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Acknowledgments

To best serve the City of Madison, Kimley-Horn assembled a master planning consulting team that is committed to delivering exceptional service and innovative solutions for the Judge Doyle Square project. Kimley-Horn greatly appreciates the collaborative effort of the entire team in the preparation of this document. Team partners and their areas of master planning responsibility are as follows:

- Kimley-Horn and Associates, Inc. Lead master planning consultant, project management, public involvement, TIA, environmental scoping, parking consulting, structural engineering
- Potter Lawson, Inc. Project architecture, land use master planning, City office space study, project management team
- Urban Assets Lead public involvement, master planning, project management team
- Mobis Transportation Alternatives / Bikestation Bicycle center consultant
- Ken Saiki Design, Inc. Public improvements and streetscape, landscape architecture
- KJWW Engineering Consultants Mechanical, electrical, HVAC engineering consultant
- PSJ Engineering, Inc. Fire protection consultant
- Mortenson Construction Construction cost estimating, construction feasibility
- Charles Quagliana, Architect Historic preservation consultant

Kimley-Horn also appreciates the contributions and partnership of the many City of Madison staff members who contributed to the content and quality of this document. The City of Madison established a Project Team that included key City staff, representing the following agencies and divisions:

- Planning and Community and Economic Development
- Traffic Engineering
- Parking Utility
- Office of the Mayor
- City Engineering

- Facility Management (Division of City Engineering)
- Metro Transit
- City Attorney's Office
- Monona Terrace Community and Convention Center



Contents

This document—**Chapter 4: Traffic Impact Analysis**—is a part of the final report summarizing the Judge Doyle Square Master Plan completed in April 2012. The structure and presentation of the final report has been developed to specifically address the many aspects of the master planning process in a manner that can be easily read as a whole or in parts based on the interest and needs of the reader. The final report is separated into an introduction and eight chapters:

INTRODUCTION
CHAPTER 1: Public Involvement
CHAPTER 2: Master Planning
CHAPTER 3: Underground Parking
CHAPTER 4: Traffic Impact Analysis
CHAPTER 5: Bicycle Center
CHAPTER 6: Environmental Scoping
CHAPTER 7: City Office Space
CHAPTER 8: Project Management

Each chapter has been bound separately and includes applicable images, tables, and drawings to provide additional information and documentation. Each chapter can stand alone as a summary document for a particular aspect of the project. When combined, the document provides a comprehensive summary of the significant areas of information gathering, study, planning, and management for the Judge Doyle Square master planning effort.









Chapter 4: Traffic Impact Analysis

Introduction

The concept plan for the redevelopment of Judge Doyle Square in Downtown Madison includes underground parking and a variety of above-grade uses. For the purposes of this analysis, it is assumed that the project will be completed by the year 2021 and will include a bicycle center, 114 residential units, 55,950 square feet of office space, 16,950 square feet of retail, and two hotels with 140 rooms on Block 105 and 289 rooms on Block 88. Additional shared parking spaces will serve the needs of the existing hourly parking and monthly permit holders who currently use the Government East Parking Garage, Madison fleet vehicles that currently park in the surface lot behind the Madison Municipal Building, and potentially some additional monthly contract parking. The



purpose of this report is to document the anticipated traffic impacts that the mixed-use development and associated parking garage will have on the surrounding roadway network.

This traffic impact analysis (TIA) represents a review of traffic impacts of the project—based on proposed uses, site plan information, and existing parking characteristics—and is intended to identify the key traffic issues associated with the project. This TIA documents the existing traffic conditions in the vicinity of the site, estimates the future traffic associated with the parking garage, distributes and assigns these trips to the adjacent roadway system, and evaluates the future traffic operations of key intersections near the site as well as those providing access to and from the site. For a basis of comparison, a No Build analysis was completed that includes the general background growth on the street network, but not the redevelopment of Judge Doyle Square.

Based on the analysis, the TIA evaluates traffic control mitigation measures to accommodate future traffic levels and whether these mitigation measures are triggered by background growth or exacerbated by the proposed project.















Study Area _

The project site is bounded by Martin Luther King Jr. Boulevard on the west, Doty Street on the north, King Street on the east, and Wilson Street on the south. Pinckney Street separates Block 105 from Block 88. The underground parking garage extends under both blocks. The existing 516-space Government East Parking Garage currently occupies a majority of Block 105, and the proposed underground parking facility will need to serve the vehicles that currently utilize this garage. Block 88 includes the Madison Municipal Building (MMB) and surface parking. Both blocks are currently zoned C-4, which is the Central Commercial District for Downtown Madison.

To leverage the importance of Pinckney Street as a pedestrian-focused environment, none of the garage access points for this concept are located on Pinckney Street. Instead, two are located on Doty Street and two on Wilson Street. Pedestrian and bicycle access to the bicycle center will be provided on Pinckney Street away from conflicts with vehicles entering and exiting the underground garage. Pinckney Street also allows safe and convenient connectivity to the bicycle network from multiple directions.

Data Collection _

A wide variety of traffic and transportation related data was collected to provide a foundation for the TIA. Initially, the existing lane geometry and traffic control were recorded for each of the intersections in the study area. Figure 4-1 displays this information. Then, pedestrian, bicycle, and vehicle volumes along with transit service data were also collected.

Pedestrian, Bicycle, and Vehicle Volumes

Pedestrian, bicycle, and vehicle turning movement counts (TMCs) were collected at the following 10 locations:

- 1. John Nolen Drive/Blair Street and Wilson Street/Williamson Street
- 2. Wilson Street and Hamilton Street and Henry Street
- 3. Hamilton Street and Doty Street and Fairchild Street
- 4. Doty Street and Martin Luther King Jr. Boulevard
- 5. Doty Street and Pinckney Street
- 6. Doty Street and King Street
- 7. Webster Street and E. Washington Avenue
- 8. Wilson Street and Martin Luther King Jr. Boulevard
- 9. Wilson Street and Pinckney Street
- 10. Wilson Street and Butler Street and King Street

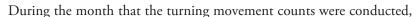


Intersection TMCs were conducted on Tuesday, September 13, 2011 and Wednesday, September 14, 2011 between the hours of 4:00 p.m. and 6:00 p.m.

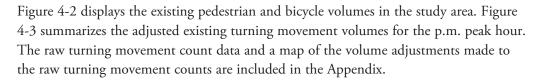
To analyze the parking characteristics of the existing Government East Parking Garage, two 13-hour counts were collected at each of the following two locations:

- 1. Pinckney Street and existing Government East Parking Garage access
- 2. Wilson Street and existing Government East Parking Garage access

The 13-hour intersection TMCs were conducted on Tuesday, September 13, 2011 and Wednesday, September 14, 2011 between the hours of 6:00 a.m. and 7:00 p.m.



Williamson Street east of John Nolen Drive was under construction. Based on discussions with the City of Madison and a review of counts conducted in 2008, it was determined that a significant number of vehicles that would otherwise use Williamson Street instead rerouted via Doty Street to Webster Street and E. Washington Avenue. Therefore, the raw TMCs were adjusted to account for this diversion due to construction.



Transit Service

An inventory of existing transit service in the project study area was conducted to take into account bus movements and pedestrian flows around Judge Doyle Square. A total of nine bus routes operate along Wilson Street: four travel westbound and turn northbound onto Martin Luther King Jr. Boulevard, four travel southbound on Martin Luther King Jr. Boulevard and turn westbound on Wilson Street, and one travels through on Wilson Street. There is one bus stop on the north side of Wilson Street, near the Martin Luther King Jr. Boulevard intersection.

In addition to the permanent routes adjacent to the site, bus service is detoured along Doty Street and Pinckney Street during events on Capitol Square and on Martin Luther King, Jr. Boulevard. A bus stop is located on Block 105 on the south side of Doty Street to serve these detoured bus routes. Because the detour service operates at various times throughout the year, bus movements need to be taken into account in both directions along Pinckney Street, and adequate roadway geometry must be provided for all Doty Street and Wilson Street turning movements.

Figure 4-4 shows existing transit service in the study area, broken down by route direction and service days.









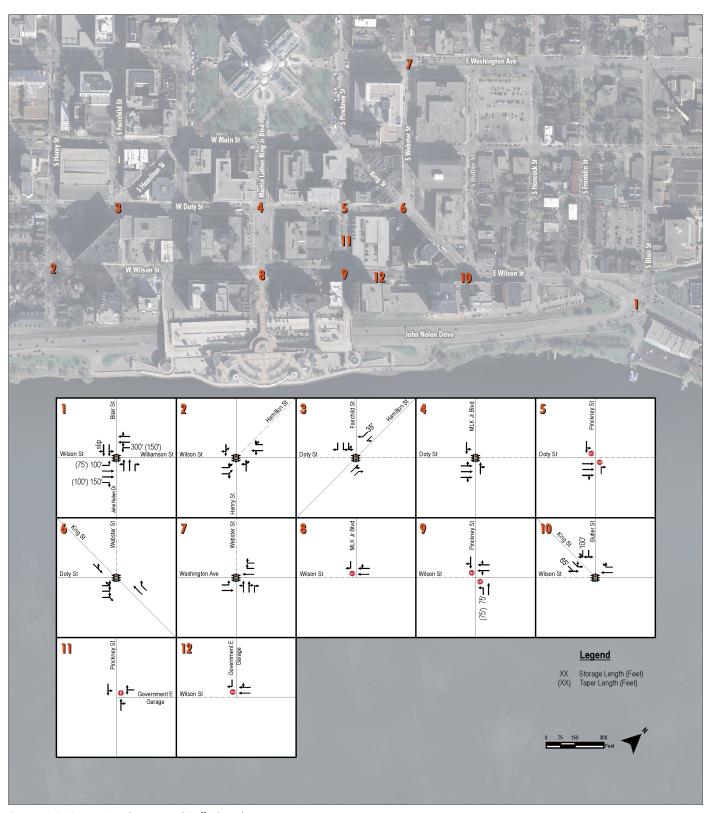


Figure 4-1: Existing Lane Geometry and Traffic Control



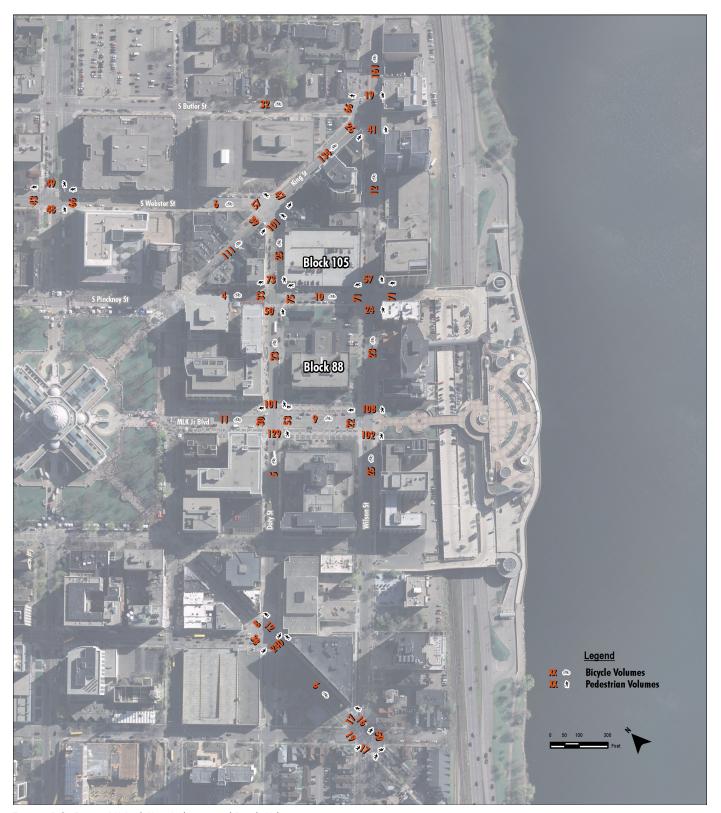


Figure 4-2: Existing PM Peak Hour Pedestrian and Bicycle Volumes









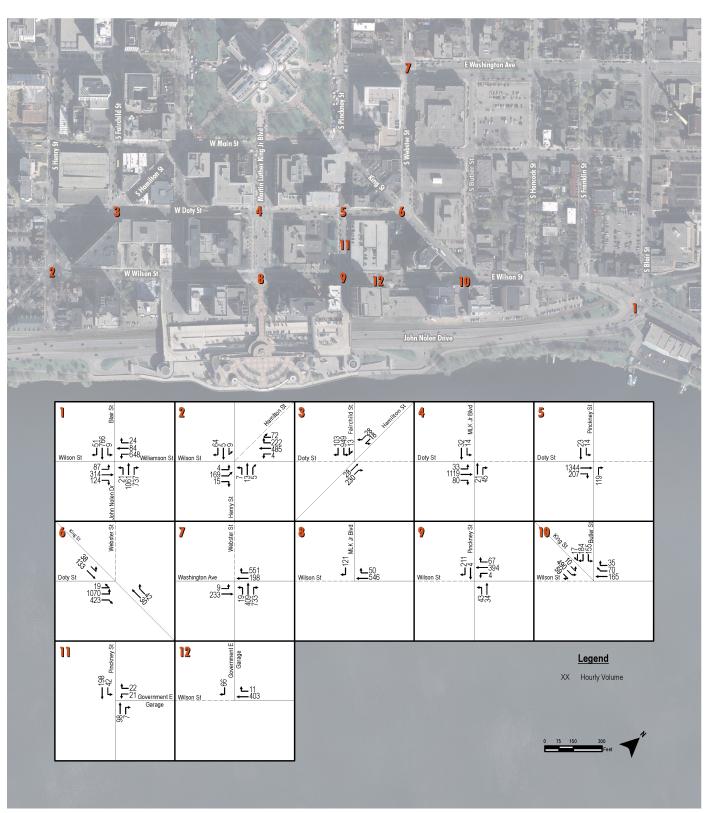


Figure 4-3: Existing PM Peak Hour Turning Movement Volumes



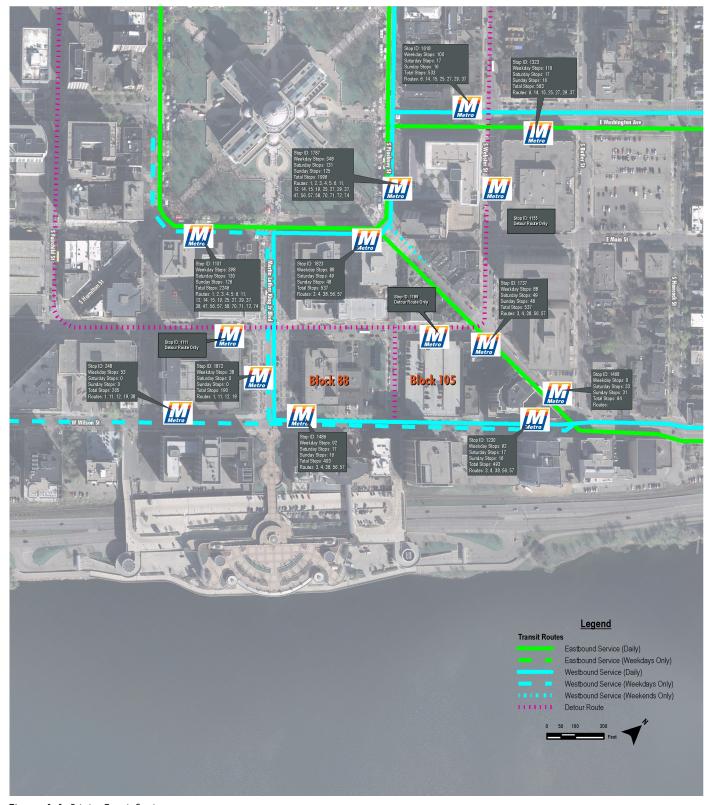


Figure 4-4: Existing Transit Service









Parking Generation _____

The proposed underground parking facility will provide parking for future on-site development as well as hourly, monthly, and City fleet parking.

An Excel-based shared parking analysis model was developed to estimate the hours of peak occupancy given the proposed on-site land uses as well as anticipated entering and exiting volumes during a variety of peak hour scenarios. Parking occupancy and hourly entrance and exit data, categorized by hourly users and monthly pass holders, were provided by the City of Madison for the existing 516-space Government East Parking Garage. The database included 242 days of activity from January 1, 2011 to August 31, 2011. Over this time period, there were a total of 89 monthly pass holders.

A combination of observed occupancy and entering and exiting volumes was used to calibrate the parking model, assuming that the proposed 480 hourly and 100 City fleet/other spaces would follow the observed trends for the existing hourly parking spaces, and the proposed 120 monthly and 200 other potential monthly contract spaces would follow the observed trends for the existing monthly pass holder spaces. This





methodology assumes a significant increase in parking demand, and therefore allows for reasonable growth while also serving as a proof of concept for garage operation under a high demand scenario.

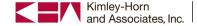
The Institute of Transportation Engineers' (ITE) Parking Generation, 4th Edition was used to estimate the peak parking demand for the proposed hotel (land use code 310), office (land use code 701/710), and residential (land use code 221/223) uses on site. Hourly occupancy percentages, obtained from the Urban Land Institute's (ULI) Shared Parking, 2nd Edition, were then applied to estimate hourly parking demand for each use over a 24-hour period. Using trip generation estimates and a.m. and p.m. directional distribution values obtained from ITE's Trip Generation, 8th Edition, hourly entering and exiting volume estimates for each of the three land uses were then added to the shared parking model.

Adjustments for internal capture, pass-by trips, and reductions for non-vehicular traffic were not applied since the hourly parking spaces provided are anticipated to serve on-site retail and multiple surrounding uses, and the observed parking garage counts only include vehicle trips. Pedestrian and transit trips do not require parking spaces, and were therefore analyzed independently. In addition to the bicycle center, bicycle parking is reflected in the current concept both on-street and within the garage.

The total calculated parking demand for the site, assuming no shared spaces, is 1,501 broken down as follows:

- 480 hourly spaces
- 120 monthly spaces
- 200 other potential contract spaces
- 100 Madison fleet and other vehicle spaces
- 259 hotel spaces (Block 88)
- 95 hotel spaces (Block 105)
- 109 residential spaces
- 138 office spaces

Applying procedures in shared parking to take into account fluctuations in demand over a 24-hour period, however, the maximum hourly parking occupancy is approximately 1,103, which occurs from around 11 a.m. to noon, as shown in Figure 4-5.









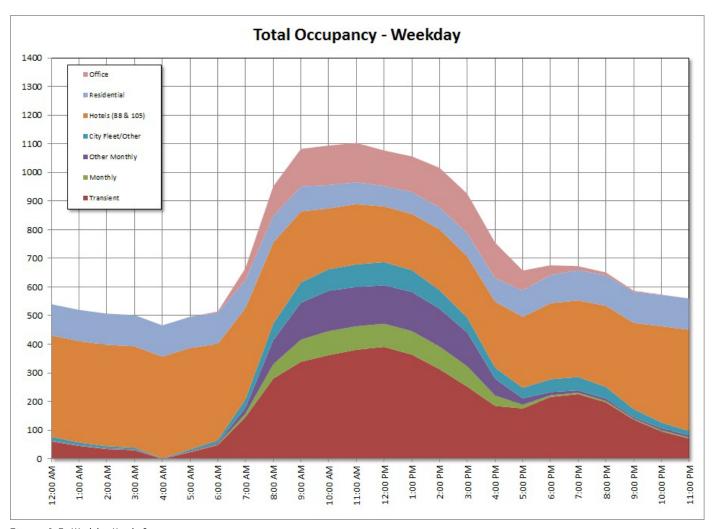


Figure 4-5: Weekday Hourly Occupancy

The current concept includes approximately 1,300 spaces, and therefore serves the peak hour of demand with approximately a 15% buffer to accommodate parking patrons' need to circulate to find available parking. Generally, a facility should have at least a 5 to 10% buffer so that a user perceives that the facility has a space available for them.



Trip Generation

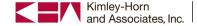
Project trips were estimated based on parking characteristics for the existing Government East Parking Garage, as well as anticipated trips based on the proposed office, hotel, and residential land uses on site. Trip generation for the p.m. peak hour was obtained by combining estimates from the shared parking model for the hourly, monthly, and fleet vehicle spaces with estimates from Trip Generation, 8th Edition for the three on-site non-retail uses. Again, the retail uses are assumed to be included in the growth in hourly parking spaces. In addition, the current concept includes some on-street parking to serve short-term retail parking demand. The proposed site is anticipated to serve 732 trips (245 entering, 487 exiting) for the p.m. peak hour, as shown in Table 4-1. The parking model has been provided to the City electronically.

Land Use #	Land Use Type	Size	Units	Formula	Total Trips	Enter	Exit
223	Mid-Rise Apartment	114	Units	T = 0.48(X) - 11.07	44	26	18
310	Hotel	140	Occupied Rooms	Ln(T) = 1.2 Ln(X) - 1.55	80	39	41
310	Hotel	289	Occupied Rooms	Ln(T) = 1.2 Ln(X) - 1.55	191	94	97
710	General Office Building	56.0	KSF	T = 1.12(X) + 78.81	141	24	117
-	Hourly	480	Spaces	[From Parking Model]	144	46	98
-	Monthly	120	Spaces	[From Parking Model]	38	2	36
-	Other Monthly Contract	200	Spaces	[From Parking Model]	65	4	61
-	City Fleet/Other	100	Spaces	[From Parking Model]	29	10	19
					732	245	487

Table 4-1: PM Peak Hour Trip Generation

Future Traffic Projections _

In order to calculate future background traffic, project build-out was assumed to be in 2021. A review of historic traffic volumes from 2001 to 2010 on E. Washington Avenue (2010 Traffic Volume Report) showed that traffic has decreased in Downtown Madison over the past 5- and 10-year periods, by about 0.7% and 1% annually, respectively. Nonetheless, to present a conservative analysis, it was determined necessary to apply a rate reflecting traffic growth over the next 10 years. A linear growth rate of 0.25% per year was applied to the existing traffic volumes to calculate 2021 No Build traffic. The 2021 No Build p.m. peak hour traffic volumes are shown in Figure 4-6.









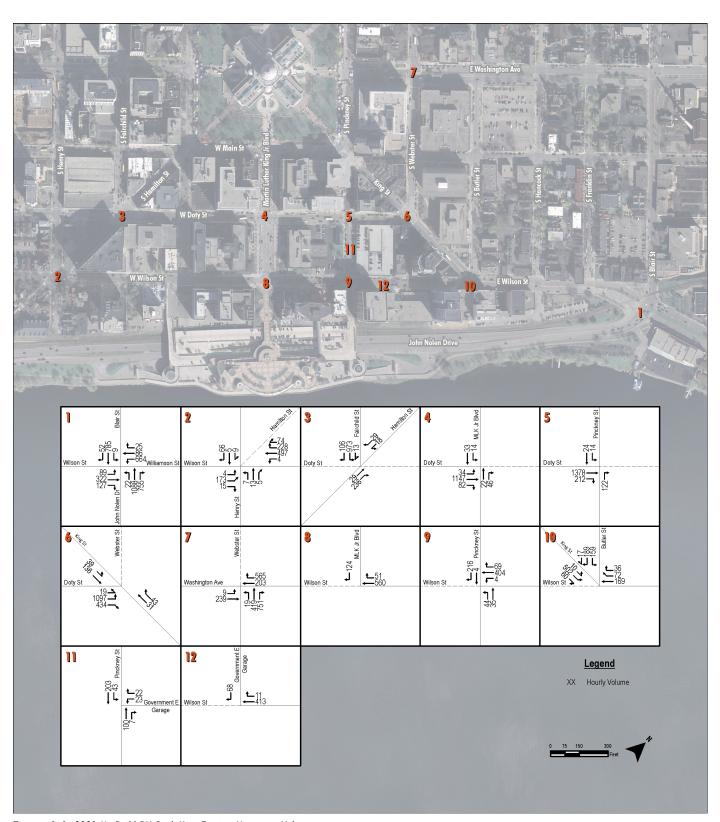


Figure 4-6: 2021 No Build PM Peak Hour Turning Movement Volumes



Project Trip Distribution

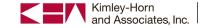
Project trips were distributed onto Doty Street and Wilson Street using the turning movement counts for the p.m. peak period at the existing access points to the Government East Parking Garage. Observations indicate that approximately 70% of the entering vehicles enter via Doty Street from the west, and 30% enter via Wilson Street from the east. Access volumes were then assigned using the same trend, assuming that vehicles will typically favor the first access point encountered, adjusting for the likely heavier usage of the east accesses for the residents and office workers of Block 105.



A similar distribution was observed for the exiting vehicles, with approximately 70% departing on Wilson Street to the west, and 30% departing on Doty Street to the east. Adjustments were then made to favor the access closest to the driver's destination. Some percentage of vehicles was assumed to use Pinckney Street to account for entering and exiting traffic circulating between one-way streets.

To ensure acceptable operating conditions under a conservative access scenario, the analyzed concept assumes that the western Wilson Street access could be limited to hotel patrons on Block 88. Without this limitation, it is expected that operations at the eastern Wilson Street access would improve due to the resulting redistribution of demand.

After assigning total project trips to each access point, project trips were distributed throughout the surrounding network based upon existing turning movement counts in the project area. To avoid double counting, trips from the existing Government East Parking Garage were then subtracted from the turning movements using the same method. Trip distribution percentages are shown in Figure 4-7. Estimated project trips and removed existing garage trips, as shown in Figure 4-8, were combined with the 2021 No Build traffic volumes to obtain the final estimated total traffic for the 2021 Build scenario, as shown in Figure 4-9.









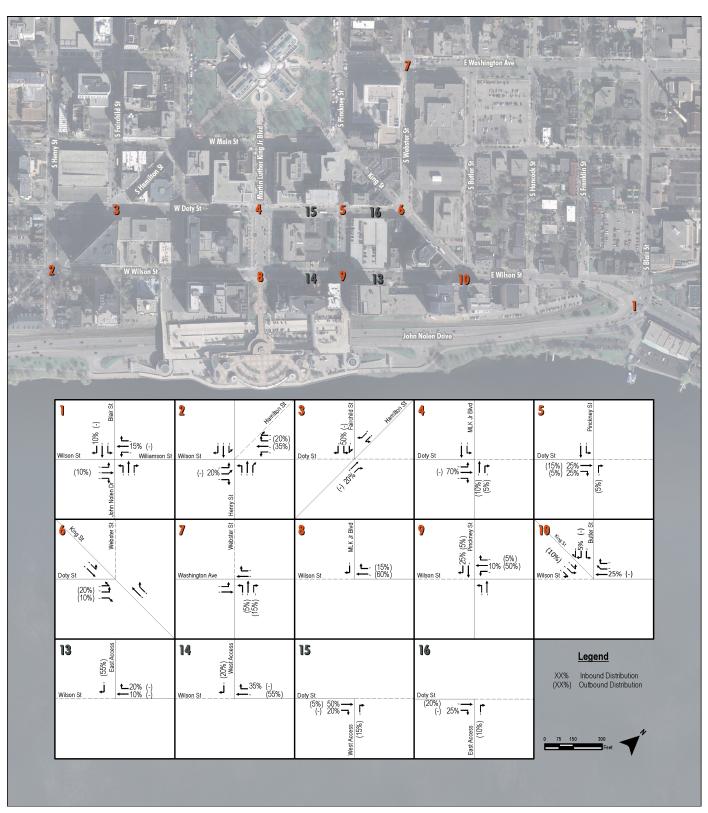


Figure 4-7: 2021 Build PM Peak Hour Trip Distribution



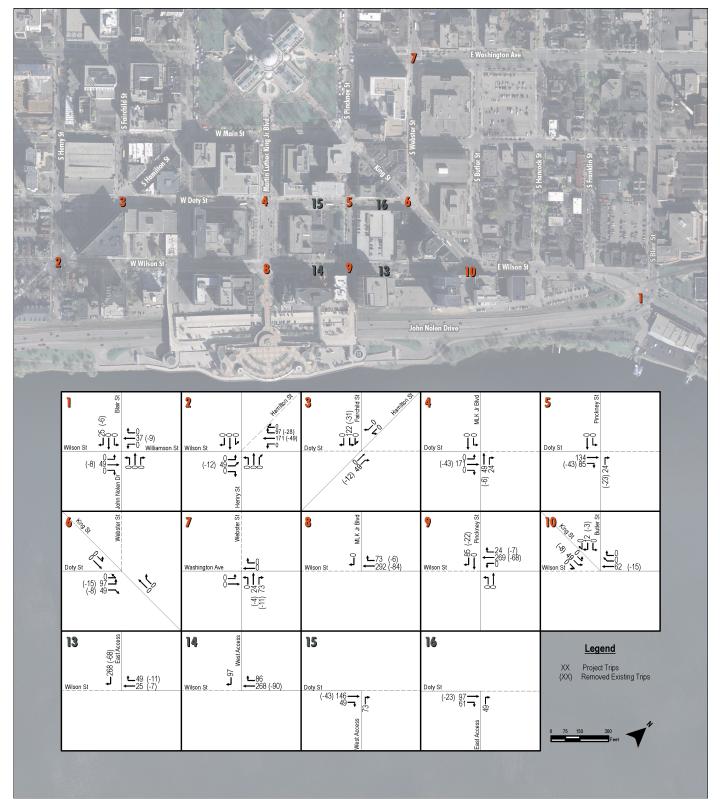
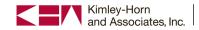


Figure 4-8: 2021 Build PM Peak Hour Project Trips









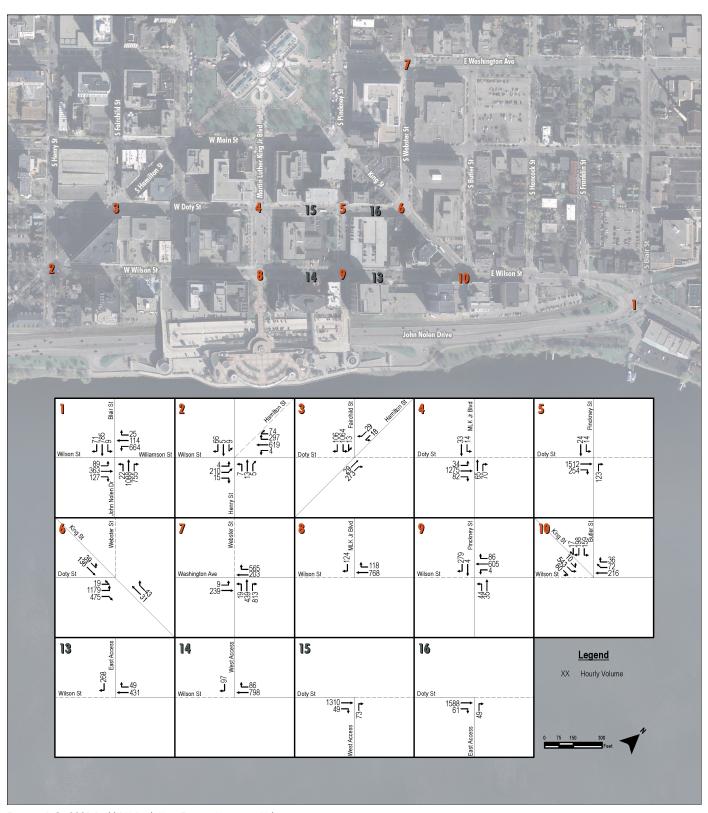


Figure 4-9: 2021 Build PM Peak Hour Turning Movement Volumes



Level of Service Analysis

An analysis of delay and level of service (LOS) was conducted for each of the 10 intersections and four access points previously identified using the methodology found in the Highway Capacity Manual (HCM) and Trafficware's Synchro version 7. Each intersection was analyzed for the p.m. peak hour for the following scenarios:

- 2011 Existing Conditions
- 2021 No Build
- 2021 Build

One of the primary measures of effectiveness used to evaluate intersection traffic operations, as defined in the HCM, is level of service (LOS)—a qualitative letter grade (A through F) based on seconds of vehicle delay due to the traffic control device at an intersection. By definition, LOS A conditions represent high-quality operations (i.e., motorists experience very little delay or interference) and LOS F conditions represent very poor operations (i.e., extreme delay or severe congestion). This study used the LOS D/E boundary as the definition of satisfactory traffic operations, and includes a discussion of the volume to capacity ratio, where applicable. Figure 4-10 shows the LOS thresholds for signalized and unsignalized intersections.

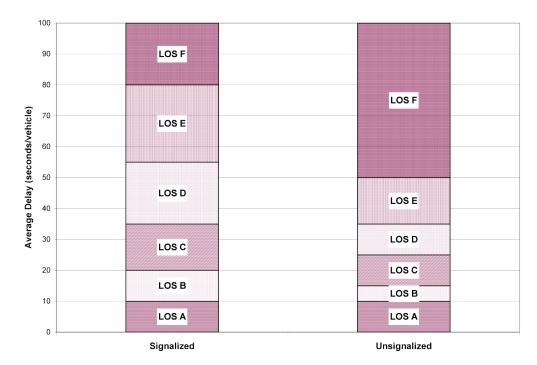


Figure 4-10: Highway Capacity Manual Level of Service Criteria

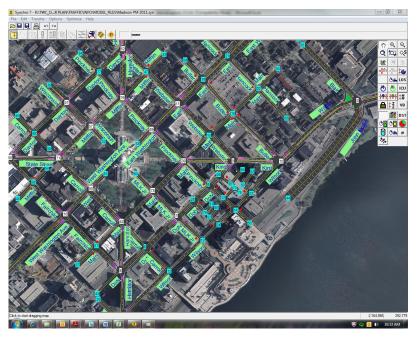






To determine the impacts of the project on the transportation network, a Synchro model of the Downtown Madison street network was created. The original network, supplied by the City of Madison, included seven of the 10 study area intersections. Wilson Street, the John Nolen Drive/Blair Street and Wilson Street/Williamson Street intersection, and the parking access locations were added to complete the network. Additionally, the Doty Street and King Street intersection was modified to allow vehicles to use all three approach lanes for the through movement from Doty Street onto Webster Street, based on observations of actual field operations. A lane utilization factor of 0.64, calculated from observations during the p.m. peak hour, was applied on the eastbound approach to reflect the operational impacts of the heavy usage of the middle through lane.

Using results from the updated Synchro model, a traffic operations analysis was performed to approximate level of service and queue lengths at each of the study intersections under each of the three scenarios. Within each of the following sections, a figure is provided to summarize level of service and queuing for the scenario. A discussion is provided for movements that operate at LOS D or better, but have a volume-to-capacity (v/c) ratio of greater than 0.9, as identified in the Synchro reports. A table is provided in the Appendix for each scenario that summarizes delay, level of service, and 95th percentile queue lengths, rounded up to the nearest 25 feet. Queues that exceed the storage capacity, defined as either the link length or the length of the storage bay, are highlighted in red.



For each scenario, delay and queue lengths are calculated based on the procedures described in the HCM. As Synchro is a macroscopic model, the calculated measures of effectiveness (MOEs) do not take into account individual driver behavior or detailed impacts due to operating conditions at other nearby intersections. The queues and delays listed therefore represent an approximation for an average condition, useful for comparing between scenarios. Due to variability in traffic flows and impacts from surrounding intersections, it is expected that actual operating conditions may differ from those shown in the Synchro reports. Supporting Synchro reports are included in the Appendix, along with simulation results generated using SimTraffic for comparison purposes.





2011 Existing Conditions

During the p.m. peak hour, all intersections operate at LOS C or better in the existing conditions, and all lane groups operate at LOS D or better. Additionally, no lane group exceeds a v/c ratio of 0.9. Figure 4-11 presents level of service and queuing results.

Under existing conditions, no queue extends into the upstream intersection. However, on four approaches, turn lane blockage or spillback was indicated:

- John Nolen Drive/Blair Street and Wilson Street/Williamson Street: vehicle spillback from the left-turn lane on the eastbound approach
- Doty Street and King Street: vehicle spillback from the left-turn lane on the southwest approach
- Wilson Street and Butler Street and King Street: vehicle spillback from the right/ through lane on the southbound approach
- Wilson Street and Butler Street and King Street: queues exceed the length of the right/through lane on the southeastbound (King Street) approach

In each case, all movements on the approach proceed simultaneously, preventing any significant lost time due to lane blockage. No mitigation is necessary.









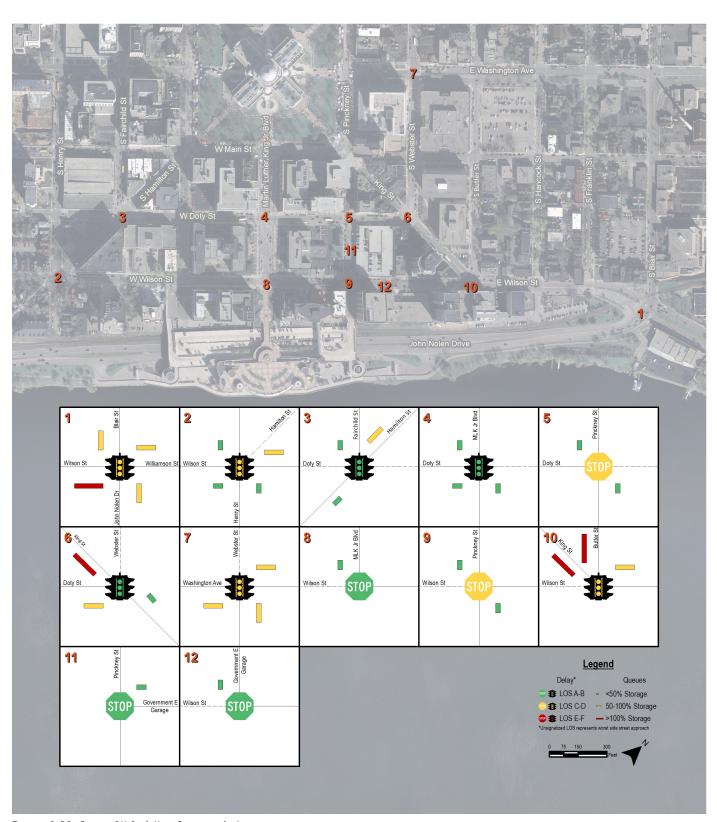


Figure 4-11: Existing PM Peak Hour Operations by Intersection



2021 No Build

As under existing conditions, during the p.m. peak hour for the 2021 No Build scenario, all intersections operate at LOS C or better, all lane groups operate at LOS D or better, and no lane group exceeds a v/c ratio of 0.9. Figure 4-12 presents level of service and queuing results.

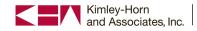
No queue extends into the upstream intersection. However, on the same four approaches as under existing conditions, turn lane blockage or spillback was indicated by slightly increased queue lengths:

- John Nolen Drive/Blair Street and Wilson Street/Williamson Street: vehicle spillback from the left-turn lane on the eastbound approach
- Doty Street and King Street: vehicle spillback from the left-turn lane on the southwest approach
- Wilson Street and Butler Street and King Street: vehicle spillback from the right/ through lane on the southbound approach
- Wilson Street and Butler Street and King Street: queues exceed the length of the right/through lane on the southeastbound (King Street) approach

Although delays are not expected to generate unacceptable operating conditions, efficiency could be improved with the addition of a left-turn lane on both the northbound and southbound approaches to the intersection of John Nolen Drive/Blair Street and Wilson Street/Williamson Street. By removing the left-turning vehicles from the shared lane on each approach, through vehicles will not have to wait behind left-turning vehicles during the peak hour.

Overall, operating conditions for the No Build scenario are expected to be similar to existing conditions, and no additional mitigation is necessary.











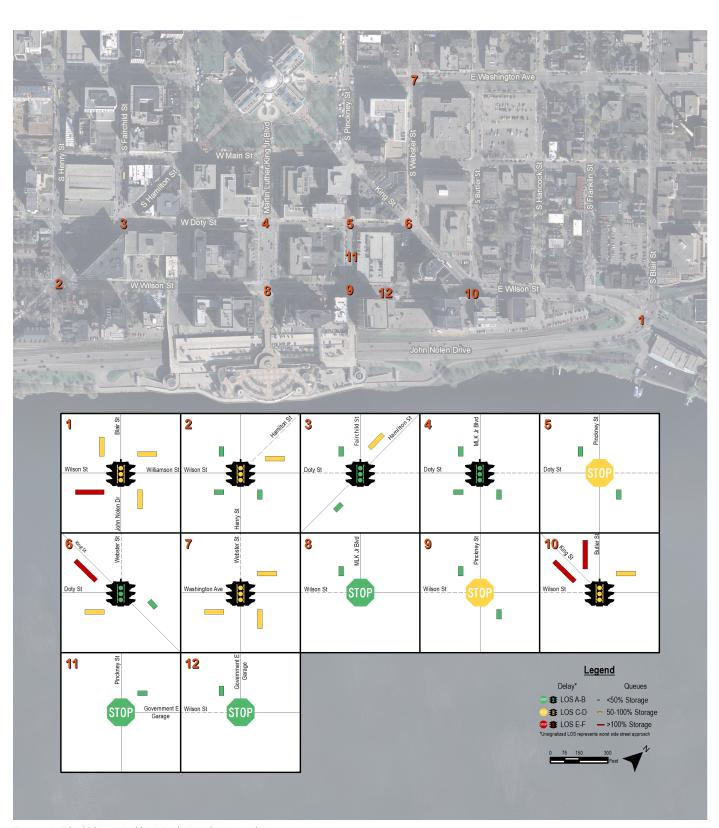


Figure 4-12: 2021 No Build PM Peak Hour Operations by Intersection



2021 Build

Under the 2021 Build scenario, the existing conditions model was updated to include the demolition of the Government East Garage, the construction of an underground parking facility with four access points, and several streetscape improvements on Wilson Street and Pinckney Street. The current concept includes the removal of 10 on-street parking stalls on Pinckney Street, along with the introduction of a shared bicycle/traffic lane within the existing traffic lane ("sharrow") in both directions. At the intersection of Pinckney Street and Doty Street, the sharrow converts to a dedicated bicycle lane to the left of the northbound right-turn lane to reduce conflicts between right-turning vehicles and northbound bicyclists.

On Wilson Street (which is one-way westbound), two bicycle improvements are proposed to provide more convenient and direct bicycle access to the proposed bicycle center and bike elevator at Monona Terrace: a westbound sharrow in the north lane, and the removal of on-street parking and loading zones on the south side of Wilson Street to allow for the installation of a buffered contraflow bicycle lane. Further analysis will be needed to determine the location of potentially relocated loading zones.

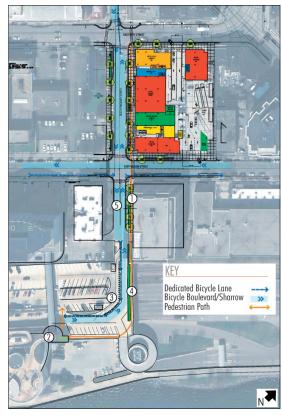
These conceptual improvements will greatly improve bicycle accessibility and flow in this area of Downtown Madison. These improvements are discussed in greater detail in the Public Improvements section of Chapter 2: Master Planning.

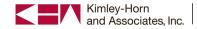
With the streetscape improvements in place, existing traffic from the Government East Parking Garage removed, and projected traffic from the proposed development added to the 2021 No Build network vehicle volumes, all intersections are expected to operate at LOS D or better during the p.m. peak hour as shown in Figure 4-13. With the increased vehicle traffic, several movements are expected to operate at LOS E:

- Wilson Street and Hamilton Street and Henry Street westbound through/left: LOS E
- Doty Street and Pinckney Street southbound left/through: LOS E
- Wilson Street and Pinckney Street northbound left: LOS F

On two approaches, link spillback is expected to generate blockage at the upstream intersection during the p.m. peak hour:

- Wilson Street and Hamilton Street and Henry Street westbound approach: queue spillback, generating blockage at Wilson Street and Carroll Street
- Doty Street and King Street eastbound approach: queue spillback, generating blockage at Doty Street and Pinckney Street











Additionally, four approaches are expected to generate turn lane blockage or spillback, the same as under the 2021 No Build scenario.

At Wilson Street and Hamilton Street and Henry Street with current signal timing, demand will exceed capacity (v/c = 1.01), generating link spillback and poor operating conditions. Signal timing modifications will be necessary to maintain an acceptable level of service.

At Doty Street and Pinckney Street, the southbound approach slightly exceeds the D/E delay threshold, but the number of vehicles experiencing more than 35 seconds of delay is minor. No mitigation is recommended based on traffic volumes alone. However, observations indicate that over 120 pedestrians currently cross Doty Street during the p.m. peak hour, and this number will likely increase significantly with the redevelopment of Judge Doyle Square. By 2021, it is highly likely that traffic volumes will exceed 1,500 vehicles on Doty Street and pedestrian demand will exceed





133, satisfying the requirement to install a signal based on the Manual on Uniform Traffic Control Devices Warrant 4 (Pedestrian Volumes). Therefore, a signal could be justified based on the pedestrian warrant, and further review of this intersection may be merited.

At Wilson Street and Pinckney Street, there is an exclusive left-turn lane (northbound) onto a one-way street (westbound). Macroscopic models, such as Synchro, do not have the level of refinement to realistically estimate delay given this geometry. No mitigation will be necessary, as the calculated delay is simply a reflection of limitations of the model rather than realistic operating conditions.

At Doty Street and King Street, the volume-to-capacity ratio is expected to increase to 0.94, and 95th percentile queues are likely to exceed the length the block, generating spillback at the Pinckney Street intersection. It should be noted, however, that the v/c ratio and queue length estimates are largely dependent on the lane utilization factor, and blockage of both the east access to the proposed parking facility and the Pinckney Street intersection depends on the way in which drivers use the three through lanes available in the p.m. peak period.

The addition of a parking garage access drive upstream of the intersection will likely influence future lane utilization, with exiting vehicles remaining in the south lane through the intersection. However, even with no change in driver behavior, average queues in the middle through lane are not expected to generate upstream blockage, indicating that any spillback will likely only occur during the peak 15 minutes, with little impact on actual delay over the rest of the peak hour. No mitigation is recommended.

At the proposed Block 88 parking facility access on Doty Street, it should be noted that the network was modeled based on the plans shown for the currently proposed design, which includes two exiting lanes during the p.m. peak hour. However, given the close proximity of this access to the Block 89 garage, potential conflicts with southbound left-turning vehicles from the two exiting lanes of Block 89 will need to be studied in more detail during project development. Consideration should be given to relocating the parking access revenue control (PARC) system to the base of the Block 88 ramp to allow two lanes through the PARC system and one lane at the street. With less than 100 vehicles using this ramp during the p.m. peak hour, a single exit lane from the parking facility will have no impact on the delays and queuing presented here for a two-lane exit.







Parking Facility Operations

Although little to no queuing is anticipated at the four garage access points based on projected traffic volumes during the p.m. peak hour, internal parking garage queuing at the PARC system was also analyzed to ensure effective operation of the proposed geometry and systems. The shared parking model previously discussed includes queuing calculations based on demand flow rate and service rates of the PARC system at each of the four access points. Parking Structures, Third Edition (A.P. Chrest, et al.) provides the following estimates for revenue control service rates:



- Proximity card: 6.0 seconds
- Credit card-online check: 32.7 seconds
- Insertion ticket for POF validation: 10.0 seconds
- Cashier Credit card online check and sign: 38.0 seconds

The shared parking model calibrates the queue length estimates assuming the use of proximity cards for monthly pass holders, City fleet, residents, and office employees, and a combination of credit card payments and insertion tickets for hotel guests and hourly users. For the purposes of this analysis, two exiting lanes

were assumed at the western Doty Street access and the eastern Wilson Street access, and one exiting lane was assumed at the eastern Doty Street access and western Wilson Street access. Additionally, one of the two lanes at the western Doty Street access was assumed to be cashier-controlled.

Based on a weighted average by user type, 14.5 seconds of delay was assumed per exiting lane. This value was increased to 26.3 for the western Doty Street exit to account for the influence of a cashier-controlled lane. During the p.m. peak hour using the aforementioned service rates and number of lanes, no significant internal queues are expected to develop. In fact, all revenue control lanes are expected to operate at no more than 55% of capacity.

It should be noted that with a fully cashiered system, demand would nearly equal capacity at the eastern Wilson Street exit during the p.m. peak, leading to unacceptable operating conditions. However, if the western Wilson Street access is



assumed to serve other users than just the Block 88 hotel, it is anticipated that the redistribution in demand would allow for one lane on the eastern Wilson Street exit to be cashier-controlled while maintaining acceptable operating conditions. Any additional modifications to the assumed revenue control systems and driveway assignment scenarios will need to be studied in further detail to ensure that effective peak hour operating conditions are maintained.

The following two sections analyze the operation of the parking facility and the surrounding street network under two event scenarios to further test the capacity of the proposed system.

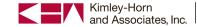
Event Scenario One: Peak Hour Event

Events, like those at the convention center or hotel, ending during the weekday p.m. peak hour have the potential to generate more demand on the PARC system and surrounding street system than modeled under the Build scenario. While hotel, residential, office, and monthly parking space users would likely remain the same during a p.m. peak event, demand by hourly users would be expected to increase.

Event Scenario One assumes the same exiting volume as shown in Table X-1, but with an increase in demand by hourly parking space users up to 240 vehicles, or half of the total spaces allocated for this user type. This represents a 150% increase in hourly exiting demand over the Build scenario.

Using the revenue control parameters outlined above, the eastern Wilson Street exit would experience demand of approximately 75% of capacity, generating internal queues of approximately four to five vehicles. All other exits would remain below 40% of capacity, generating little to no queuing. It should be noted that delay per credit card transaction used in the analysis assumes individual online card verification. The use of a high speed data line or other technology improvement beyond this assumption could reduce the time per transaction by approximately 35% and thus reduce the modeled queuing and delay.

The additional peak hour demand is not anticipated to generate significant additional queuing or delay at the surrounding intersections, and each of the exiting lanes will operate at LOS C or better. At Doty Street and King Street, 95th percentile queue lengths will increase by approximately one vehicle length over the Build scenario. 95th percentile queues at the eastern Wilson Street access will increase to approximately four vehicles, which should not significantly impact operation of the PARC system at the bottom of the ramp. However, average queues should not exceed two vehicles during the p.m. peak hour.









Event Scenario Two: Off-Peak Event with Pay on Entry

Large events that utilize pay on entry have the potential to generate high traffic volumes at the end of the event because the flows are not metered by the PARC system. To test operations during off-peak events, a scenario was generated in which 900 vehicles (approximately 70% of the parking facility capacity) are released from the parking facility over a one-hour period using the same distribution assumed for the Build condition with no revenue control delay. To account for reduced traffic volumes during the off-peak period, 2021 No Build traffic volumes were factored down to 70% of the p.m. peak volumes.

With significantly reduced overall demand on the street network relative to the p.m. peak hour, all surrounding intersections are expected to operate with limited delay. However, all exiting lanes are expected to experience increased delay with longer queues. Delay and queuing at the Doty Street exits is anticipated to be minor. Delay and queuing at the western Wilson Street exit will be minor as well, with 95th percentile queues of around two vehicles. At the eastern Wilson Street exit, however, delay will reach approximately 27 seconds, with 95th percentile queue lengths of approximately eight to nine vehicles. As these queues are sufficient to potentially disrupt internal operations within the parking facility, temporary traffic control should be considered at this exit during events that generate this magnitude of demand. For example, a traffic officer could stop through traffic in the rightmost through lane on Wilson Street, allowing the single lane exit from the garage to operate continuously with no delay.

Recommendations.

Under the 2021 No Build scenario, no significant mitigation is recommended, although the addition of a left-turn lane on both the northbound and southbound approaches to the John Nolen Drive/Blair Street and Wilson Street/Williamson Street intersection would help improve efficiency and reduce delay to the through movements.

Under the 2021 Build scenario, although several movements are expected to operate at LOS E, the duration and number of drivers impacted is very short, as presented below.

At the intersection of Wilson Street and Hamilton Street and Henry Street, signal timing adjustments will be needed to prevent the westbound approach from exceeding capacity. With the addition of approximately 1.5 seconds per cycle on the approach, taken from the eastbound approach while still maintaining the pedestrian clearance times currently provided, all approaches will operate at LOS D or better. The



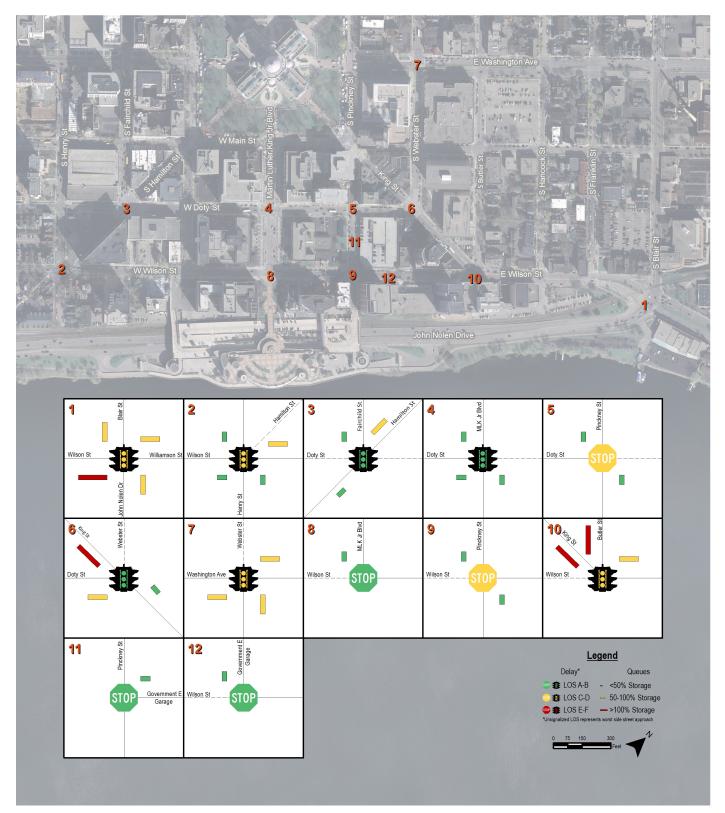
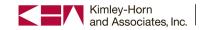


Figure 4-13: 2021 Build PM Peak Hour Operations by Intersection









adjustment will not be sufficient to reduce the westbound v/c ratio to less than 0.9, but queues will no longer generate spillback at the upstream intersection, and the average intersection delay will be reduced by approximately 4 seconds.

The PARC system analyzed assumes one cashier-controlled lane at the western Doty Street access. The current concept allows the accommodation of one additional cashier-controlled lane at the eastern Wilson Street access, but that would result in reduced operating efficiency for the parking ramp with extended queues at this location (assuming some redistribution to the western Wilson Street access). Overall, the assumed PARC system is anticipated to operate effectively during peak times; however, technology improvements or modifications to the assumed credit card processing speeds could reduce projected queuing and delay during periods of very high demand.

Additionally, it should be noted that for the design presented here, the PARC systems were placed at the bottom of each ramp leading to street level. This eliminates any delay associated with transaction time at the entrance to the street, allowing vehicles to continuously discharge when gaps are available. If no queuing space is provided beyond the PARC system, exiting flow rates are limited by the time required per transaction, which has the potential to significantly reduce the operating capacity of each exit during peak periods. During periods of very high demand, temporary traffic control, such as a traffic officer, should be considered to allow vehicles to freely exit the parking facility.

Although traffic volumes are expected to increase with the redevelopment of Judge Doyle Square, no significant geometric modifications or parking restrictions will be necessary. The proposed signal timing modifications at Wilson Street and Hamilton Street and Henry Street will not significantly impact the multiple pedestrian crossings at the intersection, maintaining a safe pedestrian environment. Additionally, the placement of the driveway access points on Doty Street and Wilson Street will eliminate the existing conflicts that exist on Pinckney Street with the mid-block access to the Government East Parking Garage. The proposed addition of a bicycle contraflow lane on Wilson Street would provide a more convenient route to the Judge Doyle Square bicycle center from the west, and potentially pull bicycle traffic from the more heavily congested Doty Street.



TRAFFIC IMPACT ANALYSIS APPENDIX 4-A

MASTER PLAN
CITY OF MADISON, WI

Existing Conditions HCM Summary - PM Peak Hour																				
										Operat	tions by Mo	vement							Overall In	torcoction
Intersection		Control	Approach	Left					Through					Right					Overall Intersection	
	intersection	Control	Approach	Volume	Storage (feet)	Queue (95th)	Delay (sec/veh)	LOS	Volume	Storage (feet)	Queue (95th)	Delay (sec/veh)	LOS	Volume	Storage (feet)	Queue (95th)	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
			EB	87	100	125	40	D	314	250	175	43	D	124	150	125	40	D		
1	W Wilson St &	Signal	WB	648	650	350	34	C	84	650	200	29	C	24	650	200	29	С	29	С
	John Nolen Dr	Signai	SB	9	675	#445	32	C	675	675	#445	32	C	51	675	#445	32	С	25	
			NB	21	1150	#616	35	С	1061	1150	#616	35	С	737	1150	250	6	Α	1	
2		Signal	EB	4	-	-	-		169	550	175	38	D	15	550	175	38	D		С
	W Wilson St & S Henry St		WB	4	575	#375	31	С	485	575	#375	31	С	294	575	200	20	С	29	
			SB	9	250	50	28	С	5	250	50	28	С	64	250	50	28	С		
			NB	7	250	50	28	С	13	250	50	28	С	5	250	50	28	С		
		Signal	NE		-	-	-		28	375	150	32	С	230	375	125	32	С		В
3	W Doty St & S		SW	18	325	25	15	В	-	-	-	-	-	28	35	25	19	В	12	
,	Fairchild St	J.B.I.G.	SB	13	250	150	7	Α	949	250	150	7	Α	103	250	25	5	Α		
			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
4	W Doty St & Martin Luther	Signal	EB	33	350	75	6	Α	1119	350	75	6	Α	80	350	75	6	Α		А
			-	-	-	-	-	-	-		-	-	-	-		-	-	-	7	
	King Jr Blvd		SB	14	275	75	16	В	32	275	75	16	В	-	-	-	-	-	_ ′	
	Killig 31 Divu		NB	-	-	-	-	-	21	275	50	23	С	45	275	50	23	С		
5		TWSC	EB		-		-		1344	350	0	0	Α	207	350	0	0	Α		А
	E Doty St & S Pinckney St		-		-		-		-	,	-	-		-	-		-	-	2	
			SB	14	225	25	32	D	23	225	25	32	D	-	-		-	-	_	
			NB		-		-		-	-	-	-		119	275	25	11	В		
6		Signal	EB	19	250	150	13	В	1070	250	150	13	В	423	250	-	-	-		В
	E Doty St & King		-	-		-	-	-	-	,	-	-	-	-		-	-	-	17	
	St		SW	38	30	50	43	D	133	300	#131	53	D	-	-	-	-	-	1/	
			NE	-	-	-	-	-	30	375	50	25	С	42	375	50	22	С		
	E Washington		EB	9	275	25	10	Α	233	275	200	21	С	-	-	-	-	-		С
7		e:1	WB	-	-	-	-	-	198	275	150	22	С	551	275	225	29	С	23	
/	Ave & S Webster St	Signal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	23	
			NB	19	325	200	19	В	409	325	200	19	В	733	325	200	24	С		
	W Wilson St &	TWSC	-	-		-	-	-	-	,	-	-	-	-		-	-	-		А
8	Martin Luther King Jr Blvd		WB	-		-	-	-	546	350	0	0	Α	50	350	0	0	Α	2	
8			SB	-		-	-	-	-	,	-	-	-	121	275	25	14	В	_ ′	
			-		-		-		-	-	-	-		-	-		-	-		
		TWSC	-	-		-	-		-	,	-	-					-	-		А
9	E Wilson St & S Pinckney St		WB	4	625	0	0	Α	394	625	0	0	Α	67	625	0	0	Α	7	
,			SB		-		-		4	275	75	16	C	211	275	75	16	С	,	
			NB	43	75	25	30	D	34	300	25	18	С			-	-	-		
	E Wilson St & S Butler St	Signal	-	-	-	-	-	-	-		-	-	-	-		-	-	-		С
10			SB	155	575	175	31	С	184	100	#167	36	D	17	100	#167	36	D	25	
10			SE	10	375	175	20	С	490	375	175	20	С	59	65	175	20	С	2.5	
			WB	165	275	150	32	С	70	275	50	6	Α	35	275	50	6	Α		
	Government East & S Pinckney Street	TWSC	-		-	-	-	-	-		-	-	-	-	-	-	-	-		1
11			WB	21	100	25	12	В	-		-	-	-	22	100	25	12	В	2	Α
11			SB	42	150	25	2	Α	198	150	25	2	Α	-		-	-	-	J '	_ ^
			NB	-	-	-	-	-	98	150	0	0	Α	7	150	0	0	Α		
	E Wilson Street		-		-	-	-	-	-		-	-	-	-		-	-	-		
12	& Government	TWSC	WB		-	-	-	-	403	500	0	0	Α	11	500	0	0	Α	2	А
12	East		SB		-	-	-	-	-		-	-	-	66	100	25	11	В	_ '	
	East		-		-	-	-	-	-	-	-	-	-	-	-	-	-	-		

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

								2021 N	o Build HC											
										Opera	tions by Mo	vement							Overall In	tersection
	Intersection	Control	Approach			Left					Through					Right				
				Volume	Storage (feet)	Queue (95th)	Delay (sec/veh)	LOS	Volume	Storage (feet)	Queue (95th)	Delay (sec/veh)	LOS	Volume	Storage (feet)	Queue (95th)	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
			EB	89	100	125	40	D	322	250	175	43	D	127	150	125	40	D		
1	W Wilson St &	Signal	WB	664	650	375	35	С	86	650	200	30	С	25	650	200	30	С	32	С
1	John Nolen Dr	Signal	SB	9	675	#481	36	D	785	675	#481	36	D	52	675	#481	36	D	32	C
			NB	22	1150	#660	41	D	1088	1150	#660	41	D	755	1150	275	7	Α		
			EB	4		25	33	С	173	550	200	40	D	15	550	200	40	D		
2	W Wilson St & S	Signal	WB	4	575	#406	32	С	497	575	#406	32	С	302	575	225	21	С	30	С
_	Henry St	Jigital	SB	9	250	50	28	С	5	250	50	28	С	66	250	50	28	С	30	C
			NB	7	250	50	28	С	13	250	50	28	С	5	250	50	28	С		
			NE	-	-	-	-		29	375	150	33	С	236	375	125	32	С		
3	W Doty St & S	Signal	SW	18	325	25	16	В	-	-	-	-	-	29	35	25	19	В	12	В
,	Fairchild St	J.B.I.u.	SB	13	250	150	8	Α	973	250	150	8	Α	106	250	25	5	Α		
			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	W Doty St &		EB	34	350	75	6	Α	1147	350	75	6	Α	82	350	75	6	Α		
4	Martin Luther	Signal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	Α
	King Jr Blvd	J.B.I.u.	SB	14	275	75	16	В	33	275	75	16	В	-	-	-	-	-	1 '	,,
	King ar bivu		NB	-	-	-	-	-	22	275	50	23	С	46	275	50	23	С		
			EB	-	-	-	-	-	1378	350	0	0	A	212	350	0	0	Α		
5	E Doty St & S	TWSC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	Α
-	Pinckney St		SB	14	225	25	34	D	24	225	25	34	D	-	-	-	-	-		
			NB	-	-	-	-	-	-	-	-	-	-	122	275	25	11	В		
			EB	19	250	175	14	В	1097	250	175	14	В	434	250	-	-	-	_	
6	E Doty St & King	Signal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18	В
Ů	St	J.B.I.u.	SW	39	30	50	44	D	136	300	#137	54	D	-	-	-	-	-	10	
			NE	-	-	-	-	-	31	375	50	25	С	43	375	50	22	С		
	E Washington		EB	9	275	25	10	Α	239	275	200	22	С	-	-	-	-	-		
7	Ave & S	Signal	WB	-	-	-	-	-	203	275	150	22	С	565	275	#222	30	С	24	С
<i>'</i>	Webster St	J.B.I.u.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Webster St		NB	19	325	200	20	В	419	325	200	20	В	751	325	200	24	С		
	W Wilson St &		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
8	Martin Luther	TWSC	WB	-	-	-	-	-	768	350	0	0	Α	118	350	0	0	Α	2	Α
-	King Jr Blvd		SB	-	-	-	-	-	-	-	-	-	-	124	275	50	14	В	4	
			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	
9	E Wilson St & S	TWSC	WB	4	625	0	0	Α	404	625	0	0	Α	69	625	0	0	Α	7	Α
	Pinckney St		SB	-	-	-	-	-	4	275	75	16	С	216	275	75	16	С		
			NB	44	75	25	18	С	35	300	25	18	С	-	-	-	-	-		
	5 MCl C. O C		-	-	-	-	-	-	-	-	-	-	-	-	-	-		-		
10	E Wilson St & S	Signal	SB	159	575	175	32	С	189	100	#181	37	D	17	100	#181	37	D	25	С
	Butler St		SE	10	375	175	21	С	502	375	175	21	С	60	65	175	21	С	-	
			WB	169	275	150	32	С	72	275	50	6	A	36	275	50	6	Α		
	Government		-	22	-	-	- 42	-		-	-	-	-	22	- 400	-	- 42	-	4	
11	East & S	TWSC	WB	22	100	25	12	В	202	-	-	-	-	23	100	25	12	В	2	Α
	Pinckney Street		SB	43	150	25	2	Α	203	150	25 0	2	A	-	-	-	-	-	4	
	,		NB		-	-	-	-		150	0	0	A		150	0	0	Α		
	E Wilson Street		-	-	-	-	-	-	- 442	-	-	-				-	-		4	
12	& Government	TWSC	WB	-	-	-	-	-	413	500	0	0	A	11	500	0	0	A	2	Α
	East		SB -	-	-	-	-	-	-	-	-	-	-	68	100	25	11	В	1	
			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		

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

								2021	Build HCN											
						Left				Opera	tions by Mov Through	vement				Di-La			Overall In	tersection
	Intersection	Control	Approach		Storage	Queue	Delay			Storage	Queue	Delay			Storage	Right Queue	Delay		Delay	
				Volume	(feet)	(95th)	(sec/veh)	LOS	Volume	(feet)	(95th)	(sec/veh)	LOS	Volume	(feet)	(95th)	(sec/veh)	LOS	(sec/veh)	LOS
			EB	89	100	125	39.7	D	363	250	200	44.0	D	127	150	125	39.9	D		
1	W Wilson St & John Nolen Dr	Signal	WB SB	664 9	650	375 #508	35.3 38.7	D D	114 785	650	225 #508	30.4 38.7	C D	25 71	650 675	225 #508	30.4 38.7	C D	33.8	С
	John Noien Dr		NB	22	675 1150	#674	44.9	D	1088	675 1150	#508	44.9	D	755	1150	300	6.8	A	ł	
			EB	4	-	25	32.0	С	210	550	#228	45.7	D	15	550	#228	45.7	D		
2	W Wilson St & S	Signal	WB	4	575	#565	61.5	E	619	575	#565	61.5	E	371	575	275	22.2	С	45.1	D
-	Henry St	8	SB	9	250	50	28.2	C	5	250	50 50	28.2 28.0	C C	66	250	50 50	28.2 28.0	С		-
			NB NE	7	250	50	28.0	-	13 29	250 375	150	35.2	D	5 273	250 375	150	34.4	C C		
	W Doty St & S		SW	18	325	25	15.7	В	-	-	-	-	-	29	35	25	18.9	В		_
3	Fairchild St	Signal	SB	13	250	150	8.3	Α	1064	250	150	8.3	Α	106	250	25	5.2	Α	13.6	В
			-	-	-	-	-	-	- 4275	-	- 100	-	-	-	-	100	-	-		
	W Doty St &		EB	34	350	100	6.2	A	1275	350	100	6.2	A	82	350	100	6.2	Α .		
4	Martin Luther	Signal	SB	14	275	75	16.3	В	33	275	75	16.3	В		-	-	-	-	8.2	Α
	King Jr Blvd		NB		-		-	-	65	275	m75	26.4	С	70	275	m75	26.4	С		
			EB	-	-	-	-	-	1512	350	0	0.0	A	254	350	0	0.0	Α		
5	E Doty St & S Pinckney St	TWSC	- SB	14	225	-	- 41.0	E	- 24	225	50	41.0	E	-	-	-	-	-	1.5	Α
	Pinckney St		NB NB	- 14	- 225	50	41.9		24	225	- 50	41.9		123	275	25	10.9	В .	ł	
			EB	19	250	#559	19.3	В	1179	250	#559	19.3	В	475	250	-	-	-		
6	E Doty St & King	Signal	-		-	-	-				-	-	-	-		-	-	-	22.4	С
О	St	Signal	SW	39	30	50	43.6	D	136	300	#137	53.8	D	-		-	-	-	22.4	·
			NE	-	-	-	-	-	31	375	50	25.3	С	43	375	50	21.5	С		
	E Washington		EB WB	9	275	25	10.0	A -	239 203	275 275	200 150	22.1 22.2	C C	565	275	- #222	29.5	- C		
7	Ave & S	Signal	- VV D	-	-	-	-	-	-	-	-	-	-	-	-	-	- 25.3	-	24.4	С
	Webster St		NB	19	325	200	21.0	С	439	325	200	21.0	С	813	325	225	27.3	С		
	W Wilson St &		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
8	Martin Luther	TWSC	WB	-	-	-	-	-	768	350	0	0.0	A	118	350	0	0.0	A	2.2	Α
	King Jr Blvd		SB	-	-	-	-	-	-	-	-	-	-	124	275	50	17.6	C -	ł	
			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
9	E Wilson St & S	TWSC	WB	4	625	0	0.1	Α	605	625	0	0.1	Α	86	625	0	0.0	Α	11.9	В
9	Pinckney St	TWSC	SB	-	-	-	-	-	4	275	125	26.4	D	279	275	125	26.4	D	11.5	ь
			NB -	44	75	75	95.3	F	35	300	25	24.0	C -	-	-	-	-	-		
	E Wilson St & S		SB	159	575	175	32.3	C	198	100	#185	37.6	D	17	100	#185	37.6	- D		
10	Butler St	Signal	SE	10	375	175	21.7	C	543	375	175	21.7	C	60	65	175	21.7	C	26.7	С
			WB	216	275	#185	37.0	D	72	275	50	6.0	Α	36	275	50	6.0	Α		
	Government		-		-	-	-	-		-	-	-	-		-	-	-	-		
11	East & S	TWSC	WB SB		100 150	-	-	-		150	-	-	-		100	-	-	-	ł	-
	Pinckney Street		NB		-	-	-	-		150	-	-	-		150	-	-	-	i	
			-		-		-			-	-	-	-	-			-	-		
13	E Wilson Street	TWSC	WB	-	-	-	-	-	431	500	0	0.0	Α	49	500	0	0.0	Α	5.6	Α
	& East Entrance		SB	-	-	-	-	-		-	-	-	-	268	100	75	15.7	C		
			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
١.,	E Wilson Street	T14/56	WB	-	-	-	-	-	798	150	0	0.0	A	86	150	0	0.0	A		
14	& West Entrance	TWSC	SB		-	-	-	-	-	-	-	-	-	97	100	25	13.4	В	1.3	Α
	Entrance		-	-	-	-	-	-		-		-	-	-	-	-	-	-		
	E Doty Street &		EB -	-	-	-	-	-	1310	250	0	0.0	A -	49	250	0	0.0	Α	l	
15	West Entrance	TWSC	- NB	-	-	-	-	-	-	-	-	-	-	73	100	25	9.3	- A	0.5	Α
	se Emiliance		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	l i		EB	-	-	-	-	-	1588	150	0	0.0	А	61	150	0	0.0	А		
16	E Doty Street &	TWSC	-			-	-	-		-	-	-	-	-	-		-		0.3	Α
	East Entrance		NB	-	-	-	-	-	-	-	-	-	-	49	100	25	11.1	В		
	l l		-	-	-	-	_	-				_	-	-	-	_	-	-		

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

							Exi	sting Con	ditions Si			- PM Peak	Hour							
										Operat	ions by Mo	vement							Overall In	tersection
	Intersection	Control	Approach			Left					Through					Right				
				Volume	Storage (feet)	Queue (95th)	Delay (sec/veh)	LOS	Volume	Storage (feet)	Queue (95th)	Delay (sec/veh)	LOS	Volume	Storage (feet)	Queue (95th)	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
			EB	87	100	150	43	D	314	250	200	32	С	124	150	100	5	Α		
1	W Wilson St &	Signal	WB	648	650	275	32	С	84	650	275	28	С	24	650	275	17	В	151	
1	John Nolen Dr	Signal	SB	9	675	650	122		766	675	650	69		51	675	650	35	D	131	
			NB	21	1150	1350	405		1061	1150	1350	361		737	1150	1425	192			
			EB	4	-	-	24	С	169	550	100	25	С	15	550	100	2	Α		
2	W Wilson St & S	Cinnal	WB	4	575	300	19	В	485	575	300	20	C	294	575	175	16	В	19	
2	Henry St	Signal	SB	9	250	75	28	С	5	250	75	21	C	64	250	75	9	Α	19	В
	· ·		NB	7	250	50	31	С	13	250	50	24	С	5	250	50	24	С	1	
			NE	-	-	-	-	-	28	375	100	26	С	230	375	100	27	С	1	
	W Doty St & S		SW	18	325	50	27	С		-	-	-	-	28	35	75	21	Ċ		
3	Fairchild St	Signal	SB	13	250	200	9	A	949	250	200	10	В	103	250	75	12	В	14	В
	rairerina se		-	-	-	-		-		-		-	-	- 105	- 250	-		-	1	
	-		EB	33	350	200	10	В	1119	350	200	8	Α	80	350	200	8	Α		
	W Doty St &			- 33	330	- 200	- 10	-	- 1119	330	-	-	-	- 60	- 330	-	-	-	1	
4	Martin Luther	Signal	SB	14	275	75	20	C	32	275	75	9			-	-	-	-	9	Α
	King Jr Blvd		NB	- 14	- 2/3	- 75	- 20	-	21	275	75	21	A C	45	275	75	12	В	-	
			EB	-	-	-	-	-	1344	350	175	7	A	207	350	200	9	Α		
5	E Doty St & S	TWSC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	В
	Pinckney St		SB	14	225	100	51	F	23	225	100	73	F	-	-	-	-	-		
			NB	-	-	-	-	-	-	-	-	7	A	119	275	150	66	F		
			EB	19	250	125	6	A	1070	250	125	10	A	423	250	-	11	В		
6	E Doty St & King	Signal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	В
U	St	Signal	SE	38	30		46	D	133	300	175	40	D	-	-	-	-	-	14	l
			NW	-	-	-	-	-	30	375	50	15	В	42	375	50	8	Α		
	E March Control		EB	9	275	50	65	E	233	275	175	16	В	-	-	-	-	-		
_	E Washington		WB	-	-	-	-	-	198	275	175	17	В	551	275	175	21	С	1	
7	Ave & S	Signal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21	С
	Webster St		NB	19	325	275	12	В	409	325	275	18	В	733	325	275	26	С	1	
			-		-	-	-	-	-	-		-	-	-	-	-	-		1	
	W Wilson St &		WB		-	-	-	-	546	350	75	1	Α	50	350	50	1	Α	1	
8	Martin Luther	TWSC	SB		-	-	-	-	-	-	-	-	-	121	275	75	8	A	2	A
	King Jr Blvd		-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
	1 1		-	-	-	-		-	-	-	-	-	-			-	-	-		
	E Wilson St & S		WB	4	625	75	3	A	394	625	75	2	A	67	625	100	10	Α	1	
9	Pinckney St	TWSC	SB		- 023	-	-	-	4	275	100	7	A	211	275	100	9	A	6	A
	Tillickliey St		NB	43	75	50	12	В	34	300	75	25	Ĉ	-		-	-			
	+		INB	43	- 75	- 50	- 12	-	- 34	300	-	-	-							-
	E Wilson St & S		SB	155	575	200	31	C	184	100	150	28	C	17	100	150	27	C	1	l
10	Butler St	Signal	SE	10	375	200	21	C	184 490	375	275	28 18	В	59	65	275	13	В	22	С
	Butter St																		-	
	1		WB	165	275	175	32	С	70	275	75	10	Α	35	275	75	7	Α		
	Government		-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	1	l
11	East & S	TWSC	WB	21	100	100	38	E	-		-	-	-	22	100	125	66	F	12	В
_	Pinckney Street		SB	42	150	75	3	Α	198	150	75	2	Α	-	-	-	-	-	1	1
	curcy street		NB	-	-	-	-	-	98	150	100	20	С	7	150	100	15	В		
	E Wilson Street		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-]	l
12	& Government	TWSC	WB	-	-	-	-	-	403	500	25	1	Α	11	500	25	1	Α	2	Α
	East		SB	-	-	-	-	-	-	-	-	-	-	66	100	75	6	Α	1 '	l ^
	Edol		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		l

							- 2	2021 No B	uild SimT			M Peak Ho	ur							
										Operat	ions by Mo	vement							Overall In	tersection
	Intersection	Control	Approach			Left					Through					Right			Overall III	tersection
	intersection	Control	Аррговен	Volume	Storage (feet)	Queue (95th)	Delay (sec/veh)	LOS	Volume	Storage (feet)	Queue (95th)	Delay (sec/veh)	LOS	Volume	Storage (feet)	Queue (95th)	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
			EB	87	100	125	41	D	314	250	200	34	С	124	150	100	5	Α		
1	W Wilson St &	Signal	WB	648	650	275	33	С	84	650	300	28	С	24	650	300	13	В	166	
1	John Nolen Dr	Signal	SB	9	675	675	116		766	675	675	76		51	675	675	51	D	100	
			NB	21	1150	1350	447		1061	1150	1350	400		737	1150	1475	228			
			EB	4		-	26	С	169	550	175	3	Α	15	550	175	17	В		
2	W Wilson St & S	Signal	WB	4	575	325	38	D	485	575	325	22	C	294	575	225	16	В	20	С
2	Henry St	Signal	SB	9	250	75	30	С	5	250	75	26	C	64	250	75	10	Α	20	C
			NB	7	250	50	25	С	13	250	50	28	С	5	250	50	26	С		
			NE	-	-	-	-	-	28	375	100	26	С	230	375	100	26	С		
3	W Doty St & S	C' I	SW	18	325	50	28	С	-	-	-	-	-	28	35	75	23	С	1	
5	Fairchild St	Signal	SB	13	250	200	10	Α	949	250	200	11	В	103	250	75	12	В	14	В
			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
			EB	33	350	200	- 8	Α	1119	350	200	9	Α	80	350	200	8	A		
	W Doty St &		-		-	-	-	-	-	-	-	-	-	-	-	-	-	-		
4	Martin Luther	Signal	SB	14	275	75	20	С	32	275	75	9	Α			-	-	-	9	Α
	King Jr Blvd		NB	-	-	-	-	-	21	275	75	21	C	45	275	75	12	В		
			EB		-	-	-		1344	350	175	9	A	207	350	200	11	В		
	E Doty St & S		-	-					1344	-	- 1/3	-	-	-	-	-	-	-		
5	Pinckney St	TWSC	SB	14	225	125	118	F	23	225	125	145	F	-	-	-	-	-	18	С
	i ilickiley St		NB	14		123	- 110		23	- 223	123	-		119	275	150	95	F		
			EB	19	250	150	8	A	1070	250	150	10	В	423	250	-	12	В		
	E Doty St & King		-	- 15	230	- 130		- A	1070	230	- 130	-	В	423	230		- 12	-	-	
6	St St	Signal	SE	38	-		54	D D	133	300	200	42	- D		-	-	-	-	14	В
	St				30	75						17	В							
			NW	-	-	-	-	-	30	375	50			42	375	50	9	A		
	E Washington		EB	9	275	50	47	D	233	275	175	18	В	-	-	-	-	-		
7	Ave & S	Signal	WB	-	-	-	-	-	198	275	175	19	В	551	275	225	22	С	22	С
	Webster St		-	-	-		-	-		-	-	-	-	-	-	-	-	-		
			NB	19	325	200	12	В	409	325	275	19	В	733	325	275	27	С		
	W Wilson St &		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
8	Martin Luther	TWSC	WB	-	-	-	-	-	546	350	75	1	Α	50	350	50	1	Α	2	Α
	King Jr Blvd		SB	-	-	-	-	-	-	-	-	-	-	121	275	100	8	Α		
	8		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	F 14/21		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
9	E Wilson St & S	TWSC	WB	4	625	125	2	Α	394	625	125	3	Α	67	625	125	32	D	17	С
	Pinckney St		SB	-	-	-	-	-	4	275	100	7	Α	211	275	100	10	Α		
			NB	43	75	75	71	F	34	300	125	111	F		-	-	-	-		
			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
10	E Wilson St & S	Signal	SB	155	575	200	31	С	184	100	150	30	С	17	100	150	30	С	23	С
10	Butler St	J.B.I.u.	SE	10	375	275	15	В	490	375	275	19	В	59	65	275	15	В		
			WB	165	275	175	32	С	70	275	75	9	Α	35	275	75	6	Α		
	Government		-		-	-	-				-	-	-	-	-	-	-	-]	
11	East & S	TWSC	WB	21	100	175	173	F			-	-	-	22	100	175	262	F	34	D
11	Pinckney Street	1 4430	SB	42	150	100	4	Α	198	150	100	3	Α	-	-	-	-	-	J-1	
	rinckney Street		NB	-	-	-	-		98	150	125	39	Е	7	150	125	28	D		
	E Wilson Street				-	-	-					-					-			
12	& Government	TWSC	WB		-	-	-		403	500	125	8	Α	11	500	150	10	Α	12	В
12		IVVSC	SB		-	-	-	-	-		-	-	-	66	100	75	29	D	12	ь
	East		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	

								2021 Bu	ild SimTra			Peak Hou	r							
						1.6				Operat	tions by Mo	vement				B*-1-1			Overall In	tersection
	Intersection	Control	Approach	Volume	Storage (feet)	Left Queue (95th)	Delay (sec/veh)	LOS	Volume	Storage (feet)	Through Queue (95th)	Delay (sec/veh)	LOS	Volume	Storage (feet)	Right Queue (95th)	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
			EB	89	100	150	43	D	363	250	225	34	С	127	150	150	5	Α		
1	W Wilson St &	Signal	WB	664	650	275	33	С	114	650	300	30	С	25	650	300	17	В	125	
	John Nolen Dr		SB	9 22	675	550	81 358	F	785	675	550 1400	54 300	D	71 755	675	550 1500	24 156	C		
			NB EB	4	1150 550	1400 25	40	D	1088 210	1150 550	200	28	C	15	1150 550	200	18	В		
	W Wilson St & S		WB	4	575	500	33	C	619	575	500	32	C	371	575	375	21	C		
2	Henry St	Signal	SB	9	250	75	33	C	5	250	75	32	C	66	250	75	13	В	27	С
	, , , , , , , , , , , , , , , , , , ,		NB	7	250	50	31	С	13	250	50	25	С	5	250	50	23	С		
			NE	-		-	-		29	375	125	25	С	273	375	125	32	С		
3	W Doty St & S	Signal	SW	18	325	50	1	Α	-	-	-	-	-	29	35	75	20	С	18	В
	Fairchild St	8	SB	13	250	225	14	В	1064	250	225	14	В	106	250	75	12	В		_
			-	-		-	-	-	-	-	-	-	-	-	-	_	- 42	-		
	W Doty St &		EB	34	350	275	16	В	1275	350	275	14	В	82	350	275	12	В -		
4	Martin Luther	Signal	SB	14	275	100	48	D	33	275	100	15	В		-	-	-	-	15	В
	King Jr Blvd		NB	- 14	-	-	-	-	65	275	150	27	C	70	275	150	29	С		
			EB	-	-	-	-	-	1512	350	275	19	С	254	350	275	22	C		
5	E Doty St & S	T1466	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22	
5	Pinckney St	TWSC	SB	14	225	175	154	F	24	225	175	230	F	-	-	-	-	-	33	D
			NB	-			-					-		123	275	225	171	F		
			EB	19	250	225	5	Α	1179	250	225	11	В	475	250	225	14	В		
6	E Doty St & King	Signal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15	В
	St		SE	39	30	75	50	D	136	300	200	42	D	-	-	-	-	-		
			NW	-	-	-	-	-	31	375	50	15	В	43	375	75	9	Α		
	E Washington		EB	9	275	50	66	E	239 203	275 275	175	15	В	-	275	225	-	- C		
7	Ave & S	Signal	WB -	-	-	-	-	-	203	2/3	175	18	B -	565		- 225	23	-	23	С
	Webster St		NB	19	325	300	12	В	439	325	300	20	С	813	325	300	30	С		
			-	-	-	-	-	-		-	-		-	-	-					
	W Wilson St &	T1466	WB	-	-	-	-	-	768	350	100	2	Α	118	350	100	1	Α	,	
8	Martin Luther King Jr Blvd	TWSC	SB	-	-	-	-	-	-	-	-	-	-	124	275	100	10	В	3	Α
	KING JI BIVU		-	-		-	-		-	-		-	-	-	-	-	-			
			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
9	E Wilson St & S	TWSC	WB	4	625	150	2	Α	605	625	150	5	A	86	625	175	25	D	16	С
	Pinckney St		SB	- 44	-	- 75	- 50	E	4	275	175 125	17 115	C	279	275	175	18	С		
			NB	44	75	/5	30		35	300	- 123	- 113	F	-			-			
	E Wilson St & S		SB	159	575	225	33	C	198	100	150	29	С	17	100	150	30	С		
10	Butler St	Signal	SE	10	375	325	20	C	543	375	325	20	В	60	65	325	17	В	25	С
			WB	216	275	225	38	D	72	275	75	9	Α	36	275	75	6	Α		
			-	-		-	-	-		-	-	-	-	-		-	-	-		
13	E Wilson Street	TWSC	WB	-		-	-		431	500	75	3	Α	49	500	75	3	Α	6	Α
13	& East Entrance		SB	-	-	-	-	-	-	-	-	-	-	268	100	125	13	В	Ů	,,
			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	E Wilson Street		- WB	-		-	-		798	150	100	1	- A	- 86	150	100	- 2	- A		
14	& West	TWSC	SB	-		-	_	-	798	150	- 100	-	- A	97	100	75	5	A	1	Α
	Entrance		-	-	-	-	-		-	-		-	-	-	-	-	-	- A	1	
	 		EB	-	-	-	-	-	1310	250	75	5	Α	49	250	150	6	Α		
15	E Doty Street &	TWCC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
15	West Entrance	TWSC	NB	-		-	-			-		-	-	73	100	75	33	D	6	Α
			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
			EB	-		-	-	-	1588	150	25	3	Α	61	150	175	3	Α		
16	E Doty Street &	TWSC	-	-	,	-	-	-	-	-	-	-	-	-	-	-	-	-	5	Α
	East Entrance		NB	-	-	-	-	-	-	-	-	-	-	49	100	125	72	F	Ĭ	
			-	-	-	-	-	-	-	-	-	-	-	-		-	-	-		

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Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR	SBT	
Lane Group Flow (vph)	90	324	128	334	446	1116	760	852	
v/c Ratio	0.32	0.61	0.45	0.66	0.46	0.82	0.54	0.73	
Control Delay	44.4	47.3	26.5	38.4	30.1	38.3	5.7	35.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	44.4	47.3	26.5	38.4	30.1	38.3	5.7	35.1	
Queue Length 50th (ft)	55	109	36	217	132	372	128	268	
Queue Length 95th (ft)	112	171	101	343	192	#616	245	#445	
Internal Link Dist (ft)		860			1247	1087		670	
Turn Bay Length (ft)	100		150	300					
Base Capacity (vph)	420	811	398	697	1351	1357	1564	1169	
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	0.21	0.40	0.32	0.48	0.33	0.82	0.49	0.73	
Intersection Summary									

^{# 95}th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

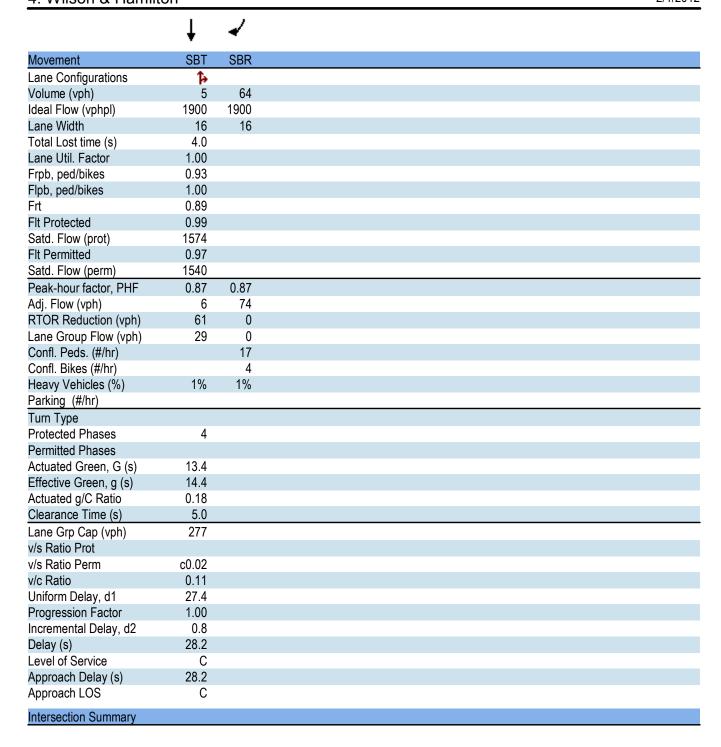
	۶	→	•	•	←	•	4	†	<i>></i>	>	ţ	4
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	^	7	ሻ	414			4₽	7		414	
Volume (vph)	87	314	124	648	84	24	21	1061	737	9	766	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	10	12	12	11	11	15	15	16	11	11	16
Total Lost time (s)	4.5	4.5	4.5	5.0	5.0			5.5	5.0		5.5	
Lane Util. Factor	1.00	0.95	1.00	0.91	0.91			0.95	1.00		0.95	
Frpb, ped/bikes	1.00	1.00	0.91	1.00	0.99			1.00	1.00		1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.96			1.00	1.00		1.00	
Satd. Flow (prot)	1711	3303	1435	1610	3113			3889	1794		3384	
Flt Permitted	0.95	1.00	1.00	0.95	0.96			0.92	1.00		0.91	
Satd. Flow (perm)	1711	3303	1435	1610	3113			3571	1794		3065	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	90	324	128	668	87	25	22	1094	760	9	790	53
RTOR Reduction (vph)	0	0	57	0	3	0	0	0	58	0	4	0
Lane Group Flow (vph)	90	324	71	334	443	0	0	1116	702	0	848	0
Confl. Peds. (#/hr)	61		50	50		61	3		91	91		3
Confl. Bikes (#/hr)						20						
Turn Type	Split		Perm	Split			Perm		custom	Perm		
Protected Phases	4	4		3	3			2	3 6		2	
Permitted Phases		4	4				2			2		
Actuated Green, G (s)	17.1	17.1	17.1	33.2	33.2			40.3	79.0		40.3	
Effective Green, g (s)	17.1	17.1	17.1	33.2	33.2			40.3	79.0		40.3	
Actuated g/C Ratio	0.16	0.16	0.16	0.31	0.31			0.38	0.75		0.38	
Clearance Time (s)	4.5	4.5	4.5	5.0	5.0			5.5			5.5	
Vehicle Extension (s)	3.0	3.0	3.0	2.5	2.5			4.0			4.0	
Lane Grp Cap (vph)	277	535	232	506	979			1363	1342		1170	
v/s Ratio Prot	0.05	c0.10		c0.21	0.14				0.39			
v/s Ratio Perm			0.05					c0.31			0.28	
v/c Ratio	0.32	0.61	0.31	0.66	0.45			0.82	0.52		0.73	
Uniform Delay, d1	39.1	41.1	39.0	31.3	28.9			29.4	5.5		27.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.7	1.9	0.8	2.9	0.2			5.6	0.3		3.9	
Delay (s)	39.8	43.1	39.8	34.2	29.2			35.0	5.8		31.8	
Level of Service	D	D	D	С	С			С	Α		С	
Approach Delay (s)	_	41.7	_		31.3			23.1			31.8	
Approach LOS		D			С			С			С	
Intersection Summary												
HCM Average Control Delay			29.0	Н	CM Level	of Service	се		С			
HCM Volume to Capacity ratio			0.72									
Actuated Cycle Length (s)			105.6		um of los				15.0			
Intersection Capacity Utilizatio	n		101.4%	IC	U Level	of Service)		G			
Analysis Period (min)			15									
c Critical Lane Group												

	•	→	←	•	†	ļ
Lane Group	EBL2	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	5	211	562	338	29	90
v/c Ratio	0.06	0.56	0.80	0.48	0.10	0.27
Control Delay	34.2	38.5	32.5	21.0	28.4	12.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.2	38.5	32.5	21.0	28.4	12.2
Queue Length 50th (ft)	2	93	256	131	12	7
Queue Length 95th (ft)	m9	162	#375	199	33	42
Internal Link Dist (ft)		591	587		207	214
Turn Bay Length (ft)						
Base Capacity (vph)	81	375	706	708	305	338
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	0.06	0.56	0.80	0.48	0.10	0.27
Intersection Summary						

^{# 95}th 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.

	۶	≭	→	*	•	←	•	۴	1	†	۴	4
Movement	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL	NBT	NBR	SBL2
Lane Configurations	ň		f)			ર્ન	Ž.			4		
Volume (vph)	4	169	0	15	4	485	222	72	7	13	5	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	14	14	16	16	16	16	16	16	16	16
Total Lost time (s)	4.0		4.0			4.0	4.0			4.0		
Lane Util. Factor	1.00		1.00			1.00	1.00			1.00		
Frpb, ped/bikes	1.00		0.99			1.00	0.96			0.99		
Flpb, ped/bikes	0.99		1.00			1.00	1.00			0.99		
Frt	1.00		0.99			1.00	0.85			0.97		
Flt Protected	0.95		0.96			1.00	1.00			0.99		
Satd. Flow (prot)	1543		1687			1572	1573			1800		
Flt Permitted	0.23		0.96			1.00	1.00			0.93		
Satd. Flow (perm)	369		1687			1569	1573			1693		
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	5	194	0	17	5	557	255	83	8	15	6	10
RTOR Reduction (vph)	0	0	4	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	5	0	207	0	0	562	338	0	0	29	0	0
Confl. Peds. (#/hr)	19	17		50	50		19	17	17		17	17
Confl. Bikes (#/hr)											1	
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Parking (#/hr)						16						
Turn Type	Perm	Split			Perm		Perm		Perm			Perm
Protected Phases		2	2			6				4		
Permitted Phases	2				6		6		4			4
Actuated Green, G (s)	17.1		17.1			35.5	35.5			13.4		
Effective Green, g (s)	17.6		17.6			36.0	36.0			14.4		
Actuated g/C Ratio	0.22		0.22			0.45	0.45			0.18		
Clearance Time (s)	4.5		4.5			4.5	4.5			5.0		
Lane Grp Cap (vph)	81		371			706	708			305		
v/s Ratio Prot			c0.12									
v/s Ratio Perm	0.01					c0.36	0.21			0.02		
v/c Ratio	0.06		0.56			0.80	0.48			0.10		
Uniform Delay, d1	24.7		27.7			18.9	15.4			27.4		
Progression Factor	1.28		1.17			1.17	1.17			1.00		
Incremental Delay, d2	1.4		5.9			9.0	2.3			0.6		
Delay (s)	33.0		38.4			31.0	20.3			28.0		
Level of Service	С		D			С	С			С		
Approach Delay (s)			38.3			27.0				28.0		
Approach LOS			D			C				С		
Intersection Summary												
HCM Average Control Dela	ау		29.1	Н	CM Leve	l of Service	ce		С		_	
HCM Volume to Capacity r			0.59									
Actuated Cycle Length (s)			80.0	S	um of los	t time (s)			12.0			
Intersection Capacity Utiliz	ation		65.0%			of Service)		С			
Analysis Period (min)			15									
c Critical Lane Group												



5: Doty & Hamilton

	-	4	×	/	6	~
Lane Group	SBL	SBR2	NET	NER	SWL	SWR
Lane Group Flow (vph)	1106	118	151	145	21	32
v/c Ratio	0.65	0.19	0.48	0.46	0.09	0.23
Control Delay	7.4	5.2	33.3	32.7	15.8	19.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.4	5.2	33.3	32.7	15.8	19.4
Queue Length 50th (ft)	97	15	69	66	5	7
Queue Length 95th (ft)	131	m25	126	121	16	21
Internal Link Dist (ft)	251		399			
Turn Bay Length (ft)						35
Base Capacity (vph)	1692	616	313	316	233	140
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	0.65	0.19	0.48	0.46	0.09	0.23
Intersection Summary						

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

	4	-	1	×	/	6	~	
Movement	SBL2	SBL	SBR2	NET	NER	SWL	SWR	
Lane Configurations		ሽኘ	7	f.	7	*	7	
Volume (vph)	13	949	103	28	230	18	28	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	
Lane Width	15	15	13	16	13	13	13	
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		0.97	1.00	0.95	0.95	1.00	1.00	
Frpb, ped/bikes		1.00	0.77	0.98	0.97	1.00	0.49	
Flpb, ped/bikes		0.98	1.00	1.00	1.00	0.99	1.00	
Frt		1.00	0.85	0.88	0.85	1.00	0.85	
Flt Protected		0.95	1.00	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3134	1141	1360	1374	1642	607	
Flt Permitted		0.95	1.00	1.00	1.00	0.59	1.00	
Satd. Flow (perm)		3134	1141	1360	1374	1013	607	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	
Adj. Flow (vph)	15	1091	118	32	264	21	32	
RTOR Reduction (vph)	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	1106	118	151	145	21	32	
Confl. Peds. (#/hr)	8	12	240		12	12	240	
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	
Parking (#/hr)		8		7			12	
Turn Type	Perm		Perm		Perm	D.Pm	custom	
Protected Phases		6		4				
Permitted Phases	6	4	6	4.5.	4	4	4	
Actuated Green, G (s)		44.2	44.2	18.4	18.4	18.4	18.4	
Effective Green, g (s)		43.2	43.2	18.4	18.4	18.4	18.4	
Actuated g/C Ratio		0.54	0.54	0.23	0.23	0.23	0.23	
Clearance Time (s)		3.0	3.0	4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)		1692	616	313	316	233	140	
v/s Ratio Prot		0.05	0.40	c0.11	0.44	0.00	0.05	
v/s Ratio Perm		0.35	0.10	0.40	0.11	0.02	0.05	
v/c Ratio		0.65	0.19	0.48	0.46	0.09	0.23	
Uniform Delay, d1		13.1	9.4	26.7	26.5	24.2	25.0	
Progression Factor		0.42	0.47	1.04	1.05	0.61	0.60	
Incremental Delay, d2		1.8	0.6	4.6	4.1	0.8	3.8	
Delay (s)		7.3	5.1	32.4	31.9	15.4	18.7	
Level of Service		A	Α	C	С	В	В	
Approach LOS		7.1		32.1				
Approach LOS		Α		С				
Intersection Summary								
HCM Average Control Delay			12.1	Н	CM Leve	l of Serv	ice	
HCM Volume to Capacity ratio)		0.60					
Actuated Cycle Length (s)			80.0		um of los			
Intersection Capacity Utilization	n		58.8%	IC	CU Level	of Servic	e	
Analysis Period (min)			15					
c Critical Lane Group								

7: Doty & MLK Jr.

	→	†	↓
Lane Group	EBT	NBT	SBT
Lane Group Flow (vph)	1401	75	52
v/c Ratio	0.53	0.21	0.14
Control Delay	5.7	12.1	16.6
Queue Delay	0.0	0.0	0.0
Total Delay	5.7	12.1	16.6
Queue Length 50th (ft)	62	4	21
Queue Length 95th (ft)	71	m32	54
Internal Link Dist (ft)	348	263	252
Turn Bay Length (ft)			
Base Capacity (vph)	2647	364	372
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.53	0.21	0.14
Intersection Summary			

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

	۶	→	•	•	•	•	1	†	/	/	↓	4
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4 † \$						1•			ર્ન	
Volume (vph)	33	1119	80	0	0	0	0	21	45	14	32	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	15	15	15	15	15	15	15	15	15	15	15	15
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		0.91						1.00			1.00	
Frpb, ped/bikes		1.00						0.84			1.00	
Flpb, ped/bikes		1.00						1.00			0.94	
Frt		0.99						0.91			1.00	
Flt Protected		1.00						1.00			0.98	
Satd. Flow (prot)		4626						1212			1464	
Flt Permitted		1.00						1.00			0.93	
Satd. Flow (perm)		4626						1212			1377	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	38	1272	91	0	0	0	0	24	51	16	36	0
RTOR Reduction (vph)	0	10	0	0	0	0	0	37	0	0	0	0
Lane Group Flow (vph)	0	1391	0	0	0	0	0	38	0	0	52	0
Confl. Peds. (#/hr)	30		53	53		30	129		101	101	<u> </u>	129
Confl. Bikes (#/hr)			5			3			5			1
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Parking (#/hr)	.,,	25	.,,	.,,	.,,	.,,	.,,	10			10	. , ,
	Perm									Perm		
Protected Phases		2						4		. 0	4	
Permitted Phases	2	_						•		4	•	
Actuated Green, G (s)	_	43.6						21.1		•	21.1	
Effective Green, g (s)		45.6						21.6			21.6	
Actuated g/C Ratio		0.57						0.27			0.27	
Clearance Time (s)		6.0						4.5			4.5	
Lane Grp Cap (vph)		2637						327			372	
v/s Ratio Prot		2001						0.03			012	
v/s Ratio Perm		0.30						0.00			c0.04	
v/c Ratio		0.53						0.12			0.14	
Uniform Delay, d1		10.6						22.0			22.2	
Progression Factor		0.48						1.02			0.70	
Incremental Delay, d2		0.40						0.7			0.78	
Delay (s)		5.7						23.0			16.2	
Level of Service		Α						23.0 C			В	
Approach Delay (s)		5.7			0.0			23.0			16.2	
Approach LOS		Α			Α			23.0 C			В	
Intersection Summary												
HCM Average Control Delay			6.9	Н	CM Leve	l of Servic	e		Α			
HCM Volume to Capacity ratio			0.40	(1		2. 23. 110			,,			
Actuated Cycle Length (s)			80.0	S	um of los	t time (s)			12.8			
Intersection Capacity Utilization	1		60.6%			of Service	·		12.0			
Analysis Period (min)			15		3 _5.01							
c Critical Lane Group			.0									

	•	→	•	•	←	4	1	†	~	/	↓	1
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		ተተኈ							7		ર્ન	
Volume (veh/h)	0	1344	207	0	0	0	0	0	119	14	23	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	1415	218	0	0	0	0	0	125	15	24	0
Pedestrians		50			73			75			33	
Lane Width (ft)		15.0			0.0			16.0			16.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		5			0			8			4	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		432			323							
pX, platoon unblocked				0.87			0.87	0.87	0.87	0.87	0.87	
vC, conflicting volume	33			1708			1661	1632	729	703	1741	83
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	33			1279			1225	1192	150	120	1317	83
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	82	97	80	100
cM capacity (veh/h)	1526			437			80	145	694	527	121	882
Direction, Lane #	EB 1	EB 2	EB 3	NB 1	SB 1							
Volume Total	566	566	501	125	39							
Volume Left	0	0	0	0	15							
Volume Right	0	0	218	125	0							
cSH	1700	1700	1700	694	170							
Volume to Capacity	0.33	0.33	0.29	0.18	0.23							
Queue Length 95th (ft)	0	0	0	16	21							
Control Delay (s)	0.0	0.0	0.0	11.3	32.3							
Lane LOS				В	D							
Approach Delay (s)	0.0			11.3	32.3							
Approach LOS				В	D							
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utiliza	ation		69.4%	IC	CU Level o	of Service			С			
Analysis Period (min)			15									
. ,												

9: Doty & Webster

	•	•	×	×	*
Lane Group	EBL	SEL	SET	NWT	NWR
Lane Group Flow (vph)	1576	40	139	31	44
v/c Ratio	0.85	0.21	0.58	0.11	0.17
Control Delay	12.7	44.6	54.6	25.5	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	12.7	44.6	54.6	25.5	9.0
Queue Length 50th (ft)	114	20	73	14	1
Queue Length 95th (ft)	148	m46	#131	m35	m26
Internal Link Dist (ft)	110		392	387	
Turn Bay Length (ft)		30			
Base Capacity (vph)	1856	190	240	274	253
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.85	0.21	0.58	0.11	0.17

Intersection Summary

^{# 95}th 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.

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Movement	EBL2	EBL	EBR	SBL	SBR	SEL	SET	SER	NWL	NWT	NWR	
Lane Configurations		<u>ሕ</u> ግነሳ				ሻ	†			†	7	
Volume (vph)	19	1070	423	0	0	38	133	0	0	30	42	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	15	15	13	15	15	10	10	16	9	9	11	
Total Lost time (s)		4.0				4.0	4.0			4.0	4.0	
Lane Util. Factor		*0.64				1.00	1.00			1.00	1.00	
Frpb, ped/bikes		0.98				1.00	1.00			1.00	0.87	
Flpb, ped/bikes		1.00				0.91	1.00			1.00	1.00	
Frt		0.96				1.00	1.00			1.00	0.85	
Flt Protected		0.97				0.95	1.00			1.00	1.00	
Satd. Flow (prot)		3112				1360	1335			1524	1206	
Flt Permitted		0.97				0.74	1.00			1.00	1.00	
Satd. Flow (perm)		3112				1055	1335			1524	1206	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	20	1115	441	0.30	0.50	40	139	0.50	0.50	31	44	
RTOR Reduction (vph)	0	52	0	0	0	0	0	0	0	0	36	
Lane Group Flow (vph)	0	1524	0	0	0	40	139	0	0	31	8	
Confl. Peds. (#/hr)	39	1324	47	47	U	57	133	101	101	JI	57	
Confl. Bikes (#/hr)	33		6	41		31		87	101		24	
Heavy Vehicles (%)	1%	1%	1%	0%	0%	1%	1%	1%	1%	1%	1%	
Parking (#/hr)	1 /0	5	1 /0	U /0	0 /0	1 /0	170	1 /0	1 /0	1 /0	1 /0	
	Crolit	<u> </u>				Dorm	11				Dorm	
Turn Type Protected Phases	Split 2	2				Perm	4			1	Perm	
	2	2				1	4			4	4	
Permitted Phases		45.0				4	12.0			12.0		
Actuated Green, G (s)		45.9				13.9	13.9			13.9	13.9	
Effective Green, g (s)		46.4				14.4	14.4			14.4	14.4	
Actuated g/C Ratio		0.58				0.18	0.18			0.18	0.18	
Clearance Time (s)		4.5				4.5	4.5			4.5	4.5	
Lane Grp Cap (vph)		1805				190	240			274	217	
v/s Ratio Prot		c0.49					c0.10			0.02		
v/s Ratio Perm						0.04					0.01	
v/c Ratio		0.84				0.21	0.58			0.11	0.04	
Uniform Delay, d1		13.8				28.0	30.0			27.5	27.1	
Progression Factor		0.57				1.47	1.46			0.89	0.79	
Incremental Delay, d2		4.8				2.4	9.3			0.8	0.3	
Delay (s)		12.7				43.4	53.2			25.1	21.6	
Level of Service		В				D	D			С	С	
Approach Delay (s)		12.7		0.0			51.0			23.1		
Approach LOS		В		Α			D			С		
Intersection Summary												
HCM Average Control Delay			16.8	H	CM Level	of Service	:e		В			
HCM Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			80.0	Sı	um of lost	t time (s)			19.2			
Intersection Capacity Utilizatio	n		70.4%		U Level	٠,)		С			
Analysis Period (min)			15									
c Critical Lane Group												

11: East Washington & Webster

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Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Group Flow (vph)	9	240	204	568	820	378
v/c Ratio	0.04	0.62	0.43	0.76	0.74	0.76
Control Delay	10.2	21.8	22.5	29.3	19.8	25.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.2	21.8	22.5	29.3	19.8	25.3
Queue Length 50th (ft)	2	117	82	146	115	113
Queue Length 95th (ft)	m5	194	144	210	m186	m196
Internal Link Dist (ft)		274	258		347	
Turn Bay Length (ft)						
Base Capacity (vph)	247	388	470	752	1109	500
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	0.04	0.62	0.43	0.76	0.74	0.76
Intersection Summary						

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

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	†			+	77		€Î}•	7			
Volume (vph)	9	233	0	0	198	551	19	409	733	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	13	15	15	13	16	16	16
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Lane Util. Factor	1.00	1.00			1.00	0.88		0.91	*0.87			
Frpb, ped/bikes Flpb, ped/bikes	1.00 0.97	1.00 1.00			1.00 1.00	1.00 1.00		0.98 1.00	1.00 1.00			
Fit	1.00	1.00			1.00	0.85		0.93	0.85			
Flt Protected	0.95	1.00			1.00	1.00		1.00	1.00			
Satd. Flow (prot)	1493	1337			1621	2592		2843	1281			
Flt Permitted	0.54	1.00			1.00	1.00		1.00	1.00			
Satd. Flow (perm)	851	1337			1621	2592		2843	1281			
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	9	240	0	0	204	568	20	422	756	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	9	240	0	0	204	568	0	820	378	0	0	0
Confl. Peds. (#/hr)	43		66	66		43	48		49	49		48
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	0%	0%	0%
Parking (#/hr)		15						7				
Turn Type	Perm					Prot	Split		Prot			_
Protected Phases		4			8	8	2	2	2			
Permitted Phases	4											
Actuated Green, G (s)	23.7	23.7			23.7	23.7		30.2	30.2			
Effective Green, g (s)	23.2	23.2			23.2	23.2		31.2	31.2			
Actuated g/C Ratio	0.29	0.29			0.29	0.29		0.39	0.39			
Clearance Time (s)	3.5	3.5			3.5	3.5		5.0	5.0			
Lane Grp Cap (vph)	247	388			470	752		1109	500			
v/s Ratio Prot	0.04	0.18			0.13	c0.22		0.29	c0.30			
v/s Ratio Perm	0.01	0.00			0.40	0.70		0.74	0.70			
v/c Ratio	0.04	0.62			0.43	0.76		0.74	0.76			
Uniform Delay, d1 Progression Factor	20.4 0.48	24.6 0.57			23.1 0.83	25.8 0.85		20.9 0.78	21.1 0.78			
Incremental Delay, d2	0.46	7.2			2.9	6.8		3.1	7.3			
Delay (s)	10.0	21.3			21.9	28.7		19.4	23.7			
Level of Service	В	C C			C C	C C		В	C C			
Approach Delay (s)	Ь	20.9			26.9	U		20.8	U		0.0	
Approach LOS		20.0 C			20.5 C			20.0 C			Α.	
											, ,	
Intersection Summary												
HCM Average Control Dela	•		22.9	Н	CM Leve	I of Service	Э		С			
HCM Volume to Capacity r	atio		0.76		uma afla-	1 1: mag (-)			25.0			
Actuated Cycle Length (s)	otion		80.0			t time (s)			25.6			
Intersection Capacity Utiliz	allOII		79.9%	IC	U Level	of Service			D			
Analysis Period (min)			15									

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			∱ }			7
Volume (veh/h)	0	0	546	50	0	121
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	607	56	0	134
Pedestrians		102	108		22	
Lane Width (ft)		0.0	11.0		16.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	8		2	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		1105				
pX, platoon unblocked						
vC, conflicting volume	684				764	455
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	684				764	455
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	75
cM capacity (veh/h)	883				304	539
Direction, Lane #	WB 1	WB 2	SB 1			
Volume Total	404	258	134			
Volume Left	0	0	0			
Volume Right	0	56	134			
cSH	1700	1700	539			
Volume to Capacity	0.24	0.15	0.25			
Queue Length 95th (ft)	0	0	24			
Control Delay (s)	0.0	0.0	13.9			
Lane LOS			В			
Approach Delay (s)	0.0		13.9			
Approach LOS			В			
Intersection Summary						
Average Delay			2.3			
Intersection Capacity Utiliz	zation		39.7%	IC	U Level o	of Service
Analysis Period (min)			15			
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Lane Configurations	✓	ļ	>	<i>></i>	†	•	•	←	•	•	→	۶	
Volume (veh/h) 0 0 0 4 394 67 43 34 0 0 Sign Control Free Free Stop St Grade 0% 0% 0% 0% 0 Peak Hour Factor 0.88	BT SBR	SBT	SBL	NBR	NBT	NBL	WBR	WBT	WBL	EBR	EBT	EBL	Movement
Sign Control Free Free Stop Sto Grade 0% 0% 0% 0% 0 Peak Hour Factor 0.88	<u>}</u>	cî cî			†	J.		414					Lane Configurations
Grade 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0%	4 211	4	0	0	34	43	67	394	4	0	0	0	Volume (veh/h)
Peak Hour Factor 0.88	эр	Stop			Stop			Free			Free		Sign Control
Hourly flow rate (vph) 0 0 0 5 448 76 49 39 0 0 Pedestrians 24 57 71 150 160 160 160 Walking Speed (ft/s) 4.0 4.0 4.0 4.0 4.0 Percent Blockage 0 6 8 8 Right turn flare (veh) Median type None Median storage veh) Upstream signal (ft) pX, platoon unblocked vCC, conflicting volume 595 71 570 675 128 642 65 vC1, stage 1 conf vol vC2, stage 2 conf vol vC0, unblocked vO1, stage 1 conf vol vC1, stage 1 conf vol vC2, stage 2 conf vol vC1, stage 8 4.1 4.1 7.5 6.5 6.9 7.5 6 6.5 (c. 2 stage 8) If (s) 2 2 2 2 2 2 3.5 4.0 3.3 3.5 4.0 90 queue free % 100 100 75 88 100 100 9 100	%	0%			0%			0%			0%		Grade
Pedestrians	88.0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	Peak Hour Factor
Pedestrians	5 240	5	0	0	39	49	76	448	5	0	0	0	Hourly flow rate (vph)
Walking Speed (ft/s) 4.0 6.0	71	71			71			57			24		
Percent Blockage 0 6 8 Right turn flare (veh) Median type None None Median storage veh) Upstream signal (ft) 643 pX, platoon unblocked vC, conflicting volume 595 71 570 675 128 642 60 vC1, stage 1 conf vol vC2, stage 2 conf vol vC2, stage 2 conf vol vC2, stage (s) 4.1 4.1 7.5 6.5 6.9 7.5 6 tC, 2 stage (s) tF (s) 2.2 2.2 3.5 4.0 3.3 3.5 4 p0 queue free % 100 100 75 88 100 100 9 cM capacity (veh/h) 907 1414 194 318 778 250 33 Direction, Lane # WB 1 WB 2 NB 1 NB 2 SB 1 Volume Total 228 300 49 39 244 Volume Total 228 300 49 39 244 Volume Cotal 50 49 0	.0	16.0			16.0			16.0			0.0		Lane Width (ft)
Right turn flare (veh) Median type None Median type None Median storage veh) Upstream signal (ft) pX, platoon unblocked vC, conflicting volume vC2, stage 1 conf vol vC2, stage 2 conf vol vC2, stage 2 conf vol vC4, stage 8 tC, single (s) tC, single (s) tF (s) pQ queue free % 100 100 75 88 100 100 100 75 88 100 100 100 100 100 100 100 100 100	.0	4.0			4.0			4.0			4.0		Walking Speed (ft/s)
Right turn flare (veh) Median type	8	8			8			6			0		
Median type None None Median storage veh) Upstream signal (ft) 643 pX, platoon unblocked vC, conflicting volume 595 71 570 675 128 642 63 vC1, stage 1 conf vol vC2, stage 2 conf vol vCu, unblocked vol 595 71 570 675 128 642 63 tC, stage (s) 4.1 4.1 7.5 6.5 6.9 7.5 6 tC, 2 stage (s) tF (s) 2.2 2.2 3.5 4.0 3.3 3.5 4 p0 queue free % 100 100 75 88 100 100 9 9 3 3 3.5 4.0 3.3 3.5 4.0 4.0 4.0 9 9 9 100 9 9 9 9 9 3.3 3.5 4.0 3.3 3.5 4.0 3.3 3.5 4.0 3.8 100 100 9 9 9 9 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>													
Median storage veh) Upstream signal (ft) 643 PX, platoon unblocked VC, conflicting volume VC, stage 1 conf vol VC2, stage 2 conf vol VC2, stage 2 conf vol VC2, unblocked vol 595 71 570 675 128 642 63 tC, 2 stage (s) F (s) 2.2 2.2 3.5 4.0 3.3 3.5 4 p Queue free % 100 100 75 88 100 100 9 M capacity (veh/h) 907 1414 194 318 778 250 33 Direction, Lane # WB 1 WB 2 NB 1 NB 2 SB 1 Volume Total 228 300 49 39 244 Volume Left 5 0 49 0 0 Volume Right 0 76 0 0 240 0 0 CSH								None			None		
Upstream signal (ft) pX, platoon unblocked vC, conflicting volume 595 71 570 675 128 642 63 vC1, stage 1 conf vol vC2, stage 2 conf vol vCU, unblocked vol 595 71 570 675 128 642 63 645 65 65 65 65 65 65 65 65 65 65 65 65 65													
pX, platoon unblocked vC, conflicting volume 595 71 570 675 128 642 63 vC1, stage 1 conf vol vC2, stage 2 conf vol vCu, unblocked vol 595 71 570 675 128 642 63 tC, single (s) 4.1 4.1 7.5 6.5 6.9 7.5 65 tC, 2 stage (s) tEf (s) 2.2 2.2 3.5 4.0 3.3 3.5 4 p0 queue free % 100 100 75 88 100 100 90 cM capacity (veh/h) 907 1414 194 318 778 250 33 10								643					
VC, conflicting volume													
VC1, stage 1 conf vol VC2, stage 2 conf vol VCu, unblocked vol 595 71 570 675 128 642 63 tC, single (s) 4.1 4.1 7.5 6.5 6.9 7.5 66 tC, 2 stage (s) tF (s) 2.2 2.2 3.5 4.0 3.3 3.5 4.0 p0 queue free % 100 100 75 88 100 100 90 cM capacity (veh/h) 907 1414 194 318 778 250 33 Direction, Lane # WB 1 WB 2 NB 1 NB 2 SB 1	37 357	637	642	128	675	570			71			595	
vC2, stage 2 conf vol vCu, unblocked vol 595 71 570 675 128 642 63 tC, single (s) 4.1 4.1 7.5 6.5 6.9 7.5 6 tC, 2 stage (s) tF (s) 2.2 2.2 3.5 4.0 3.3 3.5 4 p0 queue free % 100 100 75 88 100 100 9 cM capacity (veh/h) 907 1414 194 318 778 250 33 Direction, Lane # WB 1 WB 2 NB 1 NB 2 SB 1 Volume Total 228 300 49 39 244 Volume Left 5 0 49 0 0 Volume Right 0 76 0 0 240 cSH 1414 1700 194 318 583 Volume to Capacity 0.00 0.18 0.25 0.12 0.42 Queue Length 95th (ft) 0 0 24 10 52 Control Delay (s) 0.2 0.0 29.6 17.9 </td <td></td>													
vCu, unblocked vol 595 71 570 675 128 642 60 tC, single (s) 4.1 4.1 7.5 6.5 6.9 7.5 6 tC, 2 stage (s) tF (s) 2.2 2.2 3.5 4.0 3.3 3.5 4 p0 queue free % 100 100 75 88 100 100 9 cM capacity (veh/h) 907 1414 194 318 778 250 33 Direction, Lane # WB 1 WB 2 NB 1 NB 2 SB 1 WB WB VB VB<													
tC, 2 stage (s) tF (s)	37 357	637	642	128	675	570			71			595	
tC, 2 stage (s) tF (s)	6.5	6.5	7.5	6.9	6.5	7.5			4.1			4.1	tC, single (s)
tF (s) 2.2 2.2 3.5 4.0 3.3 3.5 4 p0 queue free % 100 100 75 88 100 100 9 cM capacity (veh/h) 907 1414 194 318 778 250 33 Direction, Lane # WB 1 WB 2 NB 1 NB 2 SB 1 Volume Total 228 300 49 39 244 Volume Left 5 0 49 0 0 Volume Right 0 76 0 0 240 cSH 1414 1700 194 318 583 Volume to Capacity 0.00 0.18 0.25 0.12 0.42 Queue Length 95th (ft) 0 0 24 10 52 Control Delay (s) 0.2 0.0 29.6 17.9 15.5 Lane LOS A D C C Approach LOS C C C Intersection Summary 18													
p0 queue free % 100 100 75 88 100 100 9 cM capacity (veh/h) 907 1414 194 318 778 250 33 Direction, Lane # WB 1 WB 2 NB 1 NB 2 SB 1 SB 1 NB 2 SB 1 Volume Total 228 300 49 39 244 244 34 39 244 30 31 31 30	.0 3.3	4.0	3.5	3.3	4.0	3.5			2.2			2.2	
Direction, Lane # WB 1 WB 2 NB 1 NB 2 SB 1 Volume Total 228 300 49 39 244 Volume Left 5 0 49 0 0 Volume Right 0 76 0 0 240 cSH 1414 1700 194 318 583 Volume to Capacity 0.00 0.18 0.25 0.12 0.42 Queue Length 95th (ft) 0 0 24 10 52 Control Delay (s) 0.2 0.0 29.6 17.9 15.5 Lane LOS A D C C Approach Delay (s) 0.1 24.4 15.5 Approach LOS C C C Intersection Summary C C	99 59	99	100	100	88	75			100			100	
Volume Total 228 300 49 39 244 Volume Left 5 0 49 0 0 Volume Right 0 76 0 0 240 cSH 1414 1700 194 318 583 Volume to Capacity 0.00 0.18 0.25 0.12 0.42 Queue Length 95th (ft) 0 0 24 10 52 Control Delay (s) 0.2 0.0 29.6 17.9 15.5 Lane LOS A D C C Approach Delay (s) 0.1 24.4 15.5 Approach LOS C C C Intersection Summary	35 592	335	250	778	318	194			1414			907	cM capacity (veh/h)
Volume Left 5 0 49 0 0 Volume Right 0 76 0 0 240 cSH 1414 1700 194 318 583 Volume to Capacity 0.00 0.18 0.25 0.12 0.42 Queue Length 95th (ft) 0 0 24 10 52 Control Delay (s) 0.2 0.0 29.6 17.9 15.5 Lane LOS A D C C Approach Delay (s) 0.1 24.4 15.5 Approach LOS C C C Intersection Summary								SB 1	NB 2	NB 1	WB 2	WB 1	Direction, Lane #
Volume Left 5 0 49 0 0 Volume Right 0 76 0 0 240 cSH 1414 1700 194 318 583 Volume to Capacity 0.00 0.18 0.25 0.12 0.42 Queue Length 95th (ft) 0 0 24 10 52 Control Delay (s) 0.2 0.0 29.6 17.9 15.5 Lane LOS A D C C Approach Delay (s) 0.1 24.4 15.5 Approach LOS C C C Intersection Summary								244	39	49	300	228	Volume Total
CSH 1414 1700 194 318 583 Volume to Capacity 0.00 0.18 0.25 0.12 0.42 Queue Length 95th (ft) 0 0 24 10 52 Control Delay (s) 0.2 0.0 29.6 17.9 15.5 Lane LOS A D C C Approach Delay (s) 0.1 24.4 15.5 Approach LOS C C Intersection Summary								0		49	0	5	Volume Left
Volume to Capacity 0.00 0.18 0.25 0.12 0.42 Queue Length 95th (ft) 0 0 24 10 52 Control Delay (s) 0.2 0.0 29.6 17.9 15.5 Lane LOS A D C C Approach Delay (s) 0.1 24.4 15.5 Approach LOS C C C Intersection Summary C C C								240	0	0	76	0	Volume Right
Queue Length 95th (ft) 0 0 24 10 52 Control Delay (s) 0.2 0.0 29.6 17.9 15.5 Lane LOS A D C C Approach Delay (s) 0.1 24.4 15.5 Approach LOS C C Intersection Summary								583	318	194	1700	1414	cSH
Queue Length 95th (ft) 0 0 24 10 52 Control Delay (s) 0.2 0.0 29.6 17.9 15.5 Lane LOS A D C C Approach Delay (s) 0.1 24.4 15.5 Approach LOS C C Intersection Summary								0.42	0.12	0.25	0.18	0.00	Volume to Capacity
Control Delay (s) 0.2 0.0 29.6 17.9 15.5 Lane LOS A D C C Approach Delay (s) 0.1 24.4 15.5 Approach LOS C C Intersection Summary								52	10	24	0	0	
Lane LOS A D C C Approach Delay (s) 0.1 24.4 15.5 Approach LOS C C Intersection Summary C C								15.5	17.9	29.6	0.0	0.2	
Approach LOS C C Intersection Summary								С	С	D		Α	
Intersection Summary								15.5		24.4		0.1	Approach Delay (s)
·								С		С			Approach LOS
Avorage Delay 6.0													
<u> </u>										6.9			Average Delay
Intersection Capacity Utilization 48.7% ICU Level of Service A				Α			of Service	U Level	IC			ation	
Analysis Period (min) 15										15			Analysis Period (min)

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L O	WDT	WDD	CDI	CDD	CEL
Lane Group	WBT	WBR	SBL	SBR	SEL
Lane Group Flow (vph)	181	115	204	187	614
v/c Ratio	0.50	0.14	0.55	0.63	0.66
Control Delay	32.8	4.4	32.0	37.4	20.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	32.8	4.4	32.0	37.4	20.3
Queue Length 50th (ft)	80	13	88	87	127
Queue Length 95th (ft)	141	32	156	#167	m158
Internal Link Dist (ft)	860		573		387
Turn Bay Length (ft)				100	
Base Capacity (vph)	365	797	373	296	931
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.50	0.14	0.55	0.63	0.66

Intersection Summary

^{# 95}th 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.

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Movement	EBL	EBT	WBT	WBR	WBR2	SBL	SBR	SBR2	SEL2	SEL	SER	
Lane Configurations			†	Ž.		¥	Ž.			äY		
Volume (vph)	0	0	165	70	35	155	184	17	10	490	59	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	16	16	12	16	16	10	12	12	11	11	11	
Total Lost time (s)			4.0	4.0		4.0	4.0			4.0		
Lane Util. Factor			1.00	1.00		1.00	0.95			0.97		
Frpb, ped/bikes			1.00	0.90		0.99	1.00			0.97		
Flpb, ped/bikes			1.00	1.00		1.00	1.00			0.95		
Frt			1.00	0.85		0.97	0.85			0.98		
Flt Protected			1.00	1.00		0.96	1.00			0.96		
Satd. Flow (prot)			1660	1224		1436	1140			2501		
Flt Permitted			1.00	1.00		0.96	1.00			0.95		
Satd. Flow (perm)			1660	1224		1436	1140			2485		
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.92	0.91	0.91	0.91	0.91	0.91	0.91	
Adj. Flow (vph)	0	0	181	77	38	170	202	19	11	538	65	
RTOR Reduction (vph)	0	0	0	14	0	0	0	0	0	11	0	
Lane Group Flow (vph)	0	0	181	101	0	204	187	0	0	603	0	
Confl. Peds. (#/hr)	66			26	66	19	41	26	66	19	41	
Confl. Bikes (#/hr)				1	21			3			109	
Heavy Vehicles (%)	3%	3%	3%	3%	2%	3%	3%	3%	3%	3%	3%	
Parking (#/hr)			- , ,	10	_,,		10			11		
Turn Type				custom			Prot		Perm			
Protected Phases			1	Cactoni		4	4		. 0	2		
Permitted Phases			•	6			•		2	_		
Actuated Green, G (s)			17.1	51.2		20.3	20.3		_	29.6		
Effective Green, g (s)			17.6	51.2		20.8	20.8			29.6		
Actuated g/C Ratio			0.22	0.64		0.26	0.26			0.37		
Clearance Time (s)			4.5	4.0		4.5	4.5			4.0		
Lane Grp Cap (vph)			365	783		373	296			919		
v/s Ratio Prot			c0.11	700		0.14	c0.16			313		
v/s Ratio Perm			00.11	0.08		0.14	00.10			c0.24		
v/c Ratio			0.50	0.13		0.55	0.63			0.66		
Uniform Delay, d1			27.3	5.7		25.5	26.2			21.0		
Progression Factor			1.00	1.00		1.00	1.00			0.86		
Incremental Delay, d2			4.8	0.3		5.7	9.8			2.4		
Delay (s)			32.1	6.0		31.2	36.1			20.4		
Level of Service			C	Α		C C	D			20.4 C		
Approach Delay (s)		0.0	21.9			33.5	U			20.4		
Approach LOS		Α	C			C				C		
Intersection Summary												
HCM Average Control Delay			24.7	F	ICM Level	of Service	ce		С			
HCM Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			80.0	S	Sum of lost	t time (s)			12.0			
Intersection Capacity Utilization	1		66.3%		CU Level)		С			
Analysis Period (min)			15									
c Critical Lane Group												

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Movement	WBL	WBR	NBT	NBR	SBL	SBT	
Lane Configurations	¥		f)			ર્ન	
Volume (veh/h)	21	22	98	7	43	198	
Sign Control	Stop		Free			Free	
Grade	0%		0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	
Hourly flow rate (vph)	24	26	114	8	50	230	
Pedestrians	58						
Lane Width (ft)	16.0						
Walking Speed (ft/s)	4.0						
Percent Blockage	6						
Right turn flare (veh)							
Median type			None		1	None	
Median storage veh)							
Upstream signal (ft)							
pX, platoon unblocked							
vC, conflicting volume	506	176			180		
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	506	176			180		
tC, single (s)	6.4	6.2			4.1		
tC, 2 stage (s)							
tF (s)	3.5	3.3			2.2		
p0 queue free %	95	97			96		
cM capacity (veh/h)	475	814			1311		
Direction, Lane #	WB 1	NB 1	SB 1				
Volume Total	50	122	280				
Volume Left	24	0	50				
Volume Right	26	8	0				
cSH	603	1700	1311				
Volume to Capacity	0.08	0.07	0.04				
Queue Length 95th (ft)	7	0.07	3				
Control Delay (s)	11.5	0.0	1.7				
Lane LOS	В	0.0	A				
Approach Delay (s)	11.5	0.0	1.7				
Approach LOS	В	3.0					
Intersection Summary							
Average Delay			2.3				
Intersection Capacity Utiliza	ation		29.5%	IC	CU Level of	Service	
Analysis Period (min)	adon		15	10	C LOVOI OI V	201 1100	
Analysis i Gnou (IIIII)			10				

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			∱ ∱			7
Volume (veh/h)	0	0	403	11	0	66
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	0	0	458	12	0	75
Pedestrians		7			44	
Lane Width (ft)		0.0			16.0	
Walking Speed (ft/s)		4.0			4.0	
Percent Blockage		0			5	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			424			
pX, platoon unblocked						
vC, conflicting volume	514				508	286
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	514				508	286
tC, single (s)	4.2				6.9	7.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	89
cM capacity (veh/h)	989				468	673
		M/D C	OD 4			
Direction, Lane #	WB 1	WB 2	SB 1			
Volume Total	305	165	75			
Volume Left	0	0	0			
Volume Right	0	12	75			
cSH	1700	1700	673			
Volume to Capacity	0.18	0.10	0.11			
Queue Length 95th (ft)	0	0	9			
Control Delay (s)	0.0	0.0	11.0			
Lane LOS			В			
Approach Delay (s)	0.0		11.0			
Approach LOS			В			
Intersection Summary						
Average Delay			1.5			
Intersection Capacity Utiliz	zation		26.2%	IC	CU Level o	of Service
Analysis Period (min)			15			
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Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR	SBT	
Lane Group Flow (vph)	92	332	131	342	458	1145	778	872	
v/c Ratio	0.31	0.59	0.45	0.67	0.46	0.89	0.56	0.79	
Control Delay	44.2	46.8	28.1	39.2	30.7	44.3	6.2	39.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	44.2	46.8	28.1	39.2	30.7	44.3	6.2	39.0	
Queue Length 50th (ft)	57	113	42	224	136	396	135	284	
Queue Length 95th (ft)	114	175	108	354	198	#660	263	#481	
Internal Link Dist (ft)		860			1247	1087		670	
Turn Bay Length (ft)	100		150	300					
Base Capacity (vph)	410	791	386	680	1316	1283	1536	1100	
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	0.22	0.42	0.34	0.50	0.35	0.89	0.51	0.79	
Intersection Summary									

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

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	7	^	7	7	र्सी के			41∱	7		€ि	
Volume (vph)	89	322	127	664	86	25	22	1088	755	9	785	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	10	12	12	11	11	15	15	16	11	11	16
Total Lost time (s)	4.5	4.5	4.5	5.0	5.0			5.5	5.0		5.5	
Lane Util. Factor	1.00	0.95	1.00	0.91	0.91			0.95	1.00		0.95	
Frpb, ped/bikes	1.00	1.00	0.90	1.00	0.99			1.00	1.00		1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.96			1.00	1.00		1.00	
Satd. Flow (prot)	1711	3303	1432	1610	3112			3889	1794		3384	
Flt Permitted	0.95	1.00	1.00	0.95	0.96			0.89	1.00		0.87	
Satd. Flow (perm)	1711	3303	1432	1610	3112			3460	1794		2955	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	92	332	131	685	89	26	23	1122	778	9	809	54
RTOR Reduction (vph)	0	0	52	0	3	0	0	0	59	0	4	0
Lane Group Flow (vph)	92	332	79	342	455	0	0	1145	719	0	868	0
Confl. Peds. (#/hr)	61		50	50		61	3		91	91		3
Confl. Bikes (#/hr)						20						
Turn Type	Split		Perm	Split			Perm		custom	Perm		
Protected Phases	4	4		3	3			2	3 6		2	
Permitted Phases		4	4				2			2		
Actuated Green, G (s)	18.6	18.6	18.6	34.3	34.3			40.2	80.0		40.2	
Effective Green, g (s)	18.6	18.6	18.6	34.3	34.3			40.2	80.0		40.2	
Actuated g/C Ratio	0.17	0.17	0.17	0.32	0.32			0.37	0.74		0.37	
Clearance Time (s)	4.5	4.5	4.5	5.0	5.0			5.5			5.5	
Vehicle Extension (s)	3.0	3.0	3.0	2.5	2.5			4.0			4.0	
Lane Grp Cap (vph)	294	568	246	511	987			1287	1328		1099	
v/s Ratio Prot	0.05	c0.10		c0.21	0.15				0.40			
v/s Ratio Perm			0.06					c0.33			0.29	
v/c Ratio	0.31	0.58	0.32	0.67	0.46			0.89	0.54		0.79	
Uniform Delay, d1	39.2	41.2	39.2	32.0	29.5			31.9	6.1		30.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.6	1.5	8.0	3.0	0.2			9.5	0.4		5.8	
Delay (s)	39.8	42.7	40.0	35.0	29.8			41.3	6.5		36.0	
Level of Service	D	D	D	С	С			D	Α		D	
Approach Delay (s)		41.6			32.0			27.2			36.0	
Approach LOS		D			С			С			D	
Intersection Summary												
HCM Average Control Delay			31.9	Н	CM Level	of Service	e		С			
HCM Volume to Capacity rati	o		0.75									
Actuated Cycle Length (s)			108.1		um of los				15.0			
Intersection Capacity Utilizati	on		103.1%	IC	U Level	of Service)		G			
Analysis Period (min)			15									
c Critical Lane Group												

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Lane Group	EBL2	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	4	217	576	347	29	92
v/c Ratio	0.05	0.61	0.82	0.49	0.10	0.27
Control Delay	33.7	40.5	33.8	21.2	28.4	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.7	40.5	33.8	21.2	28.4	12.1
Queue Length 50th (ft)	2	101	266	135	12	7
Queue Length 95th (ft)	m8	176	#407	204	33	42
Internal Link Dist (ft)		591	587		207	214
Turn Bay Length (ft)						
Base Capacity (vph)	77	357	706	708	305	339
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	0.05	0.61	0.82	0.49	0.10	0.27

Intersection Summary

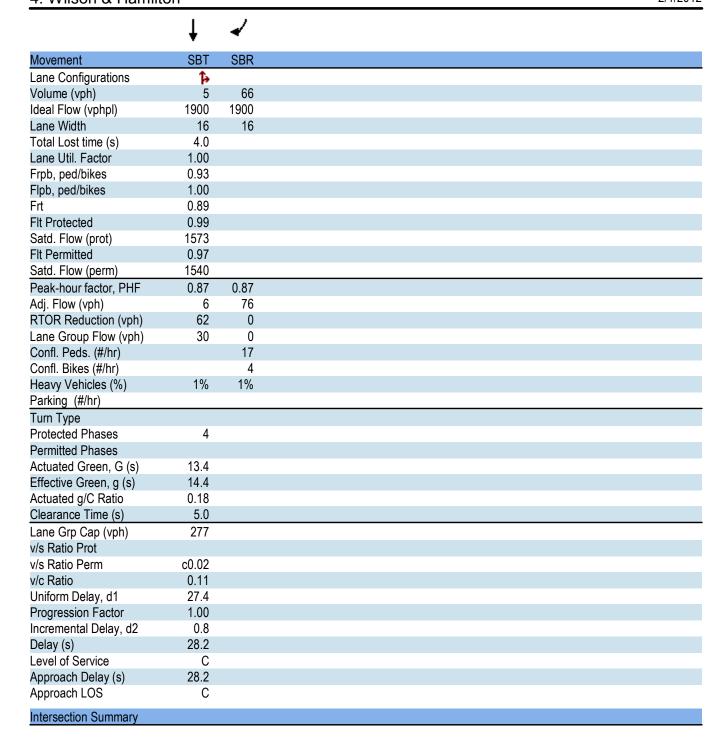
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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

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Movement	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL	NBT	NBR	SBL2
Lane Configurations	ሻ		4			ર્ન	Ž.			4		,
Volume (vph)	4	173	0	15	4	497	228	74	7	13	5	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	14	14	16	16	16	16	16	16	16	16
Total Lost time (s)	4.0		4.0			4.0	4.0			4.0		
Lane Util. Factor	0.95		0.95			1.00	1.00			1.00		
Frpb, ped/bikes	1.00		0.99			1.00	0.96			0.99		
Flpb, ped/bikes	1.00		1.00			1.00	1.00			0.99		
Frt	1.00		0.99			1.00	0.85			0.97		
Flt Protected	0.95		0.96			1.00	1.00			0.99		
Satd. Flow (prot)	1471		1604			1572	1573			1800		
Flt Permitted	0.23		0.96			1.00	1.00			0.93		
Satd. Flow (perm)	352		1604			1569	1573			1692		
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	5	199	0	17	5	571	262	85	8	15	6	10
RTOR Reduction (vph)	0	0	4	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	4	0	213	0	0	576	347	0	0	29	0	0
Confl. Peds. (#/hr)	19	17		50	50		19	17	17		17	17
Confl. Bikes (#/hr)											1	
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Parking (#/hr)						16						
Turn Type	Perm	Split			Perm		Perm		Perm			Perm
Protected Phases		2	2			6				4		
Permitted Phases	2				6		6		4			4
Actuated Green, G (s)	17.1		17.1			35.5	35.5			13.4		
Effective Green, g (s)	17.6		17.6			36.0	36.0			14.4		
Actuated g/C Ratio	0.22		0.22			0.45	0.45			0.18		
Clearance Time (s)	4.5		4.5			4.5	4.5			5.0		
Lane Grp Cap (vph)	77		353			706	708			305		
v/s Ratio Prot			c0.13									
v/s Ratio Perm	0.01					c0.37	0.22			0.02		
v/c Ratio	0.05		0.60			0.82	0.49			0.10		
Uniform Delay, d1	24.6		28.1			19.1	15.5			27.4		
Progression Factor	1.27		1.17			1.17	1.17			1.00		
Incremental Delay, d2	1.3		7.4			10.0	2.4			0.6		
Delay (s)	32.6		40.3			32.3	20.6			28.0		
Level of Service	С		D			С	С			С		
Approach Delay (s)			40.2			27.9				28.0		
Approach LOS			D			С				С		
Intersection Summary												
HCM Average Control Dela	av		30.1	Н	CM Leve	l of Servi	се		С			
HCM Volume to Capacity r			0.61									
Actuated Cycle Length (s)			80.0	S	um of los	t time (s)			12.0			
Intersection Capacity Utiliz	ation		65.0%			of Service	•		С			
Analysis Period (min)			15									
c Critical Lane Group												



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Lane Group	SBL	SBR2	NET	NER	SWL	SWR
Lane Group Flow (vph)	1133	122	155	149	21	33
v/c Ratio	0.67	0.20	0.50	0.47	0.09	0.24
Control Delay	7.7	5.4	33.5	32.9	15.8	19.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.7	5.4	33.5	32.9	15.8	19.6
Queue Length 50th (ft)	100	15	71	68	5	7
Queue Length 95th (ft)	136	m25	128	m123	16	22
Internal Link Dist (ft)	251		399			
Turn Bay Length (ft)						35
Base Capacity (vph)	1692	616	313	316	230	140
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	0.67	0.20	0.50	0.47	0.09	0.24
Intersection Summary						

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

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Movement	SBL2	SBL	SBR2	NET	NER	SWL	SWR	
Lane Configurations		ሕ ካ	7	^	7	*	7	
Volume (vph)	13	973	106	29	236	18	29	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	
Lane Width	15	15	13	16	13	13	13	
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		0.97	1.00	0.95	0.95	1.00	1.00	
Frpb, ped/bikes		1.00	0.77	0.98	0.97	1.00	0.49	
Flpb, ped/bikes		0.98	1.00	1.00	1.00	0.99	1.00	
Frt		1.00	0.85	0.88	0.85	1.00	0.85	
Flt Protected		0.95	1.00	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3134	1141	1361	1374	1642	607	
Flt Permitted		0.95	1.00	1.00	1.00	0.58	1.00	
Satd. Flow (perm)		3134	1141	1361	1374	999	607	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	
Adj. Flow (vph)	15	1118	122	33	271	21	33	
RTOR Reduction (vph)	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	1133	122	155	149	21	33	
Confl. Peds. (#/hr)	8	12	240		12	12	240	
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	
Parking (#/hr)		8		7			12	
Turn Type	Perm		Perm		Perm	D.Pm	custom	
Protected Phases		6		4				
Permitted Phases	6		6		4	4	4	
Actuated Green, G (s)		44.2	44.2	18.4	18.4	18.4	18.4	
Effective Green, g (s)		43.2	43.2	18.4	18.4	18.4	18.4	
Actuated g/C Ratio		0.54	0.54	0.23	0.23	0.23	0.23	
Clearance Time (s)		3.0	3.0	4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)		1692	616	313	316	230	140	
v/s Ratio Prot				c0.11				
v/s Ratio Perm		0.36	0.11		0.11	0.02	0.05	
v/c Ratio		0.67	0.20	0.50	0.47	0.09	0.24	
Uniform Delay, d1		13.3	9.5	26.8	26.6	24.2	25.1	
Progression Factor		0.43	0.48	1.04	1.04	0.61	0.60	
Incremental Delay, d2		1.9	0.6	4.7	4.2	0.8	3.9	
Delay (s)		7.6	5.2	32.6	32.0	15.5	18.8	
Level of Service		A	Α	C	С	В	В	
Approach Delay (s)		7.3		32.3				
Approach LOS		Α		С				
Intersection Summary								
HCM Average Control Delay			12.4	Н	CM Leve	of Serv	ce	
HCM Volume to Capacity ratio			0.62					
Actuated Cycle Length (s)			80.0		um of los			
Intersection Capacity Utilizatio	n		58.8%	IC	U Level	of Service	е	
Analysis Period (min)			15					
c Critical Lane Group								

7: Doty & MLK Jr.

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Lane Group	EBT	NBT	SBT
Lane Group Flow (vph)	1435	77	54
v/c Ratio	0.54	0.21	0.14
Control Delay	5.8	12.1	16.6
Queue Delay	0.0	0.0	0.0
Total Delay	5.8	12.1	16.6
Queue Length 50th (ft)	64	4	22
Queue Length 95th (ft)	73	m32	56
Internal Link Dist (ft)	348	263	252
Turn Bay Length (ft)			
Base Capacity (vph)	2646	366	373
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.54	0.21	0.14
Intersection Summary			

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

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4 † †						ĵ.			4	
Volume (vph)	34	1147	82	0	0	0	0	22	46	14	33	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	15	15	15	15	15	15	15	15	15	15	15	15
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		0.91						1.00			1.00	
Frpb, ped/bikes		1.00						0.84			1.00	
Flpb, ped/bikes		1.00						1.00			0.94	
Frt		0.99						0.91			1.00	
Flt Protected		1.00						1.00			0.99	
Satd. Flow (prot)		4626						1215			1468	
Flt Permitted		1.00						1.00			0.93	
Satd. Flow (perm)		4626						1215			1383	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	39	1303	93	0	0	0	0	25	52	16	38	0
RTOR Reduction (vph)	0	9	0	0	0	0	0	38	0	0	0	0
Lane Group Flow (vph)	0	1426	0	0	0	0	0	39	0	0	54	0
Confl. Peds. (#/hr)	30		53	53		30	129		101	101		129
Confl. Bikes (#/hr)			5			3			5			1
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Parking (#/hr)	. , ,	25	. , ,	. , ,	. , •	. , ,	. , •	10	. , ,	. , ,	10	. , •
Turn Type	Perm									Perm		
Protected Phases		2						4		. 0	4	
Permitted Phases	2	_						•		4	•	
Actuated Green, G (s)	_	43.6						21.1		•	21.1	
Effective Green, g (s)		45.6						21.6			21.6	
Actuated g/C Ratio		0.57						0.27			0.27	
Clearance Time (s)		6.0						4.5			4.5	
Lane Grp Cap (vph)		2637						328			373	
v/s Ratio Prot		2001						0.03			010	
v/s Ratio Perm		0.31						0.00			c0.04	
v/c Ratio		0.54						0.12			0.14	
Uniform Delay, d1		10.7						22.0			22.2	
Progression Factor		0.48						1.01			0.70	
Incremental Delay, d2		0.40						0.7			0.78	
Delay (s)		5.8						23.0			16.3	
Level of Service		Α						20.0 C			В	
Approach Delay (s)		5.8			0.0			23.0			16.3	
Approach LOS		3.0 A			Α			23.0 C			10.3 B	
• •					^			<u> </u>			D	
Intersection Summary												
HCM Average Control Delay			7.0	Н	CM Level	of Servic	e		Α			
HCM Volume to Capacity ratio			0.41									
Actuated Cycle Length (s)			80.0		um of lost				12.8			
Intersection Capacity Utilization	n		60.6%	IC	CU Level	of Service			В			
Analysis Period (min)			15									
c Critical Lane Group												

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		ተተኈ							7		ર્ન	
Volume (veh/h)	0	1378	212	0	0	0	0	0	122	14	24	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	1451	223	0	0	0	0	0	128	15	25	0
Pedestrians		50			73			75			33	
Lane Width (ft)		15.0			0.0			16.0			16.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		5			0			8			4	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		432			323							
pX, platoon unblocked				0.86			0.86	0.86	0.86	0.86	0.86	
vC, conflicting volume	33			1749			1700	1670	743	718	1782	83
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	33			1299			1242	1208	129	100	1337	83
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	82	97	78	100
cM capacity (veh/h)	1526			425			76	140	709	539	116	882
		ED 0	ED 2		CD 4			1 10		000	110	002
Direction, Lane #	EB 1	EB 2	EB 3	NB 1	SB 1							
Volume Total	580	580	513	128	40							
Volume Left	0	0	0	0	15							
Volume Right	0	0	223	128	0							
cSH	1700	1700	1700	709	164							
Volume to Capacity	0.34	0.34	0.30	0.18	0.24							
Queue Length 95th (ft)	0	0	0	16	23							
Control Delay (s)	0.0	0.0	0.0	11.2	34.0							
Lane LOS	0.0			В	D							
Approach Delay (s)	0.0			11.2	34.0							
Approach LOS				В	D							
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utiliza	ition		70.4%	IC	CU Level o	of Service			С			
Analysis Period (min)			15									

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Lane Group	EBL	SEL	SET	NWT	NWR
Lane Group Flow (vph)	1615	41	142	32	45
v/c Ratio	0.87	0.22	0.59	0.12	0.18
Control Delay	13.8	44.7	55.2	25.8	9.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.8	44.7	55.2	25.8	9.1
Queue Length 50th (ft)	120	21	74	14	1
Queue Length 95th (ft)	153	m48	#137	m36	m26
Internal Link Dist (ft)	110		392	387	
Turn Bay Length (ft)		30			
Base Capacity (vph)	1856	190	240	274	254
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.87	0.22	0.59	0.12	0.18

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.

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Movement	EBL2	EBL	EBR	SBL	SBR	SEL	SET	SER	NWL	NWT	NWR	
Lane Configurations		<u>ሕ</u> ካነሳ				ሻ	†			†	7	,
Volume (vph)	19	1097	434	0	0	39	136	0	0	31	43	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	15	15	13	15	15	10	10	16	9	9	11	
Total Lost time (s)		4.0				4.0	4.0			4.0	4.0	
Lane Util. Factor		*0.64				1.00	1.00			1.00	1.00	
Frpb, ped/bikes		0.98				1.00	1.00			1.00	0.87	
Flpb, ped/bikes		1.00				0.91	1.00			1.00	1.00	
Frt		0.96				1.00	1.00			1.00	0.85	
Flt Protected		0.97				0.95	1.00			1.00	1.00	
Satd. Flow (prot)		3112				1360	1335			1524	1206	
Flt Permitted		0.97				0.74	1.00			1.00	1.00	
Satd. Flow (perm)		3112				1054	1335			1524	1206	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	20	1143	452	0	0	41	142	0	0	32	45	
RTOR Reduction (vph)	0	52	0	0	0	0	0	0	0	0	37	
Lane Group Flow (vph)	0	1563	0	0	0	41	142	0	0	32	8	
Confl. Peds. (#/hr)	39		47	47		57		101	101		57	
Confl. Bikes (#/hr)			6					87			24	
Heavy Vehicles (%)	1%	1%	1%	0%	0%	1%	1%	1%	1%	1%	1%	
Parking (#/hr)		5					11					
Turn Type	Split					Perm					Perm	
Protected Phases	2	2					4			4		
Permitted Phases						4					4	
Actuated Green, G (s)		45.9				13.9	13.9			13.9	13.9	
Effective Green, g (s)		46.4				14.4	14.4			14.4	14.4	
Actuated g/C Ratio		0.58				0.18	0.18			0.18	0.18	
Clearance Time (s)		4.5				4.5	4.5			4.5	4.5	
Lane Grp Cap (vph)		1805				190	240			274	217	
v/s Ratio Prot		c0.50				.00	c0.11			0.02		
v/s Ratio Perm		00.00				0.04	00.11			0.02	0.01	
v/c Ratio		0.87				0.22	0.59			0.12	0.04	
Uniform Delay, d1		14.2				28.0	30.1			27.5	27.1	
Progression Factor		0.56				1.47	1.46			0.89	0.79	
Incremental Delay, d2		5.6				2.5	9.8			0.9	0.3	
Delay (s)		13.6				43.5	53.8			25.3	21.6	
Level of Service		В				D	D			C	C	
Approach Delay (s)		13.6		0.0			51.5			23.2		
Approach LOS		В		A			D			C		
Intersection Summary												
HCM Average Control Delay			17.7	H	CM Level	of Service	е		В			
HCM Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			80.0	Sı	um of lost	time (s)			19.2			
Intersection Capacity Utilization	n		70.4%			of Service	!		С			
Analysis Period (min)			15									
c Critical Lane Group												

11: East Washington & Webster

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Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Group Flow (vph)	9	246	209	582	839	387
v/c Ratio	0.04	0.63	0.44	0.77	0.76	0.77
Control Delay	10.2	22.7	22.7	30.3	20.2	26.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.2	22.7	22.7	30.3	20.2	26.1
Queue Length 50th (ft)	2	120	85	150	117	116
Queue Length 95th (ft)	m5	198	148	#222	m187	m195
Internal Link Dist (ft)		274	258		347	
Turn Bay Length (ft)						
Base Capacity (vph)	243	388	470	752	1109	500
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	0.04	0.63	0.44	0.77	0.76	0.77

Intersection Summary

^{# 95}th 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.

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ħ	↑			↑	77		414	7			
Volume (vph)	9	239	0	0	203	565	19	419	751	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	13	15	15	13	16	16	16
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Lane Util. Factor	1.00	1.00			1.00	0.88		0.91	*0.87			
Frpb, ped/bikes	1.00	1.00			1.00	1.00		0.98	1.00			
Flpb, ped/bikes	0.97	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		0.93	0.85			
Flt Protected	0.95	1.00			1.00	1.00		1.00	1.00			
Satd. Flow (prot)	1493	1337			1621	2592		2842	1281			
Flt Permitted	0.53	1.00			1.00	1.00		1.00	1.00			
Satd. Flow (perm)	838	1337			1621	2592		2842	1281			
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	9	246	0	0	209	582	20	432	774	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	9	246	0	0	209	582	0	839	387	0	0	0
Confl. Peds. (#/hr)	43		66	66		43	48		49	49		48
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	0%	0%	0%
Parking (#/hr)		15						7				
Turn Type	Perm					Prot	Split		Prot			,
Protected Phases		4			8	8	2	2	2			
Permitted Phases	4											
Actuated Green, G (s)	23.7	23.7			23.7	23.7		30.2	30.2			
Effective Green, g (s)	23.2	23.2			23.2	23.2		31.2	31.2			
Actuated g/C Ratio	0.29	0.29			0.29	0.29		0.39	0.39			
Clearance Time (s)	3.5	3.5			3.5	3.5		5.0	5.0			
Lane Grp Cap (vph)	243	388			470	752		1108	500			
v/s Ratio Prot		0.18			0.13	c0.22		0.30	c0.30			
v/s Ratio Perm	0.01											
v/c Ratio	0.04	0.63			0.44	0.77		0.76	0.77			
Uniform Delay, d1	20.4	24.7			23.1	26.0		21.1	21.3			
Progression Factor	0.48	0.59			0.83	0.85		0.78	0.78			
Incremental Delay, d2	0.3	7.6			3.0	7.5		3.3	7.8			
Delay (s)	10.0	22.1			22.1	29.5		19.8	24.4			
Level of Service	В	С			С	С		В	С			
Approach Delay (s)		21.7			27.6			21.3			0.0	
Approach LOS		С			С			С			Α	
Intersection Summary												
HCM Average Control Dela			23.5	Н	CM Leve	l of Service	9		С			
HCM Volume to Capacity ra	atio		0.77									
Actuated Cycle Length (s)			80.0			t time (s)			25.6			
Intersection Capacity Utiliza	ation		80.4%	IC	CU Level	of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			∱ ∱			7
Volume (veh/h)	0	0	560	51	0	124
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	622	57	0	138
Pedestrians		102	108		22	
Lane Width (ft)		0.0	11.0		16.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	8		2	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		1105	1073			
pX, platoon unblocked						
vC, conflicting volume	701				781	463
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	701				781	463
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	74
cM capacity (veh/h)	870				297	532
	WD 4	WD 0	CD 4			
Direction, Lane #	WB 1	WB 2	SB 1			
Volume Total	415	264	138			
Volume Left	0	0	0			
Volume Right	0	57	138			
cSH	1700	1700	532			
Volume to Capacity	0.24	0.16	0.26			
Queue Length 95th (ft)	0	0	26			
Control Delay (s)	0.0	0.0	14.1			
Lane LOS			В			
Approach Delay (s)	0.0		14.1			
Approach LOS			В			
Intersection Summary						
Average Delay			2.4			
Intersection Capacity Utiliz	ation		40.4%	IC	U Level o	of Service
Analysis Period (min)			15			

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					4î.		Ŋ	†			f)	
Volume (veh/h)	0	0	0	4	404	69	44	35	0	0	4	216
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	0	0	0	5	459	78	50	40	0	0	5	245
Pedestrians		24			57			71			71	
Lane Width (ft)		0.0			16.0			16.0			16.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			6			8			8	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					643							
pX, platoon unblocked												
vC, conflicting volume	608			71			581	689	128	655	649	364
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	608			71			581	689	128	655	649	364
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			73	87	100	100	99	58
cM capacity (veh/h)	896			1414			186	312	778	243	329	586
Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1							
Volume Total	234	308	50	40	250							
Volume Left	5	0	50	0	0							
Volume Right	0	78	0	0	245							
cSH	1414	1700	186	312	578							
Volume to Capacity	0.00	0.18	0.27	0.13	0.43							
Queue Length 95th (ft)	0	0	26	11	54							
Control Delay (s)	0.2	0.0	31.3	18.2	15.9							
Lane LOS	Α		D	С	С							
Approach Delay (s)	0.1		25.5		15.9							
Approach LOS			D		С							
Intersection Summary												
Average Delay			7.1									
Intersection Capacity Utiliz	ation		49.4%	IC	CU Level of	Service			Α			
Analysis Period (min)			15									

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Lane Group	WBT	WBR	SBL	SBR	SEL
Lane Group Flow (vph)	186	118	210	192	629
v/c Ratio	0.51	0.15	0.56	0.65	0.68
Control Delay	33.1	4.4	32.5	38.3	20.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	33.1	4.4	32.5	38.3	20.5
Queue Length 50th (ft)	82	13	91	89	130
Queue Length 95th (ft)	145	32	160	#181	m159
Internal Link Dist (ft)	860		573		387
Turn Bay Length (ft)				100	
Base Capacity (vph)	365	797	373	296	931
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.51	0.15	0.56	0.65	0.68

Intersection Summary

^{# 95}th 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.

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Movement	EBL	EBT	WBT	WBR	WBR2	SBL	SBR	SBR2	SEL2	SEL	SER	
Lane Configurations			†	Ž.		¥	Ž.			žΥ		
Volume (vph)	0	0	169	72	36	159	189	17	10	502	60	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	16	16	12	16	16	10	12	12	11	11	11	
Total Lost time (s)			4.0	4.0		4.0	4.0			4.0		
Lane Util. Factor			1.00	1.00		1.00	0.95			0.97		
Frpb, ped/bikes			1.00	0.90		0.99	1.00			0.97		
Flpb, ped/bikes			1.00	1.00		1.00	1.00			0.95		
Frt			1.00	0.85		0.97	0.85			0.98		
Flt Protected			1.00	1.00		0.96	1.00			0.96		
Satd. Flow (prot)			1660	1224		1436	1140			2502		
Flt Permitted			1.00	1.00		0.96	1.00			0.95		
Satd. Flow (perm)			1660	1224		1436	1140			2486		
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.92	0.91	0.91	0.91	0.91	0.91	0.91	
Adj. Flow (vph)	0.51	0.51	186	79	39	175	208	19	11	552	66	
RTOR Reduction (vph)	0	0	0	14	0	0	0	0	0	11	0	
Lane Group Flow (vph)	0	0	186	104	0	210	192	0	0	618	0	
Confl. Peds. (#/hr)	66	U	100	26	66	19	41	26	66	19	41	
Confl. Bikes (#/hr)	00			1	21	19	71	3	00	13	109	
Heavy Vehicles (%)	3%	3%	3%	3%	2%	3%	3%	3%	3%	3%	3%	
Parking (#/hr)	J /0	J /0	J /0	10	Z /0	J /0	10	J /0	J /0	11	J /0	
Turn Type				custom			Prot		Perm	11		
Protected Phases			1	Custom		4	4		reiiii	2		
Permitted Phases			ı	6		7	7		2			
Actuated Green, G (s)			17.1	51.2		20.3	20.3		2	29.6		
Effective Green, g (s)			17.1	51.2		20.8	20.8			29.6		
Actuated g/C Ratio			0.22	0.64		0.26	0.26			0.37		
Clearance Time (s)			4.5	4.0		4.5	4.5			4.0		
Lane Grp Cap (vph)			365	783		373	296			920		
v/s Ratio Prot			c0.11	0.00		0.15	c0.17			.0.05		
v/s Ratio Perm			0.54	0.08		0.50	0.05			c0.25		
v/c Ratio			0.51	0.13		0.56	0.65			0.67		
Uniform Delay, d1			27.4	5.7		25.7	26.3			21.1		
Progression Factor			1.00	1.00		1.00	1.00			0.86		
Incremental Delay, d2			5.0	0.4		6.0	10.5			2.5		
Delay (s)			32.4	6.0		31.7	36.9			20.6		
Level of Service		0.0	С	Α		C	D			C		
Approach Delay (s) Approach LOS		0.0 A	22.2 C			34.2 C				20.6 C		
• •												
Intersection Summary			0= 0		10147							
HCM Average Control Delay			25.0	ŀ	ICM Level	of Service	e		С			
HCM Volume to Capacity ratio			0.62						16.5			
Actuated Cycle Length (s)			80.0		Sum of lost	٠,			12.0			
Intersection Capacity Utilization	1		66.3%	10	CU Level of	of Service)		С			
Analysis Period (min)			15									
c Critical Lane Group												

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Movement	WBL	WBR	NBT	NBR	SBL	SBT	
Lane Configurations	¥		f)			र्स	
Volume (veh/h)	22	23	100	7	43	203	
Sign Control	Stop		Free			Free	
Grade	0%		0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	
Hourly flow rate (vph)	26	27	116	8	50	236	
Pedestrians	58						
Lane Width (ft)	16.0						
Walking Speed (ft/s)	4.0						
Percent Blockage	6						
Right turn flare (veh)							
Median type			None		I	None	
Median storage veh)							
Upstream signal (ft)							
pX, platoon unblocked							
vC, conflicting volume	514	178			182		
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	514	178			182		
tC, single (s)	6.4	6.2			4.1		
tC, 2 stage (s)							
tF (s)	3.5	3.3			2.2		
p0 queue free %	95	97			96		
cM capacity (veh/h)	470	811			1309		
Direction, Lane #	WB 1	NB 1	SB 1				
Volume Total	52	124	286				
Volume Left	26	0	50				
Volume Right	27	8	0				
cSH	599	1700	1309				
	0.09	0.07	0.04				
Volume to Capacity	0.09 7	0.07	0.04				
Queue Length 95th (ft)	11.6	0.0	1.7				
Control Delay (s)	11.0 B	0.0	1.7 A				
Lane LOS Approach Delay (s)	11.6	0.0	1.7				
Approach LOS	11.0 B	0.0	1.7				
	D						
Intersection Summary							
Average Delay			2.3				
Intersection Capacity Utiliz	zation		29.7%	IC	U Level of	Service	
Analysis Period (min)			15				
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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			∱ ∱			77
Volume (veh/h)	0	0	413	11	0	68
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	0	0	469	12	0	77
Pedestrians		7			44	
Lane Width (ft)		0.0			16.0	
Walking Speed (ft/s)		4.0			4.0	
Percent Blockage		0			5	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			424			
pX, platoon unblocked						
vC, conflicting volume	526				520	292
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	526				520	292
tC, single (s)	4.2				6.9	7.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	88
cM capacity (veh/h)	980				460	667
Direction, Lane #	WB 1	WB 2	SB 1	SB 2		
Volume Total	313	169	39	39		
Volume Left	0	0	0	0		
Volume Right	0	12	39	39		
cSH	1700	1700	667	667		
Volume to Capacity	0.18	0.10	0.06	0.06		
Queue Length 95th (ft)	0.10	0	5	5		
Control Delay (s)	0.0	0.0	10.7	10.7		
Lane LOS	0.0	0.0	В	В		
Approach Delay (s)	0.0		10.7			
Approach LOS	0.0		В			
Intersection Summary						
Average Delay			1.5			
Intersection Capacity Utiliz	ation		25.1%	IC	U Level o	of Service
Analysis Period (min)			15			
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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			∱ }			77
Volume (veh/h)	0	0	620	0	0	0
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)	0	0	674	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		1316	862			
pX, platoon unblocked						
vC, conflicting volume	674				674	337
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	674				674	337
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	913				388	659
Direction, Lane #	WB 1	WB 2	SB 1	SB 2		
Volume Total	449	225	0	0		
Volume Left	0	0	0	0		
Volume Right	0	0	0	0		
cSH	1700	1700	1700	1700		
Volume to Capacity	0.26	0.13	0.00	0.00		
Queue Length 95th (ft)	0.20	0.13	0.00	0.00		
Control Delay (s)	0.0	0.0	0.0	0.0		
Lane LOS	0.0	0.0	Α	Α		
Approach Delay (s)	0.0		0.0			
Approach LOS	0.0		0.0 A			
<u>··</u>			^			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utiliz	ation		20.5%	IC	U Level o	of Service
Analysis Period (min)			15			

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Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	ተተኩ					7
Volume (veh/h)	1207	0	0	0	0	0
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)	1312	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	220			535		
pX, platoon unblocked			0.83		0.83	0.83
vC, conflicting volume			1312		1312	437
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			682		682	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			757		320	905
Direction, Lane #	EB 1	EB 2	EB 3	NB 1		
Volume Total	525	525	262	0		
Volume Left	0	0	0	0		
Volume Right	0	0	0	0		
cSH	1700	1700	1700	1700		
Volume to Capacity	0.31	0.31	0.15	0.00		
Queue Length 95th (ft)	0	0	0	0		
Control Delay (s)	0.0	0.0	0.0	0.0		
Lane LOS				Α		
Approach Delay (s)	0.0			0.0		
Approach LOS				Α		
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utili	ization		26.7%	IC	U Level of	of Service
Analysis Period (min)			15			

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Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	ተተኈ					7
Volume (veh/h)	1514	0	0	0	0	0
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)	1646	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	565			190		
pX, platoon unblocked			0.94	.00	0.94	0.94
vC, conflicting volume			1646		1646	549
vC1, stage 1 conf vol			1010		1010	010
vC2, stage 2 conf vol						
vCu, unblocked vol			1451		1451	279
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)			•••		0.0	0.0
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			433		114	673
						010
Direction, Lane #	EB 1	EB 2	EB 3	NB 1		
Volume Total	658	658	329	0		
Volume Left	0	0	0	0		
Volume Right	0	0	0	0		
cSH	1700	1700	1700	1700		
Volume to Capacity	0.39	0.39	0.19	0.00		
Queue Length 95th (ft)	0	0	0	0		
Control Delay (s)	0.0	0.0	0.0	0.0		
Lane LOS				Α		
Approach Delay (s)	0.0			0.0		
Approach LOS				Α		
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utiliz	ation		32.6%	IC	U Level	of Service
Analysis Period (min)			15			
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2: Wilson & Blair 2/1/2012

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Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR	SBT	
Lane Group Flow (vph)	92	374	131	342	487	1145	778	891	
v/c Ratio	0.30	0.64	0.44	0.67	0.49	0.92	0.57	0.83	
Control Delay	43.9	48.2	27.7	39.5	31.5	47.8	6.6	41.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	43.9	48.2	27.7	39.5	31.5	47.8	6.6	41.7	
Queue Length 50th (ft)	58	131	42	225	148	413	144	304	
Queue Length 95th (ft)	114	197	108	358	213	#674	276	#508	
Internal Link Dist (ft)		860			1247	1087		670	
Turn Bay Length (ft)	100		150	300					
Base Capacity (vph)	405	782	382	672	1306	1247	1522	1074	
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	0.23	0.48	0.34	0.51	0.37	0.92	0.51	0.83	
Intersection Summary									

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

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	^	7	ሻ	414			-4↑	7		414	
Volume (vph)	89	363	127	664	114	25	22	1088	755	9	785	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	10	12	12	11	11	15	15	16	11	11	16
Total Lost time (s)	4.5	4.5	4.5	5.0	5.0			5.5	5.0		5.5	
Lane Util. Factor	1.00	0.95	1.00	0.91	0.91			0.95	1.00		0.95	
Frpb, ped/bikes	1.00	1.00	0.90	1.00	0.99			1.00	1.00		1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.97			1.00	1.00		1.00	
Satd. Flow (prot)	1711	3303	1430	1610	3121			3889	1794		3373	
Flt Permitted	0.95	1.00	1.00	0.95	0.97			0.87	1.00		0.86	
Satd. Flow (perm)	1711	3303	1430	1610	3121			3401	1794		2917	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	92	374	131	685	118	26	23	1122	778	9	809	73
RTOR Reduction (vph)	0	0	52	0	3	0	0	0	56	0	5	0
Lane Group Flow (vph)	92	374	79	342	484	0	0	1145	722	0	886	0
Confl. Peds. (#/hr)	61		50	50		61	3		91	91		3
Confl. Bikes (#/hr)						20						
Turn Type	Split		Perm	Split			Perm		custom	Perm		
Protected Phases	4	4		3	3			2	3 6		2	
Permitted Phases		4	4				2			2		
Actuated Green, G (s)	19.4	19.4	19.4	34.8	34.8			40.2	80.5		40.2	
Effective Green, g (s)	19.4	19.4	19.4	34.8	34.8			40.2	80.5		40.2	
Actuated g/C Ratio	0.18	0.18	0.18	0.32	0.32			0.37	0.74		0.37	
Clearance Time (s)	4.5	4.5	4.5	5.0	5.0			5.5			5.5	
Vehicle Extension (s)	3.0	3.0	3.0	2.5	2.5			4.0			4.0	
Lane Grp Cap (vph)	303	586	254	512	993			1250	1320		1072	
v/s Ratio Prot	0.05	c0.11		c0.21	0.15				0.40			
v/s Ratio Perm			0.06					c0.34			0.30	
v/c Ratio	0.30	0.64	0.31	0.67	0.49			0.92	0.55		0.83	
Uniform Delay, d1	39.1	41.7	39.2	32.3	30.1			33.0	6.4		31.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.6	2.3	0.7	3.0	0.3			11.9	0.4		7.3	
Delay (s)	39.7	44.0	39.9	35.3	30.4			44.9	6.8		38.7	
Level of Service	D	D	D	D	С			D	Α		D	
Approach Delay (s)		42.5			32.4			29.5			38.7	
Approach LOS		D			С			С			D	
Intersection Summary												
HCM Average Control Delay			33.8	Н	CM Level	of Service	е		С			
HCM Volume to Capacity ratio)		0.77									
Actuated Cycle Length (s)			109.4		um of los				15.0			
Intersection Capacity Utilization	n		103.9%	IC	U Level	of Service	;		G			
Analysis Period (min)			15									
c Critical Lane Group												

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Lane Group	EBL2	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	4	259	716	426	29	92
v/c Ratio	0.05	0.73	1.01	0.60	0.10	0.27
Control Delay	33.0	46.6	64.0	23.0	28.4	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.0	46.6	64.0	23.0	28.4	12.1
Queue Length 50th (ft)	1	127	~374	171	12	7
Queue Length 95th (ft)	m7	#228	#565	254	33	42
Internal Link Dist (ft)		591	587		207	214
Turn Bay Length (ft)						
Base Capacity (vph)	77	357	706	708	305	339
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	0.05	0.73	1.01	0.60	0.10	0.27

Intersection Summary

Queue shown is maximum after two cycles.

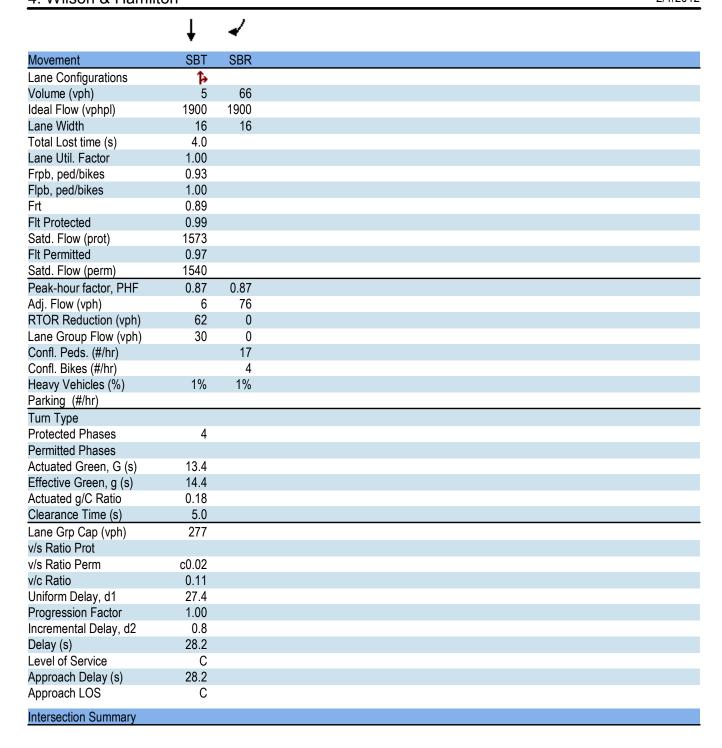
Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.

^{# 95}th percentile volume exceeds capacity, queue may be longer.

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

4: Wilson & Hamilton

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Movement	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL	NBT	NBR	SBL2
Lane Configurations	*		4			ર્ન	Ž.			4		,
Volume (vph)	4	210	0	15	4	619	297	74	7	13	5	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	14	14	16	16	16	16	16	16	16	16
Total Lost time (s)	4.0		4.0			4.0	4.0			4.0		
Lane Util. Factor	0.95		0.95			1.00	1.00			1.00		
Frpb, ped/bikes	1.00		0.99			1.00	0.96			0.99		
Flpb, ped/bikes	1.00		1.00			1.00	1.00			0.99		
Frt	1.00		0.99			1.00	0.85			0.97		
Flt Protected	0.95		0.96			1.00	1.00			0.99		
Satd. Flow (prot)	1472		1609			1572	1573			1800		
Flt Permitted	0.23		0.96			1.00	1.00			0.93		
Satd. Flow (perm)	352		1609			1570	1573			1692		
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	5	241	0	17	5	711	341	85	8	15	6	10
RTOR Reduction (vph)	0	0	3	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	4	0	256	0	0	716	426	0	0	29	0	0
Confl. Peds. (#/hr)	19	17		50	50		19	17	17		17	17
Confl. Bikes (#/hr)											1	
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Parking (#/hr)						16						
Turn Type	Perm	Split			Perm		Perm		Perm			Perm
Protected Phases		2	2			6				4		
Permitted Phases	2				6		6		4			4
Actuated Green, G (s)	17.1		17.1			35.5	35.5			13.4		
Effective Green, g (s)	17.6		17.6			36.0	36.0			14.4		
Actuated g/C Ratio	0.22		0.22			0.45	0.45			0.18		
Clearance Time (s)	4.5		4.5			4.5	4.5			5.0		
Lane Grp Cap (vph)	77		354			707	708			305		
v/s Ratio Prot			c0.16									
v/s Ratio Perm	0.01					c0.46	0.27			0.02		
v/c Ratio	0.05		0.72			1.01	0.60			0.10		
Uniform Delay, d1	24.6		28.9			22.0	16.6			27.4		
Progression Factor	1.25		1.17			1.12	1.11			1.00		
Incremental Delay, d2	1.3		11.9			37.0	3.7			0.6		
Delay (s)	32.0		45.7			61.5	22.2			28.0		
Level of Service	С		D			Е	С			С		
Approach Delay (s)			45.5			46.9				28.0		
Approach LOS			D			D				С		
Intersection Summary												
HCM Average Control Delay	,		45.1	Н	CM Leve	l of Service	се		D			
HCM Volume to Capacity rat	tio		0.75									
Actuated Cycle Length (s)			80.0	S	um of los	t time (s)			12.0			
Intersection Capacity Utilizat	tion		71.9%			of Service)		С			
Analysis Period (min)			15									
c Critical Lane Group												



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Lane Group	SBL	SBR2	NET	NER	SWL	SWR
Lane Group Flow (vph)	1238	122	177	170	21	33
v/c Ratio	0.73	0.20	0.57	0.54	0.10	0.24
Control Delay	8.4	5.3	36.2	35.3	16.1	19.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.4	5.3	36.2	35.3	16.1	19.6
Queue Length 50th (ft)	110	14	87	84	5	7
Queue Length 95th (ft)	m143	m22	m135	m130	16	22
Internal Link Dist (ft)	251		399			
Turn Bay Length (ft)						35
Base Capacity (vph)	1692	616	311	316	212	140
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	0.73	0.20	0.57	0.54	0.10	0.24
Intersection Summary						

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

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Movement	SBL2	SBL	SBR2	NET	NER	SWL	SWR	
Lane Configurations	OBLL	<u>ሕ</u> ኘ	7	^	7	ሻ	7	
Volume (vph)	13	1064	106	29	273	18	29	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	
Lane Width	15	15	13	16	13	13	13	
Total Lost time (s)	10	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		0.97	1.00	0.95	0.95	1.00	1.00	
Frpb, ped/bikes		1.00	0.77	0.98	0.97	1.00	0.49	
Flpb, ped/bikes		0.98	1.00	1.00	1.00	0.99	1.00	
Frt		1.00	0.85	0.88	0.85	1.00	0.85	
Flt Protected		0.95	1.00	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3134	1141	1354	1374	1643	607	
Flt Permitted		0.95	1.00	1.00	1.00	0.53	1.00	
Satd. Flow (perm)		3134	1141	1354	1374	920	607	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	
Adj. Flow (vph)	15	1223	122	33	314	21	33	
RTOR Reduction (vph)	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	1238	122	177	170	21	33	
Confl. Peds. (#/hr)	8	12	240		12	12	240	
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	
Parking (#/hr)		8		7			12	
Turn Type	Perm		Perm		Perm	D.Pm	custom	
Protected Phases		6		4				
Permitted Phases	6		6		4	4	4	
Actuated Green, G (s)		44.2	44.2	18.4	18.4	18.4	18.4	
Effective Green, g (s)		43.2	43.2	18.4	18.4	18.4	18.4	
Actuated g/C Ratio		0.54	0.54	0.23	0.23	0.23	0.23	
Clearance Time (s)		3.0	3.0	4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)		1692	616	311	316	212	140	
v/s Ratio Prot				c0.13				
v/s Ratio Perm		0.39	0.11		0.12	0.02	0.05	
v/c Ratio		0.73	0.20	0.57	0.54	0.10	0.24	
Uniform Delay, d1		14.0	9.5	27.3	27.1	24.3	25.1	
Progression Factor		0.42	0.48	1.09	1.09	0.61	0.60	
Incremental Delay, d2		2.4	0.6	5.5	4.8	0.9	3.9	
Delay (s)		8.3	5.2	35.2	34.4	15.7	18.9	
Level of Service		Α	Α	D	С	В	В	
Approach Delay (s)		8.0		34.8				
Approach LOS		Α		С				
Intersection Summary								
HCM Average Control Delay			13.6	Н	CM Leve	l of Servi	ice	
HCM Volume to Capacity ratio			0.68					
Actuated Cycle Length (s)			80.0	Sı	um of los	t time (s)		
Intersection Capacity Utilizatio	n		58.8%		U Level	٠,		
Analysis Period (min)			15					
c Critical Lane Group								

7: Doty & MLK Jr.

	→	†	↓
Lane Group	EBT	NBT	SBT
Lane Group Flow (vph)	1581	154	54
v/c Ratio	0.60	0.39	0.15
Control Delay	6.2	17.7	16.6
Queue Delay	0.0	0.0	0.0
Total Delay	6.2	17.7	16.6
Queue Length 50th (ft)	72	31	22
Queue Length 95th (ft)	89	m75	56
Internal Link Dist (ft)	348	263	252
Turn Bay Length (ft)			
Base Capacity (vph)	2649	399	371
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.60	0.39	0.15
Intersection Summary			

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

	•	→	•	•	←	•	•	†	/	>	ļ	4
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4 † \$						1>			4	
Volume (vph)	34	1275	82	0	0	0	0	65	70	14	33	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	15	15	15	15	15	15	15	15	15	15	15	15
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		0.91						1.00			1.00	
Frpb, ped/bikes		1.00						0.88			1.00	
Flpb, ped/bikes		1.00						1.00			0.95	
Frt		0.99						0.93			1.00	
Flt Protected		1.00						1.00			0.99	
Satd. Flow (prot)		4633						1296			1483	
Flt Permitted		1.00						1.00			0.91	
Satd. Flow (perm)		4633						1296			1374	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	39	1449	93	0	0	0	0	74	80	16	38	0
RTOR Reduction (vph)	0	9	0	0	0	0	0	49	0	0	0	0
Lane Group Flow (vph)	0	1572	0	0	0	0	0	105	0	0	54	0
Confl. Peds. (#/hr)	30	1012	53	53		30	129	100	101	101	<u> </u>	129
Confl. Bikes (#/hr)	00		5	00		3	120		5	101		1
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Parking (#/hr)	1 / 0	25	1,0	1 70	1 70	170	1 70	10	1 70	1 70	10	1 70
Turn Type	Perm									Perm		
Protected Phases	1 01111	2						4		1 01111	4	
Permitted Phases	2									4	7	
Actuated Green, G (s)	_	43.6						21.1		-	21.1	
Effective Green, g (s)		45.6						21.6			21.6	
Actuated g/C Ratio		0.57						0.27			0.27	
Clearance Time (s)		6.0						4.5			4.5	
Lane Grp Cap (vph)		2641						350			371	
v/s Ratio Prot		2041						c0.08			37 1	
v/s Ratio Perm		0.34						CU.UU			0.04	
v/c Ratio		0.60						0.30			0.04	
Uniform Delay, d1		11.2						23.2			22.2	
•												
Progression Factor Incremental Delay, d2		0.48						1.04 2.2			0.70 0.8	
Delay (s)		6.2						26.4			16.3	
Level of Service		0.2 A						20.4 C			10.3 B	
Approach Delay (s)		6.2			0.0			26.4			16.3	
Approach LOS					0.0 A			20.4 C			10.3 B	
Approach LOS		Α			А			C			D	
Intersection Summary												
HCM Average Control Delay			8.2	Н	CM Level	of Service	e		Α			
HCM Volume to Capacity ratio)		0.50									
Actuated Cycle Length (s)			80.0		um of los				12.8			
Intersection Capacity Utilizatio	n		60.6%	IC	CU Level	of Service			В			
Analysis Period (min)			15									
c Critical Lane Group												

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Movement	EBL	EBT	EBR	WBL	WBT \	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		ተተኈ							7		ર્ન	
Volume (veh/h)	0	1512	254	0	0	0	0	0	123	14	24	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	1592	267	0	0	0	0	0	129	15	25	0
Pedestrians		50			73			75			33	
Lane Width (ft)		15.0			0.0			16.0			16.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		5			0			8			4	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		432			323							
pX, platoon unblocked				0.83			0.83	0.83	0.83	0.83	0.83	
vC, conflicting volume	33			1934			1863	1833	812	766	1967	83
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	33			1427			1342	1306	83	28	1466	83
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	82	98	73	100
cM capacity (veh/h)	1526			370			59	119	737	592	94	882
Direction, Lane #	EB 1	EB 2	EB 3	NB 1	SB 1							
Volume Total	637	637	586	129	40							
Volume Left	0	0	0	0	15							
Volume Right	0	0	267	129	0							
cSH	1700	1700	1700	737	137							
Volume to Capacity	0.37	0.37	0.34	0.18	0.29							
Queue Length 95th (ft)	0	0	0	16	28							
Control Delay (s)	0.0	0.0	0.0	10.9	41.9							
Lane LOS				В	Е							
Approach Delay (s)	0.0			10.9	41.9							
Approach LOS				В	Е							
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utiliza	ition		74.4%	IC	CU Level of	Service			D			
Analysis Period (min)			15									
` '												

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Lane Group	EBL	SEL	SET	NWT	NWR
Lane Group Flow (vph)	1743	41	142	32	45
v/c Ratio	0.94	0.22	0.59	0.12	0.18
Control Delay	20.2	44.8	55.2	25.7	9.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	20.2	44.8	55.2	25.7	9.1
Queue Length 50th (ft)	151	21	74	14	1
Queue Length 95th (ft)	#559	m48	#137	m36	m26
Internal Link Dist (ft)	110		392	387	
Turn Bay Length (ft)		30			
Base Capacity (vph)	1856	190	240	274	254
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.94	0.22	0.59	0.12	0.18

Intersection Summary

^{# 95}th 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.

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Movement	EBL2	EBL	EBR	SBL	SBR	SEL	SET	SER	NWL	NWT	NWR	
Lane Configurations		ሽኘዣ				ሻ	†			†	7	
Volume (vph)	19	1179	475	0	0	39	136	0	0	31	43	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	15	15	13	15	15	10	10	16	9	9	11	
Total Lost time (s)		4.0				4.0	4.0			4.0	4.0	
Lane Util. Factor		*0.64				1.00	1.00			1.00	1.00	
Frpb, ped/bikes		0.98				1.00	1.00			1.00	0.87	
Flpb, ped/bikes		1.00				0.91	1.00			1.00	1.00	
Frt		0.96				1.00	1.00			1.00	0.85	
Flt Protected		0.97				0.95	1.00			1.00	1.00	
Satd. Flow (prot)		3110				1360	1335			1524	1206	
Flt Permitted		0.97				0.74	1.00			1.00	1.00	
Satd. Flow (perm)		3110				1054	1335			1524	1206	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	20	1228	495	0	0	41	142	0	0	32	45	
RTOR Reduction (vph)	0	54	0	0	0	0	0	0	0	0	37	
Lane Group Flow (vph)	0	1689	0	0	0	41	142	0	0	32	8	
Confl. Peds. (#/hr)	39		47	47		57		101	101		57	
Confl. Bikes (#/hr)			6					87			24	
Heavy Vehicles (%)	1%	1%	1%	0%	0%	1%	1%	1%	1%	1%	1%	
Parking (#/hr)		5					11					
Turn Type	Split					Perm					Perm	
Protected Phases	2	2					4			4		
Permitted Phases						4				-	4	
Actuated Green, G (s)		45.9				13.9	13.9			13.9	13.9	
Effective Green, g (s)		46.4				14.4	14.4			14.4	14.4	
Actuated g/C Ratio		0.58				0.18	0.18			0.18	0.18	
Clearance Time (s)		4.5				4.5	4.5			4.5	4.5	
Lane Grp Cap (vph)		1804				190	240			274	217	
v/s Ratio Prot		c0.54				100	c0.11			0.02	<u> </u>	
v/s Ratio Perm		00.01				0.04	00.11			0.02	0.01	
v/c Ratio		0.94				0.22	0.59			0.12	0.04	
Uniform Delay, d1		15.4				28.0	30.1			27.5	27.1	
Progression Factor		0.59				1.47	1.46			0.89	0.78	
Incremental Delay, d2		10.2				2.5	9.8			0.9	0.3	
Delay (s)		19.3				43.6	53.8			25.3	21.5	
Level of Service		В				D	D			C	C	
Approach Delay (s)		19.3		0.0			51.5			23.1	J	
Approach LOS		В		A			D			C		
Intersection Summary												
HCM Average Control Delay			22.4	Н	CM Level	of Service	e		С			
HCM Volume to Capacity ratio			0.85									
Actuated Cycle Length (s)			80.0	Sı	um of lost	t time (s)			19.2			
Intersection Capacity Utilization	n		70.4%			of Service)		C			
Analysis Period (min)			15		, , , , ,							
c Critical Lane Group												

11: East Washington & Webster

	•	→	←	*	†	/
Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Group Flow (vph)	9	246	209	582	892	419
v/c Ratio	0.04	0.63	0.44	0.77	0.85dr	0.84
Control Delay	10.2	22.7	22.7	30.3	21.7	29.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.2	22.7	22.7	30.3	21.7	29.5
Queue Length 50th (ft)	2	120	85	150	139	142
Queue Length 95th (ft)	m5	198	147	#222	m184	m201
Internal Link Dist (ft)		274	258		347	
Turn Bay Length (ft)						
Base Capacity (vph)	243	388	470	752	1107	500
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	0.04	0.63	0.44	0.77	0.81	0.84

Intersection Summary

^{# 95}th 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.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

	۶	→	•	•	←	•	•	†	/	>	ļ	√
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	, T	†			†	77		र्सी के	7			
Volume (vph)	9	239	0	0	203	565	19	439	813	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	13	15	15	13	16	16	16
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Lane Util. Factor	1.00	1.00			1.00	0.88		0.91	*0.87			
Frpb, ped/bikes	1.00	1.00			1.00	1.00		0.98	1.00			
Flpb, ped/bikes	0.97	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		0.93	0.85			
Flt Protected	0.95	1.00			1.00	1.00		1.00	1.00			
Satd. Flow (prot)	1493	1337			1621	2592		2837	1281			
Flt Permitted	0.53	1.00			1.00	1.00		1.00	1.00			
Satd. Flow (perm)	838	1337			1621	2592		2837	1281			
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	9	246	0	0	209	582	20	453	838	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	9	246	0	0	209	582	0	892	419	0	0	0
Confl. Peds. (#/hr)	43		66	66		43	48		49	49		48
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	0%	0%	0%
Parking (#/hr)		15						7				
Turn Type	Perm					Prot	Split		Prot			
Protected Phases		4			8	8	2	2	2			
Permitted Phases	4											
Actuated Green, G (s)	23.7	23.7			23.7	23.7		30.2	30.2			
Effective Green, g (s)	23.2	23.2			23.2	23.2		31.2	31.2			
Actuated g/C Ratio	0.29	0.29			0.29	0.29		0.39	0.39			
Clearance Time (s)	3.5	3.5			3.5	3.5		5.0	5.0			
Lane Grp Cap (vph)	243	388			470	752		1106	500			
v/s Ratio Prot		0.18			0.13	c0.22		0.31	c0.33			
v/s Ratio Perm	0.01											
v/c Ratio	0.04	0.63			0.44	0.77		0.85dr	0.84			
Uniform Delay, d1	20.4	24.7			23.1	26.0		21.7	22.1			
Progression Factor	0.48	0.59			0.83	0.85		0.79	0.79			
Incremental Delay, d2	0.3	7.6			3.0	7.5		3.9	9.8			
Delay (s)	10.0	22.1			22.2	29.5		21.0	27.3			
Level of Service	В	С			С	С		С	С			
Approach Delay (s)		21.7			27.6			23.0			0.0	
Approach LOS		С			C			С			Α	
Intersection Summary												
HCM Average Control Dela	ıy		24.4	Н	CM Leve	l of Servic	е		С			
HCM Volume to Capacity ra	•		0.81									
Actuated Cycle Length (s)			80.0	S	um of los	t time (s)			25.6			
Intersection Capacity Utiliza	ation		80.5%			of Service)		D			
Analysis Period (min)	-		15									
dr Defacto Right Lane. R	ecode with	1 though		a right la	ne.							
c Critical Lane Group		-	5 4.0	.g								
•												

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			∱ ∱			7
Volume (veh/h)	0	0	768	118	0	124
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	853	131	0	138
Pedestrians		102	108		22	
Lane Width (ft)		0.0	11.0		16.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	8		2	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		1105	1073			
pX, platoon unblocked						
vC, conflicting volume	1006				1049	616
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1006				1049	616
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	67
cM capacity (veh/h)	667				200	423
Direction, Lane #	WB 1	WB 2	SB 1			
Volume Total	569	416	138			
Volume Left	0	0	0			
Volume Right	0	131	138			
cSH	1700	1700	423			
Volume to Capacity	0.33	0.24	0.33			
Queue Length 95th (ft)	0	0	35			
Control Delay (s)	0.0	0.0	17.6			
Lane LOS			С			
Approach Delay (s)	0.0		17.6			
Approach LOS			С			
Intersection Summary						
Average Delay			2.2			
Intersection Capacity Utiliz	zation		49.3%	IC	CU Level o	of Service
Analysis Period (min)			15			

	۶	→	•	•	←	•	4	†	<i>></i>	>	↓	4
Movement	EBL	EBT	EBR	WBL	WBT '	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					414		,	†			f)	
Volume (veh/h)	0	0	0	4	605	86	44	35	0	0	4	279
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	0	0	0	5	688	98	50	40	0	0	5	317
Pedestrians		24			57			71			71	
Lane Width (ft)		0.0			16.0			12.0			16.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			6			6			8	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					643							
pX, platoon unblocked												
vC, conflicting volume	856			71			767	936	128	893	887	488
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	856			71			767	936	128	893	887	488
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			41	83	100	100	98	35
cM capacity (veh/h)	724			1444			85	229	794	160	245	487
Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1							
Volume Total	348	441	50	40	322							
Volume Left	5	0	50	0	0							
Volume Right	0	98	0	0	317							
cSH	1444	1700	85	229	480							
Volume to Capacity	0.00	0.26	0.59	0.17	0.67							
Queue Length 95th (ft)	0	0	67	15	122							
Control Delay (s)	0.1	0.0	95.3	24.0	26.4							
Lane LOS	Α		F	С	D							
Approach Delay (s)	0.1		63.7		26.4							
Approach LOS			F		D							
Intersection Summary												_
Average Delay			11.9									
Intersection Capacity Utiliza	ation		60.4%	IC	CU Level of	Service			В			
Analysis Period (min)			15									

	←	*_	-	4	\
Lane Group	WBT	WBR	SBL	SBR	SEL
Lane Group Flow (vph)	237	118	216	196	674
v/c Ratio	0.65	0.15	0.58	0.66	0.72
Control Delay	37.9	4.4	33.1	39.1	21.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	37.9	4.4	33.1	39.1	21.7
Queue Length 50th (ft)	108	13	94	91	144
Queue Length 95th (ft)	#185	32	165	#185	m164
Internal Link Dist (ft)	860		573		387
Turn Bay Length (ft)				100	
Base Capacity (vph)	365	797	372	296	933
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.65	0.15	0.58	0.66	0.72

Intersection Summary

^{# 95}th 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.

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Movement	EBL	EBT	WBT	WBR	WBR2	SBL	SBR	SBR2	SEL2	SEL	SER
Lane Configurations			^	Ž.		¥	Ž.			ăY	
Volume (vph)	0	0	216	72	36	159	198	17	10	543	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	12	16	16	10	12	12	11	11	11
Total Lost time (s)			4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor			1.00	1.00		1.00	0.95			0.97	
Frpb, ped/bikes			1.00	0.90		0.99	1.00			0.98	
Flpb, ped/bikes			1.00	1.00		1.00	1.00			0.95	
Frt			1.00	0.85		0.97	0.85			0.99	
Flt Protected			1.00	1.00		0.96	1.00			0.96	
Satd. Flow (prot)			1660	1224		1430	1140			2508	
Flt Permitted			1.00	1.00		0.96	1.00			0.95	
Satd. Flow (perm)			1660	1224		1430	1140			2493	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.92	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	0	237	79	39	175	218	19	11	597	66
RTOR Reduction (vph)	0	0	0	14	0	0	0	0	0	11	0
Lane Group Flow (vph)	0	0	237	104	0	216	196	0	0	663	0
Confl. Peds. (#/hr)	66	U	201	26	66	19	41	26	66	19	41
Confl. Bikes (#/hr)	00			1	21	10	71	3	00	10	109
Heavy Vehicles (%)	3%	3%	3%	3%	2%	3%	3%	3%	3%	3%	3%
Parking (#/hr)	0 70	0 70	0 70	10	270	070	10	0 70	0 70	11	0 70
Turn Type				custom			Prot		Perm		
Protected Phases			1	Custom		4	4		i Giiii	2	
Permitted Phases			'	6					2		
Actuated Green, G (s)			17.1	51.2		20.3	20.3		2	29.6	
Effective Green, g (s)			17.1	51.2		20.8	20.8			29.6	
Actuated g/C Ratio			0.22	0.64		0.26	0.26			0.37	
Clearance Time (s)			4.5	4.0		4.5	4.5			4.0	
			365				296				
Lane Grp Cap (vph)				783		372				922	
v/s Ratio Prot			c0.14	0.00		0.15	c0.17			-0.07	
v/s Ratio Perm			0.05	0.08		0.50	0.00			c0.27	
v/c Ratio			0.65	0.13		0.58	0.66			0.72	
Uniform Delay, d1			28.4	5.7		25.8	26.5			21.6	
Progression Factor			1.00	1.00		1.00	1.00			0.88	
Incremental Delay, d2			8.7	0.4		6.5	11.1			2.7	
Delay (s)			37.0	6.0		32.3	37.6			21.7	
Level of Service		0.0	D	Α		C	D			C	
Approach Delay (s)		0.0	26.7			34.8				21.7	
Approach LOS		Α	С			С				С	
Intersection Summary											
HCM Average Control Delay			26.7	F	ICM Level	of Service	e		С		
HCM Volume to Capacity ratio			0.68								
Actuated Cycle Length (s)			80.0	S	Sum of lost	t time (s)			12.0		
Intersection Capacity Utilizatio	n		66.3%		CU Level)		С		
Analysis Period (min)			15								
c Critical Lane Group											

	•	4	†	<i>></i>	/	
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		1			4
Volume (veh/h)	0	0	124	0	0	288
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	0	0	144	0	0	335
Pedestrians	58					
Lane Width (ft)	16.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	6					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	537	202			202	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	537	202			202	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)		•				
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	474	787			1287	
			CD 4			
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	144	335			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1287			
Volume to Capacity	0.00	0.08	0.00			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A	0.0	0.0			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	Α					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utiliz	zation		18.5%	IC	U Level o	f Service
Analysis Period (min)			15			

	•	→	•	4	-	4
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			∱ ∱			7
Volume (veh/h)	0	0	431	49	0	268
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	0	0	490	56	0	305
Pedestrians		7			44	
Lane Width (ft)		0.0			16.0	
Walking Speed (ft/s)		4.0			4.0	
Percent Blockage		0			5	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			424			
pX, platoon unblocked						
vC, conflicting volume	589				562	324
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	589				562	324
tC, single (s)	4.2				6.9	7.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	52
cM capacity (veh/h)	927				433	636
Direction, Lane #	WB 1	WB 2	SB 1			
Volume Total	327	219	305			
Volume Left			305			
	0	0				
Volume Right cSH	0 1700	56 1700	305 636			
			0.48			
Volume to Capacity	0.19	0.13				
Queue Length 95th (ft)	0	0	65 45.7			
Control Delay (s)	0.0	0.0	15.7			
Lane LOS	0.0		C 15.7			
Approach Delay (s) Approach LOS	0.0		15.7			
••			С			
Intersection Summary						
Average Delay			5.6			
Intersection Capacity Utiliza	ation		37.8%	IC	U Level o	of Service
Analysis Period (min)			15			

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			∱ ∱			7
Volume (veh/h)	0	0	798	86	0	97
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)	0	0	867	93	0	105
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		1316	862			
pX, platoon unblocked						
vC, conflicting volume	961				914	480
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	961				914	480
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	80
cM capacity (veh/h)	712				272	532
Direction, Lane #	WB 1	WB 2	SB 1			
Volume Total	578	383	105			
Volume Left	0	0	0			
Volume Right	0	93	105			
cSH	1700	1700	532			
Volume to Capacity	0.34	0.23	0.20			
Queue Length 95th (ft)	0.34	0.23	18			
Control Delay (s)	0.0	0.0	13.4			
Lane LOS	0.0	0.0	13.4 B			
Approach Delay (s)	0.0		13.4			
Approach LOS	0.0		13.4 B			
• •			Ь			
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utiliz	ation		37.5%	IC	U Level o	of Service
Analysis Period (min)			15			

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Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	ተተኈ					77	
Volume (veh/h)	1310	49	0	0	0	73	
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)	1424	53	0	0	0	79	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None			None			
Median storage veh)							
Upstream signal (ft)	220			535			
pX, platoon unblocked			0.80		0.80	0.80	
vC, conflicting volume			1477		1451	501	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol			737		704	0	
tC, single (s)			4.1		6.8	6.9	
tC, 2 stage (s)							
tF (s)			2.2		3.5	3.3	
p0 queue free %			100		100	91	
cM capacity (veh/h)			695		298	871	
Direction, Lane #	EB 1	EB 2	EB 3	NB 1	NB 2		
Volume Total	570	570	338	40	40		
Volume Left	0	0	0	0	0		
Volume Right	0	0	53	40	40		
cSH	1700	1700	1700	871	871		
Volume to Capacity	0.34	0.34	0.20	0.05	0.05		
Queue Length 95th (ft)	0	0	0	4	4		
Control Delay (s)	0.0	0.0	0.0	9.3	9.3		
Lane LOS				Α	Α		
Approach Delay (s)	0.0			9.3			
Approach LOS				Α			
Intersection Summary							
Average Delay			0.5				
Intersection Capacity Utiliz	ation		36.4%	IC	U Level	of Service	
Analysis Period (min)			15				
			. •				

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Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	ተተኩ					7
Volume (veh/h)	1588	61	0	0	0	49
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)	1726	66	0	0	0	53
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	565			190		
pX, platoon unblocked			0.93		0.93	0.93
vC, conflicting volume			1792		1759	609
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1582		1546	306
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	92
cM capacity (veh/h)			382		98	640
Direction, Lane #	EB 1	EB 2	EB 3	NB 1		
Volume Total	690	690	412	53		
Volume Left	0	0	0	0		
Volume Right	0	0	66	53		
cSH	1700	1700	1700	640		
Volume to Capacity	0.41	0.41	0.24	0.08		
Queue Length 95th (ft)	0	0	0	7		
Control Delay (s)	0.0	0.0	0.0	11.1		
Lane LOS				В		
Approach Delay (s)	0.0			11.1		
Approach LOS				В		
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization	ation		42.0%	IC	U Level	of Service
Analysis Period (min)			15			
, , ,						

2: Wilson & Blair Performance by movemen	2: Wils	on & Blaii	 Performance 	by movement
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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Delay / Veh (s)	43.1	32.0	4.5	32.3	28.3	16.8	405.1	361.2	192.1	121.8	68.8	35.3

2: Wilson & Blair Performance by movement

4: Wilson & Hamilton Performance by movement

Movement	EBL2	EBL	EBT	WBL	WBT	WBR	WBR2	NBL	NBT	SBL2	SBT	SBR
Delay / Veh (s)	24.4	24.6	2.4	19.0	20.1	15.5	16.6	30.7	24.4	28.0	20.9	8.7

4: Wilson & Hamilton Performance by movement

Movement	All	
Delay / Veh (s)	18.8	

5: Doty & Hamilton Performance by movement

Movement	SBL2	SBL	SBR2	NET	NER	SWL	SWT	SWR	All
Delay / Veh (s)	9.2	10.3	12.1	25.6	26.9	26.7	0.5	20.7	13.7

7: Doty & MLK Jr. Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All
Delay / Veh (s)	10.1	8.4	8.4	20.5	11.8	20.1	8.8	8.9

8: Doty & Pinckney Performance by movement

Movement	EBT	EBR	NBT	NBR	SBL	SBT	All
Delay / Veh (s)	7.4	9.2	7.3	66.0	50.7	73.4	13.2

9: Doty & Webster Performance by movement

Movement	EBL2	EBL	EBT	EBR	SEL	SET	NWT	NWR	All	
Delay / Veh (s)	5.5	9.9	1.4	11.3	46.3	39.9	14.7	8.2	13.5	

11: East Washington & Webster Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Delay / Veh (s)	64.9	16.1	17.4	20.8	11.9	18.4	25.5	21.2

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13: Wilson & MLK Jr. Performance by movement

Movement	WBT	WBR	SBR	All
Delay / Veh (s)	1.0	0.6	7.9	2.1

14: Wilson & Pinckney Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All	
Delay / Veh (s)	2.6	1.6	9.7	12.2	24.5	6.9	8.9	6.0	

15: Wilson & Butler Performance by movement

Movement	WBT	WBR	WBR2	SBL	SBR	SBR2	SEL2	SEL	SET	SER	All	
Delay / Veh (s)	31.5	9.7	6.5	31.4	28.4	26.5	20.6	18.3	1.9	13.0	22.1	

22: Government East & Pinckney Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Delay / Veh (s)	37.9	65.6	20.3	15.0	2.9	1.6	12.1

23: Wilson & Government East Performance by movement

Movement	WBT	WBR	SBR	All
elay / Veh (s)	1.0	0.8	5.5	1.7

Total Zone Performance

Delay / Veh (s) 2462.7

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Intersection: 2: Wilson & Blair

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	LT	TR	LT	Т	R	LT	TR
Maximum Queue (ft)	174	205	212	175	298	308	161	1143	1140	1140	644	659
Average Queue (ft)	64	108	118	14	169	186	40	1024	1036	1007	340	358
95th Queue (ft)	137	175	184	92	259	274	104	1326	1326	1411	623	630
Link Distance (ft)		833	833			1282	1282	1113	1113	1113	686	686
Upstream Blk Time (%)								25	29	32	1	2
Queuing Penalty (veh)								0	0	0	0	0
Storage Bay Dist (ft)	100			150	300							
Storage Blk Time (%)	3	11	3	0	0	0						
Queuing Penalty (veh)	5	9	3	0	1	1						

Intersection: 4: Wilson & Hamilton

Movement	EB	EB	WB	WB	NB	SB
Directions Served	<l< td=""><td>L</td><td>LT</td><td>R></td><td>LTR</td><td><tr< td=""></tr<></td></l<>	L	LT	R>	LTR	<tr< td=""></tr<>
Maximum Queue (ft)	88	96	349	206	49	76
Average Queue (ft)	36	50	172	103	15	28
95th Queue (ft)	73	85	286	175	43	59
Link Distance (ft)	579	579	518	518	245	233
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 5: Doty & Hamilton

Movement	SB	SB	SB	NE	NE	SW	SW
Directions Served	<l< td=""><td>L</td><td>></td><td>TR</td><td>R</td><td>L</td><td>R</td></l<>	L	>	TR	R	L	R
Maximum Queue (ft)	188	225	85	99	115	51	57
Average Queue (ft)	91	119	22	50	47	11	20
95th Queue (ft)	154	186	57	87	91	38	54
Link Distance (ft)	241	241	241	283	283	374	
Upstream Blk Time (%)		0					
Queuing Penalty (veh)		0					
Storage Bay Dist (ft)							35
Storage Blk Time (%)						1	11
Queuing Penalty (veh)						0	2

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Intersection: 7: Doty & MLK Jr.

Movement	EB	EB	EB	NB	SB
Directions Served	LT	T	TR	TR	LT
Maximum Queue (ft)	118	165	222	83	88
Average Queue (ft)	52	82	111	35	26
95th Queue (ft)	97	136	186	69	67
Link Distance (ft)	365	365	365	237	257
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 8: Doty & Pinckney

Movement	EB	EB	EB	NB	SB
Directions Served	Т	Т	TR	R	LT
Maximum Queue (ft)	129	190	195	118	98
Average Queue (ft)	40	79	111	86	36
95th Queue (ft)	106	161	187	137	81
Link Distance (ft)	147	147	147	101	265
Upstream Blk Time (%)	0	1	3	31	
Queuing Penalty (veh)	0	2	13	38	
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 9: Doty & Webster

Movement	EB	EB	EB	SE	SE	NW	NW
Directions Served	<l< td=""><td>L</td><td>LR</td><td>L</td><td>Т</td><td>T</td><td>R</td></l<>	L	LR	L	Т	T	R
Maximum Queue (ft)	101	121	121	55	188	71	51
Average Queue (ft)	65	88	99	28	99	16	21
95th Queue (ft)	108	123	122	67	166	47	47
Link Distance (ft)	92	92	92		371	325	325
Upstream Blk Time (%)	3	9	20				
Queuing Penalty (veh)	14	42	97				
Storage Bay Dist (ft)				30			
Storage Blk Time (%)				7	62		
Queuing Penalty (veh)				9	23		

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Intersection: 11: East Washington & Webster

Movement	EB	EB	WB	WB	WB	NB	NB	NB	
Directions Served	L	T	Т	R	R	LT	TR	R	
Maximum Queue (ft)	56	192	215	197	217	237	302	293	
Average Queue (ft)	11	85	79	105	126	80	167	172	
95th Queue (ft)	38	158	159	169	194	172	256	256	
Link Distance (ft)	281	281	243	243	243	329	329	329	
Upstream Blk Time (%)			0		0	0	0		
Queuing Penalty (veh)			0		0	0	0		
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 13: Wilson & MLK Jr.

Movement	WB	WB	SB
Directions Served	T	TR	R
Maximum Queue (ft)	74	72	93
Average Queue (ft)	18	14	44
95th Queue (ft)	54	48	73
Link Distance (ft)	128	128	237
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 14: Wilson & Pinckney

Movement	WB	WB	NB	NB	SB	
Directions Served	LT	TR	L	T	TR	
Maximum Queue (ft)	109	122	52	71	103	
Average Queue (ft)	16	29	25	26	59	
95th Queue (ft)	69	91	48	60	95	
Link Distance (ft)	148	148		167	78	
Upstream Blk Time (%)	0	1			5	
Queuing Penalty (veh)	0	3			11	
Storage Bay Dist (ft)			75			
Storage Blk Time (%)			0	2		
Queuing Penalty (veh)			0	1		

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Intersection: 15: Wilson & Butler

Movement	WB	WB	SB	SB	SE	SE
Directions Served	T	R>	LR	R>	<l< td=""><td>LR</td></l<>	LR
Maximum Queue (ft)	186	102	231	125	324	90
Average Queue (ft)	90	32	110	77	149	84
95th Queue (ft)	158	74	195	137	274	104
Link Distance (ft)	833	833	526		325	
Upstream Blk Time (%)					0	
Queuing Penalty (veh)					2	
Storage Bay Dist (ft)				100		65
Storage Blk Time (%)			12	1	19	17
Queuing Penalty (veh)			13	2	58	44

Intersection: 22: Government East & Pinckney

Movement	WB	B70	NB	SB
Directions Served	LR	T	TR	LT
Maximum Queue (ft)	91	13	86	96
Average Queue (ft)	35	2	29	20
95th Queue (ft)	92	14	88	65
Link Distance (ft)	80	34	78	101
Upstream Blk Time (%)	7	3	12	0
Queuing Penalty (veh)	0	0	13	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 23: Wilson & Government East

Movement	WB	WB	SB
Directions Served	T	TR	R
Maximum Queue (ft)	14	42	66
Average Queue (ft)	1	3	33
95th Queue (ft)	8	24	56
Link Distance (ft)	313	313	36
Upstream Blk Time (%)			6
Queuing Penalty (veh)			0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 408

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2: Wilson & Blair Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay (hr)	0.9	4.3	0.2	6.0	0.7	0.1	2.7	108.0	42.1	0.3	16.9	0.7
Delay / Veh (s)	40.9	33.9	5.0	32.7	28.0	13.2	446.8	399.7	228.4	115.8	76.3	50.6

2: Wilson & Blair Performance by movement

Movement	All
Total Delay (hr)	182.9
Delay / Veh (s)	166.4

4: Wilson & Hamilton Performance by movement

Movement	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL	NBT	NBR	SBL2
Total Delay (hr)	0.0	1.2	0.0	0.1	0.0	3.0	1.0	0.3	0.0	0.1	0.0	0.1
Delay / Veh (s)	26.0	27.7	2.5	17.1	37.8	21.9	15.7	15.6	24.7	27.7	26.0	29.8

4: Wilson & Hamilton Performance by movement

Movement	SBT SBR	All
Total Delay (hr)	0.0 0.2	6.1
Delay / Veh (s)	26.3 10.0	20.4

5: Doty & Hamilton Performance by movement

Movement	SBL2	SBL	SBR2	NET	NER	SWL	SWT	SWR	All
Total Delay (hr)	0.0	3.0	0.3	0.2	1.6	0.1	0.0	0.2	5.4
Delay / Veh (s)	9.5	11.1	12.3	25.6	25.6	27.8	0.5	23.0	14.1

7: Doty & MLK Jr. Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All
Total Delay (hr)	0.1	2.7	0.2	0.1	0.2	0.1	0.1	3.4
Delay / Veh (s)	8.3	8.6	7.8	20.8	12.4	20.1	9.2	9.1

8: Doty & Pinckney Performance by movement

Movement	EBT	EBR	NBT	NBR	SBL	SBT	All	
Total Delay (hr)	3.2	0.7	0.0	3.3	0.4	1.1	8.6	
Delay / Veh (s)	8.5	10.9	24.1	95.4	117.7	145.4	17.8	

9: Doty & Webster Performance by movement

Movement	EBL2	EBL	EBT	EBR	SEL	SET	NWT	NWR	All
Total Delay (hr)	0.0	3.0	0.0	1.4	0.5	1.9	0.2	0.1	7.2
Delay / Veh (s)	8.3	10.1	1.5	11.5	53.5	41.7	16.9	8.7	14.1

11: East Washington & Webster Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All	
Total Delay (hr)	0.1	1.2	1.1	3.5	0.1	2.2	5.5	13.7	
Delay / Veh (s)	47.3	17.5	18.6	22.0	12.2	18.8	26.9	22.2	

13: Wilson & MLK Jr. Performance by movement

Movement	WBT	WBR	SBR	All
Total Delay (hr)	0.2	0.0	0.3	0.4
Delay / Veh (s)	1.0	0.6	8.1	2.2

14: Wilson & Pinckney Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Total Delay (hr)	0.0	0.4	0.6	0.9	1.2	0.0	0.6	3.7
Delay / Veh (s)	2.3	3.4	32.1	70.6	110.6	7.1	9.7	16.7

15: Wilson & Butler Performance by movement

Movement	WBT	WBR	WBR2	SBL	SBR	SBR2	SEL2	SEL	SET	SER	All	
Total Delay (hr)	1.5	0.2	0.1	1.4	1.5	0.2	0.0	2.6	0.0	0.2	7.8	
Delay / Veh (s)	31.9	9.1	5.9	31.0	29.5	30.3	14.9	18.7	2.1	15.0	22.7	

22: Government East & Pinckney Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Total Delay (hr)	0.9	1.6	1.1	0.1	0.0	0.2	3.9
Delay / Veh (s)	173.1	261.7	38.7	27.6	3.8	2.8	34.1

23: Wilson & Government East Performance by movement

24: Wilson & West Access Performance by movement

Movement	WBT	All	
Total Delay (hr)	0.1	0.1	
Delay / Veh (s)	0.5	0.5	

25: Doty & West Access Performance by movement

Movement	EBT	All	
Total Delay (hr)	0.7	0.7	
Delay / Veh (s)	2.0	2.0	

26: Doty & East Access Performance by movement

Movement	EBT	All
Total Delay (hr)	1.4	1.4
Delay / Veh (s)	3.4	3.4

Total Zone Performance

Total Delay (hr)	247.1
Delay / Veh (s)	2190.8

Intersection: 2: Wilson & Blair

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	LT	TR	LT	T	R	LT	TR
Maximum Queue (ft)	144	205	234	146	293	306	123	1145	1152	1143	681	675
Average Queue (ft)	56	110	123	16	183	201	36	1022	1032	986	356	369
95th Queue (ft)	115	176	195	100	273	292	87	1344	1345	1453	657	659
Link Distance (ft)		833	833			1282	1282	1113	1113	1113	686	686
Upstream Blk Time (%)								30	34	33	5	6
Queuing Penalty (veh)								0	0	0	0	0
Storage Bay Dist (ft)	100			150	300							
Storage Blk Time (%)	1	13	3	0	0	0						
Queuing Penalty (veh)	2	11	4	0	1	2						

Intersection: 4: Wilson & Hamilton

Movement	EB	EB	WB	WB	NB	SB
Directions Served	<	<lr< td=""><td>LT</td><td>R></td><td>LTR</td><td><tr< td=""></tr<></td></lr<>	LT	R>	LTR	<tr< td=""></tr<>
Maximum Queue (ft)	25	206	336	271	56	68
Average Queue (ft)	2	86	184	111	18	27
95th Queue (ft)	13	163	313	204	48	55
Link Distance (ft)	579	579	524	524	246	240
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 5: Doty & Hamilton

Movement	SB	SB	SB	NE	NE	SW	SW	
Directions Served	<l< td=""><td>L</td><td>></td><td>TR</td><td>R</td><td>L</td><td>R</td><td></td></l<>	L	>	TR	R	L	R	
Maximum Queue (ft)	190	216	80	95	108	40	56	
Average Queue (ft)	104	128	24	50	47	10	23	
95th Queue (ft)	176	200	59	83	89	33	57	
Link Distance (ft)	241	241	241	289	289	374		
Upstream Blk Time (%)	0	0						
Queuing Penalty (veh)	0	0						
Storage Bay Dist (ft)							35	
Storage Blk Time (%)						1	15	
Queuing Penalty (veh)						0	3	

Intersection: 7: Doty & MLK Jr.

Movement	EB	EB	EB	NB	SB	
Directions Served	LT	T	TR	TR	LT	
Maximum Queue (ft)	104	169	222	94	88	
Average Queue (ft)	45	89	116	36	26	
95th Queue (ft)	88	147	187	72	63	
Link Distance (ft)	365	365	365	237	257	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 8: Doty & Pinckney

Movement	EB	EB	EB	NB	SB
Directions Served	T	T	TR	R	LT
Maximum Queue (ft)	134	193	197	119	119
Average Queue (ft)	44	82	119	98	51
95th Queue (ft)	109	165	198	141	121
Link Distance (ft)	147	147	147	101	265
Upstream Blk Time (%)	0	1	4	51	
Queuing Penalty (veh)	1	3	17	64	
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 9: Doty & Webster

Movement	EB	EB	EB	SE	SE	NW	NW
Directions Served	<l< td=""><td>L</td><td>LR</td><td>L</td><td>T</td><td>T</td><td>R</td></l<>	L	LR	L	T	T	R
Maximum Queue (ft)	106	132	124	55	215	46	60
Average Queue (ft)	65	90	101	26	106	17	23
95th Queue (ft)	108	127	122	62	187	43	50
Link Distance (ft)	92	92	92		371	325	325
Upstream Blk Time (%)	3	9	20		0		
Queuing Penalty (veh)	13	47	103		0		
Storage Bay Dist (ft)				30			
Storage Blk Time (%)				7	62		
Queuing Penalty (veh)				9	24		

Intersection: 11: East Washington & Webster

Movement	EB	EB	WB	WB	WB	NB	NB	NB	
Directions Served	L	Т	T	R	R	LT	TR	R	
Maximum Queue (ft)	38	200	196	212	232	212	276	305	
Average Queue (ft)	10	92	85	114	134	86	166	175	
95th Queue (ft)	34	172	164	191	209	178	253	264	
Link Distance (ft)	281	281	243	243	243	329	329	329	
Upstream Blk Time (%)		0	0	0	0		0	0	
Queuing Penalty (veh)		0	0	0	0		0	1	
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 13: Wilson & MLK Jr.

Movement	WB	WB	SB
Directions Served	T	TR	R
Maximum Queue (ft)	80	64	102
Average Queue (ft)	18	14	43
95th Queue (ft)	59	49	78
Link Distance (ft)	128	128	237
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 14: Wilson & Pinckney

Movement	WB	WB	NB	NB	SB	
Directions Served	LT	TR	L	T	TR	
Maximum Queue (ft)	152	135	79	117	88	
Average Queue (ft)	29	41	26	46	60	
95th Queue (ft)	115	120	59	125	91	
Link Distance (ft)	132	132		167	78	
Upstream Blk Time (%)	2	8		8	6	
Queuing Penalty (veh)	5	18		0	14	
Storage Bay Dist (ft)			75			
Storage Blk Time (%)			0	13		
Queuing Penalty (veh)			0	5		

Intersection: 15: Wilson & Butler

Movement	WB	WB	SB	SB	SE	SE
Directions Served	T	R>	LR	R>	<l< td=""><td>LR</td></l<>	LR
Maximum Queue (ft)	210	99	237	125	320	90
Average Queue (ft)	97	31	114	82	156	85
95th Queue (ft)	171	72	196	139	272	102
Link Distance (ft)	833	833	526		325	
Upstream Blk Time (%)					1	
Queuing Penalty (veh)					4	
Storage Bay Dist (ft)				100		65
Storage Blk Time (%)			13	2	19	19
Queuing Penalty (veh)			14	4	60	51

Intersection: 22: Government East & Pinckney

Movement	WB	B70	NB	SB
Directions Served	LR	T	TR	LT
Maximum Queue (ft)	142	41	95	141
Average Queue (ft)	72	10	46	25
95th Queue (ft)	166	39	108	87
Link Distance (ft)	80	34	78	101
Upstream Blk Time (%)	35	24	27	2
Queuing Penalty (veh)	0	0	29	4
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 23: Wilson & Government East

Movement	WB	WB	SB	SB	B69	B69
Directions Served	Ţ	TR	R	R	Ţ	T
Maximum Queue (ft)	70	103	58	72	7	11
Average Queue (ft)	16	21	26	28	1	1
95th Queue (ft)	120	134	60	72	9	15
Link Distance (ft)	313	313	36	36	131	131
Upstream Blk Time (%)	1	1	6	9		
Queuing Penalty (veh)	1	2	0	0		
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 24: Wilson & West Access

Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Intersection: 25: Doty & West Access

Movement	EB	EB	EB
Directions Served	Ţ	T	TR
Maximum Queue (ft)	36	152	188
Average Queue (ft)	1	11	37
95th Queue (ft)	20	72	125
Link Distance (ft)	152	152	152
Upstream Blk Time (%)		0	0
Queuing Penalty (veh)		0	2
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 26: Doty & East Access

Movement	EB	EB	EB	
Directions Served	T	T	TR	
Maximum Queue (ft)	75	142	154	
Average Queue (ft)	7	36	102	
95th Queue (ft)	37	106	176	
Link Distance (ft)	71	71	71	
Upstream Blk Time (%)	0	2	14	
Queuing Penalty (veh)	1	12	72	
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 604

2: Wilson & Blair Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay (hr)	1.1	4.6	0.2	5.9	1.0	0.1	1.6	85.1	30.1	0.2	12.0	0.5
Delay / Veh (s)	43.4	34.3	5.1	32.7	30.0	17.0	358.2	300.1	155.8	81.3	54.1	24.2

2: Wilson & Blair Performance by movement

Movement	All
Total Delay (hr)	142.3
Delay / Veh (s)	125.3

4: Wilson & Hamilton Performance by movement

Movement	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL	NBT	NBR	SBL2
Total Delay (hr)	0.0	1.5	0.0	0.1	0.0	5.3	1.7	0.4	0.1	0.1	0.0	0.1
Delay / Veh (s)	39.7	27.9	2.9	18.3	32.8	32.4	20.9	18.7	31.0	25.3	23.1	33.1

4: Wilson & Hamilton Performance by movement

Movement	SBT SBR	All
Total Delay (hr)	(hr) 0.1 0.2	9.6
Delay / Veh (s)		26.8

5: Doty & Hamilton Performance by movement

Movement	SBL2	SBL	SBR2	NET	NER	SWL	SWT	SWR	All
Total Delay (hr)	0.0	3.8	0.3	0.2	2.3	0.2	0.0	0.2	7.0
Delay / Veh (s)	14.1	13.9	12.4	25.2	31.5	38.5	0.6	20.3	17.6

7: Doty & MLK Jr. Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All
Total Delay (hr)	0.1	4.6	0.2	0.4	0.6	0.2	0.2	6.4
Delay / Veh (s)	16.1	13.9	11.9	27.4	28.6	48.1	14.9	15.4

8: Doty & Pinckney Performance by movement

Movement	EBT	EBR	NBT	NBR	SBL	SBT	All
Total Delay (hr)	7.3	1.5	0.1	5.3	0.6	1.6	16.3
Delay / Veh (s)	18.6	21.8	91.8	171.1	154.3	230.1	32.7

9: Doty & Webster Performance by movement

Movement	EBL2	EBL	EBT	EBR	SEL	SET	NWT	NWR	All
Total Delay (hr)	0.0	3.3	0.0	1.7	0.5	1.9	0.2	0.1	7.7
Delay / Veh (s)	5.3	10.8	2.5	14.2	50.1	42.1	15.0	9.1	15.0

11: East Washington & Webster Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All	
Total Delay (hr)	0.1	1.0	1.0	3.6	0.1	2.4	6.2	14.3	
Delay / Veh (s)	65.9	14.6	17.9	22.6	11.8	20.3	29.5	23.3	

13: Wilson & MLK Jr. Performance by movement

Movement	WBT	WBR	SBR	All
Total Delay (hr)	0.4	0.0	0.3	0.7
Delay / Veh (s)	1.7	1.4	10.2	2.7

14: Wilson & Pinckney Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Total Delay (hr)	0.0	0.8	0.6	0.7	1.1	0.0	1.3	4.5
Delay / Veh (s)	2.4	4.8	25.4	49.9	114.5	17.4	17.8	15.5

15: Wilson & Butler Performance by movement

Movement	WBT	WBR	WBR2	SBL	SBR	SBR2	SEL2	SEL	SET	SER	All	
Total Delay (hr)	2.3	0.2	0.1	1.5	1.6	0.1	0.1	2.9	0.0	0.3	9.0	
Delay / Veh (s)	37.6	9.1	5.7	33.4	29.1	29.9	20.4	20.0	3.4	16.5	24.8	

22: Government East & Pinckney Performance by movement

Movement	NBT	SBT	All
Total Delay (hr)	1.1	0.2	1.3
Delay / Veh (s)	34.4	2.4	11.8

23: Wilson & Government East Performance by movement

Movement	WBT	WBR	SBR	All
Total Delay (hr)	r) 0.3	0.0	0.9	1.3
Delay / Veh (s)	2.8	2.6	13.1	6.4

24: Wilson & West Access Performance by movement

Movement	WBT	WBR	SBR	All
Total Delay (hr)	0.2	0.0	0.1	0.4
Delay / Veh (s)	0.8	1.6	5.4	1.3

25: Doty & West Access Performance by movement

Movement	EBT	EBR	NBR	All
Total Delay (hr)	1.7	0.1	0.6	2.3
Delay / Veh (s)	4.8	5.7	33.0	6.1

26: Doty & East Access Performance by movement

Movement	nent	EBT	EBR	NBR	All
Total Delay (hr)	Pelay (hr)	1.3	0.1	1.0	2.3
Delay / Veh (s)	Veh (s)	3.2	3.1	72.2	5.3

Total Zone Performance

Total Delay (hr)	225.4
Delay / Veh (s)	1927.3

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Intersection: 2: Wilson & Blair

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	LT	TR	LT	T	R	LT	TR
Maximum Queue (ft)	166	223	255	175	291	304	156	1134	1137	1144	601	610
Average Queue (ft)	68	119	131	28	181	199	47	977	989	948	304	327
95th Queue (ft)	147	187	205	132	263	283	103	1376	1379	1480	513	539
Link Distance (ft)		833	833			1282	1282	1113	1113	1113	686	686
Upstream Blk Time (%)								21	24	29	0	0
Queuing Penalty (veh)								0	0	0	0	0
Storage Bay Dist (ft)	100			150	300							
Storage Blk Time (%)	4	16	4	0	0	0						
Queuing Penalty (veh)	8	14	5	0	1	1						

Intersection: 4: Wilson & Hamilton

Movement	EB	EB	WB	WB	NB	SB
Directions Served	<	<lr< td=""><td>LT</td><td>R></td><td>LTR</td><td><tr< td=""></tr<></td></lr<>	LT	R>	LTR	<tr< td=""></tr<>
Maximum Queue (ft)	30	202	492	409	60	94
Average Queue (ft)	1	103	265	172	18	31
95th Queue (ft)	9	177	483	374	50	72
Link Distance (ft)	579	579	524	524	246	240
Upstream Blk Time (%)			1	1		
Queuing Penalty (veh)			6	2		
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 5: Doty & Hamilton

Movement	SB	SB	SB	NE	NE	SW	SW
Directions Served	<l< td=""><td>L</td><td>></td><td>TR</td><td>R</td><td>L</td><td>R</td></l<>	L	>	TR	R	L	R
Maximum Queue (ft)	230	248	101	135	144	69	55
Average Queue (ft)	114	142	25	62	63	15	20
95th Queue (ft)	198	220	71	106	110	47	54
Link Distance (ft)	241	241	241	289	289	374	
Upstream Blk Time (%)	2	2	0				
Queuing Penalty (veh)	7	8	0				
Storage Bay Dist (ft)							35
Storage Blk Time (%)						4	11
Queuing Penalty (veh)						1	2

Intersection: 7: Doty & MLK Jr.

Movement	EB	EB	EB	NB	SB
Directions Served	LT	T	TR	TR	LT
Maximum Queue (ft)	182	255	272	156	100
Average Queue (ft)	66	111	141	67	30
95th Queue (ft)	171	220	251	129	81
Link Distance (ft)	365	365	365	237	257
Upstream Blk Time (%)	3	3	3		
Queuing Penalty (veh)	12	12	12		
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 8: Doty & Pinckney

Movement	EB	EB	EB	NB	SB
Directions Served	T	T	TR	R	LT
Maximum Queue (ft)	137	217	233	192	168
Average Queue (ft)	47	94	149	143	66
95th Queue (ft)	123	193	251	224	151
Link Distance (ft)	131	131	131	101	265
Upstream Blk Time (%)	4	1	12	66	
Queuing Penalty (veh)	16	5	55	81	
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 9: Doty & Webster

Movement	EB	EB	EB	SE	SE	NW	NW
Directions Served	<l< td=""><td>L</td><td>LR</td><td>L</td><td>Т</td><td>T</td><td>R</td></l<>	L	LR	L	Т	T	R
Maximum Queue (ft)	132	174	185	54	197	66	60
Average Queue (ft)	65	110	154	28	102	16	25
95th Queue (ft)	119	184	216	65	182	46	52
Link Distance (ft)	92	92	92		371	325	325
Upstream Blk Time (%)	2	11	25				
Queuing Penalty (veh)	13	62	139				
Storage Bay Dist (ft)				30			
Storage Blk Time (%)				7	64		
Queuing Penalty (veh)				10	25		

Intersection: 11: East Washington & Webster

Movement	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	R	LT	TR	R
Maximum Queue (ft)	40	191	196	224	256	236	327	313
Average Queue (ft)	7	81	81	112	138	89	184	190
95th Queue (ft)	29	151	152	188	212	193	287	288
Link Distance (ft)	281	281	243	243	243	329	329	329
Upstream Blk Time (%)				0	0		0	0
Queuing Penalty (veh)				0	1		1	1
Storage Bay Dist (ft)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 13: Wilson & MLK Jr.

Movement	WB	WB	SB
Directions Served	T	TR	R
Maximum Queue (ft)	115	116	105
Average Queue (ft)	34	37	44
95th Queue (ft)	87	89	79
Link Distance (ft)	145	145	237
Upstream Blk Time (%)	0	0	
Queuing Penalty (veh)	1	0	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 14: Wilson & Pinckney

Movement	WB	WB	NB	NB	SB	
Directions Served	LT	TR	L	T	TR	
Maximum Queue (ft)	198	220	70	112	158	
Average Queue (ft)	41	62	30	46	90	
95th Queue (ft)	142	174	67	125	161	
Link Distance (ft)	150	150		167	78	
Upstream Blk Time (%)	2	5		7	22	
Queuing Penalty (veh)	6	19		0	64	
Storage Bay Dist (ft)			75			
Storage Blk Time (%)			1	14		
Queuing Penalty (veh)			0	6		

Intersection: 15: Wilson & Butler

Movement	WB	WB	SB	SB	SE	SE
Directions Served	T	R>	LR	R>	<l< td=""><td>LR</td></l<>	LR
Maximum Queue (ft)	264	95	272	125	338	90
Average Queue (ft)	129	28	118	87	173	82
95th Queue (ft)	218	68	213	141	312	111
Link Distance (ft)	833	833	526		325	
Upstream Blk Time (%)					1	
Queuing Penalty (veh)					5	
Storage Bay Dist (ft)				100		65
Storage Blk Time (%)			13	2	23	19
Queuing Penalty (veh)			16	5	77	53

Intersection: 22: Government East & Pinckney

Movement	NB	SB
Directions Served	TR	LT
Maximum Queue (ft)	116	107
Average Queue (ft)	41	9
95th Queue (ft)	114	51
Link Distance (ft)	78	101
Upstream Blk Time (%)	27	1
Queuing Penalty (veh)	33	2
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 23: Wilson & Government East

Movement	WB	WB	SB	B69	
Directions Served	T	TR	R	T	
Maximum Queue (ft)	103	108	127	129	
Average Queue (ft)	5	7	73	21	
95th Queue (ft)	55	58	121	97	
Link Distance (ft)	313	313	36	131	
Upstream Blk Time (%)	0	0	35	7	
Queuing Penalty (veh)	1	0	0	0	
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 24: Wilson & West Access

Movement	WB	SB
Directions Served	TR	R
Maximum Queue (ft)	144	73
Average Queue (ft)	8	36
95th Queue (ft)	81	63
Link Distance (ft)	152	40
Upstream Blk Time (%)		5
Queuing Penalty (veh)		0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 25: Doty & West Access

Movement	EB	EB	EB	NB	NB	B79	B79
Directions Served	T	T	TR	R	R	T	T
Maximum Queue (ft)	45	110	172	76	65	11	5
Average Queue (ft)	8	15	33	28	22	0	0
95th Queue (ft)	73	83	128	63	54	5	0
Link Distance (ft)	152	152	152	50	50	45	45
Upstream Blk Time (%)	3	3	4	5	5	0	
Queuing Penalty (veh)	14	14	17	0	0	0	
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 26: Doty & East Access

Movement	EB	EB	EB	NB	B85	
Directions Served	T	T	TR	R	T	
Maximum Queue (ft)	12	100	161	95	48	
Average Queue (ft)	0	19	68	48	4	
95th Queue (ft)	9	81	160	94	28	
Link Distance (ft)	71	71	71	50	150	
Upstream Blk Time (%)	0	5	10	29		
Queuing Penalty (veh)	0	24	55	0		
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Zone Summary

Zone wide Queuing Penalty: 912



