn Bay Length (ft) | 275 | | 255 | | 345 | | 190 | |
| Base Capacity (vph) | 229 | 1106 | 200 | 1011 | 177 | 990 | 329 | 1251 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 72 |
| Spillback Cap Reductn | 87 | 0 | 0 | 0 | 0 | 32 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.49 | 0.77 | 0.54 | 0.89 | 0.49 | 0.79 | 0.68 | 1.10 |

### Intersection Summary

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

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

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 195 | 716 | 65 | 99 | 798 | 33 | 80 | 667 | 28 | 207 | 1049 | 149 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 11 | 11 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | | 0% | | | 0% | | | 3% | | | -4% | |
| Total Lost time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1711 | 3364 | | 1709 | 3396 | | 1743 | 3452 | | 1801 | 3536 | |
| Flt Permitted | 0.13 | 1.00 | | 0.18 | 1.00 | | 0.14 | 1.00 | | 0.16 | 1.00 | |
| Satd. Flow (perm) | 226 | 3364 | | 320 | 3396 | | 256 | 3452 | | 298 | 3536 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 212 | 778 | 71 | 108 | 867 | 36 | 87 | 725 | 30 | 225 | 1140 | 162 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 212 | 849 | 0 | 108 | 903 | 0 | 87 | 755 | 0 | 225 | 1302 | 0 |
| Confl. Peds. (#/hr) | 18 | | 30 | 30 | | 18 | 3 | | 64 | 64 | | 3 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 |
| Turn Type | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Actuated Green, G (s) | 40.9 | 31.9 | | 34.7 | 28.8 | | 33.5 | 28.7 | | 45.2 | 35.4 | |
| Effective Green, g (s) | 40.9 | 31.9 | | 34.7 | 28.8 | | 33.5 | 28.7 | | 45.2 | 35.4 | |
| Actuated g/C Ratio | 0.41 | 0.32 | | 0.35 | 0.29 | | 0.34 | 0.29 | | 0.45 | 0.35 | |
| Clearance Time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | |
| Vehicle Extension (s) | 2.0 | 5.0 | | 2.0 | 5.0 | | 2.0 | 5.0 | | 2.0 | 5.0 | |
| Lane Grp Cap (vph) | 226 | 1073 | | 192 | 978 | | 157 | 990 | | 307 | 1251 | |
| v/s Ratio Prot | c0.08 | 0.25 | | 0.03 | 0.27 | | 0.03 | 0.22 | | c0.08 | c0.37 | |
| v/s Ratio Perm | c0.30 | | | 0.16 | | | 0.16 | | | 0.25 | | |
| v/c Ratio | 0.94 | 0.79 | | 0.56 | 0.92 | | 0.55 | 0.76 | | 0.73 | 1.04 | |
| Uniform Delay, d1 | 23.5 | 31.0 | | 23.9 | 34.5 | | 26.5 | 32.5 | | 19.9 | 32.3 | |
| Progression Factor | 1.41 | 0.64 | | 0.83 | 0.81 | | 0.95 | 1.07 | | 1.71 | 1.13 | |
| Incremental Delay, d2 | 36.4 | 4.8 | | 2.2 | 15.0 | | 2.3 | 4.0 | | 4.2 | 30.3 | |
| Delay (s) | 69.5 | 24.6 | | 22.0 | 43.0 | | 27.4 | 38.8 | | 38.2 | 66.7 | |
| Level of Service | E | C | | C | D | | C | D | | D | E | |
| Approach Delay (s) | | 33.6 | | | 40.8 | | | 37.6 | | | 62.5 | |
| Approach LOS | | C | | | D | | | D | | | E | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 45.9 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 1.03 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 22.0 |
| Intersection Capacity Utilization | 90.5% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

# HCM Unsignalized Intersection Capacity Analysis
## 32: E. Broad St & Driveway

12/9/2015

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 58 | 991 | 10 | 6 | 688 | 183 | 15 | 0 | 22 | 41 | 0 | 88 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 63 | 1077 | 11 | 7 | 748 | 199 | 16 | 0 | 24 | 45 | 0 | 96 |
| Pedestrians | | 1 | | | | | | 5 | | | 9 | |
| Lane Width (ft) | | 12.0 | | | | | | 12.0 | | | 12.0 | |
| Walking Speed (ft/s) | | 4.0 | | | | | | 4.0 | | | 4.0 | |
| Percent Blockage | | 0 | | | | | | 0 | | | 1 | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | 461 | | | | | | | | | | |
| pX, platoon unblocked | | | | 0.79 | | | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | |
| vC, conflicting volume | 956 | | | 1093 | | | 1697 | 2182 | 549 | 1558 | 2088 | 483 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 956 | | | 596 | | | 1358 | 1969 | 0 | 1182 | 1851 | 483 |
| 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 % | 91 | | | 99 | | | 74 | 100 | 97 | 56 | 100 | 82 |
| cM capacity (veh/h) | 710 | | | 771 | | | 64 | 44 | 856 | 102 | 52 | 525 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 63 | 718 | 370 | 7 | 499 | 448 | 40 | 140 |
| Volume Left | 63 | 0 | 0 | 7 | 0 | 0 | 16 | 45 |
| Volume Right | 0 | 0 | 11 | 0 | 0 | 199 | 24 | 96 |
| cSH | 710 | 1700 | 1700 | 771 | 1700 | 1700 | 142 | 226 |
| Volume to Capacity | 0.09 | 0.42 | 0.22 | 0.01 | 0.29 | 0.26 | 0.28 | 0.62 |
| Queue Length 95th (ft) | 7 | 0 | 0 | 1 | 0 | 0 | 27 | 91 |
| Control Delay (s) | 10.6 | 0.0 | 0.0 | 9.7 | 0.0 | 0.0 | 40.2 | 43.7 |
| Lane LOS | B | | | A | | | E | E |
| Approach Delay (s) | 0.6 | | | 0.1 | | | 40.2 | 43.7 |
| Approach LOS | | | | | | | E | E |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 3.7 | | |
| Intersection Capacity Utilization | 50.4% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

# Queues
## 23: N. Washington St & Park Ave

12/9/2015

| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 183 | 116 | 1011 | 1463 |
| v/c Ratio | 0.86 | 0.41 | 0.59 | 0.87 |
| Control Delay | 79.1 | 12.6 | 3.7 | 27.2 |
| Queue Delay | 0.0 | 1.1 | 0.0 | 47.2 |
| Total Delay | 79.1 | 13.8 | 3.7 | 74.4 |
| Queue Length 50th (ft) | 116 | 0 | 34 | 501 |
| Queue Length 95th (ft) | #239 | 51 | m12 | 584 |
| Internal Link Dist (ft) | 437 | | 1 | 403 |
| Turn Bay Length (ft) | 150 | | | |
| Base Capacity (vph) | 212 | 281 | 1711 | 1678 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 54 | 0 | 410 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.86 | 0.51 | 0.59 | 1.15 |

Intersection Summary

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

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 168 | 107 | 36 | 894 | 1266 | 80 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 12 | 12 | 11 | 11 | 11 | 11 |
| Grade (%) | 0% | | | 3% | -3% | |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 0.95 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1498 | | 3336 | 3417 | |
| Flt Permitted | 0.95 | 1.00 | | 0.86 | 1.00 | |
| Satd. Flow (perm) | 1770 | 1498 | | 2888 | 3417 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 183 | 116 | 39 | 972 | 1376 | 87 |
| RTOR Reduction (vph) | 0 | 102 | 0 | 0 | 5 | 0 |
| Lane Group Flow (vph) | 183 | 14 | 0 | 1011 | 1458 | 0 |
| Confl. Peds. (#/hr) | | 17 | 33 | | | 33 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 4 | 0 | 4 |
| Turn Type | Prot | Perm | pm+pt | NA | NA | |
| Protected Phases | 3 | | 5 4 | 2 4 | 6 | |
| Permitted Phases | | 3 | 2 4 | | | |
| Actuated Green, G (s) | 12.0 | 12.0 | | 56.0 | 49.0 | |
| Effective Green, g (s) | 12.0 | 12.0 | | 56.0 | 49.0 | |
| Actuated g/C Ratio | 0.12 | 0.12 | | 0.56 | 0.49 | |
| Clearance Time (s) | 6.0 | 6.0 | | | 6.0 | |
| Vehicle Extension (s) | 4.0 | 4.0 | | | 3.0 | |
| Lane Grp Cap (vph) | 212 | 179 | | 1711 | 1674 | |
| v/s Ratio Prot | c0.10 | | | c0.12 | c0.43 | |
| v/s Ratio Perm | | 0.01 | | 0.21 | | |
| v/c Ratio | 0.86 | 0.08 | | 0.59 | 0.87 | |
| Uniform Delay, d1 | 43.2 | 39.1 | | 14.5 | 22.7 | |
| Progression Factor | 1.00 | 1.00 | | 0.17 | 0.94 | |
| Incremental Delay, d2 | 29.2 | 0.3 | | 0.4 | 5.4 | |
| Delay (s) | 72.4 | 39.3 | | 2.9 | 26.7 | |
| Level of Service | E | D | | A | C | |
| Approach Delay (s) | 59.6 | | | 2.9 | 26.7 | |
| Approach LOS | E | | | A | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 21.6 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.88 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 24.0 |
| Intersection Capacity Utilization | 70.4% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | WBL | NBT | SBT |
|---|---|---|---|
| Lane Group Flow (vph) | 197 | 979 | 1518 |
| v/c Ratio | 1.53 | 0.64 | 0.79 |
| Control Delay | 301.7 | 20.7 | 13.5 |
| Queue Delay | 0.6 | 29.6 | 48.0 |
| Total Delay | 302.4 | 50.2 | 61.5 |
| Queue Length 50th (ft) | ~159 | 297 | 136 |
| Queue Length 95th (ft) | #302 | m386 | 195 |
| Internal Link Dist (ft) | 183 | 28 | 1 |
| Turn Bay Length (ft) | | | |
| Base Capacity (vph) | 129 | 1522 | 1913 |
| Starvation Cap Reductn | 0 | 587 | 0 |
| Spillback Cap Reductn | 4 | 117 | 571 |
| Storage Cap Reductn | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.58 | 1.05 | 1.13 |

Intersection Summary

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

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

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

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 101 | 80 | 867 | 34 | 99 | 1297 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Grade (%) | 0% | | 3% | | | -4% |
| Total Lost time (s) | 6.0 | | 6.0 | | | 6.0 |
| Lane Util. Factor | 1.00 | | 0.95 | | | 0.95 |
| Frpb, ped/bikes | 0.99 | | 1.00 | | | 1.00 |
| Flpb, ped/bikes | 1.00 | | 1.00 | | | 1.00 |
| Frt | 0.94 | | 0.99 | | | 1.00 |
| Flt Protected | 0.97 | | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 1691 | | 3455 | | | 3597 |
| Flt Permitted | 0.97 | | 1.00 | | | 0.60 |
| Satd. Flow (perm) | 1691 | | 3455 | | | 2182 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 110 | 87 | 942 | 37 | 108 | 1410 |
| RTOR Reduction (vph) | 28 | 0 | 3 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 169 | 0 | 976 | 0 | 0 | 1518 |
| Confl. Peds. (#/hr) | | 1 | | 21 | | |
| Turn Type | Prot | | NA | | pm+pt | NA |
| Protected Phases | 4 | | 2 | | 1 3 | 3 6 |
| Permitted Phases | | | | | 3 6 | |
| Actuated Green, G (s) | 6.0 | | 44.0 | | | 67.0 |
| Effective Green, g (s) | 6.0 | | 44.0 | | | 67.0 |
| Actuated g/C Ratio | 0.06 | | 0.44 | | | 0.67 |
| Clearance Time (s) | 6.0 | | 6.0 | | | |
| Vehicle Extension (s) | 4.0 | | 3.0 | | | |
| Lane Grp Cap (vph) | 101 | | 1520 | | | 1914 |
| v/s Ratio Prot | c0.10 | | c0.28 | | | c0.25 |
| v/s Ratio Perm | | | | | | c0.28 |
| v/c Ratio | 1.67 | | 0.64 | | | 0.79 |
| Uniform Delay, d1 | 47.0 | | 21.9 | | | 11.6 |
| Progression Factor | 1.00 | | 0.87 | | | 1.20 |
| Incremental Delay, d2 | 341.3 | | 1.4 | | | 1.4 |
| Delay (s) | 388.3 | | 20.5 | | | 15.3 |
| Level of Service | F | | C | | | B |
| Approach Delay (s) | 388.3 | | 20.5 | | | 15.3 |
| Approach LOS | F | | C | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 44.5 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.91 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 24.0 |
| Intersection Capacity Utilization | 89.4% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

# Queues
## 4: S. Washington St/N. Washington St & W. Broad St/E. Broad St

12/9/2015

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 197 | 753 | 84 | 718 | 110 | 704 | 309 | 737 |
| v/c Ratio | 0.66 | 0.70 | 0.36 | 0.82 | 0.40 | 0.81 | 0.85 | 0.66 |
| Control Delay | 35.0 | 40.9 | 26.5 | 52.0 | 26.4 | 52.1 | 50.9 | 39.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 |
| Total Delay | 35.0 | 41.0 | 26.5 | 52.0 | 26.4 | 52.1 | 50.9 | 40.0 |
| Queue Length 50th (ft) | 97 | 273 | 38 | 283 | 49 | 277 | 170 | 260 |
| Queue Length 95th (ft) | 183 | 398 | 80 | 410 | 103 | 403 | #408 | 401 |
| Internal Link Dist (ft) | | 453 | | 381 | | 503 | | 175 |
| Turn Bay Length (ft) | 275 | | 255 | | 345 | | 190 | |
| Base Capacity (vph) | 357 | 1838 | 334 | 1704 | 426 | 1752 | 380 | 1741 |
| Starvation Cap Reductn | 0 | 85 | 0 | 0 | 0 | 0 | 0 | 358 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.55 | 0.43 | 0.25 | 0.42 | 0.26 | 0.40 | 0.81 | 0.53 |

### Intersection Summary

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 181 | 621 | 72 | 77 | 604 | 56 | 101 | 621 | 27 | 284 | 494 | 184 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 11 | 11 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | | 0% | | | 0% | | | 3% | | | -4% | |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.98 | | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.96 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1711 | 3358 | | 1709 | 3369 | | 1742 | 3461 | | 1805 | 3444 | |
| Flt Permitted | 0.14 | 1.00 | | 0.25 | 1.00 | | 0.29 | 1.00 | | 0.14 | 1.00 | |
| Satd. Flow (perm) | 252 | 3358 | | 452 | 3369 | | 525 | 3461 | | 261 | 3444 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 197 | 675 | 78 | 84 | 657 | 61 | 110 | 675 | 29 | 309 | 537 | 200 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 197 | 753 | 0 | 84 | 718 | 0 | 110 | 704 | 0 | 309 | 737 | 0 |
| Confl. Peds. (#/hr) | 11 | | 11 | 11 | | 11 | 4 | | 5 | 5 | | 4 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 |
| Turn Type | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Actuated Green, G (s) | 53.4 | 39.0 | | 40.1 | 31.7 | | 40.5 | 30.6 | | 55.8 | 39.9 | |
| Effective Green, g (s) | 53.4 | 39.0 | | 40.1 | 31.7 | | 40.5 | 30.6 | | 55.8 | 39.9 | |
| Actuated g/C Ratio | 0.44 | 0.32 | | 0.33 | 0.26 | | 0.33 | 0.25 | | 0.46 | 0.33 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lane Grp Cap (vph) | 300 | 1080 | | 236 | 881 | | 274 | 873 | | 364 | 1133 | |
| v/s Ratio Prot | c0.09 | c0.22 | | 0.02 | c0.21 | | 0.03 | 0.20 | | c0.13 | 0.21 | |
| v/s Ratio Perm | 0.20 | | | 0.09 | | | 0.10 | | | c0.26 | | |
| v/c Ratio | 0.66 | 0.70 | | 0.36 | 0.81 | | 0.40 | 0.81 | | 0.85 | 0.65 | |
| Uniform Delay, d1 | 24.7 | 35.9 | | 29.0 | 42.0 | | 28.9 | 42.5 | | 28.8 | 34.7 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 3.9 | 1.6 | | 0.3 | 5.6 | | 0.4 | 5.2 | | 16.0 | 1.0 | |
| Delay (s) | 28.6 | 37.5 | | 29.3 | 47.5 | | 29.3 | 47.7 | | 44.8 | 35.7 | |
| Level of Service | C | D | | C | D | | C | D | | D | D | |
| Approach Delay (s) | | 35.7 | | | 45.6 | | | 45.2 | | | 38.4 | |
| Approach LOS | | D | | | D | | | D | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 40.8 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.84 | | |
| Actuated Cycle Length (s) | 121.2 | Sum of lost time (s) | 24.0 |
| Intersection Capacity Utilization | 82.4% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

# HCM Unsignalized Intersection Capacity Analysis
## 32: E. Broad St & Driveway

12/9/2015

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 71 | 920 | 4 | 3 | 642 | 214 | 2 | 1 | 2 | 45 | 0 | 121 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 77 | 1000 | 4 | 3 | 698 | 233 | 2 | 1 | 2 | 49 | 0 | 132 |
| Pedestrians | | | | | | | | 4 | | | 7 | |
| Lane Width (ft) | | | | | | | | 12.0 | | | 12.0 | |
| Walking Speed (ft/s) | | | | | | | | 4.0 | | | 4.0 | |
| Percent Blockage | | | | | | | | 0 | | | 1 | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | 461 | | | | | | | | | | |
| pX, platoon unblocked | | | | 0.83 | | | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | |
| vC, conflicting volume | 937 | | | 1008 | | | 1647 | 2104 | 506 | 1485 | 1990 | 472 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 937 | | | 596 | | | 1368 | 1919 | 0 | 1171 | 1781 | 472 |
| 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 % | 89 | | | 100 | | | 96 | 98 | 100 | 55 | 100 | 75 |
| cM capacity (veh/h) | 722 | | | 806 | | | 60 | 49 | 895 | 109 | 59 | 535 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 77 | 667 | 338 | 3 | 465 | 465 | 5 | 180 |
| Volume Left | 77 | 0 | 0 | 3 | 0 | 0 | 2 | 49 |
| Volume Right | 0 | 0 | 4 | 0 | 0 | 233 | 2 | 132 |
| cSH | 722 | 1700 | 1700 | 806 | 1700 | 1700 | 89 | 259 |
| Volume to Capacity | 0.11 | 0.39 | 0.20 | 0.00 | 0.27 | 0.27 | 0.06 | 0.70 |
| Queue Length 95th (ft) | 9 | 0 | 0 | 0 | 0 | 0 | 5 | 117 |
| Control Delay (s) | 10.6 | 0.0 | 0.0 | 9.5 | 0.0 | 0.0 | 48.1 | 45.6 |
| Lane LOS | B | | | A | | | E | E |
| Approach Delay (s) | 0.8 | | | 0.0 | | | 48.1 | 45.6 |
| Approach LOS | | | | | | | E | E |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 4.2 | | |
| Intersection Capacity Utilization | 50.4% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

# Queues
## 23: N. Washington St & Park Ave

12/9/2015

| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 149 | 62 | 953 | 965 |
| v/c Ratio | 0.70 | 0.25 | 0.55 | 0.57 |
| Control Delay | 61.1 | 13.6 | 2.6 | 19.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.1 |
| Total Delay | 61.1 | 13.6 | 2.6 | 19.6 |
| Queue Length 50th (ft) | 93 | 0 | 16 | 217 |
| Queue Length 95th (ft) | #181 | 38 | m10 | 278 |
| Internal Link Dist (ft) | 437 | | 1 | 403 |
| Turn Bay Length (ft) | 150 | | | |
| Base Capacity (vph) | 212 | 244 | 1740 | 1681 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 1 | 0 | 101 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.70 | 0.26 | 0.55 | 0.61 |

### Intersection Summary

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

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 137 | 57 | 39 | 838 | 806 | 82 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 12 | 12 | 11 | 11 | 11 | 11 |
| Grade (%) | 0% | | | 3% | -3% | |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1583 | | 3335 | 3415 | |
| Flt Permitted | 0.95 | 1.00 | | 0.89 | 1.00 | |
| Satd. Flow (perm) | 1770 | 1583 | | 2972 | 3415 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 149 | 62 | 42 | 911 | 876 | 89 |
| RTOR Reduction (vph) | 0 | 55 | 0 | 0 | 8 | 0 |
| Lane Group Flow (vph) | 149 | 7 | 0 | 953 | 957 | 0 |
| Confl. Peds. (#/hr) | 3 | | 3 | | | 3 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 4 | 0 | 4 |
| Turn Type | Prot | Perm | pm+pt | NA | NA | |
| Protected Phases | 3 | | 5 4 | 2 4 | 6 | |
| Permitted Phases | | 3 | 2 4 | | | |
| Actuated Green, G (s) | 12.0 | 12.0 | | 56.0 | 49.0 | |
| Effective Green, g (s) | 12.0 | 12.0 | | 56.0 | 49.0 | |
| Actuated g/C Ratio | 0.12 | 0.12 | | 0.56 | 0.49 | |
| Clearance Time (s) | 6.0 | 6.0 | | | 6.0 | |
| Vehicle Extension (s) | 4.0 | 4.0 | | | 3.0 | |
| Lane Grp Cap (vph) | 212 | 189 | | 1740 | 1673 | |
| v/s Ratio Prot | c0.08 | | | c0.11 | c0.28 | |
| v/s Ratio Perm | | 0.00 | | 0.19 | | |
| v/c Ratio | 0.70 | 0.04 | | 0.55 | 0.57 | |
| Uniform Delay, d1 | 42.3 | 38.9 | | 14.0 | 18.1 | |
| Progression Factor | 1.00 | 1.00 | | 0.12 | 1.00 | |
| Incremental Delay, d2 | 10.8 | 0.1 | | 0.3 | 1.4 | |
| Delay (s) | 53.1 | 39.0 | | 2.0 | 19.5 | |
| Level of Service | D | D | | A | B | |
| Approach Delay (s) | 48.9 | | | 2.0 | 19.5 | |
| Approach LOS | D | | | A | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 14.6 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.65 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 24.0 |
| Intersection Capacity Utilization | 69.5% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

# Queues
## 36: N. Washington St & driveway

12/9/2015

| Lane Group | WBL | NBT | SBT |
|---|---|---|---|
| Lane Group Flow (vph) | 225 | 942 | 965 |
| v/c Ratio | 1.84 | 0.62 | 0.51 |
| Control Delay | 436.3 | 23.6 | 2.8 |
| Queue Delay | 0.0 | 3.2 | 0.0 |
| Total Delay | 436.3 | 26.7 | 2.8 |
| Queue Length 50th (ft) | ~209 | 235 | 16 |
| Queue Length 95th (ft) | #360 | 301 | 38 |
| Internal Link Dist (ft) | 211 | 50 | 1 |
| Turn Bay Length (ft) | | | |
| Base Capacity (vph) | 122 | 1526 | 1903 |
| Starvation Cap Reductn | 0 | 464 | 0 |
| Spillback Cap Reductn | 0 | 35 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.84 | 0.89 | 0.51 |

### Intersection Summary

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

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

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 137 | 70 | 832 | 35 | 98 | 789 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Grade (%) | 0% | | 3% | | | -4% |
| Total Lost time (s) | 6.0 | | 6.0 | | | 6.0 |
| 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 | 0.95 | | 0.99 | | | 1.00 |
| Flt Protected | 0.97 | | 1.00 | | | 0.99 |
| Satd. Flow (prot) | 1721 | | 3461 | | | 3590 |
| Flt Permitted | 0.97 | | 1.00 | | | 0.60 |
| Satd. Flow (perm) | 1721 | | 3461 | | | 2159 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 149 | 76 | 904 | 38 | 107 | 858 |
| RTOR Reduction (vph) | 19 | 0 | 3 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 206 | 0 | 939 | 0 | 0 | 965 |
| Confl. Peds. (#/hr) | | | | 2 | | |
| Turn Type | Prot | | NA | | pm+pt | NA |
| Protected Phases | 4 | | 2 | | 1 3 | 3 6 |
| Permitted Phases | | | | | 3 6 | |
| Actuated Green, G (s) | 6.0 | | 44.0 | | | 67.0 |
| Effective Green, g (s) | 6.0 | | 44.0 | | | 67.0 |
| Actuated g/C Ratio | 0.06 | | 0.44 | | | 0.67 |
| Clearance Time (s) | 6.0 | | 6.0 | | | |
| Vehicle Extension (s) | 4.0 | | 3.0 | | | |
| Lane Grp Cap (vph) | 103 | | 1522 | | | 1904 |
| v/s Ratio Prot | c0.12 | | c0.27 | | | c0.16 |
| v/s Ratio Perm | | | | | | 0.18 |
| v/c Ratio | 2.00 | | 0.62 | | | 0.51 |
| Uniform Delay, d1 | 47.0 | | 21.5 | | | 8.2 |
| Progression Factor | 1.00 | | 1.00 | | | 0.26 |
| Incremental Delay, d2 | 483.4 | | 1.9 | | | 0.2 |
| Delay (s) | 530.4 | | 23.4 | | | 2.4 |
| Level of Service | F | | C | | | A |
| Approach Delay (s) | 530.4 | | 23.4 | | | 2.4 |
| Approach LOS | F | | C | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 67.4 | HCM 2000 Level of Service | E |
| HCM 2000 Volume to Capacity ratio | 0.74 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 24.0 |
| Intersection Capacity Utilization | 75.6% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

# APPENDIX K

INTERSECTION CAPACITY ANALYSIS –

FUTURE WITH DEVELOPMENT CONDITION (2020) SCENARIO 4

# Queues
## 4: S. Washington St/N. Washington St & W. Broad St/E. Broad St

12/9/2015

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 149 | 657 | 53 | 868 | 72 | 1099 | 147 | 633 |
| v/c Ratio | 0.83 | 0.58 | 0.20 | 0.82 | 0.23 | 0.99 | 0.64 | 0.49 |
| Control Delay | 69.0 | 37.9 | 12.3 | 31.1 | 16.3 | 52.8 | 30.4 | 23.9 |
| Queue Delay | 63.5 | 0.0 | 0.0 | 0.0 | 0.0 | 38.5 | 0.0 | 0.0 |
| Total Delay | 132.5 | 37.9 | 12.3 | 31.1 | 16.3 | 91.2 | 30.4 | 23.9 |
| Queue Length 50th (ft) | 83 | 205 | 11 | 273 | 20 | 215 | 56 | 176 |
| Queue Length 95th (ft) | m#164 | 205 | m25 | #380 | m50 | #485 | 109 | 242 |
| Internal Link Dist (ft) | | 453 | | 375 | | 503 | | 144 |
| Turn Bay Length (ft) | 275 | | 255 | | 345 | | 190 | |
| Base Capacity (vph) | 180 | 1142 | 266 | 1056 | 319 | 1111 | 254 | 1320 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 66 | 0 | 0 | 0 | 0 | 229 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.31 | 0.58 | 0.20 | 0.82 | 0.23 | 1.25 | 0.58 | 0.48 |

### Intersection Summary

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

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 137 | 575 | 29 | 49 | 731 | 67 | 66 | 992 | 19 | 135 | 501 | 81 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 11 | 11 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | | 0% | | | 0% | | | 3% | | | -4% | |
| Total Lost time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 1.00 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1710 | 3392 | | 1708 | 3370 | | 1742 | 3474 | | 1805 | 3527 | |
| Flt Permitted | 0.13 | 1.00 | | 0.28 | 1.00 | | 0.36 | 1.00 | | 0.11 | 1.00 | |
| Satd. Flow (perm) | 234 | 3392 | | 509 | 3370 | | 652 | 3474 | | 206 | 3527 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 149 | 625 | 32 | 53 | 795 | 73 | 72 | 1078 | 21 | 147 | 545 | 88 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 149 | 657 | 0 | 53 | 868 | 0 | 72 | 1099 | 0 | 147 | 633 | 0 |
| Confl. Peds. (#/hr) | 13 | | 12 | 12 | | 13 | 3 | | 16 | 16 | | 3 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 |
| Turn Type | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Actuated Green, G (s) | 37.6 | 31.6 | | 35.0 | 30.3 | | 37.9 | 33.1 | | 45.5 | 36.9 | |
| Effective Green, g (s) | 37.6 | 31.6 | | 35.0 | 30.3 | | 37.9 | 33.1 | | 45.5 | 36.9 | |
| Actuated g/C Ratio | 0.38 | 0.32 | | 0.35 | 0.30 | | 0.38 | 0.33 | | 0.46 | 0.37 | |
| Clearance Time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | |
| Vehicle Extension (s) | 2.0 | 5.0 | | 2.0 | 5.0 | | 2.0 | 5.0 | | 2.0 | 5.0 | |
| Lane Grp Cap (vph) | 176 | 1071 | | 234 | 1021 | | 299 | 1149 | | 231 | 1301 | |
| v/s Ratio Prot | c0.05 | 0.19 | | 0.01 | 0.26 | | 0.01 | c0.32 | | c0.05 | 0.18 | |
| v/s Ratio Perm | c0.27 | | | 0.07 | | | 0.08 | | | 0.23 | | |
| v/c Ratio | 0.85 | 0.61 | | 0.23 | 0.85 | | 0.24 | 0.96 | | 0.64 | 0.49 | |
| Uniform Delay, d1 | 23.7 | 29.0 | | 22.2 | 32.7 | | 20.2 | 32.7 | | 21.2 | 24.3 | |
| Progression Factor | 1.87 | 1.25 | | 0.61 | 0.74 | | 0.98 | 0.81 | | 1.04 | 0.91 | |
| Incremental Delay, d2 | 26.2 | 2.4 | | 0.2 | 8.2 | | 0.1 | 16.8 | | 4.1 | 0.6 | |
| Delay (s) | 70.5 | 38.7 | | 13.8 | 32.3 | | 19.9 | 43.4 | | 26.3 | 22.6 | |
| Level of Service | E | D | | B | C | | B | D | | C | C | |
| Approach Delay (s) | | 44.6 | | | 31.2 | | | 41.9 | | | 23.3 | |
| Approach LOS | | D | | | C | | | D | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 35.9 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.88 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 22.0 |
| Intersection Capacity Utilization | 83.9% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

# HCM Unsignalized Intersection Capacity Analysis
## 32: E. Broad St & Driveway

12/9/2015

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 31 | 779 | 36 | 17 | 879 | 107 | 4 | 0 | 13 | 46 | 0 | 86 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 34 | 847 | 39 | 18 | 955 | 116 | 4 | 0 | 14 | 50 | 0 | 93 |
| Pedestrians | | | | | | | | 4 | | | 4 | |
| Lane Width (ft) | | | | | | | | 12.0 | | | 12.0 | |
| 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) | | 460 | | | | | | | | | | |
| pX, platoon unblocked | | | | 0.85 | | | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | |
| vC, conflicting volume | 1076 | | | 890 | | | 1546 | 2050 | 447 | 1559 | 2012 | 540 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 1076 | | | 526 | | | 1295 | 1887 | 7 | 1311 | 1841 | 540 |
| 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 % | 95 | | | 98 | | | 94 | 100 | 98 | 45 | 100 | 81 |
| cM capacity (veh/h) | 642 | | | 882 | | | 77 | 55 | 913 | 92 | 59 | 485 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 34 | 564 | 321 | 18 | 637 | 435 | 18 | 143 |
| Volume Left | 34 | 0 | 0 | 18 | 0 | 0 | 4 | 50 |
| Volume Right | 0 | 0 | 39 | 0 | 0 | 116 | 14 | 93 |
| cSH | 642 | 1700 | 1700 | 882 | 1700 | 1700 | 257 | 194 |
| Volume to Capacity | 0.05 | 0.33 | 0.19 | 0.02 | 0.37 | 0.26 | 0.07 | 0.74 |
| Queue Length 95th (ft) | 4 | 0 | 0 | 2 | 0 | 0 | 6 | 120 |
| Control Delay (s) | 10.9 | 0.0 | 0.0 | 9.2 | 0.0 | 0.0 | 20.1 | 62.8 |
| Lane LOS | B | | | A | | | C | F |
| Approach Delay (s) | 0.4 | | | 0.2 | | | 20.1 | 62.8 |
| Approach LOS | | | | | | | C | F |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 4.6 | | |
| Intersection Capacity Utilization | 46.8% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

# Queues
## 23: N. Washington St & Park Ave

12/9/2015

| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 99 | 55 | 1364 | 804 |
| v/c Ratio | 0.52 | 0.25 | 0.65 | 0.29 |
| Control Delay | 50.8 | 13.7 | 11.0 | 2.9 |
| Queue Delay | 0.0 | 0.0 | 29.1 | 0.0 |
| Total Delay | 50.8 | 13.7 | 40.0 | 2.9 |
| Queue Length 50th (ft) | 61 | 0 | 442 | 54 |
| Queue Length 95th (ft) | 108 | 34 | m460 | 70 |
| Internal Link Dist (ft) | 437 | | 1 | 403 |
| Turn Bay Length (ft) | 150 | | | |
| Base Capacity (vph) | 283 | 295 | 2109 | 2748 |
| Starvation Cap Reductn | 0 | 0 | 811 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.35 | 0.19 | 1.05 | 0.29 |

Intersection Summary

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 91 | 51 | 98 | 1156 | 651 | 88 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 12 | 12 | 11 | 11 | 11 | 11 |
| Grade (%) | 0% | | | 3% | -3% | |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 0.98 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1555 | | 3328 | 3391 | |
| Flt Permitted | 0.95 | 1.00 | | 0.78 | 1.00 | |
| Satd. Flow (perm) | 1770 | 1555 | | 2609 | 3391 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 99 | 55 | 107 | 1257 | 708 | 96 |
| RTOR Reduction (vph) | 0 | 50 | 0 | 0 | 8 | 0 |
| Lane Group Flow (vph) | 99 | 5 | 0 | 1364 | 796 | 0 |
| Confl. Peds. (#/hr) | 2 | 2 | 9 | | | 9 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 4 | 0 | 4 |
| Turn Type | Prot | Perm | Perm | NA | NA | |
| Protected Phases | 4 | | | 6 | 2 | |
| Permitted Phases | | 4 | 6 | | | |
| Actuated Green, G (s) | 9.6 | 9.6 | | 78.4 | 78.4 | |
| Effective Green, g (s) | 9.6 | 9.6 | | 78.4 | 78.4 | |
| Actuated g/C Ratio | 0.10 | 0.10 | | 0.78 | 0.78 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 169 | 149 | | 2045 | 2658 | |
| v/s Ratio Prot | c0.06 | | | | 0.23 | |
| v/s Ratio Perm | | 0.00 | | c0.52 | | |
| v/c Ratio | 0.59 | 0.04 | | 0.67 | 0.30 | |
| Uniform Delay, d1 | 43.3 | 41.0 | | 4.9 | 3.0 | |
| Progression Factor | 1.00 | 1.00 | | 1.77 | 0.81 | |
| Incremental Delay, d2 | 5.1 | 0.1 | | 0.4 | 0.3 | |
| Delay (s) | 48.4 | 41.1 | | 9.0 | 2.7 | |
| Level of Service | D | D | | A | A | |
| Approach Delay (s) | 45.8 | | | 9.0 | 2.7 | |
| Approach LOS | D | | | A | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 9.3 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.66 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 75.8% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

# HCM Unsignalized Intersection Capacity Analysis
## 36: N. Washington St

12/9/2015

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 27 | 50 | 1212 | 12 | 33 | 675 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 3% | | | -4% |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 29 | 54 | 1317 | 13 | 36 | 734 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | 368 | | | 61 |
| pX, platoon unblocked | 0.72 | 0.69 | | | 0.69 | |
| vC, conflicting volume | 1762 | 665 | | | 1330 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 898 | 0 | | | 588 | |
| tC, single (s) | 6.8 | 6.9 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 85 | 93 | | | 95 | |
| cM capacity (veh/h) | 191 | 750 | | | 681 | |

| Direction, Lane # | WB 1 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 84 | 878 | 452 | 280 | 489 |
| Volume Left | 29 | 0 | 0 | 36 | 0 |
| Volume Right | 54 | 0 | 13 | 0 | 0 |
| cSH | 371 | 1700 | 1700 | 681 | 1700 |
| Volume to Capacity | 0.23 | 0.52 | 0.27 | 0.05 | 0.29 |
| Queue Length 95th (ft) | 21 | 0 | 0 | 4 | 0 |
| Control Delay (s) | 17.5 | 0.0 | 0.0 | 1.9 | 0.0 |
| Lane LOS | C | | | A | |
| Approach Delay (s) | 17.5 | 0.0 | | 0.7 | |
| Approach LOS | C | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.9 | | |
| Intersection Capacity Utilization | 54.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

# Queues
## 4: S. Washington St/N. Washington St & W. Broad St/E. Broad St

12/9/2015

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 212 | 849 | 112 | 920 | 87 | 755 | 174 | 1283 |
| v/c Ratio | 0.92 | 0.76 | 0.56 | 0.90 | 0.50 | 0.76 | 0.60 | 1.03 |
| Control Delay | 67.1 | 23.9 | 26.1 | 41.4 | 25.1 | 40.0 | 25.4 | 67.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 26.2 |
| Total Delay | 67.1 | 23.9 | 26.1 | 41.4 | 25.1 | 40.0 | 25.4 | 93.6 |
| Queue Length 50th (ft) | 70 | 225 | 33 | 308 | 38 | 261 | 63 | ~465 |
| Queue Length 95th (ft) | #224 | 253 | 68 | #440 | m59 | 327 | 105 | #598 |
| Internal Link Dist (ft) | | 453 | | 381 | | 503 | | 197 |
| Turn Bay Length (ft) | 275 | | 255 | | 345 | | 190 | |
| Base Capacity (vph) | 230 | 1117 | 203 | 1022 | 177 | 1025 | 333 | 1242 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 97 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.92 | 0.76 | 0.55 | 0.90 | 0.49 | 0.74 | 0.52 | 1.12 |

### Intersection Summary

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

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

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 195 | 716 | 65 | 103 | 813 | 33 | 80 | 667 | 28 | 160 | 1046 | 134 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 11 | 11 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | | 0% | | | 0% | | | 3% | | | -4% | |
| Total Lost time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1711 | 3364 | | 1709 | 3396 | | 1743 | 3452 | | 1801 | 3542 | |
| Flt Permitted | 0.12 | 1.00 | | 0.18 | 1.00 | | 0.13 | 1.00 | | 0.17 | 1.00 | |
| Satd. Flow (perm) | 224 | 3364 | | 325 | 3396 | | 246 | 3452 | | 317 | 3542 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 212 | 778 | 71 | 112 | 884 | 36 | 87 | 725 | 30 | 174 | 1137 | 146 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 212 | 849 | 0 | 112 | 920 | 0 | 87 | 755 | 0 | 174 | 1283 | 0 |
| Confl. Peds. (#/hr) | 18 | | 30 | 30 | | 18 | 3 | | 64 | 64 | | 3 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 |
| Turn Type | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Actuated Green, G (s) | 41.2 | 32.2 | | 35.0 | 29.1 | | 34.6 | 29.8 | | 44.9 | 35.1 | |
| Effective Green, g (s) | 41.2 | 32.2 | | 35.0 | 29.1 | | 34.6 | 29.8 | | 44.9 | 35.1 | |
| Actuated g/C Ratio | 0.41 | 0.32 | | 0.35 | 0.29 | | 0.35 | 0.30 | | 0.45 | 0.35 | |
| Clearance Time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | |
| Vehicle Extension (s) | 2.0 | 5.0 | | 2.0 | 5.0 | | 2.0 | 5.0 | | 2.0 | 5.0 | |
| Lane Grp Cap (vph) | 226 | 1083 | | 195 | 988 | | 156 | 1028 | | 292 | 1243 | |
| v/s Ratio Prot | c0.08 | 0.25 | | 0.03 | 0.27 | | 0.03 | 0.22 | | c0.06 | c0.36 | |
| v/s Ratio Perm | c0.30 | | | 0.17 | | | 0.16 | | | 0.21 | | |
| v/c Ratio | 0.94 | 0.78 | | 0.57 | 0.93 | | 0.56 | 0.73 | | 0.60 | 1.03 | |
| Uniform Delay, d1 | 23.4 | 30.7 | | 23.7 | 34.5 | | 26.0 | 31.5 | | 19.2 | 32.5 | |
| Progression Factor | 1.41 | 0.64 | | 0.83 | 0.82 | | 0.95 | 1.06 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 36.4 | 4.6 | | 2.5 | 15.9 | | 2.3 | 3.2 | | 2.2 | 34.2 | |
| Delay (s) | 69.4 | 24.1 | | 22.1 | 44.0 | | 27.0 | 36.7 | | 21.4 | 66.6 | |
| Level of Service | E | C | | C | D | | C | D | | C | E | |
| Approach Delay (s) | | 33.2 | | | 41.6 | | | 35.7 | | | 61.2 | |
| Approach LOS | | C | | | D | | | D | | | E | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 44.9 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 1.01 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 22.0 |
| Intersection Capacity Utilization | 90.4% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

# HCM Unsignalized Intersection Capacity Analysis
## 32: E. Broad St & Driveway

12/9/2015

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 58 | 944 | 10 | 6 | 688 | 183 | 15 | 0 | 22 | 103 | 0 | 107 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 63 | 1026 | 11 | 7 | 748 | 199 | 16 | 0 | 24 | 112 | 0 | 116 |
| Pedestrians | | 1 | | | | | | 5 | | | 9 | |
| Lane Width (ft) | | 12.0 | | | | | | 12.0 | | | 12.0 | |
| Walking Speed (ft/s) | | 4.0 | | | | | | 4.0 | | | 4.0 | |
| Percent Blockage | | 0 | | | | | | 0 | | | 1 | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | 461 | | | | | | | | | | |
| pX, platoon unblocked | | | | 0.79 | | | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | |
| vC, conflicting volume | 956 | | | 1042 | | | 1667 | 2131 | 523 | 1532 | 2037 | 483 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 956 | | | 536 | | | 1322 | 1907 | 0 | 1153 | 1788 | 483 |
| 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 % | 91 | | | 99 | | | 75 | 100 | 97 | 0 | 100 | 78 |
| cM capacity (veh/h) | 710 | | | 814 | | | 65 | 48 | 858 | 107 | 57 | 525 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 63 | 684 | 353 | 7 | 499 | 448 | 40 | 228 |
| Volume Left | 63 | 0 | 0 | 7 | 0 | 0 | 16 | 112 |
| Volume Right | 0 | 0 | 11 | 0 | 0 | 199 | 24 | 116 |
| cSH | 710 | 1700 | 1700 | 814 | 1700 | 1700 | 143 | 180 |
| Volume to Capacity | 0.09 | 0.40 | 0.21 | 0.01 | 0.29 | 0.26 | 0.28 | 1.26 |
| Queue Length 95th (ft) | 7 | 0 | 0 | 1 | 0 | 0 | 27 | 318 |
| Control Delay (s) | 10.6 | 0.0 | 0.0 | 9.5 | 0.0 | 0.0 | 39.6 | 206.6 |
| Lane LOS | B | | | A | | | E | F |
| Approach Delay (s) | 0.6 | | | 0.1 | | | 39.6 | 206.6 |
| Approach LOS | | | | | | | E | F |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 21.3 | | |
| Intersection Capacity Utilization | 56.9% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

# Queues
## 23: N. Washington St & Park Ave

12/9/2015

| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 183 | 116 | 994 | 1463 |
| v/c Ratio | 0.66 | 0.39 | 0.50 | 0.58 |
| Control Delay | 54.2 | 22.8 | 7.7 | 8.5 |
| Queue Delay | 0.0 | 0.0 | 0.6 | 0.0 |
| Total Delay | 54.2 | 22.8 | 8.4 | 8.5 |
| Queue Length 50th (ft) | 123 | 32 | 134 | 217 |
| Queue Length 95th (ft) | 186 | 81 | 214 | 332 |
| Internal Link Dist (ft) | 437 | | 1 | 403 |
| Turn Bay Length (ft) | 150 | | | |
| Base Capacity (vph) | 370 | 370 | 1999 | 2505 |
| Starvation Cap Reductn | 0 | 0 | 591 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.49 | 0.31 | 0.71 | 0.58 |

Intersection Summary

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 168 | 107 | 36 | 879 | 1266 | 80 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 12 | 12 | 11 | 11 | 11 | 11 |
| Grade (%) | 0% | | | 3% | -3% | |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 0.96 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1514 | | 3335 | 3415 | |
| Flt Permitted | 0.95 | 1.00 | | 0.82 | 1.00 | |
| Satd. Flow (perm) | 1770 | 1514 | | 2726 | 3415 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 183 | 116 | 39 | 955 | 1376 | 87 |
| RTOR Reduction (vph) | 0 | 55 | 0 | 0 | 3 | 0 |
| Lane Group Flow (vph) | 183 | 61 | 0 | 994 | 1460 | 0 |
| Confl. Peds. (#/hr) | | 17 | 33 | | | 33 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 4 | 0 | 4 |
| Turn Type | Prot | Perm | Perm | NA | NA | |
| Protected Phases | 4 | | | 6 | 2 | |
| Permitted Phases | | 4 | 6 | | | |
| Actuated Green, G (s) | 17.4 | 17.4 | | 80.6 | 80.6 | |
| Effective Green, g (s) | 17.4 | 17.4 | | 80.6 | 80.6 | |
| Actuated g/C Ratio | 0.16 | 0.16 | | 0.73 | 0.73 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 4.0 | 4.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 279 | 239 | | 1997 | 2502 | |
| v/s Ratio Prot | c0.10 | | | | c0.43 | |
| v/s Ratio Perm | | 0.04 | | 0.36 | | |
| v/c Ratio | 0.66 | 0.26 | | 0.50 | 0.58 | |
| Uniform Delay, d1 | 43.5 | 40.6 | | 6.2 | 6.9 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 6.0 | 0.8 | | 0.9 | 1.0 | |
| Delay (s) | 49.5 | 41.4 | | 7.1 | 7.9 | |
| Level of Service | D | D | | A | A | |
| Approach Delay (s) | 46.4 | | | 7.1 | 7.9 | |
| Approach LOS | D | | | A | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 11.8 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.60 | | |
| Actuated Cycle Length (s) | 110.0 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 70.0% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

# HCM Unsignalized Intersection Capacity Analysis
## 36: N. Washington St

12/9/2015

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 36 | 65 | 867 | 34 | 99 | 1297 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 3% | | | -4% |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 36 | 65 | 867 | 34 | 99 | 1297 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | 382 | | | 81 |
| pX, platoon unblocked | 0.89 | 0.82 | | | 0.82 | |
| vC, conflicting volume | 1730 | 450 | | | 901 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 670 | 0 | | | 443 | |
| tC, single (s) | 6.8 | 6.9 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 88 | 93 | | | 89 | |
| cM capacity (veh/h) | 310 | 890 | | | 914 | |

| Direction, Lane # | WB 1 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 101 | 578 | 323 | 531 | 865 |
| Volume Left | 36 | 0 | 0 | 99 | 0 |
| Volume Right | 65 | 0 | 34 | 0 | 0 |
| cSH | 534 | 1700 | 1700 | 914 | 1700 |
| Volume to Capacity | 0.19 | 0.34 | 0.19 | 0.11 | 0.51 |
| Queue Length 95th (ft) | 17 | 0 | 0 | 9 | 0 |
| Control Delay (s) | 13.3 | 0.0 | 0.0 | 2.9 | 0.0 |
| Lane LOS | B | | | A | |
| Approach Delay (s) | 13.3 | 0.0 | | 1.1 | |
| Approach LOS | B | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.2 | | |
| Intersection Capacity Utilization | 79.8% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

# Queues
## 4: S. Washington St/N. Washington St & W. Broad St/E. Broad St

12/9/2015

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 197 | 753 | 89 | 739 | 110 | 704 | 246 | 709 |
| v/c Ratio | 0.64 | 0.68 | 0.35 | 0.81 | 0.41 | 0.79 | 0.79 | 0.69 |
| Control Delay | 31.9 | 38.3 | 25.0 | 48.9 | 27.3 | 49.5 | 43.2 | 41.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 31.9 | 38.3 | 25.0 | 48.9 | 27.3 | 49.5 | 43.2 | 41.8 |
| Queue Length 50th (ft) | 88 | 253 | 37 | 273 | 49 | 261 | 118 | 247 |
| Queue Length 95th (ft) | 181 | 402 | 84 | 426 | 105 | 411 | #254 | 392 |
| Internal Link Dist (ft) | | 453 | | 381 | | 503 | | 175 |
| Turn Bay Length (ft) | 275 | | 255 | | 345 | | 190 | |
| Base Capacity (vph) | 376 | 1933 | 357 | 1793 | 418 | 1841 | 394 | 1838 |
| Starvation Cap Reductn | 0 | 91 | 0 | 0 | 0 | 0 | 0 | 154 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.52 | 0.41 | 0.25 | 0.41 | 0.26 | 0.38 | 0.62 | 0.42 |

### Intersection Summary

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

# HCM Signalized Intersection Capacity Analysis
## 4: S. Washington St/N. Washington St & W. Broad St/E. Broad St

12/9/2015

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 181 | 621 | 72 | 82 | 624 | 56 | 101 | 621 | 27 | 226 | 489 | 163 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 11 | 11 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | | 0% | | | 0% | | | 3% | | | -4% | |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.98 | | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.96 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1711 | 3358 | | 1709 | 3371 | | 1742 | 3461 | | 1805 | 3457 | |
| Flt Permitted | 0.14 | 1.00 | | 0.27 | 1.00 | | 0.25 | 1.00 | | 0.15 | 1.00 | |
| Satd. Flow (perm) | 259 | 3358 | | 478 | 3371 | | 453 | 3461 | | 289 | 3457 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 197 | 675 | 78 | 89 | 678 | 61 | 110 | 675 | 29 | 246 | 532 | 177 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 197 | 753 | 0 | 89 | 739 | 0 | 110 | 704 | 0 | 246 | 709 | 0 |
| Confl. Peds. (#/hr) | 11 | | 11 | 11 | | 11 | 4 | | 5 | 5 | | 4 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 |
| Turn Type | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Actuated Green, G (s) | 53.7 | 39.2 | | 40.6 | 32.1 | | 40.4 | 30.3 | | 49.8 | 35.0 | |
| Effective Green, g (s) | 53.7 | 39.2 | | 40.6 | 32.1 | | 40.4 | 30.3 | | 49.8 | 35.0 | |
| Actuated g/C Ratio | 0.46 | 0.34 | | 0.35 | 0.27 | | 0.35 | 0.26 | | 0.43 | 0.30 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lane Grp Cap (vph) | 313 | 1127 | | 255 | 926 | | 268 | 897 | | 315 | 1035 | |
| v/s Ratio Prot | c0.08 | c0.22 | | 0.03 | c0.22 | | 0.04 | 0.20 | | c0.10 | c0.21 | |
| v/s Ratio Perm | 0.21 | | | 0.10 | | | 0.11 | | | c0.23 | | |
| v/c Ratio | 0.63 | 0.67 | | 0.35 | 0.80 | | 0.41 | 0.78 | | 0.78 | 0.69 | |
| Uniform Delay, d1 | 22.6 | 33.2 | | 26.6 | 39.3 | | 27.3 | 40.2 | | 25.1 | 36.0 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 2.8 | 1.2 | | 0.3 | 4.5 | | 0.4 | 4.2 | | 11.0 | 1.5 | |
| Delay (s) | 25.4 | 34.4 | | 26.9 | 43.9 | | 27.6 | 44.4 | | 36.1 | 37.6 | |
| Level of Service | C | C | | C | D | | C | D | | D | D | |
| Approach Delay (s) | | 32.5 | | | 42.1 | | | 42.2 | | | 37.2 | |
| Approach LOS | | C | | | D | | | D | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 38.2 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.80 | | |
| Actuated Cycle Length (s) | 116.8 | Sum of lost time (s) | 24.0 |
| Intersection Capacity Utilization | 79.7% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

# HCM Unsignalized Intersection Capacity Analysis
## 32: E. Broad St & Driveway

12/9/2015

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 71 | 861 | 4 | 3 | 642 | 214 | 2 | 1 | 2 | 122 | 0 | 147 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 77 | 936 | 4 | 3 | 698 | 233 | 2 | 1 | 2 | 133 | 0 | 160 |
| Pedestrians | | | | | | | | 4 | | | 7 | |
| Lane Width (ft) | | | | | | | | 12.0 | | | 12.0 | |
| Walking Speed (ft/s) | | | | | | | | 4.0 | | | 4.0 | |
| Percent Blockage | | | | | | | | 0 | | | 1 | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | 461 | | | | | | | | | | |
| pX, platoon unblocked | | | | 0.83 | | | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | |
| vC, conflicting volume | 937 | | | 944 | | | 1612 | 2040 | 474 | 1453 | 1926 | 472 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 937 | | | 535 | | | 1336 | 1850 | 0 | 1145 | 1713 | 472 |
| 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 % | 89 | | | 100 | | | 96 | 98 | 100 | 0 | 100 | 70 |
| cM capacity (veh/h) | 722 | | | 855 | | | 59 | 54 | 901 | 114 | 66 | 535 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 77 | 624 | 316 | 3 | 465 | 465 | 5 | 292 |
| Volume Left | 77 | 0 | 0 | 3 | 0 | 0 | 2 | 133 |
| Volume Right | 0 | 0 | 4 | 0 | 0 | 233 | 2 | 160 |
| cSH | 722 | 1700 | 1700 | 855 | 1700 | 1700 | 92 | 201 |
| Volume to Capacity | 0.11 | 0.37 | 0.19 | 0.00 | 0.27 | 0.27 | 0.06 | 1.46 |
| Queue Length 95th (ft) | 9 | 0 | 0 | 0 | 0 | 0 | 5 | 442 |
| Control Delay (s) | 10.6 | 0.0 | 0.0 | 9.2 | 0.0 | 0.0 | 46.7 | 275.2 |
| Lane LOS | B | | | A | | | E | F |
| Approach Delay (s) | 0.8 | | | 0.0 | | | 46.7 | 275.2 |
| Approach LOS | | | | | | | E | F |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 36.3 | | |
| Intersection Capacity Utilization | 60.1% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

# Queues
## 23: N. Washington St & Park Ave

12/9/2015

| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 149 | 62 | 933 | 965 |
| v/c Ratio | 0.44 | 0.18 | 0.60 | 0.53 |
| Control Delay | 19.6 | 6.6 | 9.4 | 8.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 19.6 | 6.6 | 9.4 | 8.1 |
| Queue Length 50th (ft) | 29 | 0 | 70 | 67 |
| Queue Length 95th (ft) | 78 | 22 | 137 | 127 |
| Internal Link Dist (ft) | 437 | | 1 | 403 |
| Turn Bay Length (ft) | 150 | | | |
| Base Capacity (vph) | 1092 | 1000 | 2925 | 3414 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.14 | 0.06 | 0.32 | 0.28 |

Intersection Summary

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 137 | 57 | 39 | 820 | 806 | 82 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 12 | 12 | 11 | 11 | 11 | 11 |
| Grade (%) | 0% | | | 3% | -3% | |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1583 | | 3335 | 3417 | |
| Flt Permitted | 0.95 | 1.00 | | 0.88 | 1.00 | |
| Satd. Flow (perm) | 1770 | 1583 | | 2926 | 3417 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 149 | 62 | 42 | 891 | 876 | 89 |
| RTOR Reduction (vph) | 0 | 50 | 0 | 0 | 9 | 0 |
| Lane Group Flow (vph) | 149 | 12 | 0 | 933 | 956 | 0 |
| Confl. Peds. (#/hr) | 3 | | 3 | | | 3 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 4 | 0 | 4 |
| Turn Type | Prot | Perm | Perm | NA | NA | |
| Protected Phases | 4 | | | 6 | 2 | |
| Permitted Phases | | 4 | 6 | | | |
| Actuated Green, G (s) | 8.5 | 8.5 | | 23.7 | 23.7 | |
| Effective Green, g (s) | 8.5 | 8.5 | | 23.7 | 23.7 | |
| Actuated g/C Ratio | 0.19 | 0.19 | | 0.54 | 0.54 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 2.0 | 2.0 | | 1.5 | 1.5 | |
| Lane Grp Cap (vph) | 340 | 304 | | 1568 | 1832 | |
| v/s Ratio Prot | c0.08 | | | | 0.28 | |
| v/s Ratio Perm | | 0.01 | | c0.32 | | |
| v/c Ratio | 0.44 | 0.04 | | 0.60 | 0.52 | |
| Uniform Delay, d1 | 15.7 | 14.5 | | 7.0 | 6.6 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.3 | 0.0 | | 0.4 | 0.1 | |
| Delay (s) | 16.1 | 14.5 | | 7.4 | 6.7 | |
| Level of Service | B | B | | A | A | |
| Approach Delay (s) | 15.6 | | | 7.4 | 6.7 | |
| Approach LOS | B | | | A | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 7.9 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.55 | | |
| Actuated Cycle Length (s) | 44.2 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 69.0% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

# HCM Unsignalized Intersection Capacity Analysis
## 36: N. Washington St

12/9/2015

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 53 | 51 | 832 | 35 | 98 | 789 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 3% | | | -4% |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 58 | 55 | 904 | 38 | 107 | 858 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | 402 | | | 61 |
| pX, platoon unblocked | 0.91 | 0.82 | | | 0.82 | |
| vC, conflicting volume | 1565 | 471 | | | 942 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 552 | 0 | | | 498 | |
| tC, single (s) | 6.8 | 6.9 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 84 | 94 | | | 88 | |
| cM capacity (veh/h) | 371 | 892 | | | 874 | |

| Direction, Lane # | WB 1 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 113 | 603 | 339 | 392 | 572 |
| Volume Left | 58 | 0 | 0 | 107 | 0 |
| Volume Right | 55 | 0 | 38 | 0 | 0 |
| cSH | 520 | 1700 | 1700 | 874 | 1700 |
| Volume to Capacity | 0.22 | 0.35 | 0.20 | 0.12 | 0.34 |
| Queue Length 95th (ft) | 21 | 0 | 0 | 10 | 0 |
| Control Delay (s) | 13.8 | 0.0 | 0.0 | 3.7 | 0.0 |
| Lane LOS | B | | | A | |
| Approach Delay (s) | 13.8 | 0.0 | | 1.5 | |
| Approach LOS | B | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.5 | | |
| Intersection Capacity Utilization | 64.8% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

# APPENDIX L

INTERSECTION CAPACITY ANALYSIS –

FUTURE WITH DEVELOPMENT CONDITION (2020) SCENARIO 5

# Queues
## 4: S. Washington St/N. Washington St & W. Broad St/E. Broad St

12/9/2015

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 149 | 657 | 53 | 868 | 72 | 1099 | 147 | 633 |
| v/c Ratio | 0.83 | 0.58 | 0.20 | 0.82 | 0.23 | 0.99 | 0.64 | 0.49 |
| Control Delay | 69.0 | 37.9 | 12.3 | 31.1 | 16.3 | 52.8 | 18.9 | 18.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.3 |
| Total Delay | 69.0 | 37.9 | 12.3 | 31.1 | 16.3 | 52.8 | 18.9 | 20.0 |
| Queue Length 50th (ft) | 83 | 205 | 11 | 273 | 20 | 215 | 35 | 205 |
| Queue Length 95th (ft) | m#164 | 205 | m25 | #380 | m50 | #485 | m62 | 272 |
| Internal Link Dist (ft) | | 453 | | 375 | | 503 | | 144 |
| Turn Bay Length (ft) | 275 | | 255 | | 345 | | 190 | |
| Base Capacity (vph) | 180 | 1142 | 266 | 1056 | 319 | 1111 | 254 | 1320 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 451 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.83 | 0.58 | 0.20 | 0.82 | 0.23 | 0.99 | 0.58 | 0.73 |

### Intersection Summary

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

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

# HCM Signalized Intersection Capacity Analysis
## 4: S. Washington St/N. Washington St & W. Broad St/E. Broad St

12/9/2015

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 137 | 575 | 29 | 49 | 731 | 67 | 66 | 992 | 19 | 135 | 501 | 81 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 11 | 11 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | | 0% | | | 0% | | | 3% | | | -4% | |
| Total Lost time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 1.00 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1710 | 3392 | | 1708 | 3370 | | 1742 | 3474 | | 1805 | 3527 | |
| Flt Permitted | 0.13 | 1.00 | | 0.28 | 1.00 | | 0.36 | 1.00 | | 0.11 | 1.00 | |
| Satd. Flow (perm) | 234 | 3392 | | 509 | 3370 | | 652 | 3474 | | 206 | 3527 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 149 | 625 | 32 | 53 | 795 | 73 | 72 | 1078 | 21 | 147 | 545 | 88 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 149 | 657 | 0 | 53 | 868 | 0 | 72 | 1099 | 0 | 147 | 633 | 0 |
| Confl. Peds. (#/hr) | 13 | | 12 | 12 | | 13 | 3 | | 16 | 16 | | 3 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 |
| Turn Type | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Actuated Green, G (s) | 37.6 | 31.6 | | 35.0 | 30.3 | | 37.9 | 33.1 | | 45.5 | 36.9 | |
| Effective Green, g (s) | 37.6 | 31.6 | | 35.0 | 30.3 | | 37.9 | 33.1 | | 45.5 | 36.9 | |
| Actuated g/C Ratio | 0.38 | 0.32 | | 0.35 | 0.30 | | 0.38 | 0.33 | | 0.46 | 0.37 | |
| Clearance Time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | |
| Vehicle Extension (s) | 2.0 | 5.0 | | 2.0 | 5.0 | | 2.0 | 5.0 | | 2.0 | 5.0 | |
| Lane Grp Cap (vph) | 176 | 1071 | | 234 | 1021 | | 299 | 1149 | | 231 | 1301 | |
| v/s Ratio Prot | c0.05 | 0.19 | | 0.01 | 0.26 | | 0.01 | c0.32 | | c0.05 | 0.18 | |
| v/s Ratio Perm | c0.27 | | | 0.07 | | | 0.08 | | | 0.23 | | |
| v/c Ratio | 0.85 | 0.61 | | 0.23 | 0.85 | | 0.24 | 0.96 | | 0.64 | 0.49 | |
| Uniform Delay, d1 | 23.7 | 29.0 | | 22.2 | 32.7 | | 20.2 | 32.7 | | 21.2 | 24.3 | |
| Progression Factor | 1.87 | 1.25 | | 0.61 | 0.74 | | 0.98 | 0.81 | | 0.41 | 0.70 | |
| Incremental Delay, d2 | 26.2 | 2.4 | | 0.2 | 8.2 | | 0.1 | 16.8 | | 3.9 | 0.6 | |
| Delay (s) | 70.5 | 38.7 | | 13.8 | 32.3 | | 19.9 | 43.4 | | 12.5 | 17.5 | |
| Level of Service | E | D | | B | C | | B | D | | B | B | |
| Approach Delay (s) | | 44.6 | | | 31.2 | | | 41.9 | | | 16.6 | |
| Approach LOS | | D | | | C | | | D | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 34.5 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.88 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 22.0 |
| Intersection Capacity Utilization | 83.9% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

# HCM Unsignalized Intersection Capacity Analysis
## 32: E. Broad St & Driveway

12/9/2015

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 31 | 779 | 36 | 17 | 879 | 107 | 4 | 0 | 13 | 46 | 0 | 86 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 34 | 847 | 39 | 18 | 955 | 116 | 4 | 0 | 14 | 50 | 0 | 93 |
| Pedestrians | | | | | | | | 4 | | | 4 | |
| Lane Width (ft) | | | | | | | | 12.0 | | | 12.0 | |
| 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) | | 460 | | | | | | | | | | |
| pX, platoon unblocked | | | | 0.85 | | | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | |
| vC, conflicting volume | 1076 | | | 890 | | | 1546 | 2050 | 447 | 1559 | 2012 | 540 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 1076 | | | 526 | | | 1295 | 1887 | 7 | 1311 | 1841 | 540 |
| 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 % | 95 | | | 98 | | | 94 | 100 | 98 | 45 | 100 | 81 |
| cM capacity (veh/h) | 642 | | | 882 | | | 77 | 55 | 913 | 92 | 59 | 485 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 34 | 564 | 321 | 18 | 637 | 435 | 18 | 143 |
| Volume Left | 34 | 0 | 0 | 18 | 0 | 0 | 4 | 50 |
| Volume Right | 0 | 0 | 39 | 0 | 0 | 116 | 14 | 93 |
| cSH | 642 | 1700 | 1700 | 882 | 1700 | 1700 | 257 | 194 |
| Volume to Capacity | 0.05 | 0.33 | 0.19 | 0.02 | 0.37 | 0.26 | 0.07 | 0.74 |
| Queue Length 95th (ft) | 4 | 0 | 0 | 2 | 0 | 0 | 6 | 120 |
| Control Delay (s) | 10.9 | 0.0 | 0.0 | 9.2 | 0.0 | 0.0 | 20.1 | 62.8 |
| Lane LOS | B | | | A | | | C | F |
| Approach Delay (s) | 0.4 | | | 0.2 | | | 20.1 | 62.8 |
| Approach LOS | | | | | | | C | F |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 4.6 | | |
| Intersection Capacity Utilization | 46.8% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

# Queues
## 23: N. Washington St & Park Ave

12/9/2015

| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 99 | 55 | 1364 | 804 |
| v/c Ratio | 0.80 | 0.35 | 0.81 | 0.54 |
| Control Delay | 88.8 | 18.8 | 5.1 | 12.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 88.8 | 18.8 | 5.1 | 12.9 |
| Queue Length 50th (ft) | 63 | 0 | 19 | 65 |
| Queue Length 95th (ft) | #154 | 38 | 54 | 98 |
| Internal Link Dist (ft) | 437 | | 15 | 403 |
| Turn Bay Length (ft) | 150 | | | |
| Base Capacity (vph) | 123 | 159 | 1676 | 1502 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.80 | 0.35 | 0.81 | 0.54 |

### Intersection Summary

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 91 | 51 | 98 | 1156 | 651 | 88 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 12 | 12 | 11 | 11 | 11 | 11 |
| Grade (%) | 0% | | | 3% | -3% | |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 0.98 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1551 | | 3328 | 3391 | |
| Flt Permitted | 0.95 | 1.00 | | 0.80 | 1.00 | |
| Satd. Flow (perm) | 1770 | 1551 | | 2685 | 3391 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 99 | 55 | 107 | 1257 | 708 | 96 |
| RTOR Reduction (vph) | 0 | 51 | 0 | 0 | 11 | 0 |
| Lane Group Flow (vph) | 99 | 4 | 0 | 1364 | 793 | 0 |
| Confl. Peds. (#/hr) | 2 | 2 | 9 | | | 9 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 4 | 0 | 4 |
| Turn Type | Prot | Perm | pm+pt | NA | NA | |
| Protected Phases | 3 | | 5 4 | 2 4 | 6 | |
| Permitted Phases | | 3 | 2 4 | | | |
| Actuated Green, G (s) | 7.0 | 7.0 | | 55.0 | 44.0 | |
| Effective Green, g (s) | 7.0 | 7.0 | | 55.0 | 44.0 | |
| Actuated g/C Ratio | 0.07 | 0.07 | | 0.55 | 0.44 | |
| Clearance Time (s) | 6.0 | 6.0 | | | 6.0 | |
| Vehicle Extension (s) | 4.0 | 4.0 | | | 3.0 | |
| Lane Grp Cap (vph) | 123 | 108 | | 1676 | 1492 | |
| v/s Ratio Prot | c0.06 | | | c0.25 | c0.23 | |
| v/s Ratio Perm | | 0.00 | | c0.20 | | |
| v/c Ratio | 0.80 | 0.04 | | 0.81 | 0.53 | |
| Uniform Delay, d1 | 45.8 | 43.4 | | 18.3 | 20.5 | |
| Progression Factor | 1.00 | 1.00 | | 0.14 | 0.57 | |
| Incremental Delay, d2 | 31.9 | 0.2 | | 1.6 | 1.3 | |
| Delay (s) | 77.7 | 43.5 | | 4.3 | 13.1 | |
| Level of Service | E | D | | A | B | |
| Approach Delay (s) | 65.5 | | | 4.3 | 13.1 | |
| Approach LOS | E | | | A | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 11.4 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.82 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 24.0 |
| Intersection Capacity Utilization | 75.8% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | WBL | NBT | SBT |
|---|---|---|---|
| Lane Group Flow (vph) | 83 | 1330 | 770 |
| v/c Ratio | 0.62 | 0.87 | 0.41 |
| Control Delay | 41.3 | 16.9 | 2.2 |
| Queue Delay | 0.3 | 5.4 | 0.0 |
| Total Delay | 41.6 | 22.3 | 2.2 |
| Queue Length 50th (ft) | 18 | 142 | 16 |
| Queue Length 95th (ft) | #83 | m164 | 14 |
| Internal Link Dist (ft) | 182 | 64 | 15 |
| Turn Bay Length (ft) | | | |
| Base Capacity (vph) | 134 | 1532 | 1901 |
| Starvation Cap Reductn | 0 | 21 | 0 |
| Spillback Cap Reductn | 2 | 157 | 41 |
| Storage Cap Reductn | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.63 | 0.97 | 0.41 |

Intersection Summary

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

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

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 27 | 50 | 1212 | 12 | 33 | 675 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Grade (%) | 0% | | 3% | | | -4% |
| Total Lost time (s) | 6.0 | | 6.0 | | | 6.0 |
| 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 | 0.91 | | 1.00 | | | 1.00 |
| Flt Protected | 0.98 | | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 1670 | | 3479 | | | 3602 |
| Flt Permitted | 0.98 | | 1.00 | | | 0.82 |
| Satd. Flow (perm) | 1670 | | 3479 | | | 2966 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 29 | 54 | 1317 | 13 | 36 | 734 |
| RTOR Reduction (vph) | 51 | 0 | 1 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 32 | 0 | 1329 | 0 | 0 | 770 |
| Confl. Peds. (#/hr) | | | | 12 | | |
| Turn Type | Prot | | NA | | pm+pt | NA |
| Protected Phases | 4 | | 2 | | 1 3 | 3 6 |
| Permitted Phases | | | | | 3 6 | |
| Actuated Green, G (s) | 5.0 | | 44.0 | | | 57.0 |
| Effective Green, g (s) | 5.0 | | 44.0 | | | 57.0 |
| Actuated g/C Ratio | 0.05 | | 0.44 | | | 0.57 |
| Clearance Time (s) | 6.0 | | 6.0 | | | |
| Vehicle Extension (s) | 4.0 | | 3.0 | | | |
| Lane Grp Cap (vph) | 83 | | 1530 | | | 1900 |
| v/s Ratio Prot | c0.02 | | c0.38 | | | c0.13 |
| v/s Ratio Perm | | | | | | 0.10 |
| v/c Ratio | 0.38 | | 0.87 | | | 0.41 |
| Uniform Delay, d1 | 46.0 | | 25.4 | | | 12.0 |
| Progression Factor | 1.00 | | 0.53 | | | 0.14 |
| Incremental Delay, d2 | 4.0 | | 2.8 | | | 0.2 |
| Delay (s) | 50.0 | | 16.3 | | | 1.8 |
| Level of Service | D | | B | | | A |
| Approach Delay (s) | 50.0 | | 16.3 | | | 1.8 |
| Approach LOS | D | | B | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 12.5 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.72 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 24.0 |
| Intersection Capacity Utilization | 57.6% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

# Queues
## 4: S. Washington St/N. Washington St & W. Broad St/E. Broad St

12/9/2015

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 212 | 849 | 112 | 920 | 87 | 755 | 174 | 1283 |
| v/c Ratio | 0.92 | 0.76 | 0.56 | 0.90 | 0.50 | 0.76 | 0.60 | 1.03 |
| Control Delay | 67.1 | 23.9 | 26.1 | 41.4 | 25.1 | 40.0 | 34.9 | 63.0 |
| Queue Delay | 52.9 | 0.0 | 0.0 | 13.6 | 0.0 | 0.1 | 0.0 | 21.2 |
| Total Delay | 120.0 | 23.9 | 26.1 | 55.0 | 25.1 | 40.1 | 34.9 | 84.2 |
| Queue Length 50th (ft) | 70 | 225 | 33 | 308 | 38 | 261 | 68 | ~427 |
| Queue Length 95th (ft) | #224 | 253 | 68 | #440 | m59 | 327 | m82 | m#537 |
| Internal Link Dist (ft) | | 453 | | 381 | | 503 | | 197 |
| Turn Bay Length (ft) | 275 | | 255 | | 345 | | 190 | |
| Base Capacity (vph) | 230 | 1117 | 203 | 1022 | 177 | 1025 | 333 | 1242 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 63 |
| Spillback Cap Reductn | 86 | 0 | 0 | 108 | 0 | 17 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.47 | 0.76 | 0.55 | 1.01 | 0.49 | 0.75 | 0.52 | 1.09 |

### Intersection Summary

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

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

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 195 | 716 | 65 | 103 | 813 | 33 | 80 | 667 | 28 | 160 | 1046 | 134 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 11 | 11 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | | 0% | | | 0% | | | 3% | | | -4% | |
| Total Lost time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1711 | 3364 | | 1709 | 3396 | | 1743 | 3452 | | 1801 | 3542 | |
| Flt Permitted | 0.12 | 1.00 | | 0.18 | 1.00 | | 0.13 | 1.00 | | 0.17 | 1.00 | |
| Satd. Flow (perm) | 224 | 3364 | | 325 | 3396 | | 246 | 3452 | | 317 | 3542 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 212 | 778 | 71 | 112 | 884 | 36 | 87 | 725 | 30 | 174 | 1137 | 146 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 212 | 849 | 0 | 112 | 920 | 0 | 87 | 755 | 0 | 174 | 1283 | 0 |
| Confl. Peds. (#/hr) | 18 | | 30 | 30 | | 18 | 3 | | 64 | 64 | | 3 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 |
| Turn Type | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Actuated Green, G (s) | 41.2 | 32.2 | | 35.0 | 29.1 | | 34.6 | 29.8 | | 44.9 | 35.1 | |
| Effective Green, g (s) | 41.2 | 32.2 | | 35.0 | 29.1 | | 34.6 | 29.8 | | 44.9 | 35.1 | |
| Actuated g/C Ratio | 0.41 | 0.32 | | 0.35 | 0.29 | | 0.35 | 0.30 | | 0.45 | 0.35 | |
| Clearance Time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | |
| Vehicle Extension (s) | 2.0 | 5.0 | | 2.0 | 5.0 | | 2.0 | 5.0 | | 2.0 | 5.0 | |
| Lane Grp Cap (vph) | 226 | 1083 | | 195 | 988 | | 156 | 1028 | | 292 | 1243 | |
| v/s Ratio Prot | c0.08 | 0.25 | | 0.03 | 0.27 | | 0.03 | 0.22 | | c0.06 | c0.36 | |
| v/s Ratio Perm | c0.30 | | | 0.17 | | | 0.16 | | | 0.21 | | |
| v/c Ratio | 0.94 | 0.78 | | 0.57 | 0.93 | | 0.56 | 0.73 | | 0.60 | 1.03 | |
| Uniform Delay, d1 | 23.4 | 30.7 | | 23.7 | 34.5 | | 26.0 | 31.5 | | 19.2 | 32.5 | |
| Progression Factor | 1.41 | 0.64 | | 0.83 | 0.82 | | 0.95 | 1.06 | | 1.88 | 1.13 | |
| Incremental Delay, d2 | 36.4 | 4.6 | | 2.5 | 15.9 | | 2.3 | 3.2 | | 1.0 | 26.1 | |
| Delay (s) | 69.4 | 24.1 | | 22.1 | 44.0 | | 27.0 | 36.7 | | 37.0 | 62.7 | |
| Level of Service | E | C | | C | D | | C | D | | D | E | |
| Approach Delay (s) | | 33.2 | | | 41.6 | | | 35.7 | | | 59.7 | |
| Approach LOS | | C | | | D | | | D | | | E | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 44.4 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 1.01 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 22.0 |
| Intersection Capacity Utilization | 90.4% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

# HCM Unsignalized Intersection Capacity Analysis
## 32: E. Broad St & Driveway

12/9/2015

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 58 | 944 | 10 | 6 | 688 | 183 | 15 | 0 | 22 | 103 | 0 | 107 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 63 | 1026 | 11 | 7 | 748 | 199 | 16 | 0 | 24 | 112 | 0 | 116 |
| Pedestrians | | 1 | | | | | | 5 | | | 9 | |
| Lane Width (ft) | | 12.0 | | | | | | 12.0 | | | 12.0 | |
| Walking Speed (ft/s) | | 4.0 | | | | | | 4.0 | | | 4.0 | |
| Percent Blockage | | 0 | | | | | | 0 | | | 1 | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | 461 | | | | | | | | | | |
| pX, platoon unblocked | | | | 0.79 | | | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | |
| vC, conflicting volume | 956 | | | 1042 | | | 1667 | 2131 | 523 | 1532 | 2037 | 483 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 956 | | | 536 | | | 1322 | 1907 | 0 | 1153 | 1788 | 483 |
| 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 % | 91 | | | 99 | | | 75 | 100 | 97 | 0 | 100 | 78 |
| cM capacity (veh/h) | 710 | | | 814 | | | 65 | 48 | 858 | 107 | 57 | 525 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 63 | 684 | 353 | 7 | 499 | 448 | 40 | 228 |
| Volume Left | 63 | 0 | 0 | 7 | 0 | 0 | 16 | 112 |
| Volume Right | 0 | 0 | 11 | 0 | 0 | 199 | 24 | 116 |
| cSH | 710 | 1700 | 1700 | 814 | 1700 | 1700 | 143 | 180 |
| Volume to Capacity | 0.09 | 0.40 | 0.21 | 0.01 | 0.29 | 0.26 | 0.28 | 1.26 |
| Queue Length 95th (ft) | 7 | 0 | 0 | 1 | 0 | 0 | 27 | 318 |
| Control Delay (s) | 10.6 | 0.0 | 0.0 | 9.5 | 0.0 | 0.0 | 39.6 | 206.6 |
| Lane LOS | B | | | A | | | E | F |
| Approach Delay (s) | 0.6 | | | 0.1 | | | 39.6 | 206.6 |
| Approach LOS | | | | | | | E | F |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 21.3 | | |
| Intersection Capacity Utilization | 56.9% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

# Queues
## 23: N. Washington St & Park Ave

12/9/2015

| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 183 | 116 | 994 | 1463 |
| v/c Ratio | 1.15 | 0.49 | 0.58 | 1.02 |
| Control Delay | 160.0 | 15.8 | 2.9 | 52.5 |
| Queue Delay | 0.0 | 3.7 | 0.0 | 32.6 |
| Total Delay | 160.0 | 19.5 | 2.9 | 85.0 |
| Queue Length 50th (ft) | ~138 | 0 | 16 | ~535 |
| Queue Length 95th (ft) | #274 | 53 | 12 | #673 |
| Internal Link Dist (ft) | 437 | | 3 | 403 |
| Turn Bay Length (ft) | 150 | | | |
| Base Capacity (vph) | 159 | 238 | 1700 | 1439 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 63 | 0 | 362 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.15 | 0.66 | 0.58 | 1.36 |

### Intersection Summary

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

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 168 | 107 | 36 | 879 | 1266 | 80 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 12 | 12 | 11 | 11 | 11 | 11 |
| Grade (%) | 0% | | | 3% | -3% | |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 0.93 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1476 | | 3335 | 3417 | |
| Flt Permitted | 0.95 | 1.00 | | 0.91 | 1.00 | |
| Satd. Flow (perm) | 1770 | 1476 | | 3028 | 3417 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 183 | 116 | 39 | 955 | 1376 | 87 |
| RTOR Reduction (vph) | 0 | 106 | 0 | 0 | 5 | 0 |
| Lane Group Flow (vph) | 183 | 10 | 0 | 994 | 1458 | 0 |
| Confl. Peds. (#/hr) | | 17 | 33 | | | 33 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 4 | 0 | 4 |
| Turn Type | Prot | Perm | pm+pt | NA | NA | |
| Protected Phases | 3 | | 5 4 | 2 4 | 6 | |
| Permitted Phases | | 3 | 2 4 | | | |
| Actuated Green, G (s) | 9.0 | 9.0 | | 53.0 | 42.0 | |
| Effective Green, g (s) | 9.0 | 9.0 | | 53.0 | 42.0 | |
| Actuated g/C Ratio | 0.09 | 0.09 | | 0.53 | 0.42 | |
| Clearance Time (s) | 6.0 | 6.0 | | | 6.0 | |
| Vehicle Extension (s) | 4.0 | 4.0 | | | 3.0 | |
| Lane Grp Cap (vph) | 159 | 132 | | 1700 | 1435 | |
| v/s Ratio Prot | c0.10 | | | c0.18 | c0.43 | |
| v/s Ratio Perm | | 0.01 | | 0.13 | | |
| v/c Ratio | 1.15 | 0.08 | | 0.58 | 1.02 | |
| Uniform Delay, d1 | 45.5 | 41.7 | | 16.0 | 29.0 | |
| Progression Factor | 1.00 | 1.00 | | 0.11 | 0.89 | |
| Incremental Delay, d2 | 117.7 | 0.4 | | 0.4 | 25.6 | |
| Delay (s) | 163.2 | 42.1 | | 2.2 | 51.4 | |
| Level of Service | F | D | | A | D | |
| Approach Delay (s) | 116.2 | | | 2.2 | 51.4 | |
| Approach LOS | F | | | A | D | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 40.7 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.95 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 24.0 |
| Intersection Capacity Utilization | 70.0% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | WBL | NBT | SBT |
|---|---|---|---|
| Lane Group Flow (vph) | 110 | 979 | 1518 |
| v/c Ratio | 0.74 | 0.67 | 0.91 |
| Control Delay | 50.3 | 28.7 | 19.8 |
| Queue Delay | 1.6 | 30.2 | 45.9 |
| Total Delay | 51.9 | 58.9 | 65.7 |
| Queue Length 50th (ft) | 26 | 324 | 174 |
| Queue Length 95th (ft) | #114 | m385 | m177 |
| Internal Link Dist (ft) | 183 | 23 | 3 |
| Turn Bay Length (ft) | | | |
| Base Capacity (vph) | 148 | 1453 | 1667 |
| Starvation Cap Reductn | 0 | 520 | 0 |
| Spillback Cap Reductn | 5 | 57 | 301 |
| Storage Cap Reductn | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.77 | 1.05 | 1.11 |

Intersection Summary

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

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

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 36 | 65 | 867 | 34 | 99 | 1297 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Grade (%) | 0% | | 3% | | | -4% |
| Total Lost time (s) | 6.0 | | 6.0 | | | 6.0 |
| Lane Util. Factor | 1.00 | | 0.95 | | | 0.95 |
| Frpb, ped/bikes | 0.99 | | 1.00 | | | 1.00 |
| Flpb, ped/bikes | 1.00 | | 1.00 | | | 1.00 |
| Frt | 0.91 | | 0.99 | | | 1.00 |
| Flt Protected | 0.98 | | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 1652 | | 3455 | | | 3597 |
| Flt Permitted | 0.98 | | 1.00 | | | 0.51 |
| Satd. Flow (perm) | 1652 | | 3455 | | | 1858 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 39 | 71 | 942 | 37 | 108 | 1410 |
| RTOR Reduction (vph) | 66 | 0 | 3 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 44 | 0 | 976 | 0 | 0 | 1518 |
| Confl. Peds. (#/hr) | | 1 | | 21 | | |
| Turn Type | Prot | | NA | | pm+pt | NA |
| Protected Phases | 4 | | 2 | | 1 3 | 3 6 |
| Permitted Phases | | | | | 3 6 | |
| Actuated Green, G (s) | 5.0 | | 42.0 | | | 57.0 |
| Effective Green, g (s) | 5.0 | | 42.0 | | | 57.0 |
| Actuated g/C Ratio | 0.05 | | 0.42 | | | 0.57 |
| Clearance Time (s) | 6.0 | | 6.0 | | | |
| Vehicle Extension (s) | 4.0 | | 3.0 | | | |
| Lane Grp Cap (vph) | 82 | | 1451 | | | 1667 |
| v/s Ratio Prot | c0.03 | | c0.28 | | | c0.32 |
| v/s Ratio Perm | | | | | | c0.20 |
| v/c Ratio | 0.54 | | 0.67 | | | 0.91 |
| Uniform Delay, d1 | 46.4 | | 23.4 | | | 19.2 |
| Progression Factor | 1.00 | | 1.14 | | | 0.98 |
| Incremental Delay, d2 | 8.9 | | 1.7 | | | 2.8 |
| Delay (s) | 55.3 | | 28.4 | | | 21.7 |
| Level of Service | E | | C | | | C |
| Approach Delay (s) | 55.3 | | 28.4 | | | 21.7 |
| Approach LOS | E | | C | | | C |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 25.6 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.90 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 24.0 |
| Intersection Capacity Utilization | 84.9% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

# Queues
## 4: S. Washington St/N. Washington St & W. Broad St/E. Broad St

12/9/2015

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 197 | 753 | 89 | 739 | 110 | 704 | 246 | 709 |
| v/c Ratio | 0.64 | 0.68 | 0.35 | 0.81 | 0.41 | 0.79 | 0.79 | 0.69 |
| Control Delay | 31.9 | 38.3 | 25.0 | 48.9 | 27.3 | 49.5 | 43.2 | 41.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 |
| Total Delay | 31.9 | 38.3 | 25.0 | 48.9 | 27.3 | 49.5 | 43.2 | 41.8 |
| Queue Length 50th (ft) | 88 | 253 | 37 | 273 | 49 | 261 | 118 | 247 |
| Queue Length 95th (ft) | 181 | 402 | 84 | 426 | 105 | 411 | #254 | 392 |
| Internal Link Dist (ft) | | 453 | | 381 | | 503 | | 175 |
| Turn Bay Length (ft) | 275 | | 255 | | 345 | | 190 | |
| Base Capacity (vph) | 376 | 1933 | 357 | 1793 | 418 | 1841 | 394 | 1838 |
| Starvation Cap Reductn | 0 | 91 | 0 | 0 | 0 | 0 | 0 | 288 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.52 | 0.41 | 0.25 | 0.41 | 0.26 | 0.38 | 0.62 | 0.46 |

### Intersection Summary

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

# HCM Signalized Intersection Capacity Analysis
## 4: S. Washington St/N. Washington St & W. Broad St/E. Broad St

12/9/2015

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 181 | 621 | 72 | 82 | 624 | 56 | 101 | 621 | 27 | 226 | 489 | 163 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 11 | 11 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | | 0% | | | 0% | | | 3% | | | -4% | |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.98 | | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.96 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1711 | 3358 | | 1709 | 3371 | | 1742 | 3461 | | 1805 | 3457 | |
| Flt Permitted | 0.14 | 1.00 | | 0.27 | 1.00 | | 0.25 | 1.00 | | 0.15 | 1.00 | |
| Satd. Flow (perm) | 259 | 3358 | | 478 | 3371 | | 453 | 3461 | | 289 | 3457 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 197 | 675 | 78 | 89 | 678 | 61 | 110 | 675 | 29 | 246 | 532 | 177 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 197 | 753 | 0 | 89 | 739 | 0 | 110 | 704 | 0 | 246 | 709 | 0 |
| Confl. Peds. (#/hr) | 11 | | 11 | 11 | | 11 | 4 | | 5 | 5 | | 4 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 |
| Turn Type | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Actuated Green, G (s) | 53.7 | 39.2 | | 40.6 | 32.1 | | 40.4 | 30.3 | | 49.8 | 35.0 | |
| Effective Green, g (s) | 53.7 | 39.2 | | 40.6 | 32.1 | | 40.4 | 30.3 | | 49.8 | 35.0 | |
| Actuated g/C Ratio | 0.46 | 0.34 | | 0.35 | 0.27 | | 0.35 | 0.26 | | 0.43 | 0.30 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lane Grp Cap (vph) | 313 | 1127 | | 255 | 926 | | 268 | 897 | | 315 | 1035 | |
| v/s Ratio Prot | c0.08 | c0.22 | | 0.03 | c0.22 | | 0.04 | 0.20 | | c0.10 | c0.21 | |
| v/s Ratio Perm | 0.21 | | | 0.10 | | | 0.11 | | | c0.23 | | |
| v/c Ratio | 0.63 | 0.67 | | 0.35 | 0.80 | | 0.41 | 0.78 | | 0.78 | 0.69 | |
| Uniform Delay, d1 | 22.6 | 33.2 | | 26.6 | 39.3 | | 27.3 | 40.2 | | 25.1 | 36.0 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 2.8 | 1.2 | | 0.3 | 4.5 | | 0.4 | 4.2 | | 11.0 | 1.5 | |
| Delay (s) | 25.4 | 34.4 | | 26.9 | 43.9 | | 27.6 | 44.4 | | 36.1 | 37.6 | |
| Level of Service | C | C | | C | D | | C | D | | D | D | |
| Approach Delay (s) | | 32.5 | | | 42.1 | | | 42.2 | | | 37.2 | |
| Approach LOS | | C | | | D | | | D | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 38.2 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.80 | | |
| Actuated Cycle Length (s) | 116.8 | Sum of lost time (s) | 24.0 |
| Intersection Capacity Utilization | 79.7% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

# HCM Unsignalized Intersection Capacity Analysis
## 32: E. Broad St & Driveway

12/9/2015

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 71 | 861 | 4 | 3 | 642 | 214 | 2 | 1 | 2 | 122 | 0 | 147 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 77 | 936 | 4 | 3 | 698 | 233 | 2 | 1 | 2 | 133 | 0 | 160 |
| Pedestrians | | | | | | | | 4 | | | 7 | |
| Lane Width (ft) | | | | | | | | 12.0 | | | 12.0 | |
| Walking Speed (ft/s) | | | | | | | | 4.0 | | | 4.0 | |
| Percent Blockage | | | | | | | | 0 | | | 1 | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | 461 | | | | | | | | | | |
| pX, platoon unblocked | | | | 0.83 | | | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | |
| vC, conflicting volume | 937 | | | 944 | | | 1612 | 2040 | 474 | 1453 | 1926 | 472 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 937 | | | 535 | | | 1336 | 1850 | 0 | 1145 | 1713 | 472 |
| 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 % | 89 | | | 100 | | | 96 | 98 | 100 | 0 | 100 | 70 |
| cM capacity (veh/h) | 722 | | | 855 | | | 59 | 54 | 901 | 114 | 66 | 535 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 77 | 624 | 316 | 3 | 465 | 465 | 5 | 292 |
| Volume Left | 77 | 0 | 0 | 3 | 0 | 0 | 2 | 133 |
| Volume Right | 0 | 0 | 4 | 0 | 0 | 233 | 2 | 160 |
| cSH | 722 | 1700 | 1700 | 855 | 1700 | 1700 | 92 | 201 |
| Volume to Capacity | 0.11 | 0.37 | 0.19 | 0.00 | 0.27 | 0.27 | 0.06 | 1.46 |
| Queue Length 95th (ft) | 9 | 0 | 0 | 0 | 0 | 0 | 5 | 442 |
| Control Delay (s) | 10.6 | 0.0 | 0.0 | 9.2 | 0.0 | 0.0 | 46.7 | 275.2 |
| Lane LOS | B | | | A | | | E | F |
| Approach Delay (s) | 0.8 | | | 0.0 | | | 46.7 | 275.2 |
| Approach LOS | | | | | | | E | F |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 36.3 | | |
| Intersection Capacity Utilization | 60.1% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

# Queues
## 23: N. Washington St & Park Ave

12/9/2015

| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 149 | 62 | 933 | 965 |
| v/c Ratio | 0.70 | 0.25 | 0.54 | 0.57 |
| Control Delay | 61.1 | 13.6 | 2.4 | 19.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.1 |
| Total Delay | 61.1 | 13.6 | 2.4 | 19.6 |
| Queue Length 50th (ft) | 93 | 0 | 16 | 217 |
| Queue Length 95th (ft) | #181 | 38 | 11 | 278 |
| Internal Link Dist (ft) | 437 | | 18 | 403 |
| Turn Bay Length (ft) | 150 | | | |
| Base Capacity (vph) | 212 | 244 | 1739 | 1681 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 1 | 0 | 106 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.70 | 0.26 | 0.54 | 0.61 |

Intersection Summary

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 137 | 57 | 39 | 820 | 806 | 82 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 12 | 12 | 11 | 11 | 11 | 11 |
| Grade (%) | 0% | | | 3% | -3% | |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1583 | | 3335 | 3415 | |
| Flt Permitted | 0.95 | 1.00 | | 0.89 | 1.00 | |
| Satd. Flow (perm) | 1770 | 1583 | | 2968 | 3415 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 149 | 62 | 42 | 891 | 876 | 89 |
| RTOR Reduction (vph) | 0 | 55 | 0 | 0 | 8 | 0 |
| Lane Group Flow (vph) | 149 | 7 | 0 | 933 | 957 | 0 |
| Confl. Peds. (#/hr) | 3 | | 3 | | | 3 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 4 | 0 | 4 |
| Turn Type | Prot | Perm | pm+pt | NA | NA | |
| Protected Phases | 3 | | 5 4 | 2 4 | 6 | |
| Permitted Phases | | 3 | 2 4 | | | |
| Actuated Green, G (s) | 12.0 | 12.0 | | 56.0 | 49.0 | |
| Effective Green, g (s) | 12.0 | 12.0 | | 56.0 | 49.0 | |
| Actuated g/C Ratio | 0.12 | 0.12 | | 0.56 | 0.49 | |
| Clearance Time (s) | 6.0 | 6.0 | | | 6.0 | |
| Vehicle Extension (s) | 4.0 | 4.0 | | | 3.0 | |
| Lane Grp Cap (vph) | 212 | 189 | | 1739 | 1673 | |
| v/s Ratio Prot | c0.08 | | | c0.11 | c0.28 | |
| v/s Ratio Perm | | 0.00 | | 0.19 | | |
| v/c Ratio | 0.70 | 0.04 | | 0.54 | 0.57 | |
| Uniform Delay, d1 | 42.3 | 38.9 | | 13.8 | 18.1 | |
| Progression Factor | 1.00 | 1.00 | | 0.10 | 1.00 | |
| Incremental Delay, d2 | 10.8 | 0.1 | | 0.3 | 1.4 | |
| Delay (s) | 53.1 | 39.0 | | 1.8 | 19.5 | |
| Level of Service | D | D | | A | B | |
| Approach Delay (s) | 48.9 | | | 1.8 | 19.5 | |
| Approach LOS | D | | | A | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 14.6 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.64 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 24.0 |
| Intersection Capacity Utilization | 69.0% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

# Queues
## 36: N. Washington St & driveway

12/9/2015

| Lane Group | WBL | NBT | SBT |
|---|---|---|---|
| Lane Group Flow (vph) | 113 | 942 | 965 |
| v/c Ratio | 0.84 | 0.62 | 0.51 |
| Control Delay | 77.0 | 23.6 | 3.0 |
| Queue Delay | 0.0 | 5.5 | 0.0 |
| Total Delay | 77.0 | 29.1 | 3.0 |
| Queue Length 50th (ft) | 49 | 235 | 17 |
| Queue Length 95th (ft) | #149 | 301 | 40 |
| Internal Link Dist (ft) | 211 | 30 | 18 |
| Turn Bay Length (ft) | | | |
| Base Capacity (vph) | 135 | 1526 | 1903 |
| Starvation Cap Reductn | 0 | 515 | 0 |
| Spillback Cap Reductn | 0 | 44 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.84 | 0.93 | 0.51 |

### Intersection Summary

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

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 53 | 51 | 832 | 35 | 98 | 789 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Grade (%) | 0% | | 3% | | | -4% |
| Total Lost time (s) | 6.0 | | 6.0 | | | 6.0 |
| 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 | 0.93 | | 0.99 | | | 1.00 |
| Flt Protected | 0.97 | | 1.00 | | | 0.99 |
| Satd. Flow (prot) | 1697 | | 3461 | | | 3590 |
| Flt Permitted | 0.97 | | 1.00 | | | 0.60 |
| Satd. Flow (perm) | 1697 | | 3461 | | | 2159 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 58 | 55 | 904 | 38 | 107 | 858 |
| RTOR Reduction (vph) | 34 | 0 | 3 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 79 | 0 | 939 | 0 | 0 | 965 |
| Confl. Peds. (#/hr) | | | | 2 | | |
| Turn Type | Prot | | NA | | pm+pt | NA |
| Protected Phases | 4 | | 2 | | 1 3 | 3 6 |
| Permitted Phases | | | | | 3 6 | |
| Actuated Green, G (s) | 6.0 | | 44.0 | | | 67.0 |
| Effective Green, g (s) | 6.0 | | 44.0 | | | 67.0 |
| Actuated g/C Ratio | 0.06 | | 0.44 | | | 0.67 |
| Clearance Time (s) | 6.0 | | 6.0 | | | |
| Vehicle Extension (s) | 4.0 | | 3.0 | | | |
| Lane Grp Cap (vph) | 101 | | 1522 | | | 1904 |
| v/s Ratio Prot | c0.05 | | c0.27 | | | c0.16 |
| v/s Ratio Perm | | | | | | 0.18 |
| v/c Ratio | 0.78 | | 0.62 | | | 0.51 |
| Uniform Delay, d1 | 46.4 | | 21.5 | | | 8.2 |
| Progression Factor | 1.00 | | 1.00 | | | 0.28 |
| Incremental Delay, d2 | 33.3 | | 1.9 | | | 0.2 |
| Delay (s) | 79.7 | | 23.4 | | | 2.6 |
| Level of Service | E | | C | | | A |
| Approach Delay (s) | 79.7 | | 23.4 | | | 2.6 |
| Approach LOS | E | | C | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 16.6 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.65 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 24.0 |
| Intersection Capacity Utilization | 69.8% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

# APPENDIX M

INTERSECTION CAPACITY ANALYSIS –

FUTURE WITH DEVELOPMENT CONDITION (2020) SCENARIO 6

# Queues
## 4: S. Washington St/N. Washington St & W. Broad St/E. Broad St

12/10/2015

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 149 | 657 | 53 | 868 | 72 | 1099 | 147 | 633 |
| v/c Ratio | 0.83 | 0.58 | 0.20 | 0.82 | 0.23 | 0.99 | 0.64 | 0.49 |
| Control Delay | 69.0 | 37.9 | 10.8 | 24.6 | 16.3 | 52.8 | 26.5 | 11.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.7 |
| Total Delay | 69.0 | 37.9 | 10.8 | 24.6 | 16.3 | 52.8 | 26.5 | 12.4 |
| Queue Length 50th (ft) | 83 | 205 | 8 | 73 | 20 | 215 | 10 | 191 |
| Queue Length 95th (ft) | m#164 | 205 | m16 | #247 | m50 | #485 | m59 | 255 |
| Internal Link Dist (ft) | | 453 | | 375 | | 503 | | 144 |
| Turn Bay Length (ft) | 275 | | 255 | | 345 | | 190 | |
| Base Capacity (vph) | 180 | 1142 | 266 | 1056 | 319 | 1111 | 254 | 1320 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 357 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.83 | 0.58 | 0.20 | 0.82 | 0.23 | 0.99 | 0.58 | 0.66 |

### Intersection Summary

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

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

# HCM Signalized Intersection Capacity Analysis
## 4: S. Washington St/N. Washington St & W. Broad St/E. Broad St

12/10/2015

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 137 | 575 | 29 | 49 | 731 | 67 | 66 | 992 | 19 | 135 | 501 | 81 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 11 | 11 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | | 0% | | | 0% | | | 3% | | | -4% | |
| Total Lost time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 1.00 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1710 | 3392 | | 1708 | 3370 | | 1742 | 3474 | | 1805 | 3527 | |
| Flt Permitted | 0.13 | 1.00 | | 0.28 | 1.00 | | 0.36 | 1.00 | | 0.11 | 1.00 | |
| Satd. Flow (perm) | 234 | 3392 | | 509 | 3370 | | 652 | 3474 | | 206 | 3527 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 149 | 625 | 32 | 53 | 795 | 73 | 72 | 1078 | 21 | 147 | 545 | 88 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 149 | 657 | 0 | 53 | 868 | 0 | 72 | 1099 | 0 | 147 | 633 | 0 |
| Confl. Peds. (#/hr) | 13 | | 12 | 12 | | 13 | 3 | | 16 | 16 | | 3 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 |
| Turn Type | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Actuated Green, G (s) | 37.6 | 31.6 | | 35.0 | 30.3 | | 37.9 | 33.1 | | 45.5 | 36.9 | |
| Effective Green, g (s) | 37.6 | 31.6 | | 35.0 | 30.3 | | 37.9 | 33.1 | | 45.5 | 36.9 | |
| Actuated g/C Ratio | 0.38 | 0.32 | | 0.35 | 0.30 | | 0.38 | 0.33 | | 0.46 | 0.37 | |
| Clearance Time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | |
| Vehicle Extension (s) | 2.0 | 5.0 | | 2.0 | 5.0 | | 2.0 | 5.0 | | 2.0 | 5.0 | |
| Lane Grp Cap (vph) | 176 | 1071 | | 234 | 1021 | | 299 | 1149 | | 231 | 1301 | |
| v/s Ratio Prot | c0.05 | 0.19 | | 0.01 | 0.26 | | 0.01 | c0.32 | | c0.05 | 0.18 | |
| v/s Ratio Perm | c0.27 | | | 0.07 | | | 0.08 | | | 0.23 | | |
| v/c Ratio | 0.85 | 0.61 | | 0.23 | 0.85 | | 0.24 | 0.96 | | 0.64 | 0.49 | |
| Uniform Delay, d1 | 23.7 | 29.0 | | 22.2 | 32.7 | | 20.2 | 32.7 | | 21.2 | 24.3 | |
| Progression Factor | 1.87 | 1.25 | | 0.53 | 0.54 | | 0.98 | 0.81 | | 0.85 | 0.42 | |
| Incremental Delay, d2 | 26.2 | 2.4 | | 0.2 | 7.9 | | 0.1 | 16.8 | | 3.9 | 0.6 | |
| Delay (s) | 70.5 | 38.7 | | 11.9 | 25.5 | | 19.9 | 43.4 | | 21.9 | 10.8 | |
| Level of Service | E | D | | B | C | | B | D | | C | B | |
| Approach Delay (s) | | 44.6 | | | 24.7 | | | 41.9 | | | 12.9 | |
| Approach LOS | | D | | | C | | | D | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 32.1 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.88 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 22.0 |
| Intersection Capacity Utilization | 83.9% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

# Queues
## 32: E. Broad St & Driveway

12/10/2015

| Lane Group | EBL | EBT | WBL | WBT | NBT | SBT |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 34 | 886 | 18 | 1071 | 18 | 143 |
| v/c Ratio | 0.11 | 0.41 | 0.04 | 0.52 | 0.04 | 0.36 |
| Control Delay | 4.0 | 5.8 | 1.8 | 9.1 | 0.2 | 17.1 |
| Queue Delay | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 4.0 | 5.9 | 1.8 | 9.1 | 0.2 | 17.1 |
| Queue Length 50th (ft) | 4 | 55 | 1 | 103 | 0 | 29 |
| Queue Length 95th (ft) | m7 | m90 | m3 | 122 | 0 | 83 |
| Internal Link Dist (ft) | | 380 | | 128 | 137 | 115 |
| Turn Bay Length (ft) | | | 100 | | | |
| Base Capacity (vph) | 325 | 2164 | 407 | 2071 | 414 | 398 |
| Starvation Cap Reductn | 0 | 192 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 30 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.10 | 0.45 | 0.04 | 0.52 | 0.04 | 0.36 |

Intersection Summary

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 31 | 779 | 36 | 17 | 879 | 107 | 4 | 0 | 13 | 46 | 0 | 86 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | | 6.0 | | | 6.0 | |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | | 1.00 | | | 1.00 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | | 1.00 | | | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | | 1.00 | | | 1.00 | |
| Frt | 1.00 | 0.99 | | 1.00 | 0.98 | | | 0.90 | | | 0.91 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | | 0.99 | | | 0.98 | |
| Satd. Flow (prot) | 1769 | 3511 | | 1769 | 3471 | | | 1649 | | | 1670 | |
| Flt Permitted | 0.20 | 1.00 | | 0.28 | 1.00 | | | 0.95 | | | 0.89 | |
| Satd. Flow (perm) | 373 | 3511 | | 522 | 3471 | | | 1576 | | | 1505 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 34 | 847 | 39 | 18 | 955 | 116 | 4 | 0 | 14 | 50 | 0 | 93 |
| RTOR Reduction (vph) | 0 | 3 | 0 | 0 | 9 | 0 | 0 | 14 | 0 | 0 | 68 | 0 |
| Lane Group Flow (vph) | 34 | 883 | 0 | 18 | 1062 | 0 | 0 | 4 | 0 | 0 | 75 | 0 |
| Confl. Peds. (#/hr) | 4 | | 4 | 4 | | 4 | | | | | | |
| Turn Type | pm+pt | NA | | pm+pt | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | | 7 | | | 3 | |
| Permitted Phases | 2 | | | 6 | | | 7 | | | 3 | | |
| Actuated Green, G (s) | 62.2 | 58.6 | | 59.8 | 57.4 | | | 22.0 | | | 22.0 | |
| Effective Green, g (s) | 62.2 | 58.6 | | 59.8 | 57.4 | | | 22.0 | | | 22.0 | |
| Actuated g/C Ratio | 0.62 | 0.59 | | 0.60 | 0.57 | | | 0.22 | | | 0.22 | |
| Clearance Time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | | 6.0 | | | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | | 3.0 | | | 3.0 | |
| Lane Grp Cap (vph) | 282 | 2057 | | 342 | 1992 | | | 346 | | | 331 | |
| v/s Ratio Prot | c0.00 | 0.25 | | 0.00 | c0.31 | | | | | | | |
| v/s Ratio Perm | 0.07 | | | 0.03 | | | | 0.00 | | | c0.05 | |
| v/c Ratio | 0.12 | 0.43 | | 0.05 | 0.53 | | | 0.01 | | | 0.23 | |
| Uniform Delay, d1 | 8.4 | 11.5 | | 8.4 | 13.1 | | | 30.5 | | | 32.0 | |
| Progression Factor | 0.60 | 0.50 | | 0.28 | 0.65 | | | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | 0.2 | 0.6 | | 0.1 | 0.9 | | | 0.1 | | | 0.4 | |
| Delay (s) | 5.3 | 6.3 | | 2.4 | 9.5 | | | 30.6 | | | 32.4 | |
| Level of Service | A | A | | A | A | | | C | | | C | |
| Approach Delay (s) | | 6.2 | | | 9.3 | | | 30.6 | | | 32.4 | |
| Approach LOS | | A | | | A | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 9.7 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.43 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 17.0 |
| Intersection Capacity Utilization | 50.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

# Queues
## 23: N. Washington St & Park Ave

12/10/2015

| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 99 | 55 | 1364 | 804 |
| v/c Ratio | 0.62 | 0.29 | 0.84 | 0.56 |
| Control Delay | 61.9 | 16.2 | 6.8 | 16.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 61.9 | 16.2 | 6.8 | 16.7 |
| Queue Length 50th (ft) | 62 | 0 | 5 | 213 |
| Queue Length 95th (ft) | #130 | 37 | m51 | 275 |
| Internal Link Dist (ft) | 437 | | 15 | 403 |
| Turn Bay Length (ft) | 150 | | | |
| Base Capacity (vph) | 159 | 189 | 1623 | 1434 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.62 | 0.29 | 0.84 | 0.56 |

### Intersection Summary

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

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 91 | 51 | 98 | 1156 | 651 | 88 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 12 | 12 | 11 | 11 | 11 | 11 |
| Grade (%) | 0% | | | 3% | -3% | |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 0.98 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1554 | | 3328 | 3391 | |
| Flt Permitted | 0.95 | 1.00 | | 0.80 | 1.00 | |
| Satd. Flow (perm) | 1770 | 1554 | | 2686 | 3391 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 99 | 55 | 107 | 1257 | 708 | 96 |
| RTOR Reduction (vph) | 0 | 50 | 0 | 0 | 10 | 0 |
| Lane Group Flow (vph) | 99 | 5 | 0 | 1364 | 794 | 0 |
| Confl. Peds. (#/hr) | 2 | 2 | 9 | | | 9 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 4 | 0 | 4 |
| Turn Type | Prot | Perm | pm+pt | NA | NA | |
| Protected Phases | 3 | | 5 4 | 2 4 | 6 | |
| Permitted Phases | | 3 | 2 4 | | | |
| Actuated Green, G (s) | 9.0 | 9.0 | | 53.0 | 42.0 | |
| Effective Green, g (s) | 9.0 | 9.0 | | 53.0 | 42.0 | |
| Actuated g/C Ratio | 0.09 | 0.09 | | 0.53 | 0.42 | |
| Clearance Time (s) | 6.0 | 6.0 | | | 6.0 | |
| Vehicle Extension (s) | 4.0 | 4.0 | | | 3.0 | |
| Lane Grp Cap (vph) | 159 | 139 | | 1622 | 1424 | |
| v/s Ratio Prot | c0.06 | | | c0.26 | c0.23 | |
| v/s Ratio Perm | | 0.00 | | c0.18 | | |
| v/c Ratio | 0.62 | 0.04 | | 0.84 | 0.56 | |
| Uniform Delay, d1 | 43.9 | 41.5 | | 19.9 | 22.0 | |
| Progression Factor | 1.00 | 1.00 | | 0.19 | 0.70 | |
| Incremental Delay, d2 | 8.3 | 0.1 | | 1.9 | 1.5 | |
| Delay (s) | 52.2 | 41.7 | | 5.7 | 16.8 | |
| Level of Service | D | D | | A | B | |
| Approach Delay (s) | 48.4 | | | 5.7 | 16.8 | |
| Approach LOS | D | | | A | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 12.4 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.83 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 24.0 |
| Intersection Capacity Utilization | 75.8% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | WBL | NBT | SBT |
|---|---|---|---|
| Lane Group Flow (vph) | 83 | 1330 | 770 |
| v/c Ratio | 0.62 | 0.91 | 0.40 |
| Control Delay | 41.3 | 14.0 | 1.5 |
| Queue Delay | 1.5 | 2.2 | 0.0 |
| Total Delay | 42.8 | 16.1 | 1.5 |
| Queue Length 50th (ft) | 18 | 91 | 12 |
| Queue Length 95th (ft) | #83 | m94 | 9 |
| Internal Link Dist (ft) | 182 | 64 | 15 |
| Turn Bay Length (ft) | | | |
| Base Capacity (vph) | 134 | 1462 | 1940 |
| Starvation Cap Reductn | 0 | 58 | 0 |
| Spillback Cap Reductn | 8 | 46 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.66 | 0.95 | 0.40 |

Intersection Summary

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

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

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 27 | 50 | 1212 | 12 | 33 | 675 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Grade (%) | 0% | | 3% | | | -4% |
| Total Lost time (s) | 6.0 | | 6.0 | | | 6.0 |
| 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 | 0.91 | | 1.00 | | | 1.00 |
| Flt Protected | 0.98 | | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 1670 | | 3479 | | | 3602 |
| Flt Permitted | 0.98 | | 1.00 | | | 0.85 |
| Satd. Flow (perm) | 1670 | | 3479 | | | 3086 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 29 | 54 | 1317 | 13 | 36 | 734 |
| RTOR Reduction (vph) | 51 | 0 | 1 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 32 | 0 | 1329 | 0 | 0 | 770 |
| Confl. Peds. (#/hr) | | | | 12 | | |
| Turn Type | Prot | | NA | | pm+pt | NA |
| Protected Phases | 4 | | 2 | | 1 3 | 3 6 |
| Permitted Phases | | | | | 3 6 | |
| Actuated Green, G (s) | 5.0 | | 42.0 | | | 57.0 |
| Effective Green, g (s) | 5.0 | | 42.0 | | | 57.0 |
| Actuated g/C Ratio | 0.05 | | 0.42 | | | 0.57 |
| Clearance Time (s) | 6.0 | | 6.0 | | | |
| Vehicle Extension (s) | 4.0 | | 3.0 | | | |
| Lane Grp Cap (vph) | 83 | | 1461 | | | 1939 |
| v/s Ratio Prot | c0.02 | | c0.38 | | | c0.14 |
| v/s Ratio Perm | | | | | | 0.09 |
| v/c Ratio | 0.38 | | 0.91 | | | 0.40 |
| Uniform Delay, d1 | 46.0 | | 27.2 | | | 11.9 |
| Progression Factor | 1.00 | | 0.32 | | | 0.09 |
| Incremental Delay, d2 | 4.0 | | 4.2 | | | 0.2 |
| Delay (s) | 50.0 | | 12.8 | | | 1.2 |
| Level of Service | D | | B | | | A |
| Approach Delay (s) | 50.0 | | 12.8 | | | 1.2 |
| Approach LOS | D | | B | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 10.1 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.73 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 24.0 |
| Intersection Capacity Utilization | 57.6% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

# Queues
## 4: S. Washington St/N. Washington St & W. Broad St/E. Broad St

12/10/2015

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 212 | 849 | 112 | 920 | 87 | 755 | 174 | 1283 |
| v/c Ratio | 0.92 | 0.76 | 0.56 | 0.90 | 0.50 | 0.76 | 0.60 | 1.03 |
| Control Delay | 67.1 | 23.9 | 28.0 | 34.1 | 25.1 | 40.0 | 18.6 | 54.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 26.5 |
| Total Delay | 67.1 | 23.9 | 28.0 | 34.1 | 25.1 | 40.0 | 18.6 | 81.3 |
| Queue Length 50th (ft) | 70 | 225 | 22 | 311 | 38 | 261 | 44 | ~456 |
| Queue Length 95th (ft) | #224 | 253 | 69 | #425 | m59 | 327 | m53 | #596 |
| Internal Link Dist (ft) | | 453 | | 381 | | 503 | | 197 |
| Turn Bay Length (ft) | 275 | | 255 | | 345 | | 190 | |
| Base Capacity (vph) | 230 | 1117 | 203 | 1022 | 177 | 1025 | 333 | 1242 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 168 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.92 | 0.76 | 0.55 | 0.90 | 0.49 | 0.74 | 0.52 | 1.19 |

### Intersection Summary

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

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

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 195 | 716 | 65 | 103 | 813 | 33 | 80 | 667 | 28 | 160 | 1046 | 134 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 11 | 11 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | | 0% | | | 0% | | | 3% | | | -4% | |
| Total Lost time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1711 | 3364 | | 1709 | 3396 | | 1743 | 3452 | | 1801 | 3542 | |
| Flt Permitted | 0.12 | 1.00 | | 0.18 | 1.00 | | 0.13 | 1.00 | | 0.17 | 1.00 | |
| Satd. Flow (perm) | 224 | 3364 | | 325 | 3396 | | 246 | 3452 | | 317 | 3542 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 212 | 778 | 71 | 112 | 884 | 36 | 87 | 725 | 30 | 174 | 1137 | 146 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 212 | 849 | 0 | 112 | 920 | 0 | 87 | 755 | 0 | 174 | 1283 | 0 |
| Confl. Peds. (#/hr) | 18 | | 30 | 30 | | 18 | 3 | | 64 | 64 | | 3 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 |
| Turn Type | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Actuated Green, G (s) | 41.2 | 32.2 | | 35.0 | 29.1 | | 34.6 | 29.8 | | 44.9 | 35.1 | |
| Effective Green, g (s) | 41.2 | 32.2 | | 35.0 | 29.1 | | 34.6 | 29.8 | | 44.9 | 35.1 | |
| Actuated g/C Ratio | 0.41 | 0.32 | | 0.35 | 0.29 | | 0.35 | 0.30 | | 0.45 | 0.35 | |
| Clearance Time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | | 5.0 | 6.0 | |
| Vehicle Extension (s) | 2.0 | 5.0 | | 2.0 | 5.0 | | 2.0 | 5.0 | | 2.0 | 5.0 | |
| Lane Grp Cap (vph) | 226 | 1083 | | 195 | 988 | | 156 | 1028 | | 292 | 1243 | |
| v/s Ratio Prot | c0.08 | 0.25 | | 0.03 | 0.27 | | 0.03 | 0.22 | | c0.06 | c0.36 | |
| v/s Ratio Perm | c0.30 | | | 0.17 | | | 0.16 | | | 0.21 | | |
| v/c Ratio | 0.94 | 0.78 | | 0.57 | 0.93 | | 0.56 | 0.73 | | 0.60 | 1.03 | |
| Uniform Delay, d1 | 23.4 | 30.7 | | 23.7 | 34.5 | | 26.0 | 31.5 | | 19.2 | 32.5 | |
| Progression Factor | 1.41 | 0.64 | | 0.97 | 0.61 | | 0.95 | 1.06 | | 0.78 | 0.73 | |
| Incremental Delay, d2 | 36.4 | 4.6 | | 2.3 | 15.0 | | 2.3 | 3.2 | | 1.4 | 29.0 | |
| Delay (s) | 69.4 | 24.1 | | 25.2 | 35.9 | | 27.0 | 36.7 | | 16.4 | 52.9 | |
| Level of Service | E | C | | C | D | | C | D | | B | D | |
| Approach Delay (s) | | 33.2 | | | 34.8 | | | 35.7 | | | 48.5 | |
| Approach LOS | | C | | | C | | | D | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 39.1 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 1.01 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 22.0 |
| Intersection Capacity Utilization | 90.4% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

# Queues
## 32: E. Broad St & Driveway

12/10/2015

| Lane Group | EBL | EBT | WBL | WBT | NBT | SBT |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 63 | 1037 | 7 | 947 | 40 | 228 |
| v/c Ratio | 0.20 | 0.51 | 0.03 | 0.56 | 0.08 | 0.48 |
| Control Delay | 8.8 | 10.4 | 3.8 | 12.9 | 0.6 | 21.7 |
| Queue Delay | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 8.8 | 10.6 | 3.8 | 12.9 | 0.6 | 21.7 |
| Queue Length 50th (ft) | 10 | 100 | 1 | 241 | 0 | 72 |
| Queue Length 95th (ft) | m21 | 195 | m2 | 218 | 2 | 145 |
| Internal Link Dist (ft) | | 381 | | 141 | 90 | 46 |
| Turn Bay Length (ft) | | | | | | |
| Base Capacity (vph) | 317 | 2020 | 275 | 1706 | 488 | 473 |
| Starvation Cap Reductn | 0 | 249 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.20 | 0.59 | 0.03 | 0.56 | 0.08 | 0.48 |

Intersection Summary

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 58 | 944 | 10 | 6 | 688 | 183 | 15 | 0 | 22 | 103 | 0 | 107 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | | 6.0 | | | 6.0 | |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | | 1.00 | | | 1.00 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 0.99 | | | 1.00 | | | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | | 1.00 | | | 1.00 | |
| Frt | 1.00 | 1.00 | | 1.00 | 0.97 | | | 0.92 | | | 0.93 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | | 0.98 | | | 0.98 | |
| Satd. Flow (prot) | 1769 | 3532 | | 1769 | 3399 | | | 1678 | | | 1682 | |
| Flt Permitted | 0.20 | 1.00 | | 0.22 | 1.00 | | | 0.86 | | | 0.82 | |
| Satd. Flow (perm) | 369 | 3532 | | 411 | 3399 | | | 1471 | | | 1419 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 63 | 1026 | 11 | 7 | 748 | 199 | 16 | 0 | 24 | 112 | 0 | 116 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 23 | 0 | 0 | 28 | 0 | 0 | 62 | 0 |
| Lane Group Flow (vph) | 63 | 1037 | 0 | 7 | 924 | 0 | 0 | 12 | 0 | 0 | 166 | 0 |
| Confl. Peds. (#/hr) | 9 | | 5 | 5 | | 9 | 1 | | | | | 1 |
| Turn Type | pm+pt | NA | | pm+pt | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | | 7 | | | 3 | |
| Permitted Phases | 2 | | | 6 | | | 7 | | | 3 | | |
| Actuated Green, G (s) | 58.6 | 53.2 | | 49.4 | 48.6 | | | 29.0 | | | 29.0 | |
| Effective Green, g (s) | 58.6 | 53.2 | | 49.4 | 48.6 | | | 29.0 | | | 29.0 | |
| Actuated g/C Ratio | 0.59 | 0.53 | | 0.49 | 0.49 | | | 0.29 | | | 0.29 | |
| Clearance Time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | | 6.0 | | | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | | 3.0 | | | 3.0 | |
| Lane Grp Cap (vph) | 291 | 1879 | | 213 | 1651 | | | 426 | | | 411 | |
| v/s Ratio Prot | c0.01 | c0.29 | | 0.00 | 0.27 | | | | | | | |
| v/s Ratio Perm | 0.11 | | | 0.02 | | | | 0.01 | | | c0.12 | |
| v/c Ratio | 0.22 | 0.55 | | 0.03 | 0.56 | | | 0.03 | | | 0.40 | |
| Uniform Delay, d1 | 10.8 | 15.5 | | 13.3 | 18.1 | | | 25.4 | | | 28.6 | |
| Progression Factor | 0.91 | 0.71 | | 0.44 | 0.66 | | | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | 0.3 | 0.9 | | 0.1 | 1.3 | | | 0.1 | | | 0.7 | |
| Delay (s) | 10.1 | 11.9 | | 5.9 | 13.3 | | | 25.5 | | | 29.2 | |
| Level of Service | B | B | | A | B | | | C | | | C | |
| Approach Delay (s) | | 11.8 | | | 13.3 | | | 25.5 | | | 29.2 | |
| Approach LOS | | B | | | B | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 14.4 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.50 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 17.0 |
| Intersection Capacity Utilization | 61.1% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

# Queues
## 23: N. Washington St & Park Ave

12/10/2015

| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 183 | 116 | 994 | 1463 |
| v/c Ratio | 0.94 | 0.43 | 0.53 | 0.82 |
| Control Delay | 97.3 | 13.5 | 2.0 | 10.3 |
| Queue Delay | 0.0 | 1.2 | 0.0 | 14.8 |
| Total Delay | 97.3 | 14.7 | 2.0 | 25.1 |
| Queue Length 50th (ft) | 118 | 0 | 10 | 91 |
| Queue Length 95th (ft) | #250 | 51 | 11 | 124 |
| Internal Link Dist (ft) | 437 | | 3 | 403 |
| Turn Bay Length (ft) | 150 | | | |
| Base Capacity (vph) | 194 | 267 | 1890 | 1781 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 48 | 0 | 336 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.94 | 0.53 | 0.53 | 1.01 |

Intersection Summary

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 168 | 107 | 36 | 879 | 1266 | 80 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 12 | 12 | 11 | 11 | 11 | 11 |
| Grade (%) | 0% | | | 3% | -3% | |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 0.94 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1492 | | 3336 | 3417 | |
| Flt Permitted | 0.95 | 1.00 | | 0.85 | 1.00 | |
| Satd. Flow (perm) | 1770 | 1492 | | 2856 | 3417 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 183 | 116 | 39 | 955 | 1376 | 87 |
| RTOR Reduction (vph) | 0 | 103 | 0 | 0 | 5 | 0 |
| Lane Group Flow (vph) | 183 | 13 | 0 | 994 | 1458 | 0 |
| Confl. Peds. (#/hr) | | 17 | 33 | | | 33 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 4 | 0 | 4 |
| Turn Type | Prot | Perm | pm+pt | NA | NA | |
| Protected Phases | 3 | | 5 4 | 2 4 | 6 | |
| Permitted Phases | | 3 | 2 4 | | | |
| Actuated Green, G (s) | 11.0 | 11.0 | | 63.0 | 52.0 | |
| Effective Green, g (s) | 11.0 | 11.0 | | 63.0 | 52.0 | |
| Actuated g/C Ratio | 0.11 | 0.11 | | 0.63 | 0.52 | |
| Clearance Time (s) | 6.0 | 6.0 | | | 6.0 | |
| Vehicle Extension (s) | 4.0 | 4.0 | | | 3.0 | |
| Lane Grp Cap (vph) | 194 | 164 | | 1890 | 1776 | |
| v/s Ratio Prot | c0.10 | | | c0.10 | c0.43 | |
| v/s Ratio Perm | | 0.01 | | 0.23 | | |
| v/c Ratio | 0.94 | 0.08 | | 0.53 | 0.82 | |
| Uniform Delay, d1 | 44.2 | 39.9 | | 10.2 | 20.1 | |
| Progression Factor | 1.00 | 1.00 | | 0.10 | 0.33 | |
| Incremental Delay, d2 | 48.6 | 0.3 | | 0.3 | 3.6 | |
| Delay (s) | 92.8 | 40.2 | | 1.4 | 10.2 | |
| Level of Service | F | D | | A | B | |
| Approach Delay (s) | 72.4 | | | 1.4 | 10.2 | |
| Approach LOS | E | | | A | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 13.8 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.84 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 24.0 |
| Intersection Capacity Utilization | 70.0% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | WBL | NBT | SBT |
|---|---|---|---|
| Lane Group Flow (vph) | 110 | 979 | 1518 |
| v/c Ratio | 0.74 | 0.54 | 0.78 |
| Control Delay | 50.3 | 7.9 | 11.7 |
| Queue Delay | 3.7 | 0.4 | 5.7 |
| Total Delay | 53.9 | 8.3 | 17.3 |
| Queue Length 50th (ft) | 26 | 76 | 97 |
| Queue Length 95th (ft) | #114 | m90 | 195 |
| Internal Link Dist (ft) | 183 | 23 | 3 |
| Turn Bay Length (ft) | | | |
| Base Capacity (vph) | 148 | 1798 | 1939 |
| Starvation Cap Reductn | 0 | 321 | 0 |
| Spillback Cap Reductn | 10 | 0 | 366 |
| Storage Cap Reductn | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.80 | 0.66 | 0.97 |

Intersection Summary

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

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

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 36 | 65 | 867 | 34 | 99 | 1297 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Grade (%) | 0% | | 3% | | | -4% |
| Total Lost time (s) | 6.0 | | 6.0 | | | 6.0 |
| Lane Util. Factor | 1.00 | | 0.95 | | | 0.95 |
| Frpb, ped/bikes | 0.99 | | 1.00 | | | 1.00 |
| Flpb, ped/bikes | 1.00 | | 1.00 | | | 1.00 |
| Frt | 0.91 | | 0.99 | | | 1.00 |
| Flt Protected | 0.98 | | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 1652 | | 3455 | | | 3597 |
| Flt Permitted | 0.98 | | 1.00 | | | 0.65 |
| Satd. Flow (perm) | 1652 | | 3455 | | | 2364 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 39 | 71 | 942 | 37 | 108 | 1410 |
| RTOR Reduction (vph) | 66 | 0 | 3 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 44 | 0 | 976 | 0 | 0 | 1518 |
| Confl. Peds. (#/hr) | | 1 | | 21 | | |
| Turn Type | Prot | | NA | | pm+pt | NA |
| Protected Phases | 4 | | 2 | | 1 3 | 3 6 |
| Permitted Phases | | | | | 3 6 | |
| Actuated Green, G (s) | 5.0 | | 52.0 | | | 69.0 |
| Effective Green, g (s) | 5.0 | | 52.0 | | | 69.0 |
| Actuated g/C Ratio | 0.05 | | 0.52 | | | 0.69 |
| Clearance Time (s) | 6.0 | | 6.0 | | | |
| Vehicle Extension (s) | 4.0 | | 3.0 | | | |
| Lane Grp Cap (vph) | 82 | | 1796 | | | 1939 |
| v/s Ratio Prot | c0.03 | | c0.28 | | | c0.20 |
| v/s Ratio Perm | | | | | | c0.34 |
| v/c Ratio | 0.54 | | 0.54 | | | 0.78 |
| Uniform Delay, d1 | 46.4 | | 16.1 | | | 10.4 |
| Progression Factor | 1.00 | | 0.44 | | | 1.12 |
| Incremental Delay, d2 | 8.9 | | 0.8 | | | 1.4 |
| Delay (s) | 55.3 | | 7.9 | | | 13.1 |
| Level of Service | E | | A | | | B |
| Approach Delay (s) | 55.3 | | 7.9 | | | 13.1 |
| Approach LOS | E | | A | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 12.9 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.81 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 24.0 |
| Intersection Capacity Utilization | 84.9% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

# Queues
## 4: S. Washington St/N. Washington St & W. Broad St/E. Broad St

12/10/2015

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 197 | 753 | 89 | 739 | 110 | 704 | 246 | 709 |
| v/c Ratio | 0.64 | 0.68 | 0.35 | 0.81 | 0.41 | 0.79 | 0.79 | 0.69 |
| Control Delay | 31.9 | 38.3 | 25.0 | 48.9 | 27.3 | 49.5 | 43.2 | 41.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 |
| Total Delay | 31.9 | 38.3 | 25.0 | 48.9 | 27.3 | 49.5 | 43.2 | 41.8 |
| Queue Length 50th (ft) | 88 | 253 | 37 | 273 | 49 | 261 | 118 | 247 |
| Queue Length 95th (ft) | 181 | 402 | 84 | 426 | 105 | 411 | #254 | 392 |
| Internal Link Dist (ft) | | 453 | | 381 | | 503 | | 175 |
| Turn Bay Length (ft) | 275 | | 255 | | 345 | | 190 | |
| Base Capacity (vph) | 376 | 1933 | 357 | 1793 | 418 | 1841 | 394 | 1838 |
| Starvation Cap Reductn | 0 | 91 | 0 | 74 | 0 | 0 | 0 | 288 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.52 | 0.41 | 0.25 | 0.43 | 0.26 | 0.38 | 0.62 | 0.46 |

### Intersection Summary

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 181 | 621 | 72 | 82 | 624 | 56 | 101 | 621 | 27 | 226 | 489 | 163 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 11 | 11 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | | 0% | | | 0% | | | 3% | | | -4% | |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.98 | | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.96 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1711 | 3358 | | 1709 | 3371 | | 1742 | 3461 | | 1805 | 3457 | |
| Flt Permitted | 0.14 | 1.00 | | 0.27 | 1.00 | | 0.25 | 1.00 | | 0.15 | 1.00 | |
| Satd. Flow (perm) | 259 | 3358 | | 478 | 3371 | | 453 | 3461 | | 289 | 3457 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 197 | 675 | 78 | 89 | 678 | 61 | 110 | 675 | 29 | 246 | 532 | 177 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 197 | 753 | 0 | 89 | 739 | 0 | 110 | 704 | 0 | 246 | 709 | 0 |
| Confl. Peds. (#/hr) | 11 | | 11 | 11 | | 11 | 4 | | 5 | 5 | | 4 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 |
| Turn Type | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Actuated Green, G (s) | 53.7 | 39.2 | | 40.6 | 32.1 | | 40.4 | 30.3 | | 49.8 | 35.0 | |
| Effective Green, g (s) | 53.7 | 39.2 | | 40.6 | 32.1 | | 40.4 | 30.3 | | 49.8 | 35.0 | |
| Actuated g/C Ratio | 0.46 | 0.34 | | 0.35 | 0.27 | | 0.35 | 0.26 | | 0.43 | 0.30 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lane Grp Cap (vph) | 313 | 1127 | | 255 | 926 | | 268 | 897 | | 315 | 1035 | |
| v/s Ratio Prot | c0.08 | c0.22 | | 0.03 | c0.22 | | 0.04 | 0.20 | | c0.10 | c0.21 | |
| v/s Ratio Perm | 0.21 | | | 0.10 | | | 0.11 | | | c0.23 | | |
| v/c Ratio | 0.63 | 0.67 | | 0.35 | 0.80 | | 0.41 | 0.78 | | 0.78 | 0.69 | |
| Uniform Delay, d1 | 22.6 | 33.2 | | 26.6 | 39.3 | | 27.3 | 40.2 | | 25.1 | 36.0 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 2.8 | 1.2 | | 0.3 | 4.5 | | 0.4 | 4.2 | | 11.0 | 1.5 | |
| Delay (s) | 25.4 | 34.4 | | 26.9 | 43.9 | | 27.6 | 44.4 | | 36.1 | 37.6 | |
| Level of Service | C | C | | C | D | | C | D | | D | D | |
| Approach Delay (s) | | 32.5 | | | 42.1 | | | 42.2 | | | 37.2 | |
| Approach LOS | | C | | | D | | | D | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 38.2 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.80 | | |
| Actuated Cycle Length (s) | 116.8 | Sum of lost time (s) | 24.0 |
| Intersection Capacity Utilization | 79.7% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

# Queues
## 32: E. Broad St & Driveway

12/10/2015

| Lane Group | EBL | EBT | WBL | WBT | NBT | SBT |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 77 | 940 | 3 | 931 | 5 | 293 |
| v/c Ratio | 0.27 | 0.48 | 0.01 | 0.56 | 0.01 | 0.50 |
| Control Delay | 19.1 | 25.1 | 16.0 | 32.2 | 30.6 | 34.9 |
| Queue Delay | 0.0 | 6.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 19.1 | 31.4 | 16.0 | 32.2 | 30.6 | 34.9 |
| Queue Length 50th (ft) | 39 | 327 | 1 | 379 | 2 | 189 |
| Queue Length 95th (ft) | 66 | 440 | 7 | 456 | 14 | 314 |
| Internal Link Dist (ft) | | 381 | | 140 | 62 | 28 |
| Turn Bay Length (ft) | | | | | | |
| Base Capacity (vph) | 309 | 1958 | 285 | 1762 | 599 | 586 |
| Starvation Cap Reductn | 0 | 955 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.25 | 0.94 | 0.01 | 0.53 | 0.01 | 0.50 |

Intersection Summary

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 71 | 861 | 4 | 3 | 642 | 214 | 2 | 1 | 2 | 122 | 0 | 147 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | | 6.0 | | | 6.0 | |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | | 1.00 | | | 1.00 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 0.99 | | | 1.00 | | | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | | 1.00 | | | 1.00 | |
| Frt | 1.00 | 1.00 | | 1.00 | 0.96 | | | 0.95 | | | 0.93 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | | 0.98 | | | 0.98 | |
| Satd. Flow (prot) | 1770 | 3536 | | 1770 | 3357 | | | 1728 | | | 1687 | |
| Flt Permitted | 0.20 | 1.00 | | 0.25 | 1.00 | | | 0.93 | | | 0.85 | |
| Satd. Flow (perm) | 374 | 3536 | | 457 | 3357 | | | 1637 | | | 1470 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 77 | 936 | 4 | 3 | 698 | 233 | 2 | 1 | 2 | 133 | 0 | 160 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 18 | 0 | 0 | 1 | 0 | 0 | 50 | 0 |
| Lane Group Flow (vph) | 77 | 940 | 0 | 3 | 913 | 0 | 0 | 4 | 0 | 0 | 244 | 0 |
| Confl. Peds. (#/hr) | 7 | | 4 | 4 | | 7 | | | | | | |
| Turn Type | pm+pt | NA | | pm+pt | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | | 7 | | | 3 | |
| Permitted Phases | 2 | | | 6 | | | 7 | | | 3 | | |
| Actuated Green, G (s) | 103.2 | 97.1 | | 90.4 | 89.3 | | | 64.0 | | | 64.0 | |
| Effective Green, g (s) | 103.2 | 97.1 | | 90.4 | 89.3 | | | 64.0 | | | 64.0 | |
| Actuated g/C Ratio | 0.58 | 0.54 | | 0.50 | 0.50 | | | 0.36 | | | 0.36 | |
| Clearance Time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | | | 6.0 | | | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | | 3.0 | | | 3.0 | |
| Lane Grp Cap (vph) | 284 | 1915 | | 238 | 1672 | | | 584 | | | 525 | |
| v/s Ratio Prot | c0.01 | c0.27 | | 0.00 | c0.27 | | | | | | | |
| v/s Ratio Perm | 0.14 | | | 0.01 | | | | 0.00 | | | c0.17 | |
| v/c Ratio | 0.27 | 0.49 | | 0.01 | 0.55 | | | 0.01 | | | 0.46 | |
| Uniform Delay, d1 | 20.3 | 25.6 | | 22.9 | 31.0 | | | 37.1 | | | 44.4 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | 0.5 | 0.9 | | 0.0 | 0.4 | | | 0.0 | | | 0.7 | |
| Delay (s) | 20.8 | 26.5 | | 22.9 | 31.4 | | | 37.1 | | | 45.0 | |
| Level of Service | C | C | | C | C | | | D | | | D | |
| Approach Delay (s) | | 26.1 | | | 31.3 | | | 37.1 | | | 45.0 | |
| Approach LOS | | C | | | C | | | D | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 30.8 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.51 | | |
| Actuated Cycle Length (s) | 179.2 | Sum of lost time (s) | 17.0 |
| Intersection Capacity Utilization | 64.3% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

# Queues
## 23: N. Washington St & Park Ave

12/10/2015

| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 149 | 62 | 933 | 965 |
| v/c Ratio | 0.65 | 0.24 | 0.54 | 0.61 |
| Control Delay | 55.5 | 13.0 | 2.3 | 22.0 |
| Queue Delay | 0.0 | 0.1 | 0.0 | 0.2 |
| Total Delay | 55.5 | 13.1 | 2.3 | 22.2 |
| Queue Length 50th (ft) | 92 | 0 | 17 | 232 |
| Queue Length 95th (ft) | #169 | 38 | 10 | 298 |
| Internal Link Dist (ft) | 437 | | 18 | 403 |
| Turn Bay Length (ft) | 150 | | | |
| Base Capacity (vph) | 230 | 259 | 1721 | 1578 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 9 | 0 | 135 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.65 | 0.25 | 0.54 | 0.67 |

Intersection Summary

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 137 | 57 | 39 | 820 | 806 | 82 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 12 | 12 | 11 | 11 | 11 | 11 |
| Grade (%) | 0% | | | 3% | -3% | |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1583 | | 3335 | 3415 | |
| Flt Permitted | 0.95 | 1.00 | | 0.89 | 1.00 | |
| Satd. Flow (perm) | 1770 | 1583 | | 2983 | 3415 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 149 | 62 | 42 | 891 | 876 | 89 |
| RTOR Reduction (vph) | 0 | 54 | 0 | 0 | 8 | 0 |
| Lane Group Flow (vph) | 149 | 8 | 0 | 933 | 957 | 0 |
| Confl. Peds. (#/hr) | 3 | | 3 | | | 3 |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 4 | 0 | 4 |
| Turn Type | Prot | Perm | pm+pt | NA | NA | |
| Protected Phases | 3 | | 5 4 | 2 4 | 6 | |
| Permitted Phases | | 3 | 2 4 | | | |
| Actuated Green, G (s) | 13.0 | 13.0 | | 55.0 | 46.0 | |
| Effective Green, g (s) | 13.0 | 13.0 | | 55.0 | 46.0 | |
| Actuated g/C Ratio | 0.13 | 0.13 | | 0.55 | 0.46 | |
| Clearance Time (s) | 6.0 | 6.0 | | | 6.0 | |
| Vehicle Extension (s) | 4.0 | 4.0 | | | 3.0 | |
| Lane Grp Cap (vph) | 230 | 205 | | 1721 | 1570 | |
| v/s Ratio Prot | c0.08 | | | c0.12 | c0.28 | |
| v/s Ratio Perm | | 0.01 | | 0.17 | | |
| v/c Ratio | 0.65 | 0.04 | | 0.54 | 0.61 | |
| Uniform Delay, d1 | 41.3 | 38.0 | | 14.4 | 20.3 | |
| Progression Factor | 1.00 | 1.00 | | 0.09 | 1.00 | |
| Incremental Delay, d2 | 6.8 | 0.1 | | 0.3 | 1.8 | |
| Delay (s) | 48.2 | 38.1 | | 1.6 | 22.0 | |
| Level of Service | D | D | | A | C | |
| Approach Delay (s) | 45.2 | | | 1.6 | 22.0 | |
| Approach LOS | D | | | A | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 15.3 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.66 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 24.0 |
| Intersection Capacity Utilization | 69.0% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

# Queues
## 36: N. Washington St & driveway

12/10/2015

| Lane Group | WBL | NBT | SBT |
|---|---|---|---|
| Lane Group Flow (vph) | 113 | 942 | 965 |
| v/c Ratio | 0.67 | 0.66 | 0.52 |
| Control Delay | 50.6 | 26.5 | 3.9 |
| Queue Delay | 0.0 | 8.1 | 0.0 |
| Total Delay | 50.6 | 34.7 | 3.9 |
| Queue Length 50th (ft) | 48 | 249 | 18 |
| Queue Length 95th (ft) | #125 | 320 | 52 |
| Internal Link Dist (ft) | 211 | 30 | 18 |
| Turn Bay Length (ft) | | | |
| Base Capacity (vph) | 169 | 1422 | 1849 |
| Starvation Cap Reductn | 0 | 441 | 0 |
| Spillback Cap Reductn | 0 | 44 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.67 | 0.96 | 0.52 |

### Intersection Summary

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

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 53 | 51 | 832 | 35 | 98 | 789 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Grade (%) | 0% | | 3% | | | -4% |
| Total Lost time (s) | 6.0 | | 6.0 | | | 6.0 |
| 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 | 0.93 | | 0.99 | | | 1.00 |
| Flt Protected | 0.97 | | 1.00 | | | 0.99 |
| Satd. Flow (prot) | 1697 | | 3461 | | | 3590 |
| Flt Permitted | 0.97 | | 1.00 | | | 0.58 |
| Satd. Flow (perm) | 1697 | | 3461 | | | 2080 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 58 | 55 | 904 | 38 | 107 | 858 |
| RTOR Reduction (vph) | 34 | 0 | 3 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 79 | 0 | 939 | 0 | 0 | 965 |
| Confl. Peds. (#/hr) | | | | 2 | | |
| Turn Type | Prot | | NA | | pm+pt | NA |
| Protected Phases | 4 | | 2 | | 1 3 | 3 6 |
| Permitted Phases | | | | | 3 6 | |
| Actuated Green, G (s) | 8.0 | | 41.0 | | | 65.0 |
| Effective Green, g (s) | 8.0 | | 41.0 | | | 65.0 |
| Actuated g/C Ratio | 0.08 | | 0.41 | | | 0.65 |
| Clearance Time (s) | 6.0 | | 6.0 | | | |
| Vehicle Extension (s) | 4.0 | | 3.0 | | | |
| Lane Grp Cap (vph) | 135 | | 1419 | | | 1850 |
| v/s Ratio Prot | c0.05 | | c0.27 | | | c0.17 |
| v/s Ratio Perm | | | | | | 0.17 |
| v/c Ratio | 0.58 | | 0.66 | | | 0.52 |
| Uniform Delay, d1 | 44.4 | | 23.9 | | | 9.3 |
| Progression Factor | 1.00 | | 1.00 | | | 0.36 |
| Incremental Delay, d2 | 7.4 | | 2.4 | | | 0.3 |
| Delay (s) | 51.8 | | 26.3 | | | 3.6 |
| Level of Service | D | | C | | | A |
| Approach Delay (s) | 51.8 | | 26.3 | | | 3.6 |
| Approach LOS | D | | C | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 16.9 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.66 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 24.0 |
| Intersection Capacity Utilization | 69.8% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |