

Smithsonian Institution South Mall Campus Master Plan

Comprehensive Transportation Review



Prepared for: Smithsonian Institution

Prepared by: Stantec Consulting Services, Inc.

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Executive Summary

The Smithsonian Institution (SI) South Mall Campus Master Plan includes several improvements that are intended to enhance the user experience by providing seamless connections between the various South Mall Campus facilities, increasing the visibility of the facilities, and providing additional education and visitor service space. The SI Master Plan is expected to be implemented over a 15- to 20-year timeframe. As part of the overall vision for the South Mall Campus, SI is proposing to add approximately 317,500 square feet of additional educational and support spaces, consolidate the existing loading areas adjacent to the Sackler Gallery (underground) and the Arts and Industry Building (at-grade) into a single loading driveway that would be accessed via a ramp at the intersection of Independence Avenue SW and 12th Street SW, on the west side of the Freer Gallery of Art, and to reconfigure the courtyard and garden space to provide more cohesive pedestrian connections between facilities.

It is anticipated that the proposed underground expansion of the South Mall Campus buildings to provide additional education and retail/service space will generate additional trips comprised of both visitors and employees. The other proposed enhancements, including the consolidation/relocation of the loading driveways and modifications to the gardens and courtyard, are not anticipated to generate additional trips. It should be noted that the analysis conducted for this CTR covers the expansion of facilities, with the assumption that the consolidated loading dock is in place. A separate CTR has been completed and submitted to DDOT for the analysis of the proposed consolidated loading dock. A copy of the loading dock CTR can be found in Appendix D.

Methodology

Stantec Consulting Services, Inc. (Stantec) conducted the assessment of the proposed facility expansion based on Chapter 45 of the DDOT Design and Engineering Manual (DEM) and DDOT Guidelines for Comprehensive Transportation Review Requirements. The assessment includes:

- A review of several city-wide planning documents as well as local studies including the 2005 Bicycle Master Plan, 2009 Pedestrian Master Plan, moveDC, Southwest Ecodistrict Plan, Memorials & Museums Master Plan, Maryland Avenue SW Transportation Study, and Smithsonian Institution South Mall Campus Master Plan.
- A capacity analysis conducted on the Independence Avenue SW and Jefferson Drive SW corridors, including the signalized intersections at 14th Street SW, 12th Street SW, and 10th Street SW (L'Enfant Promenade/Plaza), 9th Street SW, and 7th Street SW for the 2017 Existing, 2040 No Build, and 2040 Build, and 2040 Build with Mitigation Conditions.
- An inventory of the current study area Capital Bikeshare network
- An assessment of the impact of the proposed facility expansion on existing and potential future pedestrian, bicycle, transit, and parking facilities.



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Development of recommendations to mitigate operational deficiencies.

Conclusions and Recommendations

The proposed Smithsonian South Mall Campus expansion would have a negligible effect on the local roadway network, increasing overall vehicle volumes by approximately 1%. However, due to existing capacity deficiencies and future growth within the study area, the following minor mitigation measures are proposed to mitigate the small increases in delay generated by the proposed facility expansion:

Vehicle

- 1. Signal timing, phasing, and offset modifications, including an increase in cycle lengths from 110 seconds to 150 seconds in the PM peak hour. This would need to be conducted as a part of a wider signal retiming effort, which would likely be required in the future to accommodate background growth and other projects by 2040.
- 2. Modify the existing unsignalized intersection of SW Jefferson Drive and 12th Street SW from a two-way stop controlled intersection to an all-way stop controlled intersection. Modifying the SW Jefferson Drive eastbound shared thru-right movement from a free movement to a stop-controlled movement would grant more acceptable gaps for pedestrians to cross SW Jefferson Drive, along with reducing delay for right turning vehicles on 12th Street SW.
- 3. Modify the southbound 14th Street SW approach to Jefferson Drive to include a protected-permitted left-turn phase.

Pedestrian/Bicycle

- Monitor utilization of onsite bicycle parking, as well as Capital Bikeshare stations within ¼ mile.
 If demand exceeds capacity install new bike racks and/or a Capital Bikeshare Station. If a new Capital Bikeshare Station is required, consider locating it near the intersection of 7th Street SW and Jefferson Drive SW to fill an existing gap in the system.
- 2. Upgrade all curb ramps connecting to/from the South Mall Campus to meet current ADA standards.
- 3. Provide a new crosswalk along the east side of the intersection of Independence Avenue SW and 12th Street SW.



Passenger Loading

1. Monitor passenger loading areas to determine if they continue to meet SI needs without impacting traffic operations on Jefferson Drive SW or Independence Avenue SW.

Loading

- 1. All deliveries made with trucks WB-50 or larger will be scheduled in advance. These deliveries will be scheduled to avoid the AM (7:00 AM 9:00 AM) and PM (4:00 PM 6:00 PM) peak periods, unless necessary. This would likely have a minimal impact on the South Mall Campus facilities, as the majority of deliveries with larger trucks currently occur during off-peak periods.
- 2. Deliveries made in vehicles larger than a single unit truck should enter from northbound 12th Street SW or eastbound Independence Avenue SW to avoid wide right-turns into the proposed driveway.
- 3. Right-turns on red should be restricted at the proposed driveway and the westbound Independence Avenue SW approach at the signalized intersection with 12th Street SW.



Introduction October 24, 2017

1.0 INTRODUCTION

The Smithsonian Institution (SI) South Mall Campus Master Plan includes several improvements that are intended to enhance the user experience by providing seamless connections between the various South Mall Campus facilities, increasing the visibility of the facilities, and providing additional education and visitor service space. The SI Master Plan is expected to be implemented over a 15- to 20-year timeframe. As part of the overall vision for the South Mall Campus, SI is proposing to add approximately 317,500 square feet of additional educational and support spaces, consolidate the existing loading areas adjacent to the Sackler Gallery (underground) and the Arts and Industry Building (at-grade) into a single loading driveway that would be accessed via a ramp at the intersection of Independence Avenue SW and 12th Street SW, on the west side of the Freer Gallery of Art, and to reconfigure the courtyard and garden space to provide more cohesive pedestrian connections between facilities.

In addition to expanding and enhancing the campus, the consolidated loading areas is necessary because the current loading areas along Independence Avenue SW do not provide adequate space for larger vehicles. Large box trucks and tractor trailers often back into or out of the loading areas, creating disruptions to traffic flow on Independence Avenue SW. Large exhibition deliveries, which typically arrive in larger tractor trailers (WB-67), must park and load/unload on Independence Avenue SW, which exposes the exhibit materials to unnecessary risk. The proposed loading driveway would be able to accept all truck types (up to WB-67), as well as eliminate the need for trucks to back in to or out of the driveways, as occurs in the existing condition. Instead, trucks would be able to turn around within the underground loading area. A separate CTR was prepared in August 2017 to evaluate the loading dock consolidation, and a copy of the CTR can be found in Appendix A.

This assessment of the proposed facility expansion is based on Chapter 45 of the DDOT Design and Engineering Manual (DEM) and DDOT Guidelines for Comprehensive Transportation Review Requirements. It is anticipated that the proposed underground expansion of the South Mall Campus buildings to provide additional education and retail/service space will generate additional trips comprised of both visitors and employees. The other proposed enhancements, including the consolidation/relocation of the loading driveways and modifications to the gardens and courtyard, are not anticipated to generate additional trips. It should be noted that the analysis conducted for this CTR covers the expansion of facilities, with the assumption that the consolidated loading dock is in place. A separate CTR has been completed and submitted to DDOT for the analysis of the proposed consolidated loading dock.



Strategic Planning Elements October 24, 2017

2.0 STRATEGIC PLANNING ELEMENTS

Stantec reviewed several city-wide planning documents as well as local studies to determine how the proposed project considers District growth goals and objectives within the study area. These documents included the 2005 Bicycle Master Plan, 2009 Pedestrian Master Plan, moveDC, Southwest Ecodistrict Plan, Memorials & Museums Master Plan, Maryland Avenue SW Transportation Study, and Smithsonian Institution South Mall Campus Master Plan.

2.1 PLANS/STUDIES REVIEWED

2005 Bicycle Master Plan. This plan is a guide to establishing high-quality bicycle facilities and programs from 2005 to 2015 through facility improvements, policy changes, education, promotion, and enforcement. The plan shows that no dedicated bicycle facilities exist along Independence Avenue SW or 14th Street SW, resulting in bicycle levels of service (BLOS) of D and E, respectively. To correct these deficiencies, the plan proposes a bicycle lane on 14th Street SW and signed bicycle routes along Independence Avenue SW and 14th Street SW. A progress update to the plan can be found in an appendix of moveDC.

2009 Pedestrian Master Plan. This plan serves as the foundation for DDOT's pedestrian programs and represents the first comprehensive city-wide effort to address pedestrian safety challenges and related issues. The goals of the plan are to reduce the number of pedestrian fatalities and injuries associated with motor vehicle crashes and to increase pedestrian activity by creating a comfortable and accessible environment for walking throughout all parts of the District.

Through an analysis of existing conditions, the plan identified the segments of 14th Street SW and Independence Avenue SW within the study area to have medium-high pedestrian activity with medium- high pedestrian facility deficiencies. This process also identified Independence Avenue SW, from 15th Street SW to South Capitol St SW, as a priority corridor for improvements. However, no action was recommended at the time due to few pedestrian injuries occurring during the period from 2000 to 2006. A progress update to the plan can be found in an appendix of moveDC.

moveDC. Published in October 2014, moveDC was a collaborative effort led by DDOT to present a vision and improvement course for the District's transportation system over the next 25 years. MoveDC focuses on more travel options, reliability of transportation systems, safety for all, and efficiency of investments. The plan proposes more than 200 new miles of bicycle facilities, a 22-mile streetcar system with the possibility of extension lines, and more than 40 miles of High Capacity Transit. Within the study area specifically, the plan shows that the bicycle level of service (LOS) is D or better and proposes a cycle track on Independence Avenue SW. It also contains progress updates to the 2005 Bicycle and 2009 Pedestrian Master Plans as of December 2013.



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Southwest Ecodistrict Initiative. Published by the National Capital Planning Commission (NCPC), the SW Ecodistrict Initiative is a comprehensive and forward-looking approach to urban sustainability and livability through transformation of the Maryland Avenue SW and 10th Street SW (L'Enfant Promenade and Plaza) area into a highly sustainable mixed-use community. The study area is bounded by Independence Avenue SW to the north, Maine Avenue SW to the south, 12th Street SW to the west, and 4th Street SW to the east. The plan examines the redevelopment of 12 sites and streetscaping of 10th Street SW to encourage a walkable neighborhood and economic growth. The U.S. General Services Administration (GSA) Regional Office Building (ROB) and Cotton Annex, located on D Street SW and 12th Street SW respectively, are two sites that are beginning the redevelopment process. Traffic studies for these developments were included in the 2030 Background/No Build Condition analysis.

Memorials & Museums Master Plan. The NCPC, in consultation with the U.S. Commission of Fine Arts and the National Capital Memorial Advisory Committee, developed a plan that shows how to meet demand for museums and commemorative works while protecting the National Mall and preserving other existing museum and memorial settings. The plan inventories existing, and forecasts future demand for memorials and museums, identifies and evaluates suitable sites for future memorials and museums, and establishes a zoning policy for siting. The plan is currently guiding the construction of the Dwight D. Eisenhower Memorial on a site adjacent to the study area, north of the U.S. Department of Education and across Independence Avenue SW from the National Air and Space Museum. A traffic study for this development was included in the 2030 Background /No Build Condition analysis.

Maryland Avenue SW Transportation Study. DDOT is currently studying the impacts on multimodal operations, including vehicular, bus, rail, pedestrian, and bicycle, from the creation of a new Maryland Avenue SW corridor between 12th Street SW and 7th Street SW. The study examines three potential configurations of a future connection over the existing rail corridor. The plan would propose a new 11th Street SW that would connect to the study area and create a new intersection. To maintain optimal traffic flow, signal retiming at the study area intersections may be required along the corridor.

Smithsonian Institution South Mall Campus Master Plan. The Smithsonian Institution (SI) South Mall Campus Master Plan includes several improvements that are intended to enhance the user experience by providing seamless connections between the various South Mall Campus facilities, increasing the visibility of the facilities, and providing additional education and visitor service space. Among these improvements is the consolidation of up to three loading docks/driveways along Independence Avenue SW into one new underground loading area and driveway. The new loading area would accept all truck types and eliminate the need for trucks to park or make any loading maneuvers within the roadway. Potential Impact of Proposed Driveway on Plans

Ultimately, the expanded facilities and consolidation of the loading driveways along Independence Avenue SW into one loading dock/driveway for the South Mall Campus would not affect the findings and recommendations of these planning documents and studies. In fact,



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the consolidation of the loading driveways would likely enhance pedestrian and bicycle operations along Independence Avenue SW by eliminating conflict points at the uncontrolled driveways. The proposed consolidated driveway would be signal controlled, and thus potential pedestrian and bicycle conflicts with trucks would be better controlled. Consolidating the driveways would also eliminate potential conflict points along the cycle track proposed on Independence Avenue SW in the moveDC plan.



Roadway Capacity & Operations October 24, 2017

3.0 ROADWAY CAPACITY & OPERATIONS

3.1 VEHICLE STUDY AREA

The study area is formally located in the Southwest Federal Center neighborhood, in Ward 6, between the National Mall and I-395. The neighborhood is primarily a business district and almost entirely occupied by offices for various branches of the U.S. Government and many of SI's museums. Bounded by Jefferson Drive SW to the north, Independence Avenue SW to the south, 14th Street SW to the west, and 7th Street SW to the east, the study area includes the South Mall Campus. The study area includes the following signalized intersections:

- Independence Avenue SW and 14th Street SW
- Independence Avenue SW and 12th Street SW
- Independence Avenue SW and L'Enfant Plaza SW
- Independence Avenue SW and 9th Street SW
- Independence Avenue SW and 7th Street SW
- Jefferson Drive SW and 14th Street SW
- Jefferson Drive SW and 12th Street SW
- Jefferson Drive SW and 7th Street SW

Characteristics of the study area roadways were obtained from maps on the DDOT website denoting functional classification, 2015 Average Annual Daily Traffic (AADT), speed limits, and truck routes/loading zones. This information is summarized in Table 1. The table also lists the number of lanes and parking types as observed during a roadway inventory.



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Table 1: Study Area Roadway Characteristics

Roadway	Functional Class	2015 AADT	Number of Lanes, Division	Parking Type	Speed Limit (mph)	Primary Truck Route/Designated Loading Zones?
Jefferson Drive SW	Local	6,300	1, Undivided	On-street 3 Hour Limit	15	No/No
Independence Avenue SW	Principal Arterial	27,500	8, Undivided	On-street Metered	25	Yes/No
14 th Street SW	Principal Arterial	41,500	7, Divided south of Independence Avenue SW	On-street Metered Special Permit	25	Yes/No
12 th Street SW	Local	15,800	5, Divided south of Independence Avenue SW	On-street Metered	25	Yes/No
L'Enfant Plaza SW	Local	4,400	2, Divided south of Independence Avenue SW	On-street Metered	25	No/No
9 th Street SW	Local	21,300	1, Undivided	On-street Metered	25	Yes/No
7 th Street SW	Principal Arterial	17,300	8, Undivided	On-street Metered	25	Yes/No

It should be noted that most on-street, metered parking in the study area is only permitted between specific hours. At all other times on arterials, the parking lane operates as a travel lane during peak commuting hours.

3.2 DATA COLLECTION AND HOURS OF ANALYSIS

Stantec conducted a comprehensive data collection program to establish "average day" baseline conditions for vehicular, transit, pedestrian, and cyclist traffic within the study area. The program consisted of manual turning movement counts and queuing and loading activity observations. All data were collected on a typical weekday when District schools and Congress were in session and there were no major special events on the National Mall.

Saturday data was also collected on September 30th and October 7th, 2017. No issues were noted with the data collected on Saturday, September 30th at the intersections on Independence Avenue SW & 9th Street SW and Independence Avenue SW & 7th Street SW. However, the intersections of Independence Avenue SW & 14th Street SW, Independence Avenue SW & 12th Street, and SW Independence Avenue SW & L'Enfant Plaza SW had inflated eastbound through volumes resulting from a baseball game occurring at Nationals Park in the Navy Yard neighborhood of Washington DC on Saturday, October 7th, 2017. Volumes are adjusted for the incoming traffic by balancing them with turning movement counts taken on Saturday September 30th, 2017.



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3.2.1 Turning Movement Counts

Manual turning movement counts were collected during the PM peak period (3:30PM – 6:30PM) and Saturday peak period (12:00PM – 4:00PM) at the seven study intersections in September and October 2017. It should be noted that the weekday AM peak period is not included. Most of the SI facilities do not open until 10:00 AM, with the exception of the Smithsonian Institution Building (SIB), which opens at 8:30 AM. However, SI is planning to relocate many office staff from SIB to another location as part of the Master Plan. Therefore, the proposed modifications to the South Mall Campus are anticipated to have a negligible impact on the weekday AM peak hour operations of the adjacent roadway network.

The traffic counts include vehicles, heavy vehicles, buses, pedestrians, and bicyclists. Appendix B contains the raw count data. An analysis of this data revealed the PM peak hour to be 5:00PM – 6:00PM and the Saturday peak hour to be 3:00PM – 4:00PM.

3.2.2 Queuing

Queuing observations were conducted during the turning movement counts to determine if additional unmet demand would need to be considered in the traffic analysis. Despite clear peak hour directional volume (westbound in the PM), the results of the queue observations show minimal to no queuing was observed along Independence Avenue SW and Jefferson Drive SW. Therefore, it was determined that the traffic analysis did not need to consider additional unmet demand.

3.3 CAPACITY ANALYSIS METHODOLOGY

Capacity analysis, a procedure used to estimate the traffic-carrying ability of roadway facilities over a range of defined operating conditions, was performed using Synchro 9, which is based on the methodology of the 2010 Highway Capacity Manual (HCM 2010) to establish average volume to capacity (v/c) ratios, delays, and level of service (LOS) for each intersection. Roadway geometry, signal timing, and traffic data were entered into the model.

The v/c ratio relates the demand at an intersection (traffic volume) to the available capacity. The available capacity for each movement varies depending on number of lanes, lane width, perception/reaction time, green time, and cycle length, among others. A v/c ratio of 1.0 means that the demand for a specific turning movement is equal to the capacity. A movement with a v/c ratio at or over 1.0 is considered undesirable because the movement volume exceeds the capacity, which results in queuing, indicating unmet demand along that approach.

LOS is an evaluation of the quality of operation of an intersection and is a measure of the average delay a driver experiences while traveling through the intersection. LOS is dependent on a range of defined operating conditions such as traffic demand, lane geometry, and traffic signal timing and phasing.



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LOS can range from A to F and is based on the average control delay per vehicle in seconds. For a signalized intersection, LOS A indicates operations with an average control delay less than 10 seconds per vehicle, while LOS F describes operations with an average control delay in excess of 80 seconds per vehicle or a v/c ratio greater than 1.0. For an unsignalized intersection, LOS A indicates operations with an average control delay less than 10 seconds per vehicle, while LOS F describes operations with an average control delay exceeding 50 seconds per vehicle or a v/c ratio greater than 1.0. The HCM 2010 delay criteria for signalized and unsignalized intersections are summarized in Table 2.

Table 2: LOS Criteria for Signalized and Unsignalized Intersections

	Average Control Delay (seconds/vehicle)					
Level of Service	Signalized	Unsignalized				
Α	Less than or equal to 10.0	Less than or equal to 10.0				
B > 10.0 and ≤ 20.0		>10.0 and ≤ 15.0				
С	> 20.0 and ≤ 35.0	>15.0 and ≤ 25.0				
D	> 35.0 and ≤ 55.0	>25.0 and ≤ 35.0				
E	> 55.0 and ≤ 80.0	>35.0 and ≤ 50.0				
F	Greater than 80.0 or v/c > 1.0	Greater than 50.0 or v/c > 1.0				

Source: 2010 Highway Capacity Manual

While LOS D or better operations are generally deemed satisfactory from a traffic operations perspective, LOS E or F operations are often indicative of queuing and congestion. Improvements as recommended in this study seek to maintain or improve traffic operations to LOS D or better, as reported by HCM 2010.

Signal plans and timing directives were delivered by DDOT and were field-verified to accurately model signal operation type, phasing, detection, and cycle length in the HCM 2010 output files utilized for capacity analysis.

3.4 DEVELOPMENT SCENARIOS

3.4.1 2017 Existing Condition

2017 Existing Condition volumes for the PM and Saturday peak hours, shown in Exhibit 1 in Appendix C, were modeled in Synchro 9 to produce capacity analysis results, summarized in Exhibits 2 and 3 in Appendix C. All Synchro capacity analysis outputs are located in Appendix D. Table 3 summarizes the delay for all study area intersections in the PM and Saturday peak hours.



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Table 3: 2017 Existing Condition Intersection Capacity Analysis

	PM Peak	Hour	Saturday	Peak Hour
Intersection	Delay	Level of Service	Delay	Level of Service
14th Street SW & Jefferson Drive SW	17.4	В	10.2	В
12th Street SW & Jefferson Drive SW	0.7	Α	2.9	Α
7th Street SW & Jefferson Drive SW	8.8	Α	9.3	Α
14th Street SW & Independence Avenue SW	37.4	D	21.2	С
12th Street SW & Independence Avenue SW	47.1	D	15.4	В
Independence Avenue SW & L'Enfant Plaza	19.5	В	9.5	А
9th Street SW & Independence Avenue SW	20.0	В	9.2	Α
7th Street SW & Independence Avenue SW	28.3	С	12.3	В

The results show that all lane groups in the study area intersections currently operate at LOS D or better with 95th percentile queuing (< 500 feet), except for the following:

SW Jefferson Drive & 14th Street SW

• The eastbound shared through-right movement operates at LOS E during the PM peak hour.

Independence Avenue SW & 14th Street SW

- The westbound shared left-through-right movement operates at LOS F during the PM peak hour.
- The southbound left turn movement operates at LOS E during the PM peak hour.

Independence Avenue SW & 12th Street SW

- The westbound left-turn movement operates at LOS F and E during the PM and Saturday peak hours, respectively. The movement also has a 95th percentile queue length of over 500 feet during the PM peak hour.
- The westbound shared through-right movement operates at LOS F during the PM peak hour.

Independence Avenue SW & 7th Street SW

The Northbound left-turn movement operates at LOS E during the PM peak hour.

According to the table presented in Chapter 45 of the DDOT DEM, the threshold capacity for major arterials such as Independence Avenue SW, 14th Street SW, and 7th Street SW, is



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approximately 45,000 vehicles per day. Using historical AADT data (2009-2013) provided on the DDOT website and presented in Table 4, Stantec estimated the current v/c ratio for these roadways to be 0.55, 0.91, and 0.39, respectively.

Table 4: Historical AADT

Year	Independence Avenue SW between 9 th Street SW and 12 th Street SW	14 th Street SW between C Street SW and Jefferson Drive SW	7 th Street SW between Jefferson Drive SW and Independence Avenue SW
2011	21.5	40.9	18.9
2012	21.3	N/A	18.7
2013	26.6	40.7	16.7
2014	27.1	40.8	17.0
2015	27.5	41.5	17.3
Average	24.8	41.0	17.7

Note: AADT in 1,000s

3.4.2 2040 Background/No Build Condition

The horizon year of 2040 was selected for the proposed project to correspond with the projected completion of the Smithsonian South Mall Campus construction. Stantec applied a background growth rate of 0.9 percent per year based on historical AADT data along a segment of Independence Avenue SW from 2009 to 2013 as reported by DDOT. This is the same growth rate that was applied to the Loading Dock CTR to be consistent. Table 5 shows this data. Exhibit 10 in Appendix C shows the projected background volumes within the study area.

Table 5: Growth Rate

	Independence Avenue SW between 9th Street SW and 12th Street SW						
Year	AADT in 1,000	Difference %					
2009	26.9						
2010	26.2	-2.6%					
2011	21.5	-17.9%					
2012	21.3	-0.9%					
2013	26.6	24.9%					
Growth Rate	 Total	-1.1%					
	Average	0.875% ~ 0.9%					



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Three developments, previously discussed in Section 2.0 as part of the SW Ecodistrict Plan and Memorials & Museums Master Plan, and included in the Loading Dock CTR, are expected to have an impact on traffic volumes in the study area. These include the redevelopment of the GSA ROB and Cotton Annex as well as the construction of the Eisenhower Memorial. Since the GSA redevelopment projects are still in their scoping phase with DDOT, their trip generation, trip distribution, and corresponding mode splits were obtained from DDOT. Vehicular trip generation and distribution for the Eisenhower Memorial were obtained from the report entitled "Eisenhower Memorial Traffic Impact Study" by EarthTech and dated May 2006. Exhibits 5 through 10 in Appendix C show how all anticipated development trips were distributed through the existing roadway network.

Project background growth volumes and development volumes were summed to obtain 2040 No Build Condition volumes for the AM and PM peak hours, shown in Exhibit 11 in Appendix C. These volumes were modeled in Synchro 9 to produce capacity analysis results, summarized in Exhibit 11 in Appendix C. Table 6 summarizes the delay for all study area intersections in the PM and Saturday peak hours.

Table 6: 2040 Background/No Build Intersection Capacity Analysis

	PM Peak	Hour	Saturday Peak Hour	
Intersection	Delay Level of Service		Delay	Level of Service
14th Street SW & Jefferson Drive SW	43.7	D	13.1	В
12th Street SW & Jefferson Drive SW	0.7	Α	4.0	А
7th Street SW & Jefferson Drive SW	10.0	Α	10.4	В
14th Street SW & Independence Avenue SW	94.1	F	23.5	С
12th Street SW & Independence Avenue SW	130.2	F	20.4	С
Independence Avenue SW & L'Enfant Plaza	23.7	С	9.7	Α
9th Street SW & Independence Avenue SW	26.9	С	10.0	Α
7th Street SW & Independence Avenue SW	57.0	E	14.2	В

All Synchro capacity analysis outputs are located in Appendix D. Based on the results of the capacity analysis, all lane groups in the study area intersections would operate at LOS D or better with 95th percentile queuing of less than 500 feet in the 2040 horizon year, except for the following:

SW Jefferson Drive & 14th Street SW

• The eastbound shared through-right movement would operate at LOS F during the PM peak hour and has queue length of over 500 feet.



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- The northbound shared through-right movement would operate at LOS E and would have a 95th percentile queue length of over 550 feet during the PM peak hour
- The southbound left-turn lane would operate at LOS F and E during the PM and Saturday peak hours, respectively.

Independence Avenue SW & 14th Street SW

- The westbound shared left-through-right movement would operate at LOS F during the PM peak hour.
- The northbound shared through-right movement would operate at LOS F during the PM peak hour and would have a 95th percentile queue length of over 600 feet.
- The southbound left turn movement would operate at LOS F during the PM peak hour.

Independence Avenue SW & 12th Street SW

- The westbound left-turn movement would operate at LOS F and E during the PM and Saturday peak hours, respectively. The movement would also have a 95th percentile queue length of over 600 feet during the PM peak hour.
- The westbound shared through-right movement would operate at LOS F during the PM and Saturday peak hours. The movement would also have a 95th queue length of over 900 feet during the PM peak hour.
- The northbound shared through-right moment would operate at LOS E during the PM peak hour

Independence Avenue SW & L'Enfant Plaza

• The northbound left-turn lane would operate at LOS E during the PM peak hour

Independence Avenue SW & 9th Street SW

• The northbound shared left-through movement would operate at LOS F during the PM peak hour.

Independence Avenue SW & 7th Street SW

- The eastbound left-through-right movement would operate at LOS F during the PM peak
- The northbound left-turn movement would operate at LOS F during the PM peak hour.
- The southbound left turn lane would operate at LOS E during the PM peak hour.



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3.4.3 2040 Future Build Condition

3.4.3.1 Trip Generation

Stantec obtained facility entrance logs from SI for April 2016, which provide the number of people entering each facility (including visitors, staff, and volunteers) by hour, for each day of the month. It should be noted that the Freer Gallery was closed in April 2016; thus, data from April 2015 was utilized for that facility. A weekday average was calculated for each hour between 10:00 AM and 6:00 PM (facilities close at 5:30 PM) utilizing data from each Tuesday, Wednesday, and Thursday in April (See Exhibit 1 in Appendix B). A similar method was applied to calculate a Saturday average by using data from each Saturday in April.

In should be noted that the entrance log is only a record of people entering the facilities. Therefore, exiting volumes were estimated with the assumption that all people entering must exit within the same day. Information obtained from SI indicates that most visitors spend one to two hours at any one of the South Mall Campus facilities. Thus, an algorithm was developed to calculate the exiting volumes utilizing the following assumptions (see Exhibit 1):

- 10% of visitors leave within one hour:
- 40% of visitors leave within one to two hours:
- 40% of visitors leave within two to three hours;
- 10% of visitors leave after three hours; and,
- All remaining visitors and staff must leave during the 5:00 PM 6:00 PM hour.

Based on data collected for the South Mall Campus Loading Dock CTR, the weekday PM peak hour of the adjacent roadway network was determined to be 5:00 PM – 6:00 PM. Utilizing the entrance log data shown in Exhibit 1, as well as the total square footage of all the South Mall Campus facilities (845,500 square feet), a rate of 1.90 person-trips per 1,000 square feet was calculated for the weekday PM peak hour. The data shows that 15% of trips would enter and 85% of trips would exit.

Adjacent roadway network volumes were not available for the Saturday peak hour, therefore the Saturday peak hour trip generation rate was calculated for the peak hour of person-trips at the facilities, which occurred between 2:00 PM and 3:00 PM. The resulting Saturday peak hour trip generation rate is 6.75 person-trips per 1,000 square feet. The data also shows that 54% of trips would enter and 46% of trips would exit.

3.4.3.1.1 Mode Split Data

Mode split data was obtained from SI's 2013 Visitor Experience Summary Report (see Table 6). While the mode split estimates come from a survey of visitors, feedback from SI indicates that the non-auto mode split for employees and volunteers would likely be similar because parking is not provided for employees or volunteers. Furthermore, the 2013 survey was taken prior to an



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expansion of Capital Bikeshare stations in the area. Therefore, DDOT has provided a recommendation to increase the bike mode share to 6%.

Furthermore, although it is expected that employees and volunteers would likely have a higher transit mode share and a lower walking mode share, both transit and walk trips would be reflected as pedestrian trips in the capacity analysis. Thus, their impact to the adjacent roadway network would be similar.

Table 7: Mode Split (Source: 2013 Visitor Experience Summary Rep		
	Made of Transportation	Percentage of Trips

Mode of Transportation	Percentage of Trips
Public Transit (Bus, Metrorail, Commuter Rail)	49%
Walking	20%
Vehicle	23%
Bike	6%
Other (Shuttle, Tour Bus, etc.)	2%

3.4.3.1.2 Trip Generation and Mode Split Calculations

A person-trip generation and mode split estimate was calculated utilizing the information described above (Table 6). While transit, walking, and other non-auto modes will be represented in the analysis as person-trips walking to/from nearby transit stops or other major origins and destinations near the South Mall Campus, it is not appropriate to equate individual person-trips with vehicle trips. Information obtained from SI indicates an average group size of approximately three (3) people per vehicle. Thus, the number of vehicle person-trips was divided by three to estimate the number of new vehicle trips that would be generated by the expansion.

Table 8: Trip Generation and Mode Split

Existing Square	Proposed Square	Additional	PM Pea	k Hour		Saturday	Peak	Hour
Footage	Footage*	Square Footage	In	Out	Total	In	Out	Total
845,500	1,163,000	317,500	91	511	602	1,149	995	2,144
Public Transit	(49%)		45	251	295	563	487	1,051
Walking (20%)			18	102	120	230	199	429
Bike (6%)			5	31	36	69	60	129
Other (2%)			2	10	12	23	20	43
Total Non-Auto	Person Trips		70	394	463	885	766	1,652
Vehicle (23%)			21	118	139	264	229	492
Total New	Vehicle Trips		7	39	46	88	76	164

^{*}Includes expansion of existing facilities and opening of Arts and Industries Building as detailed in Master Plan Alternative F



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3.4.3.1.3 Employees

As noted previously, it is anticipated that up to 200 office staff members that currently occupy a portion of the Castle building will be relocated off-site as part of the Master Plan. These employees have a typical "9 to 5" work schedule. The proposed expansion of the South Mall campus facilities would also likely require additional exhibit support staff and volunteers, although the exact number of additional staff is not known at this Master Plan level. However, it should be noted that the door count data includes visitors, staff, and volunteers. Therefore, it can be assumed that the trip generation figures shown in Table 2 include additional staff and volunteers. While it is likely that the staff and volunteers have a higher transit mode split, specific mode split data is not available. Therefore, the visitor mode split data was utilized to be conservative.

Furthermore, no PM peak hour credit was taken for the 200 existing employees that may potentially be relocated, due to the uncertainty around future staffing levels at this stage of the Master Plan effort. It is our opinion that this provides for a conservative analysis which is flexible to future Master Plan changes and likely represents a maximum trip generation rate.

3.4.3.2 Trip Distribution

3.4.3.2.1 Non-Auto Trip Distribution

The traffic analysis considers all non-auto modes as pedestrian trips, but with distinct trip origins/destinations. Transit trips are assigned as pedestrian trips to and from adjacent bus stops and Metrorail stations. Walking and "Other" (bicycle, shuttle, tour bus, etc.) trips are assigned as pedestrian trips to and from other museums and attractions. A preliminary distribution of these trips is shown in Table 9.

Table 7: Trip Distribution for Transit and Walking/Other Trips

Trip Type	Origin/Destination	Percentage
Transit	Smithsonian Metro	40%
	L'Enfant Plaza Metro/VRE	30%
	Bus Stops on Independence Ave and Jefferson Dr (in front of site)	10%
	Bus Stop on 14th Street (at Jefferson Dr)	10%
	Bus Stop on 7th Street (at Jefferson Dr)	10%
Walking/Other	To/From North via National Mall	30%
	To/From West via Jefferson Drive	25%
	To/From East via Jefferson Drive	25%
	To/From South and West via Independence Avenue	10%
	To/From South and East via Independence Avenue	10%



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3.4.3.2.2 Vehicle Trip Distribution

Vehicle trip distribution was estimated utilizing Google maps to plot the most direct route to the South Mall Campus from the surrounding DC metropolitan area and the 2014 Traffic Volume Map provided on DDOT's website. The resulting vehicle trip distributions are shown in Table 10. The South Mall Campus does not provide parking for visitors or staff; therefore, for the purposes of this analysis, it was assumed that the new vehicle trips would utilize existing on-street parking on Jefferson Drive and Independence Avenue.

Table 8: Trip Distribution for Vehicular Trips

Origin/Destination	Percentage
To/From the North and West via I-395 to 14th Street	45%
To/From South and East via I-695 to 12th Street	20%
To/From North via I-395 to 12th Street	15%
To/From North via 7th Street	1%
To/From South via 7th Street	1%
To/From North via 14th Street	7%
To/From West via Independence Avenue	7%
To/From East via Independence Avenue	4%

3.4.3.3 Loading Dock/Driveway Consolidation

The proposed loading dock/driveway would be located between the ramp to the 12th Street Expressway and the Freer Gallery of Art at the intersection of Independence Avenue SW & 12th Street SW. For the purpose of this CTR, Stantec utilized the results of the trip generation calculated as part of the Loading Dock CTR (see Appendix A).

3.4.3.4 2040 Build Condition Capacity Analysis

Stantec modeled the study area with the proposed Independence Avenue SW & 12th Street SW intersection configuration for the new loading dock in Synchro 9 for the 2040 Future Build Condition with optimized PM and Saturday timing plans to obtain capacity analysis results (Exhibits 2 and 3 in Appendix C). More detailed Synchro capacity analysis output is located in Appendix D. Table 9 summarizes the delay for all study area intersections in the PM and Saturday peak hours compared to the results from the 2040 Background/No Build Condition capacity analysis.



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Table 11: 2040 Background/No Build and 2040 Build Intersection Capacity Analyses

	2040 Bo	ıckground/	/No Build (Condition	2040 Build Condition				
Intersection	PM Pe	ak Hour	Saturday	Peak Hour	PM Pe	ak Hour	Saturday Peak Hour		
	Delay	Level of Service	Delay	Level of Service	Delay	Level of Service	Delay	Level of Service	
14th Street SW & Jefferson Drive SW	43.7	D	13.1	В	44.5	D	14.4	В	
12th Street SW & Jefferson Drive SW	0.7	Α	4.0	А	1.2	А	121.6	F	
7th Street SW & Jefferson Drive SW	10.0	Α	10.4	В	10.5	В	12.0	В	
14th Street SW & Independence Avenue SW	94.1	F	23.5	С	102.9	F	23.7	С	
12th Street SW & Independence Avenue SW	130.2	F	20.4	С	108. <i>7</i>	F	32.8	С	
Independence Avenue SW & L'Enfant Plaza	23.7	С	9.7°	А	23.0	С	10.1	В	
9th Street SW & Independence Avenue SW	26.9	С	10.0	Α	28.9	С	9.7	А	
7th Street SW & Independence Avenue SW	57.0	Е	14.2	В	58.1	Е	14.0	В	

Based on the results of the capacity analysis, all lane groups in the study area intersections would operate at LOS D or better with 95th percentile queues of less than 500 feet, except for the following:

SW Jefferson Drive & 14th Street SW

- The eastbound shared through-right movement would operate at LOS F during the PM peak hour and has queue length of over 500 feet.
- The northbound shared through-right movement would operate at LOS E and would have a 95th percentile queue length of over 550 feet during the PM peak hour
- The southbound left-turn lane would operate at LOS F and E during the PM and Saturday peak hours, respectively.

SW Jefferson Drive & 12th Street SW



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• The northbound right-turn lane would operate at LOS F during the Saturday peak hour.

Independence Avenue SW & 14th Street SW

- The westbound shared left-through-right movement would operate at LOS F during the PM peak hour and would have a 95th percentile queue length of over 750 feet.
- The northbound shared through-right movement would operate at LOS F during the PM peak hour and would have a 95th percentile queue length of over 600 feet.
- The southbound left turn movement would operate at LOS F during the PM peak hour.

Independence Avenue SW & 12th Street SW

- The eastbound left-through-right movement would operate at LOS F during the PM peak hour.
- The westbound left-turn movement would operate at LOS F the PM and Saturday peak hours. The movement would also have a 95th percentile queue length of over 600 feet during the PM peak hour.
- The westbound shared through-right movement would operate at LOS F during the PM and Saturday peak hours. The movement would also have a 95th queue length of over 900 feet during the PM peak hour.
- The northbound shared U-turn-right movement would operate at LOS F during the PM peak hour.
- The northbound shared through-right moment would operate at LOS F during the PM peak hour.
- The southwestbound shared left-through-right movement would operate at LOS F during the PM peak hour.

Independence Avenue SW & L'Enfant Plaza

The northbound left-turn lane would operate at LOS E during the PM peak hour

Independence Avenue SW & 9th Street SW

 The northbound shared left-through movement would operate at LOS F during the PM peak hour.

Independence Avenue SW & 7th Street SW

- The eastbound left-through-right movement would operate at LOS F during the PM peak hour.
- The northbound left-turn movement would operate at LOS F during the PM peak hour.
- The southbound left turn lane would operate at LOS E during the PM peak hour.



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To accommodate the proposed driveway, restriping, signal equipment and sign installation, new curb ramps, and streetscaping would be required at the intersection of Independence Avenue SW & 12th Street SW. All roadway improvements would conform to DEM standards.

3.4.4 2040 Build Condition with Mitigation

The results of the 2040 Build Condition capacity analysis revealed the additional site generated trips, although relatively minor compared to the background volume, would result in an increase in delay and queuing at one or more turning movements at most study area intersections. This is primarily due to background growth in the study area that is anticipated to occur between 2017 and 2040. Therefore, mitigation measures are required. Given the built-out nature of the transportation network within the area, emphasis was placed on improving the overall intersection operations through adjustments to signal timing and phasing. In accordance with DDOT standards, mitigation measures were performed to any movements that exhibited at least one of the following results:

- Degradation of LOS to "E" or worse in future scenario.
- Increase in delay at intersection operating under LOS "E" or "F" of greater than 5 seconds, when compared to background scenario.
- Increase in 95% queue length of greater than 150 feet, when compared to background scenario.

Table 10 summarizes the delay for all study area intersections in the PM and Saturday peak hours compared to the results from the 2040 Background/No Build and 2040 Build Conditions capacity analyses.



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Table 12: 2040 Background/No Build, 2040 Build, and 2040 Build with Mitigation Intersection Capacity Analyses

	2040 Background/No Build Condition				2040 Build Condition				2040 Build with Mitigation Condition			
Intersection	PM Peak Hour		Saturday Peak Hour		PM Peak Hour		Saturday Peak Hour		PM Peak Hour		Saturday Peak Hour	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
14th St SW & Jefferson Dr SW	43.7	D	13.1	В	44.5	D	14.4	В	26.3	С	16.9	В
12th St SW & Jefferson Dr SW	0.7	Α	4.0	Α	1.2	Α	121.6	E	8.9	Α	9.6	Α
7th St SW & Jefferson Dr SW	10.0	Α	10.4	В	10.5	В	12.0	В	19.4	В	11.2	В
14th St SW & Independence Ave SW	94.1		23.5	С	102.9		23.7	С	88.5	Б	25.2	С
12th St SW & Independence Ave SW	130.2		20.4	С	108.7		32.8	С	133.6	F	30.6	С
Independence Ave SW & L'Enfant Plaza	23.7	С	9.7	А	23.0	С	10.1	В	17.6	В	10.0	Α
9th St SW & Independence Ave SW	26.9	С	10.0	Α	28.9	С	9.7	Α	16.4	В	9.7	Α
7th St SW & Independence Ave SW	57.0	Е	14.2	В	58.1	Е	14.0	В	53.1	D	14.0	В

Recommended mitigation measures include:

- Signal timing, phasing, and offset modifications, including an increase in cycle lengths from 110 seconds to 150 seconds in the PM peak hour. This would need to be conducted as a part of a wider signal retiming effort, which would likely be required in the future to accommodate background growth and other projects by 2040.
- Modify the existing unsignalized intersection of SW Jefferson Drive and 12th Street SW from a
 two-way stop controlled intersection to an all-way stop controlled intersection. Modifying the
 SW Jefferson Drive eastbound shared thru-right movement from a free movement to a stopcontrolled movement would grant more acceptable gaps for pedestrians to cross SW
 Jefferson Drive, along with reducing delay for right turning vehicles on 12th Street SW.
- Modify the southbound 14th Street SW approach to Jefferson Drive to include a protected-permitted left-turn phase.



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Synchro 9 Outputs for the 2040 Build Condition with Mitigation Condition can be found in Appendix D. The results of the analysis, shown in Exhibits 2 and 3, reveal that the proposed mitigation measures would address the additional delay and queueing that was identified in the 2040 Build Condition capacity analysis, and would even improve operations when compared to the No Build Condition for many movements.



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4.0 BICYCLE & PEDESTRIAN FACILITIES

The South Mall Campus is located in an area with extensive bicycle and pedestrian facilities. This section will evaluate these existing facilities, identify planned improvements, and recommend additional improvements if necessary.

4.1 EXISTING FACILITIES

4.1.1 Bicycle

Bicycle facilities within a one-mile bikeshed of the study area were assessed. There are 27 Capital Bikeshare locations and dedicated bicycle lanes and/or bicycle street ROW provided on the following streets: 4th, 6th, 8th, 9th, 10th, 11th, 12th, 15th, E, F, G, I, and Pennsylvania Avenue. Off-street bike trails exist throughout the areas of the National Mall, Tidal Basin, and Washington Channel. Bike routes and trails are signed on 4th Street SW and along the Washington Channel. There are no dedicated bicycle facilities along Independence Avenue SW. However, given the width of the sidewalks along this corridor, bicyclists were observed to ride both on street and on the sidewalks, particularly on the eastbound side.

4.1.1.1 Capital Bikeshare Analysis

Capital bikeshare stations in a ¼-mile radius of the study area were assessed for their utilization. The results for the assessment can be seen in Figures 1 – 9 show the average count of available bike and bike docks on weekdays from April 1st, 2016 through October 31st, 2016. Figures 10 – 19 show the same data for weekends during the above time period. The red line is a count of available bikes at the station while the gray line is a count of available bike docks at the station. It should be noted that the bikeshare station at 7th & E St SW has been added in the past year and thus only data on from April 1st, 2017 through September 30th, 2017 could be provided.



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Figure 1: Washington & Independence Ave SW/HHS Weekday

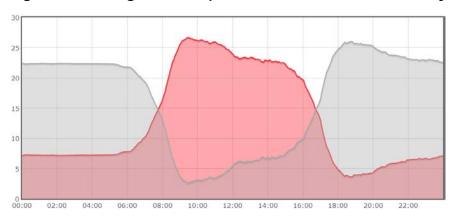


Figure 2: 4th & E St SW Weekday



Figure 3: Maryland & Independence Ave Weekday

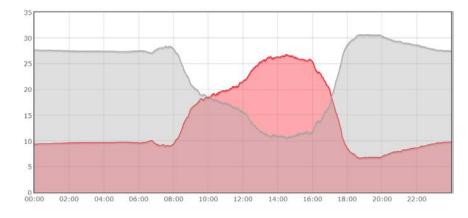


Figure 4: L'Enfant Plaza / 7th & C St SW Weekday

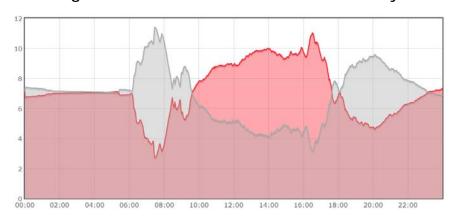


Figure 5: 7th & E St SW (4/1/2017 - 9/30/2017) Weekday

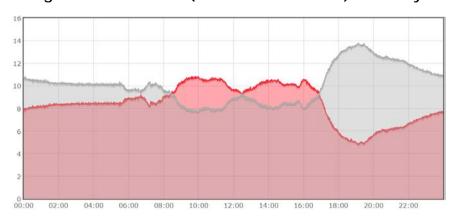


Figure 6: 10th St & L'Enfant Plaza SW Weekday

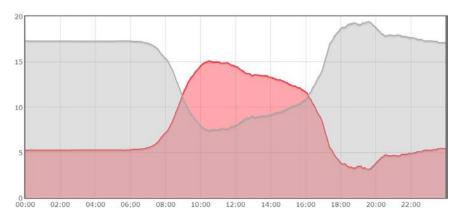


Figure 7: Independence Ave & L'Enfant Plaza SW/DOE Weekday



Figure 8: USDA/12th & Independence Ave SW Weekday

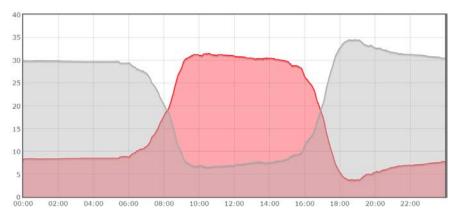
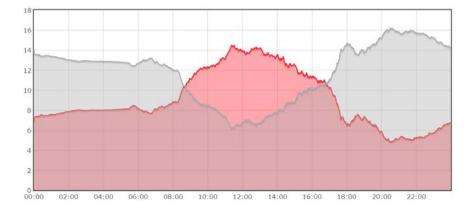


Figure 9: Jefferson Drive & 14th St SW Weekday





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Figure 10: Washington & Independence Ave SW/HHS Weekend

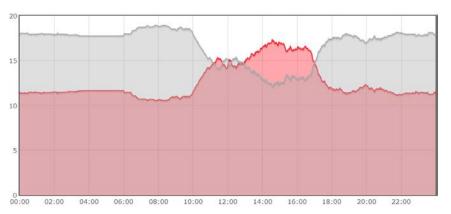


Figure 11: 4th & E St SW Weekend



Figure 12: Maryland & Independence Ave SW Weekend

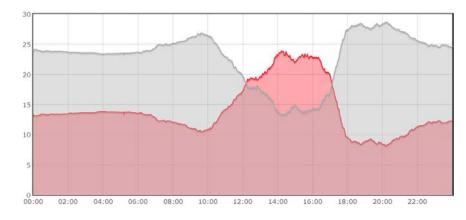


Figure 13: L'Enfant Plaza / 7th & C St S Weekend

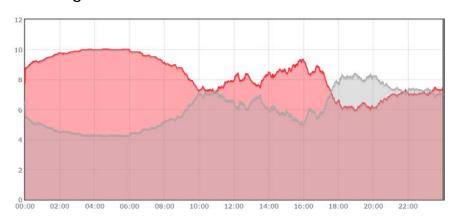


Figure 14: 7th & E St SW (4/1/2017 - 9/30/2017) Weekend

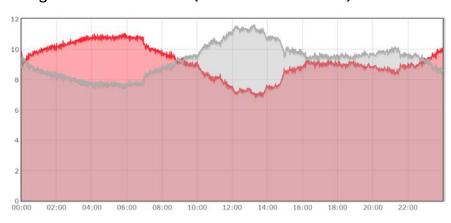


Figure 15: 10th St & L'Enfant Plaza SW Weekend

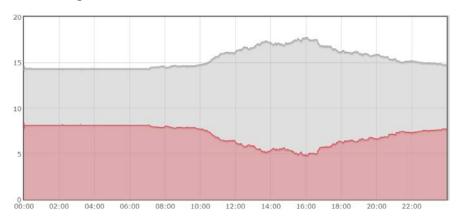


Figure 16: Independence Ave & L'Enfant Plaza SW/DOE Weekend

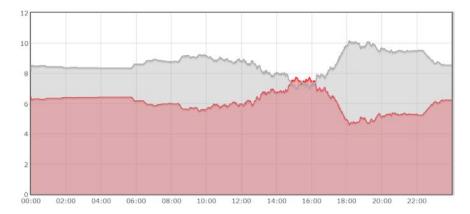


Figure 17: USDA/12th & Independence Ave SW Weekend

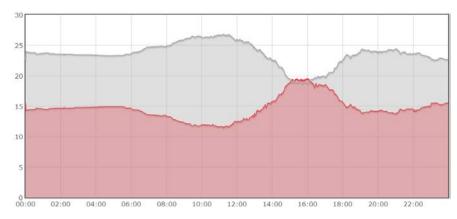
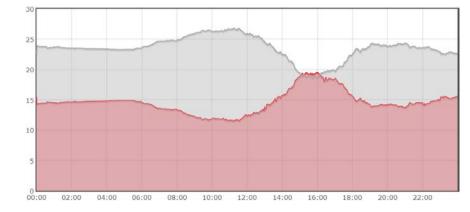


Figure 18: Jefferson Drive & 14th St SW Weekend





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The data suggests that the number of available bikes peaks on an average weekday and weekend between 10:00 AM and 4:00 PM. This pattern is consistent with trip patterns for the office space adjacent to the study area during weekdays, as well as the museum operating hours. Furthermore, the patterns reveal that the stations are relatively under-utilized during off-peak hours, which would be consistent with the stations being located in an area of destination trips, rather than origin trips. The data also reveals that the number of available bikes never drops below four to five bicycles, and that, even at peak, most stations have at least five to ten available docks. There were no stations that experience complete utilization of all bicycles, or of all docks.

While current data shows available capacity, the proposed expansion is anticipated to generate up to 36 new bicycle trips on a weekday PM peak period and 129 new bicycle trips on a Saturday peak period. While not all bicycle trips would be bikeshare, based on current data, the number of available weekday PM and Saturday peak period bikes would be 48 and 241, respectively.

While it is unclear how future growth by 2040 may affect bikeshare demand, Smithsonian could monitor nearby Capital Bikeshare stations and install a new station if demand begins to exceed supply. If a South Mall Campus new Capital Bikeshare station is required, consideration should be given to placing it in proximity to the intersection of Jefferson Drive SW and 7th Street SW because the nearest Capital Bikeshare station is approximately 900 feet away from this intersection, the farthest location from a Capital Bikeshare station on the Smithsonian South Mall Campus.

4.1.1.2 Onsite and Employee Bicycle Parking

Bicycle racks are provided throughout the National Mall and adjacent to most Smithsonian properties. There are currently two bicycle racks providing approximately 24 bicycle parking spaces along Jefferson Drive SW on the South Mall Campus, and an additional bicycle parking area that provides approximately 10 bicycle parking spaces across Jefferson Drive SW from the campus. No bicycle parking is provided along Independence Avenue SW. All of the bicycle racks were observed to be approximately 50% utilized during an average weekday.

Similar to the Capital Bikeshare Stations, it is unclear how future demand will impact the existing bicycle facilities. The proposed expansion is anticipated to generate up to 36 new bicycle trips on a weekday PM peak period and 129 new bicycle trips on a Saturday peak period. While some trips would be made with Capital Bikeshare, additional private bicycle parking may be needed. Consideration should be given to providing sheltered and secured onsite parking for employees. SI could also consider monitoring bicycle rack usage after the proposed expansion is completed and install new bike racks as needed. If additional capacity is needed, consideration should be given to installing bicycle racks along Independence Avenue SW.



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4.1.2 Pedestrian

Pedestrian facilities within a ¼-mile walkshed were also assessed. Sidewalks varying in width from nine to 16 feet are provided along all study area roadways. Wide and clearly striped crosswalks are provided at intersection approaches and two mid-block locations. Curb ramps and pedestrian countdown signal heads are provided at each crosswalk at each signalized intersection. Only two curb ramps at L'Enfant Plaza & Independence Avenue SW, three curb ramps at 12th Street SW & Jefferson Drive SW, and one each at the mid-block crosswalks on Jefferson Drive SW, have detectable warning surfaces. Smithsonian should identify crosswalks adjacent to the project site that need to be updated to current standards as the project moves from master planning to design.

Most pedestrian trips generated by the proposed expansion are anticipated to come from the National Mall. The South Mall Campus facilities and National Mall are interconnected by signalized crosswalks at 7th Street SW and 14th Street SW, as well as eleven (11) unsignalized crossings, which would easily accommodate existing and future pedestrian trips. Therefore, no additional modifications to pedestrian facilities are recommended.

4.2 PROPOSED PLANS

As previously discussed in Section 2.0, the 2005 Bicycle Master Plan shows that no dedicated bicycle facilities exist along Independence Avenue SW, resulting in a bicycle level of service (BLOS) of D. To correct this deficiency, the plan proposes a signed bicycle route and moveDC proposes a cycle track. According to the 2012 DC Bike Map, fair cycling conditions exist on Independence Avenue SW. Although the Bike Map also shows a Capital Bikeshare station on the west side of 12th Street SW, south of Independence Avenue SW, no evaluation of cycling conditions was made of 12th Street SW. As of 2015, no additional bicycle facilities are proposed for this intersection as shown and listed on the 2015 Proposed Bike Lanes Map and 2015 Bikeways Work Plan, respectively.

The 2009 Pedestrian Master Plan identifies segments of Independence Avenue SW within the study area to have medium-high pedestrian activity with medium-high pedestrian facility deficiencies. It suggests that the corridor be considered a candidate for priority corridor improvements, but does not recommend any improvement strategies.

4.3 IMPACT OF PROPOSED EXPANSION ON EXISTING AND PROPOSED FACILITIES

Expansion of the South Mall Campus facilities and construction of the proposed loading dock/driveway would not have a significant impact on existing or proposed pedestrian and bicycle facilities. The proposed South Mall Campus Master Plan includes connectivity enhancements between Jefferson Drive SW and Independence Avenue SW. Thus, these connectivity enhancements would reduce pedestrian demand on adjacent sidewalks,



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particularly along 12th Street SW. Furthermore, the bulk of pedestrian trips will be oriented to and from the National Mall, which has multiple signalized and unsignalized crosswalks across Jefferson Drive SW.

The proposed driveway would introduce a new curb cut adjacent to the signalized intersection of Independence Avenue SW and 12th Street SW. However, adequate transitions from sidewalk to street (curb ramps), pedestrian signal heads, and a clearly defined crosswalk will be provided across the driveway (see Appendix A). Furthermore, the driveway would enhance pedestrian and bicycle operations along the north side of Independence Avenue by eliminating up to three uncontrolled driveways and replacing them with a single signal-controlled driveway. This may be particularly desirable if a cycle track is to be constructed along Independence Avenue as identified in the moveDC plan.



Transit Service October 24, 2017

5.0 TRANSIT SERVICE

Transit services within ¼-mile of the study area are provided by the following organizations:

Washington Metropolitan Area Transit Authority (WMATA). WMATA provides the most extensive services through its Metrorail and bus. Services generally begin at 5:00AM Monday through Friday and 7:00AM Saturdays and Sundays, and end at 12:00AM Sunday through Thursday and 3:00AM Friday and Saturday. The study area has one Metrorail station (Smithsonian) on the Blue, Silver, and Orange lines. Bus stops for the 16X, 52, and V1 routes are located at or near the intersection of Independence Avenue SW & 12th Street for connections to Metrorail via the Smithsonian station.

DC Circulator (by WMATA and DDOT). The DC Circulator's new National Mall Service operates from Union Station to various memorials and the Tidal Basin. From October to March, service begins at 7:00AM on weekdays and 9:00AM on weekends through 7:00PM daily. Service is extended one hour during the summer months from April to September. The study area has two stops on Jefferson Drive SW at 12th Street SW and near 7th Street SW. There is also another stop on Madison Drive NW at 12th Street NW.

Maryland Transportation Authority (MTA). The MTA runs many commuter bus lines into the District. Four routes, including the 230, 250, 630, and 725, have stops at the intersection of Independence Avenue SW and 12th Street SW. Connections to MTA are also available at the Smithsonian Metrorail station.

Potomac and Rappahannock Transportation Commission (PRTC). PRTC operates the OmniRide commuter bus service into the heart of the District. Routes that service the study area include GV-R and LR-R (including select trips around the National Mall). Bus stops are located at the intersection of Independence Avenue SW & 12th Street SW near the Smithsonian Metro station.

Loudoun County. Loudoun County operates the LC Transit Commuter Bus Routes that make daily trips from Arlington, VA to the District in the AM and from the District to Arlington, VA in the PM. Marked stops are provided at the intersections of Independence Avenue SW & 12th Street SW and Independence Avenue SW & 10th Street SW (L'Enfant Promenade).

The proposed expansion is anticipated to generate 295 new transit trips during the PM peak hour, and 1,051 new transit trips during the Saturday peak hour, the majority of which are anticipated to utilize Metro. The Smithsonian Metro station is directly across Jefferson Drive SW from the South Mall Campus, and would likely be capable of supporting the additional transit trips, as the transit trips peak on the weekends when the overall Metro system is running under capacity.



Site Access & Loading October 24, 2017

6.0 SITE ACCESS & LOADING

The SI South Mall Campus Master Plan seeks to enhance the user experience by providing seamless connections between the various South Mall Campus facilities, increasing the visibility of the facilities, and providing additional education and visitor service space. These improvements include the consolidation of the existing loading driveways at the Sackler Gallery and Arts and Industry Building, as well as the potential consolidation of the HMSG loading dock at a future date, into one new underground loading area and driveway to be located between the ramp to the 12th Street Expressway and the Freer Gallery of Art. Additional information regarding the proposed loading facilities in included in the Loading Dock CTR (Appendix A).



Parking and Passenger Loading October 24, 2017

7.0 PARKING AND PASSENGER LOADING

7.1 PARKING

An inventory of parking regulations was conducted on Tuesday, October 11, 2017. The data collection team denoted posted parking regulations by segment of the roadway, including restrictions on parking duration, loading zones, ADA parking spaces, bus stops, parking meters and kiosks, and street cleaning restrictions. Figure 19 summarizes the parking regulations for the study area network.

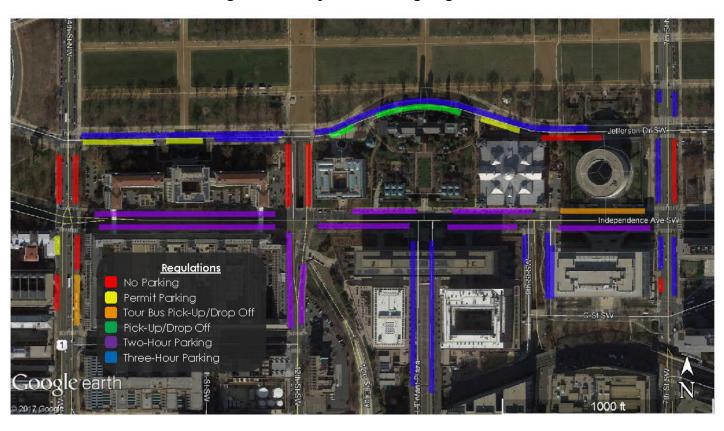


Figure 19: Study Area Parking Regulations

Exhibit 1 in Appendix E lists each segment inventoried for:

- Total number of on-street parking spaces;
- Number of permit spaces;
- Number of metered spaces; and,
- Number of ADA spaces.



Parking and Passenger Loading October 24, 2017

The primary parking for the South Mall Campus facilities is located along Jefferson Drive SW, between 14th Street SW and 7th Street SW. Parking is provided on at least one side of the roadway for most of the corridor, providing approximately 95 parking spaces. Metered parking also exists on Independence Avenue SW. However, parking is permitted for two hours during off-peak periods, from 9:30AM to 4:00PM Monday through Friday and from 7:00AM to 6:30PM Saturday. Parking is prohibited during the AM and PM peak periods, 7:00AM – 9:30AM and 4:00PM – 6:30PM, respectively. From 10th Street SW to 14th Street SW, parking is also prohibited from 10:00PM to 5:00AM on Tuesdays for street cleaning.

Some metered parking is available on 14th Street SW immediately north and south of Independence Avenue SW, but most spaces are reserved for special permits. No parking is provided on 7th Street SW. Metered parking on 12th Street SW does not have a time restriction. Independence Avenue SW, 14th Street SW, and 12th Street SW are designated snow emergency routes, on which parking is not permitted during snow emergencies.

While the proposed loading dock/driveway would not require any additional parking, the facility expansion would generate approximately 46 PM peak hour vehicle trips (7 in and 39 out) and 164 Saturday peak hour trips (88 in and 76 out). Since no additional parking will be provided as part of the South Mall Campus expansion, it was assumed that the additional vehicle trips would be absorbed by on-street parking, as well as nearby parking garages, such as L'Enfant Plaza and Capitol Plaza.

7.2 PASSENGER LOADING

Bus passenger loading occurs on Independence Avenue, during off-peak periods, as well as along the entire frontage of Jefferson Drive SW between 12th Street SW and 14th Street SW. Based on feedback from SI, the current loading areas meet the needs for the South Mall Campus. However, loading should be assessed in the future, after the South Mall Campus enhancements are completed to determine if changes to passenger loading are necessary.



Safety October 24, 2017

8.0 SAFETY

An inventory of the study area was conducted on October 11, 2017. In general, the study area has undivided, level roadways with 11-foot wide lanes and metered parking. Roadside features include wide sidewalks and streetscaping. Although all modes are encouraged to use the area, on-road traffic is mostly composed of passenger vehicles with some trucks, and off-road traffic is mostly composed of pedestrians. Traffic control includes signalized intersections supplemented with signage. Although there are no existing signs prohibiting right turns on red, the northbound 12th Street SW and 10th Street SW approaches have protected right turn signal indications.

Additional investigations of the intersections reveal:

- Striping is in good condition,
- Approaches have relatively little skew, if any,
- Excellent daylighting,
- Post-mounted signal heads, and
- Some roadside trees may obstruct sight distance.

The proposed facility expansion is not anticipated to impact traffic safety in and around the South Mall Campus. Enhancing connectivity through the South Mall Campus would encourage more pedestrian travel away from the roadways. Furthermore, consolidating loading areas to a signal-controlled location and closing the multiple existing curb cuts would reduce the likelihood of pedestrian and bicycle conflicts with vehicles.

8.1 SIGHT DISTANCE

AASHTO's A Policy on Geometric Design of Highways and Streets, 6th Edition, provides a method to calculate the required intersection sight distance for the three possible movements at an intersection: left turn, through, and right turn. Although these calculations are generally used for unsignalized intersections, they can also be applied to signalized intersections where right turns on red are permitted and consequently mimic yield-controlled conditions. Signal-controlled left turns are usually not analyzed. Therefore, according to AASHTO, the required sight distances for right turns at all three intersections is approximately 240 feet for passenger vehicles, 315 feet for single-unit trucks, and 390 feet for combination trucks for all approaches. Based on these parameters, sight distance from the proposed consolidated driveway meets the requirements. Please see Appendix A for more information regarding site distance for the proposed loading driveway.



Streetscape & The Public Realm October 24, 2017

9.0 STREETSCAPE & THE PUBLIC REALM

It is anticipated that some removal or relocation of streetscaping will be necessary to accommodate the proposed driveway and the underground expansion. All modifications to streetscaping will conform to DEM standards. It should also be noted that the overall South Mall Campus Master Plan includes improving the Independence Avenue SW frontage with more street furniture and plantings, as well as enhancing the internal on-site connections between Independence Avenue SW and Jefferson Drive SW. Sidewalks on the SI side of Independence Avenue SW also follow NCPC streetscape standards for Mall Roads, including yellow aggregate concrete paving.



Conclusion October 24, 2017

10.0 CONCLUSION

The proposed Smithsonian South Mall Campus expansion would have a negligible effect on the local roadway network, increasing overall vehicle volumes by approximately 1%. However, due to existing capacity deficiencies and future growth within the study area, the following minor mitigation measures are proposed to mitigate the small increases in delay generated by the proposed facility expansion:

Vehicle

- 1. Signal timing, phasing, and offset modifications, including an increase in cycle lengths from 110 seconds to 150 seconds in the PM peak hour. This would need to be conducted as a part of a wider signal retiming effort, which would likely be required in the future to accommodate background growth and other projects by 2040.
- 2. Modify the existing unsignalized intersection of SW Jefferson Drive and 12th Street SW from a two-way stop controlled intersection to an all-way stop controlled intersection. Modifying the SW Jefferson Drive eastbound shared thru-right movement from a free movement to a stop-controlled movement would grant more acceptable gaps for pedestrians to cross SW Jefferson Drive, along with reducing delay for right turning vehicles on 12th Street SW.
- 3. Modify the southbound 14th Street SW approach to Jefferson Drive to include a protected-permitted left-turn phase.

Pedestrian/Bicycle

- 1. Monitor utilization of onsite bicycle parking, as well as Capital Bikeshare stations within ¼ mile. If demand exceeds capacity install new bike racks and/or a Capital Bikeshare Station. If a new Capital Bikeshare Station is required, consider locating it near the intersection of 7th Street SW and Jefferson Drive SW to fill an existing gap in the system.
- 2. Upgrade all curb ramps connecting to/from the South Mall Campus to meet current ADA standards.
- 3. Provide A new crosswalk along the east side of the intersection of Independence Avenue SW and 12th Street SW.

Passenger Loading

1. Monitor passenger loading areas to determine if they continue to meet SI needs without impacting traffic operations on Jefferson Drive SW or Independence Avenue SW.

Loading

1. All deliveries made with trucks WB-50 or larger will be scheduled in advance. These deliveries will be scheduled to avoid the AM (7:00 AM – 9:00 AM) and PM (4:00 PM – 6:00 PM) peak

Conclusion October 24, 2017

- periods, unless necessary. This would likely have a minimal impact on the South Mall Campus facilities, as the majority of deliveries with larger trucks currently occur during off-peak periods.
- 2. Deliveries made in vehicles larger than a single unit truck should enter from northbound 12th Street SW or eastbound Independence Avenue SW to avoid wide right-turns into the proposed driveway.
- 3. Right-turns on red should be restricted at the proposed driveway and the westbound Independence Avenue SW approach at the signalized intersection with 12th Street SW.

APPENDIX A: SMITHSONIAN INSTITUTION SOUTH MALL CAMPUS LOADING DOCK CTR

APPENDIX B: STUDY AREA DATA

APPENDIX C: CAPACITY ANALYSIS

APPENDIX D: SYNCHRO OUTPUTS

APPENDIX E: PARKING

Smithsonian Institution South Mall Campus Master Plan – Consolidated Loading Dock and Driveway

Comprehensive Transportation Review



Prepared for: Smithsonian Institution

Prepared by: Stantec Consulting Services, Inc.

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Executive Summary

The Smithsonian Institution (SI) South Mall Campus Master Plan includes several improvements that are intended to enhance the user experience by providing seamless connections between the various South Mall Campus facilities, increasing the visibility of the facilities, and providing additional education and visitor service space. The SI Master Plan is expected to be implemented over a 15 to 20 year timeframe. As part of the overall vision for the South Campus, SI is proposing to consolidate the existing loading areas adjacent to the Sackler Gallery and the Arts and Industry Building into a single two-way loading driveway and underground facility that would be accessed via a ramp at the intersection of Independence Avenue SW and 12th Street SW, on the west side of the Freer Gallery of Art. The consolidation of these two loading driveways would eliminate breaks in the current campus site plan, allowing for a cohesive connection across the entire campus for visitors, and will provide the Smithsonian with an underground loading area that provides adequate space to separate collections loading from food and garbage loading and that allows for large trucks to maneuver below grade rather than in the street.

Although the Master Plan will be implemented over a 15 to 20 year timeframe, the construction of the new loading dock, as well as renovations to the Castle are anticipated to begin early in the Plan's implementation. Upon completion of the proposed loading driveway (estimated by 2025), the existing loading driveway between the Freer and Sackler Galleries, as well as the Arts and Industry Building parking/loading driveway, would be deactivated and closed to all deliveries. However, these driveways may be reactivated on a temporary basis for construction access and staging during the South Mall Campus renovations. Furthermore, while the removal of the Hirshhorn Museum and Sculpture Garden (HMSG) loading dock is not included as part of this proposal at this time, the proposed loading driveway would be designed to accommodate a future connection. Additional analysis would be conducted to determine if the building could be connected to the proposed loading driveway under the 9th Street tunnel in the future. Such a project is currently anticipated to be roughly twenty years away.

The proposed loading driveway would be able to accept all truck types (up to WB-67), as well as eliminate the need for trucks to back into or out of the driveways, as occurs in the existing condition. Because all deliveries are scheduled, the design of the proposed loading driveway will include a security booth to help maintain safety and to check identification. Given the proximity of the proposed loading driveway to the existing signalized intersection of Independence Avenue SW and 12th Street SW, a separate actuated signal phase would be required to provide dedicated green time to the driveway.

It should be noted that this report has been prepared to evaluate the impacts of the proposed loading driveway only. If the driveway is determined to be acceptable, based on this analysis and further coordination with the District of Columbia Department of Transportation (DDOT), a



separate Comprehensive Transportation Review will be conducted to evaluate the impacts of the remaining components of the Master Plan which will be submitted to NCPC for review in 2018.

Methodology

Stantec Consulting Services, Inc. (Stantec) conducted the assessment of the proposed loading driveway based on Chapter 45 of the DDOT Design and Engineering Manual (DEM) and DDOT Guidelines for Comprehensive Transportation Review Requirements. The assessment includes:

- A review of several city-wide planning documents as well as local studies including the 2005 Bicycle Master Plan, 2009 Pedestrian Master Plan, moveDC, Southwest Ecodistrict Plan, Memorials & Museums Master Plan, Maryland Avenue SW Transportation Study, and Smithsonian Institution South Mall Campus Master Plan.
- A capacity analysis that was conducted on the Independence Avenue SW corridor, including the signalized intersections at 14th Street SW, 12th Street SW, and 10th Street SW (L'Enfant Promenade/Plaza) for the 2015 Existing, 2030 No Build, and 2030 Build Conditions.
- An assessment of the impact of the proposed driveway on existing and potential future pedestrian, bicycle, transit, and parking facilities.
- Analysis of crash records for the three signalized study area intersections.
- Development of recommendations to mitigate operational deficiencies.

Conclusions and Recommendations

The proposed consolidation of up to three loading driveways along Independence Avenue SW into one loading dock/driveway at the intersection of Independence Avenue SW & 12th Street SW would have an overall negligible impact on the study area roadway network, and may improve safety by reducing opportunities for conflicts with trucks.

The analysis of the proposed loading driveway revealed the following:

- 1. Recommendations in city-wide planning documents and studies would not be affected by the proposed driveway.
- 2. Design of the new driveway would require elements for pedestrians such as adequate transitions from sidewalk to street (curb ramps), pedestrian signal heads, and a clearly defined crosswalk.



- 3. The new driveway is not expected to generate any new auto, transit, pedestrian, or bicycle trips. It is expected to divert two inbound and three outbound existing truck trips and generate one inbound and one outbound truck trip in both AM and PM peak hours.
- 4. The additional signal phase required for the driveway would cause degradation in the operation of the eastbound Independence Avenue SW approach from a volume-to-capacity (v/c) ratio of 0.88 during the 2030 Future No Build Condition AM peak hour to a v/c ratio of 1.04 during the 2030 Future Build Condition. The loading driveway has a negligible impact on PM peak hour operations.
- 5. The driveway would enhance pedestrian and bicycle operations along the north side of Independence Avenue SW by eliminating up to three uncontrolled driveways, over time, and replacing them with a single signal-controlled driveway.
- 6. A crosswalk could be provided across the east leg of the intersection.
- 7. Four metered parking spaces and some streetscaping on the westbound Independence Avenue SW approach at the intersection with 12th Street SW would need to be removed or relocated to accommodate the new driveway.
- 8. The existing bus stop on the northeast corner of the intersection would need to be shifted approximately 40 feet east.

To address the deficiencies, the following measures are recommended:

- 1. All deliveries made with trucks WB-50 or larger will be scheduled in advance and will avoid deliveries between 6:30 AM and 9:30 AM, as well as between 3:30 PM and 6:30 PM to correspond with peak volume periods at the intersection of Independence Avenue SW & 12th Street SW.
- 2. Deliveries made in box trucks (such as UPS, FedEx, DHL, etc.) and WB-40 (food deliveries) will be encouraged to avoid the AM (6:30 AM 9:30 AM) and PM (3:30 PM 6:30 PM) peak periods. However, specific restrictions cannot be placed on these types of deliveries.
- 3. SI will work with DDOT during events in the City to restrict or hold deliveries.
- 4. If pedestrian and/or vehicle congestion on Independence Avenue SW results in queuing that extends to upstream intersections, SI will hold trucks within the loading area until conditions improve. SI will also coordinate with DDOT and/or the MPD during emergencies to hold deliveries within the loading area.
- 5. Trash and recycling pick-up will be scheduled for off-peak periods.



Introduction August 31, 2017

1.0 INTRODUCTION

The Smithsonian Institution (SI) South Mall Campus Master Plan includes several improvements that are intended to enhance the user experience by providing seamless connections between the various South Mall Campus facilities, increasing the visibility of the facilities, and providing additional education and visitor service space. The SI Master Plan is expected to be implemented over a 15 to 20 year timeframe. As part of the overall vision for the South Campus, SI is proposing to consolidate the existing loading areas adjacent to the Sackler Gallery (underground) and the Arts and Industry Building (at-grade) into a single loading driveway that would be accessed via a ramp at the intersection of Independence Avenue SW and 12th Street SW, on the west side of the Freer Gallery of Art. The consolidation of these two loading driveways would eliminate breaks in the current campus site plan, allowing for a cohesive connection across the entire campus for visitors, and will provide the Smithsonian with an underground loading area that provides adequate space to separate collections loading from food and garbage loading and that allows for large trucks to maneuver below grade rather than in the street.

Furthermore, the current loading areas along Independence Avenue SW do not provide adequate space for larger vehicles. Large box trucks and tractor trailers often back into or out of the loading areas, creating disruptions to traffic flow on Independence Avenue SW. Large exhibition deliveries, which typically arrive in larger tractor trailers (WB-67), must park and load/unload on Independence Avenue SW, which exposes the exhibit materials to unnecessary risk. The proposed loading driveway would be able to accept all truck types (up to WB-67), as well as eliminate the need for trucks to back in to or out of the driveways, as occurs in the existing condition. Instead, trucks would be able to turn around within the underground loading area. In addition, because all deliveries are scheduled, the design of the proposed loading driveway will include a security booth to help maintain safety and to check identification.

Although the Master Plan will be implemented over a 15 to 20 year timeframe, the construction of the new loading dock, as well as renovations to the Castle are anticipated to begin early in the Plan's implementation. Upon completion of the proposed loading driveway (estimated by 2025), the existing loading driveway between the Freer and Sackler Galleries, as well as the Arts and Industry Building parking/loading driveway, would be deactivated and closed to all deliveries. However, these driveways may be reactivated on a temporary basis for construction access and staging during the South Mall Campus renovations. Furthermore, while the removal of the Hirshhorn Museum and Sculpture Garden (HMSG) loading dock is not included as part of this proposal at this time, the proposed loading driveway would be designed to accommodate a future connection. Additional analysis would be conducted to determine if the building could be connected to the proposed loading driveway under the 9th Street tunnel in the future. Such a project is currently anticipated to be roughly twenty years away.



Introduction August 31, 2017

Given the proximity of the proposed loading driveway to the existing signalized intersection of Independence Avenue SW and 12th Street SW, a separate actuated signal phase would be required to provide dedicated green time to the driveway. Therefore, an assessment of the impact of the loading driveway and the additional signal phase is required. It should be noted that this report has been prepared to evaluate the impacts of the proposed loading driveway only, as it is a critical component to the overall South Mall Campus Master Plan. If the driveway is determined to be acceptable, based on this analysis and further coordination with the District of Columbia Department of Transportation (DDOT), a separate Comprehensive Transportation Review will be conducted to evaluate the impacts of the remaining components of the Master Plan.

This assessment of the proposed consolidated loading driveway is based on Chapter 45 of the DDOT Design and Engineering Manual (DEM) and DDOT Guidelines for Comprehensive Transportation Review Requirements.



Strategic Planning Elements August 31, 2017

2.0 STRATEGIC PLANNING ELEMENTS

Stantec reviewed several city-wide planning documents as well as local studies to determine how the proposed loading driveway considers District growth goals and objectives within the study area. These documents included the 2005 Bicycle Master Plan, 2009 Pedestrian Master Plan, moveDC, Southwest Ecodistrict Plan, Memorials & Museums Master Plan, Maryland Avenue SW Transportation Study, and Smithsonian Institution South Mall Campus Master Plan.

2.1 PLANS/STUDIES REVIEWED

2005 Bicycle Master Plan. This plan is a guide to establishing high-quality bicycle facilities and programs from 2005 to 2015 through facility improvements, policy changes, education, promotion, and enforcement. The plan shows that no dedicated bicycle facilities exist along Independence Avenue SW or 14th Street SW, resulting in bicycle levels of service (BLOS) of D and E, respectively. To correct these deficiencies, the plan proposes a bicycle lane on 14th Street SW and signed bicycle routes along Independence Avenue SW and 14th Street SW. A progress update to the plan can be found in an appendix of moveDC.

2009 Pedestrian Master Plan. This plan serves as the foundation for DDOT's pedestrian programs and represents the first comprehensive city-wide effort to address pedestrian safety challenges and related issues. The goals of the plan are to reduce the number of pedestrian fatalities and injuries associated with motor vehicle crashes and to increase pedestrian activity by creating a comfortable and accessible environment for walking throughout all parts of the District.

Through an analysis of existing conditions, the plan identified the segments of 14th Street SW and Independence Avenue SW within the study area to have medium-high pedestrian activity with medium- high pedestrian facility deficiencies. This process also identified Independence Avenue SW, from 15th Street SW to South Capitol St SW, as a priority corridor for improvements. However, no action was recommended at the time due to few pedestrian injuries occurring during the period from 2000 to 2006. A progress update to the plan can be found in an appendix of moveDC.

moveDC. Published in October 2014, moveDC was a collaborative effort led by DDOT to present a vision and improvement course for the District's transportation system over the next 25 years. MoveDC focuses on more travel options, reliability of transportation systems, safety for all, and efficiency of investments. The plan proposes more than 200 new miles of bicycle facilities, a 22-mile streetcar system with the possibility of extension lines, and more than 40 miles of High Capacity Transit. Within the study area specifically, the plan shows that the bicycle level of service (LOS) is D or better and proposes a cycle track on Independence Avenue SW. It also contains progress updates to the 2005 Bicycle and 2009 Pedestrian Master Plans as of December 2013.



Strategic Planning Elements August 31, 2017

Southwest Ecodistrict Initiative. Published by the National Capital Planning Commission (NCPC), the SW Ecodistrict Initiative is a comprehensive and forward-looking approach to urban sustainability and livability through transformation of the Maryland Avenue SW and 10th Street SW (L'Enfant Promenade and Plaza) area into a highly sustainable mixed-use community. The study area is bounded by Independence Avenue SW to the north, Maine Avenue SW to the south, 12th Street SW to the west, and 4th Street SW to the east. The plan examines the redevelopment of 12 sites and streetscaping of 10th Street SW to encourage a walkable neighborhood and economic growth. The U.S. General Services Administration (GSA) Regional Office Building (ROB) and Cotton Annex, located on D Street SW and 12th Street SW respectively, are two sites that are beginning the redevelopment process. Traffic studies for these developments were included in the 2030 Background/No Build Condition analysis.

Memorials & Museums Master Plan. The NCPC, in consultation with the U.S. Commission of Fine Arts and the National Capital Memorial Advisory Committee, developed a plan that shows how to meet demand for museums and commemorative works while protecting the National Mall and preserving other existing museum and memorial settings. The plan inventories existing, and forecasts future demand for memorials and museums, identifies and evaluates suitable sites for future memorials and museums, and establishes a zoning policy for siting. The plan is currently guiding the construction of the Dwight D. Eisenhower Memorial on a site adjacent to the study area, north of the U.S. Department of Education and across Independence Avenue SW from the National Air and Space Museum. A traffic study for this development was included in the 2030 Background /No Build Condition analysis.

Maryland Avenue SW Transportation Study. DDOT is currently studying the impacts on multimodal operations, including vehicular, bus, rail, pedestrian, and bicycle, from the creation of a new Maryland Avenue SW corridor between 12th Street SW and 7th Street SW. The study examines three potential configurations of a future connection over the existing rail corridor. The plan would propose a new 11th Street SW that would connect to the study area and create a new intersection. To maintain optimal traffic flow, signal retiming at the study area intersections may be required along the corridor.

Smithsonian Institution South Mall Campus Master Plan. The Smithsonian Institution (SI) South Mall Campus Master Plan includes several improvements that are intended to enhance the user experience by providing seamless connections between the various South Mall Campus facilities, increasing the visibility of the facilities, and providing additional education and visitor service space. Among these improvements is the consolidation of up to three loading docks/driveways along Independence Avenue SW into one new underground loading area and driveway. The new loading area would accept all truck types and eliminate the need for trucks to park or make any loading maneuvers within the roadway.



Strategic Planning Elements August 31, 2017

2.2 POTENTIAL IMPACT OF PROPOSED DRIVEWAY ON PLANS

Ultimately, the consolidation of the loading driveways along Independence Avenue SW into one loading dock/driveway for the South Mall Campus would not affect the findings and recommendations of these planning documents and studies. In fact, the consolidation of the loading driveways would likely enhance pedestrian and bicycle operations along Independence Avenue SW by eliminating conflict points at the uncontrolled driveways. The proposed consolidated driveway would be signal controlled, and thus potential pedestrian and bicycle conflicts with trucks would be better controlled. Consolidating the driveways would also eliminate potential conflict points along the cycle track proposed on Independence Avenue SW in the moveDC plan.



Roadway Capacity & Operations August 31, 2017

3.0 ROADWAY CAPACITY & OPERATIONS

3.1 VEHICLE STUDY AREA

Located on SI's South Mall Campus in the southwest quadrant of the District, the study area is formally located in the Southwest Federal Center neighborhood, in Ward 6, between the National Mall and I-395. The neighborhood is primarily a business district and almost entirely occupied by offices for various branches of the U.S. Government and many of SI's museums. The South Mall Campus is bounded by Jefferson Drive SW to the north, Independence Avenue SW to the south, 12th Street SW to the west, and 7th Street SW to the east. The proposed loading dock/driveway would be located between the ramp to the 12th Street Expressway and the Freer Gallery of Art at the intersection of Independence Avenue SW & 12th Street SW. Therefore the study area consists of a short section of Independence Avenue SW corridor, including the signalized intersections at 14th Street SW, 12th Street SW, and 10th Street SW (L'Enfant Promenade/Plaza), shown in Figure 1 in Appendix A.

Characteristics of the study area roadways were obtained from maps on the DDOT website denoting functional classification, 2013 Average Annual Daily Traffic (AADT), speed limits, and truck routes/loading zones. This information is summarized in **Table 1**. The table also lists the number of lanes and parking types as observed during a roadway inventory.

Table 1: Study Area Roadway Characteristics

Roadway	Functional Class	2013 AADT	Number of Lanes, Division	Parking Type	Speed Limit (mph)	Primary Truck Route/Designated Loading Zones?
Independence Avenue SW	Principal Arterial	26,600	8, Undivided	On-street Metered	25	Yes/No
14 th Street SW	Principal Arterial	40,700	7, Divided south of Independence Avenue SW	On-street Metered Special Permit	25	Yes/No
12 th Street SW	Local	11,100	5, Divided south of Independence Avenue SW	On-street Metered	25	Yes/No
10 th Street SW (L'Enfant Promenade)	Collector	4,200	2, Divided	On-street Metered	25	No/No

It should be noted that most on-street, metered parking in the study area is only permitted between the hours of 9:30AM – 4:00PM. At all other times, the parking lane operates as a travel lane. See Section 7.0 for more details on parking regulations.



Roadway Capacity & Operations August 31, 2017

3.2 DATA COLLECTION AND HOURS OF ANALYSIS

Stantec conducted a comprehensive data collection program to establish "average day" baseline conditions for vehicular, transit, pedestrian, and cyclist traffic within the study area. The program consisted of manual turning movement counts and queuing and loading activity observations. All data were collected on typical weekdays when District schools and Congress were in session and there were no major special events on the National Mall.

3.2.1 Turning Movement Counts

Manual turning movement counts were collected during the AM peak period (6:00AM – 10:00AM) and PM peak period (3:00PM – 7:00PM) at the three study intersections in September and December 2015. Appendix A contains the raw count data. An analysis of this data revealed the AM peak hour to be 8:00AM – 9:00AM and the PM peak hour to be 5:00PM – 6:00PM.

3.2.2 Queuing

Queuing observations were conducted during the December 2015 turning movement counts in order to determine if additional unmet demand would need to be considered in the traffic analysis. Despite clear peak hour directional volume (eastbound in the AM, westbound in the PM), the results of the queue observations show minimal to no queuing was observed along Independence Avenue SW. Therefore, it was determined that the traffic analysis did not need to consider additional unmet demand. Appendix A contains the queue observation data.

3.2.3 Loading Activities

Stantec also observed loading activities at the three existing SI loading driveways from Thursday, September 24, 2015 to Wednesday, September 30, 2015, during a 12-hour period from 7:00AM to 7:00PM. This activity was documented in a memo addressed to DDOT from Stantec entitled "Loading Dock Trip Generation Analysis" (Appendix A). The data show that SI received approximately two inbound trips and three outbound trips during both AM and PM peak hours.

3.3 ANALYSIS METHODOLOGY

Capacity analysis, a procedure used to estimate the traffic-carrying ability of roadway facilities over a range of defined operating conditions, was performed for study area intersections using Synchro 9 traffic analysis software. This software package provides average control delay and level of service (LOS) for each lane group and for the overall intersection. LOS is an evaluation of the quality of operation of an intersection and is a measure of the average delay a driver experiences while traveling through the intersection. LOS is dependent upon a range of defined operating conditions such as traffic demand, lane geometry, and traffic signal timing and phasing.



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Utilizing Synchro instead of the more basic Highway Capacity Software (HCS) is preferable for transportation networks with a series of closely-spaced signalized intersections, such as the Independence Avenue corridor. Under these conditions, Synchro is able to more accurately model the effects that the traffic operations (such as poor LOS or extensive queuing) at one intersection have on operations at an adjacent intersection. Furthermore, HCS cannot analyze complex intersections with more than four legs.

LOS can range from A to F and is based on the average control delay per vehicle. For a signalized intersection, LOS A indicates operations with an average control delay less than 10 seconds per vehicle, while LOS F describes operations with an average control delay in excess of 80 seconds per vehicle, or a volume-to-capacity (v/c) ratio greater than 1.0. **Table 2** summarizes the 2010 Highway Capacity Manual (HCM) delay criteria for signalized intersections.

Table 2: LOS Criteria for Signalized Intersections

Level of Service	Average Control Delay (seconds/vehicle)
Α	Less than or equal to 10.0
В	> 10.0 and ≤ 20.0
С	> 20.0 and ≤ 35.0
D	> 35.0 and ≤ 55.0
E	> 55.0 and ≤ 80.0
F	Greater than 80.0 or v/c > 1.0

Source: 2010 Highway Capacity Manual

While LOS D or better operations are generally deemed satisfactory from a traffic operations perspective, LOS E or F operations are often indicative of queuing and congestion. Improvements as recommended in this study seek to maintain or improve traffic operations to LOS D or better, as reported by Synchro.

Signal plans and timing directives were delivered by DDOT and were field-verified in order to accurately model signal operation type, phasing, detection, and cycle length in the Synchro files utilized for capacity analysis.

3.4 DEVELOPMENT SCENARIOS

3.4.1 2015 Existing Condition

2015 Existing Condition volumes for the AM and PM peak hours, shown in Exhibit 1 in Appendix B, were modeled in Synchro 9 to produce capacity analysis results, summarized in Exhibit 2 in Appendix B. All Synchro capacity analysis outputs are located in Appendix C. The results show



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that all lane groups in the study area intersections currently operate at LOS D or better with 95th percentile queuing (< 500 feet), except for the following:

Independence Avenue SW & 14th Street SW

- The northbound through movement generates a 95th percentile queue approximately 517 feet in the AM peak hour.
- The southbound left turn movement operates at LOS E during the AM peak period with 95th percentile gueues that may exceed capacity of the turn lane.
- The westbound through movement operates at LOS F during the PM peak hour.

According to the table presented in Chapter 45 of the DDOT DEM, the threshold capacity for major arterials such as Independence Avenue SW and 14th Street SW is approximately 45,000 vehicles per day. Using historical AADT data (2009-2013) provided on the DDOT website and presented in **Table 3**, Stantec estimated the current v/c ratio for these roadways to be 0.54 and 0.90, respectively.

Independence Avenue SW 14th Street SW between C Street Location between 9th Street SW and 12th SW and Jefferson Drive SW Street SW Year AADT in 1,000 AADT in 1,000 2009 26.9 45.8 2010 N/A 26.2 2011 21.5 40.9 2012 21.3 N/A 2013 26.6 40.7 42.5 Average 24.5

Table 3: Historical AADT

3.4.2 2030 Background/No Build Condition

The horizon year of 2030 was selected for the proposed project in order to correspond with the SI South Mall Campus Master Plan horizon year of the same. Stantec applied a background growth rate of 0.9 percent per year based on historical AADT data along a segment of Independence Avenue SW from 2009 to 2013 as reported by DDOT. **Table 4** shows this data. Exhibit 3 in Appendix B shows the projected background volumes within the study area.



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Table 4: Growth Rate

Location	Independence Avenue SWbetween 9 th Street SW and SW 12 th Street		
Year	AADT in 1,000	Difference %	
2009	26.9		
2010	26.2	-2.6%	
2011	21.5	-17.9%	
2012	21.3	-0.9%	
2013	26.6	24.9%	
Growth	Total	-1.1%	
Rate	Average	0.875% ~ 0.9%	

Three developments, previously discussed in Section 2.0 as part of the SW Ecodistrict Plan and Memorials & Museums Master Plan, are expected to have an impact on traffic volumes in the study area. These include the redevelopment of the GSA ROB and Cotton Annex as well as the construction of the Eisenhower Memorial. Since the GSA redevelopment projects are still in their scoping phase with DDOT, their trip generation, trip distribution, and corresponding mode splits were obtained from DDOT. Vehicular trip generation and distribution for the Eisenhower Memorial were obtained from the report entitled "Eisenhower Memorial Traffic Impact Study" by EarthTech and dated May 2006. Exhibits 4 through 9 in Appendix B show how all anticipated development trips were distributed through the existing roadway network.

Project background growth volumes and development volumes were summed to obtain 2030 No Build Condition volumes for the AM and PM peak hours, shown in Exhibit 10 in Appendix B. These volumes were modeled in Synchro 9 to produce capacity analysis results, summarized in Exhibit 11 in Appendix B. All Synchro capacity analysis outputs are located in Appendix C. Based on the results of the capacity analysis, all lane groups in the study area intersections would operate at LOS D or better with 95th percentile queuing of less than 500 feet in the 2030 horizon year, except for the following:

Independence Avenue SW & 14th Street SW

- The eastbound shared through/right movement would operate at LOS F during the AM peak period with 95th percentile queues exceeding 500 feet.
- The westbound through movement would continue to operate at LOS F with 95th percentile queues exceeding 500 feet during the PM peak hour.
- The northbound through movement would generate a 95th percentile queue that would exceed 500 feet in the AM peak hour.
- The southbound left turn would operate at LOS F during the AM peak period.
- The intersection would operate at an overall LOS E during the AM peak hour.



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3.4.3 2030 Future Build Condition

The proposed loading dock/driveway would be located between the ramp to the 12th Street Expressway and the Freer Gallery of Art at the intersection of Independence Avenue SW & 12th Street SW. For the purpose of this CTR, Stantec assumed the following based on a memorandum previously submitted to DDOT entitled "Loading Dock Trip Generation Analysis" (Appendix A):

- The proposed consolidated driveway is not anticipated to generate additional auto, pedestrian, bicycle, or transit trips. However, the driveway is anticipated to generate one new truck trip per peak period and divert two inbound and three outbound existing truck trips per peak period.
- Given that the proposed consolidated loading driveway will primarily be utilized by delivery vehicles that currently service the existing loading areas, trip distribution is based on existing patterns.
- Given the proximity of the proposed loading dock/driveway to the existing signalized intersection, a vehicle-actuated signal phase would be added to the existing signal timing to service the proposed driveway. The driveway would only receive a green signal if a vehicle is detected, thus minimizing the impact of an additional signal phase on the operation of the other intersection movements.
- The analysis includes truck trips from the HMSG loading area. However, it is unclear at this
 time whether the HMSG loading area would be closed and consolidated with the proposed.
 If it is not part of the consolidation overall driveway truck trips would likely be slightly less than
 analyzed in this study.

Exhibits 12 through 14 in Appendix B show existing truck trip diversion and new truck trip distribution based on the District's Truck Route Map and existing trip patterns. These volumes were added to the roadway network to obtain 2030 Future Build Condition volumes, shown in Exhibit 15 in Appendix B.

Stantec modeled the proposed Independence Avenue SW & 12th Street SW intersection configuration in Synchro 9 for the 2030 Future Build Condition with optimized AM and PM timing plans to obtain capacity analysis results (Exhibit 16 in Appendix B). More detailed Synchro capacity analysis output is located in Appendix C. Based on the results of the capacity analysis, all lane groups in the study area intersections would operate at LOS D or better with 95th percentile queues of less than 500 feet, except for the following:

Independence Avenue SW & 14th Street SW

- The eastbound shared through/right movement would continue to operate at LOS F during the AM peak period with 95th percentile queues exceeding 500 feet.
- The westbound through movement would continue to operate at LOS F with 95th percentile queues exceeding 500 feet during the PM peak hour.
- The northbound through movement would continue to generate a 95th percentile queue that would exceed 500 feet in the AM peak hour.



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- The southbound left turn would continue to operate at LOS F during the AM peak period.
- The intersection would continue to operate at an overall LOS E during the AM peak hour.

Independence Avenue SW & 12th Street SW

- The eastbound shared left/through/right movements would operate at LOS F during the AM peak hour due to a v/c ratio greater than 1.0. However, delay would increase to 34.0 seconds per vehicle (LOS C).
- The proposed loading dock/driveway southbound shared left/through/right movements would operate at LOS E during both AM and PM peak hours.

The capacity analysis results show that all movements at all study area intersections operate within six seconds of additional delay compared to the 2030 Background/No Build Condition. In fact, some movements would see a reduction in delay due to an optimization of signal phase lengths. However, the analysis results also show that the additional signal phase for the proposed driveway would result in a v/c ratio greater than 1.0 for the eastbound Independence Avenue SW approach in the AM peak hour. Therefore, it is recommended that SI consider restricting deliveries to the extent possible during the AM peak hour (8:00 AM – 9:00 AM) in order to ensure that the additional driveway phase is not actuated during this time. It should also be noted that the proposed driveway would operate at LOS E in both AM and PM peak hours. However, this is solely due to control delay and not related to volume, since only three inbound and four outbound trips would be expected during each peak hour. The loading driveway would have ample room to accommodate any minor queuing that may occur.

To accommodate the proposed driveway, restriping, signal equipment and sign installation, new curb ramps, and streetscaping would be required at the intersection of Independence Avenue SW & 12th Street SW. All roadway improvements would conform to DEM standards.



Bicycle & Pedestrian Facilities August 31, 2017

4.0 BICYCLE & PEDESTRIAN FACILITIES

Because the proposed consolidated loading driveway is not anticipated to generate additional pedestrian or bicycle trips, this CTR only evaluates pedestrian and bicycle circulation and safety at the intersection of Independence Avenue SW & 12th Street SW to ensure that safe and efficient pedestrian facilities are provided under the proposed condition.

4.1 EXISTING FACILITIES

Sidewalks varying in width from nine to 16 feet are provided along both sides of Independence Avenue SW and 12th Street SW. Within the area of the proposed driveway, a 15-foot sidewalk is provided along the north side of Independence Avenue SW. However, given the placement of concrete security barriers, the effective width is approximately nine to ten feet. Furthermore, this sidewalk narrows to approximately six feet (effective width) due to an existing drop-off area located at the main entrance to the Freer Gallery of Art, approximately 90 feet east of the proposed driveway location. A 12-foot sidewalk is also provided along the east side of the 12th Street Expressway ramp that connects Independence Avenue SW to Jefferson Drive SW.

Wide and clearly striped crosswalks are provided across the northbound, southbound, and eastbound approaches to the intersection. No crosswalk is provided across the westbound approach at the proposed driveway location. Curb ramps and pedestrian countdown signal heads are provided at each crosswalk. However, the curb ramps do not have detectable warning surfaces.

There are no dedicated bicycle facilities within the vicinity of the proposed loading driveway. However, given the width of the sidewalks in this area, bicyclists were observed to ride both on street and on the sidewalks, particularly on the south side of Independence Avenue SW.

4.2 PROPOSED PLANS

As previously discussed in Section 2.0, the 2005 Bicycle Master Plan shows that no dedicated bicycle facilities exist along Independence Avenue SW, resulting in a bicycle level of service (BLOS) of D. To correct this deficiency, the plan proposes a signed bicycle route and moveDC proposes a cycle track. However, according to the 2012 DC Bike Map, fair cycling conditions exist on Independence Avenue SW. Although the Bike Map also shows a Capital Bikeshare station on the west side of 12th Street SW, south of Independence Avenue SW, no evaluation of cycling conditions was made of 12th Street SW. As of 2015, no additional bicycle facilities are proposed for this intersection as shown and listed on the 2015 Proposed Bike Lanes Map and 2015 Bikeways Work Plan, respectively.

The 2009 Pedestrian Master Plan identifies segments of Independence Avenue SW within the study area to have medium-high pedestrian activity with medium-high pedestrian facility



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deficiencies. It suggests that the corridor be considered a candidate for priority corridor improvements, but does not recommend any improvement strategies.

4.3 IMPACT OF PROPOSED DRIVEWAY ON EXISTING AND PROPOSED FACILITIES

Construction of the proposed loading dock/driveway would not have a significant impact on existing or proposed pedestrian and bicycle facilities. The proposed driveway would introduce a new curb cut adjacent to the signalized intersection of Independence Avenue SW and 12th Street SW. However, adequate transitions from sidewalk to street (curb ramps), pedestrian signal heads, and a clearly defined crosswalk will be provided across the driveway (see Appendix E). Furthermore, the driveway would enhance pedestrian and bicycle operations along the north side of Independence Avenue by eliminating up to three uncontrolled driveways and replacing them with a single signal-controlled driveway. This may be particularly desirable if a cycle track was to be constructed along Independence Avenue as identified in the moveDC plan.

The sidewalk connecting Independence Avenue SW with Jefferson Drive SW would remain. The proposed South Mall Campus Master Plan also includes several improvements to pedestrian flow between Jefferson Drive SW and Independence Avenue SW. Thus, it is likely that these improvements would reduce pedestrian demand on this sidewalk section. Finally, the proposed modifications to the intersection of \$ 12th Street SW and Independence Avenue SW introduce the opportunity to provide a new crosswalk across the westbound approach (see Appendix E).



Transit Service August 31, 2017

5.0 TRANSIT SERVICE

Transit services within the study area are provided by the following organizations:

- Washington Metropolitan Area Transit Authority (WMATA). WMATA provides the most extensive services through its Metrorail and bus. Services generally begin at 5:00AM Monday through Friday and 7:00AM Saturdays and Sundays, and end at 12:00AM Sunday through Thursday and 3:00AM Friday and Saturday. The study area contains three Metrorail stations on the Blue, Silver, Orange, Yellow, and Green lines, including Smithsonian (Blue, Silver, Orange), L'Enfant Plaza (transfer station; Blue, Silver, Orange, Yellow, Green), and Federal Center SW (Blue, Silver, Orange). L'Enfant Plaza station also provides connections to the Virginia Railway Express. Bus stops for the 11Y, 13Y, 16X, and V1 routes are located at or near the intersection of Independence Avenue SW & 14th Street SW. Bus stops for the 16X, 52, and V1 routes are located at or near the intersection of Independence Avenue SW & 12th Street for connections to Metrorail via the Smithsonian station.
- Maryland Transportation Authority (MTA). The MTA runs many commuter bus lines into the District. Four routes, including the 230, 250, 630, and 725, have stops at the intersection of Independence Avenue SW and 12th Street SW. Connections to MTA are also available at the Smithsonian and L'Enfant Plaza Metro stations.
- Potomac and Rappahannock Transportation Commission (PRTC). The PRTC, in conjunction with the Northern Virginia Transportation Commission (NVTC), operates the Virginia Railway Express, which services parts of northeastern Virginia into northern Washington, DC. A connection to Metrorail and WMATA bus routes is provided via a stop at the L'Enfant Plaza Metro station. PRTC also operates the OmniRide commuter bus service into the heart of the District. Routes that service the study area include GV-R, MN-R, DC-R, LR-R (including select trips around the National Mall), R1-R, and MC-R. Bus stops are located on 14th Street SW, at the intersection of Independence Avenue SW & 12th Street SW near the Smithsonian Metro station, and the L'Enfant Plaza Metro station.
- Loudoun County. Loudoun County operates the LC Transit Commuter Bus Routes that make daily trips from Arlington, VA to the District in the AM and from the District to Arlington, VA in the PM. Marked stops are provided at the intersections of Independence Avenue SW & 12th Street SW and Independence Avenue SW & 10th Street SW (L'Enfant Promenade).

The proposed consolidated driveway would not generate additional transit trips and is not anticipated to affect most existing bus stops adjacent to the intersection of Independence Avenue SW & 12th Street SW. However, the existing bus stop located on the northeast corner of the intersection will most likely need to be relocated approximately 40 feet east of the new driveway to provide a safe area for boarding and alighting passengers. This would require relocation of the bus service sign only.



Site Access & Loading August 31, 2017

6.0 SITE ACCESS & LOADING

The SI South Mall Campus Master Plan seeks to enhance the user experience by providing seamless connections between the various South Mall Campus facilities, increasing the visibility of the facilities, and providing additional education and visitor service space. These improvements include the consolidation of the existing loading driveways at the Sackler Gallery and Arts and Industry Building, as well as the potential consolidation of the HMSG loading dock at a future date, into one new underground loading area and driveway to be located between the ramp to the 12th Street Expressway and the Freer Gallery of Art.

Typically, DDOT requires an examination of the site to determine if an existing alley or side street can be used for loading activities to avoid the necessity of a new curb cut. However, neither available alley nor side street exists. Therefore, a new curb cut must be requested.

6.1.1 Existing Loading Activity

Existing site loading occurs across three driveways along Independence Avenue. A study of existing loading activities over a typical week is contained in the memorandum entitled "Loading Dock Trip Generation Analysis" in Appendix A. Although the exact purpose of each truck entering the loading areas was not noted during the observations, based on notes made by the data collection team, the trucks observed (excluding the exhibit deliveries) consisted of typical deliveries (Fed-Ex, UPS), food delivery, and maintenance (including trash). These were typically made using box trucks, vans, and small trucks (WB-40 or smaller). Typically, an exhibit is delivered via tractor trailer (WB-50 or larger); however, these deliveries are infrequent (one per month or less) and typically scheduled during off-peak periods.

6.1.2 Existing and Future Loading Needs and Alternatives

The location, configuration, and size of the existing loading facilities presents circulation, materials handling, and security deficiencies, most which are related to how a vehicle accesses the loading facilities. The limited size of the existing facilities requires large box trucks and small tractor-trailers (WB-40s) to back in from Independence Avenue, which interrupts traffic and pedestrian flow. Larger trucks (WB-50 or larger) must park and unload on the street, introducing security concerns and potentially exposing exhibit materials to weather conditions. Furthermore, the location of the existing loading facilities block east / west pedestrian circulation on the site and preclude several of the accessibility and connectivity goals of the new Master Plan.

The existing loading facilities do not meet Smithsonian Institution Facilities Design Standards or DC loading requirements, and do not meet any of the design criteria for future servicing of the museums, which include two-way traffic, on-site vehicle turn around, and height clearance and sizing for large vehicles.

While several loading facility alternatives were considered, there are multiple challenges to locating a new loading facility on the site (see Appendix D). These include limited space available at-grade, existing below-grade structures and footprints, and the extensive



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dimensional requirements for a ramp, truck apron, and loading dock to accommodate the design vehicle, which is a WB-67. The maximum slope for a ramp to below-grade loading is 12%, per section 11-2204 of the DC zoning code, requiring an at-grade footprint that would have significant impact to overall site circulation if not placed on the perimeter of the South Mall campus.

Several possible locations were examined, both above and below-grade, but it was determined that there were no design solutions utilizing existing curb-cut locations that met the design criteria for future servicing of the museums, which include two-way traffic, on-site vehicle turn around, height clearance, accommodation of large vehicles, limited visual impact, accommodation of future circulation, and constructability.

Reuse of the existing curb cut and existing ramp between the Freer and the Sackler Galleries (Scheme A in Appendix D) would not accommodate two-way traffic, would require extensive renovations that would impact adjacent program, would worsen east-west circulation, have a large visual impact, and would be difficult to construct. In order to accommodate a WB-67, the ramp would have to be approximately 184 feet long at a 12% grade, cutting through a large section of the Quad, before being able to pass underground. This scheme would also require extensive modifications to the existing galleries under the Quad.

Reuse of the existing curb cut with a new ramp between the Freer and the Quad (Scheme B in Appendix D), would similarly require extensive renovations and an increase in footprint that would prevent east-west circulation, decrease the size of the Haupt Garden, and worsen many of the circulation and site planning conditions that the Master Plan sought to improve.

Placement of a ramp west of the Freer to a new below-grade dock (Freer Ramp in Appendix D), would satisfy all the service loading requirements of the project, accommodate larger vehicles, and facilitate the programmatic and circulation goals of the Master Plan. This is the proposed option for servicing, in short, because it is the only place that meets the design criteria, and accommodates that goals of the Master Plan. The full off-street accommodation of large delivery vehicles will also reduce the impact of service vehicles on Independence Avenue.

6.1.3 Future Loading Activity

It is anticipated that future loading activity would be similar to the existing condition. The proposed expansion of the dining and retail spaces within the South Campus may lead to additional food deliveries (see Appendix A). However, the overall net increase in activity may be negligible. Consolidating the existing loading driveways would reduce overall delivery trips by eliminating the need for the same delivery vehicle to serve three separate driveways. These repeat trips are included in the trip estimates to be conservative because vehicles were not tracked between driveways (see Appendix A). However, it is likely overall delivery trips would be less than analyzed because of the inclusion of the repeat trips. Secondly, the additional food/retail delivery trips would likely also be balanced by the reduction in deliveries that would result from the removal of office staff from the Castle building to an offsite location.

It should also be noted that it is unclear at this time if the HMSG loading area would be consolidated with the proposed driveway because of the need to construct and underground connection under the 9th Street tunnel. The capacity analysis conducted for this report assumes the inclusion of truck trips from the HMSG loading area. However, if the HMSG loading area is not



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consolidated, overall truck trips entering and exiting the proposed loading driveway would be slightly less than estimated.

The proposed driveway would provide adequate maneuvering space for all anticipated types of trucks to preclude the need to maneuver within the public right of way. Appendix E contains loading diagrams for various heavy vehicle sizes from a single unit trucks to a WB-67.

The loading diagrams show that the underground loading area would be able to accommodate trucks up to WB-67, preventing the need for trucks to maneuver into or out of the driveway onto Independence Avenue SW as occurs in the existing condition. However, according to Figure 2-15 in AASHTO's A Policy on Geometric Design of Highways and Streets, 6th Edition, right-turning tractor trailers (WB-40 and larger) from westbound Independence Avenue SW would have to make wide turns and cross westbound lanes to their left. While this likely occurs in the existing condition at the three loading driveways, it is not desirable, particularly at a signalized intersection. Therefore, since SI controls and schedules all deliveries to the South Mall Campus facilities, it is recommended that all deliveries made in trucks larger than a single unit be required to enter the loading driveway from northbound 12th Street SW or eastbound Independence Avenue SW.

6.1.4 Project Phasing

The proposed loading driveway would be constructed as part of the larger Castle Revitalization Project expected to begin phased construction in approximately 2022. Upon completion of the proposed loading driveway (estimated by 2025), the existing loading driveway between the Freer and Sackler Galleries, as well as the Arts and Industry Building parking/loading driveway, would be deactivated and closed to all deliveries. However, these driveways may be reactivated on a temporary basis for construction access and staging during the South Mall Campus renovations, and would be fully removed by 2030. The existing AIB parking and loading area would be used until its permanent use as a museum facility is funded and the necessary permanent loading facilities are constructed and connected to the new underground space at the west end of the Castle. The designation of a permanent use for the AIB awaits action by Congress. Legislation has been introduced that would designate it as a Latino Museum. Furthermore, the feasibility of closing and consolidating the HMSG loading area is still being assessed; however, it would likely not be closed until 2035 or later because a tunnel under the 9th Street tunnel would be required to connect the HMSG to the proposed loading driveway.

6.1.5 Loading Management Plan

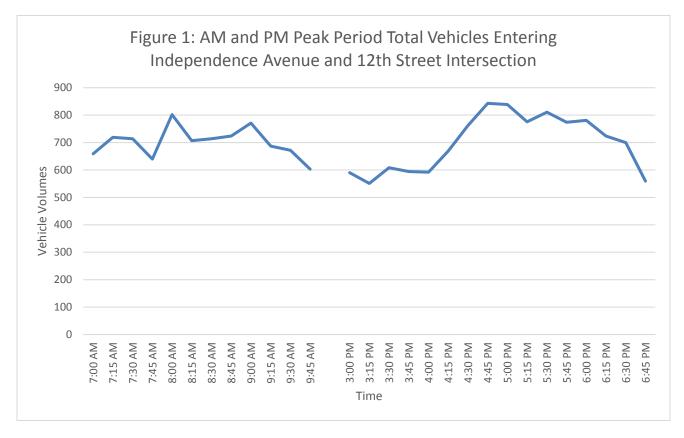
Based on feedback provided by SI, the following strategies would be utilized to reduce the impact of the loading driveway on peak period traffic on Independence Boulevard:

1. All deliveries made with trucks WB-50 or larger will be scheduled in advance. Figure 1 depicts the distribution of vehicle volume entering the intersection of



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Independence Avenue SW and 12th Street SW over the AM (7:00 AM – 10:00 AM) and PM (3:00 PM – 7:00 PM) peak periods. Based on the volume distribution trends. It is recommended that all trucks WB-50 or larger avoid deliveries between 6:30 AM and 9:30 AM, as well as between 3:30 PM and 6:30 PM to correspond with peak volume periods at the intersection.



- 2. Deliveries made in box trucks (such as UPS, FedEx, DHL, etc.) and WB-40 (food deliveries) will be encouraged to avoid the AM (6:30 AM 9:30 AM) and PM (3:30 PM 6:30 PM) peak periods. However, specific restrictions cannot be placed on these types of deliveries.
- 3. SI will work with DDOT during events in the City to restrict or hold deliveries.
- 4. If pedestrian and/or vehicle congestion on Independence Avenue SW results in queuing that extends to upstream intersections, SI will hold trucks within the loading area until conditions improve. SI will also coordinate with DDOT and/or the MPD during emergencies to hold deliveries within the loading area.
- 5. Trash and recycling pick-up will be scheduled for off-peak periods.



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6.1.6 Impacts to 12th Street Intersection

Given the proximity of the proposed driveway to the signalized intersection of Independence Avenue SW & 12th Street SW, it is anticipated that the driveway would operate under signal control. Vehicle detection would be provided so that the phase serving the driveway would only be activated if a vehicle is present. Because right turns on red would be prohibited, intersection sight distance is not applicable. The proposed driveway would also require that the westbound Independence Avenue approach be signed for "No Right Turn On Red".

The proposed design of the east side of the intersection is contained in the truck turning template diagrams in Appendix E. The proposed driveway would require the relocation of some signal equipment and streetscaping. A crosswalk would be maintained along the north side of Independence Avenue SW, and a new crosswalk across the east leg of the intersection could be added.

No access for private/visitor vehicles would be provided. For security reasons, all deliveries to SI are required to be scheduled in advance, providing the flexibility to direct deliveries to off-peak periods if possible. A guard would be posted to turn away vehicles without advanced arrangements.



Parking August 31, 2017

7.0 PARKING

An inventory of parking regulations was conducted on Tuesday, December 8, 2015. The data collection team denoted posted parking regulations by segment of the roadway, including restrictions on parking duration, loading zones, ADA parking spaces, bus stops, parking meters and kiosks, and street cleaning restrictions.

Exhibit 17 in Appendix F lists each segment inventoried for:

- Total number of on-street parking spaces;
- Number of permit spaces;
- Number of metered spaces; and,
- Number of ADA spaces.

Notes regarding the parking restrictions are listed in the last column. Typically, metered parking on Independence Avenue SW is permitted for two hours during the period from 9:30AM to 4:00PM Monday through Friday and from 7:00AM to 6:30PM Saturday. Parking is prohibited during the AM and PM peak periods, 7:00AM – 9:30AM and 4:00PM – 6:30PM, respectively. From 10th Street SW to 14th Street SW, parking is also prohibited from 10:00PM to 5:00AM on Tuesdays for street cleaning.

Some metered parking is available on 14th Street SW immediately north and south of Independence Avenue SW, but most spaces are reserved for special permits. Metered parking on 12th Street SW does not have a time restriction. Independence Avenue SW, 14th Street SW, and 12th Street SW are designated snow emergency routes, on which parking is not permitted during snow emergencies.

The proposed loading dock/driveway would not require any additional parking. However, it is anticipated that four metered parking space on the westbound Independence Avenue SW approach at the intersection with 12th Street SW would need to be removed to accommodate the new driveway and relocated bus stop.



Safety August 31, 2017

8.0 SAFETY

An inventory of the study area was conducted on December 8, 2015. In general, the study area has undivided, level roadways with 11-foot wide lanes and metered parking. Roadside features include wide sidewalks and streetscaping. Although all modes are encouraged to use the area, on-road traffic is mostly composed of passenger vehicles with some trucks, and off-road traffic is mostly composed of pedestrians. Traffic control includes signalized intersections supplemented with signage. Although there are no existing signs prohibiting right turns on red, the northbound 12th Street SW and 10th Street SW approaches have protected right turn signal indications.

Additional investigations of the intersections reveal:

- Striping is in good condition,
- Approaches have relatively little skew, if any,
- Excellent daylighting,
- · Post-mounted signal heads, and
- Some roadside trees may obstruct sight distance.

8.1 SIGHT DISTANCE

AASHTO's A Policy on Geometric Design of Highways and Streets, 6th Edition, provides a method to calculate the required intersection sight distance for the three possible movements at an intersection: left turn, through, and right turn. Although these calculations are generally used for unsignalized intersections, they can also be applied to signalized intersections where right turns on red are permitted and consequently mimic yield-controlled conditions. Signal-controlled left turns are usually not analyzed. Therefore, according to AASHTO, the required sight distances for right turns at all three intersections is approximately 240 feet for passenger vehicles, 315 feet for single-unit trucks, and 390 feet for combination trucks for all approaches.

Sketches 1 through 4 in Appendix G illustrate the sight distance triangles for right turns at the intersection of Independence Avenue SW & 12th Street SW. Sight distance for passenger vehicles is shown in red, while the sight distance for single-unit trucks and combination trucks is shown in yellow and blue, respectively. Sketches 1 and 2 reveal that existing sight distance is adequate for vehicles on all approaches except the SB approach due to the retaining wall for the 12th Street Expressway. In addition, sight distance for single-unit and combination trucks on the NB 12th Street SW approach is blocked due to the pedestrian archway just west of the intersection.

Sketches 3 and 4 illustrate the approximate sight distances for the SB loading dock/driveway and relocated WB Independence Avenue SW approaches. Sketch 3 shows that the sight distance at the approximate location of the new driveway may be partially obstructed by trees, although this is not expected to have a significant impact on driveway operations because all movements from the driveway would be signal-controlled. Sketch 4 shows that although the



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stop bar would be relocated approximately 20 feet east, the sight distance would not be affected.

8.2 CRASH ANALYSIS

To supplement the roadway inventory, Stantec received crash analysis summaries (Appendix G) from DDOT for the three study area intersections for the three-year period between January 2012 and December 2014 to evaluate any existing safety deficiencies at the study intersections. The analyses, further summarized in **Table 5**, revealed most crashes at the intersections are rear-end and sideswipe with property damage only.

Total Total Total Total Total Total Total Intersection Independence Crashes Rear-End Sideswipe Ped/ Fatal Injury **PDO** Avenue SW @ Bike 14th Street SW 17 (27.4%) 0 (0.0%) 62 31 (50.0%) 2 11 (17.7%) 51 (82.3%) 7 12th Street SW 53 10 (18.9%) 19 (35.8%) 0 (0.0%) 18 (34.0%) 35 (66.0%) 10th Street SW 1 (12.5%) 3 (37.5%) 2 (25.0%) 6 (75.0%) 8 0 0 (0.0%) (L'Enfant Promenade)

Table 5: Crash Summary, 01/2012 to 12/2014

According to the Highway Safety Manual (HSM), rear-end and sideswipe crashes are most commonly caused by inappropriate approach speeds, poor visibility of signals, unexpected lane changes on approach, unexpected stops on approach, and/or excessive speed.

A speed study performed in 2006 by DDOT shows that all study area roadways experience excessive speeding. Although the posted speed limit is 25 mph on all study area roadways, 85th percentile speed is greater than 35 mph. In addition, the roadways can potentially experience peak period directional congestion, which can generate unexpected lane changes and stops on the approaches. Lastly, the intersections are wide and drivers may not anticipate post-mounted signals, especially in high-tourist areas, due to placement at the intersection, resulting in last-minute braking. Considering these factors, the data does not identify a specific safety deficiency, and thus no additional safety enhancements are proposed.

Furthermore, it is unlikely the proposed loading dock/driveway would contribute to an increase in crashes. In fact, the proposed driveway would consolidate three uncontrolled driveways to a single signal-controlled driveway. This would reduce vehicle-vehicle, vehicle-pedestrian, and vehicle-bicycle conflicts and would also provide for enhanced control of these types of conflicts at the proposed driveway location. In addition, the proposed loading driveway would be located diagonally across from the Smithsonian Metro station entrance, where the highest concentration of pedestrians is experienced at the intersection.



Streetscape & the Public Realm August 31, 2017

9.0 STREETSCAPE & THE PUBLIC REALM

It is anticipated that some removal or relocation of streetscaping will be necessary to accommodate the proposed driveway. All modifications to streetscaping will conform to DEM standards. It should also be noted that the overall South Mall Campus Master Plan includes improving the Independence Avenue SW frontage with more street furniture and plantings, as well as enhancing the internal on-site connections between Independence Avenue SW and Jefferson Drive SW. Sidewalks on the SI side of Independence Avenue SW also follow NCPC streetscape standards for Mall Roads, including yellow aggregate concrete paving.



Conclusion August 31, 2017

10.0 CONCLUSION

In conclusion, the proposed consolidation of the loading driveways along Independence Avenue SW into one loading dock/driveway at the intersection of Independence Avenue SW & 12th Street SW would have an overall negligible impact on the study area roadway network.

The analysis of the proposed loading driveway revealed the following:

- 1. Recommendations in city-wide planning documents and studies would not be affected by the proposed driveway.
- 2. Design of the new driveway would require safety elements for pedestrians to maintain the goals and objectives presented in the 2005 Bicycle Master Plan, 2009 Pedestrian Master Plan, and moveDC, such as adequate transitions from sidewalk to street (curb ramps), pedestrian signal heads, and a clearly defined crosswalk.
- 3. The new driveway is not expected to generate any new auto, transit, pedestrian, or bicycle trips. It is expected to divert two inbound and three outbound existing truck trips and generate one inbound and one outbound truck trip in both AM and PM peak hours.
- 4. The additional signal phase required for the driveway would cause degradation in the operation of the eastbound Independence Avenue SW approach from a volume-to-capacity (v/c) ratio of 0.88 during the 2030 Future No Build Condition AM peak hour to a v/c ratio of 1.04 during the 2030 Future Build Condition. The loading driveway has a negligible impact on PM peak hour operations.
- 5. The driveway would enhance pedestrian and bicycle operations along the north side of Independence Avenue SW by eliminating up to three uncontrolled driveway and replacing them with a single signal-controlled driveway. This may be particularly desirable if a cycle track was to be constructed along Independence Avenue SW as identified in the moveDC plan.
- 6. A crosswalk could be provided across the east leg of the intersection.
- 7. Four metered parking spaces and some streetscaping on the westbound Independence Avenue SW approach at the intersection with 12th Street SW would need to be removed or relocated to accommodate the new driveway.
- 8. The existing bus stop on the northeast corner of the intersection would need to be shifted approximately 40 feet east.

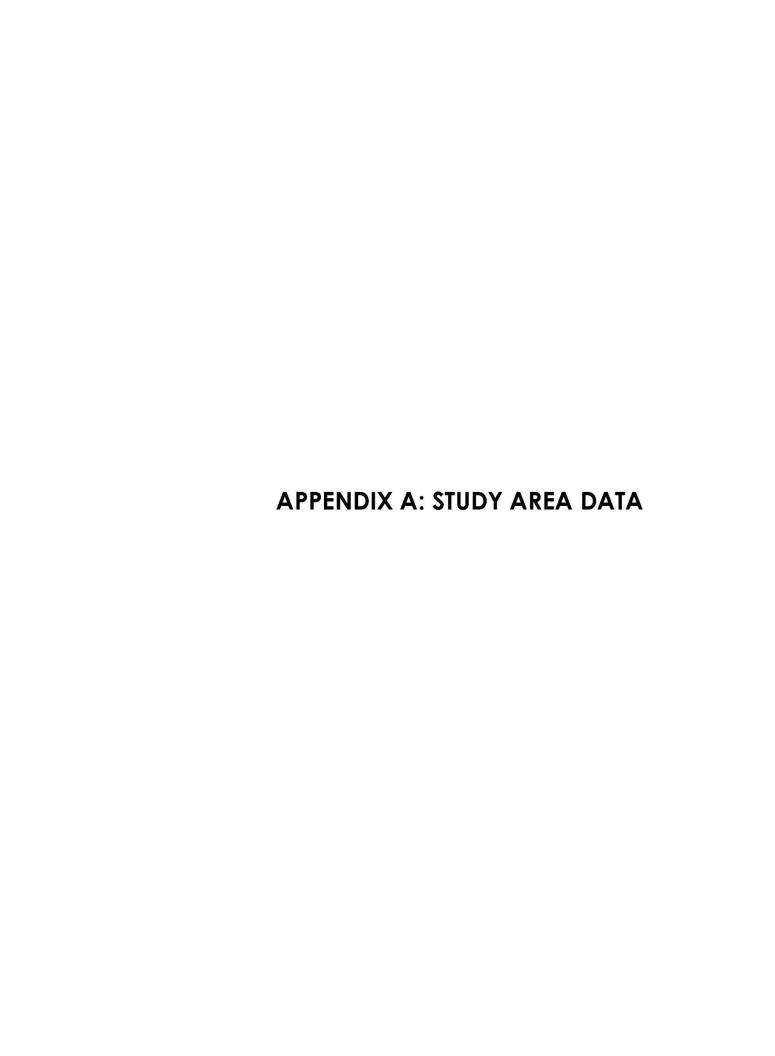


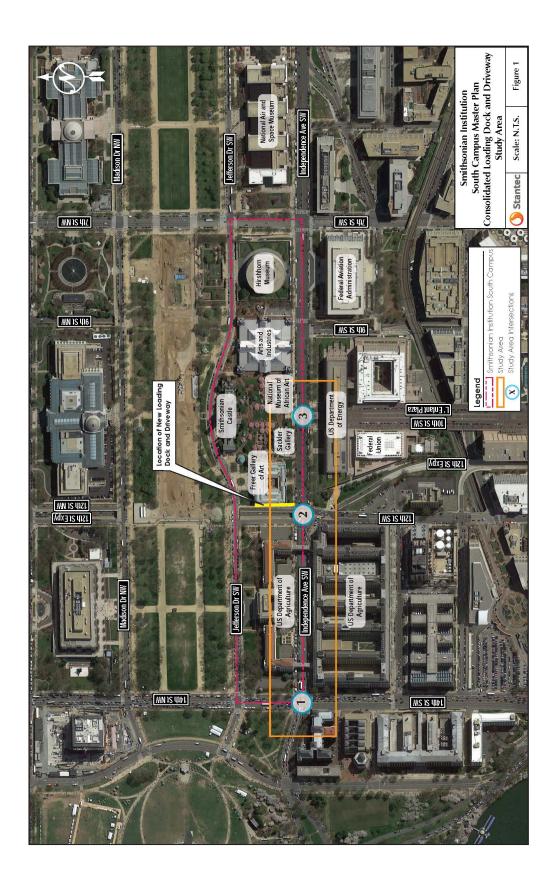
Conclusion August 31, 2017

To address the deficiencies, the following measures are recommended:

- 1. All deliveries made with trucks WB-50 or larger will be scheduled in advance and will avoid deliveries between 6:30 AM and 9:30 AM, as well as between 3:30 PM and 6:30 PM to correspond with peak volume periods at the intersection of Independence Avenue SW & 12th Street SW.
- 2. Deliveries made in box trucks (such as UPS, FedEx, DHL, etc.) and WB-40 (food deliveries) will be encouraged to avoid the AM (6:30 AM 9:30 AM) and PM (3:30 PM 6:30 PM) peak periods. However, specific restrictions cannot be placed on these types of deliveries.
- 3. SI will work with DDOT during events in the City to restrict or hold deliveries.
- 4. If pedestrian and/or vehicle congestion on Independence Avenue SW results in queuing that extends to upstream intersections, SI will hold trucks within the loading area until conditions improve. SI will also coordinate with DDOT and/or the MPD during emergencies to hold deliveries within the loading area.
- 5. Trash and recycling pick-up will be scheduled for off-peak periods.











To: Jonathan Rogers From: Adam Catherine

DDOT Stantec

File: 2028110978 Date: October 20, 2015

Reference: Loading Dock Trip Generation Analysis

The Smithsonian Institution (SI) South Campus Master Plan includes several improvements that are intended to enhance the user experience by providing seamless connections between the various South Campus facilities, increasing the visibility of the facilities, and providing additional education and visitor service space. As part of the overall vision for the South Campus, SI is proposing to consolidate three existing loading areas along Independence Avenue into a single loading driveway that would be accessed via a ramp at the intersection of Independence Avenue and 12th Street, on the west side of the Freer Gallery (see **Attachment A**). The consolidation of the three existing loading driveways would eliminate breaks in the current campus site plan, allowing for a cohesive connection across the entire campus for visitors. In addition, the new loading driveway would be able to accept all truck types, as well as eliminate the need for trucks to back in to or out of the driveways, as occurs in the existing condition.

This memorandum summarizes the analysis that was performed to estimate the number of AM peak hour, PM peak hour, and weekday loading trips that would be consolidated at the new driveway location. It should be noted that the proposed loading driveway consolidation is not anticipated to generate additional personal auto (car), transit, pedestrian, or bicycle trips.

Existing Conditions

Observations of the existing loading areas were conducted from 7:00 AM - 7:00 PM for a period of seven days between Thursday, September 24 and Wednesday, September 30, 2015. Field data collection technicians noted the arrival and departure times of each vehicle, the vehicle type (van, box truck, or tractor trailer), the direction from which they entered and the direction to which they exited, as well as if the vehicle needed to back into or out of the loading area. The raw data is contained in **Attachment B**, and a summary of the data is shown in **Table 1**.

In addition to the loading area data, turning movement counts were conducted at the signalized intersections of Independence Avenue and 12^{th} Street, and Independence Avenue and L'Enfant Plaza on Tuesday, September 29 from 7:00 AM – 10:00 AM and 3:00 PM – 7:00 PM. The turning movement counts were used to determine the AM and PM peak hours of Independence Avenue for the purposes of the truck trip generation analysis, and will also be used to conduct the capacity analysis for the existing and proposed conditions.

The data shown in **Table 1** reveals that the majority of truck activity occurs on weekday, off-peak periods. No deliveries were recorded on Saturday, and only two were recorded on Sunday. It should also be noted that almost 60% of all the delivery vehicles either back into or out of the existing loading driveways, thus impeding traffic flow on Independence Avenue.



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Reference: Loading Dock Trip Generation Analysis

Table 1: Summary of Existing Loading Area Activity

	142	Total Number of Vehicles over 7-Day Count Period
99%	140	Number of Vehicles Arriving/Departing on a Weekday
1%	2	Number of Vehicles Arriving/Departing on a Weekend
	38 min	Average Duration of Loading Area Activity (per Vehicle)
44%	62	Vehicles Backing Into Loading Dock
13%	19	Vehicles Backing out of Loading Dock
80%	110	Vehicles Entering From WB Independence Ave*
20%	29	Vehicles Entering From EB Independence Ave*
64%	87	Vehicles Departing to WB Independence Ave*
36%	50	Vehicles Departing to EB Independence Ave*
	6	Highest Number of Trips During AM Peak Hour of Independence Avenue (8:00 AM - 9:00 AM)
50%	3	Entering
	0	Van
	2	Box Truck
	1	Tractor Trailer
50%	3	Exiting
	0	Van
	2	Box Truck
	1	Tractor Trailer
	5	Highest Number of Trips During PM Peak Hour of Independence Avenue (4:45 PM - 5:45 PM)
40%	2	Entering
	0	Van
	2	Box Truck
	0	Tractor Trailer
60%	3	Exiting
	0	Van
	2	Box Truck
	1	Tractor Trailer
	96	Highest Number of Weekday Trips
50%	48	Entering
	6	Van
	34	Box Truck
	8	Tractor Trailer
50%	48	Exiting
	6	Van
		Box Truck
	34	Tractor Trailer

^{*}The total number of entering and departing vehicles is slightly less than the total vehicles recorded because of vehicle arrivals/departures that occurred before or after the count period.



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Reference: Loading Dock Trip Generation Analysis

The AM peak hour, PM peak hour, and weekday trips shown in **Table 1** represent the highest number of trips that were recorded on any given weekday during the duration of the counts. This will provide a conservative analysis of the proposed condition.

Estimate of Future Loading Activity

In addition to the consolidated loading driveway, the Master Plan includes an expansion of the South Campus facilities to provide additional user amenities, such as dining and shopping. While the exact square footages of the retail/dining areas are unclear at this time, an increase in loading driveway activity is anticipated. SI provided Stantec with an estimate of food-related delivery activity at the National Museum of the American Indian (NMAI), which has facilities similar to those anticipated for the South Campus.

Table 2: Estimate of Future Loading Area Activity

Weekday Trips			Existing	New	Future
35. 0	Entering	Total	48	13	61
	200	Van	6	0	6
	1	Box Truck	34	13	47
		Tractor Trailer	8	0	8
	Exiting	Total	48	12	60
		Van	6	0	6
	1	Box Truck	34	12	46
		Tractor Trailer	8	0	8
	Total	·	96	25	121
AM Peak Hour Trips	Entering	Total	3	1	4
	_	Van	0	0	0
	1	Box Truck	2	1	3
		Tractor Trailer	1	0	1
	Exiting	Total	3	1	4
		Van	0	0	0
	1	Box Truck	2	1	3
		Tractor Trailer	1	0	1
	Total		6	2	8
PM Peak Hour Trips	Entering	Total	2	1	3
		Van	0	0	0
	1	Box Truck	2	1	3
	l.	Tractor Trailer	0	0	0
	Exiting	Total	3	1	4
		Van	0	0	0
	l	Box Truck	2	1	3
		Tractor Trailer	1	0	1
	Total		5	2	7



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Reference: Loading Dock Trip Generation Analysis

The data provided by NMAI indicates that there are approximately 25 food-related deliveries on a typical weekday, which primarily utilize box trucks. However, SI did not have logs to identify the time or duration of the deliveries. Therefore, the NMAI data was applied to the ratio of peak hour to daily trips, obtained from the South Campus data, to estimate the number of additional deliveries that would occur at the consolidated driveway location. **Table 2** provides the total AM peak hour, PM peak hour, and weekday trips that would be experienced in the proposed condition.

Trip Arrival and Distribution Patterns

It is assumed that the distribution of both existing and new trips would follow the existing distribution pattern shown in **Table 1**. However, it should be noted the proposed consolidated loading area is being designed so that trucks of all types can enter the facility and use an L-shaped loading area within the site to back into the dock, thereby eliminating the backing activity that currently occurs on Independence Avenue (see **Attachment A**).

Conclusions and Next Steps

This memorandum summarizes the analysis that was performed to estimate the number of AM peak hour, PM peak hour, and weekday truck loading trips that would be consolidated at the new driveway location. The results of the analysis indicate that the majority of trips occur on weekdays and during off-peak periods. The data also reveals that almost 60% of the loading trips require a vehicle to back into or out of the loading dock, thus blocking traffic on Independence Avenue.

Based on the results of the trip estimate, the proposed consolidated driveway would experience approximately 121 daily trips, with a minimal amount occurring during the AM peak hour (8) and PM peak hour (7). The proposed loading driveway would also eliminate backing activity that currently occurs on Independence Avenue. However, due to its proximity to the intersection of Independence Avenue and 12^{th} Street, a capacity analysis must be performed to determine if an actuated traffic signal phase for the new driveway could be provided without significantly impacting intersection operations.

STANTEC CONSULTING SERVICES INC.

Adam Catherine

Associate

Phone: (856) 234-0800 ext 8542

Fax: (856) 234-5926

Adam.Catherine@stantec.com

Attachment: Attachment A: Proposed Loading Dock Plan

Attachment B: Existing Delivery Data

Attachment B
Smithsonian South Campus Loading Dock
Vehicle Counts
Thursday, September 24, 2015 - Wednesday, September 30, 2015

					Duration						Fatadas	Fort series of	D	Damatian
Vehicle	Day	Date	Time In	Time Out	(min)	Vehicle Type	Pull In	Back In	Pull Out	Back Out	Entering From WB	Entering From EB	Departing to WB	Departing to EB
1	Thursday	9/24/2015		9:15 AM	31	Box Truck	1	Duck III	1	Duck Duc	1		1	10 20
2	Thursday	9/24/2015		10:31 AM	46	Box Truck	1		1		1		1	
3	Thursday	9/24/2015	9:32 AM	10:46 AM	74	Van	1		1			1		1
4	Thursday	9/24/2015	9:36 AM	9:47 AM	11	Box Truck		1	1		1			1
5	Thursday	9/24/2015		9:52 AM	7	Box Truck		1	1		1		1	
6	Thursday	9/24/2015			18	Box Truck		1	1		1			1
7	Thursday	9/24/2015		1:12 PM	11	Van	1		1			1	1	
8	Thursday	9/24/2015		3:52 PM	10	Tractor Trailer		1	1		1		2	1
9	Friday	9/25/2015		7:08 AM	21	Tractor Trailer	191	1	1		1		1	
10	Friday	9/25/2015		7:58 AM	16	Box Truck	1	1	1		1		1	
11	Friday Friday	9/25/2015		8:32 AM 8:41 AM	28	Tractor Trailer Box Truck	1	1	1		1		1	
13	Friday	9/25/2015		9:10 AM	7	Box Truck	1		1		1		1	
14	Friday	9/25/2015		9:23 AM	17	Box Truck	1		1		1		1	
15	Friday	9/25/2015		9:23 AM	12	Box Truck	1		1		1			1
16	Friday	9/25/2015		9:55 AM	12	Tractor Trailer	100	1	1		1			1
17	Friday	9/25/2015		9:55 AM	6	Box Truck	1		1		1			1
18	Friday	9/25/2015			26	Box Truck	1		1		1		1	
19	Friday	9/25/2015			19	Box Truck		1	1			1		1
20	Friday	9/25/2015	10:23 AM	11:29 AM	.6	Box Truck	1		1		1			1
21	Friday	9/25/2015	10:27 AM	10:46 AM	19	Tractor Trailer		1	1			1	1	
22	Friday	9/25/2015	10:49 AM	11:12 AM	23	Tractor Trailer		1	1		1			1
23	Friday	9/25/2015	11:10 AM	12:05 PM	55	Box Truck	1		1		1		1	
24	Friday	9/25/2015			54	Box Truck	1		1		1		1	
25	Friday	9/25/2015			83	Tractor Trailer		1	1		1		1	
26	Friday	9/25/2015			43	Box Truck		1	1		1		1	
27	Friday	9/25/2015			55	Box Truck	1		1		1			1
28	Friday	9/25/2015			90	Tractor Trailer		1	1		1		1	
29 30	Friday	9/25/2015			41	Box Truck	1		1		1			1
30 31	Friday	9/25/2015		1:31 PM 1:51 PM	45	Box Truck Box Truck	1		1			1	1	
32	Friday Friday	9/25/2015		2:13 PM	40	Tractor Trailer	1	1	1		1	1	1	1
33	Friday	9/25/2015		2:13 PM	30	Tractor Trailer		1	1		1			1
34	Friday	9/25/2015		Z.13 F W	-	Box Truck	1	*	1		1			
35	Friday	9/25/2015				Box Truck	1		1		1			
36	Friday	9/25/2015		2:11 PM	6	Box Truck	1		1		1		1	
37	Friday	9/25/2015		2:54 PM	11	Box Truck	1		1		1		1	
38	Friday	9/25/2015		2:58 PM	14	Box Truck	1		1			1	1	
39	Friday	9/25/2015	2:55 PM	3:05 PM	10	Box Truck		1	1		1		1	
40	Friday	9/25/2015	3:30 PM	5:22 PM	112	Box Truck	1		1		1		1	
41	Friday	9/25/2015	5:21 PM	5:42 PM	21	Tractor Trailer		1	1		1			1
42	Sunday	9/27/2015			51	Van	1		1			1	1	
43	Sunday	9/27/2015		3:32 PM	175	Van	1		1			1	1	
44	Monday	9/28/2015		7:24 AM	12	Box Truck	1		1			1	1	
45	Monday	9/28/2015		8:23 AM	38	Tractor Trailer		1		1		1		1
46	Monday	9/28/2015		8:38 AM	34	Box Truck		1	1			1	1	
47	Monday	9/28/2015		9:31 AM	41	Tractor Trailer		1	1		1		.2	1
48	Monday Monday	9/28/2015		9:01 AM 9:09 AM	9	Box Truck Box Truck	1	1	1		1	1	1	
50	Monday	9/28/2015		9:32 AM	21	Tractor Trailer	7	1	1		1	1	1	
51	Monday	9/28/2015		9:54 AM	18	Box Truck	1		1		1		1	1
52	Monday	9/28/2015			10	Box Truck		1	1		1		1	
53	Monday	9/28/2015			143	Box Truck		1	-	1	1		1	
54	Monday	9/28/2015			50	Box Truck	1	-	1	-	1		1	
55	Monday	9/28/2015			30	Box Truck	1		1		1		1	
56	Monday	9/28/2015			21	Box Truck	1		1			1		1
57	Monday	9/28/2015		1:37 PM	46	Box Truck	1		1		1			1
58	Monday	9/28/2015	1:25 PM	1:34 PM	9	Tractor Trailer		1			1		1	
59	Monday	9/28/2015		1:51 PM	6	Box Truck	1		1		1			1
60	Monday	9/28/2015		1:56 PM	9	Box Truck	1		1		1		1	
61	Monday	9/28/2015		2:17 PM	10	Box Truck	1		1		1			1
62	Monday	9/28/2015	3:18 PM	3:24 PM	6	Box Truck	1		1		1		1	

63	Tuesday	9/29/2015	~	7:16 AM	0.40	Box Truck			1				1	
64	Tuesday	9/29/2015	-	7:19 AM	100	Box Truck			1.				1	
65	Tuesday	9/29/2015		7:20 AM		Box Truck			1					1
66	Tuesday	9/29/2015	6:15 000	7:09 AM	54	Box Truck	1		1			1	1	-
67					142		1		1			1		
	Tuesday	9/29/2015		9:37 AM		Tractor Trailer		1		1	1		1	
68	Tuesday	9/29/2015		7:47 AM	21	Box Truck	1		1		1			1
69	Tuesday	9/29/2015	7:27 AM	7:51 AM	24	Box Truck	1		1		1		1	
70	Tuesday	9/29/2015	7:29 AM	8:45 AM	76	Box Truck	1		1		1		1	
71	Tuesday	9/29/2015	7:45 AM	8:49 AM	64	Box Truck	1		1		1		1	
72	Tuesday	9/29/2015	8:38 AM	9:16 AM	38	Box Truck	1		1		1		1	
73					77				-	242				
	Tuesday	9/29/2015				Box Truck	1			1	1		1	
74	Tuesday	9/29/2015			54	Box Truck	1		1		1		1	
75	Tuesday	9/29/2015			58	Tractor Trailer		1		1		1		1
76	Tuesday	9/29/2015	9:40 AM	10:46 AM	66	Tractor Trailer		1		1	1		1	
77	Tuesday	9/29/2015	9:46 AM	10:07 AM	21	Box Truck	1			1	1		1	
78	Tuesday	9/29/2015	9-53 AM	10:09 AM	16	Box Truck	1			1	1			1
79	Tuesday	9/29/2015			60	Tractor Trailer		1	1		2			1
								-						1
80	Tuesday	9/29/2015			26	Box Truck		1	1		1		1	
81	Tuesday	9/29/2015			25	Box Truck		1	1		1			1
82	Tuesday	9/29/2015	10:14 AM	10:34 AM	20	Box Truck		1	1		1		1	
83	Tuesday	9/29/2015	10:17 AM	10:41 AM	24	Box Truck	1			1	1			1
84	Tuesday	9/29/2015			40	Box Truck	1				1			1
85	Tuesday	9/29/2015			34	Tractor Trailer		1		1		1		1
86					28				6					
	Tuesday	9/29/2015				Box Truck		1	1		1			1
87	Tuesday	9/29/2015			58	Box Truck	1		1			1		1
88	Tuesday	9/29/2015	10:56 AM	11:15 AM	19	Box Truck	1		1		1		1	
89	Tuesday	9/29/2015	11:00 AM	11:34 AM	34	Box Truck	1		1			1	1	
90	Tuesday	9/29/2015	11:25 AM	12:34 PM	69	Tractor Trailer		1		1	1			1
91	Tuesday	9/29/2015			28	Box Truck		1	1		1		1	
92	Tuesday	9/29/2015			21	Box Truck		1	1		1		1	
93	Tuesday	9/29/2015	12:07 PM	12:35 PM	28	Box Truck	1			1	1			1
94	Tuesday	9/29/2015	12:12 PM	12:40 PM	28	Box Truck	1		1		1			1
95	Tuesday	9/29/2015	12:24 PM	1:53 PM	89	Tractor Trailer		1		1	1		1	
96	Tuesday	9/29/2015			52	Box Truck		1		1		1		1
97	Tuesday	9/29/2015			10	Box Truck	1	*	3.		1		1	
											-		-	
98	Tuesday	9/29/2015		1:03 PM	25	Box Truck		1	1		1		1	
99	Tuesday	9/29/2015		1:34 PM	38	Box Truck	1		1		1		1	
100	Tuesday	9/29/2015	1:15 PM	1:43 PM	28	Box Truck		1	1			1	1	
101	Tuesday	9/29/2015	1:18 PM	3:31 PM	133	Box Truck	1		1		1		1	
102	Tuesday	9/29/2015	1:20 PM	3:31 PM	131	Box Truck	1			1	1		1	
103	Tuesday	9/29/2015	1:20 PM	3:37 PM	137	Box Truck	1		1		1		1	
104	Tuesday			3:22 PM	97	Tractor Trailer		1	1		1		1	
105	Tuesday	9/29/2015		3:37 PM	76	Box Truck	1			1	1			1
106	Tuesday	9/29/2015	3:03 PM	4:15 PM	72	Tractor Trailer		1		1	1		1	
107	Tuesday	9/29/2015	3:20 PM	4:07 PM	47	Box Truck		1	1		1		1	
108	Tuesday	9/29/2015		4:10 PM	40	Box Truck	1		1.			1		1
109	Tuesday	9/29/2015	4:05 PM	-1.20 / 141		Box Truck	1				1			
							T	2						
110	Tuesday	9/29/2015	4:44 PM		(*)	Tractor Trailer		1			1			
111	Wednesday		7:47 AM	7:50 AM	3	Box Truck		1	1			1	1	
112	Wednesday	9/30/2015	8:42 AM	9:17 AM	35	Van	1		1		1		1	
113	Wednesday	9/30/2015	8:50 AM	9:05 AM	15	Van	1		1			1	1	
114	Wednesday	9/30/2015	9:02 AM	10:02 AM	60	Van	1		1.		1			1
115	Wednesday			9:17 AM	7	Box Truck	1		1		1		1	
116	Wednesday			9:22 AM	8	Box Truck		1		1	1		1	
									- 4	1			1	
117	Wednesday				105	Tractor Trailer		1	1		1			
118	Wednesday			9:56 AM	7	Box Truck		1	1			1	1	
119	Wednesday	9/30/2015	10:22 AM	10:27 AM	65	Box Truck	1			1		1		1
120	Wednesday	9/30/2015	10:35 AM	11:02 AM	27	Box Truck	1		1		1		1	
121	Wednesday	9/30/2015	10:41 AM	11:41 AM	60	Box Truck		1	1		1		1	
122	Wednesday	9/30/2015	11-17 AM	11-28 AM	11	Van	1		1		1		1	
123	Wednesday				6	Van		1	1		1		1	
								4			(4)		4	
124	Wednesday	-,,			4	Van	1		1		20	1	9	1
125	Wednesday			12:26 PM	32	Box Truck		1	1		1		1	
126	Wednesday				32	Van	1		1		1		1	
127	Wednesday	9/30/2015	12:16 PM	12:32 PM	16	Box Truck		1	1		1		1	
128	Wednesday				12	Box Truck		1	3.		1		1	
129	Wednesday			1:18 PM	5	Box Truck		1	1		1			1
130			1:14 PM	1:37 PM	23	Box Truck		_					1	1
	Wednesday							1	12		1			
131	Wednesday			1:38 PM	13	Van	1		1			1	1	
132	Wednesday		1:56 PM	2:11 PM	15	Van	1		1		1		1	
133	Wednesday	9/30/2015	1:56 PM	2:38 PM	42	Van	1		1		1			1
134	Wednesday		2:42 PM	3:22 PM	40	Box Truck		1	1		1		1	
135	Wednesday		3:03 PM	3:27 PM	24	Box Truck		1	1		1		107	1
				3:24 PM										
136	Wednesday		3:11 PM		13	Van		1	1		1	100		1
137	Wednesday			4:01 PM	44	Box Truck		1	1			1		1
138	Wednesday	9/30/2015	3:21 PM	3:22 PM	1	Van	1		1		1			1
139	Wednesday	9/30/2015	3:33 PM	4:25 PM	52	Box Truck	1		1		1		1	
140	Wednesday		3:56 PM	5:12 PM	76	Box Truck		1	1.		1			1
141	Wednesday		5:05 PM		(4)	Van		1	-22		1		1	
142	Wednesday					Box Truck	1				1		100	1
7-45	•veuriesudy	2/30/2013	JUST PIN	4		DOX ITUCK	77	62	447	19		29	87	
					37.78195		11	62	117	19	110	29	87	50

Ĩ		14th St, SW Northbound		1	4th St, SW Southbound			endence Ave Eastbound	e, SW		ndence Ave Vestbound	e, SW
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
07:00	0	470	62	15	122	6	0	245	8	0	79	29
07:15	0	474	67	22	156	3	0	326	10	1	90	37
07:30	0	537	71	21	110	3	0	263	10	0	106	21
07:45	0	558	64	20	145	3	0	353	14	0	117	35
08:00	0	577	52	35	118	1	0	361	14	1	143	48
08:15	0	657	56	31	126	5	0	408	9	0	150	56
08:30	0	546	30	33	103	2	0	370	11	0	162	65
08:45	0	506	46	23	127	7	0	396	14	0	142	61
09:00	0	552	43	34	146	3	0	377	5	0	126	81
09:15	0	494	29	36	97	9	1	414	12	0	104	66
09:30	0	512	30	27	82	3	0	365	6	1	90	33
09:45	0	445	42	26	103	5	2	280	7	1	116	40
Peak Hour	0	2286	184	122	474	15	0	1535	48	1	597	230
15:00	0		26	29	261	8	0	80	10	1	112	23
15:15	0		49	35	286	10	1	117	7	1	89	22
15:30	0		30	27	307	5	1	66	2	0	118	20
15:45	0	0.000	22	43	331	10	0	72	5	3	154	32
16:00	0		57	52	362	8	1	68	7	3	245	27
16:15	0	370	92	51	457	6	0	101	4	2	281	30
16:30	0		65	26	344	6	0	117	3	0	189	25
16:45	0		87	39	314	3	0	81	4	2	204	27
17:00	0		92	34	331	11	0	117	12	1	210	23
17:15	0		87	38	360	6	0	127	5	0	229	22
17:30	0		77	26	332	0	1	130	6	0	207	19
17:45	0		96	38	421	4	0	99	13	2	226	22
18:00	0		85	29	422	8	0	65	2	3	123	51
18:15	0	326	54	23	356	11	0	96	3	2	213	43
18:30	0	309	50	32	400	11	0	106	8	3	172	29
18:45	0	230	43	17	395	9	1	98	4	2	148	23
Peak Hour	0	1469	352	136	1444	21	1	473	36	3	872	86

Ĩ	1	4th St, SW Northbound			14th St, SW Southbound			endence Ave Eastbound	e, SW		ndence Ave Vestbound	e, SW
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
07:00	0	6	2	3	9	0	0	0	0	1	1	7
07:15	0	9	3	3	8	1	0	1	0	0	1	3
07:30	0	2	3	4	6	1	1	- 1	0	1	0	8
07:45	0	7	1	4	13	0	2	3	0	1	1	4
08:00	0	8	2	6	5	1	0	1	0	1	2	4
08:15	0	4	3	4	6	0	1	2	0	0	0	2
08:30	0	5	3	8	9	1	3	1	0	3	0	5
08:45	0	6	3	5	5	0	2	2	0	0	2	4
09:00	0	3	0	4	9	0	1	4	0	1	1	1
09:15	0	0	3	4	6	1	0	2	0	0	1	6
09:30	0	3	1	5	8	0	1	3	0	2	0	1
09:45	0	6	2	3	3	1	0	1	0	1	3	4
Peak Hour	0	23	11	23	25	2	6	6	0	4	4	15
15:00	0	3	2	2	6	0	0	0	0	0	7	2
15:15	0	5	1	2	3	0	2	0	0	0	5	2
15:30	0	3	2	5	4	0	0	1	0	1	7	2
15:45	0	7	0	0	3	0	1	1	1	3	7	5
16:00	0	4	1	5	4	0	0	2	0	2	3	2
16:15	0	5	2	5	3	0	1	3	0	4	7	9
16:30	0	8	2	3	8	0	3	2	0	2	3	5
16:45	0	3	2	4	3	0	2	3	0	1	8	4
17:00	0	2	3	0	1	0	1	2	0	2	15	5
17:15	0	7	- 1	1	8	0	2	1	- 1	2	6	1
17:30	0	4	2	3	10	0	0	3	0	2	5	3
17:45	0	1	2	4	7	0	1	1	0	5	4	6
18:00	0	2	2	2	6	0	2	2	0	4	0	1
18:15	0	3	1	0	3	0	1	1	0	0	2	2
18:30	0	4	1	3	2	0	2	1	0	3	0	5
18:45	0	1	3	2	6	0	0	0	0	2	2	1
Peak Hour	0	14	8	8	26	0	4	7	1	11	30	15

		4th St, SW	1		4th St, SW		Indepe	ndence Ave	e. SW	Indeper	ndence Ave	e. SW	
		Northbound			outhbound			astbound			Vestbound		
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
07:00	0	476	64	18	131	6	0	245	8	1	80	36	1065
07:15	0	483	70	25	164	4	0	327	10	1	91	40	1215
07:30	0	539	74	25	116	4	1	264	10	1	106	29	1169
07:45	0	565	65	24	158	3	2	356	14	1	118	39	1345
08:00	0	585	54	41	123	2	0	362	14	2	145	52	1380
08:15	0	661	59	35	132	5	1	410	9	0	150	58	1520
08:30	0	551	33	41	112	3	3	371	11	3	162	70	1360
08:45	0	512	49	28	132	7	2	398	14	0	144	65	1351
09:00	0	555	43	38	155	3	1	381	5	1	127	82	1391
09:15	0	494	32	40	103	10	- 1	416	12	0	105	72	1285
09:30	0	515	31	32	90	3	1	368	6	3	90	34	1173
09:45	0	451	44	29	106	6	2	281	7	2	119	44	1091
Peak Total	0	2309	195	145	499	17	6	1541	48	5	601	245	5611
PHF	#DIV/0!	0.873	0.826	0.884	0.945	0.607	0.500	0.940	0.857	0.417	0.927	0.875	0.923
%HV	#DIV/0!	1.0%	5.6%	15.9%	5.0%	11.8%	100.0%	0.4%	0.0%	80.0%	0.7%	6.1%	0.0%
15:00	0	260	28	31	267	8	0	80	10	1	119	25	829
15:15	0	311	50	37	289	10	3	117	7	1	94	24	943
15:30	0	187	32	32	311	5	1	67	2	1	125	22	785
15:45	0	196	22	43	334	10	1	73	6	6	161	37	889
16:00	0	285	58	57	366	8	1	70	7	5	248	29	1134
16:15	0	375	94	56	460	6	1	104	4	6	288	39	1433
16:30	0	374	67	29	352	6	3	119	3	2	192	30	1177
16:45	0	359	89	43	317	3	2	84	4	3	212	31	1147
17:00	0	360	95	34	332	11	1	119	12	3	225	28	1220
17:15	0	380	88	39	368	6	2	128	6	2	235	23	1277
17:30	0	372	79	29	342	0	1	133	6	2	212	22	1198
17:45	0	371	98	42	428	4	1	100	13	7	230	28	1322
18:00	0	391	87	31	428	8	2	67	2	7	123	52	1198
18:15	0	329	55	23	359	11	1	97	3	2	215	45	1140
18:30	0	313	51	35	402	11	2	107	8	6	172	34	1141
18:45	0	231	46	19	401	9	1	98	4	4	150	24	987
Peak Total	0	1483	360	144	1470	21	5	480	37	14	902	101	5017
PHF	#DIV/0!	0.976	0.918	0.857	0.859	0.477	0.625	0.902	0.712	0.500	0.960	0.902	0.949
%HV	#DIV/0!	0.9%	2.2%	5.6%	1.8%	0.0%	80.0%	1.5%	2.7%	78.6%	3.3%	14.9%	0.0%

Total Vehicles

ŭ	ite Code. 1	14th S	t, SW	, 011 01	i itir ot, o	14th St	t, SW		In	dependenc	e Ave, SW		In	dependenc	e Ave, SW	
		Northb				Southb				Eastb				Westb		
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
07:00	0	0	0	7	0	0	0	11	0	2	0	7	0	0	0	25
07:15	1	0	0	18	2	3	1	6	0	2	2	4	0	2	0	40
07:30	0	0	0	15	0	0	0	12	0	2	0	3	0	1	0	54
07:45	0	0	0	21	1	0	0	20	0	6	0	5	0	1	0	50
08:00	0	0	0	15	0	1	0	8	0	1	0	3	0	2	0	60
08:15	0	1	0	8	0	3	0	5	0	3	0	3	0	0	0	54
08:30	0	0	0	12	1	0	0	5	0	5	0	10	0	1	0	47
08:45	0	0	0	7	0	0	0	5	1	2	0	8	0	1	0	54
09:00	0	0	0	6	2	1	0	8	0	0	0	10	0	1	0	42
09:15	0	0	0	3	0	1	0	5	0	4	1	7	0	1	0	28
09:30	0	0	0	0	0	0	0	13	0	1	0	7	0	0	0	26
09:45	0	1	0	4	0	0	0	2	1	2	0	11	0	0	0	9
Peak Total	0	1	0	42	1	4	0	23	1	11	0	24	0	4	0	215
15:00	1	0	0	34	0	0	0	17	0	0	0	6	0	0	0	24
15:15	0	0	0	27	0	1	0	2	0	0	0	4	0	2	0	22
15:30	0	0	0	12	0	0	0	7	0	0	0	10	0	0	0	9
15:45	0	1	0	28	0	0	0	3	0	0	0	16	0	1	0	9
16:00	0	0	0	25	0	0	0	1	0	1	0	15	0	3	0	27
16:15	0	0	0	75	0	2	0	1	0	1	0	10	0	3	0	30
16:30	0	2	0	47	0	1	0	10	0	0	0	37	0	2	0	8
16:45	0	1	0	49	0	1	0	14	0	0	0	7	0	7	0	11
17:00	0	0	0	26	0	0	0	12	0	0	0	4	0	8	1	14
17:15	0	1	0	99	0	1	1	18	0	1	0	11	0	3	1	8
17:30	0	1	1	44	0	1	1	9	0	0	0	9	0	6	0	14
17:45	1	0	0	25	0	0	0	7	0	0	0	3	0	6	0	4
18:00	0	0	0	38	0	0	0	11	0	1	0	2	0	4	1	7
18:15	2	0	0	32	0	1	0	4	0	0	0	6	0	1	1	4
18:30	0	1	0	14	0	0	0	13	1	1	0	6	0	1	0	1
18:45	0	0	0	10	0	0	0	6	0	2	0	4	0	2	0	1
Peak Total	1	2	1	194	0	2	2	46	0	1	0	27	0	23	2	40

J	12	2th St, NW	The Ave		th St, NW		Inc	dependence	e I	Inder	endence Ave S	SW	
		orthbound			outhbound			Eastbound			Westbound	-0.503	
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
07:00	19	27	13	0	0	0	13	324	49	40	153	21	659
07:15	13	30	8	0	3	1	6	361	45	30	198	24	719
07:30	22	60	20	0	4	2	15	356	38	35	142	20	714
07:45	11	32	25	0	2	0	5	285	49	36	160	35	640
08:00	32	80	31	3	2	1	13	359	37	33	180	31	802
08:15	46	44	21	2	2	2	7	324	32	32	160	35	707
08:30	44	44	23	2	5	2	11	308	40	37	168	30	714
08:45	44	32	34	3	4	3	17	351	25	37	142	32	724
09:00	49	66	39	1	4	1	4	357	22	35	155	38	771
09:15	31	21	49	0	4	4	10	281	28	47	174	38	687
09:30	67	31	45	0	3	4	13	284	15	30	157	23	672
09:45	36	54	48	5	4	1	5	276	19	30	102	23	603
Peak Total	166	200	109	10	13	8	48	1342	134	139	650	128	2947
PHF	0.902	0.625	0.801	0.833	0.650	0.667	0.706	0.935	0.838	0.939	0.903	0.914	0.919
15:00	25	39	61	1	6	2	8	209	14	34	160	31	590
15:15	17	24	55	4	5	2	10	192	12	30	169	31	551
15:30	29	40	63	3	7	2	8	184	24	44	183	21	608
15:45	26	36	52	1	3	5	3	213	15	35	179	26	594
16:00	25	31	34	3	5	3	3	221	6	51	184	26	592
16:15	30	47	55	1	0	0	3	229	8	56	226	14	669
16:30	44	43	71	0	1	2	2	243	14	69	249	24	762
16:45	51	59	88	3	6	8	2	242	10	78	262	34	843
17:00	30	35	78	4	5	4	0	217	6	73	348	39	839
17:15	25	47	56	3	5	2	0	196	8	84	307	43	776
17:30	18	84	54	2	4	3	0	238	3	93	278	34	811
17:45	20	42	56	3	6	0	0	215	5	84	294	49	774
18:00	21	61	72	1	2	2	2	156	0	94	322	48	781
18:15	26	29	44	1	4	2	4	205	2	101	270	36	724
18:30	19	29	63	1	1	2	24	179	0	96	257	29	700
18:45	21	30	53	0	0	1	10	156	0	55	216	17	559
Peak Total	93	208	244	12	20	9	0	866	22	334	1227	165	3200
PHF	0.775	0.619	0.782	0.750	0.833	0.563	#DIV/0!	0.910	0.688	0.898	0.881	0.842	0.954

Vehicles

		12th S			.,	12th S				Indeper			li I		ce Ave SW	
		Northb				Southt				Eastb				Westb		
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
07:00	0	0	0	0	0	1	0	33	0	1	0	50	0	2	0	41
07:15	0	0	3	0	0	4	0	6	0	4	0	68	0	6	0	22
07:30	0	1	0	0	0	3	0	31	0	5	0	76	0	3	0	38
07:45	0	0	0	0	0	9	0	21	0	6	2	102	0	8	0	46
08:00	0	0	1	0	1	3	0	35	0	0	0	90	0	2	0	34
08:15	0	0	0	0	0	5	0	25	0	5	0	121	0	1	0	21
08:30	0	1	0	0	0	13	0	32	0	7	0	102	0	5	0	39
08:45	0	2	0	2	0	9	0	24	0	4	1	104	0	2	0	46
09:00	0	0	2	3	1	6	0	26	0	4	0	80	0	2	0	43
09:15	0	0	0	0	0	8	0	11	0	- 1	0	33	0	5	0	14
09:30	0	0	0	0	0	6	0	8	0	2	0	72	0	5	0	28
09:45	0	0	0	0	0	1	0	16	0	0	0	58	0	5	0	20
Peak Total	0	3	1	2	1	30	0	116	0	16	1	417	0	10	0	140
15:00	0	1	0	0	0	2	1	22	0	4	0	37	0	1	0	62
15:15	1	0	0	0	1	1	0	27	0	21	0	21	0	2	0	50
15:30	0	0	0	2	0	0	0	32	0	8	0	49	0	3	0	59
15:45	1	0	0	0	0	1	0	24	0	10	0	39	0	3	0	45
16:00	0	0	0	0	0	1	0	8	0	0	0	26	0	1	0	39
16:15	0	0	0	0	0	0	0	0	0	1	0	5	0	1	0	0
16:30	1	0	4	3	0	0	0	5	0	0	0	20	0	1	0	48
16:45	0	0	6	0	0	0	0	23	0	1	0	12	0	8	0	95
17:00	0	1	3	0	0	0	0	6	0	1	0	32	0	5	0	86
17:15	0	1	1	0	0	4	0	12	0	14	0	11	0	3	0	83
17:30	0	1	2	0	0	0	0	20	0	0	0	12	0	4	0	76
17:45	0	1	2	0	0	3	0	13	0	1	0	4	0	3	0	40
18:00	0	1	5	0	0	0	0	1	0	1	0	10	0	3	0	37
18:15	0	1	0	0	0	0	0	2	0	0	0	22	0	2	0	33
18:30	0	1	0	0	0	0	0	0	0	0	0	1	0	1	0	30
18:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22
Peak Total	0	4	8	0	0	7	0	51	0	16	0	59	0	15	0	285

Start Date: 9/29/2015 Start Time: 7:00:00 AM Site Code: PEAK-HOUR COUNT AT L'ENFANT

Start Time Left Right Thru Right Left Thru Total 07:00 8 8 293 42 12 218 581 07:15 10 21 349 14 19 245 658 07:30 10 19 332 37 20 180 598 07:45 13 23 305 14 17 223 595 08:00 11 33 361 23 18 216 662 08:15 12 45 348 15 19 235 674 08:45 16 50 376 20 22 200 684 09:00 19 29 377 25 15 204 669 09:15 18 26 317 13 18 224 616 09:30 3 21 310 17 4 186 54
07:00 8 8 293 42 12 218 581 07:15 10 21 349 14 19 245 658 07:30 10 19 332 37 20 180 595 07:45 13 23 305 14 17 223 595 08:00 11 33 361 23 18 216 662 08:15 12 45 348 15 19 235 674 08:30 17 24 300 27 7 220 604 08:45 16 50 376 20 22 200 684 09:00 19 29 377 25 15 204 669 09:15 18 26 317 13 18 224 616 09:30 3 21 310 17 4 186 54
07:15 10 21 349 14 19 245 658 07:30 10 19 332 37 20 180 598 08:00 11 33 305 14 17 223 595 08:00 11 33 361 23 18 216 662 08:15 12 45 348 15 19 235 674 08:30 17 24 300 27 7 229 604 08:45 16 50 376 20 22 200 684 09:00 19 29 377 25 15 204 669 09:15 18 26 317 13 18 224 616 09:30 3 21 310 17 4 186 541 09:45 7 7 72 294 16 5 145 484 <
07:30 10 19 332 37 20 180 598 07:45 13 23 305 14 17 223 595 08:00 11 33 361 23 18 216 662 08:15 12 45 348 15 19 235 674 08:30 17 24 300 27 7 229 604 08:45 16 50 376 20 22 200 684 09:00 19 29 377 25 15 204 669 09:15 18 26 317 13 18 224 616 09:30 3 21 310 17 4 186 541 09:45 7 7 17 294 16 5 145 484 Feak Total 56 152 1385 85 66 880 2624
07:45 13 23 305 14 17 223 595 08:00 11 33 361 23 18 216 662 08:15 12 45 348 15 19 235 674 08:30 17 24 300 27 7 229 604 08:45 16 50 376 20 22 200 684 09:00 19 29 377 25 15 204 669 09:15 18 26 317 13 18 224 616 09:30 3 21 310 17 4 186 51 09:45 7 17 294 16 5 145 484 Peak Total 56 152 1385 85 66 880 2624
08:00 11 33 361 23 18 216 662 08:15 12 45 348 15 19 235 674 08:30 17 24 300 27 7 229 604 08:45 16 50 376 20 22 200 684 09:00 19 29 377 25 15 204 669 09:15 18 26 317 13 18 224 616 09:30 3 21 310 17 4 186 541 09:45 7 17 294 16 5 145 484 Peak Total 56 152 1385 85 66 880 2624
08:15 12 45 348 15 19 235 674 08:30 17 24 300 27 7 229 604 08:45 16 50 376 20 22 200 684 09:00 19 29 377 25 15 204 669 09:15 18 26 317 13 18 224 616 09:30 3 21 310 17 4 186 541 19:45 7 17 294 16 5 145 484 Peak Total 56 152 1385 85 66 880 2624
08:30 17 24 300 27 7 229 604 08:45 16 50 376 20 22 200 684 09:00 19 29 377 25 15 204 669 09:15 18 26 317 13 18 224 616 09:30 3 21 310 17 4 186 541 09:45 7 17 294 16 5 145 484 Peak Total 56 152 1385 85 66 880 2624
08:45 16 50 376 20 22 200 684 09:00 19 29 377 25 15 204 669 09:15 18 26 317 13 18 224 616 09:30 3 21 310 17 4 186 541 09:45 7 7 17 294 16 5 145 484 Peak Total 56 152 1385 85 66 880 2624
09:00 19 29 377 25 15 204 669 09:15 18 26 317 13 18 224 616 09:30 3 21 310 17 4 186 54 09:45 7 17 294 16 5 145 484 Peak Total 56 152 1385 85 66 880 2624
09:15 18 26 317 13 18 224 616 09:30 3 21 310 17 4 186 541 09:45 7 17 294 16 5 145 484 Peak Total 56 152 1385 85 66 880 2624
09:30 3 21 310 17 4 186 541 09:45 7 17 294 16 5 145 484 Peak Total 56 152 1385 85 66 880 2624
09:45 7 17 294 16 5 145 484 Peak Total 56 152 1385 85 66 880 2624
Peak Total 56 152 1385 85 66 880 2624
PHF 0.824 0.760 0.921 0.787 0.750 0.936 0.959
15:00 10 16 252 19 10 218 525
15:15 16 15 238 16 14 204 503
15:30 21 20 231 25 15 248 560
15:45 15 16 236 23 12 231 533
16:00 15 19 242 22 7 252 557
16:15 27 9 271 17 15 323 662
16:30 32 18 303 15 17 316 701
16:45 23 15 299 22 8 353 720
17:00 46 34 286 20 18 412 816
17:15 66 4 261 10 12 381 734
17:30 54 13 259 14 9 365 714
17:45 60 4 251 10 11 346 682
18:00 59 14 226 10 8 419 736
18:15 25 11 255 5 4 369 669
18:30 14 6 245 3 6 362 636
18:45 9 5 203 3 2 293 515
Peak Total 226 55 1057 54 50 1504 2946
PHF 0.856 0.404 0.924 0.675 0.694 0.913 0.903

Vehicles

Start Date: 9/29/2015 Start Time: 7:00:00 AM

		L'Enfan				L'Enfan				Independ				Independe		
		Northb				Southb				Eastb				Westb		
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	7	0	0	0	2	0	0	1	0	0	3	0	4
07:30	0	0	0	10	0	0	0	13	0	7	0	11	1	6	0	28
07:45	1	0	2	20	0	0	0	16	0	2	0	7	2	8	0	21
08:00	0	2	0	0	0	0	0	1	0	1	1	8	1	5	0	14
08:15	0	0	1	11	0	0	0	7	0	2	1	9	0	3	0	17
08:30	0	1	0	9	0	0	0	19	0	3	2	24	0	4	0	25
08:45	1	2	0	7	0	0	0	13	0	3	0	12	0	8	0	13
09:00	0	0	0	8	0	0	0	1	0	2	3	5	0	4	0	10
09:15	0	0	0	35	0	0	0	0	0	2	0	12	0	2	0	5
09:30	0	0	0	7	0	0	0	7	0	0	0	30	0	0	0	0
09:45	0	0	0	10	0	0	0	0	0	0	0	34	0	0	0	0
Peak Total	1	5	1	27	0	0	0	40	0	9	4	53	1	20	0	69
400-0000					-	200		No.			2000	and a common of the common of	10000	200		
15:00	0	0	0	4	0	0	0	8	0	5	0	42	0	2	0	16
15:15	0	0	0	4	0	0	0	35	0	2	1	28	0	5	0	2
15:30	0	1	0	27	0	0	0	36	0	3	0	58	0	2	0	31
15:45	0	1	0	12	0	0	0	26	0	10	0	39	0	3	0	1
16:00	0	0	0	20	0	0	0	17	0	1	0	65	4	9	0	3
16:15	0	0	0	14	0	0	0	1	0	3	0	63	0	1	0	0
16:30	0	1	0	26	0	0	0	16	0	0	0	83	3	2	0	2
16:45	2	1	0	23	0	0	0	2	0	2	0	35	3	5	0	0
17:00	0	1	1	3	0	0	0	20	0	2	0	68	0	4	0	0
17:15	0	0	0	5	0	0	0	22	0	5	0	23	5	2	0	5
17:30	0	1	0	1	0	0	0	8	0		0	38	2	1	0	2
17:45	0	3	0	1	0	0	0	2	0	4	0	25	4	0	0	0
18:00	0	0	0	1	0	0	0	0	0	1	0	14	1	0	0	0
18:15	0	0	0	3	0	0	0	0	0	0	0	31	0	0	0	0
18:30	9	0	0	10	0	0	0	0	0	0	0	17	0	0	0	0
18:45	4	0		6	0	0	0	0	0	0	0	11	0	3	0	0
Peak Total	0	5	1	10	0	0	0	52	0	13	0	154	11	7	0	7

Bicycles and Peds

Ronald Catterton

Ronald Catterton

Intersection: 14th Street and Independence Ave

Date: 12/8/15

Time	Approach	Vehicles in Queue at Start of Green	Vehicles Left in Queue at End of Green	Comments
	NB	62	3	tight terms left
7:15 AM	SB	26	0	
7:13 AIVI	ЕВ	28	0	
	WB	12	0	#
	NB	60	14	U-TURN MESSEN UPTRAFFIC
7.20 484	SB	21	4	left have left
7:30 AM	ЕВ	32	0	
	WB	12	0	
	NB	58	2	right turnes
7:45 AM	SB	13	0	9
7:45 AIVI	EB	20	0	
	WB	13	0	
9.00 AB4	NB	50	6	
8:00 AM	SB	15	4	the annut the

7:00 Am 10 seconds -> Signal - SB Lead 8:00 Am 12 seconds > Left fine

		1		T
	EB	16	0	
	WB	15	0	
	NB	45	6	
0.45 404	SB	16	i.f	left Turn left
8:15 AM	EB	10	0	
	WB	20	0	
	NB	43	6	
9.30 ABA	SB	19	9	left Tuno left.
8:30 AM	EB	10	0	
	WB	3 (0	
	NB	45	0	
0.45.484	SB	15	3	left Turns left
8:45 AM	EB	12	0	
	WB	30	0	
	NB	45	0	
9:00 AM	SB			tt h
	EB	15	0	
	WB	29	0	

Intersection: 14th Street and Independence Ave

Date:_

Time	Approach	Vehicles in Queue at Start of Green	Vehicles Left in Queue at End of Green	Comments
Laure	NB	15		
4:15 PM	SB	13	0	
4.13 FW	EB		0	
	WB	33	0	
	NB	16	0	
4:30 PM	SB	16	0	
4.30 PW	EB	2	0	
	WB	25	0	
	NB	23	0	
4:45 PM	SB	18	0	
4.43 FIVI	EB	4	0	
	WB	38	0	
5:00 PM	NB	30	0	
3.00 FIVE	SB	24	0	

4:00 pm 18 sec. > Signal SB Lead 5:00 pm 18 sec. > Left time

	EB	6	0	
	WB	33	0	
	NB	15	0	
5:15 PM	SB	21	٥	
3.13 PW	EB	2	0	
	WB	32	0	
	NB	18	0	
5:30 PM	SB	27	0	
3.30 F W	EB	6	0	
	WB	32	0	
	NB	8	0	
5:45 PM	SB	11	0	
3.43 FIVI	EB	6 .	0	
	WB	38	0	
	NB	16	0	
6:00 PM	SB	30	0	
	EB	4	0	
	WB	31	0	

Babinda Lanor

Intersection: 12th Street and Independence Ave

Date: 0 8 15

Time	Approach	Vehicles in Queue at Start of Green	Vehicles Left in Queue at End of Green	Comments
	NB	3	0	
7.45 ABA	SB	0	0	
7:15 AM	EB	24	Ò	
	WB	2	Ò	
	NB	5	O	
7.20.414	SB	0	0	
7:30 AM	EB	7	0	
	WB	1-1	0	
	NB	0	0	
	SB	0	0	
7:45 AM	EB	(0	
	WB	(0	0	
0.00 485	NB	(0)	0	
8:00 AM	SB	1	0	

12 me Independence

	EB	17	0	
	WB	4	0	
	NB	3	0	
	SB	0	6	
8:15 AM	EB	12	6	All remaining were Left trins in queue
	WB	9	0	
	NB	7	0	
	SB	0	0	
8:30 AM	EB	28	1	One left turn valuede remaining
	WB	6	0	Vehicle femaning All belts were the quein All west
	NB	17	0	
	SB	0	0	
8:45 AM	EB	36		one through did not got through both were lefts and got through
	WB	36	0	both were lefts and got through
	NB	2	0	
9:00 AM	SB	4	9	
3.00 AW	EB	8	0	
	WB	4	0	

Intersection: 12th Street and Independence Ave

Date: 2 8 13

Time	Approach	Vehicles in Queue at Start of Green	Vehicles Left in Queue at End of Green	Comments
	NB	5	\Diamond	
	SB	0	0	
4:15 PM	EB	25	0	
	WB	14	D	
	NB	10	0	
	SB)	6	
4:30 PM	EB	30	2	The remaining were right behind a stopped bus
	WB	19	0	
	NB	6	0	
	SB	0	0	
4:45 PM	EB	40	0	
	WB	22	0	
E 00 DE 1	NB	10	0	
5:00 PM	SB	0	Ò	

12th St @ Independence

	EB	13	l	Bus stopped in right lane
	WB	20	0	
	NB	6	0	
E-4E DN4	SB)	0	
5:15 PM	EB	17	The same of the sa	Bus Stopped Right Lone
	WB	16	0	0
	NB	4	G	
F-20 DN4	SB	0	0	
5:30 PM	EB	28	\	Uber in right lane
	WB	19	0	
	NB	5	0	
5:45 PM	SB	Ò	6	
5:45 PIVI	EB	15	0	
	WB	19	0	
	NB	3	0	
6:00 PM	SB	0	0	
3.001101	EB	14	0	
	WB	16	0	

Bounda Conno-

Intersection: L'Enfant Plaza and Independence Ave

Date: 12 8 15

Time	Approach	Vehicles in Queue at Start of Green	Vehicles Left in Queue at End of Green	Comments
	NB	0	0	
7:15 AM	SB	0		A CALL
7:13 AIVI	EB	4	0	
	WB	18	0	
	NB	.0	0	2 made 115hts on real
7:30 AM	SB	0		>
7:30 AIVI	EB	5	0	
	WB	21	0	
	NB	8	0	
7.45 004	SB			>
7:45 AM	EB	11	C	
	WB	12	2	All LEAT TONS -
0.00 AB4	NB	6	0	£ 11/11/2
8:00 AM	SB	-	X	4

Exfort@Ind.

	ЕВ	3	0	
	WB	22	0	
	NB		0	
0.45 444	SB	>	>	><
8:15 AM	EB	6	0	
	WB	33	a range	Vehicle
	NB	4	9	
8:30 AM	SB	7	>	
8.30 AIVI	EB	4	0	
	WB	28	\Diamond	
	NB	6	0	
8:45 AM	SB	\times	>/	4
6:45 AIVI	EB	2	0	
	WB	24	\bigcirc	
	NB	白優	0	
9:00 AM	SB	7	7	×
	EB	7	0	
	WB	18		



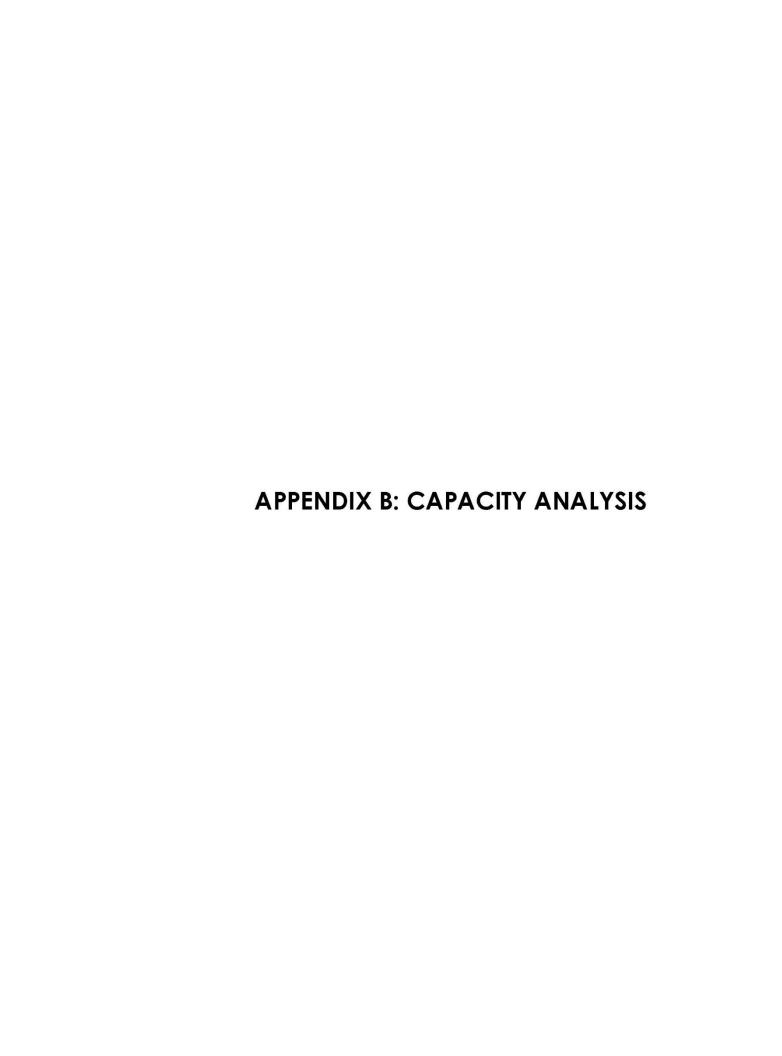
Intersection: L'Enfant Plaza and Independence Ave

Date: 12/8/15

Time	Approach	Vehicles in Queue at Start of Green	Vehicles Left in Queue at End of Green	Comments
	NB	0		
4.45.004	SB		>	
4:15 PM	EB	21	0	
	WB	2	0	
	NB	9	0	
4.30 554	SB		7	>
4:30 PM	EB	11		
	WB	15		
	NB	5		
4.45 504	SB	7	1	7
4:45 PM	EB	5	0	
	WB	1	0	
5.00 DN 5	NB	H	0	
5:00 PM	SB	7	7	7

Le Enfant Drodofendera

		1 /	~	
	EB	4		
	WB	18	0	
	NB		Ò	
5:15 PM	SB		/	7
3.13 FIVI	ЕВ	Q 4	0	
	WB	28	0	
	NB		0	
5:30 PM	SB		7	
3.30 1 141	ЕВ	5	0	
	WB	deciman	0	
	NB	\bigcirc	0	
5:45 PM	SB		7	
3.43 FIVI	EB	6	0	
	WB	8	9	
	NB	3	\bigcirc	
6:00 PM	SB	7	7	7
	EB	7	0	
	WB	5		



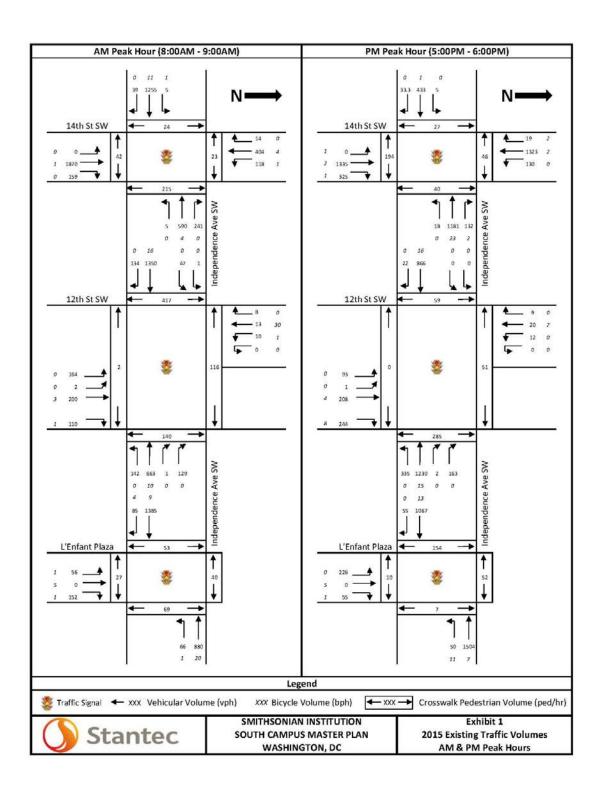
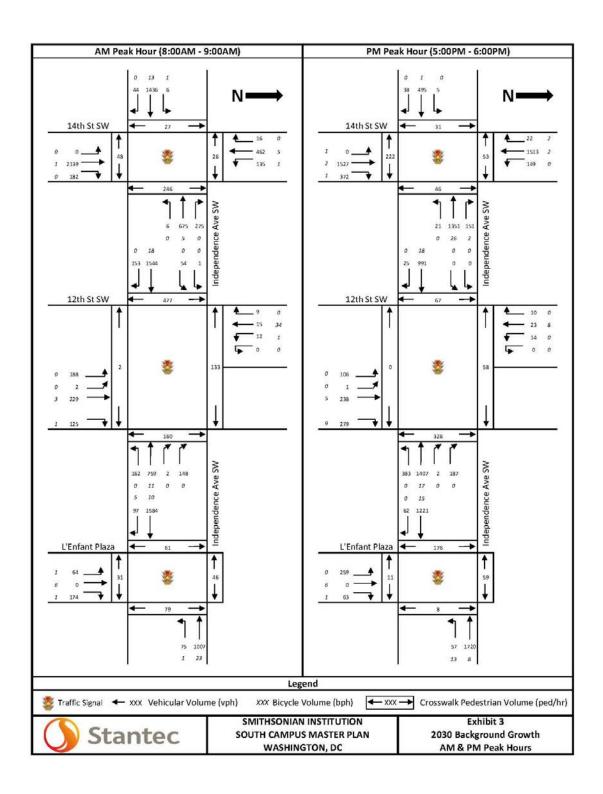
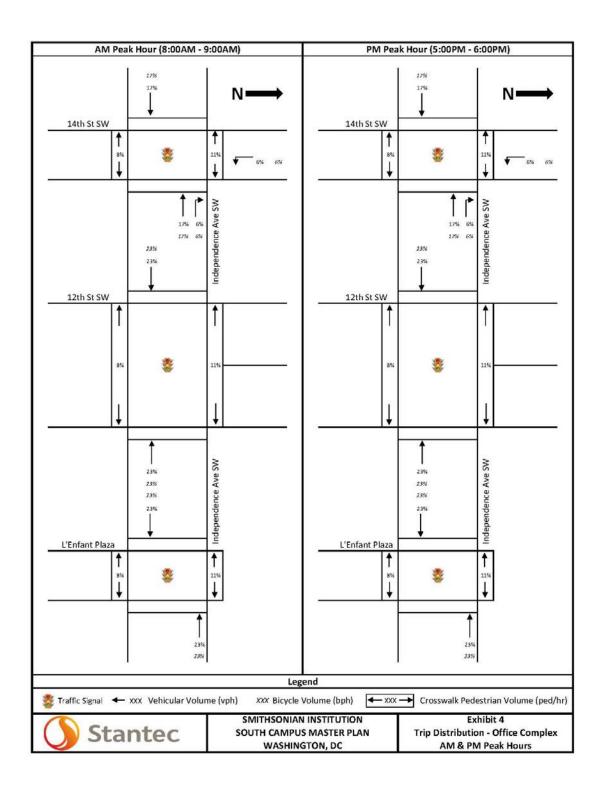


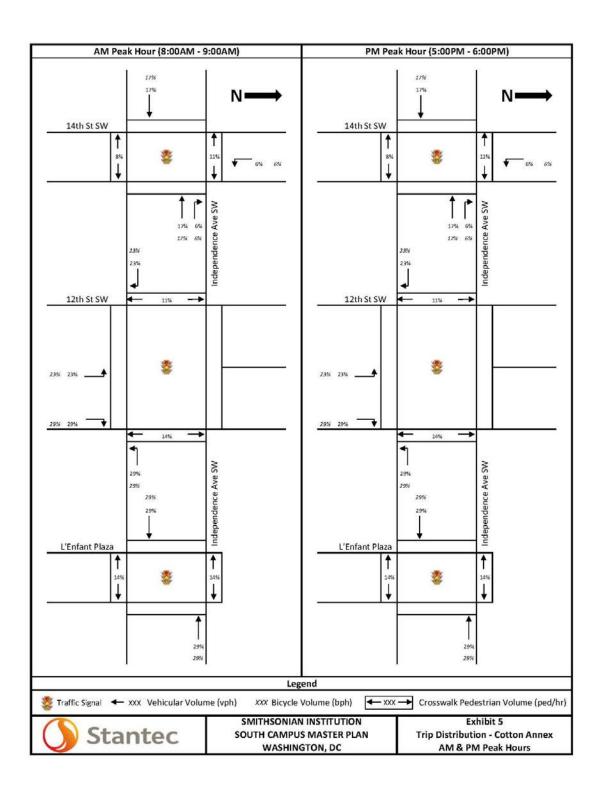
Exhibit 2 Smithsonian Institution, South Campus Master Plan Capacity Analysis Results 2015 Existing Condition

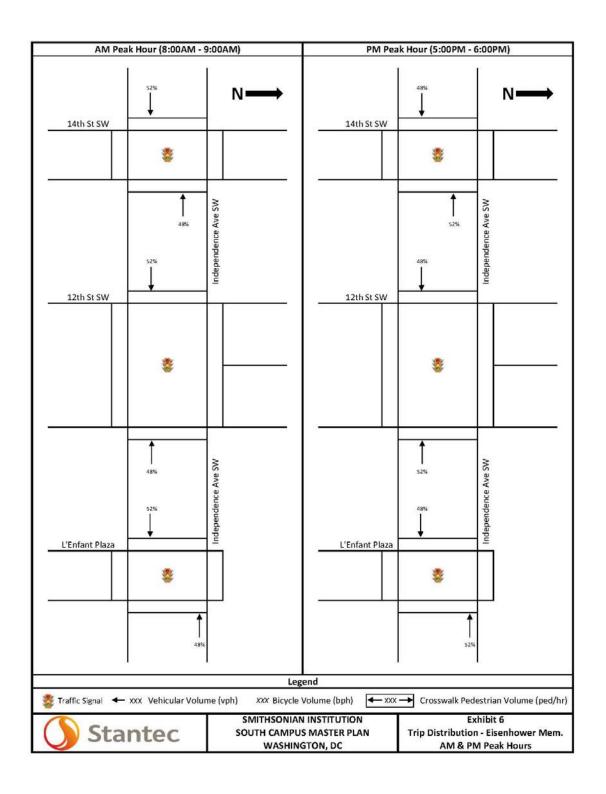
				AM Peak Hour (8:00AM - 9:00AM)	.00AM - 9:00AM)					PM Peak Hour (5:00PM - 6:00PM	:00PM - 6:00PM)	
Intersection	Lane Group	v/c Ratio	Delay (sec)	v/c Ratio Delay (sec) Level of Service	50th %tile	95th %tile	Lane Group	v/c Ratio	Delay (sec)	u/c Ratio Delay (sec) Level of Service	50th %tile	95th %tile
	1		9		Queue Length (Tt)	Queue Lengtn (Tt)		8			Queue Length (Tt)	Queue Length (Tt)
	EB-TR	0.95	51.4	D	354	#456	EB-TR	0.40	31.7	ပ	100	134
	WB-T	0.48	41.1	D	147	191	WB-T	1.01	54.4	F	~343	#445
14th Stand 100	WB-R	0.51	30.9	U	102	195	WB-R	0.31	8.1	Þ	19	m51
We ladendant from Sw	NB-T	0.85	29.4	U	447	517	T-8N	0.65	26.1	U	279	331
w illuspendence Avenue sw	NB-R	0.31	6'6	∢	32	79	NB-R	0.47	14.1	æ	88	168
paziiniis	1-8S	0.83	61.6	Е	47	#156	1-8S	0.46	18.2	В	37	90
	SB-TR	0.17	10.0	4	48	65	SB-TR	0.48	11.8	В	181	216
	Intersection	1	35.4	۵	i i	a	Intersection	'n	28.2	υ	şı	31
	EB-LTR	0.72	8.9	4	38	m43	EB-LTR	0.47	30.3	U	171	204
	WB-L	0.57	35.0	D	53	129	MB-L	99'0	23.7	U	70	125
W3 +2 C+3 ++CL	WB-LTR	0.39	5.1	∢	34	41	WB-LTR	89'0	11.6	æ	121	136
9. Indopendence August SW	NB-L	0.38	16.0	В	103	168	1-8N	0.20	21.9	U	52	96
will dependence Avenue 3w	NB-TR	0.49	18.3	В	142	224	NB-TR	0.54	30.5	O	153	242
paziiniis	NB-R	0.16	1.3	¥	0	0	NB-R	0.27	2.6	∢	1	25
	SB-LTR	80.0	0.4	A	0	0	SB-LTR	0.10	0.4	A	0	0
	Intersection	3	9.8	A		-	Intersection	'n	18.8	В	5	31
	EB-TR	0.50	3.4	¥	25	28	EB-TR	0.42	20.9	v	225	264
L'Enfant Plaza	WB-LT	0.35	8.9	A	79	95	WB-LT	0.57	12.0	В	163	188
& Independence Avenue SW	NB-L	0.14	34.7	C	33	89	NB-L	09'0	44.6	D	159	245
Siignalized	NB-R	0:30	16.9	В	47	96	NB-R	0.10	6.1	Ą	0	27
	Intersection	10	8'9	Ą		1111	Intersection	-	17.8	8	p. • 14	:: ()::

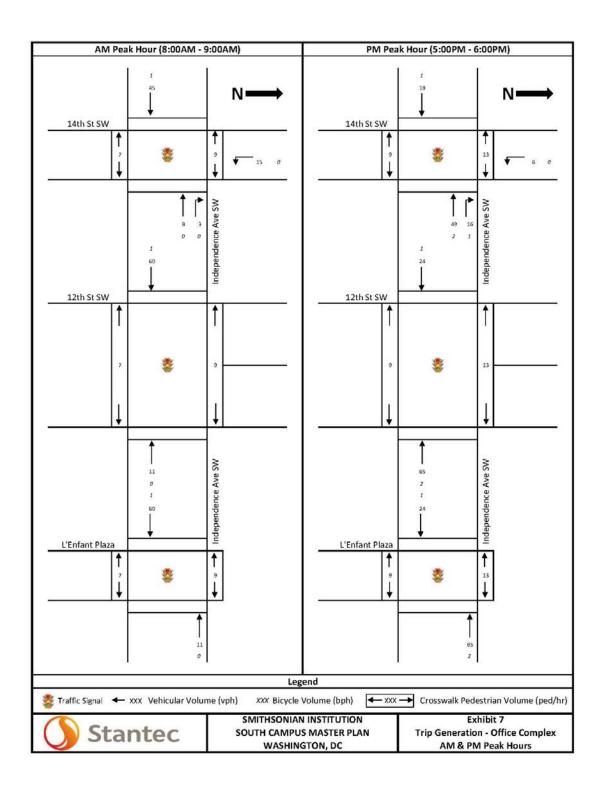
v/c ratio = volume/capacity ratio Source: Synchro 9

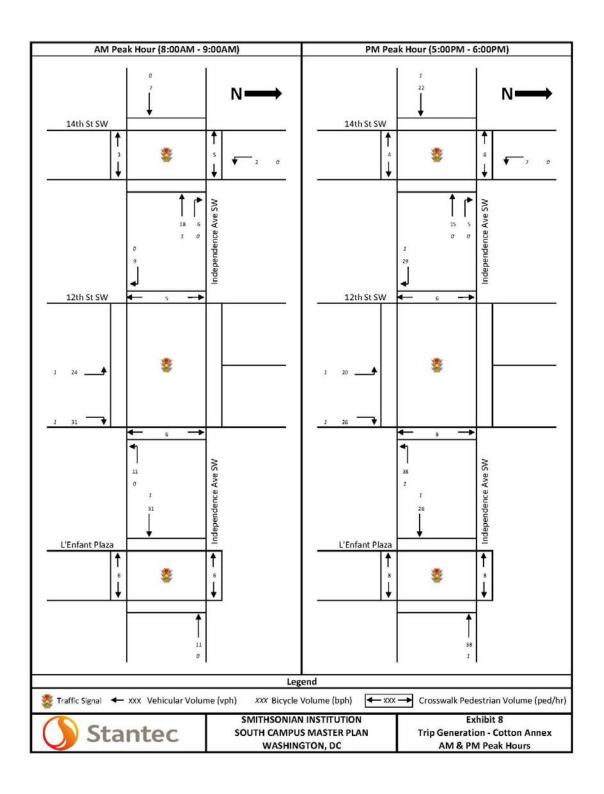


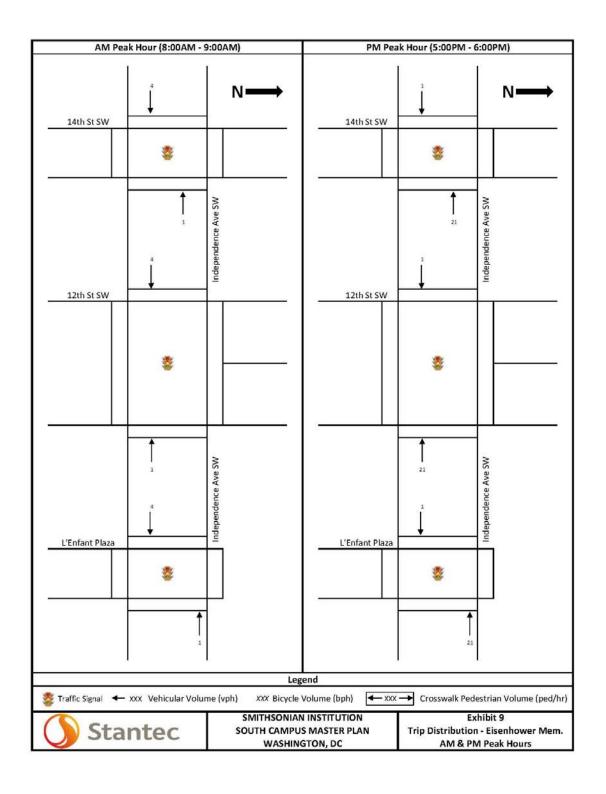












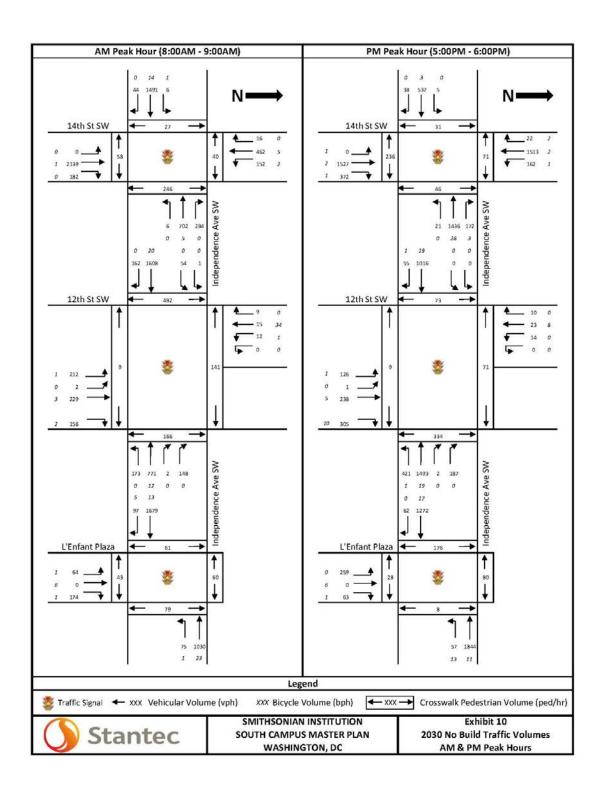
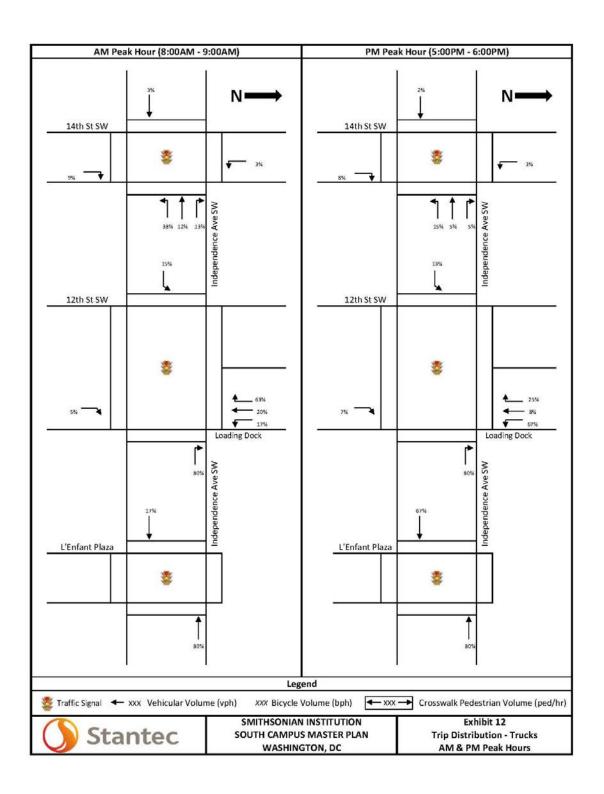
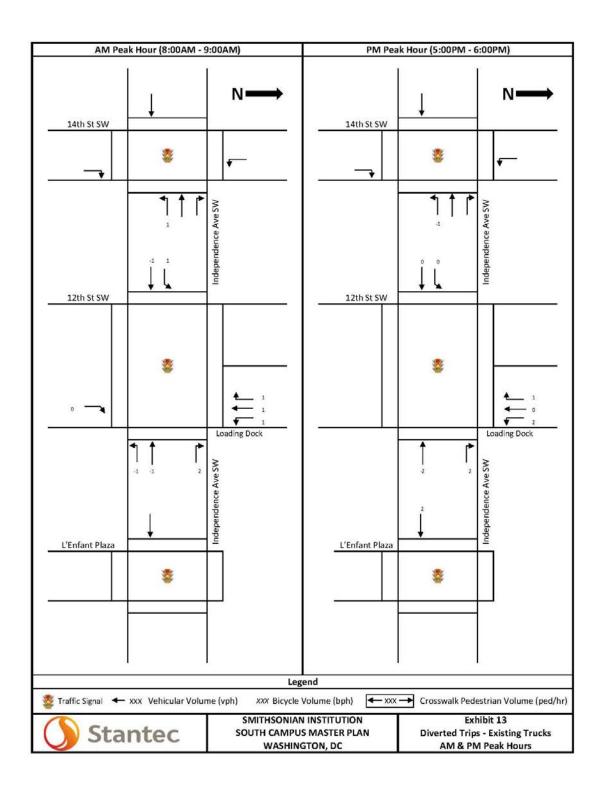


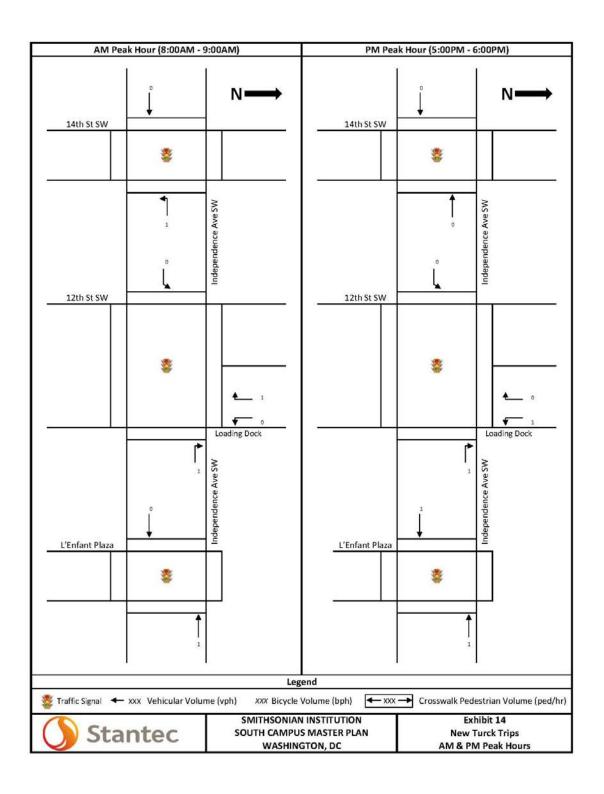
Exhibit 11 Smithsonian Institution, South Campus Master Plan Capacity Analysis Results 2030 No Build Condition

				AM Peak Hour (8:00AM - 9:00AM)	:00AM - 9:00AM)					PM Peak Hour (5:00PM - 6:00PM	:00PM - 6:00PM)	
Intersection	Lane Group	u/c Ratio	Dolay (coc)	of Carrier	50th %tile	95th %tile	Lane Group	u/c Batio	Dolay (sec)	of Ratio Delay (sec) level of Service	50th %tile	95th %tile
		A) C IMBID	reigy (sec)	בפגפו מו מפו גורב	Queue Length (ft)	Queue Length (ft)		אל ב ואפרוס	reigy (sec)	דפאפו סו ספו אורפ	Queue Length (ft)	Queue Length (ft)
	EB-TR	1.13	104.0	Н	~506	#604	EB-TR	0.53	34.2	C	130	169
	WB-T	0.63	43.5	Q	191	232	T-8W	1.23	135.0	F	~497	#601
144 64-24 610	WB-R	0.61	34.4	J	13	240	WB-R	0.40	7.4	¥	22	m37
9. Independence Account SW	NB-T	0.97	41.2	Q	268	#704	T-8N	0.74	28.4	C	338	397
will dependence Avenue 3w	NB-R	98'0	11.5	В	43	86	NB-R	95'0	19.9	8	145	242
paziiniific	SB-L	1.07	119.9	ш	98~	#225	1-8S	09'0	30.4	U	65	139
	SB-TR	0.19	10.2	В	26	74	SB-TR	0.55	12.8	В	221	261
	Intersection	1	57.3	3	151		Intersection	1	20.5	D	3	
	EB-LTR	88'0	9.3	A	45	m44	EB-LTR	0.57	32.3	0	208	242
	WB-L	0.73	47.3	Q	98	#203	WB-L	0.88	43.5	D	118	#325
13# Street SW	WB-LTR	0.47	5.7	A	41	49	WB-LTR	0.87	18.6	В	219	290
8. Indonondonco August SM	NB-L	0.49	17.5	8	137	216	1-8N	0.27	17.5	В	72	125
o illuepelluelice Avellue 3vv	NB-TR	0.58	19.5	В	169	261	NB-TR	0.67	27.9	O	196	303
Dazimirsea	NB-R	0.23	1.4	٧	0	0	NB-R	0.32	2.0	Ą	11	46
	SB-LTR	60'0	0.4	A	0	0	SB-LTR	0.11	8.0	A	0	3
	Intersection	3	10.8	В			Intersection	a	24.3	C	5	31
	EB-TR	0.61	3.9	A	36	39	EB-TR	0.49	21.4	C	270	305
L'Enfant Plaza	WB-LT	0.42	9.5	A	95	113	WB-LT	0.74	16.4	В	227	258
& Independence Avenue SW	NB-L	0.16	35.0	a	38	76	NB-L	99'0	46.2	D	184	279
Siignalized	NB-R	0.35	20.6	C	65	121	NB-R	0.12	8.0	A	4	34
	Intersection		7.5	A	-	: T	Intersection	-	20.3	C		6 10 .

v/c ratio = volume/capacity ratio Source: Synchro 9







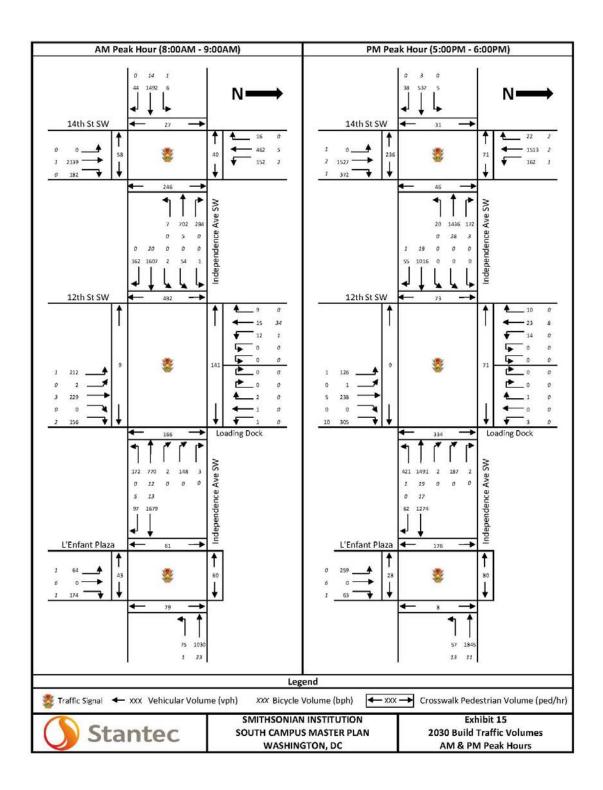


Exhibit 16 Smithsonian Institution, South Campus Master Plan Capacity Analysis Results 2030 Build Condition

				AM Peak Hour (8:00AM - 9:00AM)	:00AM - 9:00AM)					PM Peak Hour (5:00PM - 6:00PM	:00PM - 6:00PM)	
Intersection	Lane Group	v/c Ratio	Delay (sec)	v/c Ratio Delay (sec) Level of Service	Soth %tile	95th %tile	Lane Group	v/c Ratio	Delay (sec)	u/c Ratio Delay (sec) Level of Service	50th %tile Oueue Lenoth (ft)	95th %tile
	EB-TR	1.13	104.3	н	~506	#605	EB-TR	0.53	34.2	υ	130	169
	WB-T	0.64	42.5	О	205	242	WB-T	1.23	135.0	Н	~497	#577
144, 04-2-4 (10)	WB-R	0.61	34.8	0	151	255	WB-R	0.40	5.1	A	13	m26
9 Independence Account CW	NB-T	0.97	41.2	D	268	#704	NB-T	0.74	28.4	Ü	338	397
or independence Avenue sw	NB-R	98'0	11.5	В	43	86	NB-R	0.56	19.9	ω	145	242
paziiniisis	1-8S	1.07	119.9	F	-,86	#225	SB-L	09'0	30.4	Ü	65	139
	SB-TR	0.19	10.2	В	56	74	SB-TR	0.55	12.8	ω	221	261
	Intersection		57.3	Е	1	-	Intersection	Ð	50.4	٥		п
	EB-LTR	1.04	34.0	ц	~440	m375	EB-LTR	0.48	25.7	Ü	165	236
	WB-L	0.77	53.3	D	87	#212	WB-L	0.93	48.5	٥	190	#444
	WB-LTR	0.53	10.5	В	71	84	WB-LTR	0.85	12.6	В	124	#308
12th Street SW	NB-L	0.57	19.2	В	145	227	NB-L	0.33	21.3	J	78	135
& Independence Avenue SW	NB-TR	65'0	19.5	В	156	242	NB-TR	09'0	29.2	J	158	245
Signalized	NB-R	0.25	1.4	Ą	0	1	NB-R	0.40	3.7	A	41	94
	SB-LTR	60'0	0.4	Ą	0	0	SB-LTR	0.12	0.5	¥	0	0
	Loading-LTR	0.11	57.2	Е	3	15	Loading-LTR	0.11	56.8	E	3	15
	Intersection		25.0	0	ŭ	Ę	Intersection	5	19.9	В	ŧ:	
	EB-TR	0.61	3.2	A	22	m25	EB-TR	0.49	11.7	В	237	89
L'Enfant Plaza	WB-LT	0.42	9.5	¥	95	113	WB-LT	0.74	16.4	В	227	258
& Independence Avenue SW	NB-L	0.16	35.0	D	38	76	NB-L	99.0	46.2	O	184	279
Signalized	NB-R	0.35	20.6	С	65	121	NB-R	0.12	8.0	A	4	34
	Intersection		7.0	A	*		Intersection	•	16.6	В		•

v/c ratio = volume/capacity ratio Source: Synchro 9



SI South Campus Master Plan - Loading Dock Analysis

	٠	→	•	1	•	•	1	†	-	-	↓	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		ተተጉ			^	7		^ ^	۴	ሻ	^	
Traffic Volume (vph)	5	1255	39	5	590	241	0	1870	159	118	404	14
Future Volume (vph)	5	1255	39	5	590	241	0	1870	159	118	404	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	10	10	10	11	11	12	10	10	10
Satd. Flow (prot)	0	4967	0	0	4764	1422	0	4964	1524	1452	4571	0
FIt Permitted		0.937			0.894					0.075		
Satd. Flow (perm)	0	4654	0	0	4259	1366	0	4964	1081	115	4571	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				123			89		8	
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		487			1110			612			436	
Travel Time (s)		9.5			21.6			13.9			9.9	
Confl. Peds. (#/hr)	23		42	42		23	24		215	215		24
Confl. Bikes (#hr)			11			4			1			4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	100%	0%	0%	80%	1%	6%	0%	1%	6%	16%	5%	12%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1411	0	0	646	262	0	2033	173	128	454	0
Turn Type	Perm	NA		Perm	NA	Perm		NA	Perm	custom	NA	
Protected Phases		4			8			2		9	69	
Permitted Phases	4			8		8			2	6		
Minimum Split (s)	40.0	40.0		40.0	40.0	40.0		58.0	58.0	12.0		
Total Split (s)	40.0	40.0		40.0	40.0	40.0		58.0	58.0	12.0		
Total Split (%)	36.4%	36.4%		36.4%	36.4%	36.4%		52.7%	52.7%	10.9%		
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0		
All-Red Time (s)	2.5	2.5		2.5	2.5	2.5		2.5	2.5	1.5		
Lost Time Adjust (s)		-1.5			-1.5	-1.5		-1.5	-1.5	-1.0		
Total Lost Time (s)		5.0			5.0	5.0		5.0	5.0	4.5		
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)		35.0			35.0	35.0		53.0	53.0	61.0	65.5	
Actuated g/C Ratio		0.32			0.32	0.32		0.48	0.48	0.55	0.60	
v/c Ratio		0.95			0.48	0.51		0.85	0.31	0.83	0.17	
Control Delay		51.4			41.1	30.9		29.4	9.9	61.6	10.0	
Queue Delay		0.0			0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay		51.4			41.1	30.9		29.4	9.9	61.6	10.0	
LOS		D			D	С		С	Α	Е	Α	
Approach Delay		51.4			38.2			27.9	0.5%		21.3	
Approach LOS		D			D			С			С	
Intersection Summary												

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 88 (80%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 110
Control Type: Pretimed
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 35.4 Intersection Signal Delay: 35.4

Intersection LOS: D

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Lane Group	ø6	
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Ideal Flow (vphpl)		
Lane Width (ft)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Confl. Bikes (#hr)		
Peak Hour Factor		
Heavy Vehicles (%)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	6	
Permitted Phases		
Minimum Split (s)	58.0	
Total Split (s)	58.0	
Total Split (%)	53%	
Yellow Time (s)	3.5	
All-Red Time (s)	2.5	
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Intersection Summary		
intersection Summary		

1: 14th St SW & Independence Ave SW SI South Campus Master Plan - Loading Dock Analysis

2015 Existing AMPeak Hour

ntersection Capacity Utilization 99.0%	ICU Level of Service F	
Analysis Period (min) 15		
Splits and Phases: 1: 14th St SW & Independence A	ve SW	
¶ø2 (R)	- ∞4	№ ø9
58 s	40 s	12 s
ø6 (R)	₩ ø8	W W
58 s	40 s	

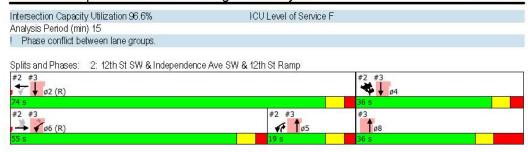
	>	•	-	•	1	•	~_	•	1	ኘ	†	1
Lane Group	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR
Lane Configurations			नााः		ሻ	444				Ä	4	7
Traffic Volume (vph)	1	47	1350	134	142	663	1	129	164	2	200	110
Future Volume (vph)	1	47	1350	134	142	663	1	129	164	2	200	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	11	11	11	11
Satd. Flow (prot)	0	0	5937	0	1407	3883	0	0	0	1695	1663	1440
Flt Permitted			0.854		0.085	0.901				0.950		
Satd. Flow (perm)	0	0	5056	0	126	3502	0	0	0	1101	1663	1440
Right Turn on Red			0000	Yes	120	OOOL		Yes		1101	1000	Yes
Satd. Flow (RTOR)			26	100		21		100			3	35
Link Speed (mph)			35			35					30	- 00
Link Distance (ft)			1110			590					162	
Travel Time (s)			21.6			11.5					3.7	
Confl. Peds. (#/hr)	116	116	21.0	2	2	11.0	116	116	417		0.7	140
Confl. Bikes (#/hr)	110	110		16	2		10	10	417			3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
	1%	1%	1%	1%	3%	3%	3%	3%	3%	0.92	3%	3%
Heavy Vehicles (%)	170	170	170	170	10%	3%	3%	3%	3%	U%	3%	200
Shared Lane Traffic (%)	^	^	400E	0	1070000	077	0	0	0	400	220	10%
Lane Group Flow (vph)	0	0	1665	U	139	877	U	U		180	229	108
Turn Type	Perm	Perm	NA		pm+pt	NA			Split	Split	NA	pt+ov
Protected Phases			6		5	2			4	4!	4!	4 5!
Permitted Phases	6	6			2							
Minimum Split (s)	42.0	42.0	42.0		19.0	61.0			36.0	36.0	36.0	
Total Split (s)	55.0	55.0	55.0		19.0	74.0			36.0	36.0	36.0	
Total Split (%)	50.0%	50.0%	50.0%		17.3%	67.3%			32.7%	32.7%	32.7%	
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0			4.0	4.0	4.0	
All-Red Time (s)	2.5	2.5	2.5		2.5	2.5			3.0	3.0	3.0	
Lost Time Adjust (s)			-1.5		-1.5	-1.5				-1.5	-1.5	
Total Lost Time (s)			5.0		5.0	5.0				5.5	5.5	
Lead/Lag	Lead	Lead	Lead		Lag							
Lead-Lag Optimize?	Yes	Yes	Yes		Yes							
Act Effct Green (s)			50.0		69.0	69.0				30.5	30.5	49.5
Actuated g/C Ratio			0.45		0.63	0.63				0.28	0.28	0.45
v/c Ratio			0.72		0.57	0.39				0.38	0.49	0.16
Control Delay			6.8		35.0	5.1				14.0	16.4	0.5
Queue Delay			0.0		0.0	0.0				2.0	1.8	0.7
Total Delay			6.8		35.0	5.1				16.0	18.3	1.3
LOS			Α		D	A				В	В	A
Approach Delay			6.8			9.2					13.9	
Approach LOS			Α			Α					В	
Intersection Summary												
Area Type:	Other											
Cycle Length: 110												
Actuated Cycle Length: 11	0											
Offset: 57 (52%), Reference	ed to phase	2:WBTL	and 6:EE	TL, Star	of Green	1						
Natural Cycle: 100												
Control Type: Pretimed												
Maximum v/c Ratio: 0.72												
Intersection Signal Delay: 8	3.6			I	ntersectio	n LOS: A						

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Lane Group	1	7	4	
	SEL	SER	SER2	ø8
Lane Configurations	M	OLIV	JEINE	50
Traffic Volume (vph)	10	13	8	
Future Volume (vph)	10	13	8	
Ideal Flow (vphpl)	1900	1900	1900	
Lane Width (ft)	14	14	14	
Satd. Flow (prot)	1299	0	0	
FIt Permitted	0.984			
Satd. Flow (perm)	1222	0	0	
Right Turn on Red			Yes	
Satd. Flow (RTOR)	99			
Link Speed (mph)	30			
Link Distance (ft)	395			
Travel Time (s)	9.0			
Confl. Peds. (#/hr)	140		417	
Confl. Bikes (#/hr)	110	30	30	
Peak Hour Factor	0.92	0.92	0.92	
Heavy Vehicles (%)	0.92	10%	0.92	
Shared Lane Traffic (%)	070	1070	070	
	34	0	0	
Lane Group Flow (vph)	7.1	U	U	
Turn Type	Prot			
Protected Phases	4!			8
Permitted Phases				
Minimum Split (s)	36.0			36.0
Total Split (s)	36.0			36.0
Total Split (%)	32.7%			33%
Yellow Time (s)	4.0			4.0
All-Red Time (s)	3.0			6.5
Lost Time Adjust (s)	-1.5			
Total Lost Time (s)	5.5			
Lead/Lag	0.0			
Lead-Lag Optimize?				
Act Effet Green (s)	30.5			
Actuated g/C Ratio	0.28			
v/c Ratio	0.08			
Control Delay	0.4			
	0.0			
Queue Delay	0.4			
Total Delay				
Total Delay LOS	Α			
Total Delay	0.4			
Total Delay LOS				

2: 12th St SW & Independence Ave SW & 12th St Ramp SI South Campus Master Plan - Loading Dock Analysis

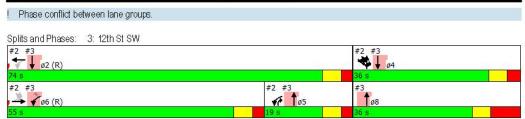
2015 Existing AMPeak Hour



3: 12th St SW SI South Campus Master Plan - Loading Dock Analysis

	•	•	†	1	-	ţ					
ane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø2	04	ø5	ø8	
ane Configurations	ሻ	7	ተተኩ			^					
Fraffic Volume (vph)	0	0	476	0	0	289					
Future Volume (vph)	0	0	476	0	0	289					
deal Flow (vphpl)	1900	1900	1900	1900	1900	1900					
ane Width (ft)	10	11	11	11	10	10					
Satd. Flow (prot)	1773	1837	4868	0	0	3271					
Flt Permitted											
Satd. Flow (perm)	1773	1837	4868	0	0	3271					
Right Turn on Red		Yes		Yes							
Satd. Flow (RTOR)											
ink Speed (mph)	20		30			30					
ink Distance (ft)	188		380			162					
Fravel Time (s)	6.4		8.6			3.7					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92					
Heavy Vehides (%)	0%	0%	3%	0%	0%	3%					
Shared Lane Traffic (%)											
ane Group Flow (vph)	0	0	517	0	0	314					
Furn Type	Prot	Perm	NA			NA					
Protected Phases	6!		85			2 4!	2	4	5	8	
Permitted Phases		6									
Minimum Split (s)	42.0	42.0					61.0	36.0	19.0	36.0	
otal Split (s)	55.0	55.0					74.0	36.0	19.0	36.0	
Fotal Split (%)	50.0%	50.0%					67%	33%	17%	33%	
rellow Time (s)	4.0	4.0					4.0	4.0	4.0	4.0	
All-Red Time (s)	2.5	2.5					2.5	3.0	2.5	6.5	
ost Time Adjust (s)	-1.5	-1.5									
Total Lost Time (s)	5.0	5.0									
_ead/Lag	Lead	Lead							Lag		
_ead-Lag Optimize?	Yes	Yes							Yes		
Act Effct Green (s)			46.0			110.0					
Actuated g/C Ratio			0.42			1.00					
//c Ratio			0.25			0.10					
Control Delay			21.3			0.0					
Queue Delay			0.0			0.0					
Total Delay			21.3			0.0					
.OS			С			Α					
Approach Delay			21.3			0.0					
Approach LOS			С			Α					
ntoreaction Cummany											
ntersection Summary Area Type:	Other										
GREAT CONTRACTOR CONTR	Otner										
Cycle Length: 110											
Actuated Cycle Length: 110		2-M/DTI	and E-ED	TI Ctort	of Groom						
Offset: 57 (52%), Reference	eu to phase	Z.VVBIL	and o.EB	IL, Start	or Green						
Natural Cycle: 100											
Control Type: Pretimed											
Maximum v/c Ratio: 0.72	2.2			1	lana a - M	100.0					
ntersection Signal Delay: 1		0.			tersection						
ntersection Capacity Utiliza Analysis Period (min) 15	ition 16.7%)		IC	U Level (of Service	Α				

2015 Existing AM Peak Hour SI South Campus Master Plan - Loading Dock Analysis



	→	•	1	•	1	-		
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	ø3	
Lane Configurations	1117-		100000000000000000000000000000000000000	ना	*	7	100000	
Traffic Volume (vph)	1385	85	66	880	56	152		
Future Volume (vph)	1385	85	66	880	56	152		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Lane Width (ft)	10	10	10	10	12	12		
Storage Length (ft)		0	0		0	210		
Storage Lanes		0	0		1	1		
Taper Length (ft)			25		25			
Satd. Flow (prot)	5940	0	0	5905	1805	1615		
Flt Permitted				0.758	0.950			
Satd. Flow (perm)	5940	0	0	4487	1673	1441		
Right Turn on Red		Yes	Ť	1101	1010	Yes		
Satd. Flow (RTOR)	17					58		
Link Speed (mph)	35			35	20			
Link Distance (ft)	590			1087	758			
Travel Time (s)	11.5			21.2	25.8			
Confl. Peds. (#/hr)	11.0	27	27	21.2	53	69		
Confl. Bikes (#/hr)		9	21		00	5		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96		
Heavy Vehicles (%)	1%	1%	3%	3%	0%	0%		
Shared Lane Traffic (%)	170	1 70	070	070	0,0	0,0		
Lane Group Flow (vph)	1532	0	0	986	58	158		
Turn Type	NA		pm+pt	NA	Prot	pm+ov		
Protected Phases	2		9	6	4	9	3	
Permitted Phases	_		6	•		4	•	
Minimum Split (s)	61.5		14.5	61.5	30.0	14.5	4.0	
Total Split (s)	61.5		14.5	61.5	30.0	14.5	4.0	
Total Split (%)	55.9%		13.2%	55.9%	27.3%	13.2%	4%	
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0	2.0	
All-Red Time (s)	2.5		1.0	2.5	1.5	1.0	0.0	
Lost Time Adjust (s)	-1.5		1.0	-1.5	-1.0	-1.0	0.0	
Total Lost Time (s)	5.0			5.0	4.5	4.0		
Lead/Lag	5.0			0.0	Lag	4.0	Lead	
Lead-Lag Optimize?					Yes		Yes	
Act Effct Green (s)	56.5			66.0	25.5	36.5	169	
	0.51			0.60	0.23	0.33		
Actuated g/C Ratio v/c Ratio	0.50				0.23	0.33		
Control Delay	3.4			0.35	34.7	16.9		
	0.0			0.0	0.0	0.0		
Queue Delay	3.4			8.9	34.7	16.9		
Total Delay								
LOS Approach Delevi	Α			A	C 24.7	В		
Approach Delay	3.4			8.9	21.7			
Approach LOS	Α			Α	С			

Intersection Summary

Area Type: Cycle Length: 110

Actuated Cycle Length: 110
Offset: 67 (61%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 110

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4: L'Enfant Plaza & Independence Ave SW SI South Campus Master Plan - Loading Dock Analysis

2015 Existing AMPeak Hour

ntersection Signal Delay, 6.8	Intersection LOS: A	
ntersection Capacity Utilization 67.5%	ICU Level of Service C	
Include Harad (min) 16		
Arialysis Ferrou (IIIIII) 15		
Analysis Period (min) 15 Splits and Phases: 4: L'Enfant Plaza & Independe	ence Ave SW	
	ence Ave SW	₽ ₽09

SI South Campus Master Plan - Loading Dock Analysis

	٠	→	*	•	•	•	1	†	-	-	↓	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
Lane Configurations		ተተጉ			^ ^	7		ተተተ	۴	ሻ	ተተኩ	
Traffic Volume (vph)	5	433	33	18	1181	132	0	1335	325	130	1323	19
Future Volume (vph)	5	433	33	18	1181	132	0	1335	325	130	1323	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	10	10	10	11	11	12	10	10	10
Satd. Flow (prot)	0	4741	0	0	4644	1311	0	4964	1583	1589	4735	0
Flt Permitted		0.898			0.925					0.105		
Satd. Flow (perm)	0	4262	0	0	4293	1209	0	4964	1481	175	4735	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11				139			151		2	
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		487			1110			612			436	
Travel Time (s)		9.5			21.6			13.9			9.9	
Confl. Peds. (#/hr)	46		194	194		46	27		40	40		27
Confl. Bikes (#/hr)			1			23			2			2
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
Heavy Vehicles (%)	80%	2%	3%	79%	3%	15%	0%	1%	2%	6%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	496	0	0	1262	139	0	1405	342	137	1413	0
Turn Type	Perm	NA		Perm	NA	Perm		NA	Perm	custom	NA	
Protected Phases		4			8			2		9	69	
Permitted Phases	4			8		8			2	6		
Minimum Split (s)	37.0	37.0		37.0	37.0	37.0		53.0	53.0	20.0		
Total Split (s)	37.0	37.0		37.0	37.0	37.0		53.0	53.0	20.0		
Total Split (%)	33.6%	33.6%		33.6%	33.6%	33.6%		48.2%	48.2%	18.2%		
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0		
All-Red Time (s)	2.5	2.5		2.5	2.5	2.5		2.5	2.5	1.5		
Lost Time Adjust (s)		-1.5			-1.5	-1.5		-1.5	-1.5	-1.0		
Total Lost Time (s)		5.0			5.0	5.0		5.0	5.0	4.5		
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)		32.0			32.0	32.0		48.0	48.0	64.0	68.5	
Actuated g/C Ratio		0.29			0.29	0.29		0.44	0.44	0.58	0.62	
v/c Ratio		0.40			1.01	0.31		0.65	0.47	0.46	0.48	
Control Delay		31.7			54.4	8.1		26.1	14.1	18.2	11.8	
Queue Delay		0.0			0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay		31.7			54.4	8.1		26.1	14.1	18.2	11.8	
LOS		С			D	A		С	В	В	В	
Approach Delay		31.7			49.8			23.8			12.4	
Approach LOS		С			D			С			В	
Intersection Summary												

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 16 (15%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 110

Control Type: Pretimed Maximum v/c Ratio: 1.01 Intersection Signal Delay: 28.2

Intersection LOS: C

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Lane Group	ø6		
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Satd. Flow (prot)			
FIt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Confl. Bikes (#hr)			
Peak Hour Factor			
Heavy Vehides (%)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	6		
Permitted Phases			
Minimum Split (s)	53.0		
Total Split (s)	53.0		
Total Split (%)	48%		
Yellow Time (s)	3.5		
All-Red Time (s)	2.5		
Lost Time Adjust (s)	770		
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Intersection Summary			

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1: 14th St SW & Independence Ave SW SI South Campus Master Plan - Loading Dock Analysis

2015 Existing PMPeak Hour

Intersection Capacity Utilization 88.3%	ICU Level of Service E	
Analysis Period (min) 15		
Splits and Phases: 1: 14th St SW & Independence	Ave SW	
↑ ø2 (R)	♣ 04	№ ø9
53 s	37 s	20 s
ø6 (R)	₩ ø8	
53 s	37 s	

	-	•	1	•	*_	•	1	ኘ	†	-	\	>
Lane Group	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR	SEL	SER
Lane Configurations	41114		ሻ	444				ă	1	7	M	
Traffic Volume (vph)	866	22	335	1230	2	163	93	1	208	244	12	20
Future Volume (vph)	866	22	335	1230	2	163	93	1	208	244	12	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	11	11	11	11	14	14
Satd. Flow (prot)	5896	0	1393	4060	0	0	0	1678	1568	1426	1281	0
Flt Permitted			0.225	0.855				0.950			0.985	
Satd. Flow (perm)	5896	0	330	3478	0	0	0	1548	1568	1426	1159	0
Right Turn on Red		Yes				Yes				Yes		
Satd. Flow (RTOR)	5			1					8	35	99	
Link Speed (mph)	35			35					30		30	
Link Distance (ft)	1110			590					162		395	
Travel Time (s)	21.6			11.5					3.7		9.0	
Confl. Peds. (#/hr)					51	51	59			285	285	
Confl. Bikes (#/hr)		16			15	15				4		7
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
Heavy Vehicles (%)	3%	3%	4%	4%	0%	4%	4%	0%	4%	4%	40%	40%
Shared Lane Traffic (%)	• • • • • • • • • • • • • • • • • • • •		17%	.,,		.,,				14%		1070
Lane Group Flow (vph)	935	0	293	1529	0	0	0	99	255	221	43	0
Turn Type	NA		pm+pt	NA			Split	Split	NA	pt+ov	Prot	_
Protected Phases	6		5	2			4	41	4!	4 5!	4!	
Permitted Phases	-0.		2				20,40	34.	55.80	10.	300	
Minimum Split (s)	42.0		30.0	72.0			38.0	38.0	38.0		38.0	
Total Split (s)	42.0		30.0	72.0			38.0	38.0	38.0		38.0	
Total Split (%)	38.2%		27.3%	65.5%			34.5%	34.5%	34.5%		34.5%	
Yellow Time (s)	4.0		4.0	4.0			4.0	4.0	4.0		4.0	
All-Red Time (s)	2.5		2.5	2.5			3.0	3.0	3.0		3.0	
Lost Time Adjust (s)	-1.5		-1.5	-1.5			0.0	-1.5	-1.5		-1.5	
Total Lost Time (s)	5.0		5.0	5.0				5.5	5.5		5.5	
Lead/Lag	Lead		Lag	0.0				0.0	0.0		0.0	
Lead-Lag Optimize?	Yes		Yes									
Act Effet Green (s)	37.0		67.0	67.0				32.5	32.5	62.5	32.5	
Actuated g/C Ratio	0.34		0.61	0.61				0.30	0.30	0.57	0.30	
v/c Ratio	0.47		0.66	0.68				0.20	0.54	0.27	0.10	
Control Delay	30.3		23.7	11.6				19.0	25.1	2.0	0.10	
Queue Delay	0.0		0.0	0.0				2.9	5.4	0.6	0.0	
Total Delay	30.3		23.7	11.6				21.9	30.5	2.6	0.4	
LOS	C		C	В.				C	C	Α.	Α.4	
Approach Delay	30.3		U	13.6				C	18.3		0.4	
Approach LOS	C			В					В		Α.4	
Approach LOS	C			Ь					Ь		^	
Intersection Summary												
Area Type:	Other											
Cycle Length: 110												
Actuated Cycle Length: 11					The same of the same of							
Offset: 4 (4%), Referenced	to phase 2:	WBTL a	nd 6:EBT	L, Start of	Green							
Natural Cycle: 110												
Control Type: Pretimed												
Maximum v/c Ratio: 0.68												
Intersection Signal Delay: 1	18.8			In	itersectio	n LOS B						

Intersection LOS: B

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Intersection Signal Delay: 18.8



	*2	
Lane Group	SER2	ø8
Lane Configurations		
Traffic Volume (vph)	9	
Future Volume (vph)	9	
Ideal Flow (vphpl)	1900	
Lane Width (ft)	14	
Satd. Flow (prot)	0	
Flt Permitted		
Satd. Flow (perm)	0	
Right Turn on Red	Yes	
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)	59	
Confl. Bikes (#/hr)	7	
Peak Hour Factor	0.95	
Heavy Vehicles (%)	0%	
Shared Lane Traffic (%)		
Lane Group Flow (vph)	0	
Turn Type		
Protected Phases		8
Permitted Phases		
Minimum Split (s)		38.0
Total Split (s)		38.0
Total Split (%)		35%
Yellow Time (s)		4.0
All-Red Time (s)		6.5
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Intersection Summary		

2: 12th St SW & Independence Ave SW & 12th St Ramp SI South Campus Master Plan - Loading Dock Analysis

2015 Existing PMPeak Hour

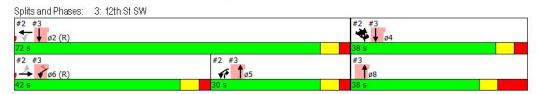


3: 12th St SW SI South Campus Master Plan - Loading Dock Analysis

	•	•	†	-	1	ţ					
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø2	04	ø5	ø8	
Lane Configurations	ሻ	7	11			11					
Traffic Volume (vph)	0	0	546	0	0	377					
Future Volume (vph)	0	0	546	0	0	377					
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900					
Lane Width (ft)	10	11	11	11	10	10					
Satd. Flow (prot)	1739	1801	4916	0	0	3303					
Flt Permitted											
Satd. Flow (perm)	1739	1801	4916	0	0	3303					
Right Turn on Red		Yes		Yes							
Satd. Flow (RTOR)											
Link Speed (mph)	20		30			30					
ink Distance (ft)	188		380			162					
Travel Time (s)	6.4		8.6			3.7					
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95					
Shared Lane Traffic (%)	0.00	0.00	0.00	0.00	0.00	0.00					
Lane Group Flow (vph)	0	0	575	0	0	397					
Turn Type	Prot	Perm	NA			NA					
Protected Phases	6!	i Oilli	58			2 4!	2	4	5	8	
Permitted Phases	J:	6	0.0			4 71	-	7	- 3		
Minimum Split (s)	42.0	42.0					72.0	38.0	30.0	38.0	
Fotal Split (s)	42.0	42.0					72.0	38.0	30.0	38.0	
Fotal Split (%)	38.2%	38.2%					65%	35%	27%	35%	
rellow Time (s)	4.0	4.0					4.0	4.0	4.0	4.0	
All-Red Time (s)	2.5	2.5					2.5	3.0	2.5	6.5	
	-1.5	-1.5					2.5	3.0	2.0	0.5	
Lost Time Adjust (s)	5.0	5.0									
Total Lost Time (s)									Log		
_ead/Lag	Lead Yes	Lead Yes							Lag		
Lead-Lag Optimize?	res	1 65	00.0			440.0			Yes		
Act Effet Green (s)			63.0			110.0					
Actuated g/C Ratio			0.57			1.00					
/c Ratio			0.20			0.12					
Control Delay			11.6			0.1					
Queue Delay			0.0			0.0					
Total Delay			11.6			0.1					
LOS			В			A					
Approach Delay			11.6			0.1					
Approach LOS			В			Α					
ntersection Summary											
Area Type:	Other										
Cycle Length: 110											
Actuated Cycle Length: 110)										
Offset: 4 (4%), Referenced Natural Cycle: 110	to phase 2	WBTL an	d 6:EBTL	, Start of	Green						
Control Type: Pretimed											
Maximum v/c Ratio: 0.68											
ntersection Signal Delay: 6	6.9			In	tersection	LOS: A					
ntersection Capacity Utiliza)				of Service	Α				
Analysis Period (min) 15											
Phase conflict between I	lane groups										

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2015 Existing PMPeak Hour



	-	•	1	•	1	-	
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	ø3
Lane Configurations	1117>			ना	ሻ	7	Mark. N
Traffic Volume (vph)	1067	55	50	1504	226	55	
Future Volume (vph)	1067	55	50	1504	226	55	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	10	10	10	10	12	12	
Storage Length (ft)		0	0		0	210	
Storage Lanes		0	0		1	1	
Taper Length (ft)			25		25		
Satd. Flow (prot)	5862	0	0	5854	1805	1615	
Flt Permitted				0.827	0.950		
Satd. Flow (perm)	5862	0	0	4850	1415	1580	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)	13					61	
Link Speed (mph)	35			35	20		
Link Distance (ft)	590			1087	758		
Travel Time (s)	11.5			21.2	25.8		
Confl. Peds. (#/hr)		10	10		157	7	
Confl. Bikes (#hr)		13					
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Heavy Vehides (%)	3%	3%	4%	4%	0%	0%	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	1247	0	0	1727	251	61	
Turn Type	NA		pm+pt	NA	Prot	pm+ov	
Protected Phases	2		9	6	4	9	3
Permitted Phases			6			4	
Minimum Split (s)	58.5		13.5	58.5	30.0	13.5	4.0
Total Split (s)	60.5		15.5	60.5	30.0	15.5	4.0
Total Split (%)	55.0%		14.1%	55.0%	27.3%	14.1%	4%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	2.5		1.0	2.5	1.5	1.0	0.0
Lost Time Adjust (s)	-1.5			-1.5	-1.0	-1.0	
Total Lost Time (s)	5.0			5.0	4.5	4.0	
Lead/Lag					Lag		Lead
Lead-Lag Optimize?					Yes		Yes
Act Effct Green (s)	55.5			66.0	25.5	37.5	
Actuated g/C Ratio	0.50			0.60	0.23	0.34	
v/c Ratio	0.42			0.57	0.60	0.10	
Control Delay	20.9			12.0	44.6	6.1	
Queue Delay	0.0			0.0	0.0	0.0	
Total Delay	20.9			12.0	44.6	6.1	
LOS	С			В	D	Α	
Approach Delay	20.9			12.0	37.1		
Approach LOS	С			В	D		

Intersection Summary

Area Type: Cycle Length: 110

Actuated Cycle Length: 110
Offset: 38 (35%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 110

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4: L'Enfant Plaza & Independence Ave SW SI South Campus Master Plan - Loading Dock Analysis

2015 Existing PMPeak Hour

evel of Service C	
	ction LOS: B vvel of Service C

	٠	→	•	1	•	•	4	†	-	-	↓	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		ተተኩ			^	7		† ††	7	7	**	
Traffic Volume (vph)	6	1491	44	6	702	284	0	2139	182	152	462	16
Future Volume (vph)	6	1491	44	6	702	284	0	2139	182	152	462	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	10	10	10	11	11	12	10	10	10
Satd. Flow (prot)	0	4961	0	0	4759	1422	0	4964	1524	1452	4570	0
Flt Permitted		0.936			0.806					0.075	10.0	
Satd. Flow (perm)	0	4644	0	0	3836	1339	0	4964	1050	115	4570	0
Right Turn on Red		1011	Yes		0000	Yes	•	1001	Yes	110	1010	Yes
Satd. Flow (RTOR)		4	100			122			89		8	
Link Speed (mph)		35			35	1,444		30			30	
Link Distance (ft)		487			1110			612			436	
Travel Time (s)		9.5			21.6			13.9			9.9	
Confl. Peds. (#/hr)	40	3.0	58	58	21.0	40	27	10.0	246	246	0.0	27
Confl. Bikes (#hr)	40		14	00		5	21		1	240		5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
			55,500									
Heavy Vehicles (%)	100%	0%	0%	80%	1%	6%	0%	1%	6%	16%	5%	12%
Shared Lane Traffic (%)		4070			770	000		0005	400	405	540	
Lane Group Flow (vph)	0	1676	0	0	770	309	0	2325	198	165	519	0
Turn Type	Perm	NA		Perm	NA	Perm		NA	Perm	custom	NA	
Protected Phases		4			8			2	-	9	69	
Permitted Phases	4			8		8			2	6		
Minimum Split (s)	40.0	40.0		40.0	40.0	40.0		58.0	58.0	12.0		
Total Split (s)	40.0	40.0		40.0	40.0	40.0		58.0	58.0	12.0		
Total Split (%)	36.4%	36.4%		36.4%	36.4%	36.4%		52.7%	52.7%	10.9%		
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0		
All-Red Time (s)	2.5	2.5		2.5	2.5	2.5		2.5	2.5	1.5		
Lost Time Adjust (s)		-1.5			-1.5	-1.5		-1.5	-1.5	-1.0		
Total Lost Time (s)		5.0			5.0	5.0		5.0	5.0	4.5		
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)		35.0			35.0	35.0		53.0	53.0	61.0	65.5	
Actuated g/C Ratio		0.32			0.32	0.32		0.48	0.48	0.55	0.60	
v/c Ratio		1.13			0.63	0.61		0.97	0.36	1.07	0.19	
Control Delay		104.0			43.5	34.4		41.2	11.5	119.9	10.2	
Queue Delay		0.0			0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay		104.0			43.5	34.4		41.2	11.5	119.9	10.2	
LOS		F			D	С		D	В	F	В	
Approach Delay		104.0			40.9			38.9			36.7	
Approach LOS		F			D			D			D	
Intersection Summary												
Area Type:	Other											
Cycle Length: 110	- Curior											
Actuated Cycle Length: 11	0											
Offset: 88 (80%), Reference		2 NRT a	nd 6:SRT	1 Start o	f Green							
Natural Cycle: 120	ou to pilast		0.001	c, otali C	, Groon							
Control Type: Pretimed												
Maximum v/c Ratio: 1.13												
Intersection Signal Delay:	57.3			li li	ntersection	n LOS: E						
intorosotion orginal Dady.	01.0				no sectio	11 LOO. L						

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Lane Configurations Traffic Volume (vph)		
Traffic Volume (vnh)		
rianic volumo (vpm)		
Future Volume (vph)		
deal Flow (vphpl)		
Lane Width (ft)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Confl. Bikes (#hr)		
Peak Hour Factor		
Heavy Vehicles (%)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	6	
Permitted Phases		
Minimum Split (s)	58.0	
Total Split (s)	58.0	
Total Split (%)	53%	
Yellow Time (s)	3.5	
All-Red Time (s)	2.5	
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
ntersection Summary		

1: 14th St SW & Independence Ave SW SI South Campus Master Plan - Loading Dock Analysis

2030 No Build AM Peak Hour

ntersection Capacity Utilization 108.9%	ICU Level of Service G	
Analysis Period (min) 15		
Splits and Phases: 1: 14th St SW & Inde	pendence Ave SW	
∮ø2 (R)	<u></u>	№ ø9
58 s	40 s	12 s
ø6 (R)	₩ ø8	W W
58 s	40 s	

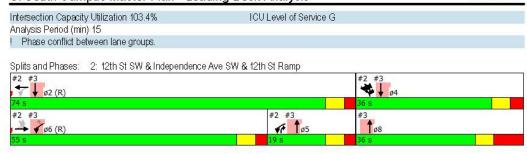
	>	•	-	•	1	•	*_	•	1	ኘ	†	1
Lane Group	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR
Lane Configurations			नााः		7	444				Ä	7	7
Traffic Volume (vph)	1	54	1608	162	173	771	2	148	212	2	229	156
Future Volume (vph)	1	54	1608	162	173	771	2	148	212	2	229	156
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	11	11	11	11
Satd. Flow (prot)	0	0	5931	0	1407	3851	0	0	0	1694	1653	1440
Flt Permitted			0.835		0.073	0.876				0.950		
Satd. Flow (perm)	0	0	4945	0	108	3377	0	0	0	1072	1653	1440
Right Turn on Red	-			Yes				Yes				Yes
Satd. Flow (RTOR)			26			10					3	35
Link Speed (mph)			35			35					30	10.0
Link Distance (ft)			1110			590					162	
Travel Time (s)			21.6			11.5					3.7	
Confl. Peds. (#/hr)	141	141	21.0	9	9	1,1.0	141	141	482		0.1	166
Confl. Bikes (#hr)		1.11		Ü	Ÿ		12	12	102			3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	1%	1%	3%	3%	3%	3%	3%	0%	3%	3%
Shared Lane Traffic (%)	170	170	170	170	10%	0,0	070	070	070	070	070	10%
Lane Group Flow (vph)	0	0	1984	0	169	1020	0	0	0	232	266	153
Turn Type	Perm	Perm	NA		pm+pt	NA			Split	Split	NA	pt+ov
Protected Phases	1 OIIII	1 01111	6		5	2			4	4!	41	4 5!
Permitted Phases	6	6	Ü		2						780.	10.
Minimum Split (s)	42.0	42.0	42.0		19.0	61.0			36.0	36.0	36.0	
Total Split (s)	55.0	55.0	55.0		19.0	74.0			36.0	36.0	36.0	
Total Split (%)	50.0%	50.0%	50.0%		17.3%	67.3%			32.7%	32.7%	32.7%	
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0			4.0	4.0	4.0	
All-Red Time (s)	2.5	2.5	2.5		2.5	2.5			3.0	3.0	3.0	
Lost Time Adjust (s)	2.0	2.0	-1.5		-1.5	-1.5			0.0	-1.5	-1.5	
Total Lost Time (s)			5.0		5.0	5.0				5.5	5.5	
Lead/Lag	Lead	Lead	Lead		Lag	.0.0				0.0	0.0	
Lead-Lag Optimize?	Yes	Yes	Yes		Yes							
Act Effet Green (s)	103	100	50.0		69.0	69.0				30.5	30.5	49.5
Actuated g/C Ratio			0.45		0.63	0.63				0.28	0.28	0.45
v/c Ratio			0.88		0.73	0.47				0.49	0.58	0.23
Control Delay			9.3		47.3	5.7				15.8	18.1	0.20
Queue Delay			0.0		0.0	0.0				1.7	1.4	0.6
Total Delay			9.3		47.3	5.7				17.5	19.5	1.4
LOS			Α.		77.5 D	Α.				В.	В.	Α.
Approach Delay			9.3		U	11.7				Ь	14.5	
Approach LOS			Α.			В					14.5 B	
						Ь					ь	
Intersection Summary	011											
Area Type:	Other											
Cycle Length: 110	^											
Actuated Cycle Length: 11				T. 0.								
Offset: 57 (52%), Reference	ced to phase	2:WBTL	and 6:EE	IL, Starl	of Green	1						
Natural Cycle: 100												
Control Type: Pretimed												
Maximum v/c Ratio: 0.88	40.0			.4		100 5						
Intersection Signal Delay:	10.8			li li	ntersectio	n LOS: B						

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	\	>	4	
Lane Group	SEL	SER	SER2	ø8
Lane Configurations	M		Section 18 had	
Traffic Volume (vph)	12	15	9	
Future Volume (vph)	12	15	9	
Ideal Flow (vphpl)	1900	1900	1900	
	100000000000000000000000000000000000000			
Lane Width (ft)	14	14	14	
Satd. Flow (prot)	1311	0	0	
FIt Permitted	0.984			
Satd. Flow (perm)	1215	0	0	
Right Turn on Red			Yes	
Satd. Flow (RTOR)	99			
Link Speed (mph)	30			
Link Distance (ft)	395			
Travel Time (s)	9.0			
Confl. Peds. (#/hr)	166		482	
Confl. Bikes (#hr)				
Peak Hour Factor	0.92	0.92	0.92	
Heavy Vehicles (%)	0.92	10%	0.92	
	070	1070	070	
Shared Lane Traffic (%)	39	0	0	
Lane Group Flow (vph)	7.7	U	U	
Turn Type	Prot			
Protected Phases	4!			8
Permitted Phases				
Minimum Split (s)	36.0			36.0
Total Split (s)	36.0			36.0
Total Split (%)	32.7%			33%
Yellow Time (s)	4.0			4.0
All-Red Time (s)	3.0			6.5
Lost Time Adjust (s)	-1.5			
Total Lost Time (s)	5.5			
Lead/Lag	0.0			
Lead-Lag Optimize?				
Act Effet Green (s)	30.5			
	0.28			
Actuated g/C Ratio				
v/c Ratio	0.09			
Control Delay	0.4			
Queue Delay	0.0			
Total Delay	0.4			
LOS	Α			
Approach Delay	0.4			
Approach LOS	Α			
Interesting Comme	750)7			
Intersection Summary				

2: 12th St SW & Independence Ave SW & 12th St Ramp SI South Campus Master Plan - Loading Dock Analysis

2030 No Build AM Peak Hour

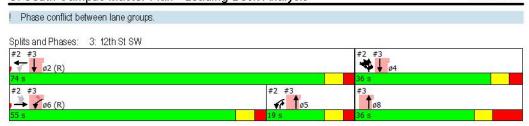


3: 12th St SW SI South Campus Master Plan - Loading Dock Analysis

	•	•	†	-	1	ţ					
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø2	04	ø5	ø8	
Lane Configurations	ሻ	7	ተተጉ			^					
Traffic Volume (vph)	0	0	599	0	0	350					
Future Volume (vph)	0	0	599	0	0	350					
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900					
Lane Width (ft)	10	11	11	11	10	10					
Satd. Flow (prot)	1773	1837	4868	0	0	3271					
FIt Permitted											
Satd. Flow (perm)	1773	1837	4868	0	0	3271					
Right Turn on Red		Yes		Yes							
Satd. Flow (RTOR)											
Link Speed (mph)	20		30			30					
Link Distance (ft)	188		380			162					
Travel Time (s)	6.4		8.6			3.7					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92					
Heavy Vehicles (%)	0%	0%	3%	0%	0%	3%					
Shared Lane Traffic (%)	• • • • • • • • • • • • • • • • • • • •										
Lane Group Flow (vph)	0	0	651	0	0	380					
Turn Type	Prot	Perm	NA			NA					
Protected Phases	6!	T OITH	8.5			2 4!	2	4	5	8	
Permitted Phases	91	6				- "		_			
Minimum Split (s)	42.0	42.0					61.0	36.0	19.0	36.0	
Total Split (s)	55.0	55.0					74.0	36.0	19.0	36.0	
Total Split (%)	50.0%	50.0%					67%	33%	17%	33%	
Yellow Time (s)	4.0	4.0					4.0	4.0	4.0	4.0	
All-Red Time (s)	2.5	2.5					2.5	3.0	2.5	6.5	
Lost Time Adjust (s)	-1.5	-1.5						0.0	2.0	0.0	
Total Lost Time (s)	5.0	5.0									
Lead/Lag	Lead	Lead							Lag		
Lead-Lag Optimize?	Yes	Yes							Yes		
Act Effct Green (s)			46.0			110.0					
Actuated g/C Ratio			0.42			1.00					
v/c Ratio			0.32			0.12					
Control Delay			22.0			0.0					
Queue Delay			0.0			0.0					
Total Delay			22.1			0.0					
LOS			C			A					
Approach Delay			22.1			0.0					
Approach LOS			С			A					
Intersection Summary			V-74			1000					
Area Type:	Other										
Cycle Length: 110	2										
Actuated Cycle Length: 110	0										
Offset: 57 (52%), Reference		2·WBTI	and 6:FP	TI Start	of Green						
Natural Cycle: 100	ou to pridoc			, w, Otor (-, -,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,						
Control Type: Pretimed											
Maximum v/c Ratio: 0.88											
Intersection Signal Delay: 1	14.0			In	tersection	LOS B					
Intersection Capacity Utiliza						of Service	Α				
Analysis Period (min) 15		10		-10							

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2030 No Build AM Peak Hour SI South Campus Master Plan - Loading Dock Analysis



	-	•	1	•	1	-	
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	ø3
Lane Configurations	1117>		100000000000000000000000000000000000000	ना	ሻ	۴	
Traffic Volume (vph)	1679	97	75	1030	64	174	
Future Volume (vph)	1679	97	75	1030	64	174	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	10	10	10	10	12	12	
Storage Length (ft)	1,0	0	0		0	210	
Storage Lanes		0	0		1	1	
Taper Length (ft)			25		25		
Satd. Flow (prot)	5928	0	0	5905	1805	1615	
FIt Permitted	0020			0.734	0.950	1010	
Satd. Flow (perm)	5928	0	0	4347	1654	1418	
Right Turn on Red	0020	Yes		1017	1004	Yes	
Satd. Flow (RTOR)	16	100				46	
Link Speed (mph)	35			35	20	70	
Link Distance (ft)	590			1087	758		
Travel Time (s)	11.5			21.2	25.8		
Confl. Peds. (#/hr)	11.0	43	43	21.2	61	79	
Confl. Bikes (#hr)		13	40		01	6	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	
Heavy Vehides (%)	1%	1%	3%	3%	0.90	0.90	
Shared Lane Traffic (%)	170	170	370	370	U70	U70	
Lane Group Flow (vph)	1850	0	0	1151	67	181	
	NA	0	7	NA	Prot		
Turn Type	NA 2		pm+pt 9	NA 6	Prot 4	pm+ov	2
Protected Phases Permitted Phases	2		6	0	4	9	3
	61.5		14.5	C1 E	20.0	14.5	4.0
Minimum Split (s)	0.700.000			61.5	30.0		4.0
Total Split (s)	61.5		14.5	61.5	30.0	14.5	4.0
Total Split (%)	55.9%		13.2%	55.9%	27.3%	13.2%	4%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	2.5		1.0	2.5	1.5	1.0	0.0
Lost Time Adjust (s)	-1.5			-1.5	-1.0	-1.0	
Total Lost Time (s)	5.0			5.0	4.5	4.0	
Lead/Lag					Lag		Lead
Lead-Lag Optimize?					Yes		Yes
Act Effct Green (s)	56.5			66.0	25.5	36.5	
Actuated g/C Ratio	0.51			0.60	0.23	0.33	
v/c Ratio	0.61			0.42	0.16	0.35	
Control Delay	3.9			9.5	35.0	20.6	
Queue Delay	0.0			0.0	0.0	0.0	
Total Delay	3.9			9.5	35.0	20.6	
LOS	Α			Α	D	C	
Approach Delay	3.9			9.5	24.5		
Approach LOS	Α			Α	С		
Intersection Cummany	10100			30000	2000		

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 67 (61%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 110

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4: L'Enfant Plaza & Independence Ave SW SI South Campus Master Plan - Loading Dock Analysis

2030 No Build AM Peak Hour

4 5 30 s	14.5 s
#Rp ₹ 04	₹ 09
ce Ave SW	70
ICU Level of Service D	
Intersection LOS: A	
	ICU Level of Service D ce Ave SW

SI South Campus Master Plan - Loading Dock Analysis

	١	→	•	•	•	•	1	†	-	-	↓	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		ተተጉ			^ ^	7		^ ^^	۴	ሻ	^^	
Traffic Volume (vph)	5	537	38	21	1436	172	0	1527	372	162	1513	22
Future Volume (vph)	5	537	38	21	1436	172	0	1527	372	162	1513	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	10	10	10	11	11	12	10	10	10
Satd. Flow (prot)	0	4748	0	0	4646	1311	0	4964	1583	1589	4735	0
Flt Permitted		0.821			0.921					0.083		
Satd. Flow (perm)	0	3898	0	0	4280	1170	0	4964	1469	139	4735	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10				164			107			
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		487			1110			612			436	
Travel Time (s)		9.5			21.6			13.9			9.9	
Confl. Peds. (#/hr)	71		236	136		71	31		46	46		31
Confl. Bikes (#hr)			3			28			2			2
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
Heavy Vehicles (%)	80%	2%	3%	79%	3%	15%	0%	1%	2%	6%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	610	0	0	1534	181	0	1607	392	171	1616	0
Turn Type	Perm	NA		Perm	NA	Perm		NA	Perm	custom	NA	
Protected Phases		4			8			2		9	69	
Permitted Phases	4			8		8			2	6		
Minimum Split (s)	37.0	37.0		37.0	37.0	37.0		53.0	53.0	20.0		
Total Split (s)	37.0	37.0		37.0	37.0	37.0		53.0	53.0	20.0		
Total Split (%)	33.6%	33.6%		33.6%	33.6%	33.6%		48.2%	48.2%	18.2%		
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0		
All-Red Time (s)	2.5	2.5		2.5	2.5	2.5		2.5	2.5	1.5		
Lost Time Adjust (s)		-1.5			-1.5	-1.5		-1.5	-1.5	-1.0		
Total Lost Time (s)		5.0			5.0	5.0		5.0	5.0	4.5		
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)		32.0			32.0	32.0		48.0	48.0	64.0	68.5	
Actuated g/C Ratio		0.29			0.29	0.29		0.44	0.44	0.58	0.62	
v/c Ratio		0.53			1.23	0.40		0.74	0.56	0.60	0.55	
Control Delay		34.2			135.0	7.4		28.4	19.9	30.4	12.8	
Queue Delay		0.0			0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay		34.2			135.0	7.4		28.4	19.9	30.4	12.8	
LOS		С			F	Α		С	В	С	В	
Approach Delay		34.2			121.5			26.8			14.4	
Approach LOS		С			F			С			В	
Intersection Summary												

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 16 (15%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 120
Control Type: Pretimed
Maximum v/c Ratio: 1.23
Intersection Signal Delay: 50.5 Intersection Signal Delay: 50.5

Intersection LOS: D

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Lane Group	ø6		
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Satd. Flow (prot)			
FIt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Confl. Bikes (#hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	6		
Permitted Phases			
Minimum Split (s)	53.0		
Total Split (s)	53.0		
Total Split (%)	48%		
Yellow Time (s)	3.5		
All-Red Time (s)	2.5		
Lost Time Adjust (s)	2.0		
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Act Effet Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay LOS			
Approach Delay			
Approach LOS			
Intersection Summary			

Stantec Lanes, Volumes, Timings 2030_nbpm.syn Page 2

1: 14th St SW & Independence Ave SW SI South Campus Master Plan - Loading Dock Analysis

2030 No Build PM Peak Hour

Intersection Capacity Utilization 93.0%	ICU Level of Service F	
Analysis Period (min) 15		
Splits and Phases: 1: 14th St SW & Independence	Ave SW	
∮ø2 (R)	→ 04	№ ø9
53 s	37 s	20 s
ø6 (R)	₩ ø8	
53 s	37 s	

	→	•	1	•	*_	•	1	ኘ	†	-	\	>
Lane Group	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR	SEL	SER
Lane Configurations	41114		ሻ	444				Ä	1	7	M	
Traffic Volume (vph)	1016	55	421	1493	2	187	126	1	238	305	14	23
Future Volume (vph)	1016	55	421	1493	2	187	126	1	238	305	14	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	11	11	11	11	14	14
Satd. Flow (prot)	5861	0	1393	4060	0	0	0	1678	1534	1426	1265	0
Flt Permitted			0.164	0.776				0.950			0.985	
Satd. Flow (perm)	5861	0	240	3156	0	0	0	1516	1534	1426	1140	0
Right Turn on Red		Yes				Yes				Yes		
Satd. Flow (RTOR)	11								10	35	99	
Link Speed (mph)	35			35					30		30	
Link Distance (ft)	1110			590					162		395	
Travel Time (s)	21.6			11.5					3.7		9.0	
Confl. Peds. (#/hr)		9	9	,	71	71	73			334	334	
Confl. Bikes (#/hr)		19			19	19	, ,			5	00 1	8
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
Heavy Vehicles (%)	3%	3%	4%	4%	0%	4%	4%	0%	4%	4%	40%	40%
Shared Lane Traffic (%)	0.0	0.0	19%	170	0,0	170	170	0,0	.,,	17%	1070	1070
Lane Group Flow (vph)	1127	0	359	1855	0	0	0	134	306	266	50	0
Turn Type	NA		pm+pt	NA			Split	Split	NA	pt+ov	Prot	, i
Protected Phases	6		5	2			4	41	4!	4 5!	4!	
Permitted Phases			2				6.70	712	976	4.0:	700.0	
Minimum Split (s)	42.0		30.0	72.0			38.0	38.0	38.0		38.0	
Total Split (s)	42.0		30.0	72.0			38.0	38.0	38.0		38.0	
Total Split (%)	38.2%		27.3%	65.5%			34.5%	34.5%	34.5%		34.5%	
Yellow Time (s)	4.0		4.0	4.0			4.0	4.0	4.0		4.0	
All-Red Time (s)	2.5		2.5	2.5			3.0	3.0	3.0		3.0	
Lost Time Adjust (s)	-1.5		-1.5	-1.5			3.0	-1.5	-1.5		-1.5	
Total Lost Time (s)	5.0		5.0	5.0				5.5	5.5		5.5	
Lead/Lag	Lead		Lag	5.0				0.0	0.0		0.0	
Lead-Lag Optimize?	Yes		Yes									
Act Effet Green (s)	37.0		67.0	67.0				32.5	32.5	62.5	32.5	
Actuated g/C Ratio	0.34		0.61	0.61				0.30	0.30	0.57	0.30	
v/c Ratio	0.57		0.88	0.87				0.30	0.67	0.32	0.30	
Control Delay	32.3		43.5	18.6				17.5	27.9	2.0	0.11	
Participation of the Control of the	0.0		0.0	0.0				3.0	3.8	0.4	0.0	
Queue Delay Total Delay	32.3		43.5	18.6				20.6	31.6	2.3	0.8	
LOS	32.3 C		43.3 D	10.0 B				20.0 C	31.0 C	2.5 A	Α.	
	32.3		D	22.6				C		А	0.8	
Approach Delay	32.3 C			22.0 C					18.5 B		υ.ο	
Approach LOS	C			C					В		А	
Intersection Summary	2.1											
Area Type:	Other											
Cycle Length: 110												
Actuated Cycle Length: 11												
Offset: 4 (4%), Referenced	to phase 2:	WBTL a	nd 6:EBT	L, Start of	Green							
Natural Cycle: 110												
Control Type: Pretimed												
Maximum v/c Ratio: 0.88	reteran											
Intersection Signal Delay: 3	24.3			In	tersection	n LOS C						

Intersection LOS: C

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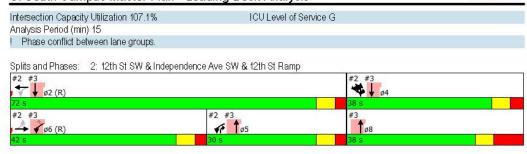
Intersection Signal Delay: 24.3



	*7	
Lane Group	SER2	ø8
Lane Configurations		
Traffic Volume (vph)	10	
Future Volume (vph)	10	
Ideal Flow (vphpl)	1900	
Lane Width (ft)	14	
Satd. Flow (prot)	0	
Flt Permitted		
Satd. Flow (perm)	0	
Right Turn on Red	Yes	
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)	73	
Confl. Bikes (#hr)	8	
Peak Hour Factor	0.95	
Heavy Vehicles (%)	0%	
Shared Lane Traffic (%)		
Lane Group Flow (vph)	0	
Turn Type		
Protected Phases		8
Permitted Phases		
Minimum Split (s)		38.0
Total Split (s)		38.0
Total Split (%)		35%
Yellow Time (s)		4.0
All-Red Time (s)		6.5
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Intersection Summary		
morocolon ouninary		

2: 12th St SW & Independence Ave SW & 12th St Ramp SI South Campus Master Plan - Loading Dock Analysis

2030 No Build PM Peak Hour

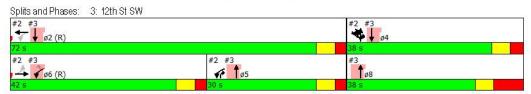


3: 12th St SW SI South Campus Master Plan - Loading Dock Analysis

	•	•	†	-	-	ţ					
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø2	04	ø5	ø8	
Lane Configurations	ሻ	7	ተተጉ			^					
Traffic Volume (vph)	0	0	670	0	0	499					
Future Volume (vph)	0	0	670	0	0	499					
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900					
Lane Width (ft)	10	11	11	11	10	10					
Satd. Flow (prot)	1739	1801	4916	0	0	3303					
Flt Permitted											
Satd. Flow (perm)	1739	1801	4916	0	0	3303					
Right Turn on Red		Yes		Yes		0000					
Satd. Flow (RTOR)											
Link Speed (mph)	20		30			30					
Link Distance (ft)	188		380			162					
Travel Time (s)	6.4		8.6			3.7					
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95					
Shared Lane Traffic (%)	0.50	0.50	0.30	0.50	0.30	0.50					
Lane Group Flow (vph)	0	0	705	0	0	525					
	Prot	Perm	NA	U	U	NA					
Turn Type Protected Phases	Prot 6!	Perm	8.5			2 4!	2	4	5	8	
Permitted Phases	O!	6	00			2 4!	2	4	3	0	
70.03930-77	40.0	42.0					70.0	20.0	20.0	38.0	
Minimum Split (s)	42.0	107707					72.0	38.0	30.0	1.010000	
Total Split (s)	42.0	42.0					72.0	38.0	30.0	38.0	
Total Split (%)	38.2%	38.2%					65%	35%	27%	35%	
Yellow Time (s)	4.0	4.0					4.0	4.0	4.0	4.0	
All-Red Time (s)	2.5	2.5					2.5	3.0	2.5	6.5	
Lost Time Adjust (s)	-1.5	-1.5									
Total Lost Time (s)	5.0	5.0									
Lead/Lag	Lead	Lead							Lag		
Lead-Lag Optimize?	Yes	Yes				100000000			Yes		
Act Effct Green (s)			59.0			110.0					
Actuated g/C Ratio			0.54			1.00					
v/c Ratio			0.27			0.16					
Control Delay			14.1			0.1					
Queue Delay			0.0			0.0					
Total Delay			14.2			0.1					
LOS			В			Α					
Approach Delay			14.2			0.1					
Approach LOS			В			Α					
Intersection Summary											
Area Type:	Other										
Cycle Length: 110											
Actuated Cycle Length: 110											
Offset: 4 (4%), Referenced	to phase 2	:WBTL an	d 6:EBTL	., Start of	Green						
Natural Cycle: 110											
Control Type: Pretimed											
Maximum v/c Ratio: 0.88	2202					OSTONOVA PORMINA					
Intersection Signal Delay: 8					tersection						
Intersection Capacity Utiliza	ation 20.4%	6		IC	U Level	of Service	Α				
Analysis Period (min) 15											
Phase conflict between I	ane groups	S.									

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2030 No Build PM Peak Hour



	→	•	1	•	1	-	
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	ø3
Lane Configurations	ttta			ना	ሻ	7	- I Market N
Traffic Volume (vph)	1272	62	57	1844	259	63	
Future Volume (vph)	1272	62	57	1844	259	63	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	10	10	10	10	12	12	
Storage Length (ft)	1,0	0	0	.0	0	210	
Storage Lanes		0	0		1	1	
Taper Length (ft)		U	25		25		
Satd. Flow (prot)	5843	0	0	5860	1805	1615	
Flt Permitted	0040			0.801	0.950	1010	
Satd. Flow (perm)	5843	0	0	4697	1368	1572	
Right Turn on Red	0040	Yes	J	4001	1300	Yes	
Satd. Flow (RTOR)	13	1 65				60	
Link Speed (mph)	35			35	20	00	
Link Speed (mpn) Link Distance (ft)	590			1087	758		
Travel Time (s)	11.5			21.2	25.8		
	11.5	28	28	21.2	176	0	
Confl. Peds. (#/hr)		17	28		1/6	8	
Confl. Bikes (#hr)	0.00		0.00	0.00	0.00		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Heavy Vehicles (%)	3%	3%	4%	4%	0%	0%	
Shared Lane Traffic (%)	4400			0446	000	70	
Lane Group Flow (vph)	1482	0	0	2112	288	70	
Turn Type	NA		pm+pt	NA	Prot	pm+ov	52
Protected Phases	2		9	6	4	9	3
Permitted Phases			6			4	
Minimum Split (s)	58.5		13.5	58.5	30.0	13.5	4.0
Total Split (s)	61.5		13.5	61.5	31.0	13.5	4.0
Total Split (%)	55.9%		12.3%	55.9%	28.2%	12.3%	4%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	2.5		1.0	2.5	1.5	1.0	0.0
Lost Time Adjust (s)	-1.5			-1.5	-1.0	-1.0	
Total Lost Time (s)	5.0			5.0	4.5	4.0	
Lead/Lag					Lag		Lead
Lead-Lag Optimize?					Yes		Yes
Act Effct Green (s)	56.5			65.0	26.5	36.5	
Actuated g/C Ratio	0.51			0.59	0.24	0.33	
v/c Ratio	0.49			0.74	0.66	0.12	
Control Delay	21.4			16.4	46.2	8.0	
Queue Delay	0.0			0.0	0.0	0.0	
Total Delay	21.4			16.4	46.2	8.0	
LOS	С			В	D	Α	
Approach Delay	21.4			16.4	38.7	1,753	
Approach LOS	C			В	D		
r pprodon 200	150				-		

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 38 (35%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 110

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4: L'Enfant Plaza & Independence Ave SW SI South Campus Master Plan - Loading Dock Analysis

2030 No Build PM Peak Hour

ntersection Signal Delay: 20.3	Intersection LOS: C						
Intersection Capacity Utilization 79.3%	ICU Level of Service D						
Analysis Period (min) 15							
Splits and Phases: 4: L'Enfant Plaza & Independ	ence Ave SW						
Splits and Phases: 4: L'Enfant Plaza & Independ	ence Ave SW	₽ ø9					
Splits and Phases: 4: L'Enfant Plaza & Independ	10 4	€f*o					
	10 4	13.5 s					

	٠	→	•	1	-	•	1	1	-	-	ļ	4
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
Lane Configurations		ተተኩ			^ ^	۴		^ ^^	7	ሻ	^	
Traffic Volume (vph)	6	1492	44	7	702	284	0	2139	182	152	462	16
Future Volume (vph)	6	1492	44	7	702	284	0	2139	182	152	462	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	10	10	10	11	11	12	10	10	10
Satd. Flow (prot)	0	4961	0	0	4750	1422	0	4964	1524	1452	4570	C
Flt Permitted		0.936			0.799					0.075		
Satd. Flow (perm)	0	4644	0	0	3799	1339	0	4964	1050	115	4570	C
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				122			89		8	
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		487			1110			612			436	
Travel Time (s)		9.5			21.6			13.9			9.9	
Confl. Peds. (#/hr)	40		58	58		40	27		246	246		27
Confl. Bikes (#hr)			14			5			1			5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	100%	0%	0%	80%	1%	6%	0%	1%	6%	16%	5%	12%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1677	0	0	771	309	0	2325	198	165	519	C
Turn Type	Perm	NA		Perm	NA	Perm		NA	Perm	custom	NA	
Protected Phases		4			8			2		9	69	
Permitted Phases	4			8		8			2	6		
Minimum Split (s)	40.0	40.0		40.0	40.0	40.0		58.0	58.0	12.0		
Total Split (s)	40.0	40.0		40.0	40.0	40.0		58.0	58.0	12.0		
Total Split (%)	36.4%	36.4%		36.4%	36.4%	36.4%		52.7%	52.7%	10.9%		
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0		
All-Red Time (s)	2.5	2.5		2.5	2.5	2.5		2.5	2.5	1.5		
Lost Time Adjust (s)		-1.5			-1.5	-1.5		-1.5	-1.5	-1.0		
Total Lost Time (s)		5.0			5.0	5.0		5.0	5.0	4.5		
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)		35.0			35.0	35.0		53.0	53.0	61.0	65.5	
Actuated g/C Ratio		0.32			0.32	0.32		0.48	0.48	0.55	0.60	
v/c Ratio		1.13			0.64	0.61		0.97	0.36	1.07	0.19	
Control Delay		104.3			42.5	34.8		41.2	11.5	119.9	10.2	
Queue Delay		0.0			0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay		104.3			42.5	34.8		41.2	11.5	119.9	10.2	
LOS		F			D	С		D	В	F	В	
Approach Delay		104.3			40.3			38.9			36.7	
Approach LOS		F			D			D			D	
Intersection Summary												
Area Type: Cyde Length: 110	Other											
Actuated Cycle Length: 11	0											
Offset: 88 (80%), Reference		2:NRT a	nd 6:SRT	1 Start o	f Green							
Natural Cycle: 120	ou to pilast	, Z.14D1 a1	0.001	c, otali C	n Oroon							
Control Type: Pretimed												

Intersection LOS: E

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Control Type: Pretimed Maximum v/c Ratio: 1.13 Intersection Signal Delay: 57.3

Lane Group	ø6	
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Ideal Flow (vphpl)		
Lane Width (ft)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Confl. Bikes (#hr)		
Peak Hour Factor		
Heavy Vehicles (%)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	6	
Permitted Phases		
Minimum Split (s)	58.0	
Total Split (s)	58.0	
Total Split (%)	53%	
Yellow Time (s)	3.5	
All-Red Time (s)	2.5	
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Intersection Summary		
intersection Summary		

Stantec Lanes, Volumes, Timings 2030_barn.syn Page 2

1: 14th St SW & Independence Ave SW SI South Campus Master Plan - Loading Dock Analysis

2030 Build AM Peak Hour

Intersection Capacity Utilization 108.9%	ICU Level of Service G	
Analysis Period (min) 15		
Splits and Phases: 1: 14th St SW & Independence.	Ave SW	
¶ø2 (R)	→ 04	₽ ø9
58 s	40 s	12 s
ø6 (R)	₩ ø8	W W
58 s	40 s	

	٠	_#	-	•	1	•	*_	•	1	ኘ	†	۲
Lane Group	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBF
Lane Configurations			नााः		ሻ	444	1001277000		***************************************	Ä	1	
Traffic Volume (vph)	54	2	1607	162	172	770	2	151	212	2	229	1
Future Volume (vph)	54	2	1607	162	172	770	2	151	212	2	229	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	12	10	10	10	10	10	10	11	11	11	12
Satd. Flow (prot)	0	0	5929	0	1407	3843	0	0	0	1694	1775	0
Flt Permitted			0.819		0.083	0.875				0.950	17.10	J
Satd. Flow (perm)	0	0	4854	0	123	3366	0	0	0	1072	1775	0
Right Turn on Red			1001	Yes	120	0000				1012	11.10	U
Satd. Flow (RTOR)			24	, 00								
Link Speed (mph)			35			35					30	
Link Distance (ft)			1110			590					162	
Travel Time (s)			21.6			11.5					3.7	
Confl. Peds. (#/hr)	141		21.0	9	9	11.0	141	141	482		0.7	
Confl. Bikes (#/hr)	171			9	9		12	12	402			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	100%	1%	1%	3%	3%	3%	3%	3%	0.32	3%	100%
Shared Lane Traffic (%)	170	10076	170	170	10%	370	370	370	370	070	370	10076
Lane Group Flow (vph)	0	0	1984	0	168	1022	0	0	0	232	250	0
	Perm	Perm	NA	U		NA	U	U			NA NA	U
Turn Type Protected Phases	Perm	Perm	NA 6		pm+pt 5	2			Split 4	Split 41	NA 4l	
Permitted Phases	6	6	0		2	2			4	4!	4!	
	6	6	6		5	2			4	4	4	
Detector Phase	0	0	0		5	2			4	4	4	
Switch Phase	10.0	10.0	40.0		5 0	10.0			7.0	7.0	7.0	
Minimum Initial (s)	10.0	10.0	10.0		5.0	0.000			7.0	7.0	7.0	
Minimum Split (s)	42.0	42.0	42.0		17.0	61.0			32.0	32.0	32.0	
Total Split (s)	48.0	48.0	48.0		18.0	66.0			32.0	32.0 29.1%	32.0	
Total Split (%)	43.6%	43.6%	43.6%		16.4%	60.0%			29.1%		29.1%	
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0			4.0	4.0	4.0	
All-Red Time (s)	2.5	2.5	2.5		2.5	2.5			3.0	3.0	3.0	
Lost Time Adjust (s)			-1.5		-1.5	-1.5				-1.5	-1.5	
Total Lost Time (s)	London	I-reserved.	5.0		5.0	5.0				5.5	5.5	
Lead/Lag	Lead	Lead	Lead		Lag							
Lead-Lag Optimize?	Yes	Yes	Yes		Yes							
Recall Mode	C-Max	C-Max	C-Max		Max	C-Max			Max	Max	Max	
Act Effct Green (s)			43.0		61.0	61.0				26.5	26.5	
Actuated g/C Ratio			0.39		0.55	0.55				0.24	0.24	
v/c Ratio			1.04		0.77	0.53				0.57	0.59	
Control Delay			34.0		53.3	10.5				17.6	17.8	
Queue Delay			0.0		0.0	0.0				1.7	1.6	
Total Delay			34.0		53.3	10.5				19.2	19.5	
LOS			С		D	В				В	В	
Approach Delay			34.0			16.5					14.7	
Approach LOS			С			В					В	
Intersection Summary												
Area Type:	Other											
Cycle Length: 110												
Actuated Cycle Length: 11	0											
Offset: 62 (56%), Reference		2:WBTL	and 6:EB	TL, Start	of Green	1						

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	1	\	>	4	6	4	1		
Lane Group	NBR2	SEL	SER	SER2	SWL2	SWL	SWR	ø8	
Lane Configurations	7	A				H			
Traffic Volume (vph)	156	12	15	9	1	1	2		
Future Volume (vph)	156	12	15	9	1	1	2		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900		
Lane Width (ft)	11	14	14	14	10	10	10		
Satd. Flow (prot)	1516	1311	0	0	0	807	0		
Flt Permitted		0.984				0.976			
Satd. Flow (perm)	1516	1215	0	0	0	807	0		
Right Turn on Red	Yes			Yes					
Satd. Flow (RTOR)	116	169							
Link Speed (mph)		30				15			
Link Distance (ft)		395				273			
Travel Time (s)		9.0				12.4			
Confl. Peds. (#/hr)	166	166		482					
Confl. Bikes (#hr)	3	,00		, oz					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92		
Heavy Vehides (%)	3%	0%	10%	0%	100%	100%	100%		
Shared Lane Traffic (%)	070	070	1070	070	10070	10070	10070		
Lane Group Flow (vph)	170	39	0	0	0	4	0		
Turn Type	pt+ov	Prot		U	Perm	Prot	Ü		
Protected Phases	4 5!	4!			1 Cilli	9		8	
Permitted Phases	7.0:	76.TG			9	,		U	
Detector Phase	45	4			9	9			
Switch Phase	4.0	7			3	3			
Minimum Initial (s)		7.0			5.0	5.0		5.0	
Minimum Split (s)		32.0			12.0	12.0		32.0	
Total Split (s)		32.0			12.0	12.0		32.0	
Total Split (%)		29.1%			10.9%	10.9%		29%	
Yellow Time (s)		4.0			4.0	4.0		4.0	
All-Red Time (s)		3.0			3.0	3.0		6.5	
		-1.5			3.0	0.0		0.0	
Lost Time Adjust (s)		5.5				7.0			
Total Lost Time (s)		5.5				7.0			
Lead/Lag									
Lead-Lag Optimize?		Marie			Mana	Mana		Many	
Recall Mode	445	Max			None	None		Max	
Act Effet Green (s)	44.5	26.5				5.0			
Actuated g/C Ratio	0.40	0.24				0.05			
//c Ratio	0.25	0.09				0.11			
Control Delay	0.9	0.4				57.2			
Queue Delay	0.6	0.0				0.0			
Total Delay	1.4	0.4				57.2			
LOS	Α	Α				E			
Approach Delay		0.4				57.3			
Approach LOS		А				Е			
Intersection Summary									

2: 12th St SW & Independence Ave SW & 12th St Ramp & Loading Dock SI South Campus Master Plan - Loading Dock Analysis

2030 Build AM Peak Hour

Natural Cycle: 105 Control Type: Actuated-Coordinated			
Vaximum v/c Ratio: 1.04			
ntersection Signal Delay: 25.0	Intersection	LOS: C	
ntersection Capacity Utilization 113.4%	ICU Level of	f Service H	
Analysis Period (min) 15			
Phase conflict between lane groups.			
Splits and Phases: 2: 12th St SW & Independer	ce Ave SW & 12th St Ram	ip & Loading Dock	
#2 #3	~	#2 #3	#2 #3
▼ ▼ ø2 (R)		₩ 04	↓ ▶ ♦ ø9
ø2 (R) 66 s		32 s	↓ ↓ ø!

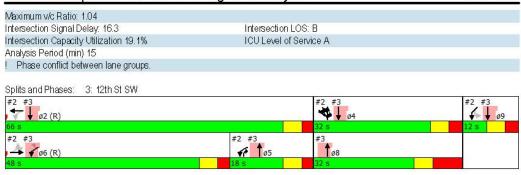
3: 12th St SW SI South Campus Master Plan - Loading Dock Analysis

	1	•	†	-	1	ţ					
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø2	04	05	ø8	ø9
Lane Configurations	7	7	ተተኩ			^					
Traffic Volume (vph)	0	0	600	0	0	350					
Future Volume (vph)	0	0	600	0	0	350					
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900					
Lane Width (ft)	10	11	11	11	10	10					
Satd. Flow (prot)	1773	1837	4868	0	0	3271					
Flt Permitted											
Satd. Flow (perm)	1773	1837	4868	0	0	3271					
Right Turn on Red		Yes		Yes							
Satd. Flow (RTOR)											
Link Speed (mph)	20		30			30					
_ink Distance (ft)	188		380			162					
Travel Time (s)	6.4		8.6			3.7					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92					
Heavy Vehides (%)	0%	0%	3%	0%	0%	3%					
Shared Lane Traffic (%)		// ** (***/*/									
Lane Group Flow (vph)	0	0	652	0	0	380					
Furn Type	Prot	Perm	NA	-	100,0	NA					
Protected Phases	6!		8.5			2 4 9!	2	4	5	8	9
Permitted Phases	211	6									
Detector Phase	6	6	85			249					
Switch Phase											
Minimum Initial (s)	10.0	10.0					10.0	7.0	5.0	5.0	5.0
Minimum Split (s)	42.0	42.0					61.0	32.0	17.0	32.0	12.0
Total Split (s)	48.0	48.0					66.0	32.0	18.0	32.0	12.0
Total Split (%)	43.6%	43.6%					60%	29%	16%	29%	11%
Yellow Time (s)	4.0	4.0					4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5					2.5	3.0	2.5	6.5	3.0
ost Time Adjust (s)	-1.5	-1.5									
Total Lost Time (s)	5.0	5.0									
_ead/Lag	Lead	Lead							Lag		
Lead-Lag Optimize?	Yes	Yes							Yes		
Recall Mode	C-Max	C-Max					C-Max	Max	Max	Max	None
Act Effct Green (s)			41.0			110.0		.000000.0	recent.	cerema.	CORRECT
Actuated g/C Ratio			0.37			1.00					
//c Ratio			0.36			0.12					
Control Delay			25.7			0.0					
Queue Delay			0.1			0.0					
Total Delay			25.8			0.0					
LOS			С			Α					
Approach Delay			25.8			0.0					
Approach LOS			C			A					
Intersection Summary											
Area Type:	Other										
Cycle Length: 110	70 000										
Actuated Cycle Length: 110)										
Offset: 62 (56%), Reference Natural Cycle: 105		2:WBTL	and 6:EB	TL, Start	of Green						

Control Type: Actuated-Coordinated

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SI South Campus Master Plan - Loading Dock Analysis



	-	•	1	-	1	-	
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	ø3
Lane Configurations	1117-		1001001001	नाा	ሻ	7	
Traffic Volume (vph)	1679	97	75	1030	64	174	
Future Volume (vph)	1679	97	75	1030	64	174	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	10	10	10	10	12	12	
Storage Length (ft)		0	0		0	210	
Storage Lanes		0	0		1	1	
Taper Length (ft)			25		25		
Satd. Flow (prot)	5928	0	0	5905	1805	1615	
FIt Permitted				0.734	0.950		
Satd. Flow (perm)	5928	0	0	4347	1654	1418	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)	16					46	
Link Speed (mph)	35			35	20		
Link Distance (ft)	590			1087	758		
Travel Time (s)	11.5			21.2	25.8		
Confl. Peds. (#/hr)		43	43		61	79	
Confl. Bikes (#/hr)		13				6	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	
Heavy Vehides (%)	1%	1%	3%	3%	0%	0%	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	1850	0	0	1151	67	181	
Turn Type	NA		pm+pt	NA	Prot	pm+ov	
Protected Phases	2		9	6	4	9	3
Permitted Phases			6			4	
Minimum Split (s)	61.5		14.5	61.5	30.0	14.5	4.0
Total Split (s)	61.5		14.5	61.5	30.0	14.5	4.0
Total Split (%)	55.9%		13.2%	55.9%	27.3%	13.2%	4%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	2.5		1.0	2.5	1.5	1.0	0.0
Lost Time Adjust (s)	-1.5			-1.5	-1.0	-1.0	15715
Total Lost Time (s)	5.0			5.0	4.5	4.0	
Lead/Lag	0.0			5.5	Lag		Lead
Lead-Lag Optimize?					Yes		Yes
Act Effet Green (s)	56.5			66.0	25.5	36.5	
Actuated g/C Ratio	0.51			0.60	0.23	0.33	
v/c Ratio	0.61			0.42	0.16	0.35	
Control Delay	3.2			9.5	35.0	20.6	
Queue Delay	0.0			0.0	0.0	0.0	
Total Delay	3.2			9.5	35.0	20.6	
LOS	Α.			Α.	D	20.0 C	
Approach Delay	3.2			9.5	24.5	0	
Approach LOS	A.2			3.5 A	24.5 C		
Approach Loo	^			^	C		
Intersection Summary							

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 75 (68%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 110

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4: L'Enfant Plaza & Independence Ave SW SI South Campus Master Plan - Loading Dock Analysis

2030 Build AM Peak Hour

4 \$ 30 \$	14.5 s
£80 ₹ 04	₹ ø9
nce Ave SW	-
ICU Level of Service D	
Intersection LOS: A	
	ICU Level of Service D nce Ave SW At s ↑ ø4

SI South Campus Master Plan - Loading Dock Analysis

	٠	→	•	1	•	•	1	†	-	>	Į.	4
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
Lane Configurations		ተተኩ			^ ^	7		ተተተ	۴	ሻ	ተተኩ	
Traffic Volume (vph)	5	537	38	21	1436	172	0	1527	372	162	1513	22
Future Volume (vph)	5	537	38	21	1436	172	0	1527	372	162	1513	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	10	10	10	11	11	12	10	10	10
Satd. Flow (prot)	0	4748	0	0	4646	1311	0	4964	1583	1589	4735	0
Flt Permitted		0.821			0.921					0.083		
Satd. Flow (perm)	0	3898	0	0	4280	1170	0	4964	1469	139	4735	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10				164			107			
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		487			1110			612			436	
Travel Time (s)		9.5			21.6			13.9			9.9	
Confl. Peds. (#/hr)	71		236	136		71	31		46	46		31
Confl. Bikes (#hr)			3			28			2			2
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
Heavy Vehicles (%)	80%	2%	3%	79%	3%	15%	0%	1%	2%	6%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	610	0	0	1534	181	0	1607	392	171	1616	0
Turn Type	Perm	NA		Perm	NA	Perm		NA	Perm	custom	NA	
Protected Phases		4			8			2		9	69	
Permitted Phases	4			8		8			2	6		
Minimum Split (s)	37.0	37.0		37.0	37.0	37.0		53.0	53.0	20.0		
Total Split (s)	37.0	37.0		37.0	37.0	37.0		53.0	53.0	20.0		
Total Split (%)	33.6%	33.6%		33.6%	33.6%	33.6%		48.2%	48.2%	18.2%		
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0		
All-Red Time (s)	2.5	2.5		2.5	2.5	2.5		2.5	2.5	1.5		
Lost Time Adjust (s)		-1.5			-1.5	-1.5		-1.5	-1.5	-1.0		
Total Lost Time (s)		5.0			5.0	5.0		5.0	5.0	4.5		
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)		32.0			32.0	32.0		48.0	48.0	64.0	68.5	
Actuated g/C Ratio		0.29			0.29	0.29		0.44	0.44	0.58	0.62	
v/c Ratio		0.53			1.23	0.40		0.74	0.56	0.60	0.55	
Control Delay		34.2			135.0	5.1		28.4	19.9	30.4	12.8	
Queue Delay		0.0			0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay		34.2			135.0	5.1		28.4	19.9	30.4	12.8	
LOS		С			F	Α		С	В	С	В	
Approach Delay		34.2			121.3			26.8			14.4	
Approach LOS		C			F			С			В	
Intersection Summary												
Area Type:	Other											

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 16 (15%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 120

Control Type: Pretimed Maximum v/c Ratio: 1.23 Intersection Signal Delay: 50.4

Intersection LOS: D

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Lane Group	ø6		
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Satd. Flow (prot)			
FIt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Confl. Bikes (#hr)			
Peak Hour Factor			
Heavy Vehides (%)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	6		
Permitted Phases			
Minimum Split (s)	53.0		
Total Split (s)	53.0		
Total Split (%)	48%		
Yellow Time (s)	3.5		
All-Red Time (s)	2.5		
Lost Time Adjust (s)	770		
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Intersection Summary			

Stantec Lanes, Volumes, Timings 2030_bpm.syn Page 2

1: 14th St SW & Independence Ave SW SI South Campus Master Plan - Loading Dock Analysis

2030 Build PMPeak Hour

Intersection Capacity Utilization 93.0%	ICU Level of Service F	
Analysis Period (min) 15		
Splits and Phases: 1: 14th St SW & Independence	e Ave SW	
↑ ø2 (R)	₩94	№ ø9
53 s	37 s	20 s
ø6 (R)	₹ ø8	
53 s	37 s	

	-	•	1	•	*_	•	1	ኘ	†	7	1	\
Lane Group	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR	NBR2	SE
Lane Configurations	1117+		ሻ	414				Ä	↑		7	*
Traffic Volume (vph)	1016	55	421	1493	2	189	126	1	238	1	305	1
Future Volume (vph)	1016	55	421	1493	2	189	126	1	238	1	305	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	190
Lane Width (ft)	10	10	10	10	10	10	11	11	11	12	11	1
Satd. Flow (prot)	5861	0	1393	4057	0	0	0	1678	1758	0	1501	126
FIt Permitted		18	0.167	0.772				0.950				0.98
Satd. Flow (perm)	5861	0	244	3138	0	0	0	1516	1758	0	1501	113
Right Turn on Red	0001	Yes		0100			•	1010	11 00		Yes	110
Satd. Flow (RTOR)	10	100									141	169
Link Speed (mph)	35			35					30		6550	30
Link Distance (ft)	1110			590					162			39
Travel Time (s)	21.6			11.5					3.7			9.0
Confl. Peds. (#/hr)	21.0	9	9	11.0	71	71	73		0.7		334	33
Confl. Bikes (#/hr)		19	9		19	19	13				5	33
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	0.9
	3%	3%		4%	0.95	4%	4%	0.95	4%	100%	4%	409
Heavy Vehicles (%)	3%	3%	4% 19%	470	0%	4%	4%	0%	470	100%	4%	407
Shared Lane Traffic (%)	4407	0		4057	0		0	404	050	0	204	E/
Lane Group Flow (vph)	1127	U	359	1857	U	0	0	134	252	U	321	50
Turn Type	NA		pm+pt	NA			Split	Split	NA		pt+ov	Pro
Protected Phases	6		5	2			4	4!	4!		4 5!	4
Permitted Phases			2					796				
Detector Phase	6		5	2			4	4	4		4 5	-
Switch Phase	1000000											-
Minimum Initial (s)	10.0		5.0	10.0			7.0	7.0	7.0			7.0
Minimum Split (s)	39.0		21.0	60.0			32.0	32.0	32.0			32.0
Total Split (s)	39.0		27.0	66.0			32.0	32.0	32.0			32.0
Total Split (%)	35.5%		24.5%	60.0%			29.1%	29.1%	29.1%			29.19
Yellow Time (s)	4.0		4.0	4.0			4.0	4.0	4.0			4.0
All-Red Time (s)	2.5		2.5	2.5			3.0	3.0	3.0			3.0
Lost Time Adjust (s)	-1.5		-1.5	-1.5				-1.5	-1.5			-1.5
Total Lost Time (s)	5.0		5.0	5.0				5.5	5.5			5.5
Lead/Lag	Lead		Lag									
Lead-Lag Optimize?	Yes		Yes									
Recall Mode	C-Max		Max	C-Max			Max	Max	Max			Max
Act Effct Green (s)	43.6		70.6	70.6				26.5	26.5		53.5	26.5
Actuated g/C Ratio	0.40		0.64	0.64				0.24	0.24		0.49	0.24
v/c Ratio	0.48		0.93	0.85				0.33	0.60		0.40	0.12
Control Delay	25.7		48.5	12.6				17.9	24.3		3.5	0.5
Queue Delay	0.0		0.0	0.0				3.4	4.9		0.2	0.0
Total Delay	25.7		48.5	12.6				21.3	29.2		3.7	0.5
LOS	C		D	В				С	C		Α	1
Approach Delay	25.7			18.4					16.1			0.5
Approach LOS	С			В					В			1
Intersection Summary												
Area Type:	Other											
Cycle Length: 110												
Actuated Cycle Length: 11	٥											

Stantec 2030_bpm.syn Lanes, Volumes, Timings Page 4

	>	4	6	4	~	
Lane Group	SER	SER2	SWL2	SWL	SWR	ø8
Lane Configurations				M	W-02-2-1-2-1	707
Traffic Volume (vph)	23	10	3	0	- 1	
Future Volume (vph)	23	10	3	0	1	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	
Lane Width (ft)	14	14	10	10	10	
Satd. Flow (prot)	0	0	0	826	0	
Flt Permitted			7	0.964		
Satd. Flow (perm)	0	0	0	826	0	
Right Turn on Red		Yes		OLO	•	
Satd. Flow (RTOR)		100				
Link Speed (mph)				15		
Link Distance (ft)				362		
Travel Time (s)				16.5		
Confl. Peds. (#/hr)		73		10.0		
Confl. Bikes (#/hr)	8	8				
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	
	40%	0.95	100%	100%	100%	
Heavy Vehicles (%) Shared Lane Traffic (%)	40%	U%0	100%	100%	100%	
	0	0	0	4	0	
Lane Group Flow (vph)	0	U			U	
Turn Type			Perm	Prot		0
Protected Phases				9		8
Permitted Phases			9			
Detector Phase			9	9		
Switch Phase			(SIRTE)	12000		220
Minimum Initial (s)			5.0	5.0		5.0
Minimum Split (s)			12.0	12.0		32.0
Total Split (s)			12.0	12.0		32.0
Total Split (%)			10.9%	10.9%		29%
Yellow Time (s)			4.0	4.0		4.0
All-Red Time (s)			3.0	3.0		6.5
Lost Time Adjust (s)				0.0		
Total Lost Time (s)				7.0		
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode			None	None		None
Act Effct Green (s)				5.0		
Actuated g/C Ratio				0.05		
v/c Ratio				0.11		
Control Delay				56.8		
Queue Delay				0.0		
Total Delay				56.8		
LOS				50.0 E		
200				56.8		
Annroach Delay						
Approach Delay Approach LOS				Е		

2: 12th St SW & Independence Ave SW & 12th St Ramp & Loading Dock SI South Campus Master Plan - Loading Dock Analysis

#2 #3 # 1 ø5 2030 Build PMPeak Hour

Control Type: Actuated-Coordinated		
Vaximum v/c Ratio: 0.93		
ntersection Signal Delay: 19.9	Intersection LOS: B	
ntersection Capacity Utilization 116.5%	ICU Level of Service H	
knalysis Period (min) 15		
Phase conflict between lane groups.		
Splits and Phases: 2: 12th St SW & Independence	Ave SW & 12th St Ramp & Loading Dock	
#2 #3	#2 #3	#2
The state of the s		

3: 12th St SW SI South Campus Master Plan - Loading Dock Analysis

	1	•	†	-	/	ţ					
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø2	04	ø5	ø8	ø9
Lane Configurations	ሻ	7	11			^					
Traffic Volume (vph)	0	0	671	0	0	499					
Future Volume (vph)	0	0	671	0	0	499					
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900					
Lane Width (ft)	10	11	11	11	10	10					
Satd. Flow (prot)	1739	1801	4916	0	0	3303					
Flt Permitted											
Satd. Flow (perm)	1739	1801	4916	0	0	3303					
Right Turn on Red		Yes		Yes							
Satd. Flow (RTOR)											
Link Speed (mph)	20		30			30					
Link Distance (ft)	188		380			162					
Travel Time (s)	6.4		8.6			3.7					
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95					
Shared Lane Traffic (%)											
Lane Group Flow (vph)	0	0	706	0	0	525					
Turn Type	Prot	Perm	NA			NA					
Protected Phases	6!	7.7	8.5			2 4!	2	4	5	8	9
Permitted Phases		6									
Detector Phase	6	6	85			24					
Switch Phase		17.1									
Minimum Initial (s)	10.0	10.0					10.0	7.0	5.0	5.0	5.0
Minimum Split (s)	39.0	39.0					60.0	32.0	21.0	32.0	12.0
Total Split (s)	39.0	39.0					66.0	32.0	27.0	32.0	12.0
Total Split (%)	35.5%	35.5%					60%	29%	25%	29%	11%
Yellow Time (s)	4.0	4.0					4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5					2.5	3.0	2.5	6.5	3.0
Lost Time Adjust (s)	-1.5	-1.5					2.0	0.0	2.0	0.0	0.0
Total Lost Time (s)	5.0	5.0									
Lead/Lag	Lead	Lead							Lag		
Lead-Lag Optimize?	Yes	Yes							Yes		
Recall Mode	C-Max	C-Max					C-Max	Max	Max	None	None
Act Effet Green (s)	O-IVIAX	O-IVIAX	50.0			106.6	O-IVIAX	IVICA	WIGA	TWOTIE	None
Actuated g/C Ratio			0.45			0.97					
v/c Ratio			0.32			0.16					
Control Delay			19.6			0.10					
Queue Delay			0.1			0.0					
Total Delay			19.7			0.0					
LOS			19.7 B			Ο.1					
Approach Delay			19.7			0.1					
Approach LOS			19.7 B			Ο.1					
Approach LOS			Б			A					

Intersection Summary

Other

Area Type: Cycle Length: 110

Actuated Cycle Length: 110
Offset: 22 (20%), Referenced to phase 2:WBTL and 6:EBT, Start of Green

Natural Cycle: 105 Control Type: Actuated-Coordinated Maximum v/c Ratio: 0.93

Stantec 2030_bpm.syn Lanes, Volumes, Timings Page 7

SI South Campus Master Plan - Loading Dock Analysis

Intersection Signal Delay. 11.3 Intersection Capacity Utilization 20.5% Analysis Period (min) 15 ! Phase conflict between lane groups. Intersection LOS: B
ICU Level of Service A Splits and Phases: 3: 12th St SW #2 #3 Ø5

	→	•	1	•	1	-		
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	ø3	
Lane Configurations	1117-			ना	ሻ	7	100000	
Traffic Volume (vph)	1274	62	57	1845	259	63		
Future Volume (vph)	1274	62	57	1845	259	63		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Lane Width (ft)	10	10	10	10	12	12		
Storage Length (ft)	10	0	0	10	0	210		
Storage Lanes		0	0		1	1		
Taper Length (ft)			25		25			
Satd. Flow (prot)	5843	0	0	5860	1805	1615		
Fit Permitted	0040		·	0.801	0.950	1010		
Satd. Flow (perm)	5843	0	0	4697	1368	1572		
Right Turn on Red	3043	Yes	0	4037	1500	Yes		
Satd. Flow (RTOR)	13	168				60		
Link Speed (mph)	35			35	20	00		
	590			1087	758			
Link Distance (ft)	11.5			21.2	25.8			
Travel Time (s)	11.0	00	00	21.2				
Confl. Peds. (#/hr)		28	28		176	8		
Confl. Bikes (#hr)	0.00	17	0.00	0.00	0.00	6		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90		
Heavy Vehicles (%)	3%	3%	4%	4%	0%	0%		
Shared Lane Traffic (%)	4105			0116	000	70		
Lane Group Flow (vph)	1485	0	0	2113	288	70		
Turn Type	NA		pm+pt	NA	Prot	pm+ov		
Protected Phases	2		9	6	4	9	3	
Permitted Phases			6			4		
Minimum Split (s)	58.5		13.5	58.5	30.0	13.5	4.0	
Total Split (s)	61.5		13.5	61.5	31.0	13.5	4.0	
Total Split (%)	55.9%		12.3%	55.9%	28.2%	12.3%	4%	
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0	2.0	
All-Red Time (s)	2.5		1.0	2.5	1.5	1.0	0.0	
Lost Time Adjust (s)	-1.5			-1.5	-1.0	-1.0		
Total Lost Time (s)	5.0			5.0	4.5	4.0		
Lead/Lag					Lag		Lead	
Lead-Lag Optimize?					Yes		Yes	
Act Effct Green (s)	56.5			65.0	26.5	36.5		
Actuated g/C Ratio	0.51			0.59	0.24	0.33		
v/c Ratio	0.49			0.74	0.66	0.12		
Control Delay	11.7			16.4	46.2	8.0		
Queue Delay	0.0			0.0	0.0	0.0		
Total Delay	11.7			16.4	46.2	8.0		
LOS	В			В	D	A		
Approach Delay	11.7			16.4	38.7	્લ		
Approach LOS	11.7 B			10.4 B	30.7 D			
Approach Loo	٥			٥	J			

Intersection Summary

Area Type: Cycle Length: 110

Actuated Cycle Length: 110
Offset: 29 (26%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 110

Stantec 2030_bpm.syn Lanes, Volumes, Timings Page 9

4: L'Enfant Plaza & Independence Ave SW SI South Campus Master Plan - Loading Dock Analysis

2030 Build PMPeak Hour

4 s 31 s	13.5 s
#Rp 104	√ €ø9
nce Ave SW	
ICU Level of Service D	
Intersection LOS: B	
	ICU Level of Service D nce Ave SW

Startec Lanes, Volumes, Timings 2030_bpm.syn Page 10

APPENDIX D: LOADING ALTERNATIVES



MEMORANDUM

DATE: January 18, 2017

TO: Bjarke Ingels Group, Smithsonian FROM: Jonathan Parker, Kleinfelder

SUBJECT: South Mall Master Plan - Loading Dock Design Vehicle

For Kleinfelder's report in February 2014, the geometric proof-of-concept for the proposed materials management design for the South Mall Master Plan was based on the movement of the largest truck and the movement of the largest object expected to come and go from any of the museums. The largest vehicle is expected to be a long-haul semi-truck like those used by specialty art shipping companies. The conceptual ramp, truck apron, and loading dock layout was based on a WB-67. The question has recently been raised as to whether it is possible to plan around a vehicle other than a WB-67. The reduction

Operational Reductions

Operationally, moving to a smaller design vehicle would exclude receiving large art delivery trucks for Collections in the loading dock. These deliveries would need to continue to be made on the street. Though infrequent, they are valuable deliveries. Delivery on the street exposes collections to greater risk for security, screening, handling, and environmental conditions. It is difficult to quantify the potential cost of not making improvements to materials handling for Collections.





Fig 1. Collections Delivery on Independence Ave Fig 2. Collections Delivery down Quad ramp from http://artists-in-dialogue2.blogspot.com/2011/01/welcome-arrivals.html

It is possible that food service would take advantage of the accommodation of large vehicles in the below-grade dock as well and employee WB-67s or WB-50s for occasional delivery.

If the design-vehicle were reduced, it would be to a WB-40, which is referred to as a city sized semi, and typically used by food service operators and vendors such as Sysco, Sodexho, Coca-Cola, Frito-Lay, and Poland Springs. The tractor and trailer typically measure 45' long.

The operational implications of the smaller design vehicle should be weighed against the dimensional implications of planning for a smaller design vehicle.

Dimensional Reductions - the Ramp

The ramp requirements for smaller delivery vehicles is equivalent to those for a WB-67. The slope of the ramp would not be reduced by reducing the size of the design vehicle. The overall length of the ramp to achieve desired dock elevation would not be reduced. With the traffic on Independence Avenue

and the likely length of the ramp, we would strongly recommend maintaining two-way traffic for all but the WB-67 on the ramp, therefore the width of the truck ramp would not be reduced either. The radius of the turn in the ramp to accommodate two-way traffic of WB-40s and large box trucks is adequate to accommodate the one-way at-a-time turning of a WB-67 on the ramp. (See Figures 3 and 4)

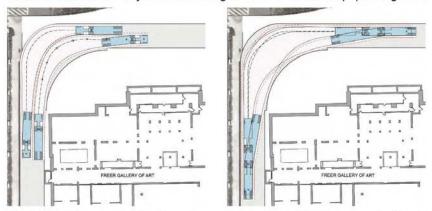


Fig 3. WB-40 two-way traffic at turn in ramp.

Fig 4. WB-67 one-way traffic at turn in ramp.

Dimensional Reductions - the Truck Apron and Loading Dock

The additional dimensional requirements for accommodating a large semi over a small semi are partially achieved by overlapping with space that is already being provided for smaller vehicles.

The width of the truck apron that is provided in order to accommodate roll-off vehicle pickup of compactors is adequate to accommodate the wide swings in the 3-point turning of a WB-67. (See dimension A in Figure 5)

A program for sizing the required number of delivery and recycling bays for materials management has not been developed, so it is unknown whether the truck apron length to accommodate the total number of recommended bays would be shorter or longer than the truck apron length needed for a WB-67. (See dimension B1 and B2 in Figure 5)

The square footage at the dock for unloading large semis would be removed, but square footage, equipment, and distribution paths would need to be added to accommodate receiving art deliveries atgrade and transporting them horizontally and vertically to collections receiving. (See C in Figure 5)

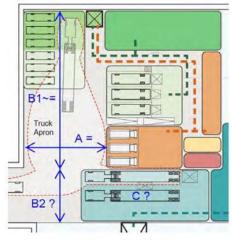


Fig 5. Truck Apron and Loading Dock

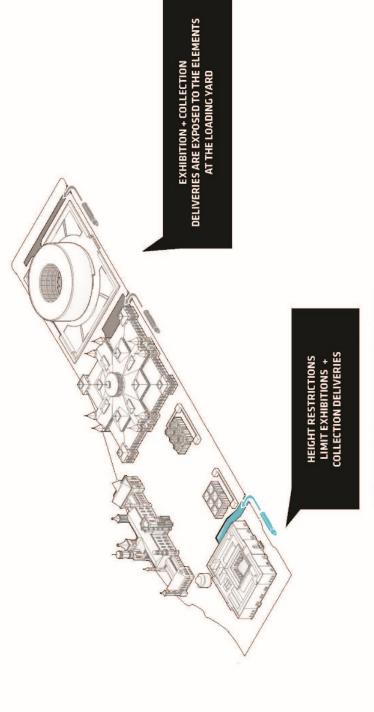
Conclusions

The footprint and dimensions of the ramp would see little if any reduction from switching from a WB-67 for the design vehicle to a WB-40. The size of the truck apron below-grade may see some moderate reduction, but that would depend on a more detailed programming effort also showing a need for fewer delivery, service, and recycling bays. The square footage for the large bays themselves would result in a reduction, however square footage, equipment, and distribution paths would need to be added to accommodate receiving art deliveries at-grade and transporting them horizontally and vertically to collections receiving.

The value of substantially improving the handling and receiving of collections by accommodating large semi-trucks in the below-grade dock should be weighed against the minimal to moderate potential reductions in footprint and dimensions of not designing for a WB-67.

SMITHSONIAN SOUTH CAMPUS LOADING FACILITIES

EXISTING CURB CUTS & LOADING FACILITIES

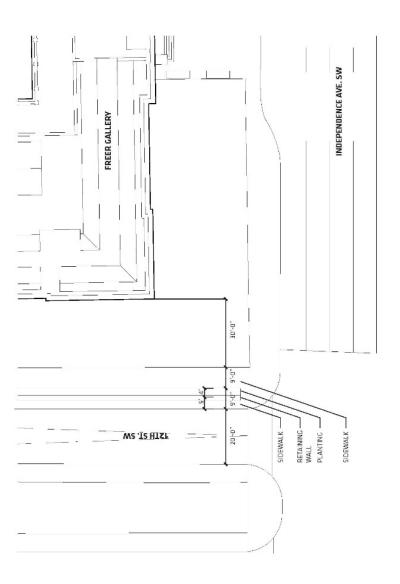


EXISTING CURB CUTS AND LOADING FACILITIES

The 3 existing loading facilities require large vehicles to back in from the street because of limited turn around area. The largest vehicles and deliveries must unload on the street because they do not fit into the dock.

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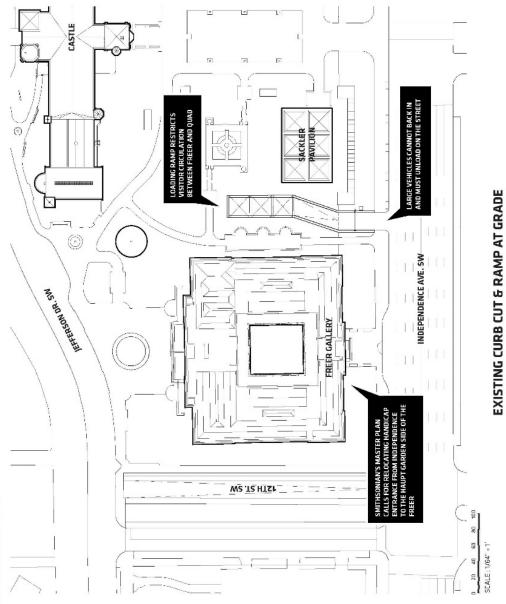
EXISTING CURB CUT | LOADING FACILITIES: QUAD COMPLEX



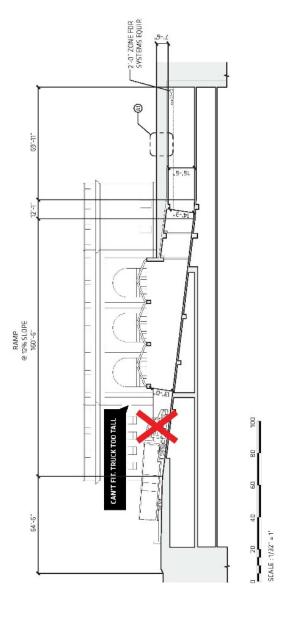
EXISTING CURB CUT | LOADING FACILITIES: QUAD COMPLEX



PERSPECTIVE @ 12TH ST. SW & INDEPENDENCE AVE. SW



EXISTING CURB CUT | LOADING FACILITIES: QUAD COMPLEX

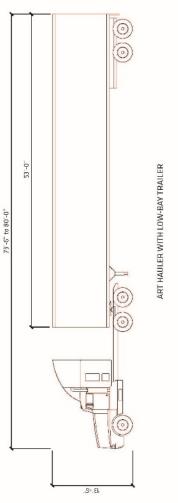


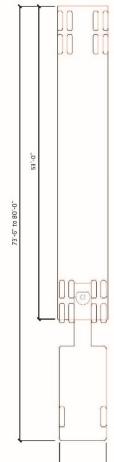
 Clearance requirements not met with current scheme. WB 67 truck type will be the basis of future loading dock design with a height 15' minimum required for passage.

EXISTING LOADING FACILITIES SECTION

(A1) R00FT0P DETAIL SCALE: 1/2" = 1'

SECTION DETAIL @ A1

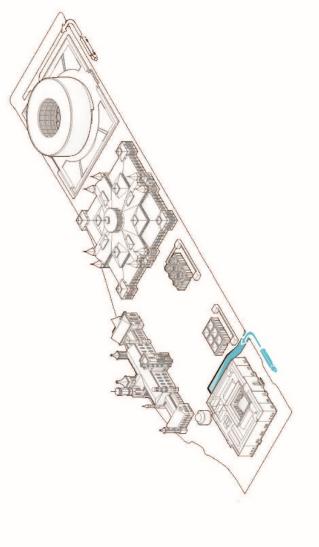




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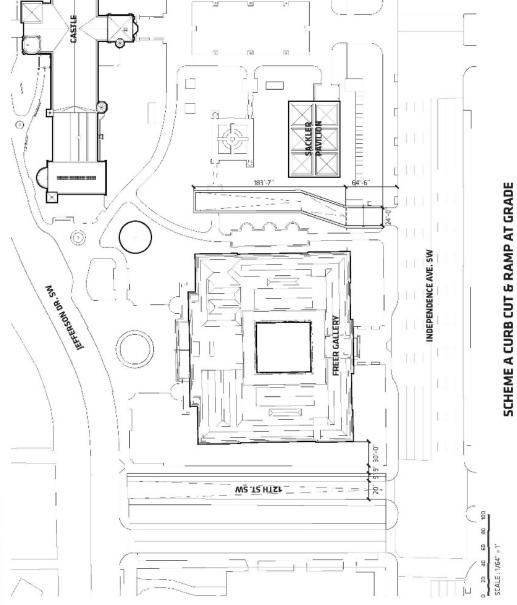
ART HAULER WITH LOW-BAY TRAILER

SCHEME A

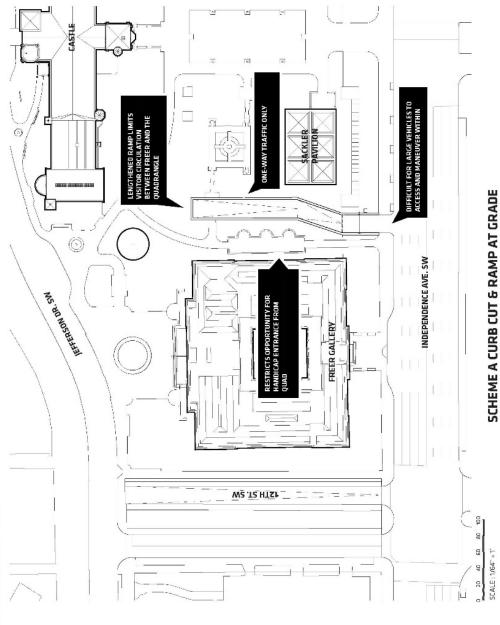


SCHEME A CURB CUT AND LOADING FACILITY

Reuse of the existing curb cut and ramp requires an expansion of the ramp and
expansion of the below grade loading complex. Scheme A would limit vehicle traffic
to one-way, and interfere with the Master Plan's East/West circulation.



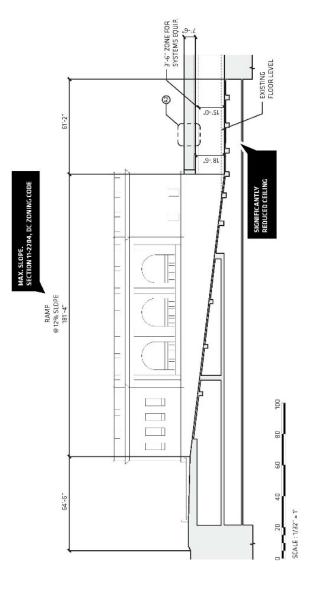
SCHEME A CURB CUT | LOADING FACILITIES: QUAD COMPLEX



SCHEME A CURB CUT | LOADING FACILITIES: QUAD COMPLEX

SCHEME A RAMP & LOADING FACILITY BELOW GRADE





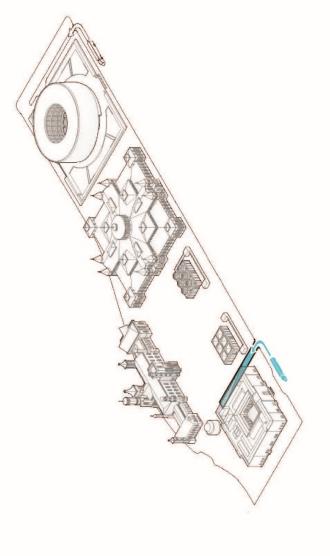
Scheme A requires the expansion of below grade loading support areas
to provide increased maneuvering clearance. The floor of the loading
dock will need to be lowered. The alteration will greatly reduce the ceiling height in floor level below loading dock

SCHEME A LOADING FACILITY SECTION

(A2) ROOFTOP DETAIL SCALE: 1/2" = 1'

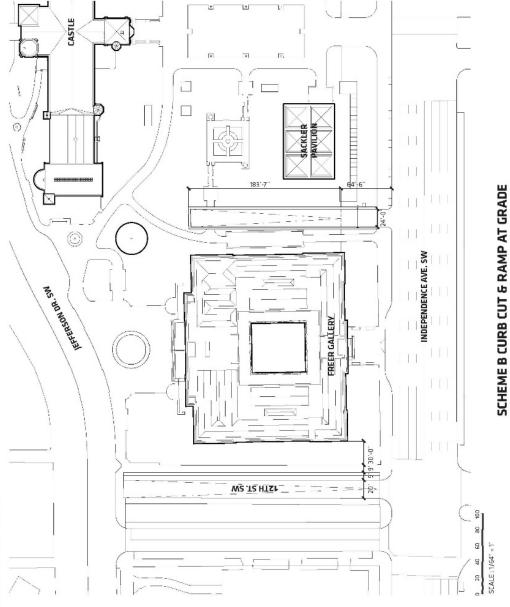
SECTION DETAIL @ A2

SCHEME B



SCHEME B CURB CUT AND LOADING FACILITY

 Widening of the existing curb cut and new ramp would maintain approximate location of existing curb cut. The new ramp would allow for two-way traffic, but require an expansion of below grade complex.



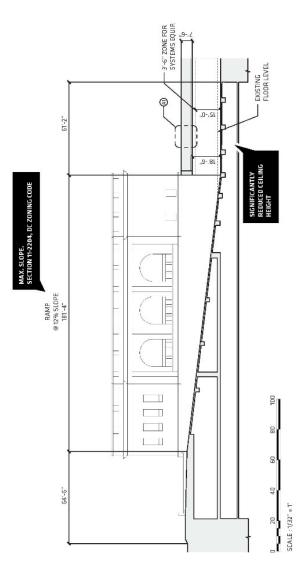
SCHEME B CURB CUT | LOADING FACILITIES: QUAD COMPLEX

SCHEME B CURB CUT | LOADING FACILITIES: QUAD COMPLEX

SCHEME B CURB CUT & RAMP AT GRADE

SCHEME B RAMP & LOADING FACILITY BELOW GRADE

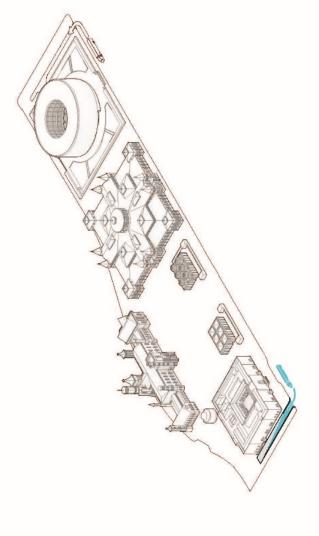




Scheme B requires the expansion of below grade loading support areas
to provide increased maneuvering clearance. The floor of the loading
dock will need to be lowered. The alteration will greatly reduce the ceiling height in floor level below loading dock

SCHEME B LOADING FACILITY SECTION

FREER RAMP



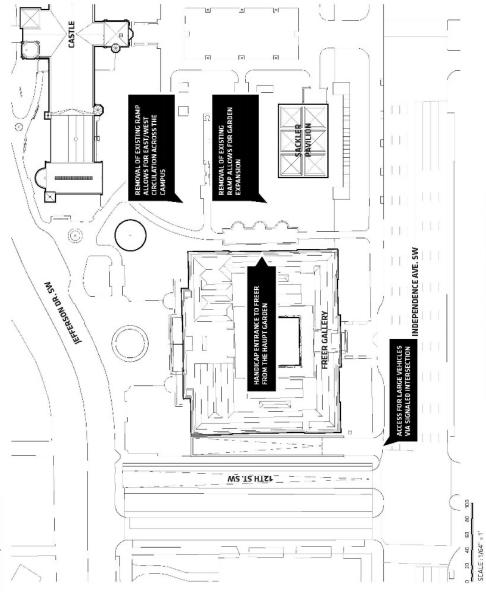
FREER CURB CUT AND LOADING FACILITY

 A new curb cut and ramp would allow for the consolidation of existing curb cuts and loading facilities and allow two-way traffic. Scheme allows for East/West circulation across the Campus

FREER CURB CUT | LOADING FACILITIES: QUAD COMPLEX

PROPOSED DIMENSIONS

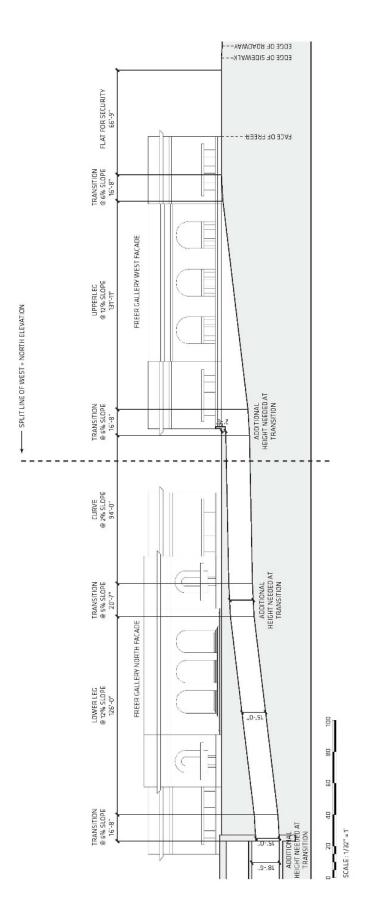
FREER CURB CUT & RAMP AT GRADE



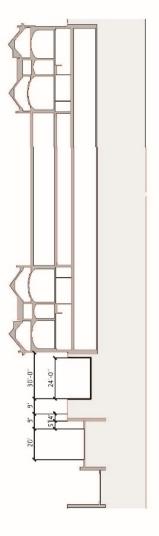
FREER CURB CUT | LOADING FACILITIES: QUAD COMPLEX





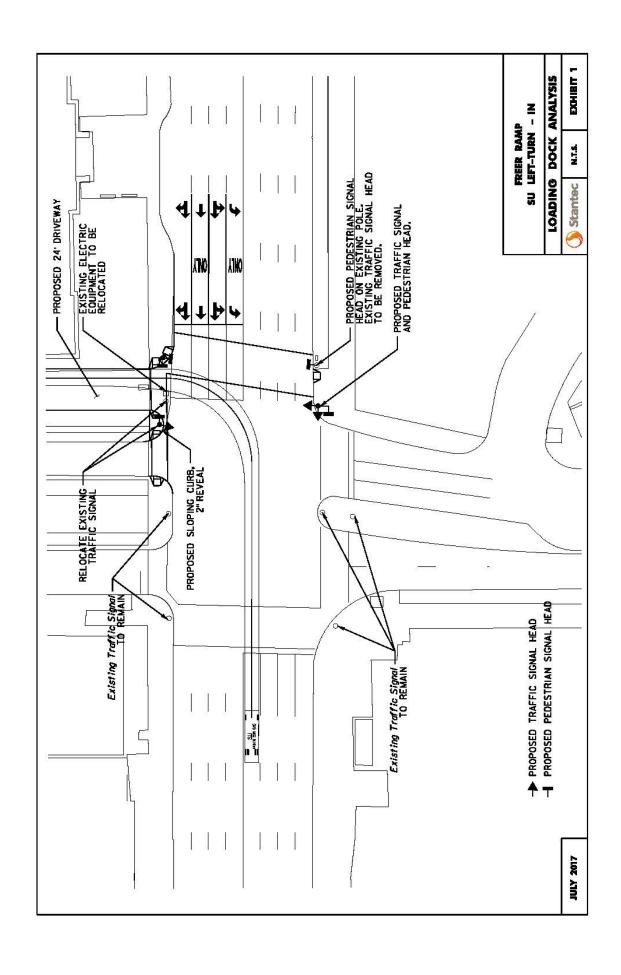


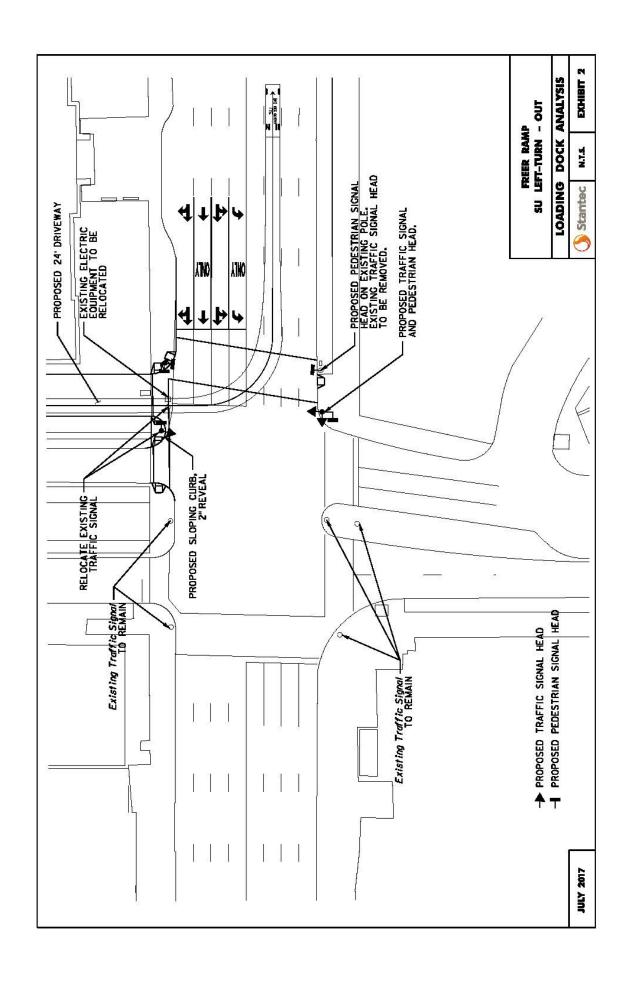
FREER LOADING FACILITY SECTION

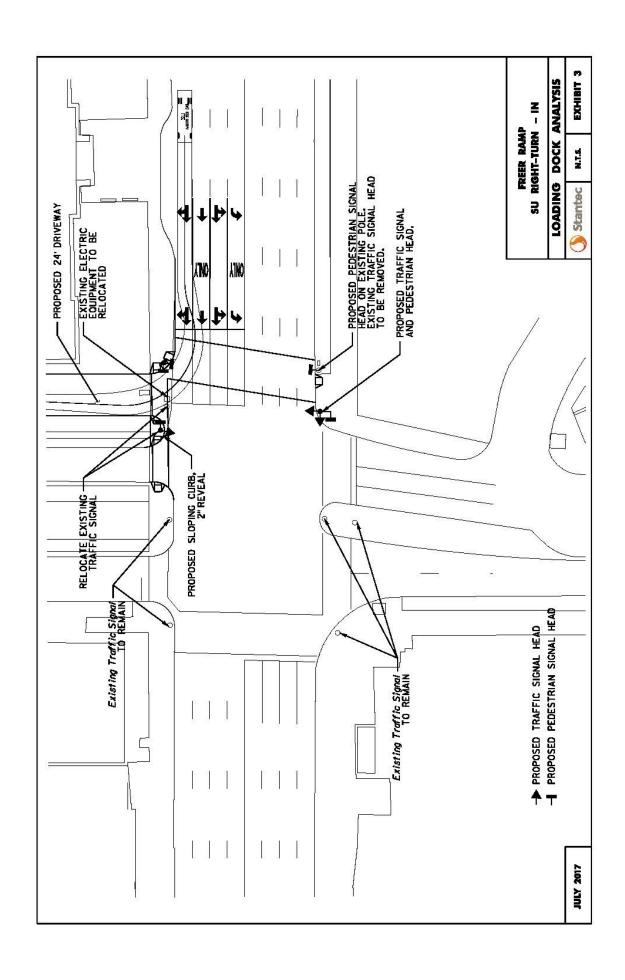


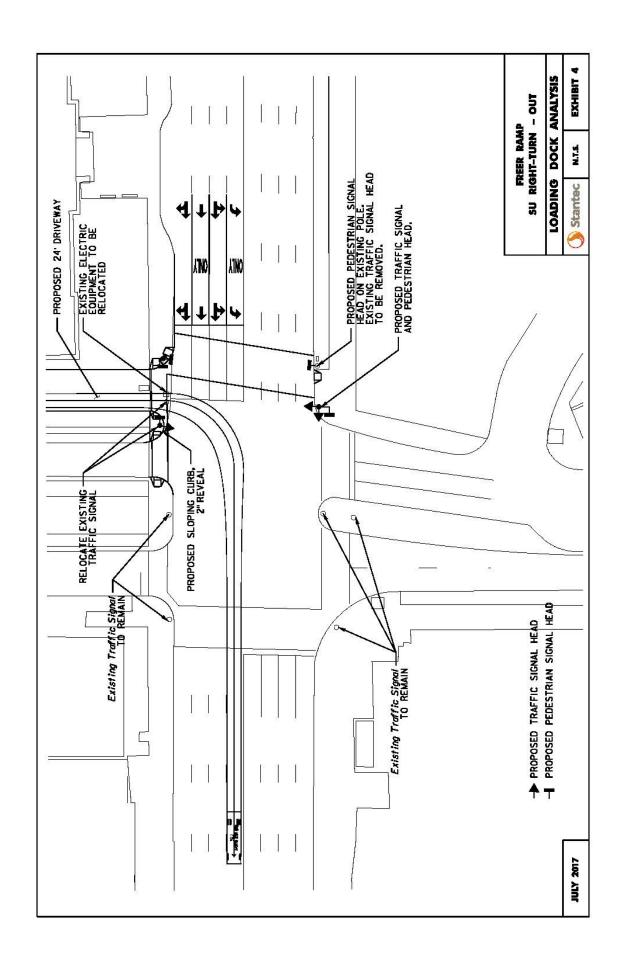
0 20 40 60 80 10 SCALE:1/32"=1'

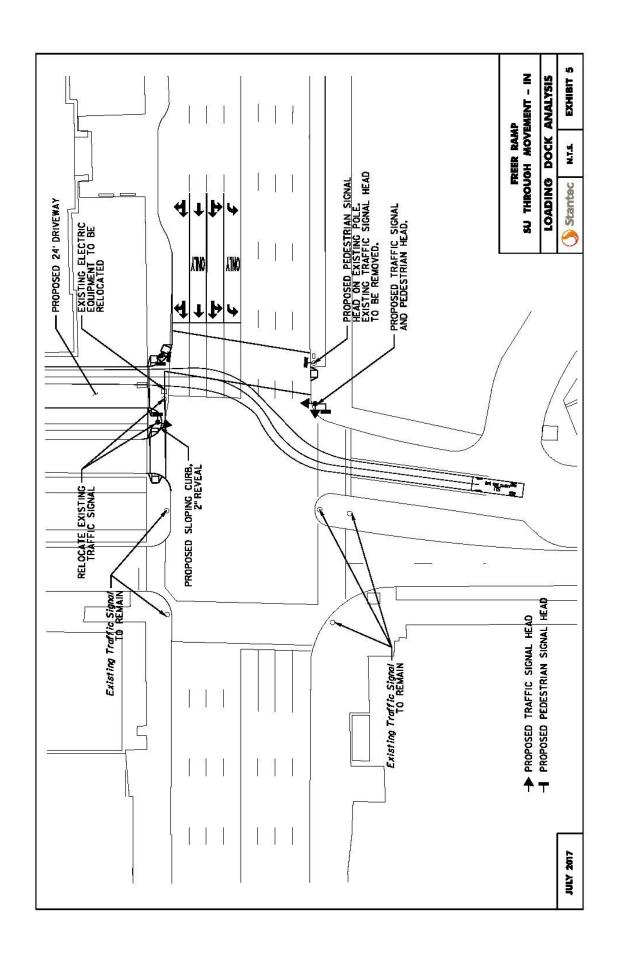
APPENDIX E:
INTERSECTION CONCEPT
WITH TRUCK TURNING
DIAGRAMS

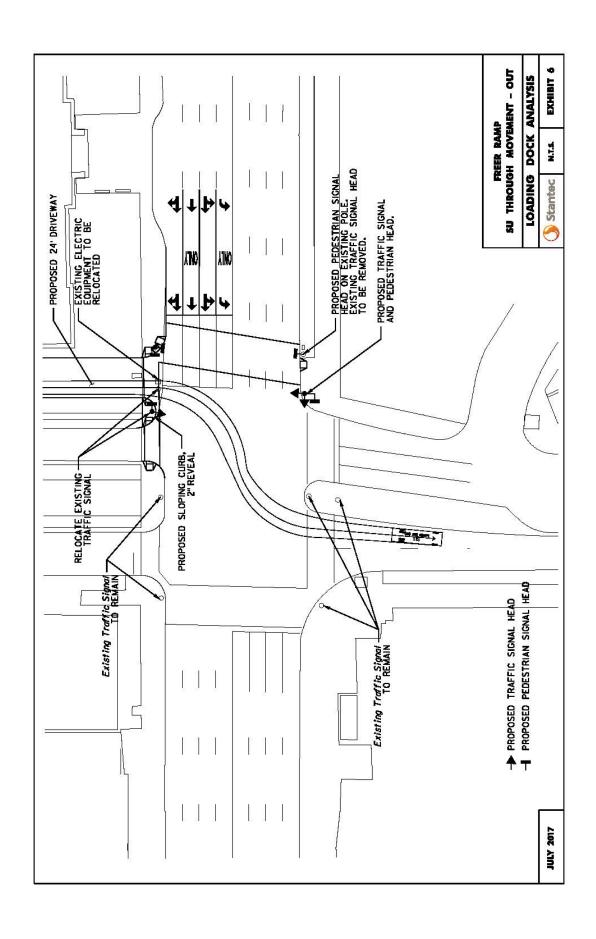


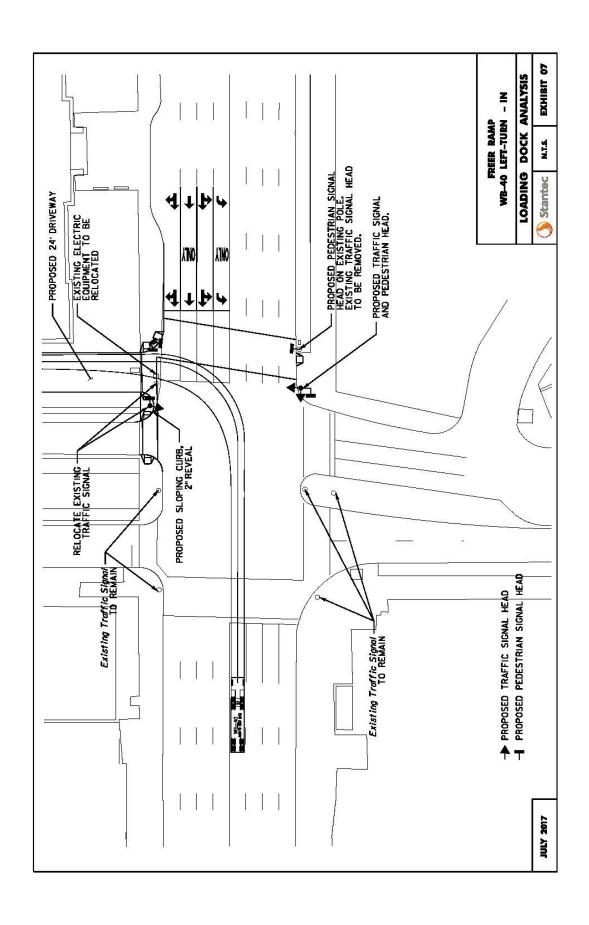


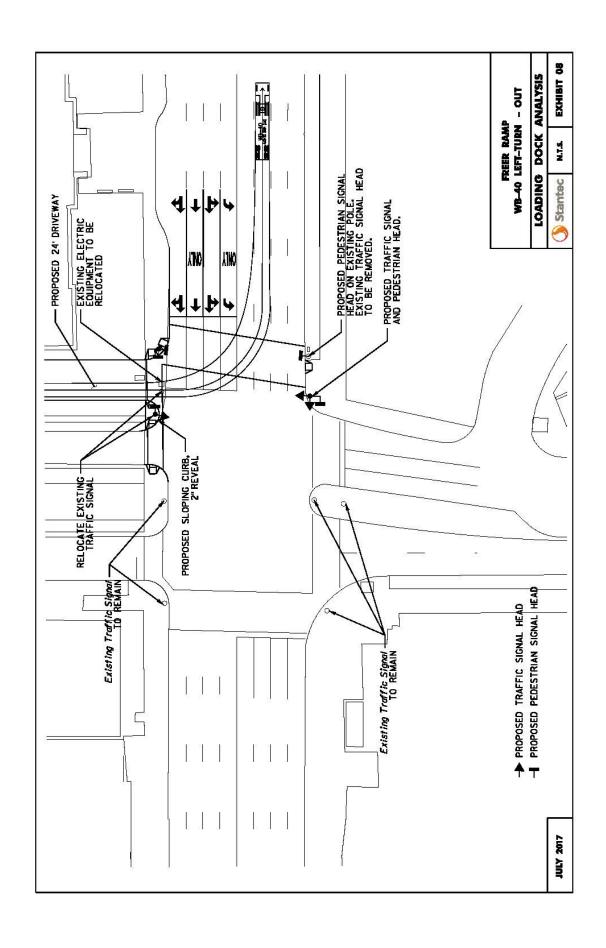


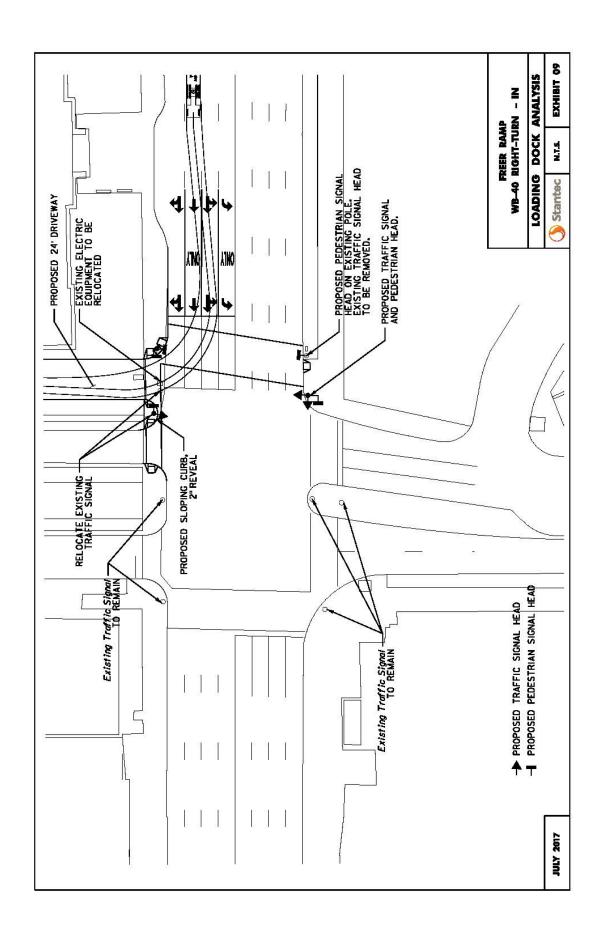


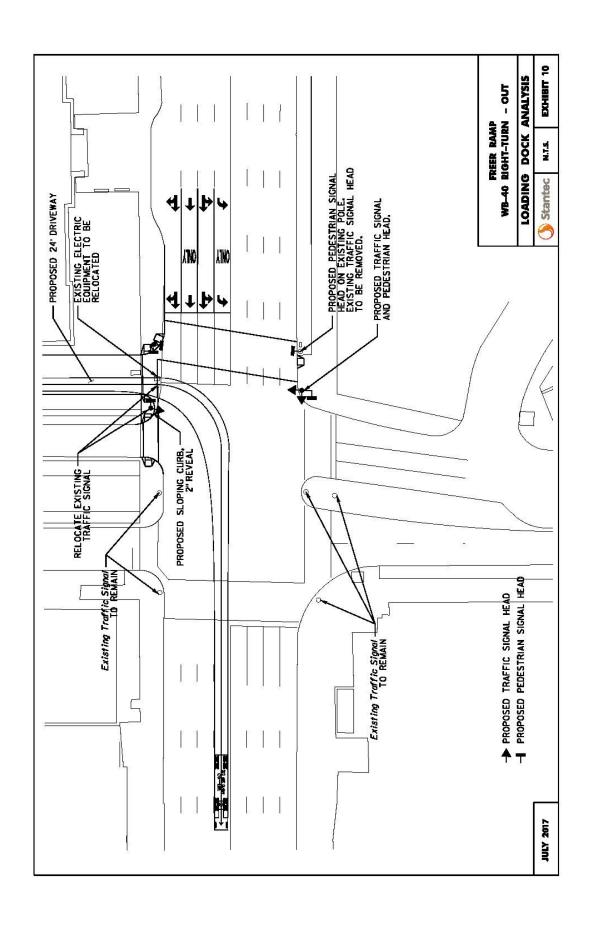


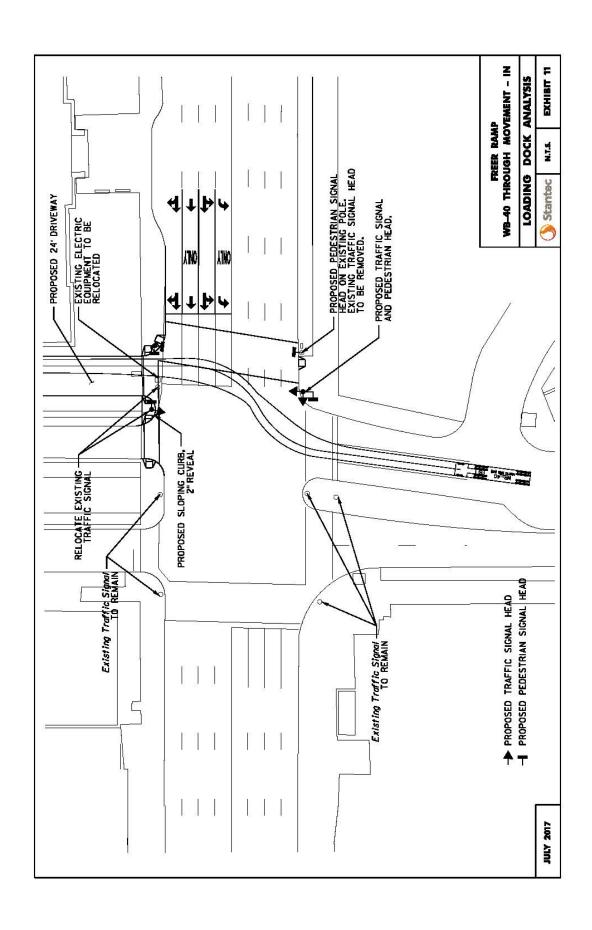


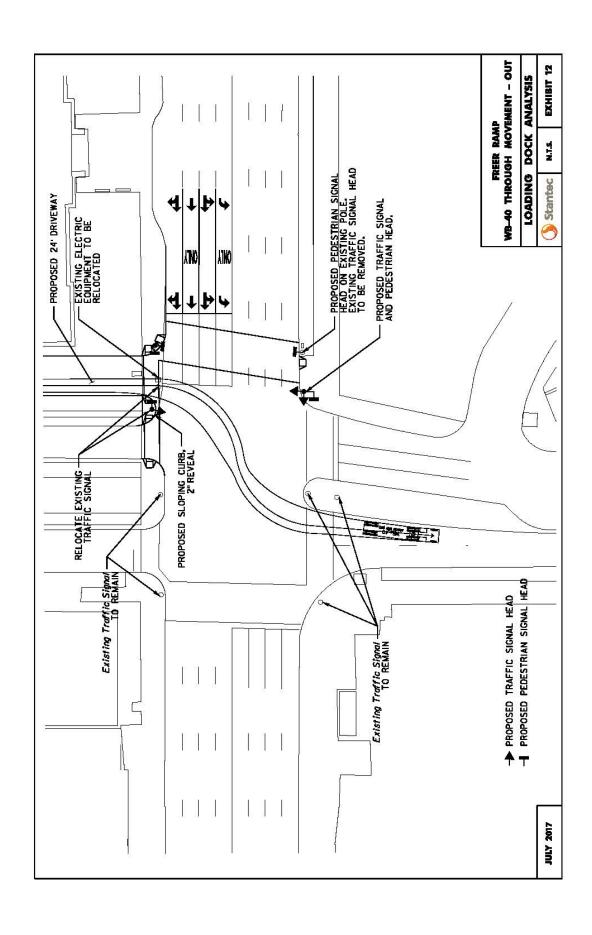


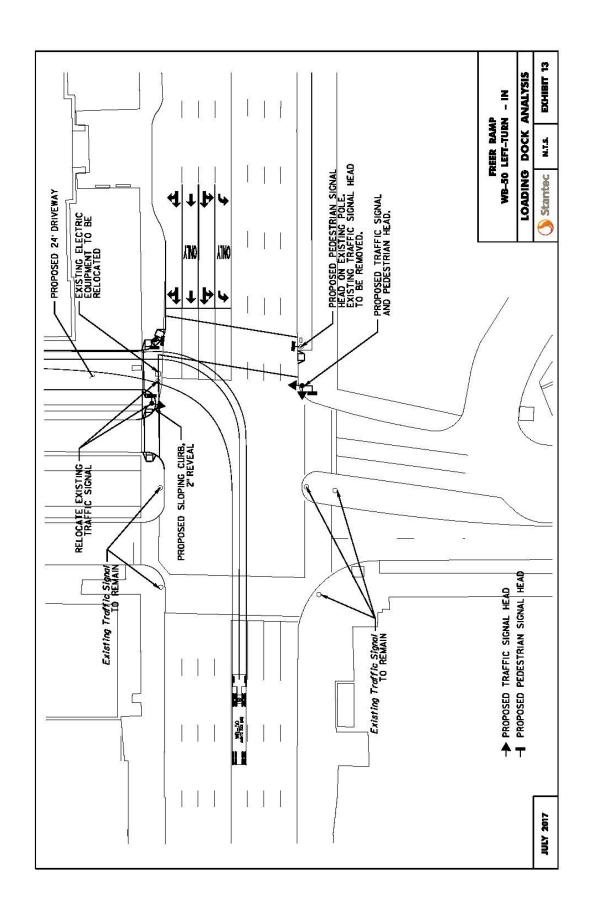


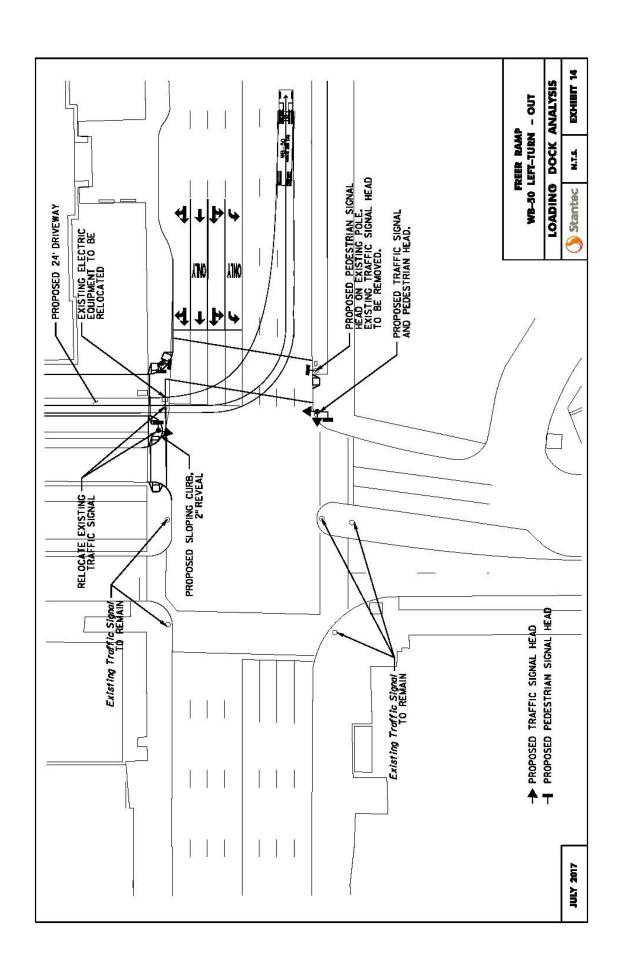


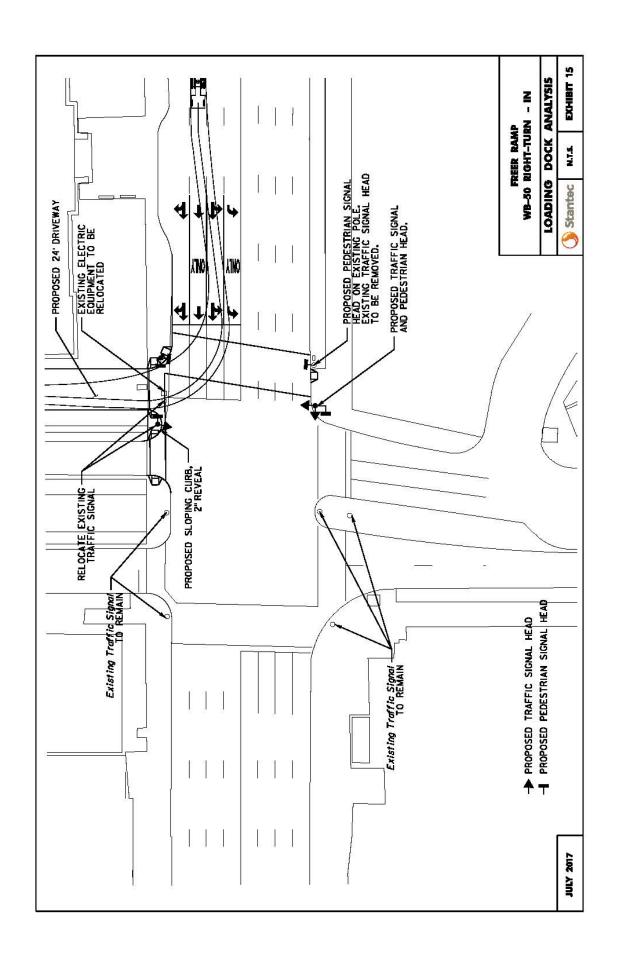


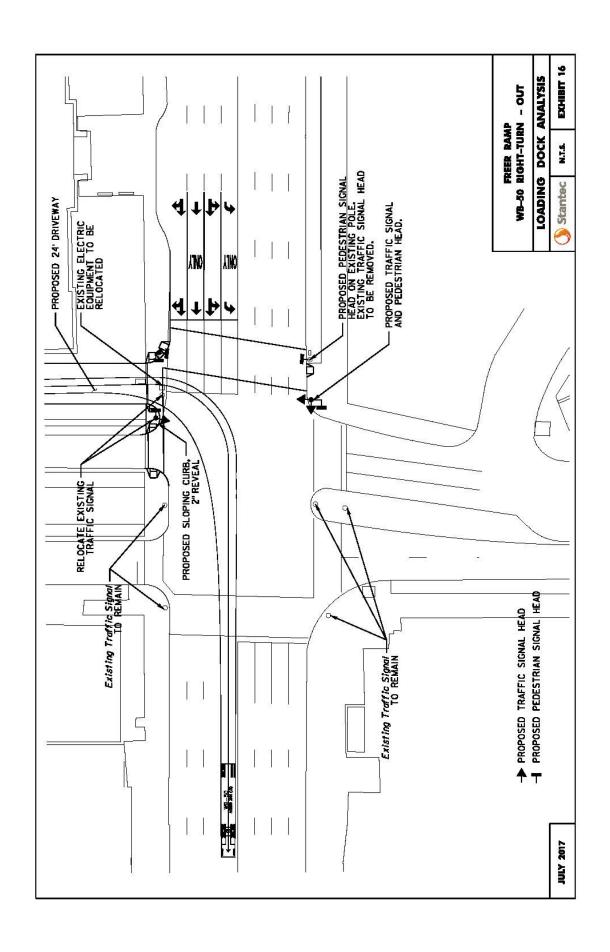


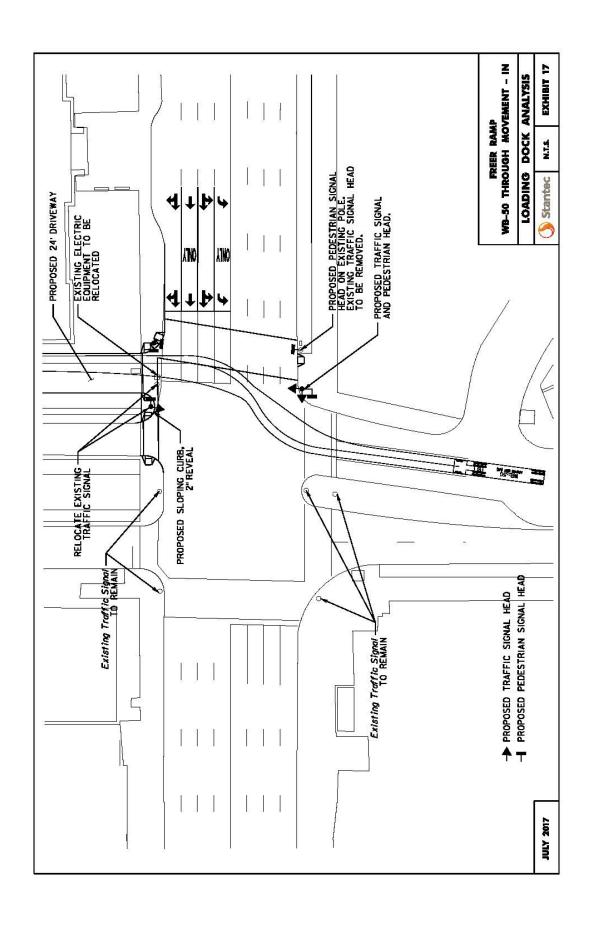


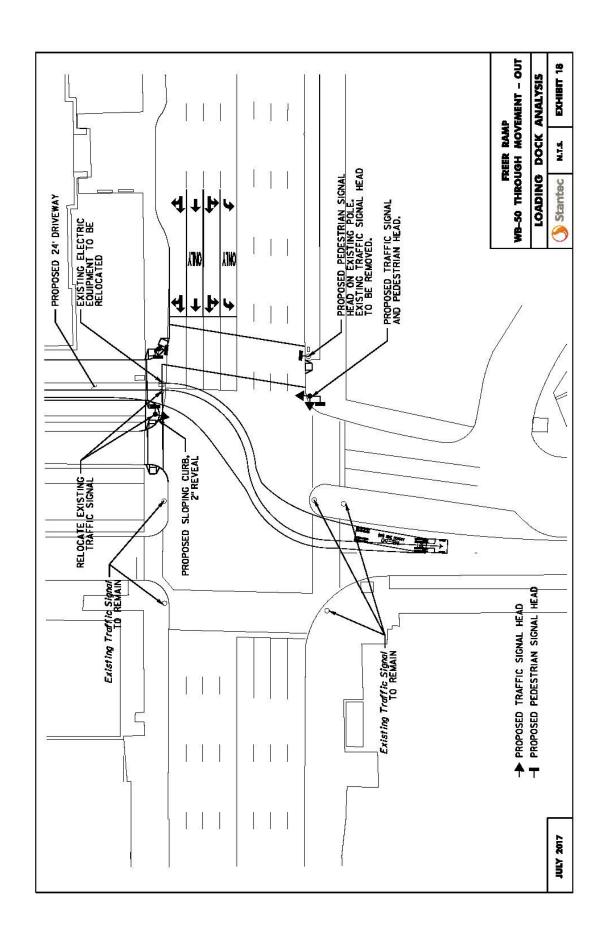


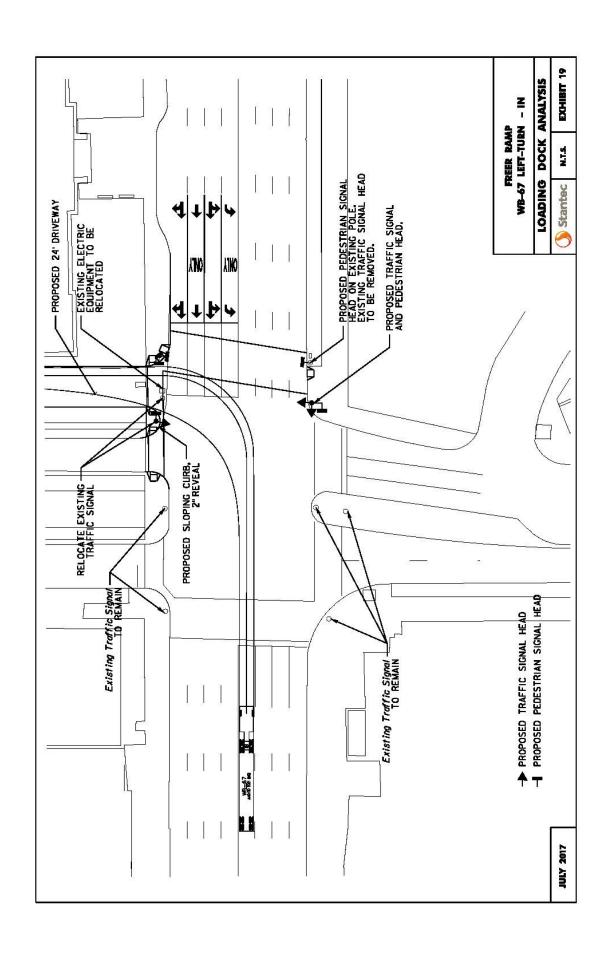


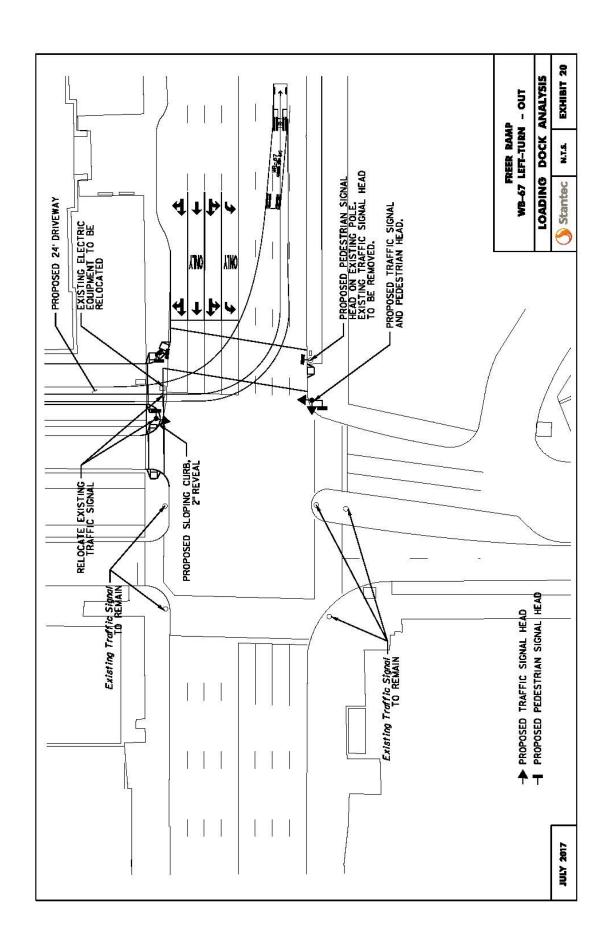


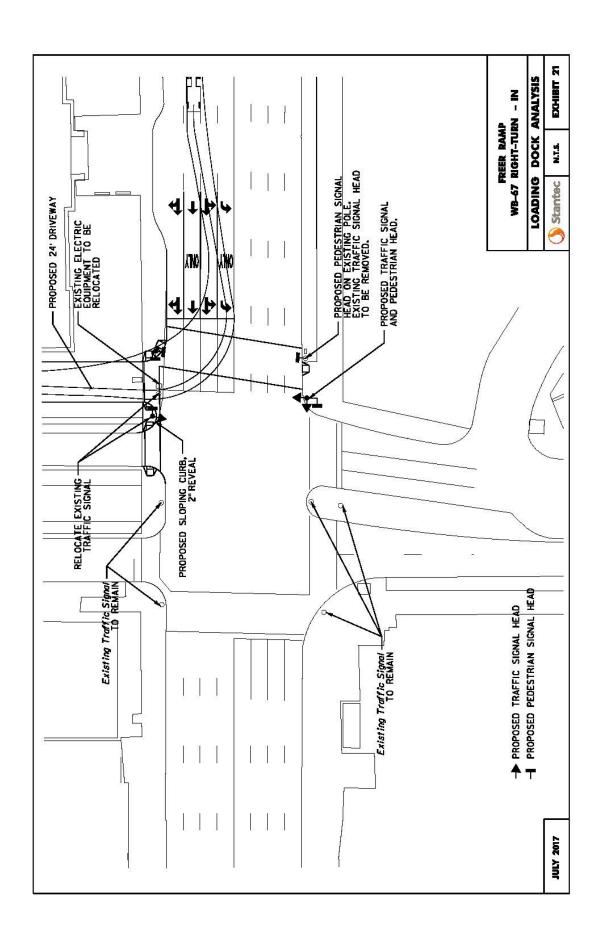


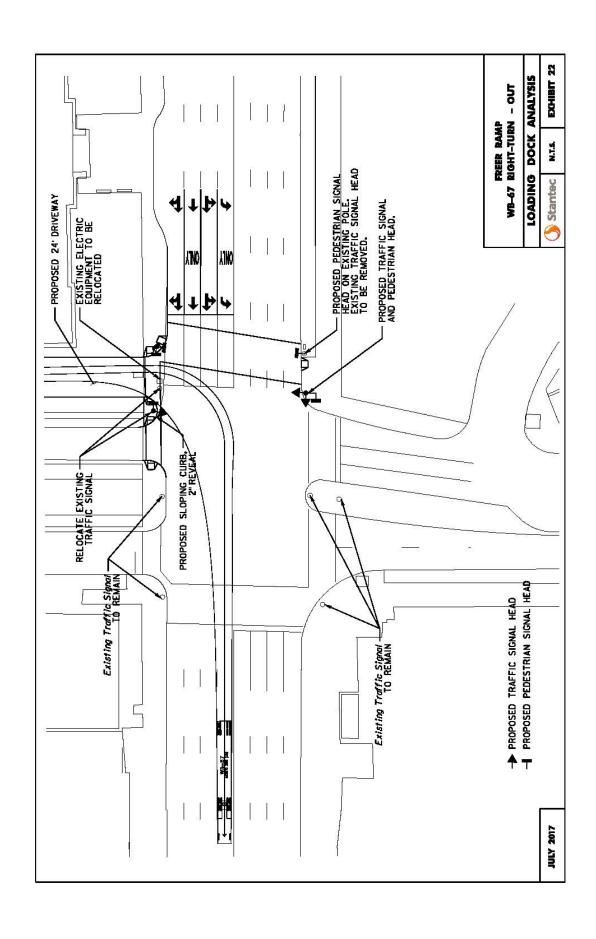


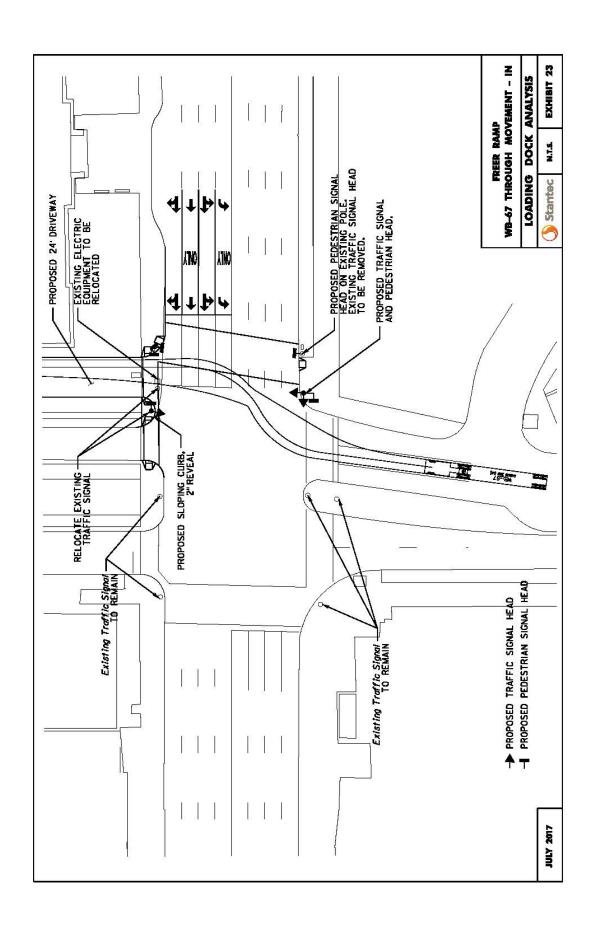












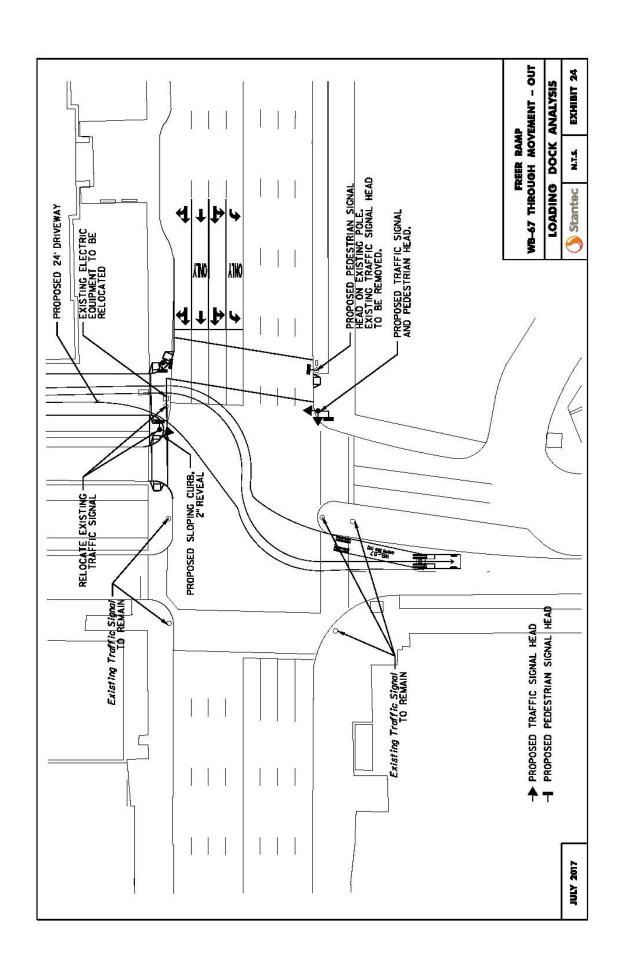
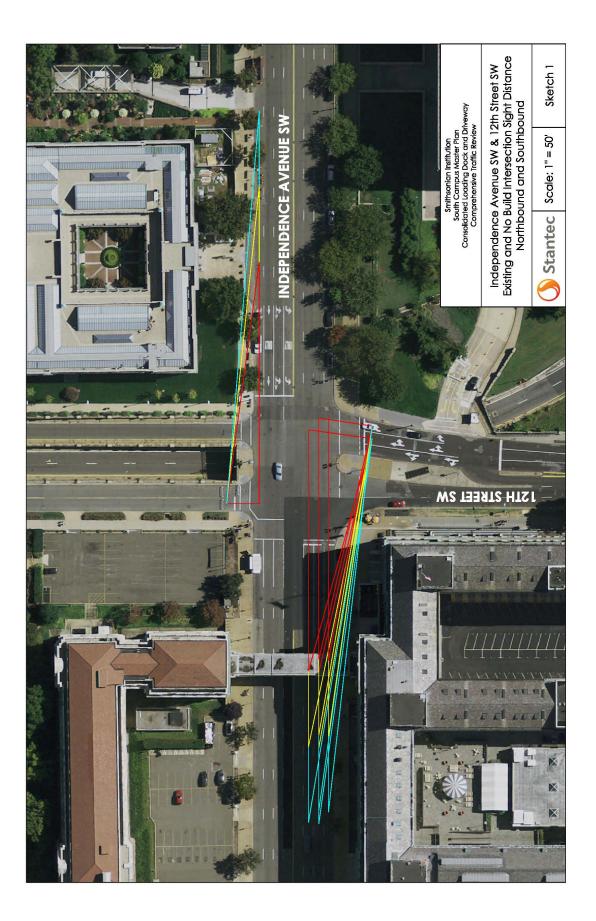


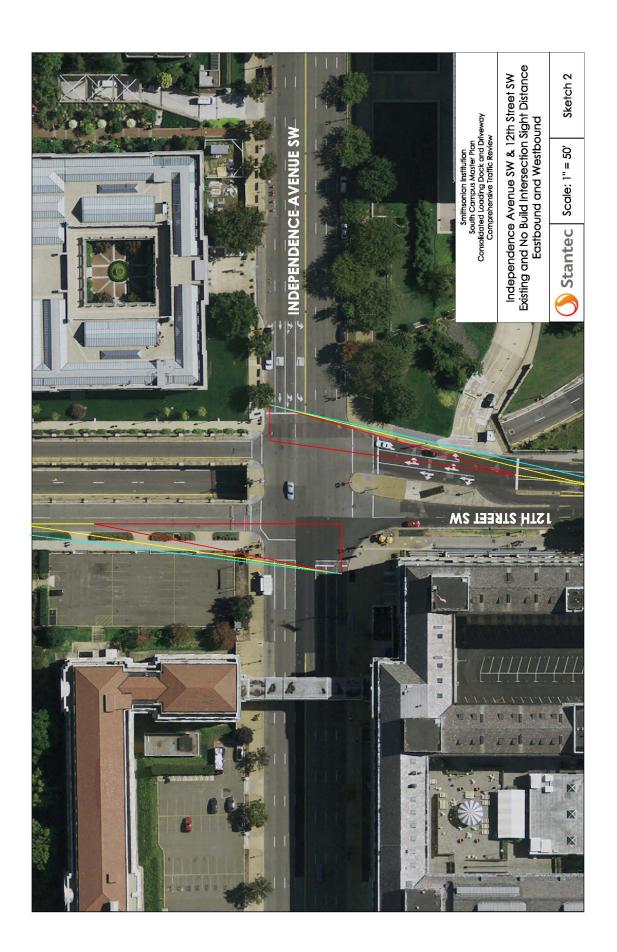


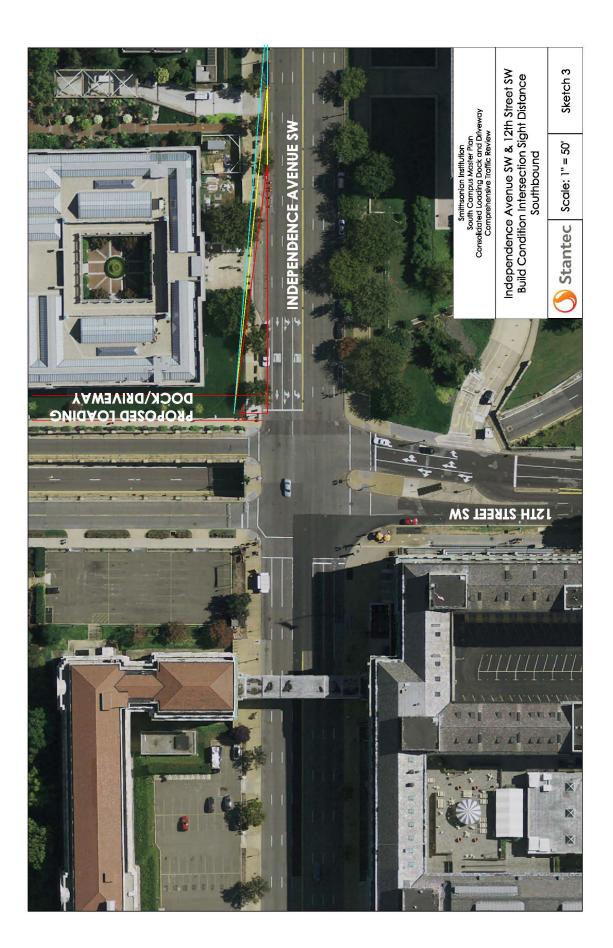
Exhibit 17 Smithsonian Institution, South Campus Master Plan Parking Inventory Tuesday, December 08, 2015

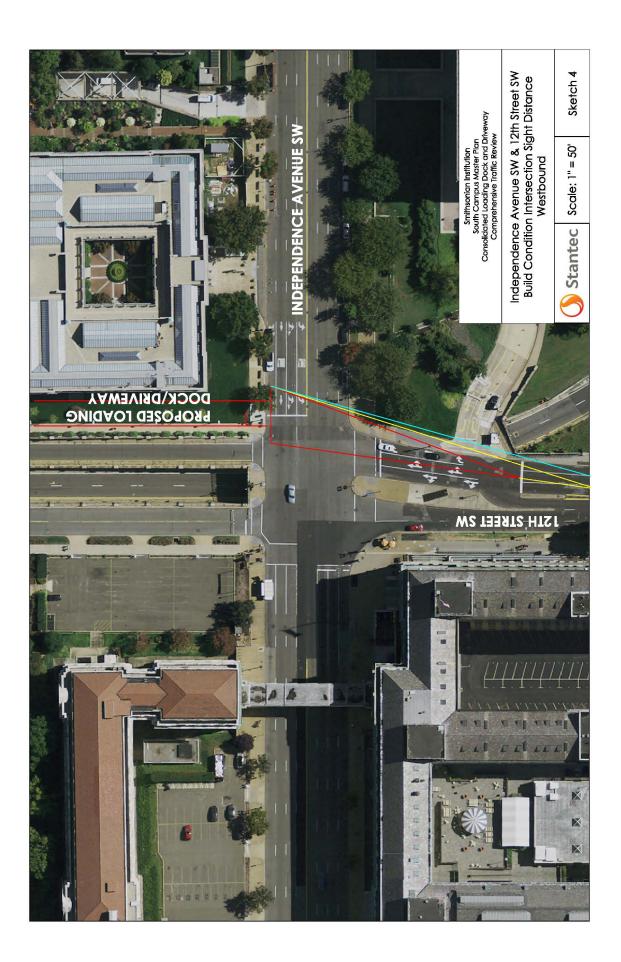
	Segment	Total # On-street # of Permit # of Metered # of ADA	# of Permit	# of Metered	# of ADA	Parking Regulations
	IS.	Parking Spaces	Spaces	Spaces	Spaces	
						1. No Parking Monday - Street Cleaning
1	Independence WB b/w 7th and 9th	15	3 Vendor	0	0	2. Tow Away/No Standing or Parking 7-9:30AM, 4-6:30PM M-F
						3. No Parking Bus Zone
,	the state of the s	r,	ď	**		1. Tow Away/No Standing or Parking 7-9:30AM, 4-6:30PM M-F
7	independence WB b/w 9th and L'enfant	1/	0	1/	0	2. Snow Emergency Route - Tow Away
3	Independence WB b/w L'Enfant and 12th	21	0	18	0	1. Tow Away/No Standing or Parking 7-9:30AM, 4-6:30PM M-F
						1. Tow Away/No Standing or Parking 7-9:30AM, 4-6:30PM M-F
					277	2. No Parking 9:30-11:30AM - Street Cleaning Tuesday
4	Independence WB b/w 12th and 14th	15	0	15	0	3. Metro Bus
						4. Snow Emergency Route - Tow Away
					(12.50)	5. Vendor Stand
		22				1. Tow Away/No Standing or Parking 7-9:30AM, 4-6:30PM M-F
2	Independence EB b/w 14th and 12th	17	0	17	0	2. No Parking 9:30-11:30AM - Street Cleaning Tuesday
						3. Tow Away - Metro Bus Zone
						1. Tow Away/No Standing or Parking 7-9:30AM, 4-6:30PM M-F
,	A STATE OF THE PARTY OF THE PAR	00	(90	2577	2. 2-Hour Parking 9:30AM-4PM, M-F, 7AM-6:30PM Saturday
٥	independence EB b/w 12th and L'Enfant	07	0	07	5	3. Pay by Phone
						4. No Parking 10PM - SAM - Street Cleaning Tuesday
7	Independence EB b/w L'Enfant and 9th	12	0	12	0	Has 3 main Signs
						1. ADA Parking
		•	(;		2. Tow Away/No Standing or Parking 7-9:30AM, 4-6:30PM M-F
0	True of we by we stand independence	ħŢ.	>	ΡŢ	7	3. 2-Hour Parking 9:30AM-4PM, M-F, 7AM-6:30PM Saturday
						4. Snow Emergency Route - Tow Away
	10 to	c	¢	c		1. Snow Emergency Route - Tow Away
ת	12th St SB B/W C St and Independence	'n	0	ת	0	2. 2-Hour Parking 9:30AM-4PM, M-Sat
10	14th St NB b/w C St and Independence	3	0	0	0	1. 15-min Tour Bus Stand 9:30AM-4PM, No Parking All Other Times
						1. No Standing or Parking Metro Bus Zones
11	14th St SB b/w C St and Independence	4	4	0	0	2. Snow Emergency Route - Tow Away
						3. Special Permit Parking (all times)
12	14th St NB b/w Independence and Jefferson	0	0	0	0	1. Snow Emergency Route - Tow Away
13		0	c	c	0121	1. Snow Emergency Route - Tow Away
13	14th 3t 3b b/w independence and Jerrerson	۰	5	,	5	2. Tow Away/No Standing or Parking 7-9:30AM, 4-6:30PM M-F

APPENDIX G: SAFETY









Accident Summary Report (R-7)

Time Per	riod Covered:	From 01/01/20	12 To 12/31	/2014 Prepa	red By:	admin TARAS	Prepa	ared Date	: 12/8/2015
Total Nur	mber of Accident		62	Collision Type	#ACC	%	Collision	Type #	ACC %
Total Nur	mber of Fatalities	s:	0	Right Angle:	3	4.8%	Fixed Obje	ect: 1	1.6%
Total Nur	mber of Injuries:		12	Left Turn:	0	0.0%	Ran Off R		1.6%
	nber of Disabling	njuries:	0	Right Turn:	4	6.5%	Ped. Invol		1.6%
	mber of NonDisa		4	Rear End:	17	27.4%	Backing:	C	
	mber of Pedestria	The state of the s	1	Side Swiped:	31	50.0%	Non Collis	ion: 0	
	mber of Bicycles		1	Head On:	0	0.0%	Under/Ove		
Total Nur	mber of Motorcyo	cles involved:	1	Parked:	0	0.0%	Unspecifie		
Time of I	Day	#ACC	%			Day o fweek		#ACC	: %
07:30 ~ 0	9:30:	7	11.3%			Sunday:		6	9.7%
09:30 ~ 1	1:30:	12	19.4%			Monday:		8	12.9%
11:30 ~ 1	3:30:	7	11.3%			Tuesday:		8	12.9%
13:30 ~ 1	6:00:	12	19.4%			Wednesday:		13	21.0%
16:00 ~1	8:30:	8	12.9%			Thursday:		11	17.7%
18:30 ~ 0		16	25.8%			Friday:		9	14.5%
Unspecifi		0	0.0%			Saturday:		7	11.3%
Weather	Condition	#ACC	%			Surface Cond	ition	#ACC	: %
Clear:		54	87.1%			Dry:		54	87.1%
Rain:		5	8.1%			Wet:		5	8.1%
Snow:		1	1.6%			Snow/Ice:		0	0.0%
Sleet/Hai	l:	0	0.0%			Slush:		0	0.0%
Fog/Mist:		0	0.0%			Water/Sand:		0	0.0%
	d/Blowing Sand:	1	1.6%			Repairing:		0	0.0%
Unspecifi		1	1.6%			Unspecified:		3	4.8%
Type of	Vehicle	#VEH	%			Accident Sev	erity Type	#ACC	: %
Passenge	er Car:	68	55.3%			Fatal Collision:	350 7000	0	0.0%
Bus:		20	16.3%			Injury Collision	:	11	17.7%
Truck:		8	6.5%			PDO Collision:		51	82.3%
Taxi:		12	9.8%						
Minivan:		0	0.0%			Light Condition	on	#ACC	
Police/En	nergency Vehicle	e: 2	1.6%			Daylight:		46	74.2%
	le/Moped:	1	0.8%			Dawn/Dusk:		1	1.6%
Bicycle:	3.5	1	0.8%			Dark(Lighted):		11	17.7%
Fixed Ob	iect:	0	0.0%			Dark(Not Light		1	1.6%
Unspecifi		11	8.9%			Dark(Unknown	Lighting):	0	0.0%
						Unspecified:		3	4.8%
	iting Factor	#VEH	%			Pedestrian Ad		#ACC	
Driver: Sp		0	0.0%			In Crosswalk w		1	100.0%
	cohol/Drug:	2	1.6%			In Crosswalk a	gainst Signal:	0	0.0%
Driver: El	ectronic Device:		0.0%			In Crosswalk n	o Signal:	0	0.0%
Driver: O	thers:	22	17.9%			In Unmarked C	crosswalk:	0	0.0%
Vehicle:		0	0.0%			Not in Crosswa	alk:	0	0.0%
Roadway	r.	1	0.8%			From Between	Parked Cars:	0	0.0%
Unspecifi	ed:	98	79.7%			Unspecified:		0	0.0%
Year	Accidents	Fatalities	Injurie	s Disabli	ng Injurie			iles I	Motorcycles
2012	19	0	3		3	0	1		0
2013	19	0	2		1	0	0		1
2014	24	0	7		0	1	0		0

¹ Records are not approved as of 12/8/2015 8:18:44 AM

Accident Summary Report (R-7)

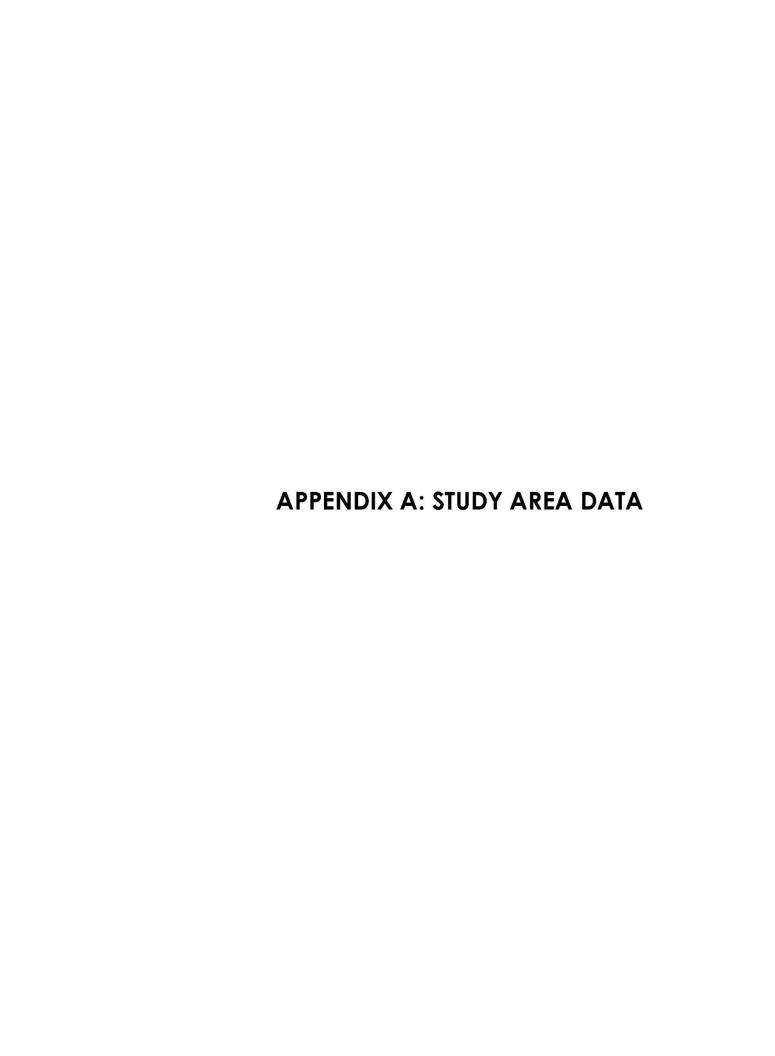
Intersec	tion: INDEPE	NDENCE AVE	and TWELF1	H ST, SW					
Time Pe	riod Covered:	From 01/01/20	12 To 12/31	2014 Prepar	red By:	admin TARAS	Prepa	red Date:	12/8/201
Total Nur	mber of Accident	ti	53	Collision Type	#ACC	%	Collision 7	Type ##	ACC 9
Total Nur	mber of Fatalities	5:	0	Right Angle:	7	13.2%	Fixed Obje	ct: 0	0.09
Total Nur	mber of Injuries:		24	Left Turn:	6	11.3%	Ran Off Ro	oad: 0	0.09
Total Nur	mber of Disabling	g Injuries:	3	Right Turn:	2	3.8%	Ped. Involv	red: 4	7.59
Total Nur	mber of NonDisa	bling Injuries:	9	Rear End:	10	18.9%	Backing:	1	1.99
Total Nur	mber of Pedestri	ans Involved:	5	Side Swiped:	19	35.8%	Non Collisi	on: 1	1.99
Total Nur	mber of Bicycles	Involved:	2	Head On:	1	1.9%	Under/Ove	r Ride: 0	0.09
Total Nur	mber of Motorcy	cles involved:	2	Parked:	1	1.9%	Unspecified	d: 1	1.99
Time of	Day	#ACC	%			Day o fweek		#ACC	9
07:30 ~ 0	9:30:	5	9.4%			Sunday:		2	3.89
09:30 ~ 1	11:30:	3	5.7%			Monday:		9	17.09
11:30 ~ 1	13:30:	10	18.9%			Tuesday:		7	13.29
13:30 ~ 1		11	20.8%			Wednesday:		8	15.19
16:00 ~1		16	30.2%			Thursday:		14	26.49
18:30 ~ 0		8	15.1%			Friday:		6	11.39
Unspecif		0	0.0%			Saturday:		7	13.29
Weather	Condition	#ACC	%			Surface Condi	tion	#ACC	9
Clear:		45	84.9%			Dry:		45	84.99
Rain:		8	15.1%			Wet:		8	15.19
Snow:		0	0.0%			Snow/Ice:		0	0.0
Sleet/Hai	le.	0	0.0%			Slush:		0	0.0
Fog/Mist		0	0.0%			Water/Sand:		0	0.0
	d/Blowing Sand		0.0%			Repairing:		0	0.09
Unspecif	Contraction of the contraction o	0	0.0%			Unspecified:		0	0.09
Type of	Vehicle	#VEH	%			Accident Seve	rity Type	#ACC	0
Passeng		58	57.4%			Fatal Collision:		0	0.0
Bus:		15	14.9%			Injury Collision:		18	34.09
Truck:		3	3.0%			PDO Collision:		35	66.09
Taxi:		19	18.8%						
Minivan:		0	0.0%			Light Condition	n	#ACC	
	mergency Vehicle		1.0%			Daylight:		45	84.9
	le/Moped:	2	2.0%			Dawn/Dusk:		0	0.0
Bicycle:	телиореа.	2	2.0%			Dark(Lighted):		7	13.29
Fixed Ob	iect:	ō	0.0%			Dark(Not Lighte	d):	0	0.0
Unspecifi		1	1.0%			Dark(Unknown	Lighting):	0	0.0
Onspecia		•	1.070			Unspecified:		1	1.99
Contribu	iting Factor	#VEH	%			Pedestrian Act	ions	#ACC	,
Driver: S	peed:	1	1.0%			In Crosswalk wi	th Signal:	3	60.09
Driver: A	lcohol/Drug:	0	0.0%			In Crosswalk ag	gainst Signal:	0	0.0
Driver: E	lectronic Device:	0	0.0%			In Crosswalk no	Signal:	0	0.0
Driver: O	thers:	21	20.8%			In Unmarked Cr	osswalk:	0	0.0
Vehicle:		0	0.0%			Not in Crosswal	k:	1	20.09
Roadway	r.	0	0.0%			From Between	Parked Cars:	0	0.0
Unspecif		79	78.2%			Unspecified:		1	20.09
Year	Accidents	Fatalities	Injurie	s Disablir	ng Injurie			les M	lotorcycles
2012	20	0	7		3	2	0		1
2013	16	0	6		3	2	0		1
2014	17	0	11		3	1	2		0

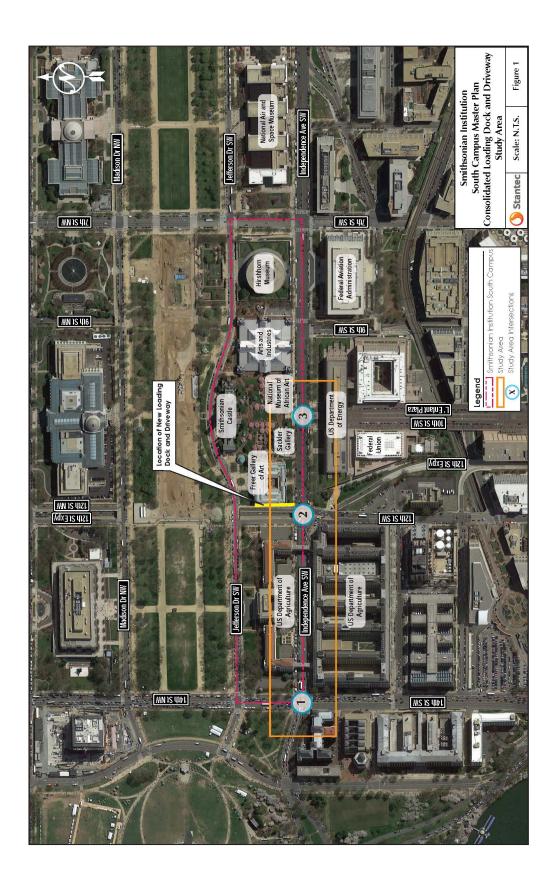
⁰ Records are not approved as of 12/8/2015 8:17:02 AM

Accident Summary Report (R-7)

Time Per	riod Covered:	From 01/01/20	12 To 12/31	/2014 Prepa	red By:	admin TARAS	Prepar	ed Date:	12/8/2015
Total Nun	nber of Accident		8	Collision Type	#ACC	: %	Collision T	vpe #/	ACC %
Total Nun	nber of Fatalities	:	0	Right Angle:	0	0.0%	Fixed Object	et: 0	0.0%
Total Nun	nber of Injuries:		3	Left Turn:	1	12.5%	Ran Off Ro	ad: 0	0.09
Total Nun	nber of Disabling	Injuries:	0	Right Turn:	0	0.0%	Ped. Involv	ed: 0	0.0%
	nber of NonDisal		0	Rear End:	1	12.5%	Backing:	0	0.0%
	nber of Pedestria		0	Side Swiped:	3	37.5%	Non Collisio	on: 0	0.0%
	nber of Bicycles		0	Head On:	1	12.5%	Under/Over		0.0%
	nber of Motorcyc		0	Parked:	2	25.0%	Unspecified		0.0%
Time of D	Day	#ACC	%			Day o fweek		#ACC	9/
07:30 ~ 0	9:30:	0	0.0%			Sunday:		0	0.0%
09:30 ~ 1		1	12.5%			Monday:		0	0.0%
11:30 ~ 1		3	37.5%			Tuesday:		2	25.0%
13:30 ~ 1		2	25.0%			Wednesday:		1	12.5%
16:00 ~18		0	0.0%			Thursday:		1	12.5%
18:30 ~ 0		2	25.0%			Friday:		2	25.0%
Unspecifi		0	0.0%			Saturday:		2	25.0%
Weather	Condition	#ACC	%			Surface Condition	on.	#ACC	9/
Clear:		8	100.0%			Dry:		8	100.0%
Rain:		0	0.0%			Wet:		0	0.0%
Snow:		o	0.0%			Snow/Ice:		0	0.0%
Sleet/Hail		o	0.0%			Slush:		0	0.0%
Fog/Mist:		0	0.0%			Water/Sand:		0	0.09
	d/Blowing Sand:		0.0%			Repairing:		0	0.0%
Unspecifi	All the second second second second	0	0.0%			Unspecified:		0	0.0%
Type of	Vehicle	#VEH	%			Accident Severi	ty Tyne	#ACC	%
Passenge		10	62.5%			Fatal Collision:	, .,,-	0	0.0%
Bus:		3	18.8%			Injury Collision:		2	25.0%
Truck:		1	6.3%			PDO Collision:		6	75.0%
Taxi:		i	6.3%			1 DO COMBION.			10.07
Minivan:		o	0.0%			Light Condition		#ACC	9/
	nergency Vehicle		6.3%			Daylight:		6	75.0%
	le/Moped:	0	0.0%			Dawn/Dusk:		1	12.5%
-	ie/iviopeu.	0	0.0%			Dark(Lighted):		1	12.5%
Bicycle:	COL	0				Dark(Not Lighted):	0	0.0%
Fixed Obj		0	0.0%			Dark(Unknown Li		0	0.0%
Unspecifi	ea.	U	0.0%			Unspecified:		0	0.0%
Contribu	ting Factor	#VEH	%			Pedestrian Actio	ons	#ACC	%
Driver: Sp		2	12.5%			In Crosswalk with	Signal:	0	0.0%
	cohol/Drug:	0	0.0%			In Crosswalk aga		0	0.0%
Driver: El	ectronic Device:	0	0.0%			In Crosswalk no	Signal:	0	0.0%
Driver: Ot		3	18.8%			In Unmarked Cro	100	0	0.0%
Vehicle:		0	0.0%			Not in Crosswalk		0	0.0%
Roadway	:	0	0.0%			From Between Pa		0	0.0%
Unspecifi		11	68.8%			Unspecified:		0	0.09
Year	Accidents	Fatalities	Injurie	es Disabli	ng Injurie			es N	lotorcycles
2013	2	0	0		0	0	0		0
2014	6	0	3		0	0	0		0

⁰ Records are not approved as of 12/8/2015 8:22:05 AM









To: Jonathan Rogers From: Adam Catherine

DDOT Stantec

File: 2028110978 Date: October 20, 2015

Reference: Loading Dock Trip Generation Analysis

The Smithsonian Institution (SI) South Campus Master Plan includes several improvements that are intended to enhance the user experience by providing seamless connections between the various South Campus facilities, increasing the visibility of the facilities, and providing additional education and visitor service space. As part of the overall vision for the South Campus, SI is proposing to consolidate three existing loading areas along Independence Avenue into a single loading driveway that would be accessed via a ramp at the intersection of Independence Avenue and 12th Street, on the west side of the Freer Gallery (see **Attachment A**). The consolidation of the three existing loading driveways would eliminate breaks in the current campus site plan, allowing for a cohesive connection across the entire campus for visitors. In addition, the new loading driveway would be able to accept all truck types, as well as eliminate the need for trucks to back in to or out of the driveways, as occurs in the existing condition.

This memorandum summarizes the analysis that was performed to estimate the number of AM peak hour, PM peak hour, and weekday loading trips that would be consolidated at the new driveway location. It should be noted that the proposed loading driveway consolidation is not anticipated to generate additional personal auto (car), transit, pedestrian, or bicycle trips.

Existing Conditions

Observations of the existing loading areas were conducted from 7:00 AM - 7:00 PM for a period of seven days between Thursday, September 24 and Wednesday, September 30, 2015. Field data collection technicians noted the arrival and departure times of each vehicle, the vehicle type (van, box truck, or tractor trailer), the direction from which they entered and the direction to which they exited, as well as if the vehicle needed to back into or out of the loading area. The raw data is contained in **Attachment B**, and a summary of the data is shown in **Table 1**.

In addition to the loading area data, turning movement counts were conducted at the signalized intersections of Independence Avenue and 12^{th} Street, and Independence Avenue and L'Enfant Plaza on Tuesday, September 29 from 7:00 AM – 10:00 AM and 3:00 PM – 7:00 PM. The turning movement counts were used to determine the AM and PM peak hours of Independence Avenue for the purposes of the truck trip generation analysis, and will also be used to conduct the capacity analysis for the existing and proposed conditions.

The data shown in **Table 1** reveals that the majority of truck activity occurs on weekday, off-peak periods. No deliveries were recorded on Saturday, and only two were recorded on Sunday. It should also be noted that almost 60% of all the delivery vehicles either back into or out of the existing loading driveways, thus impeding traffic flow on Independence Avenue.



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Reference: Loading Dock Trip Generation Analysis

Table 1: Summary of Existing Loading Area Activity

	142	Total Number of Vehicles over 7-Day Count Period
99%	140	Number of Vehicles Arriving/Departing on a Weekday
1%	2	Number of Vehicles Arriving/Departing on a Weekend
	38 min	Average Duration of Loading Area Activity (per Vehicle)
44%	62	Vehicles Backing Into Loading Dock
13%	19	Vehicles Backing out of Loading Dock
80%	110	Vehicles Entering From WB Independence Ave*
20%	29	Vehicles Entering From EB Independence Ave*
64%	87	Vehicles Departing to WB Independence Ave*
36%	50	Vehicles Departing to EB Independence Ave*
	6	Highest Number of Trips During AM Peak Hour of Independence Avenue (8:00 AM - 9:00 AM)
50%	3	Entering
	0	Van
	2	Box Truck
	1	Tractor Trailer
50%	3	Exiting
	0	Van
	2	Box Truck
	1	Tractor Trailer
	5	Highest Number of Trips During PM Peak Hour of Independence Avenue (4:45 PM - 5:45 PM)
40%	2	Entering
	0	Van
	2	Box Truck
	0	Tractor Trailer
60%	3	Exiting
	0	Van
	2	Box Truck
	1	Tractor Trailer
	96	Highest Number of Weekday Trips
50%	48	Entering
	6	Van
	34	Box Truck
	8	Tractor Trailer
50%	48	Exiting
	6	Van
		Box Truck
	34	Tractor Trailer

^{*}The total number of entering and departing vehicles is slightly less than the total vehicles recorded because of vehicle arrivals/departures that occurred before or after the count period.



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Reference: Loading Dock Trip Generation Analysis

The AM peak hour, PM peak hour, and weekday trips shown in **Table 1** represent the highest number of trips that were recorded on any given weekday during the duration of the counts. This will provide a conservative analysis of the proposed condition.

Estimate of Future Loading Activity

In addition to the consolidated loading driveway, the Master Plan includes an expansion of the South Campus facilities to provide additional user amenities, such as dining and shopping. While the exact square footages of the retail/dining areas are unclear at this time, an increase in loading driveway activity is anticipated. SI provided Stantec with an estimate of food-related delivery activity at the National Museum of the American Indian (NMAI), which has facilities similar to those anticipated for the South Campus.

Table 2: Estimate of Future Loading Area Activity

Weekday Trips			Existing	New	Future
35. 0	Entering	Total	48	13	61
	200	Van	6	0	6
	1	Box Truck	34	13	47
		Tractor Trailer	8	0	8
	Exiting	Total	48	12	60
		Van	6	0	6
	1	Box Truck	34	12	46
		Tractor Trailer	8	0	8
	Total	·	96	25	121
AM Peak Hour Trips	Entering	Total	3	1	4
	_	Van	0	0	0
	1	Box Truck	2	1	3
		Tractor Trailer	1	0	1
	Exiting	Total	3	1	4
		Van	0	0	0
	1	Box Truck	2	1	3
		Tractor Trailer	1	0	1
	Total		6	2	8
PM Peak Hour Trips	Entering	Total	2	1	3
		Van	0	0	0
	1	Box Truck	2	1	3
	l.	Tractor Trailer	0	0	0
	Exiting	Total	3	1	4
		Van	0	0	0
	l	Box Truck	2	1	3
		Tractor Trailer	1	0	1
	Total		5	2	7



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Reference: Loading Dock Trip Generation Analysis

The data provided by NMAI indicates that there are approximately 25 food-related deliveries on a typical weekday, which primarily utilize box trucks. However, SI did not have logs to identify the time or duration of the deliveries. Therefore, the NMAI data was applied to the ratio of peak hour to daily trips, obtained from the South Campus data, to estimate the number of additional deliveries that would occur at the consolidated driveway location. **Table 2** provides the total AM peak hour, PM peak hour, and weekday trips that would be experienced in the proposed condition.

Trip Arrival and Distribution Patterns

It is assumed that the distribution of both existing and new trips would follow the existing distribution pattern shown in **Table 1**. However, it should be noted the proposed consolidated loading area is being designed so that trucks of all types can enter the facility and use an L-shaped loading area within the site to back into the dock, thereby eliminating the backing activity that currently occurs on Independence Avenue (see **Attachment A**).

Conclusions and Next Steps

This memorandum summarizes the analysis that was performed to estimate the number of AM peak hour, PM peak hour, and weekday truck loading trips that would be consolidated at the new driveway location. The results of the analysis indicate that the majority of trips occur on weekdays and during off-peak periods. The data also reveals that almost 60% of the loading trips require a vehicle to back into or out of the loading dock, thus blocking traffic on Independence Avenue.

Based on the results of the trip estimate, the proposed consolidated driveway would experience approximately 121 daily trips, with a minimal amount occurring during the AM peak hour (8) and PM peak hour (7). The proposed loading driveway would also eliminate backing activity that currently occurs on Independence Avenue. However, due to its proximity to the intersection of Independence Avenue and 12^{th} Street, a capacity analysis must be performed to determine if an actuated traffic signal phase for the new driveway could be provided without significantly impacting intersection operations.

STANTEC CONSULTING SERVICES INC.

Adam Catherine

Associate

Phone: (856) 234-0800 ext 8542

Fax: (856) 234-5926

Adam.Catherine@stantec.com

Attachment: Attachment A: Proposed Loading Dock Plan

Attachment B: Existing Delivery Data

Attachment B
Smithsonian South Campus Loading Dock
Vehicle Counts
Thursday, September 24, 2015 - Wednesday, September 30, 2015

					Duration						Fatadas	Fort series of	D	Damatian
Vehicle	Day	Date	Time In	Time Out	(min)	Vehicle Type	Pull In	Back In	Pull Out	Back Out	Entering From WB	Entering From EB	Departing to WB	Departing to EB
1	Thursday	9/24/2015		9:15 AM	31	Box Truck	1	Duck III	1	Duck Duc	1		1	10 20
2	Thursday	9/24/2015		10:31 AM	46	Box Truck	1		1		1		1	
3	Thursday	9/24/2015	9:32 AM	10:46 AM	74	Van	1		1			1		1
4	Thursday	9/24/2015	9:36 AM	9:47 AM	11	Box Truck		1	1		1			1
5	Thursday	9/24/2015		9:52 AM	7	Box Truck		1	1		1		1	
6	Thursday	9/24/2015			18	Box Truck		1	1		1			1
7	Thursday	9/24/2015		1:12 PM	11	Van	1		1			1	1	
8	Thursday	9/24/2015		3:52 PM	10	Tractor Trailer		1	1		1		2	1
9	Friday	9/25/2015		7:08 AM	21	Tractor Trailer	191	1	1		1		1	
10	Friday	9/25/2015		7:58 AM	16	Box Truck	1	1	1		1		1	
11	Friday Friday	9/25/2015		8:32 AM 8:41 AM	28	Tractor Trailer Box Truck	1	1	1		1		1	
13	Friday	9/25/2015		9:10 AM	7	Box Truck	1		1		1		1	
14	Friday	9/25/2015		9:23 AM	17	Box Truck	1		1		1		1	
15	Friday	9/25/2015		9:23 AM	12	Box Truck	1		1		1			1
16	Friday	9/25/2015		9:55 AM	12	Tractor Trailer	100	1	1		1			1
17	Friday	9/25/2015		9:55 AM	6	Box Truck	1		1		1			1
18	Friday	9/25/2015			26	Box Truck	1		1		1		1	
19	Friday	9/25/2015			19	Box Truck		1	1			1		1
20	Friday	9/25/2015	10:23 AM	11:29 AM	.6	Box Truck	1		1		1			1
21	Friday	9/25/2015	10:27 AM	10:46 AM	19	Tractor Trailer		1	1			1	1	
22	Friday	9/25/2015	10:49 AM	11:12 AM	23	Tractor Trailer		1	1		1			1
23	Friday	9/25/2015	11:10 AM	12:05 PM	55	Box Truck	1		1		1		1	
24	Friday	9/25/2015			54	Box Truck	1		1		1		1	
25	Friday	9/25/2015			83	Tractor Trailer		1	1		1		1	
26	Friday	9/25/2015			43	Box Truck		1	1		1		1	
27	Friday	9/25/2015			55	Box Truck	1		1		1			1
28	Friday	9/25/2015			90	Tractor Trailer		1	1		1		1	
29 30	Friday	9/25/2015			41	Box Truck	1		1		1			1
30 31	Friday	9/25/2015		1:31 PM 1:51 PM	45	Box Truck Box Truck	1		1			1	1	
32	Friday Friday	9/25/2015		2:13 PM	40	Tractor Trailer	1	1	1		1	1	1	1
33	Friday	9/25/2015		2:13 PM	30	Tractor Trailer		1	1		1			1
34	Friday	9/25/2015		Z.13 F W	-	Box Truck	1	*	1		1			
35	Friday	9/25/2015				Box Truck	1		1		1			
36	Friday	9/25/2015		2:11 PM	6	Box Truck	1		1		1		1	
37	Friday	9/25/2015		2:54 PM	11	Box Truck	1		1		1		1	
38	Friday	9/25/2015		2:58 PM	14	Box Truck	1		1			1	1	
39	Friday	9/25/2015	2:55 PM	3:05 PM	10	Box Truck		1	1		1		1	
40	Friday	9/25/2015	3:30 PM	5:22 PM	112	Box Truck	1		1		1		1	
41	Friday	9/25/2015	5:21 PM	5:42 PM	21	Tractor Trailer		1	1		1			1
42	Sunday	9/27/2015			51	Van	1		1			1	1	
43	Sunday	9/27/2015		3:32 PM	175	Van	1		1			1	1	
44	Monday	9/28/2015		7:24 AM	12	Box Truck	1		1			1	1	
45	Monday	9/28/2015		8:23 AM	38	Tractor Trailer		1		1		1		1
46	Monday	9/28/2015		8:38 AM	34	Box Truck		1	1			1	1	
47	Monday	9/28/2015		9:31 AM	41	Tractor Trailer		1	1		1		.2	1
48	Monday Monday	9/28/2015		9:01 AM 9:09 AM	9	Box Truck Box Truck	1	1	1		1	1	1	
50	Monday	9/28/2015		9:32 AM	21	Tractor Trailer	7	1	1		1	1	1	
51	Monday	9/28/2015		9:54 AM	18	Box Truck	1		1		1		1	1
52	Monday	9/28/2015			10	Box Truck		1	1		1		1	
53	Monday	9/28/2015			143	Box Truck		1	-	1	1		1	
54	Monday	9/28/2015			50	Box Truck	1	-	1	-	1		1	
55	Monday	9/28/2015			30	Box Truck	1		1		1		1	
56	Monday	9/28/2015			21	Box Truck	1		1			1		1
57	Monday	9/28/2015		1:37 PM	46	Box Truck	1		1		1			1
58	Monday	9/28/2015	1:25 PM	1:34 PM	9	Tractor Trailer		1			1		1	
59	Monday	9/28/2015		1:51 PM	6	Box Truck	1		1		1			1
60	Monday	9/28/2015		1:56 PM	9	Box Truck	1		1		1		1	
61	Monday	9/28/2015		2:17 PM	10	Box Truck	1		1		1			1
62	Monday	9/28/2015	3:18 PM	3:24 PM	6	Box Truck	1		1		1		1	

63	Tuesday	9/29/2015	~	7:16 AM	0.40	Box Truck			1				1	
64	Tuesday	9/29/2015	-	7:19 AM	100	Box Truck			1.				1	
65	Tuesday	9/29/2015		7:20 AM		Box Truck			1					1
66	Tuesday	9/29/2015	6:15 000	7:09 AM	54	Box Truck	1		1			1	1	-
67					142		1		1			1		
	Tuesday	9/29/2015		9:37 AM		Tractor Trailer		1		1	1		1	
68	Tuesday	9/29/2015		7:47 AM	21	Box Truck	1		1		1			1
69	Tuesday	9/29/2015	7:27 AM	7:51 AM	24	Box Truck	1		1		1		1	
70	Tuesday	9/29/2015	7:29 AM	8:45 AM	76	Box Truck	1		1		1		1	
71	Tuesday	9/29/2015	7:45 AM	8:49 AM	64	Box Truck	1		1		1		1	
72	Tuesday	9/29/2015	8:38 AM	9:16 AM	38	Box Truck	1		1		1		1	
73					77				-	242				
	Tuesday	9/29/2015				Box Truck	1			1	1		1	
74	Tuesday	9/29/2015			54	Box Truck	1		1		1		1	
75	Tuesday	9/29/2015			58	Tractor Trailer		1		1		1		1
76	Tuesday	9/29/2015	9:40 AM	10:46 AM	66	Tractor Trailer		1		1	1		1	
77	Tuesday	9/29/2015	9:46 AM	10:07 AM	21	Box Truck	1			1	1		1	
78	Tuesday	9/29/2015	9-53 AM	10:09 AM	16	Box Truck	1			1	1			1
79	Tuesday	9/29/2015			60	Tractor Trailer		1	1		2			1
								-						1
80	Tuesday	9/29/2015			26	Box Truck		1	1		1		1	
81	Tuesday	9/29/2015			25	Box Truck		1	1		1			1
82	Tuesday	9/29/2015	10:14 AM	10:34 AM	20	Box Truck		1	1		1		1	
83	Tuesday	9/29/2015	10:17 AM	10:41 AM	24	Box Truck	1			1	1			1
84	Tuesday	9/29/2015			40	Box Truck	1				1			1
85	Tuesday	9/29/2015			34	Tractor Trailer		1		1		1		1
86					28				6					
	Tuesday	9/29/2015				Box Truck		1	1		1			1
87	Tuesday	9/29/2015			58	Box Truck	1		1			1		1
88	Tuesday	9/29/2015	10:56 AM	11:15 AM	19	Box Truck	1		1		1		1	
89	Tuesday	9/29/2015	11:00 AM	11:34 AM	34	Box Truck	1		1			1	1	
90	Tuesday	9/29/2015	11:25 AM	12:34 PM	69	Tractor Trailer		1		1	1			1
91	Tuesday	9/29/2015			28	Box Truck		1	1		1		1	
92	Tuesday	9/29/2015			21	Box Truck		1	1		1		1	
93	Tuesday	9/29/2015	12:07 PM	12:35 PM	28	Box Truck	1			1	1			1
94	Tuesday	9/29/2015	12:12 PM	12:40 PM	28	Box Truck	1		1		1			1
95	Tuesday	9/29/2015	12:24 PM	1:53 PM	89	Tractor Trailer		1		1	1		1	
96	Tuesday	9/29/2015			52	Box Truck		1		1		1		1
97	Tuesday	9/29/2015			10	Box Truck	1	*	3.		1		1	
											-		-	
98	Tuesday	9/29/2015		1:03 PM	25	Box Truck		1	1		1		1	
99	Tuesday	9/29/2015		1:34 PM	38	Box Truck	1		1		1		1	
100	Tuesday	9/29/2015	1:15 PM	1:43 PM	28	Box Truck		1	1			1	1	
101	Tuesday	9/29/2015	1:18 PM	3:31 PM	133	Box Truck	1		1		1		1	
102	Tuesday	9/29/2015	1:20 PM	3:31 PM	131	Box Truck	1			1	1		1	
103	Tuesday	9/29/2015	1:20 PM	3:37 PM	137	Box Truck	1		1		1		1	
104	Tuesday			3:22 PM	97	Tractor Trailer		1	1		1		1	
105	Tuesday	9/29/2015		3:37 PM	76	Box Truck	1			1	1			1
106	Tuesday	9/29/2015	3:03 PM	4:15 PM	72	Tractor Trailer		1		1	1		1	
107	Tuesday	9/29/2015	3:20 PM	4:07 PM	47	Box Truck		1	1		1		1	
108	Tuesday	9/29/2015		4:10 PM	40	Box Truck	1		1.			1		1
109	Tuesday	9/29/2015	4:05 PM	-1.20 / 141		Box Truck	1				1			
							T	2						
110	Tuesday	9/29/2015	4:44 PM		(*)	Tractor Trailer		1			1			
111	Wednesday		7:47 AM	7:50 AM	3	Box Truck		1	1			1	1	
112	Wednesday	9/30/2015	8:42 AM	9:17 AM	35	Van	1		1		1		1	
113	Wednesday	9/30/2015	8:50 AM	9:05 AM	15	Van	1		1			1	1	
114	Wednesday	9/30/2015	9:02 AM	10:02 AM	60	Van	1		1.		1			1
115	Wednesday			9:17 AM	7	Box Truck	1		1		1		1	
116	Wednesday			9:22 AM	8	Box Truck		1		1	1		1	
									- 4	1			1	
117	Wednesday				105	Tractor Trailer		1	1		1			
118	Wednesday			9:56 AM	7	Box Truck		1	1			1	1	
119	Wednesday	9/30/2015	10:22 AM	10:27 AM	65	Box Truck	1			1		1		1
120	Wednesday	9/30/2015	10:35 AM	11:02 AM	27	Box Truck	1		1		1		1	
121	Wednesday	9/30/2015	10:41 AM	11:41 AM	60	Box Truck		1	1		1		1	
122	Wednesday	9/30/2015	11-17 AM	11-28 AM	11	Van	1		1		1		1	
123	Wednesday				6	Van		1	1		1		1	
								4			(4)		4	
124	Wednesday	-,,			4	Van	1		1		31	1	9	1
125	Wednesday			12:26 PM	32	Box Truck		1	1		1		1	
126	Wednesday				32	Van	1		1		1		1	
127	Wednesday	9/30/2015	12:16 PM	12:32 PM	16	Box Truck		1	1		1		1	
128	Wednesday				12	Box Truck		1	3.		1		1	
129	Wednesday			1:18 PM	5	Box Truck		1	1		1			1
130			1:14 PM	1:37 PM	23	Box Truck		_					1	1
	Wednesday							1	1		1			
131	Wednesday			1:38 PM	13	Van	1		1			1	1	
132	Wednesday		1:56 PM	2:11 PM	15	Van	1		1		1		1	
133	Wednesday	9/30/2015	1:56 PM	2:38 PM	42	Van	1		1		1			1
134	Wednesday		2:42 PM	3:22 PM	40	Box Truck		1	1		1		1	
135	Wednesday		3:03 PM	3:27 PM	24	Box Truck		1	1		1		107	1
				3:24 PM										
136	Wednesday		3:11 PM		13	Van		1	1		1	100		1
137	Wednesday			4:01 PM	44	Box Truck		1	1			1		1
138	Wednesday	9/30/2015	3:21 PM	3:22 PM	1	Van	1		1		1			1
139	Wednesday	9/30/2015	3:33 PM	4:25 PM	52	Box Truck	1		1		1		1	
140	Wednesday		3:56 PM	5:12 PM	76	Box Truck		1	1.		1			1
141	Wednesday		5:05 PM		(4)	Van		1	-22		1		1	
142	Wednesday					Box Truck	1				1		100	1
7-45	•veuriesudy	2/30/2013	JUST PIN	4		DOX ITUCK	77	62	447	19		29	87	
					37.78195		11	62	117	19	110	29	87	50

Ĩ	14th St, SW Northbound			1	4th St, SW Southbound			endence Ave Eastbound	e, SW	Independence Ave, SW Westbound		
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
07:00	0	470	62	15	122	6	0	245	8	0	79	29
07:15	0	474	67	22	156	3	0	326	10	1	90	37
07:30	0	537	71	21	110	3	0	263	10	0	106	21
07:45	0	558	64	20	145	3	0	353	14	0	117	35
08:00	0	577	52	35	118	1	0	361	14	1	143	48
08:15	0	657	56	31	126	5	0	408	9	0	150	56
08:30	0	546	30	33	103	2	0	370	11	0	162	65
08:45	0	506	46	23	127	7	0	396	14	0	142	61
09:00	0	552	43	34	146	3	0	377	5	0	126	81
09:15	0	494	29	36	97	9	1	414	12	0	104	66
09:30	0	512	30	27	82	3	0	365	6	1	90	33
09:45	0	445	42	26	103	5	2	280	7	1	116	40
Peak Hour	0	2286	184	122	474	15	0	1535	48	1	597	230
15:00	0		26	29	261	8	0	80	10	1	112	23
15:15	0		49	35	286	10	1	117	7	1	89	22
15:30	0		30	27	307	5	1	66	2	0	118	20
15:45	0	0.000	22	43	331	10	0	72	5	3	154	32
16:00	0		57	52	362	8	1	68	7	3	245	27
16:15	0	370	92	51	457	6	0	101	4	2	281	30
16:30	0		65	26	344	6	0	117	3	0	189	25
16:45	0		87	39	314	3	0	81	4	2	204	27
17:00	0		92	34	331	11	0	117	12	1	210	23
17:15	0		87	38	360	6	0	127	5	0	229	22
17:30	0		77	26	332	0	1	130	6	0	207	19
17:45	0		96	38	421	4	0	99	13	2	226	22
18:00	0		85	29	422	8	0	65	2	3	123	51
18:15	0	326	54	23	356	11	0	96	3	2	213	43
18:30	0	309	50	32	400	11	0	106	8	3	172	29
18:45	0	230	43	17	395	9	1	98	4	2	148	23
Peak Hour	0	1469	352	136	1444	21	1	473	36	3	872	86

Ĩ	1	4th St, SW Northbound			14th St, SW Southbound			endence Ave Eastbound	e, SW		ndence Ave Vestbound	e, SW
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
07:00	0	6	2	3	9	0	0	0	0	1	1	7
07:15	0	9	3	3	8	1	0	1	0	0	1	3
07:30	0	2	3	4	6	1	1	- 1	0	1	0	8
07:45	0	7	1	4	13	0	2	3	0	1	1	4
08:00	0	8	2	6	5	1	0	1	0	1	2	4
08:15	0	4	3	4	6	0	1	2	0	0	0	2
08:30	0	5	3	8	9	1	3	1	0	3	0	5
08:45	0	6	3	5	5	0	2	2	0	0	2	4
09:00	0	3	0	4	9	0	1	4	0	1	1	1
09:15	0	0	3	4	6	1	0	2	0	0	1	6
09:30	0	3	1	5	8	0	1	3	0	2	0	1
09:45	0	6	2	3	3	1	0	1	0	1	3	4
Peak Hour	0	23	11	23	25	2	6	6	0	4	4	15
15:00	0	3	2	2	6	0	0	0	0	0	7	2
15:15	0	5	1	2	3	0	2	0	0	0	5	2
15:30	0	3	2	5	4	0	0	1	0	1	7	2
15:45	0	7	0	0	3	0	1	1	1	3	7	5
16:00	0	4	1	5	4	0	0	2	0	2	3	2
16:15	0	5	2	5	3	0	1	3	0	4	7	9
16:30	0	8	2	3	8	0	3	2	0	2	3	5
16:45	0	3	2	4	3	0	2	3	0	1	8	4
17:00	0	2	3	0	1	0	1	2	0	2	15	5
17:15	0	7	- 1	1	8	0	2	1	- 1	2	6	1
17:30	0	4	2	3	10	0	0	3	0	2	5	3
17:45	0	1	2	4	7	0	1	1	0	5	4	6
18:00	0	2	2	2	6	0	2	2	0	4	0	1
18:15	0	3	1	0	3	0	1	1	0	0	2	2
18:30	0	4	1	3	2	0	2	1	0	3	0	5
18:45	0	1	3	2	6	0	0	0	0	2	2	1
Peak Hour	0	14	8	8	26	0	4	7	1	11	30	15

		4th St, SW	1		4th St, SW		Independence Ave, SW Independence Ave, SW					e. SW	
		Northbound			outhbound			astbound			Vestbound		
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
07:00	0	476	64	18	131	6	0	245	8	1	80	36	1065
07:15	0	483	70	25	164	4	0	327	10	1	91	40	1215
07:30	0	539	74	25	116	4	1	264	10	1	106	29	1169
07:45	0	565	65	24	158	3	2	356	14	1	118	39	1345
08:00	0	585	54	41	123	2	0	362	14	2	145	52	1380
08:15	0	661	59	35	132	5	1	410	9	0	150	58	1520
08:30	0	551	33	41	112	3	3	371	11	3	162	70	1360
08:45	0	512	49	28	132	7	2	398	14	0	144	65	1351
09:00	0	555	43	38	155	3	1	381	5	1	127	82	1391
09:15	0	494	32	40	103	10	- 1	416	12	0	105	72	1285
09:30	0	515	31	32	90	3	1	368	6	3	90	34	1173
09:45	0	451	44	29	106	6	2	281	7	2	119	44	1091
Peak Total	0	2309	195	145	499	17	6	1541	48	5	601	245	5611
PHF	#DIV/0!	0.873	0.826	0.884	0.945	0.607	0.500	0.940	0.857	0.417	0.927	0.875	0.923
%HV	#DIV/0!	1.0%	5.6%	15.9%	5.0%	11.8%	100.0%	0.4%	0.0%	80.0%	0.7%	6.1%	0.0%
15:00	0	260	28	31	267	8	0	80	10	1	119	25	829
15:15	0	311	50	37	289	10	3	117	7	1	94	24	943
15:30	0	187	32	32	311	5	1	67	2	1	125	22	785
15:45	0	196	22	43	334	10	1	73	6	6	161	37	889
16:00	0	285	58	57	366	8	1	70	7	5	248	29	1134
16:15	0	375	94	56	460	6	1	104	4	6	288	39	1433
16:30	0	374	67	29	352	6	3	119	3	2	192	30	1177
16:45	0	359	89	43	317	3	2	84	4	3	212	31	1147
17:00	0	360	95	34	332	11	1	119	12	3	225	28	1220
17:15	0	380	88	39	368	6	2	128	6	2	235	23	1277
17:30	0	372	79	29	342	0	1	133	6	2	212	22	1198
17:45	0	371	98	42	428	4	1	100	13	7	230	28	1322
18:00	0	391	87	31	428	8	2	67	2	7	123	52	1198
18:15	0	329	55	23	359	11	1	97	3	2	215	45	1140
18:30	0	313	51	35	402	11	2	107	8	6	172	34	1141
18:45	0	231	46	19	401	9	1	98	4	4	150	24	987
Peak Total	0	1483	360	144	1470	21	5	480	37	14	902	101	5017
PHF	#DIV/0!	0.976	0.918	0.857	0.859	0.477	0.625	0.902	0.712	0.500	0.960	0.902	0.949
%HV	#DIV/0!	0.9%	2.2%	5.6%	1.8%	0.0%	80.0%	1.5%	2.7%	78.6%	3.3%	14.9%	0.0%

Total Vehicles

ŭ	14th St, SW Northbound				i itir ot, o	14th St	t, SW		In	dependenc	e Ave, SW		In	dependenc	e Ave, SW	
						Southb				Eastb				Westb		
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
07:00	0	0	0	7	0	0	0	11	0	2	0	7	0	0	0	25
07:15	1	0	0	18	2	3	1	6	0	2	2	4	0	2	0	40
07:30	0	0	0	15	0	0	0	12	0	2	0	3	0	1	0	54
07:45	0	0	0	21	1	0	0	20	0	6	0	5	0	1	0	50
08:00	0	0	0	15	0	1	0	8	0	1	0	3	0	2	0	60
08:15	0	1	0	8	0	3	0	5	0	3	0	3	0	0	0	54
08:30	0	0	0	12	1	0	0	5	0	5	0	10	0	1	0	47
08:45	0	0	0	7	0	0	0	5	1	2	0	8	0	1	0	54
09:00	0	0	0	6	2	1	0	8	0	0	0	10	0	1	0	42
09:15	0	0	0	3	0	1	0	5	0	4	1	7	0	1	0	28
09:30	0	0	0	0	0	0	0	13	0	1	0	7	0	0	0	26
09:45	0	1	0	4	0	0	0	2	1	2	0	11	0	0	0	9
Peak Total	0	1	0	42	1	4	0	23	1	11	0	24	0	4	0	215
15:00	1	0	0	34	0	0	0	17	0	0	0	6	0	0	0	24
15:15	0	0	0	27	0	1	0	2	0	0	0	4	0	2	0	22
15:30	0	0	0	12	0	0	0	7	0	0	0	10	0	0	0	9
15:45	0	1	0	28	0	0	0	3	0	0	0	16	0	1	0	9
16:00	0	0	0	25	0	0	0	1	0	1	0	15	0	3	0	27
16:15	0	0	0	75	0	2	0	1	0	1	0	10	0	3	0	30
16:30	0	2	0	47	0	1	0	10	0	0	0	37	0	2	0	8
16:45	0	1	0	49	0	1	0	14	0	0	0	7	0	7	0	11
17:00	0	0	0	26	0	0	0	12	0	0	0	4	0	8	1	14
17:15	0	1	0	99	0	1	1	18	0	1	0	11	0	3	1	8
17:30	0	1	1	44	0	1	1	9	0	0	0	9	0	6	0	14
17:45	1	0	0	25	0	0	0	7	0	0	0	3	0	6	0	4
18:00	0	0	0	38	0	0	0	11	0	1	0	2	0	4	1	7
18:15	2	0	0	32	0	1	0	4	0	0	0	6	0	1	1	4
18:30	0	1	0	14	0	0	0	13	1	1	0	6	0	1	0	1
18:45	0	0	0	10	0	0	0	6	0	2	0	4	0	2	0	1
Peak Total	1	2	1	194	0	2	2	46	0	1	0	27	0	23	2	40

J	12	2th St, NW	Tille Ave		th St, NW		Inc	dependence	e I	Inder	endence Ave S	SW	
		orthbound			outhbound			Eastbound			Westbound	-0.503	
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
07:00	19	27	13	0	0	0	13	324	49	40	153	21	659
07:15	13	30	8	0	3	1	6	361	45	30	198	24	719
07:30	22	60	20	0	4	2	15	356	38	35	142	20	714
07:45	11	32	25	0	2	0	5	285	49	36	160	35	640
08:00	32	80	31	3	2	1	13	359	37	33	180	31	802
08:15	46	44	21	2	2	2	7	324	32	32	160	35	707
08:30	44	44	23	2	5	2	11	308	40	37	168	30	714
08:45	44	32	34	3	4	3	17	351	25	37	142	32	724
09:00	49	66	39	1	4	1	4	357	22	35	155	38	771
09:15	31	21	49	0	4	4	10	281	28	47	174	38	687
09:30	67	31	45	0	3	4	13	284	15	30	157	23	672
09:45	36	54	48	5	4	1	5	276	19	30	102	23	603
Peak Total	166	200	109	10	13	8	48	1342	134	139	650	128	2947
PHF	0.902	0.625	0.801	0.833	0.650	0.667	0.706	0.935	0.838	0.939	0.903	0.914	0.919
15:00	25	39	61	1	6	2	8	209	14	34	160	31	590
15:15	17	24	55	4	5	2	10	192	12	30	169	31	551
15:30	29	40	63	3	7	2	8	184	24	44	183	21	608
15:45	26	36	52	1	3	5	3	213	15	35	179	26	594
16:00	25	31	34	3	5	3	3	221	6	51	184	26	592
16:15	30	47	55	1	0	0	3	229	8	56	226	14	669
16:30	44	43	71	0	1	2	2	243	14	69	249	24	762
16:45	51	59	88	3	6	8	2	242	10	78	262	34	843
17:00	30	35	78	4	5	4	0	217	6	73	348	39	839
17:15	25	47	56	3	5	2	0	196	8	84	307	43	776
17:30	18	84	54	2	4	3	0	238	3	93	278	34	811
17:45	20	42	56	3	6	0	0	215	5	84	294	49	774
18:00	21	61	72	1	2	2	2	156	0	94	322	48	781
18:15	26	29	44	1	4	2	4	205	2	101	270	36	724
18:30	19	29	63	1	1	2	24	179	0	96	257	29	700
18:45	21	30	53	0	0	1	10	156	0	55	216	17	559
Peak Total	93	208	244	12	20	9	0	866	22	334	1227	165	3200
PHF	0.775	0.619	0.782	0.750	0.833	0.563	#DIV/0!	0.910	0.688	0.898	0.881	0.842	0.954

Vehicles

		12th S			.,	12th S				Indeper			li I		ce Ave SW	
		Northb				Southt				Eastb				Westb		
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
07:00	0	0	0	0	0	1	0	33	0	1	0	50	0	2	0	41
07:15	0	0	3	0	0	4	0	6	0	4	0	68	0	6	0	22
07:30	0	1	0	0	0	3	0	31	0	5	0	76	0	3	0	38
07:45	0	0	0	0	0	9	0	21	0	6	2	102	0	8	0	46
08:00	0	0	1	0	1	3	0	35	0	0	0	90	0	2	0	34
08:15	0	0	0	0	0	5	0	25	0	5	0	121	0	1	0	21
08:30	0	1	0	0	0	13	0	32	0	7	0	102	0	5	0	39
08:45	0	2	0	2	0	9	0	24	0	4	1	104	0	2	0	46
09:00	0	0	2	3	1	6	0	26	0	4	0	80	0	2	0	43
09:15	0	0	0	0	0	8	0	11	0	- 1	0	33	0	5	0	14
09:30	0	0	0	0	0	6	0	8	0	2	0	72	0	5	0	28
09:45	0	0	0	0	0	1	0	16	0	0	0	58	0	5	0	20
Peak Total	0	3	1	2	1	30	0	116	0	16	1	417	0	10	0	140
15:00	0	1	0	0	0	2	1	22	0	4	0	37	0	1	0	62
15:15	1	0	0	0	1	1	0	27	0	21	0	21	0	2	0	50
15:30	0	0	0	2	0	0	0	32	0	8	0	49	0	3	0	59
15:45	1	0	0	0	0	1	0	24	0	10	0	39	0	3	0	45
16:00	0	0	0	0	0	1	0	8	0	0	0	26	0	1	0	39
16:15	0	0	0	0	0	0	0	0	0	1	0	5	0	1	0	0
16:30	1	0	4	3	0	0	0	5	0	0	0	20	0	1	0	48
16:45	0	0	6	0	0	0	0	23	0	1	0	12	0	8	0	95
17:00	0	1	3	0	0	0	0	6	0	1	0	32	0	5	0	86
17:15	0	1	1	0	0	4	0	12	0	14	0	11	0	3	0	83
17:30	0	1	2	0	0	0	0	20	0	0	0	12	0	4	0	76
17:45	0	1	2	0	0	3	0	13	0	1	0	4	0	3	0	40
18:00	0	1	5	0	0	0	0	1	0	1	0	10	0	3	0	37
18:15	0	1	0	0	0	0	0	2	0	0	0	22	0	2	0	33
18:30	0	1	0	0	0	0	0	0	0	0	0	1	0	1	0	30
18:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22
Peak Total	0	4	8	0	0	7	0	51	0	16	0	59	0	15	0	285

Start Date: 9/29/2015 Start Time: 7:00:00 AM Site Code: PEAK-HOUR COUNT AT L'ENFANT

Start Time Left Right Thru Right Left Thru Total 07:00 8 8 293 42 12 218 581 07:15 10 21 349 14 19 245 658 07:30 10 19 332 37 20 180 598 07:45 13 23 305 14 17 223 595 08:00 11 33 361 23 18 216 662 08:15 12 45 348 15 19 235 674 08:45 16 50 376 20 22 200 684 09:00 19 29 377 25 15 204 669 09:15 18 26 317 13 18 224 616 09:30 3 21 310 17 4 186 54
07:00 8 8 293 42 12 218 581 07:15 10 21 349 14 19 245 658 07:30 10 19 332 37 20 180 595 07:45 13 23 305 14 17 223 595 08:00 11 33 361 23 18 216 662 08:15 12 45 348 15 19 235 674 08:30 17 24 300 27 7 220 604 08:45 16 50 376 20 22 200 684 09:00 19 29 377 25 15 204 669 09:15 18 26 317 13 18 224 616 09:30 3 21 310 17 4 186 54
07:15 10 21 349 14 19 245 658 07:30 10 19 332 37 20 180 598 08:00 11 33 305 14 17 223 595 08:00 11 33 361 23 18 216 662 08:15 12 45 348 15 19 235 674 08:30 17 24 300 27 7 229 604 08:45 16 50 376 20 22 200 684 09:00 19 29 377 25 15 204 669 09:15 18 26 317 13 18 224 616 09:30 3 21 310 17 4 186 541 09:45 7 7 72 294 16 5 145 484 <
07:30 10 19 332 37 20 180 598 07:45 13 23 305 14 17 223 595 08:00 11 33 361 23 18 216 662 08:15 12 45 348 15 19 235 674 08:30 17 24 300 27 7 229 604 08:45 16 50 376 20 22 200 684 09:00 19 29 377 25 15 204 669 09:15 18 26 317 13 18 224 616 09:30 3 21 310 17 4 186 541 09:45 7 7 17 294 16 5 145 484 Feak Total 56 152 1385 85 66 880 2624
07:45 13 23 305 14 17 223 595 08:00 11 33 361 23 18 216 662 08:15 12 45 348 15 19 235 674 08:30 17 24 300 27 7 229 604 08:45 16 50 376 20 22 200 684 09:00 19 29 377 25 15 204 669 09:15 18 26 317 13 18 224 616 09:30 3 21 310 17 4 186 51 09:45 7 17 294 16 5 145 484 Peak Total 56 152 1385 85 66 880 2624
08:00 11 33 361 23 18 216 662 08:15 12 45 348 15 19 235 674 08:30 17 24 300 27 7 229 604 08:45 16 50 376 20 22 200 684 09:00 19 29 377 25 15 204 669 09:15 18 26 317 13 18 224 616 09:30 3 21 310 17 4 186 541 09:45 7 17 294 16 5 145 484 Peak Total 56 152 1385 85 66 880 2624
08:15 12 45 348 15 19 235 674 08:30 17 24 300 27 7 229 604 08:45 16 50 376 20 22 200 684 09:00 19 29 377 25 15 204 669 09:15 18 26 317 13 18 224 616 09:30 3 21 310 17 4 186 541 19:45 7 17 294 16 5 145 484 Peak Total 56 152 1385 85 66 880 2624
08:30 17 24 300 27 7 229 604 08:45 16 50 376 20 22 200 684 09:00 19 29 377 25 15 204 669 09:15 18 26 317 13 18 224 616 09:30 3 21 310 17 4 186 541 09:45 7 7 17 294 16 5 145 484 Peak Total 56 152 1385 85 66 880 2624
08:45 16 50 376 20 22 200 684 09:00 19 29 377 25 15 204 669 09:15 18 26 317 13 18 224 616 09:30 3 21 310 17 4 186 541 09:45 7 7 17 294 16 5 145 484 Peak Total 56 152 1385 85 66 880 2624
09:00 19 29 377 25 15 204 669 09:15 18 26 317 13 18 224 616 09:30 3 21 310 17 4 186 54 09:45 7 17 294 16 5 145 484 Peak Total 56 152 1385 85 66 880 2624
09:15 18 26 317 13 18 224 616 09:30 3 21 310 17 4 186 541 09:45 7 17 294 16 5 145 484 Peak Total 56 152 1385 85 66 880 2624
09:30 3 21 310 17 4 186 541 09:45 7 17 294 16 5 145 484 Peak Total 56 152 1385 85 66 880 2624
09:45 7 17 294 16 5 145 484 Peak Total 56 152 1385 85 66 880 2624
Peak Total 56 152 1385 85 66 880 2624
PHF 0.824 0.760 0.921 0.787 0.750 0.936 0.959
15:00 10 16 252 19 10 218 525
15:15 16 15 238 16 14 204 503
15:30 21 20 231 25 15 248 560
15:45 15 16 236 23 12 231 533
16:00 15 19 242 22 7 252 557
16:15 27 9 271 17 15 323 662
16:30 32 18 303 15 17 316 701
16:45 23 15 299 22 8 353 720
17:00 46 34 286 20 18 412 816
17:15 66 4 261 10 12 381 734
17:30 54 13 259 14 9 365 714
17:45 60 4 251 10 11 346 682
18:00 59 14 226 10 8 419 736
18:15 25 11 255 5 4 369 669
18:30 14 6 245 3 6 362 636
18:45 9 5 203 3 2 293 515
Peak Total 226 55 1057 54 50 1504 2946
PHF 0.856 0.404 0.924 0.675 0.694 0.913 0.903

Vehicles

Start Date: 9/29/2015 Start Time: 7:00:00 AM

		L'Enfan				L'Enfan				Independ				Independe		
		Northb				Southb				Eastb				Westb		
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	7	0	0	0	2	0	0	1	0	0	3	0	4
07:30	0	0	0	10	0	0	0	13	0	7	0	11	1	6	0	28
07:45	1	0	2	20	0	0	0	16	0	2	0	7	2	8	0	21
08:00	0	2	0	0	0	0	0	1	0	1	1	8	1	5	0	14
08:15	0	0	1	11	0	0	0	7	0	2	1	9	0	3	0	17
08:30	0	1	0	9	0	0	0	19	0	3	2	24	0	4	0	25
08:45	1	2	0	7	0	0	0	13	0	3	0	12	0	8	0	13
09:00	0	0	0	8	0	0	0	1	0	2	3	5	0	4	0	10
09:15	0	0	0	35	0	0	0	0	0	2	0	12	0	2	0	5
09:30	0	0	0	7	0	0	0	7	0	0	0	30	0	0	0	0
09:45	0	0	0	10	0	0	0	0	0	0	0	34	0	0	0	0
Peak Total	1	5	1	27	0	0	0	40	0	9	4	53	1	20	0	69
400-0000					-	200		No.			2000	and a common of the common of	10000			
15:00	0	0	0	4	0	0	0	8	0	5	0	42	0	2	0	16
15:15	0	0	0	4	0	0	0	35	0	2	1	28	0	5	0	2
15:30	0	1	0	27	0	0	0	36	0	3	0	58	0	2	0	31
15:45	0	1	0	12	0	0	0	26	0	10	0	39	0	3	0	1
16:00	0	0	0	20	0	0	0	17	0	1	0	65	4	9	0	3
16:15	0	0	0	14	0	0	0	1	0	3	0	63	0	1	0	0
16:30	0	1	0	26	0	0	0	16	0	0	0	83	3	2	0	2
16:45	2	1	0	23	0	0	0	2	0	2	0	35	3	5	0	0
17:00	0	1	1	3	0	0	0	20	0	2	0	68	0	4	0	0
17:15	0	0	0	5	0	0	0	22	0	5	0	23	5	2	0	5
17:30	0	1	0	1	0	0	0	8	0		0	38	2	1	0	2
17:45	0	3	0	1	0	0	0	2	0	4	0	25	4	0	0	0
18:00	0	0	0	1	0	0	0	0	0	1	0	14	1	0	0	0
18:15	0	0	0	3	0	0	0	0	0	0	0	31	0	0	0	0
18:30	9	0	0	10	0	0	0	0	0	0	0	17	0	0	0	0
18:45	4	0		6	0	0	0	0	0	0	0	11	0	3	0	0
Peak Total	0	5	1	10	0	0	0	52	0	13	0	154	11	7	0	7

Bicycles and Peds

Ronald Catterton

Ronald Catterton

Intersection: 14th Street and Independence Ave

Date: 12/8/15

Time	Approach	Vehicles in Queue at Start of Green	Vehicles Left in Queue at End of Green	Comments
	NB	62	3	tight terms left
7:15 AM	SB	26	0	
7:13 AIVI	ЕВ	28	0	
	WB	12	0	#
	NB	60	14	U-TURN MESSER UPTRAFFIC
7.20 484	SB	21	4	left have left
7:30 AM	ЕВ	32	0	
	WB	12	0	
	NB	58	2	right turnes
7:45 AM	SB	13	0	9
7:45 AIVI	EB	20	0	
	WB	13	0	
8:00 AM	NB	50	6	
	SB	15	4	the annut the

7:00 Am 10 seconds -> Signal - SB Lead 8:00 Am 12 seconds > Left fine

		1		T
	EB	16	0	
	WB	15	0	
	NB	45	0	
0.45 404	SB	16	i.f	left Turn left
8:15 AM	EB	10	0	
	WB	20	0	
	NB	43	6	
9.30 ABA	SB	19	9	left Tuno left.
8:30 AM	EB	10	0	
	WB	3 (0	
	NB	45	0	
0.45.484	SB	15	3	left Turns left
8:45 AM	EB	12	0	
	WB	30	0	
	NB	45	0	
9:00 AM	SB			tt h
	EB	15	0	
	WB	29	0	

Intersection: 14th Street and Independence Ave

Date:_

Time	Approach	Vehicles in Queue at Start of Green	Vehicles Left in Queue at End of Green	Comments
Laure	NB	15		
4:15 PM	SB	13	0	
4.13 FW	EB		0	
	WB	33	0	
	NB	16	0	
4:30 PM	SB	16	0	
4.30 PW	EB	2	0	
	WB	25	0	
	NB	23	0	
4:45 PM	SB	18	0	
4.43 FIVI	EB	4	0	
	WB	38	0	
5:00 PM	NB	30	0	
3.00 FIVE	SB	24	0	

4:00 pm 18 sec. > Signal SB Lead 5:00 pm 18 sec. > Left time

	EB	6	0	
	WB	33	0	
	NB	15	0	
5:15 PM	SB	21	٥	
3.13 PW	EB	2	0	
	WB	32	0	
	NB	18	0	
5:30 PM	SB	27	0	
3.30 F W	EB	6	0	
	WB	32	0	
	NB	8	0	
5:45 PM	SB	11	0	
3.43 FIVI	EB	6 .	0	
	WB	38	0	
	NB	16	0	
6:00 PM	SB	30	0	
	EB	4	0	
	WB	31	0	

Babinda Lanor

Intersection: 12th Street and Independence Ave

Date: 0 8 15

Time	Approach	Vehicles in Queue at Start of Green	Vehicles Left in Queue at End of Green	Comments
	NB	3	0	
7.45 ABA	SB	0	0	
7:15 AM	EB	24	Ò	
	WB	2	Ò	
	NB	5	O	
7.20.414	SB	0	0	
7:30 AM	EB	7	0	
	WB	1-1	0	
	NB	0	0	
	SB	0	0	
7:45 AM	EB	(0	
	WB	(0	0	
0.00 485	NB	(0)	0	
8:00 AM	SB	1	0	

12 me Independence

	EB	17	0	
	WB	4	0	
	NB	3	0	
	SB	0	6	
8:15 AM	ЕВ	12	6	All remaining were Left trins in queue
	WB	9	0	
	NB	7	0	
	SB	0	0	
8:30 AM	EB	28	1	One left turn valuede remaining
	WB	6	0	Vehicle femaning All belts were the quein All west
	NB	17	0	
	SB	0	0	
8:45 AM	EB	36		one through did not got through both were lefts and got through
	WB	36	0	both were lefts and got through
	NB	2	0	
9:00 AM	SB	4	9	
3.00 AW	EB	8	0	
	WB	4	0	

Intersection: 12th Street and Independence Ave

Date: 2 8 13

Time	Approach	Vehicles in Queue at Start of Green	Vehicles Left in Queue at End of Green	Comments
	NB	5	\Diamond	
	SB	0	0	
4:15 PM	EB	25	0	
	WB	14	D	
	NB	10	0	
	SB)	6	
4:30 PM	EB	30	2	The remaining were right behind a stopped bus
	WB	19	0	
	NB	6	0	
	SB	0	0	
4:45 PM	EB	40	0	
	WB	22	0	
E 00 DE 1	NB	10	0	
5:00 PM	SB	0	Ò	

12ms+@Independence

	EB	13	l	Bus stopped in right lane
	WB	20	0	
	NB	6	0	
E-4E DN4	SB)	0	
5:15 PM	EB	17	The same of the sa	Bus Stopped Right Lone
	WB	16	0	0
	NB	4	G	
F-20 DN4	SB	0	0	
5:30 PM	EB	28	\	Uber in right lane
	WB	19	0	
	NB	5	0	
5:45 PM	SB	Ò	6	
5:45 PIVI	EB	15	0	
	WB	19	0	
6:00 PM	NB	3	0	
	SB	0	0	
3.001101	EB	14	0	
	WB	16	0	

Bounda Conno-

Intersection: L'Enfant Plaza and Independence Ave

Date: 12 8 15

Time	Approach	Vehicles in Queue at Start of Green	Vehicles Left in Queue at End of Green	Comments
7:15 AM	NB	0	0	
	SB	0		A CALL
	EB	4	0	
	WB	18	0	
7:30 AM	NB	.0	0	2 mude 115hts on real
	SB	0		>
	EB	5	0	
	WB	21	0	
7:45 AM	NB	8	0	
	SB			>
	EB	11	C	
	WB	12	2	All Left tring -
8:00 AM -	NB	6	0	£ 117/11/2
	SB	-	X	4

Exfort@Ind.

	EB	3	0	
	WB	22	0	
8:15 AM	NB		0	
	SB	>	>	><
	EB	6	0	
	WB	33	a range	Vehicle
8:30 AM	NB	4	9	
	SB	>	>	
	ЕВ	4	0	
	WB	28	\Diamond	
	NB	6	0	
O.AE ABA	SB	\times	>	4
8:45 AM	EB	2	0	
	WB	24	\bigcirc	
9:00 AM	NB	白優	0	
	SB	7	7	×
	EB	7	0	
	WB	18		



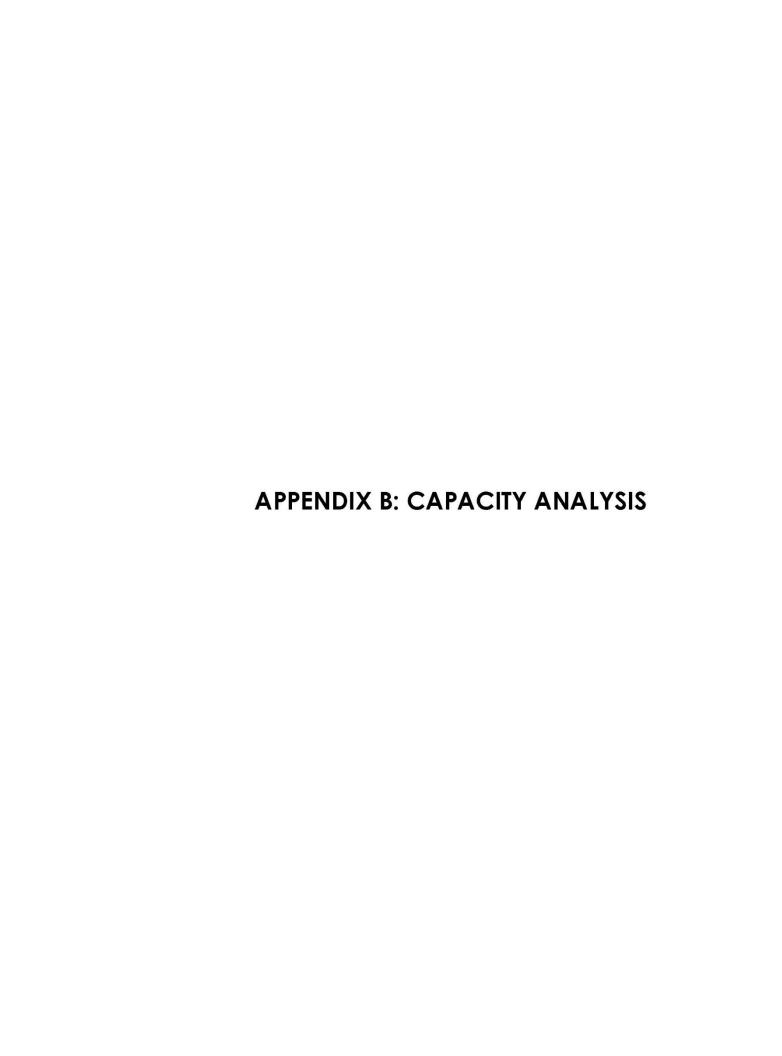
Intersection: L'Enfant Plaza and Independence Ave

Date: 12/8/15

Time	Approach	Vehicles in Queue at Start of Green	Vehicles Left in Queue at End of Green	Comments
4:15 PM	NB	0		
	SB		>	
	ЕВ	21	0	
	WB	2	0	
4:30 PM	NB	9	0	
	SB		7	>
	EB	11		
	WB	15		
4:45 PM	NB	5		
	SB	7	1	7
	EB	5	0	
	WB	1	0	
5:00 PM	NB	H	0	
	SB	7	7	7

La Enfant Drodofendera

				1
	EB	4		
	WB	18	0	
5:15 PM	NB	7	0	
	SB	>	1	7
	ЕВ	\$ 4	0	
	WB	28	0	
5:30 PM	NB	@ 1		
	SB		7	>
	EB	5	0	
	WB	· ·	0	
	NB	0	0	
5:45 PM	SB	7	~/	
	EB	6	0	1
	WB	8	9	
6:00 PM	NB	3	0	
	SB	7	7	7
	EB	7		
	WB	5	\bigcirc	



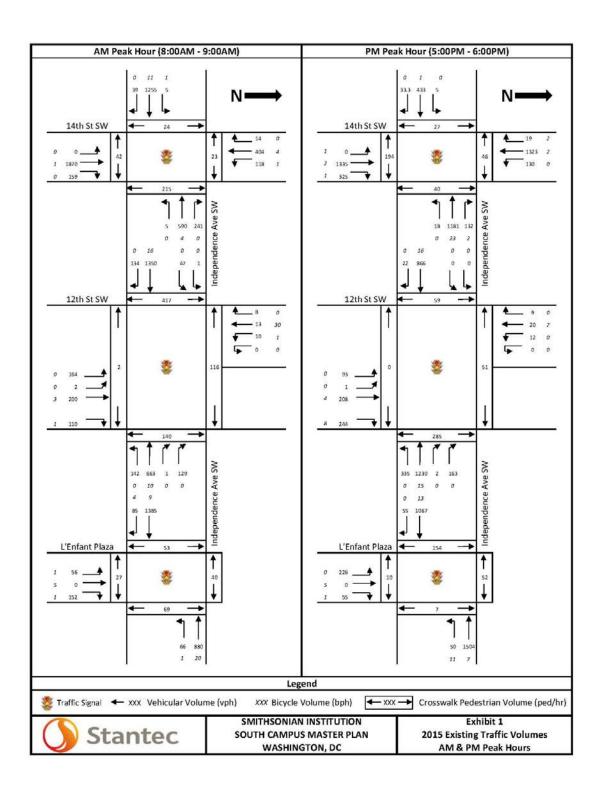
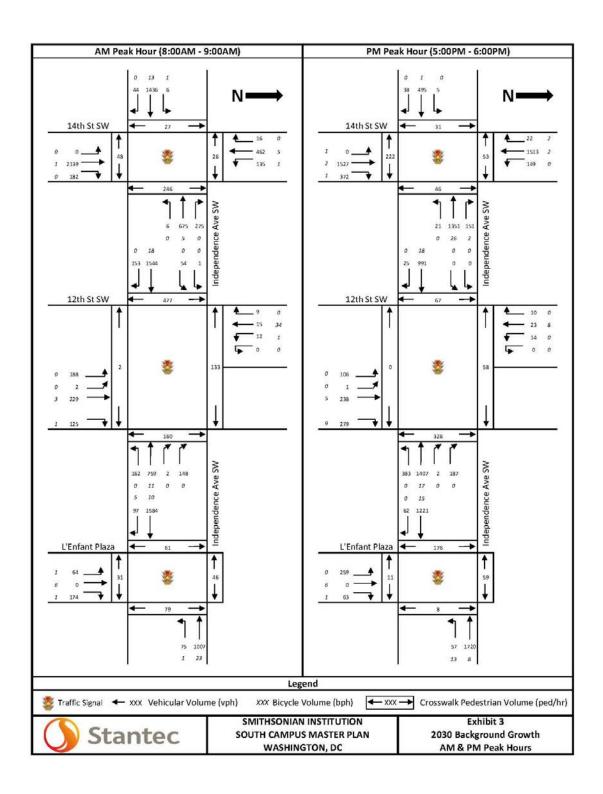
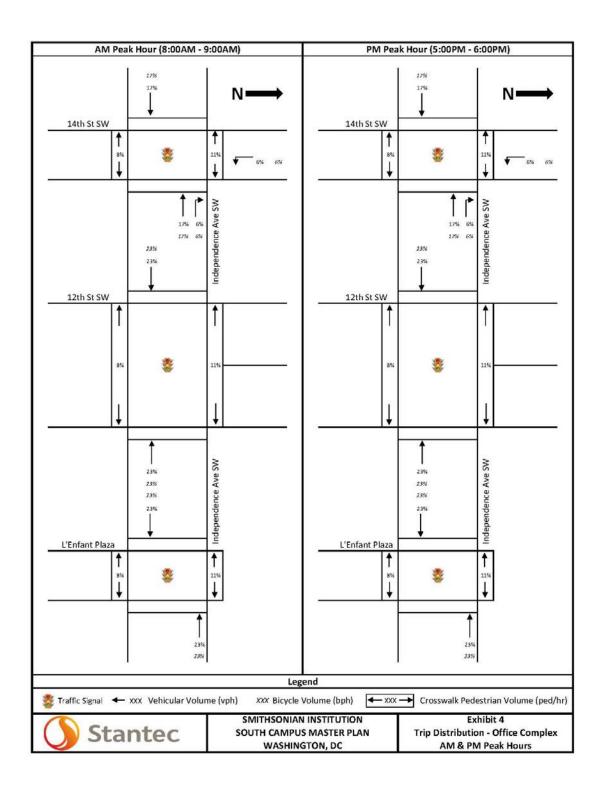


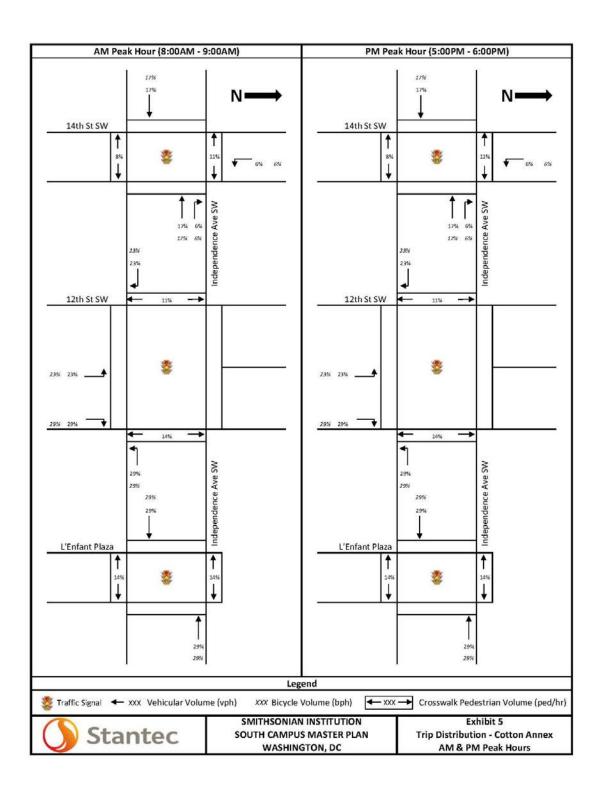
Exhibit 2 Smithsonian Institution, South Campus Master Plan Capacity Analysis Results 2015 Existing Condition

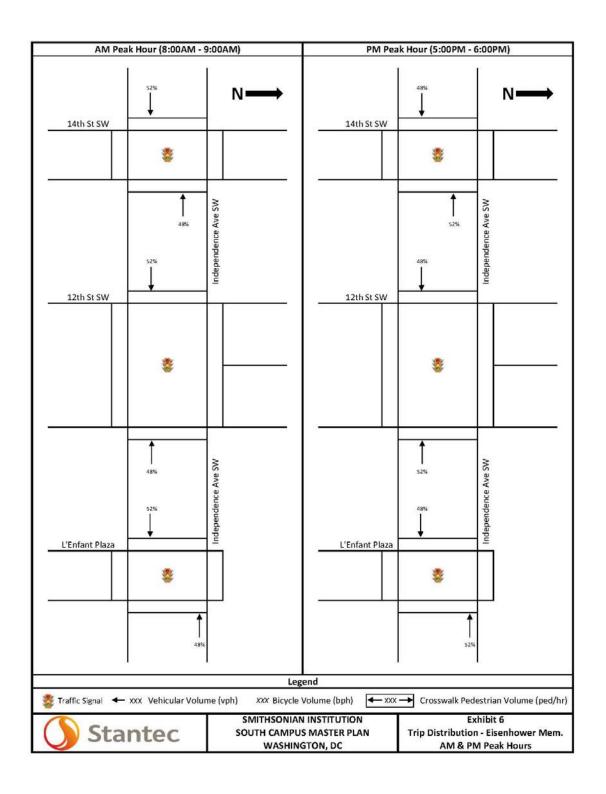
				AM Peak Hour (8:00AM - 9:00AM)	.00AM - 9:00AM)					PM Peak Hour (5:00PM - 6:00PM	:00PM - 6:00PM)	
Intersection	Lane Group	v/c Ratio	Delay (sec)	v/c Ratio Delay (sec) Level of Service	50th %tile	95th %tile	Lane Group	v/c Ratio	Delay (sec)	u/c Ratio Delay (sec) Level of Service	50th %tile	95th %tile
	1		9		Queue Length (Tt)	Queue Lengtn (Tt)		8			Queue Length (Tt)	Queue Length (Tt)
	EB-TR	0.95	51.4	D	354	#456	EB-TR	0.40	31.7	ပ	100	134
	WB-T	0.48	41.1	D	147	191	WB-T	1.01	54.4	F	~343	#445
1144, 64-2-4-510	WB-R	0.51	30.9	U	102	195	WB-R	0.31	8.1	Þ	19	m51
We ladendant from Sw	NB-T	0.85	29.4	U	447	517	T-8N	0.65	26.1	U	279	331
w illuspendence Avenue sw	NB-R	0.31	6'6	∢	32	79	NB-R	0.47	14.1	æ	88	168
paziiniis	1-8S	0.83	61.6	Е	47	#156	1-8S	0.46	18.2	В	37	90
	SB-TR	0.17	10.0	∢	48	65	SB-TR	0.48	11.8	В	181	216
	Intersection	1	35.4	۵	i i	a	Intersection	'n	28.2	υ	şı	31
	EB-LTR	0.72	8.9	4	38	m43	EB-LTR	0.47	30.3	U	171	204
	WB-L	0.57	35.0	D	53	129	MB-L	99'0	23.7	U	70	125
W3 +2 C+2 ++CL	WB-LTR	0.39	5.1	∢	34	41	WB-LTR	89'0	11.6	æ	121	136
9. Indopendence August SW	NB-L	0.38	16.0	В	103	168	1-8N	0.20	21.9	U	52	96
will dependence Avenue 3w	NB-TR	0.49	18.3	В	142	224	NB-TR	0.54	30.5	O	153	242
paziiniis	NB-R	0.16	1.3	¥	0	0	NB-R	0.27	2.6	∢	1	25
	SB-LTR	80.0	0.4	A	0	0	SB-LTR	0.10	0.4	A	0	0
	Intersection	3	9.8	A		-	Intersection	'n	18.8	В	5	31
	EB-TR	0.50	3.4	¥	25	28	EB-TR	0.42	20.9	v	225	264
L'Enfant Plaza	WB-LT	0.35	8.9	A	79	95	WB-LT	0.57	12.0	В	163	188
& Independence Avenue SW	NB-L	0.14	34.7	C	33	89	NB-L	09'0	44.6	D	159	245
Siignalized	NB-R	0:30	16.9	В	47	96	NB-R	0.10	6.1	Ą	0	27
	Intersection	10	8'9	Ą		1111	Intersection	-	17.8	8	p. • 14	:: ()::

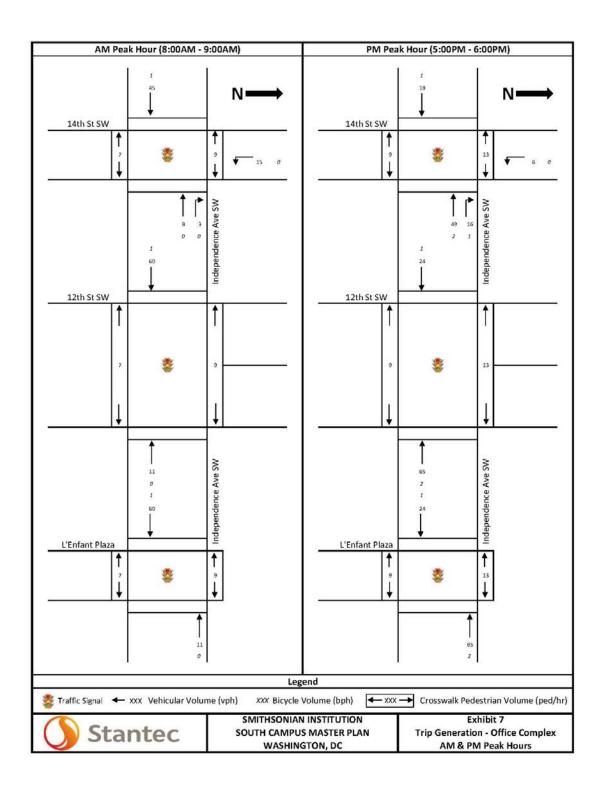
v/c ratio = volume/capacity ratio Source: Synchro 9

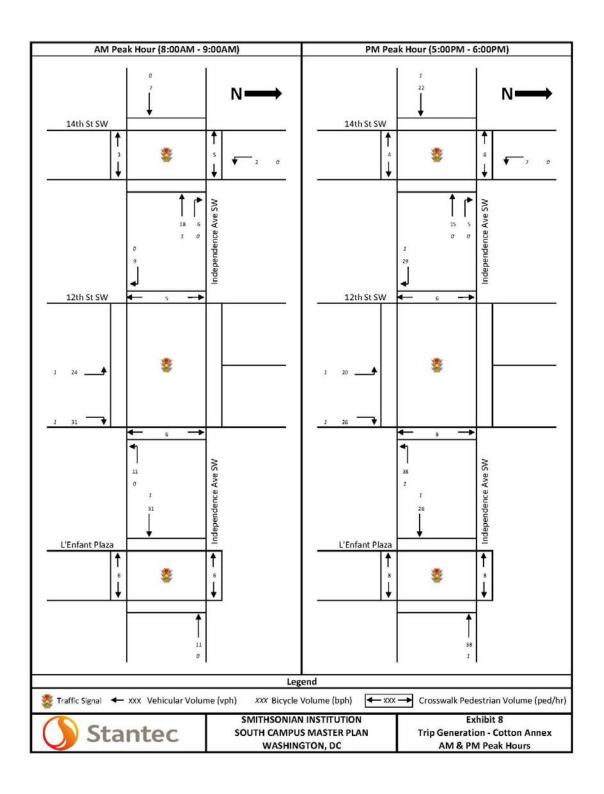


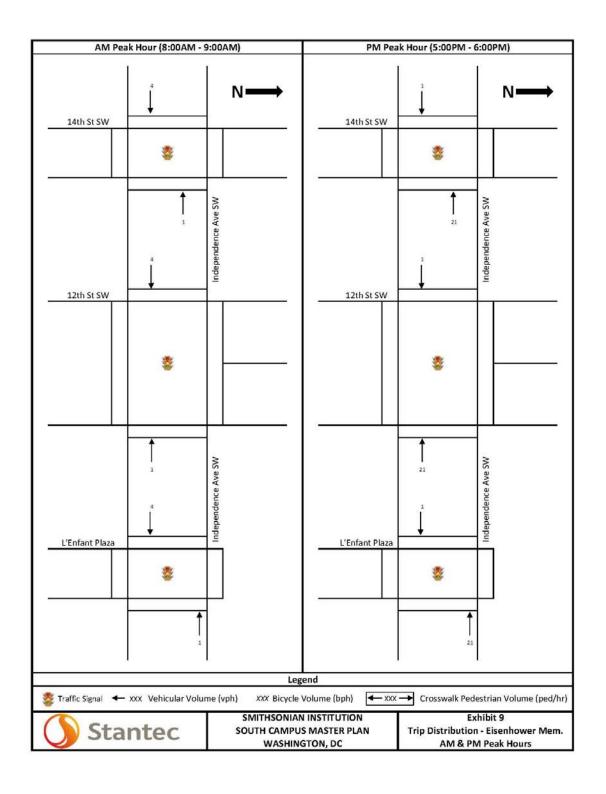












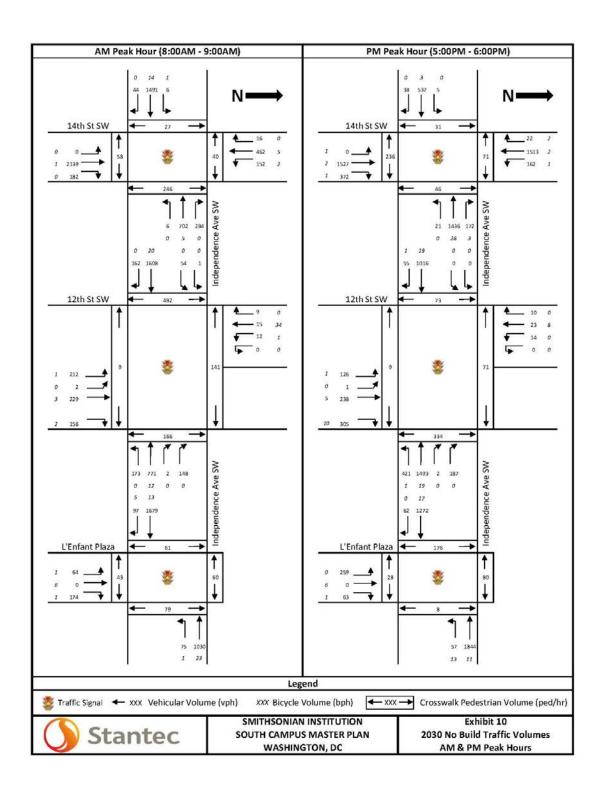
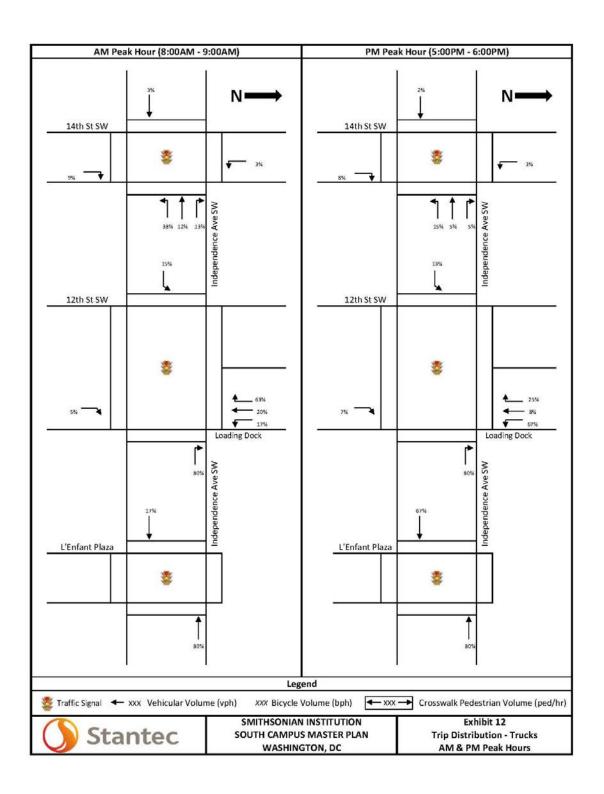
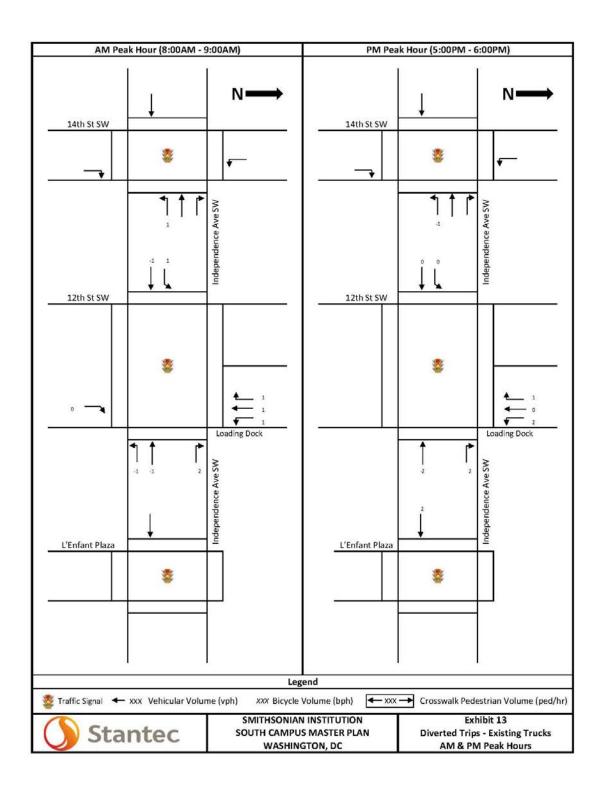


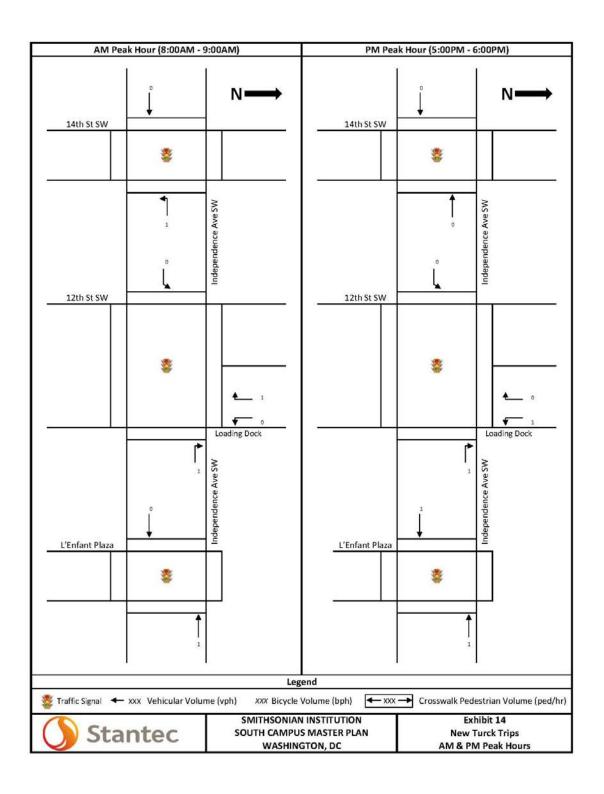
Exhibit 11 Smithsonian Institution, South Campus Master Plan Capacity Analysis Results 2030 No Build Condition

				AM Peak Hour (8:00AM - 9:00AM)	:00AM - 9:00AM)					PM Peak Hour (5:00PM - 6:00PM	:00PM - 6:00PM)	
Intersection	Lane Group	u/c Ratio	Dolay (coc)	of Carrier	50th %tile	95th %tile	Lane Group	u/c Batio	Dolay (sec)	of Ratio Delay (sec) level of Service	50th %tile	95th %tile
		A) C IMBID	reigy (sec)	בפגפו מו מפו גורב	Queue Length (ft)	Queue Length (ft)		אל ב ואפרוס	reigy (sec)	דפאפו סו ספו אורפ	Queue Length (ft)	Queue Length (ft)
	EB-TR	1.13	104.0	Н	~506	#604	EB-TR	0.53	34.2	C	130	169
	WB-T	0.63	43.5	Q	191	232	T-8W	1.23	135.0	F	~497	#601
144 64-24 610	WB-R	0.61	34.4	J	13	240	WB-R	0.40	7.4	¥	22	m37
9. Independence Account SW	NB-T	0.97	41.2	Q	268	#704	T-8N	0.74	28.4	C	338	397
will dependence Avenue 3w	NB-R	98'0	11.5	В	43	86	NB-R	95'0	19.9	8	145	242
paziiniific	SB-L	1.07	119.9	ш	98~	#225	1-8S	09'0	30.4	U	65	139
	SB-TR	0.19	10.2	В	26	74	SB-TR	0.55	12.8	В	221	261
	Intersection	1	57.3	3	151		Intersection	1	20.5	D	3	
	EB-LTR	88'0	9.3	A	45	m44	EB-LTR	0.57	32.3	0	208	242
	WB-L	0.73	47.3	Q	98	#203	WB-L	0.88	43.5	D	118	#325
13# Street SW	WB-LTR	0.47	5.7	A	41	49	WB-LTR	0.87	18.6	В	219	290
8. Indonondonco August SM	NB-L	0.49	17.5	8	137	216	1-8N	0.27	17.5	В	72	125
o illuepelluelice Avellue 3vv	NB-TR	0.58	19.5	В	169	261	NB-TR	0.67	27.9	O	196	303
Dazimirsea	NB-R	0.23	1.4	٧	0	0	NB-R	0.32	2.0	Ą	11	46
	SB-LTR	60'0	0.4	A	0	0	SB-LTR	0.11	8.0	A	0	3
	Intersection	3	10.8	В			Intersection	a	24.3	C	5	31
	EB-TR	0.61	3.9	A	36	39	EB-TR	0.49	21.4	C	270	305
L'Enfant Plaza	WB-LT	0.42	9.5	A	95	113	WB-LT	0.74	16.4	В	227	258
& Independence Avenue SW	NB-L	0.16	35.0	a	38	76	NB-L	99'0	46.2	D	184	279
Siignalized	NB-R	0.35	20.6	C	65	121	NB-R	0.12	8.0	A	4	34
	Intersection		7.5	A	-	e-1	Intersection	-	20.3	C		6 10 .

v/c ratio = volume/capacity ratio Source: Synchro 9







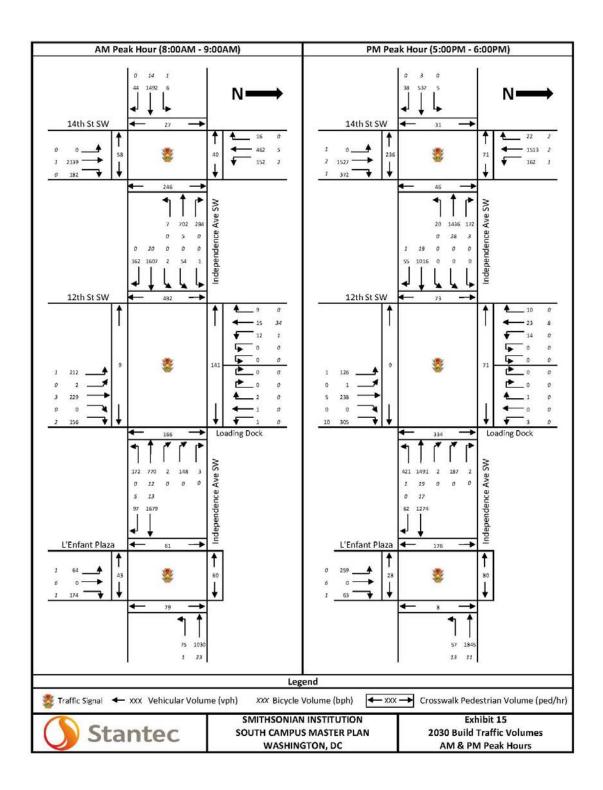


Exhibit 16 Smithsonian Institution, South Campus Master Plan Capacity Analysis Results 2030 Build Condition

				AM Peak Hour (8:00AM - 9:00AM)	:00AM - 9:00AM)					PM Peak Hour (5:00PM - 6:00PM	:00PM - 6:00PM)	
Intersection	Lane Group	v/c Ratio	Delay (sec)	v/c Ratio Delay (sec) Level of Service	Soth %tile	95th %tile	Lane Group	v/c Ratio	Delay (sec)	u/c Ratio Delay (sec) Level of Service	50th %tile Oueue Lenoth (ft)	95th %tile
	EB-TR	1.13	104.3	н	~506	#605	EB-TR	0.53	34.2	υ	130	169
	WB-T	0.64	42.5	О	205	242	WB-T	1.23	135.0	Н	~497	#577
144, 04-2-4 (10)	WB-R	0.61	34.8	0	151	255	WB-R	0.40	5.1	A	13	m26
9 Independence Account CW	NB-T	0.97	41.2	D	268	#704	NB-T	0.74	28.4	Ü	338	397
or independence Avenue sw	NB-R	98'0	11.5	В	43	86	NB-R	0.56	19.9	ω	145	242
paziiniisis	1-8S	1.07	119.9	F	-,86	#225	SB-L	09'0	30.4	Ü	65	139
	SB-TR	0.19	10.2	В	56	74	SB-TR	0.55	12.8	ω	221	261
	Intersection		57.3	Е	1	-	Intersection	Ð	50.4	٥		п
	EB-LTR	1.04	34.0	ц	~440	m375	EB-LTR	0.48	25.7	Ü	165	236
	WB-L	0.77	53.3	D	87	#212	WB-L	0.93	48.5	٥	190	#444
	WB-LTR	0.53	10.5	В	71	84	WB-LTR	0.85	12.6	В	124	#308
12th Street SW	NB-L	0.57	19.2	В	145	227	NB-L	0.33	21.3	J	78	135
& Independence Avenue SW	NB-TR	65'0	19.5	В	156	242	NB-TR	09'0	29.2	J	158	245
Signalized	NB-R	0.25	1.4	Ą	0	1	NB-R	0.40	3.7	A	41	94
	SB-LTR	60'0	0.4	Ą	0	0	SB-LTR	0.12	0.5	¥	0	0
	Loading-LTR	0.11	57.2	Е	3	15	Loading-LTR	0.11	56.8	E	3	15
	Intersection		25.0	0	ŭ	Ę	Intersection	5	19.9	В	B)	
	EB-TR	0.61	3.2	A	22	m25	EB-TR	0.49	11.7	В	237	89
L'Enfant Plaza	WB-LT	0.42	9.5	Ą	95	113	WB-LT	0.74	16.4	В	227	258
& Independence Avenue SW	NB-L	0.16	35.0	D	38	76	NB-L	99.0	46.2	O	184	279
Signalized	NB-R	0.35	20.6	С	65	121	NB-R	0.12	8.0	A	4	34
	Intersection		7.0	A	*		Intersection	•	16.6	В		•

v/c ratio = volume/capacity ratio Source: Synchro 9



SI South Campus Master Plan - Loading Dock Analysis

	٠	→	•	1	•	*	1	†	-	>	Į.	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
Lane Configurations		ተተጉ			^ ^	7		^ ^^	ř	ሻ	ተተኩ	
Traffic Volume (vph)	5	1255	39	5	590	241	0	1870	159	118	404	14
Future Volume (vph)	5	1255	39	5	590	241	0	1870	159	118	404	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	10	10	10	11	11	12	10	10	10
Satd. Flow (prot)	0	4967	0	0	4764	1422	0	4964	1524	1452	4571	0
FIt Permitted		0.937			0.894					0.075		
Satd. Flow (perm)	0	4654	0	0	4259	1366	0	4964	1081	115	4571	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				123			89		8	
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		487			1110			612			436	
Travel Time (s)		9.5			21.6			13.9			9.9	
Confl. Peds. (#/hr)	23		42	42		23	24		215	215		24
Confl. Bikes (#hr)			11			4			1			4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehides (%)	100%	0%	0%	80%	1%	6%	0%	1%	6%	16%	5%	12%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1411	0	0	646	262	0	2033	173	128	454	0
Turn Type	Perm	NA		Perm	NA	Perm		NA	Perm	custom	NA	
Protected Phases		4			8			2		9	69	
Permitted Phases	4			8		8			2	6		
Minimum Split (s)	40.0	40.0		40.0	40.0	40.0		58.0	58.0	12.0		
Total Split (s)	40.0	40.0		40.0	40.0	40.0		58.0	58.0	12.0		
Total Split (%)	36.4%	36.4%		36.4%	36.4%	36.4%		52.7%	52.7%	10.9%		
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0		
All-Red Time (s)	2.5	2.5		2.5	2.5	2.5		2.5	2.5	1.5		
Lost Time Adjust (s)		-1.5			-1.5	-1.5		-1.5	-1.5	-1.0		
Total Lost Time (s)		5.0			5.0	5.0		5.0	5.0	4.5		
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)		35.0			35.0	35.0		53.0	53.0	61.0	65.5	
Actuated g/C Ratio		0.32			0.32	0.32		0.48	0.48	0.55	0.60	
v/c Ratio		0.95			0.48	0.51		0.85	0.31	0.83	0.17	
Control Delay		51.4			41.1	30.9		29.4	9.9	61.6	10.0	
Queue Delay		0.0			0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay		51.4			41.1	30.9		29.4	9.9	61.6	10.0	
LOS		D			D	C		С	Α	E	Α	
Approach Delay		51.4			38.2			27.9			21.3	
Approach LOS		D			D			С			С	
Intersection Summary												
Area Type:	Other											

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 88 (80%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 110
Control Type: Pretimed
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 35.4 Intersection Signal Delay: 35.4

Intersection LOS: D

Stantec 2015_exam.syn

Lane Group	ø6		
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Confl. Bikes (#hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	6		
Permitted Phases	.0		
Minimum Split (s)	58.0		
Total Split (s)	58.0		
Total Split (%)	53%		
Yellow Time (s)	3.5		
All-Red Time (s)	2.5		
Lost Time Adjust (s)	2.0		
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Act Effet Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Intersection Summary			

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1: 14th St SW & Independence Ave SW SI South Campus Master Plan - Loading Dock Analysis

2015 Existing AMPeak Hour

ntersection Capacity Utilization 99.0%	ICU Level of Service F	
Analysis Period (min) 15		
Splits and Phases: 1: 14th St SW & Independence A	Ave SW	
¶ø2 (R)	→ ø4	№ ø9
58 s	40 s	12 s
ø6 (R)	₩ ø8	W W
58 c	40 s	

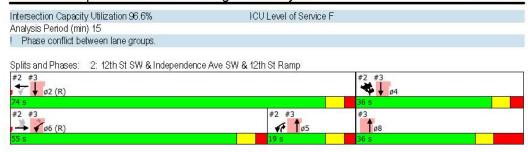
	>	١	-	•	1	•	*_	•	1	ኘ	†	1
Lane Group	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR
Lane Configurations			नााः		7	414				Ä	7	7
Traffic Volume (vph)	1	47	1350	134	142	663	1	129	164	2	200	110
Future Volume (vph)	1	47	1350	134	142	663	1	129	164	2	200	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	11	11	11	11
Satd. Flow (prot)	0	0	5937	0	1407	3883	0	0	0	1695	1663	1440
Flt Permitted		18	0.854		0.085	0.901				0.950		
Satd. Flow (perm)	0	0	5056	0	126	3502	0	0	0	1101	1663	1440
Right Turn on Red			0000	Yes	120	OUOL		Yes		1101	1000	Yes
Satd. Flow (RTOR)			26	, 00		21		100			3	35
Link Speed (mph)			35			35					30	- 00
Link Distance (ft)			1110			590					162	
Travel Time (s)			21.6			11.5					3.7	
Confl. Peds. (#/hr)	116	116	21.0	2	2	1.1.0	116	116	417		0.7	140
Confl. Bikes (#/hr)	110	110		16	2		10	10	417			3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
			-							-	10000	
Heavy Vehicles (%)	1%	1%	1%	1%	3%	3%	3%	3%	3%	0%	3%	3%
Shared Lane Traffic (%)			1005		10%	077				400	000	10%
Lane Group Flow (vph)	0	0	1665	0	139	877	0	0	0	180	229	108
Turn Type	Perm	Perm	NA		pm+pt	NA			Split	Split	NA	pt+ov
Protected Phases			6		5	2			4	4!	4!	4 5!
Permitted Phases	6	6			2							
Minimum Split (s)	42.0	42.0	42.0		19.0	61.0			36.0	36.0	36.0	
Total Split (s)	55.0	55.0	55.0		19.0	74.0			36.0	36.0	36.0	
Total Split (%)	50.0%	50.0%	50.0%		17.3%	67.3%			32.7%	32.7%	32.7%	
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0			4.0	4.0	4.0	
All-Red Time (s)	2.5	2.5	2.5		2.5	2.5			3.0	3.0	3.0	
Lost Time Adjust (s)			-1.5		-1.5	-1.5				-1.5	-1.5	
Total Lost Time (s)			5.0		5.0	5.0				5.5	5.5	
Lead/Lag	Lead	Lead	Lead		Lag							
Lead-Lag Optimize?	Yes	Yes	Yes		Yes							
Act Effct Green (s)			50.0		69.0	69.0				30.5	30.5	49.5
Actuated g/C Ratio			0.45		0.63	0.63				0.28	0.28	0.45
v/c Ratio			0.72		0.57	0.39				0.38	0.49	0.16
Control Delay			6.8		35.0	5.1				14.0	16.4	0.5
Queue Delay			0.0		0.0	0.0				2.0	1.8	0.7
Total Delay			6.8		35.0	5.1				16.0	18.3	1.3
LOS			Α		D	A				В	В	Α
Approach Delay			6.8			9.2					13.9	
Approach LOS			Α			Α					В	
Intersection Summary												
Area Type:	Other											
Cycle Length: 110												
Actuated Cycle Length: 11)											
Offset: 57 (52%), Reference		2:WBTL	and 6:EB	TL, Star	of Green	Ů.						
Natural Cycle: 100				*								
Control Type: Pretimed												
Maximum v/c Ratio: 0.72												
CONTROL OF THE PARTY OF THE PAR	3.6					n LOS: A						

Stantec 2015_exam.syn

Lane Group	1	7	4	
	SEL	SER	SER2	ø8
Lane Configurations	M	OLIV	JEINE	50
Traffic Volume (vph)	10	13	8	
Future Volume (vph)	10	13	8	
Ideal Flow (vphpl)	1900	1900	1900	
Lane Width (ft)	14	14	14	
Satd. Flow (prot)	1299	0	0	
FIt Permitted	0.984			
Satd. Flow (perm)	1222	0	0	
Right Turn on Red			Yes	
Satd. Flow (RTOR)	99			
Link Speed (mph)	30			
Link Distance (ft)	395			
Travel Time (s)	9.0			
Confl. Peds. (#/hr)	140		417	
Confl. Bikes (#/hr)	110	30	30	
Peak Hour Factor	0.92	0.92	0.92	
Heavy Vehicles (%)	0.92	10%	0.92	
Shared Lane Traffic (%)	070	1070	070	
	34	0	0	
Lane Group Flow (vph)	7.1	U	U	
Turn Type	Prot			
Protected Phases	4!			8
Permitted Phases				
Minimum Split (s)	36.0			36.0
Total Split (s)	36.0			36.0
Total Split (%)	32.7%			33%
Yellow Time (s)	4.0			4.0
All-Red Time (s)	3.0			6.5
Lost Time Adjust (s)	-1.5			
Total Lost Time (s)	5.5			
Lead/Lag	0.0			
Lead-Lag Optimize?				
Act Effet Green (s)	30.5			
Actuated g/C Ratio	0.28			
v/c Ratio	0.08			
Control Delay	0.4			
	0.0			
Queue Delay	0.4			
Total Delay				
Total Delay LOS	А			
Total Delay	0.4			
Total Delay LOS				

2: 12th St SW & Independence Ave SW & 12th St Ramp SI South Campus Master Plan - Loading Dock Analysis

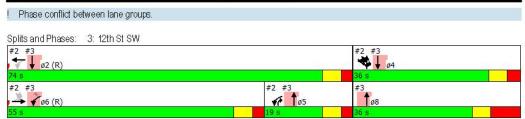
2015 Existing AMPeak Hour



3: 12th St SW SI South Campus Master Plan - Loading Dock Analysis

	•	•	†	1	-	ţ					
ane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø2	04	ø5	ø8	
ane Configurations	ሻ	7	ተተኩ			^					
Fraffic Volume (vph)	0	0	476	0	0	289					
Future Volume (vph)	0	0	476	0	0	289					
deal Flow (vphpl)	1900	1900	1900	1900	1900	1900					
ane Width (ft)	10	11	11	11	10	10					
Satd. Flow (prot)	1773	1837	4868	0	0	3271					
Flt Permitted											
Satd. Flow (perm)	1773	1837	4868	0	0	3271					
Right Turn on Red		Yes		Yes							
Satd. Flow (RTOR)											
ink Speed (mph)	20		30			30					
ink Distance (ft)	188		380			162					
Fravel Time (s)	6.4		8.6			3.7					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92					
Heavy Vehides (%)	0%	0%	3%	0%	0%	3%					
Shared Lane Traffic (%)											
ane Group Flow (vph)	0	0	517	0	0	314					
Furn Type	Prot	Perm	NA			NA					
Protected Phases	6!		85			2 4!	2	4	5	8	
Permitted Phases		6									
Minimum Split (s)	42.0	42.0					61.0	36.0	19.0	36.0	
otal Split (s)	55.0	55.0					74.0	36.0	19.0	36.0	
Fotal Split (%)	50.0%	50.0%					67%	33%	17%	33%	
rellow Time (s)	4.0	4.0					4.0	4.0	4.0	4.0	
All-Red Time (s)	2.5	2.5					2.5	3.0	2.5	6.5	
ost Time Adjust (s)	-1.5	-1.5									
Total Lost Time (s)	5.0	5.0									
_ead/Lag	Lead	Lead							Lag		
_ead-Lag Optimize?	Yes	Yes							Yes		
Act Effct Green (s)			46.0			110.0					
Actuated g/C Ratio			0.42			1.00					
//c Ratio			0.25			0.10					
Control Delay			21.3			0.0					
Queue Delay			0.0			0.0					
Total Delay			21.3			0.0					
.OS			С			Α					
Approach Delay			21.3			0.0					
Approach LOS			С			Α					
ntoreaction Cummany											
ntersection Summary Area Type:	Other										
GREAT CONTRACTOR CONTR	Other										
Cycle Length: 110											
Actuated Cycle Length: 110		2-M/DTI	and E-ED	TI Ctort	of Groom						
Offset: 57 (52%), Reference	eu to phase	Z.WBIL	and o.EB	IL, Start	or Green						
Natural Cycle: 100											
Control Type: Pretimed											
Maximum v/c Ratio: 0.72	2.2			1	lana a - M	100.0					
ntersection Signal Delay: 1		0.			tersection						
ntersection Capacity Utiliza Analysis Period (min) 15	ition 16.7%)		IC	U Level (of Service	Α				

2015 Existing AM Peak Hour SI South Campus Master Plan - Loading Dock Analysis



	→	•	1	•	1	-		
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	ø3	
Lane Configurations	1117-		100000000000000000000000000000000000000	ना	*	7	100000	
Traffic Volume (vph)	1385	85	66	880	56	152		
Future Volume (vph)	1385	85	66	880	56	152		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Lane Width (ft)	10	10	10	10	12	12		
Storage Length (ft)		0	0		0	210		
Storage Lanes		0	0		1	1		
Taper Length (ft)			25		25			
Satd. Flow (prot)	5940	0	0	5905	1805	1615		
Flt Permitted				0.758	0.950			
Satd. Flow (perm)	5940	0	0	4487	1673	1441		
Right Turn on Red		Yes	Ť	1101	1010	Yes		
Satd. Flow (RTOR)	17					58		
Link Speed (mph)	35			35	20			
Link Distance (ft)	590			1087	758			
Travel Time (s)	11.5			21.2	25.8			
Confl. Peds. (#/hr)	11.0	27	27	21.2	53	69		
Confl. Bikes (#/hr)		9	21		00	5		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96		
Heavy Vehicles (%)	1%	1%	3%	3%	0%	0%		
Shared Lane Traffic (%)	170	1 70	070	070	0,0	0,0		
Lane Group Flow (vph)	1532	0	0	986	58	158		
Turn Type	NA		pm+pt	NA	Prot	pm+ov		
Protected Phases	2		9	6	4	9	3	
Permitted Phases	_		6	•		4	•	
Minimum Split (s)	61.5		14.5	61.5	30.0	14.5	4.0	
Total Split (s)	61.5		14.5	61.5	30.0	14.5	4.0	
Total Split (%)	55.9%		13.2%	55.9%	27.3%	13.2%	4%	
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0	2.0	
All-Red Time (s)	2.5		1.0	2.5	1.5	1.0	0.0	
Lost Time Adjust (s)	-1.5		1.0	-1.5	-1.0	-1.0	0.0	
Total Lost Time (s)	5.0			5.0	4.5	4.0		
Lead/Lag	5.0			0.0	Lag	4.0	Lead	
Lead-Lag Optimize?					Yes		Yes	
Act Effct Green (s)	56.5			66.0	25.5	36.5	169	
	0.51			0.60	0.23	0.33		
Actuated g/C Ratio v/c Ratio	0.50				0.23	0.33		
Control Delay	3.4			0.35	34.7	16.9		
	0.0			0.0	0.0	0.0		
Queue Delay	3.4			8.9	34.7	16.9		
Total Delay								
LOS Approach Delevi	Α			A	C 24.7	В		
Approach Delay	3.4			8.9	21.7			
Approach LOS	Α			Α	С			

Intersection Summary

Area Type: Cycle Length: 110

Actuated Cycle Length: 110
Offset: 67 (61%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 110

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4: L'Enfant Plaza & Independence Ave SW SI South Campus Master Plan - Loading Dock Analysis

2015 Existing AMPeak Hour

ntersection Signal Delay: 6.8	Intersection LOS: A	
ntersection Capacity Utilization 67.5%	ICU Level of Service C	
Analysis Period (min) 15		
Splits and Phases: 4: L'Enfant Plaza & Independe	nce Ave SW	
Splits and Phases: 4: L'Enfant Plaza & Independe →ø2 (R)	nce Ave SW	₹ ₹ø9

SI South Campus Master Plan - Loading Dock Analysis

	٠	-	*	•	•	•	1	†	-	-	↓	4
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
Lane Configurations		ተተጉ			^	7		^ ^	7	ሻ	444	
Traffic Volume (vph)	5	433	33	18	1181	132	0	1335	325	130	1323	19
Future Volume (vph)	5	433	33	18	1181	132	0	1335	325	130	1323	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	10	10	10	11	11	12	10	10	10
Satd. Flow (prot)	0	4741	0	0	4644	1311	0	4964	1583	1589	4735	(
Flt Permitted		0.898			0.925					0.105		
Satd. Flow (perm)	0	4262	0	0	4293	1209	0	4964	1481	175	4735	C
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11				139			151		2	
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		487			1110			612			436	
Travel Time (s)		9.5			21.6			13.9			9.9	
Confl. Peds. (#/hr)	46		194	194		46	27		40	40		27
Confl. Bikes (#hr)			1			23			2			2
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
Heavy Vehicles (%)	80%	2%	3%	79%	3%	15%	0%	1%	2%	6%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	496	0	0	1262	139	0	1405	342	137	1413	C
Turn Type	Perm	NA		Perm	NA	Perm		NA	Perm	custom	NA	
Protected Phases		4			8			2		9	69	
Permitted Phases	4			8		8			2	6		
Minimum Split (s)	37.0	37.0		37.0	37.0	37.0		53.0	53.0	20.0		
Total Split (s)	37.0	37.0		37.0	37.0	37.0		53.0	53.0	20.0		
Total Split (%)	33.6%	33.6%		33.6%	33.6%	33.6%		48.2%	48.2%	18.2%		
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0		
All-Red Time (s)	2.5	2.5		2.5	2.5	2.5		2.5	2.5	1.5		
Lost Time Adjust (s)		-1.5			-1.5	-1.5		-1.5	-1.5	-1.0		
Total Lost Time (s)		5.0			5.0	5.0		5.0	5.0	4.5		
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)		32.0			32.0	32.0		48.0	48.0	64.0	68.5	
Actuated g/C Ratio		0.29			0.29	0.29		0.44	0.44	0.58	0.62	
v/c Ratio		0.40			1.01	0.31		0.65	0.47	0.46	0.48	
Control Delay		31.7			54.4	8.1		26.1	14.1	18.2	11.8	
Queue Delay		0.0			0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay		31.7			54.4	8.1		26.1	14.1	18.2	11.8	
LOS		С			D	Α		С	В	В	В	
Approach Delay		31.7			49.8			23.8			12.4	
Approach LOS		С			D			С			В	
Intersection Summary												

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 16 (15%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 110

Control Type: Pretimed Maximum v/c Ratio: 1.01 Intersection Signal Delay: 28.2

Intersection LOS: C

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Lane Group	ø6		
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Satd. Flow (prot)			
FIt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Confl. Bikes (#hr)			
Peak Hour Factor			
Heavy Vehides (%)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	6		
Permitted Phases			
Minimum Split (s)	53.0		
Total Split (s)	53.0		
Total Split (%)	48%		
Yellow Time (s)	3.5		
All-Red Time (s)	2.5		
Lost Time Adjust (s)	770		
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Intersection Summary			

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1: 14th St SW & Independence Ave SW SI South Campus Master Plan - Loading Dock Analysis

2015 Existing PMPeak Hour

Intersection Capacity Utilization 88.3%	ICU Level of Service E	
Analysis Period (min) 15		
Splits and Phases: 1: 14th St SW & Independence	Ave SW	
↑ ø2 (R)	♣ 04	№ ø9
53 s	37 s	20 s
ø6 (R)	₩ ø8	
53 s	37 s	

	→	•	1	•	*_	•	1	ኘ	†	-	\	>
Lane Group	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR	SEL	SER
Lane Configurations	41114		ሻ	444				ă	1	7	M	
Traffic Volume (vph)	866	22	335	1230	2	163	93	1	208	244	12	20
Future Volume (vph)	866	22	335	1230	2	163	93	1	208	244	12	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	11	11	11	11	14	14
Satd. Flow (prot)	5896	0	1393	4060	0	0	0	1678	1568	1426	1281	0
Flt Permitted			0.225	0.855				0.950			0.985	
Satd. Flow (perm)	5896	0	330	3478	0	0	0	1548	1568	1426	1159	0
Right Turn on Red		Yes				Yes				Yes		
Satd. Flow (RTOR)	5			1					8	35	99	
Link Speed (mph)	35			35					30		30	
Link Distance (ft)	1110			590					162		395	
Travel Time (s)	21.6			11.5					3.7		9.0	
Confl. Peds. (#/hr)					51	51	59			285	285	
Confl. Bikes (#/hr)		16			15	15				4		7
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
Heavy Vehicles (%)	3%	3%	4%	4%	0%	4%	4%	0%	4%	4%	40%	40%
Shared Lane Traffic (%)	• • • • • • • • • • • • • • • • • • • •		17%	.,,		.,,				14%		1070
Lane Group Flow (vph)	935	0	293	1529	0	0	0	99	255	221	43	0
Turn Type	NA		pm+pt	NA			Split	Split	NA	pt+ov	Prot	_
Protected Phases	6		5	2			4	41	4!	4 5!	4!	
Permitted Phases	-0.		2				20,40	34.	55.84	10.	300	
Minimum Split (s)	42.0		30.0	72.0			38.0	38.0	38.0		38.0	
Total Split (s)	42.0		30.0	72.0			38.0	38.0	38.0		38.0	
Total Split (%)	38.2%		27.3%	65.5%			34.5%	34.5%	34.5%		34.5%	
Yellow Time (s)	4.0		4.0	4.0			4.0	4.0	4.0		4.0	
All-Red Time (s)	2.5		2.5	2.5			3.0	3.0	3.0		3.0	
Lost Time Adjust (s)	-1.5		-1.5	-1.5			0.0	-1.5	-1.5		-1.5	
Total Lost Time (s)	5.0		5.0	5.0				5.5	5.5		5.5	
Lead/Lag	Lead		Lag	0.0				0.0	0.0		0.0	
Lead-Lag Optimize?	Yes		Yes									
Act Effet Green (s)	37.0		67.0	67.0				32.5	32.5	62.5	32.5	
Actuated g/C Ratio	0.34		0.61	0.61				0.30	0.30	0.57	0.30	
v/c Ratio	0.47		0.66	0.68				0.20	0.54	0.27	0.10	
Control Delay	30.3		23.7	11.6				19.0	25.1	2.0	0.10	
Queue Delay	0.0		0.0	0.0				2.9	5.4	0.6	0.0	
Total Delay	30.3		23.7	11.6				21.9	30.5	2.6	0.4	
LOS	C		C	В.				C	C	Α.	Α.4	
Approach Delay	30.3		U	13.6				C	18.3	^	0.4	
Approach LOS	C			В					В		Α.4	
Approach LOS	C			Ь					Ь		^	
Intersection Summary												
Area Type:	Other											
Cycle Length: 110												
Actuated Cycle Length: 11					The same of the same of							
Offset: 4 (4%), Referenced	to phase 2:	WBTL a	nd 6:EBT	L, Start of	Green							
Natural Cycle: 110												
Control Type: Pretimed												
Maximum v/c Ratio: 0.68				- 20								
Intersection Signal Delay: 1	18.8			In	itersectio	n LOS B						

Intersection LOS: B

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Intersection Signal Delay: 18.8



	*2	
Lane Group	SER2	ø8
Lane Configurations		
Traffic Volume (vph)	9	
Future Volume (vph)	9	
Ideal Flow (vphpl)	1900	
Lane Width (ft)	14	
Satd. Flow (prot)	0	
Flt Permitted		
Satd. Flow (perm)	0	
Right Turn on Red	Yes	
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)	59	
Confl. Bikes (#/hr)	7	
Peak Hour Factor	0.95	
Heavy Vehicles (%)	0%	
Shared Lane Traffic (%)		
Lane Group Flow (vph)	0	
Turn Type		
Protected Phases		8
Permitted Phases		
Minimum Split (s)		38.0
Total Split (s)		38.0
Total Split (%)		35%
Yellow Time (s)		4.0
All-Red Time (s)		6.5
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Intersection Summary		

2: 12th St SW & Independence Ave SW & 12th St Ramp SI South Campus Master Plan - Loading Dock Analysis

2015 Existing PMPeak Hour

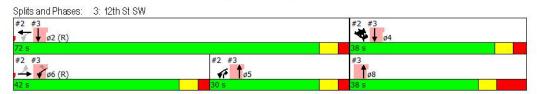


3: 12th St SW SI South Campus Master Plan - Loading Dock Analysis

	•	•	†	-	1	ţ					
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø2	ø4	ø5	ø8	
Lane Configurations	ሻ	7	ተተኩ			^					
Traffic Volume (vph)	0	0	546	0	0	377					
Future Volume (vph)	0	0	546	0	0	377					
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900					
Lane Width (ft)	10	11	11	11	10	10					
Satd. Flow (prot)	1739	1801	4916	0	0	3303					
FIt Permitted											
Satd. Flow (perm)	1739	1801	4916	0	0	3303					
Right Turn on Red		Yes		Yes							
Satd. Flow (RTOR)											
Link Speed (mph)	20		30			30					
ink Distance (ft)	188		380			162					
Fravel Time (s)	6.4		8.6			3.7					
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95					
Shared Lane Traffic (%)	0.00	0.00	0.00	0.00	0.00	0.00					
Lane Group Flow (vph)	0	0	575	0	0	397					
Turn Type	Prot	Perm	NA			NA					
Protected Phases	6!	i Oilli	5.8			2 4!	2	4	5	8	
Permitted Phases	J:	6	0.0			4 71	-	7	0		
Minimum Split (s)	42.0	42.0					72.0	38.0	30.0	38.0	
Fotal Split (s)	42.0	42.0					72.0	38.0	30.0	38.0	
Total Split (%)	38.2%	38.2%					65%	35%	27%	35%	
rellow Time (s)	4.0	4.0					4.0	4.0	4.0	4.0	
All-Red Time (s)	2.5	2.5					2.5	3.0	2.5	6.5	
	-1.5	-1.5					2.5	3.0	2.0	0.5	
Lost Time Adjust (s)	5.0	5.0									
Total Lost Time (s)									Lon		
_ead/Lag	Lead Yes	Lead Yes							Lag		
Lead-Lag Optimize?	res	1 65	00.0			440.0			Yes		
Act Effet Green (s)			63.0			110.0					
Actuated g/C Ratio			0.57			1.00					
/c Ratio			0.20			0.12					
Control Delay			11.6			0.1					
Queue Delay			0.0			0.0					
Total Delay			11.6			0.1					
LOS			В			Α					
Approach Delay			11.6			0.1					
Approach LOS			В			Α					
ntersection Summary											
Area Type:	Other										
Cycle Length: 110											
Actuated Cycle Length: 110											
Offset: 4 (4%), Referenced Natural Cycle: 110	to phase 2	WBTL an	d 6:EBTL	, Start of	Green						
Control Type: Pretimed											
Maximum v/c Ratio: 0.68											
ntersection Signal Delay: 6	3.9			In	tersection	LOS: A					
ntersection Capacity Utiliza)		IC	U Level	of Service	A				
Analysis Period (min) 15											
Phase conflict between	lane groups										

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2015 Existing PMPeak Hour



	-	•	1	•	1	-		
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	ø3	
Lane Configurations	1117-			ना	*	7		
Traffic Volume (vph)	1067	55	50	1504	226	55		
Future Volume (vph)	1067	55	50	1504	226	55		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Lane Width (ft)	10	10	10	10	12	12		
Storage Length (ft)	10	0	0	10	0	210		
Storage Lanes		0	0		1	1		
Taper Length (ft)			25		25			
Satd. Flow (prot)	5862	0	0	5854	1805	1615		
Fit Permitted	0002			0.827	0.950	1010		
Satd. Flow (perm)	5862	0	0	4850	1415	1580		
Right Turn on Red	0002	Yes	0	4000	1410	Yes		
Satd. Flow (RTOR)	13	103				61		
Link Speed (mph)	35			35	20	UI		
Link Speed (mpn) Link Distance (ft)	590			1087	758			
Travel Time (s)	11.5			21.2	25.8			
	11.0	10	10	21.2		7		
Confl. Peds. (#/hr)		10	10		157	7		
Confl. Bikes (#hr)	0.00	13	0.00	0.00	0.00	0.00		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90		
Heavy Vehides (%)	3%	3%	4%	4%	0%	0%		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	1247	0	0	1727	251	61		
Turn Type	NA		pm+pt	NA	Prot	pm+ov		
Protected Phases	2		9	6	4	9	3	
Permitted Phases			6			4		
Minimum Split (s)	58.5		13.5	58.5	30.0	13.5	4.0	
Total Split (s)	60.5		15.5	60.5	30.0	15.5	4.0	
Total Split (%)	55.0%		14.1%	55.0%	27.3%	14.1%	4%	
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0	2.0	
All-Red Time (s)	2.5		1.0	2.5	1.5	1.0	0.0	
Lost Time Adjust (s)	-1.5			-1.5	-1.0	-1.0		
Total Lost Time (s)	5.0			5.0	4.5	4.0		
Lead/Lag					Lag		Lead	
Lead-Lag Optimize?					Yes		Yes	
Act Effct Green (s)	55.5			66.0	25.5	37.5		
Actuated g/C Ratio	0.50			0.60	0.23	0.34		
v/c Ratio	0.42			0.57	0.60	0.10		
Control Delay	20.9			12.0	44.6	6.1		
Queue Delay	0.0			0.0	0.0	0.0		
Total Delay	20.9			12.0	44.6	6.1		
LOS	C			В	D	Α		
Approach Delay	20.9			12.0	37.1			
	20.5			12.0 B	37.1 D			

Intersection Summary

Area Type: Cycle Length: 110

Actuated Cycle Length: 110
Offset: 38 (35%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 110

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4: L'Enfant Plaza & Independence Ave SW SI South Campus Master Plan - Loading Dock Analysis

2015 Existing PMPeak Hour

evel of Service C	
	ction LOS: B vvel of Service C

	٠	→	•	1	•	•	4	†	-	-	↓	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		ተተኩ			^	7		† ††	7	7	**	
Traffic Volume (vph)	6	1491	44	6	702	284	0	2139	182	152	462	16
Future Volume (vph)	6	1491	44	6	702	284	0	2139	182	152	462	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	10	10	10	11	11	12	10	10	10
Satd. Flow (prot)	0	4961	0	0	4759	1422	0	4964	1524	1452	4570	0
Flt Permitted		0.936	- 2		0.806					0.075		
Satd. Flow (perm)	0	4644	0	0	3836	1339	0	4964	1050	115	4570	0
Right Turn on Red	•	1011	Yes		0000	Yes	•	1001	Yes	110	1010	Yes
Satd. Flow (RTOR)		4	100			122			89		8	
Link Speed (mph)		35			35	1,444		30			30	
Link Distance (ft)		487			1110			612			436	
Travel Time (s)		9.5			21.6			13.9			9.9	
Confl. Peds. (#/hr)	40	3.0	58	58	21.0	40	27	10.0	246	246	0.0	27
Confl. Bikes (#hr)	40		14	00		5	21		1	240		5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
			55,500									
Heavy Vehicles (%)	100%	0%	0%	80%	1%	6%	0%	1%	6%	16%	5%	12%
Shared Lane Traffic (%)		4070			770	000		0005	400	405	540	
Lane Group Flow (vph)	0	1676	0	0	770	309	0	2325	198	165	519	0
Turn Type	Perm	NA		Perm	NA	Perm		NA	Perm	custom	NA	
Protected Phases		4			8			2	-	9	69	
Permitted Phases	4			8		8			2	6		
Minimum Split (s)	40.0	40.0		40.0	40.0	40.0		58.0	58.0	12.0		
Total Split (s)	40.0	40.0		40.0	40.0	40.0		58.0	58.0	12.0		
Total Split (%)	36.4%	36.4%		36.4%	36.4%	36.4%		52.7%	52.7%	10.9%		
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0		
All-Red Time (s)	2.5	2.5		2.5	2.5	2.5		2.5	2.5	1.5		
Lost Time Adjust (s)		-1.5			-1.5	-1.5		-1.5	-1.5	-1.0		
Total Lost Time (s)		5.0			5.0	5.0		5.0	5.0	4.5		
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)		35.0			35.0	35.0		53.0	53.0	61.0	65.5	
Actuated g/C Ratio		0.32			0.32	0.32		0.48	0.48	0.55	0.60	
v/c Ratio		1.13			0.63	0.61		0.97	0.36	1.07	0.19	
Control Delay		104.0			43.5	34.4		41.2	11.5	119.9	10.2	
Queue Delay		0.0			0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay		104.0			43.5	34.4		41.2	11.5	119.9	10.2	
LOS		F			D	С		D	В	F	В	
Approach Delay		104.0			40.9			38.9			36.7	
Approach LOS		F			D			D			D	
Intersection Summary												
Area Type:	Other											
Cycle Length: 110	- Curior											
Actuated Cycle Length: 11	0											
Offset: 88 (80%), Reference		2 NRT a	nd 6:SRT	1 Start o	f Green							
Natural Cycle: 120	ou to pilast		0.001	c, otali C	, Groon							
Control Type: Pretimed												
Maximum v/c Ratio: 1.13												
Intersection Signal Delay:	57.3			li li	ntersection	n LOS: E						
intorosotion orginal Dady.	01.0				no sectio	11 LOO. L						

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Lane Configurations Traffic Volume (vph)		
Traffic Volume (vnh)		
rianic volumo (vpm)		
Future Volume (vph)		
deal Flow (vphpl)		
Lane Width (ft)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Confl. Bikes (#hr)		
Peak Hour Factor		
Heavy Vehicles (%)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	6	
Permitted Phases		
Minimum Split (s)	58.0	
Total Split (s)	58.0	
Total Split (%)	53%	
Yellow Time (s)	3.5	
All-Red Time (s)	2.5	
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
ntersection Summary		

1: 14th St SW & Independence Ave SW SI South Campus Master Plan - Loading Dock Analysis

2030 No Build AM Peak Hour

ntersection Capacity Utilization 108.9%	ICU Level of Service G	
Analysis Period (min) 15		
Splits and Phases: 1: 14th St SW & Inde	pendence Ave SW	
∮ø2 (R)	<u></u>	№ ø9
58 s	40 s	12 s
ø6 (R)	₩ ø8	W W
58 s	40 s	

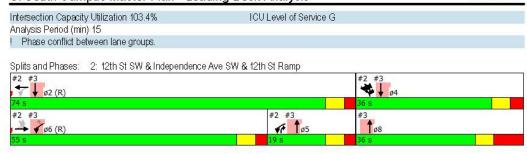
	>	•	-	•	1	•	*_	•	1	ኘ	†	1
Lane Group	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR
Lane Configurations			नााः		7	444				Ä	7	7
Traffic Volume (vph)	1	54	1608	162	173	771	2	148	212	2	229	156
Future Volume (vph)	1	54	1608	162	173	771	2	148	212	2	229	156
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	11	11	11	11
Satd. Flow (prot)	0	0	5931	0	1407	3851	0	0	0	1694	1653	1440
Flt Permitted			0.835		0.073	0.876				0.950		
Satd. Flow (perm)	0	0	4945	0	108	3377	0	0	0	1072	1653	1440
Right Turn on Red	-			Yes				Yes				Yes
Satd. Flow (RTOR)			26			10					3	35
Link Speed (mph)			35			35					30	10.0
Link Distance (ft)			1110			590					162	
Travel Time (s)			21.6			11.5					3.7	
Confl. Peds. (#/hr)	141	141	21.0	9	9	1,1.0	141	141	482		0.1	166
Confl. Bikes (#hr)		1.11		Ü	Ÿ		12	12	102			3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	1%	1%	3%	3%	3%	3%	3%	0%	3%	3%
Shared Lane Traffic (%)	170	170	170	170	10%	0,0	070	070	070	070	070	10%
Lane Group Flow (vph)	0	0	1984	0	169	1020	0	0	0	232	266	153
Turn Type	Perm	Perm	NA		pm+pt	NA			Split	Split	NA	pt+ov
Protected Phases	1 OIIII	1 01111	6		5	2			4	4!	41	4 5!
Permitted Phases	6	6	Ü		2						780.	10.
Minimum Split (s)	42.0	42.0	42.0		19.0	61.0			36.0	36.0	36.0	
Total Split (s)	55.0	55.0	55.0		19.0	74.0			36.0	36.0	36.0	
Total Split (%)	50.0%	50.0%	50.0%		17.3%	67.3%			32.7%	32.7%	32.7%	
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0			4.0	4.0	4.0	
All-Red Time (s)	2.5	2.5	2.5		2.5	2.5			3.0	3.0	3.0	
Lost Time Adjust (s)	2.0	2.0	-1.5		-1.5	-1.5			0.0	-1.5	-1.5	
Total Lost Time (s)			5.0		5.0	5.0				5.5	5.5	
Lead/Lag	Lead	Lead	Lead		Lag	.0.0				0.0	0.0	
Lead-Lag Optimize?	Yes	Yes	Yes		Yes							
Act Effet Green (s)	103	100	50.0		69.0	69.0				30.5	30.5	49.5
Actuated g/C Ratio			0.45		0.63	0.63				0.28	0.28	0.45
v/c Ratio			0.88		0.73	0.47				0.49	0.58	0.23
Control Delay			9.3		47.3	5.7				15.8	18.1	0.20
Queue Delay			0.0		0.0	0.0				1.7	1.4	0.6
Total Delay			9.3		47.3	5.7				17.5	19.5	1.4
LOS			Α.		77.5 D	Α.				В.	В.	Α.
Approach Delay			9.3		U	11.7				Ь	14.5	
Approach LOS			Α.			В					14.5 B	
						Ь					ь	
Intersection Summary	011											
Area Type:	Other											
Cycle Length: 110	^											
Actuated Cycle Length: 11				T. 0.								
Offset: 57 (52%), Reference	ced to phase	2:WBTL	and 6:EE	IL, Starl	of Green	1						
Natural Cycle: 100												
Control Type: Pretimed												
Maximum v/c Ratio: 0.88	40.0			- 4		100 5						
Intersection Signal Delay:	10.8			li li	ntersectio	n LOS: B						

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	\	>	4	
Lane Group	SEL	SER	SER2	ø8
Lane Configurations	M		Section 18 had	
Traffic Volume (vph)	12	15	9	
Future Volume (vph)	12	15	9	
Ideal Flow (vphpl)	1900	1900	1900	
	100000000			
Lane Width (ft)	14	14	14	
Satd. Flow (prot)	1311	0	0	
FIt Permitted	0.984			
Satd. Flow (perm)	1215	0	0	
Right Turn on Red			Yes	
Satd. Flow (RTOR)	99			
Link Speed (mph)	30			
Link Distance (ft)	395			
Travel Time (s)	9.0			
Confl. Peds. (#/hr)	166		482	
Confl. Bikes (#hr)				
Peak Hour Factor	0.92	0.92	0.92	
Heavy Vehicles (%)	0.92	10%	0.92	
	070	1070	070	
Shared Lane Traffic (%)	39	0	0	
Lane Group Flow (vph)	7.7	U	U	
Turn Type	Prot			
Protected Phases	4!			8
Permitted Phases				
Minimum Split (s)	36.0			36.0
Total Split (s)	36.0			36.0
Total Split (%)	32.7%			33%
Yellow Time (s)	4.0			4.0
All-Red Time (s)	3.0			6.5
Lost Time Adjust (s)	-1.5			
Total Lost Time (s)	5.5			
Lead/Lag	0.0			
Lead-Lag Optimize?				
Act Effet Green (s)	30.5			
	0.28			
Actuated g/C Ratio				
v/c Ratio	0.09			
Control Delay	0.4			
Queue Delay	0.0			
Total Delay	0.4			
LOS	Α			
Approach Delay	0.4			
Approach LOS	Α			
Interesting Comme	750)7			
Intersection Summary				

2: 12th St SW & Independence Ave SW & 12th St Ramp SI South Campus Master Plan - Loading Dock Analysis

2030 No Build AM Peak Hour

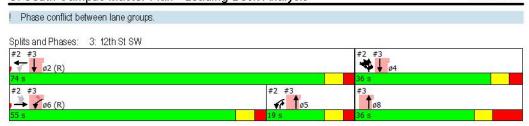


3: 12th St SW SI South Campus Master Plan - Loading Dock Analysis

	•	•	†	-	1	ţ					
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø2	04	ø5	ø8	
Lane Configurations	ሻ	7	ተተጉ			^					
Traffic Volume (vph)	0	0	599	0	0	350					
Future Volume (vph)	0	0	599	0	0	350					
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900					
Lane Width (ft)	10	11	11	11	10	10					
Satd. Flow (prot)	1773	1837	4868	0	0	3271					
FIt Permitted											
Satd. Flow (perm)	1773	1837	4868	0	0	3271					
Right Turn on Red		Yes		Yes							
Satd. Flow (RTOR)											
Link Speed (mph)	20		30			30					
Link Distance (ft)	188		380			162					
Travel Time (s)	6.4		8.6			3.7					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92					
Heavy Vehicles (%)	0%	0%	3%	0%	0%	3%					
Shared Lane Traffic (%)	• • • • • • • • • • • • • • • • • • • •										
Lane Group Flow (vph)	0	0	651	0	0	380					
Turn Type	Prot	Perm	NA			NA					
Protected Phases	6!	T OITH	8.5			2 4!	2	4	5	8	
Permitted Phases	91	6				- "		_			
Minimum Split (s)	42.0	42.0					61.0	36.0	19.0	36.0	
Total Split (s)	55.0	55.0					74.0	36.0	19.0	36.0	
Total Split (%)	50.0%	50.0%					67%	33%	17%	33%	
Yellow Time (s)	4.0	4.0					4.0	4.0	4.0	4.0	
All-Red Time (s)	2.5	2.5					2.5	3.0	2.5	6.5	
Lost Time Adjust (s)	-1.5	-1.5						0.0	2.0	0.0	
Total Lost Time (s)	5.0	5.0									
Lead/Lag	Lead	Lead							Lag		
Lead-Lag Optimize?	Yes	Yes							Yes		
Act Effct Green (s)			46.0			110.0					
Actuated g/C Ratio			0.42			1.00					
v/c Ratio			0.32			0.12					
Control Delay			22.0			0.0					
Queue Delay			0.0			0.0					
Total Delay			22.1			0.0					
LOS			C			A					
Approach Delay			22.1			0.0					
Approach LOS			С			A					
Intersection Summary			V-74			1000					
Area Type:	Other										
Cycle Length: 110	2										
Actuated Cycle Length: 110	0										
Offset: 57 (52%), Reference		2·WBTI	and 6:FP	TL Start	of Green						
Natural Cycle: 100	ou to pridoc			, L, JW	-, -,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,						
Control Type: Pretimed											
Maximum v/c Ratio: 0.88											
Intersection Signal Delay: 1	14.0			In	tersection	LOS B					
Intersection Capacity Utiliza						of Service	Α				
Analysis Period (min) 15		10		-10							

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2030 No Build AM Peak Hour SI South Campus Master Plan - Loading Dock Analysis



Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 67 (61%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 110

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4: L'Enfant Plaza & Independence Ave SW SI South Campus Master Plan - Loading Dock Analysis

2030 No Build AM Peak Hour

4 5 30 s	14.5 s
#Rp ₹ 04	₹ 09
ce Ave SW	70
ICU Level of Service D	
Intersection LOS: A	
	ICU Level of Service D ce Ave SW

SI South Campus Master Plan - Loading Dock Analysis

	١	→	•	•	•	•	1	†	-	-	↓	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		ተተጉ			^ ^	7		^ ^^	۴	ሻ	^^	
Traffic Volume (vph)	5	537	38	21	1436	172	0	1527	372	162	1513	22
Future Volume (vph)	5	537	38	21	1436	172	0	1527	372	162	1513	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	10	10	10	11	11	12	10	10	10
Satd. Flow (prot)	0	4748	0	0	4646	1311	0	4964	1583	1589	4735	0
Flt Permitted		0.821			0.921					0.083		
Satd. Flow (perm)	0	3898	0	0	4280	1170	0	4964	1469	139	4735	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10				164			107			
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		487			1110			612			436	
Travel Time (s)		9.5			21.6			13.9			9.9	
Confl. Peds. (#/hr)	71		236	136		71	31		46	46		31
Confl. Bikes (#hr)			3			28			2			2
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
Heavy Vehicles (%)	80%	2%	3%	79%	3%	15%	0%	1%	2%	6%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	610	0	0	1534	181	0	1607	392	171	1616	0
Turn Type	Perm	NA		Perm	NA	Perm		NA	Perm	custom	NA	
Protected Phases		4			8			2		9	69	
Permitted Phases	4			8		8			2	6		
Minimum Split (s)	37.0	37.0		37.0	37.0	37.0		53.0	53.0	20.0		
Total Split (s)	37.0	37.0		37.0	37.0	37.0		53.0	53.0	20.0		
Total Split (%)	33.6%	33.6%		33.6%	33.6%	33.6%		48.2%	48.2%	18.2%		
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0		
All-Red Time (s)	2.5	2.5		2.5	2.5	2.5		2.5	2.5	1.5		
Lost Time Adjust (s)		-1.5			-1.5	-1.5		-1.5	-1.5	-1.0		
Total Lost Time (s)		5.0			5.0	5.0		5.0	5.0	4.5		
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)		32.0			32.0	32.0		48.0	48.0	64.0	68.5	
Actuated g/C Ratio		0.29			0.29	0.29		0.44	0.44	0.58	0.62	
v/c Ratio		0.53			1.23	0.40		0.74	0.56	0.60	0.55	
Control Delay		34.2			135.0	7.4		28.4	19.9	30.4	12.8	
Queue Delay		0.0			0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay		34.2			135.0	7.4		28.4	19.9	30.4	12.8	
LOS		С			F	Α		С	В	С	В	
Approach Delay		34.2			121.5			26.8			14.4	
Approach LOS		С			F			С			В	
Intersection Summary												

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 16 (15%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 120
Control Type: Pretimed
Maximum v/c Ratio: 1.23
Intersection Signal Delay: 50.5 Intersection Signal Delay: 50.5

Intersection LOS: D

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Lane Group	ø6		
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Satd. Flow (prot)			
FIt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Confl. Bikes (#hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	6		
Permitted Phases			
Minimum Split (s)	53.0		
Total Split (s)	53.0		
Total Split (%)	48%		
Yellow Time (s)	3.5		
All-Red Time (s)	2.5		
Lost Time Adjust (s)	2.0		
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Act Effet Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay LOS			
Approach Delay			
Approach LOS			
Intersection Summary			

Stantec Lanes, Volumes, Timings 2030_nbpm.syn Page 2

1: 14th St SW & Independence Ave SW SI South Campus Master Plan - Loading Dock Analysis

2030 No Build PM Peak Hour

Intersection Capacity Utilization 93.0%	ICU Level of Service F	
Analysis Period (min) 15		
Splits and Phases: 1: 14th St SW & Independence	Ave SW	
∮ø2 (R)	→ 04	№ ø9
53 s	37 s	20 s
ø6 (R)	₩ ø8	
53 s	37 s	

	→	•	1	•	*_	•	1	ኘ	†	-	\	>
Lane Group	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR	SEL	SER
Lane Configurations	41114		ሻ	444				Ä	1	7	M	
Traffic Volume (vph)	1016	55	421	1493	2	187	126	1	238	305	14	23
Future Volume (vph)	1016	55	421	1493	2	187	126	1	238	305	14	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	11	11	11	11	14	14
Satd. Flow (prot)	5861	0	1393	4060	0	0	0	1678	1534	1426	1265	0
Flt Permitted			0.164	0.776				0.950			0.985	
Satd. Flow (perm)	5861	0	240	3156	0	0	0	1516	1534	1426	1140	0
Right Turn on Red		Yes				Yes				Yes		
Satd. Flow (RTOR)	11								10	35	99	
Link Speed (mph)	35			35					30		30	
Link Distance (ft)	1110			590					162		395	
Travel Time (s)	21.6			11.5					3.7		9.0	
Confl. Peds. (#/hr)		9	9	,	71	71	73			334	334	
Confl. Bikes (#/hr)		19			19	19	, ,			5	00 1	8
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
Heavy Vehicles (%)	3%	3%	4%	4%	0%	4%	4%	0%	4%	4%	40%	40%
Shared Lane Traffic (%)	0.0	0.0	19%	170	0,0	170	170	0,0	.,,	17%	1070	1070
Lane Group Flow (vph)	1127	0	359	1855	0	0	0	134	306	266	50	0
Turn Type	NA		pm+pt	NA			Split	Split	NA	pt+ov	Prot	, i
Protected Phases	6		5	2			4	41	4!	4 5!	4!	
Permitted Phases			2				6.70	712	976	4.0:	700.0	
Minimum Split (s)	42.0		30.0	72.0			38.0	38.0	38.0		38.0	
Total Split (s)	42.0		30.0	72.0			38.0	38.0	38.0		38.0	
Total Split (%)	38.2%		27.3%	65.5%			34.5%	34.5%	34.5%		34.5%	
Yellow Time (s)	4.0		4.0	4.0			4.0	4.0	4.0		4.0	
All-Red Time (s)	2.5		2.5	2.5			3.0	3.0	3.0		3.0	
Lost Time Adjust (s)	-1.5		-1.5	-1.5			3.0	-1.5	-1.5		-1.5	
Total Lost Time (s)	5.0		5.0	5.0				5.5	5.5		5.5	
Lead/Lag	Lead		Lag	5.0				0.0	0.0		0.0	
Lead-Lag Optimize?	Yes		Yes									
Act Effet Green (s)	37.0		67.0	67.0				32.5	32.5	62.5	32.5	
Actuated g/C Ratio	0.34		0.61	0.61				0.30	0.30	0.57	0.30	
v/c Ratio	0.57		0.88	0.87				0.30	0.67	0.32	0.30	
Control Delay	32.3		43.5	18.6				17.5	27.9	2.0	0.11	
Participation of the Control of the	0.0		0.0	0.0				3.0	3.8	0.4	0.0	
Queue Delay Total Delay	32.3		43.5	18.6				20.6	31.6	2.3	0.8	
LOS	32.3 C		43.3 D	10.0 B				20.0 C	31.0 C	2.5 A	Α.	
	32.3		D	22.6				C		А	0.8	
Approach Delay	32.3 C			22.0 C					18.5 B		υ.ο	
Approach LOS	C			C					В		А	
Intersection Summary												
Area Type:	Other											
Cycle Length: 110												
Actuated Cycle Length: 11												
Offset: 4 (4%), Referenced	to phase 2:	WBTL a	nd 6:EBT	L, Start of	Green							
Natural Cycle: 110												
Control Type: Pretimed												
Maximum v/c Ratio: 0.88	reteran											
Intersection Signal Delay: 3	24.3			In	tersection	n LOS C						

Intersection LOS: C

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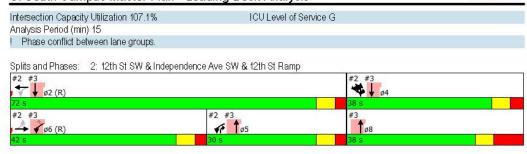
Intersection Signal Delay: 24.3



	*7	
Lane Group	SER2	ø8
Lane Configurations		
Traffic Volume (vph)	10	
Future Volume (vph)	10	
Ideal Flow (vphpl)	1900	
Lane Width (ft)	14	
Satd. Flow (prot)	0	
Flt Permitted		
Satd. Flow (perm)	0	
Right Turn on Red	Yes	
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)	73	
Confl. Bikes (#hr)	8	
Peak Hour Factor	0.95	
Heavy Vehicles (%)	0%	
Shared Lane Traffic (%)		
Lane Group Flow (vph)	0	
Turn Type		
Protected Phases		8
Permitted Phases		
Minimum Split (s)		38.0
Total Split (s)		38.0
Total Split (%)		35%
Yellow Time (s)		4.0
All-Red Time (s)		6.5
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Intersection Summary		
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2: 12th St SW & Independence Ave SW & 12th St Ramp SI South Campus Master Plan - Loading Dock Analysis

2030 No Build PM Peak Hour

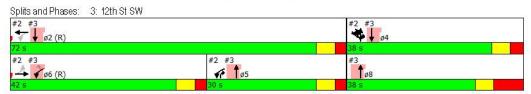


3: 12th St SW SI South Campus Master Plan - Loading Dock Analysis

	•	•	†	-	-	ţ					
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø2	04	ø5	ø8	
Lane Configurations	ሻ	7	ተተጉ			^					
Traffic Volume (vph)	0	0	670	0	0	499					
Future Volume (vph)	0	0	670	0	0	499					
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900					
Lane Width (ft)	10	11	11	11	10	10					
Satd. Flow (prot)	1739	1801	4916	0	0	3303					
Flt Permitted											
Satd. Flow (perm)	1739	1801	4916	0	0	3303					
Right Turn on Red		Yes		Yes		0000					
Satd. Flow (RTOR)											
Link Speed (mph)	20		30			30					
Link Distance (ft)	188		380			162					
Travel Time (s)	6.4		8.6			3.7					
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95					
Shared Lane Traffic (%)	0.50	0.50	0.30	0.50	0.30	0.50					
Lane Group Flow (vph)	0	0	705	0	0	525					
	Prot	Perm	NA	U	U	NA					
Turn Type Protected Phases	Prot 6!	Perm	8.5			2 4!	2	4	5	8	
Permitted Phases	O!	6	00			2 4!	2	4	3	0	
70.0390000000000000000000000000000000000	40.0	42.0					70.0	20.0	20.0	38.0	
Minimum Split (s)	42.0	107707					72.0	38.0	30.0	1.010000	
Total Split (s)	42.0	42.0					72.0	38.0	30.0	38.0	
Total Split (%)	38.2%	38.2%					65%	35%	27%	35%	
Yellow Time (s)	4.0	4.0					4.0	4.0	4.0	4.0	
All-Red Time (s)	2.5	2.5					2.5	3.0	2.5	6.5	
Lost Time Adjust (s)	-1.5	-1.5									
Total Lost Time (s)	5.0	5.0									
Lead/Lag	Lead	Lead							Lag		
Lead-Lag Optimize?	Yes	Yes				100000000			Yes		
Act Effct Green (s)			59.0			110.0					
Actuated g/C Ratio			0.54			1.00					
v/c Ratio			0.27			0.16					
Control Delay			14.1			0.1					
Queue Delay			0.0			0.0					
Total Delay			14.2			0.1					
LOS			В			Α					
Approach Delay			14.2			0.1					
Approach LOS			В			Α					
Intersection Summary											
Area Type:	Other										
Cycle Length: 110											
Actuated Cycle Length: 110											
Offset: 4 (4%), Referenced	to phase 2	:WBTL an	d 6:EBTL	., Start of	Green						
Natural Cycle: 110											
Control Type: Pretimed											
Maximum v/c Ratio: 0.88	2200					OSTONOVA PORMINA					
Intersection Signal Delay: 8					tersection						
Intersection Capacity Utiliza	ation 20.4%	6		IC	U Level	of Service	Α				
Analysis Period (min) 15											
Phase conflict between I	ane groups	S.									

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2030 No Build PM Peak Hour



	→	•	1	•	1	-	
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	ø3
Lane Configurations	tttp			ना	ሻ	7	- I Market N
Traffic Volume (vph)	1272	62	57	1844	259	63	
Future Volume (vph)	1272	62	57	1844	259	63	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	10	10	10	10	12	12	
Storage Length (ft)	1,0	0	0	.0	0	210	
Storage Lanes		0	0		1	1	
Taper Length (ft)		U	25		25		
Satd. Flow (prot)	5843	0	0	5860	1805	1615	
Flt Permitted	0040			0.801	0.950	1010	
Satd. Flow (perm)	5843	0	0	4697	1368	1572	
Right Turn on Red	0040	Yes	J	4001	1300	Yes	
Satd. Flow (RTOR)	13	1 65				60	
Link Speed (mph)	35			35	20	00	
Link Speed (mpn) Link Distance (ft)	590			1087	758		
Travel Time (s)	11.5			21.2	25.8		
	11.5	28	28	21.2	176	0	
Confl. Peds. (#/hr)		17	28		1/6	8	
Confl. Bikes (#hr)	0.00		0.00	0.00	0.00		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Heavy Vehicles (%)	3%	3%	4%	4%	0%	0%	
Shared Lane Traffic (%)	4400			0446	000	70	
Lane Group Flow (vph)	1482	0	0	2112	288	70	
Turn Type	NA		pm+pt	NA	Prot	pm+ov	52
Protected Phases	2		9	6	4	9	3
Permitted Phases			6			4	
Minimum Split (s)	58.5		13.5	58.5	30.0	13.5	4.0
Total Split (s)	61.5		13.5	61.5	31.0	13.5	4.0
Total Split (%)	55.9%		12.3%	55.9%	28.2%	12.3%	4%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	2.5		1.0	2.5	1.5	1.0	0.0
Lost Time Adjust (s)	-1.5			-1.5	-1.0	-1.0	
Total Lost Time (s)	5.0			5.0	4.5	4.0	
Lead/Lag					Lag		Lead
Lead-Lag Optimize?					Yes		Yes
Act Effct Green (s)	56.5			65.0	26.5	36.5	
Actuated g/C Ratio	0.51			0.59	0.24	0.33	
v/c Ratio	0.49			0.74	0.66	0.12	
Control Delay	21.4			16.4	46.2	8.0	
Queue Delay	0.0			0.0	0.0	0.0	
Total Delay	21.4			16.4	46.2	8.0	
LOS	С			В	D	Α	
Approach Delay	21.4			16.4	38.7	1,753	
Approach LOS	C			В	D		
r pprodon 200	150				-		

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 38 (35%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 110

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4: L'Enfant Plaza & Independence Ave SW SI South Campus Master Plan - Loading Dock Analysis

2030 No Build PM Peak Hour

ntersection Signal Delay: 20.3	Intersection LOS: C	
Intersection Capacity Utilization 79.3%	ICU Level of Service D	
Analysis Period (min) 15		
Splits and Phases: 4: L'Enfant Plaza & Independ	ence Ave SW	
Splits and Phases: 4: L'Enfant Plaza & Independ	ence Ave SW	₽ ø9
Splits and Phases: 4: L'Enfant Plaza & Independ	10 4	€f*o
	10 4	13.5 s

	٠	→	•	1	•	•	1	1	-	-	ļ	4
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
Lane Configurations		ተተኩ			^ ^	۴		^ ^^	7	ሻ	^	
Traffic Volume (vph)	6	1492	44	7	702	284	0	2139	182	152	462	16
Future Volume (vph)	6	1492	44	7	702	284	0	2139	182	152	462	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	10	10	10	11	11	12	10	10	10
Satd. Flow (prot)	0	4961	0	0	4750	1422	0	4964	1524	1452	4570	C
Flt Permitted		0.936			0.799					0.075		
Satd. Flow (perm)	0	4644	0	0	3799	1339	0	4964	1050	115	4570	C
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				122			89		8	
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		487			1110			612			436	
Travel Time (s)		9.5			21.6			13.9			9.9	
Confl. Peds. (#/hr)	40		58	58		40	27		246	246		27
Confl. Bikes (#hr)			14			5			1			5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	100%	0%	0%	80%	1%	6%	0%	1%	6%	16%	5%	12%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1677	0	0	771	309	0	2325	198	165	519	C
Turn Type	Perm	NA		Perm	NA	Perm		NA	Perm	custom	NA	
Protected Phases		4			8			2		9	69	
Permitted Phases	4			8		8			2	6		
Minimum Split (s)	40.0	40.0		40.0	40.0	40.0		58.0	58.0	12.0		
Total Split (s)	40.0	40.0		40.0	40.0	40.0		58.0	58.0	12.0		
Total Split (%)	36.4%	36.4%		36.4%	36.4%	36.4%		52.7%	52.7%	10.9%		
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0		
All-Red Time (s)	2.5	2.5		2.5	2.5	2.5		2.5	2.5	1.5		
Lost Time Adjust (s)		-1.5			-1.5	-1.5		-1.5	-1.5	-1.0		
Total Lost Time (s)		5.0			5.0	5.0		5.0	5.0	4.5		
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)		35.0			35.0	35.0		53.0	53.0	61.0	65.5	
Actuated g/C Ratio		0.32			0.32	0.32		0.48	0.48	0.55	0.60	
v/c Ratio		1.13			0.64	0.61		0.97	0.36	1.07	0.19	
Control Delay		104.3			42.5	34.8		41.2	11.5	119.9	10.2	
Queue Delay		0.0			0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay		104.3			42.5	34.8		41.2	11.5	119.9	10.2	
LOS		F			D	С		D	В	F	В	
Approach Delay		104.3			40.3			38.9			36.7	
Approach LOS		F			D			D			D	
Intersection Summary												
Area Type: Cyde Length: 110	Other											
Actuated Cycle Length: 11	0											
Offset: 88 (80%), Reference		2:NRT a	nd 6:SRT	1 Start o	f Green							
Natural Cycle: 120	ou to pilast	, Z.14D1 a1	0.001	e, oran	n Oroon							
Control Type: Pretimed												

Intersection LOS: E

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Control Type: Pretimed Maximum v/c Ratio: 1.13 Intersection Signal Delay: 57.3

Lane Group	ø6	
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Ideal Flow (vphpl)		
Lane Width (ft)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Confl. Bikes (#hr)		
Peak Hour Factor		
Heavy Vehicles (%)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	6	
Permitted Phases		
Minimum Split (s)	58.0	
Total Split (s)	58.0	
Total Split (%)	53%	
Yellow Time (s)	3.5	
All-Red Time (s)	2.5	
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Intersection Summary		
intersection Summary		

Stantec Lanes, Volumes, Timings 2030_barn.syn Page 2

1: 14th St SW & Independence Ave SW SI South Campus Master Plan - Loading Dock Analysis

2030 Build AM Peak Hour

Intersection Capacity Utilization 108.9%	ICU Level of Service G	
Analysis Period (min) 15		
Splits and Phases: 1: 14th St SW & Independence.	Ave SW	
¶ø2 (R)	→ 04	₽ ø9
58 s	40 s	12 s
ø6 (R)	₩ ø8	W W
58 s	40 s	

	٠	_#	-	•	1	•	*_	•	1	ኘ	†	۲
Lane Group	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBF
Lane Configurations			नााः		ሻ	444	1001277000		***************************************	Ä	1	
Traffic Volume (vph)	54	2	1607	162	172	770	2	151	212	2	229	1
Future Volume (vph)	54	2	1607	162	172	770	2	151	212	2	229	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	12	10	10	10	10	10	10	11	11	11	12
Satd. Flow (prot)	0	0	5929	0	1407	3843	0	0	0	1694	1775	0
Flt Permitted			0.819		0.083	0.875				0.950	17.10	J
Satd. Flow (perm)	0	0	4854	0	123	3366	0	0	0	1072	1775	0
Right Turn on Red			1001	Yes	120	0000				1012	11.10	U
Satd. Flow (RTOR)			24	, 00								
Link Speed (mph)			35			35					30	
Link Distance (ft)			1110			590					162	
Travel Time (s)			21.6			11.5					3.7	
Confl. Peds. (#/hr)	141		21.0	9	9	11.0	141	141	482		0.7	
Confl. Bikes (#hr)	171			9	9		12	12	402			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	100%	1%	1%	3%	3%	3%	3%	3%	0.32	3%	100%
Shared Lane Traffic (%)	170	10076	170	170	10%	370	370	370	370	070	370	10076
Lane Group Flow (vph)	0	0	1984	0	168	1022	0	0	0	232	250	0
	Perm	Perm	NA	U		NA	U	U			NA NA	U
Turn Type Protected Phases	Perm	Perm	NA 6		pm+pt 5	2			Split 4	Split 41	NA 4l	
Permitted Phases	6	6	0		2	2			4	4!	4!	
	6	6	6		5	2			4	4	4	
Detector Phase	0	0	0		5	2			4	4	4	
Switch Phase	10.0	10.0	40.0		5 0	10.0			7.0	7.0	7.0	
Minimum Initial (s)	10.0	10.0	10.0		5.0	0.000			7.0	7.0	7.0	
Minimum Split (s)	42.0	42.0	42.0		17.0	61.0			32.0	32.0	32.0	
Total Split (s)	48.0	48.0	48.0		18.0	66.0			32.0	32.0 29.1%	32.0	
Total Split (%)	43.6%	43.6%	43.6%		16.4%	60.0%			29.1%		29.1%	
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0			4.0	4.0	4.0	
All-Red Time (s)	2.5	2.5	2.5		2.5	2.5			3.0	3.0	3.0	
Lost Time Adjust (s)			-1.5		-1.5	-1.5				-1.5	-1.5	
Total Lost Time (s)	London	I-reserved.	5.0		5.0	5.0				5.5	5.5	
Lead/Lag	Lead	Lead	Lead		Lag							
Lead-Lag Optimize?	Yes	Yes	Yes		Yes							
Recall Mode	C-Max	C-Max	C-Max		Max	C-Max			Max	Max	Max	
Act Effct Green (s)			43.0		61.0	61.0				26.5	26.5	
Actuated g/C Ratio			0.39		0.55	0.55				0.24	0.24	
v/c Ratio			1.04		0.77	0.53				0.57	0.59	
Control Delay			34.0		53.3	10.5				17.6	17.8	
Queue Delay			0.0		0.0	0.0				1.7	1.6	
Total Delay			34.0		53.3	10.5				19.2	19.5	
LOS			С		D	В				В	В	
Approach Delay			34.0			16.5					14.7	
Approach LOS			С			В					В	
Intersection Summary												
Area Type:	Other											
Cycle Length: 110												
Actuated Cycle Length: 11	0											
Offset: 62 (56%), Reference		2:WBTL	and 6:EB	TL, Start	of Green	1						

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	1	\	>	4	6	4	1		
Lane Group	NBR2	SEL	SER	SER2	SWL2	SWL	SWR	ø8	
Lane Configurations	7	W				M			
Traffic Volume (vph)	156	12	15	9	1	1	2		
Future Volume (vph)	156	12	15	9	1	1	2		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900		
Lane Width (ft)	11	14	14	14	10	10	10		
Satd. Flow (prot)	1516	1311	0	0	0	807	0		
Flt Permitted		0.984				0.976			
Satd. Flow (perm)	1516	1215	0	0	0	807	0		
Right Turn on Red	Yes			Yes					
Satd. Flow (RTOR)	116	169							
Link Speed (mph)		30				15			
Link Distance (ft)		395				273			
Travel Time (s)		9.0				12.4			
Confl. Peds. (#/hr)	166	166		482					
Confl. Bikes (#hr)	3	100		102					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92		
Heavy Vehicles (%)	3%	0%	10%	0%	100%	100%	100%		
Shared Lane Traffic (%)	070	070	1070	070	10070	10070	10070		
Lane Group Flow (vph)	170	39	0	0	0	4	0		
Turn Type	pt+ov	Prot	·	U	Perm	Prot	Ů		
Protected Phases	4 5!	4!			Cilli	9		8	
Permitted Phases	4 0:				9	9		0	
Detector Phase	45	4			9	9			
Switch Phase	4.0	7			9	9			
Minimum Initial (s)		7.0			5.0	5.0		5.0	
Minimum Split (s)		32.0			12.0	12.0		32.0	
Total Split (s)		32.0			12.0	12.0		32.0	
Total Split (%)		29.1%			10.9%	10.9%		29%	
Yellow Time (s)		4.0			4.0	4.0		4.0	
All-Red Time (s)		3.0			3.0	3.0		6.5	
Lost Time Adjust (s)		-1.5 5.5				0.0 7.0			
Total Lost Time (s)		5.5				7.0			
Lead/Lag									
Lead-Lag Optimize?		Mari			None	Mone		May	
Recall Mode	445	Max			None	None		Max	
Act Effet Green (s)	44.5	26.5				5.0			
Actuated g/C Ratio	0.40	0.24				0.05			
v/c Ratio	0.25	0.09				0.11			
Control Delay	0.9	0.4				57.2			
Queue Delay	0.6	0.0				0.0			
Total Delay	1.4	0.4				57.2			
LOS	Α	Α				E			
Approach Delay		0.4				57.3			
Approach LOS		А				Е			
Intersection Summary									

2: 12th St SW & Independence Ave SW & 12th St Ramp & Loading Dock SI South Campus Master Plan - Loading Dock Analysis

2030 Build AM Peak Hour

Natural Cycle: 105 Control Type: Actuated-Coordinated			
Vaximum v/c Ratio: 1.04			
ntersection Signal Delay: 25.0	Intersection	LOS: C	
ntersection Capacity Utilization 113.4%	ICU Level of	f Service H	
Analysis Period (min) 15			
Phase conflict between lane groups.			
Splits and Phases: 2: 12th St SW & Independer	ce Ave SW & 12th St Ram	ip & Loading Dock	
#2 #3	~	#2 #3	#2 #3
▼ ▼ ø2 (R)	-	₩ 04	↓ ▶ ♦ ø9
ø2 (R) 66 s		32 s	↓ ↓ ø!

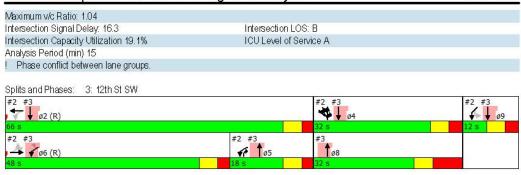
3: 12th St SW SI South Campus Master Plan - Loading Dock Analysis

	1	•	†	-	1	ţ					
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø2	04	05	ø8	ø9
Lane Configurations	ሻ	7	ተተኩ			^					
Traffic Volume (vph)	0	0	600	0	0	350					
Future Volume (vph)	0	0	600	0	0	350					
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900					
Lane Width (ft)	10	11	11	11	10	10					
Satd. Flow (prot)	1773	1837	4868	0	0	3271					
Flt Permitted											
Satd. Flow (perm)	1773	1837	4868	0	0	3271					
Right Turn on Red		Yes		Yes							
Satd. Flow (RTOR)											
Link Speed (mph)	20		30			30					
_ink Distance (ft)	188		380			162					
Travel Time (s)	6.4		8.6			3.7					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92					
Heavy Vehides (%)	0%	0%	3%	0%	0%	3%					
Shared Lane Traffic (%)		// ** (***/*/									
Lane Group Flow (vph)	0	0	652	0	0	380					
Furn Type	Prot	Perm	NA	-	100,0	NA					
Protected Phases	6!		8.5			2 4 9!	2	4	5	8	9
Permitted Phases	511	6									
Detector Phase	6	6	85			249					
Switch Phase											
Minimum Initial (s)	10.0	10.0					10.0	7.0	5.0	5.0	5.0
Minimum Split (s)	42.0	42.0					61.0	32.0	17.0	32.0	12.0
Total Split (s)	48.0	48.0					66.0	32.0	18.0	32.0	12.0
Total Split (%)	43.6%	43.6%					60%	29%	16%	29%	11%
Yellow Time (s)	4.0	4.0					4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5					2.5	3.0	2.5	6.5	3.0
ost Time Adjust (s)	-1.5	-1.5									
Total Lost Time (s)	5.0	5.0									
_ead/Lag	Lead	Lead							Lag		
Lead-Lag Optimize?	Yes	Yes							Yes		
Recall Mode	C-Max	C-Max					C-Max	Max	Max	Max	None
Act Effct Green (s)			41.0			110.0		.151500.5	recent.	cereamily.	CONTACT.
Actuated g/C Ratio			0.37			1.00					
//c Ratio			0.36			0.12					
Control Delay			25.7			0.0					
Queue Delay			0.1			0.0					
Total Delay			25.8			0.0					
LOS			С			Α					
Approach Delay			25.8			0.0					
Approach LOS			C			A					
Intersection Summary											
Area Type:	Other										
Cycle Length: 110	72000										
Actuated Cycle Length: 110	0										
Offset: 62 (56%), Reference Natural Cycle: 105		2:WBTL	and 6:EB	TL, Start	of Green						

Control Type: Actuated-Coordinated

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SI South Campus Master Plan - Loading Dock Analysis



	-	•	1	-	1	-	
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	ø3
Lane Configurations	1117-		1001001001	नाा	ሻ	7	
Traffic Volume (vph)	1679	97	75	1030	64	174	
Future Volume (vph)	1679	97	75	1030	64	174	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	10	10	10	10	12	12	
Storage Length (ft)		0	0		0	210	
Storage Lanes		0	0		1	1	
Taper Length (ft)			25		25		
Satd. Flow (prot)	5928	0	0	5905	1805	1615	
FIt Permitted				0.734	0.950		
Satd. Flow (perm)	5928	0	0	4347	1654	1418	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)	16					46	
Link Speed (mph)	35			35	20		
Link Distance (ft)	590			1087	758		
Travel Time (s)	11.5			21.2	25.8		
Confl. Peds. (#/hr)		43	43		61	79	
Confl. Bikes (#/hr)		13				6	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	
Heavy Vehides (%)	1%	1%	3%	3%	0%	0%	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	1850	0	0	1151	67	181	
Turn Type	NA		pm+pt	NA	Prot	pm+ov	
Protected Phases	2		9	6	4	9	3
Permitted Phases			6			4	
Minimum Split (s)	61.5		14.5	61.5	30.0	14.5	4.0
Total Split (s)	61.5		14.5	61.5	30.0	14.5	4.0
Total Split (%)	55.9%		13.2%	55.9%	27.3%	13.2%	4%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	2.5		1.0	2.5	1.5	1.0	0.0
Lost Time Adjust (s)	-1.5			-1.5	-1.0	-1.0	15715
Total Lost Time (s)	5.0			5.0	4.5	4.0	
Lead/Lag	7.7			5.5	Lag		Lead
Lead-Lag Optimize?					Yes		Yes
Act Effet Green (s)	56.5			66.0	25.5	36.5	
Actuated g/C Ratio	0.51			0.60	0.23	0.33	
v/c Ratio	0.61			0.42	0.16	0.35	
Control Delay	3.2			9.5	35.0	20.6	
Queue Delay	0.0			0.0	0.0	0.0	
Total Delay	3.2			9.5	35.0	20.6	
LOS	A.2			Α.	D	20.0 C	
Approach Delay	3.2			9.5	24.5		
Approach LOS	A.			3.5 A	24.5 C		
Approach Loo	^			^	C		
Intersection Summary							

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 75 (68%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 110

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4: L'Enfant Plaza & Independence Ave SW SI South Campus Master Plan - Loading Dock Analysis

2030 Build AM Peak Hour

4 \$ 30 \$	14.5 s
£80 ₹ 04	₹ ø9
nce Ave SW	-
ICU Level of Service D	
Intersection LOS: A	
	ICU Level of Service D nce Ave SW At s ↑ ø4

SI South Campus Master Plan - Loading Dock Analysis

	٠	→	•	1	•	•	4	†	-	-	ļ	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
Lane Configurations		ተተኩ			^ ^	7		ተተተ	۴	ሻ	^	
Traffic Volume (vph)	5	537	38	21	1436	172	0	1527	372	162	1513	22
Future Volume (vph)	5	537	38	21	1436	172	0	1527	372	162	1513	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	10	10	10	11	11	12	10	10	10
Satd. Flow (prot)	0	4748	0	0	4646	1311	0	4964	1583	1589	4735	0
Flt Permitted		0.821			0.921					0.083		
Satd. Flow (perm)	0	3898	0	0	4280	1170	0	4964	1469	139	4735	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10				164			107			
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		487			1110			612			436	
Travel Time (s)		9.5			21.6			13.9			9.9	
Confl. Peds. (#/hr)	71		236	136		71	31		46	46		31
Confl. Bikes (#hr)			3			28			2			2
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
Heavy Vehicles (%)	80%	2%	3%	79%	3%	15%	0%	1%	2%	6%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	610	0	0	1534	181	0	1607	392	171	1616	0
Turn Type	Perm	NA		Perm	NA	Perm		NA	Perm	custom	NA	
Protected Phases		4			8			2		9	69	
Permitted Phases	4			8		8			2	6		
Minimum Split (s)	37.0	37.0		37.0	37.0	37.0		53.0	53.0	20.0		
Total Split (s)	37.0	37.0		37.0	37.0	37.0		53.0	53.0	20.0		
Total Split (%)	33.6%	33.6%		33.6%	33.6%	33.6%		48.2%	48.2%	18.2%		
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0		
All-Red Time (s)	2.5	2.5		2.5	2.5	2.5		2.5	2.5	1.5		
Lost Time Adjust (s)		-1.5			-1.5	-1.5		-1.5	-1.5	-1.0		
Total Lost Time (s)		5.0			5.0	5.0		5.0	5.0	4.5		
Lead/Lag												
Lead-Lag Optimize?					and the same of					W-March 1	100/46000	
Act Effct Green (s)		32.0			32.0	32.0		48.0	48.0	64.0	68.5	
Actuated g/C Ratio		0.29			0.29	0.29		0.44	0.44	0.58	0.62	
v/c Ratio		0.53			1.23	0.40		0.74	0.56	0.60	0.55	
Control Delay		34.2			135.0	5.1		28.4	19.9	30.4	12.8	
Queue Delay		0.0			0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay		34.2			135.0	5.1		28.4	19.9	30.4	12.8	
LOS		С			F	Α		С	В	С	В	
Approach Delay		34.2			121.3			26.8			14.4	
Approach LOS		C			F			С			В	
Intersection Summary												
Area Type:	Other											

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 16 (15%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 120

Control Type: Pretimed Maximum v/c Ratio: 1.23 Intersection Signal Delay: 50.4

Intersection LOS: D

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Lane Group	ø6		
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Satd. Flow (prot)			
FIt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Confl. Bikes (#hr)			
Peak Hour Factor			
Heavy Vehides (%)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	6		
Permitted Phases			
Minimum Split (s)	53.0		
Total Split (s)	53.0		
Total Split (%)	48%		
Yellow Time (s)	3.5		
All-Red Time (s)	2.5		
Lost Time Adjust (s)	770		
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Intersection Summary			

Stantec Lanes, Volumes, Timings 2030_bpm.syn Page 2

1: 14th St SW & Independence Ave SW SI South Campus Master Plan - Loading Dock Analysis

2030 Build PMPeak Hour

Intersection Capacity Utilization 93.0%	ICU Level of Service F	
Analysis Period (min) 15		
Splits and Phases: 1: 14th St SW & Independence	e Ave SW	
↑ ø2 (R)	₩94	№ ø9
53 s	37 s	20 s
ø6 (R)	₹ ø8	
53 s	37 s	

	→	•	1	•	*_	•	1	ኘ	†	7	1	\
Lane Group	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR	NBR2	SE
Lane Configurations	1117-		ሻ	414				Ä	↑		7	*
Traffic Volume (vph)	1016	55	421	1493	2	189	126	1	238	1	305	1
Future Volume (vph)	1016	55	421	1493	2	189	126	1	238	1	305	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	190
Lane Width (ft)	10	10	10	10	10	10	11	11	11	12	11	1
Satd. Flow (prot)	5861	0	1393	4057	0	0	0	1678	1758	0	1501	126
FIt Permitted	7.00	18	0.167	0.772		-		0.950				0.98
Satd. Flow (perm)	5861	0	244	3138	0	0	0	1516	1758	0	1501	113
Right Turn on Red	0001	Yes	211	0100				1010	11 00		Yes	110
Satd. Flow (RTOR)	10	100									141	169
Link Speed (mph)	35			35					30		2,530	30
Link Distance (ft)	1110			590					162			39
Travel Time (s)	21.6			11.5					3.7			9.0
Confl. Peds. (#/hr)	21.0	9	9	11.0	71	71	73		0.7		334	33
Confl. Bikes (#/hr)		19	9		19	19	13				5	00
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	0.9
	3%	3%		4%	0.95	4%	4%	0.95	4%	100%	4%	409
Heavy Vehicles (%)	3%	3%	4% 19%	470	0%	4%	4%	0%	470	100%	4%	407
Shared Lane Traffic (%)	4407	0		4057	0	0	0	404	050	0	204	E/
Lane Group Flow (vph)	1127	U	359	1857	U	0	0	134	252	U	321	50
Turn Type	NA		pm+pt	NA			Split	Split	NA		pt+ov	Pro
Protected Phases	6		5	2			4	4!	4!		4 5!	4
Permitted Phases			2				100	796				
Detector Phase	6		5	2			4	4	4		4 5	-
Switch Phase												
Minimum Initial (s)	10.0		5.0	10.0			7.0	7.0	7.0			7.0
Minimum Split (s)	39.0		21.0	60.0			32.0	32.0	32.0			32.0
Total Split (s)	39.0		27.0	66.0			32.0	32.0	32.0			32.0
Total Split (%)	35.5%		24.5%	60.0%			29.1%	29.1%	29.1%			29.19
Yellow Time (s)	4.0		4.0	4.0			4.0	4.0	4.0			4.0
All-Red Time (s)	2.5		2.5	2.5			3.0	3.0	3.0			3.0
Lost Time Adjust (s)	-1.5		-1.5	-1.5				-1.5	-1.5			-1.5
Total Lost Time (s)	5.0		5.0	5.0				5.5	5.5			5.5
Lead/Lag	Lead		Lag									
Lead-Lag Optimize?	Yes		Yes									
Recall Mode	C-Max		Max	C-Max			Max	Max	Max			Max
Act Effct Green (s)	43.6		70.6	70.6				26.5	26.5		53.5	26.5
Actuated g/C Ratio	0.40		0.64	0.64				0.24	0.24		0.49	0.24
v/c Ratio	0.48		0.93	0.85				0.33	0.60		0.40	0.12
Control Delay	25.7		48.5	12.6				17.9	24.3		3.5	0.5
Queue Delay	0.0		0.0	0.0				3.4	4.9		0.2	0.0
Total Delay	25.7		48.5	12.6				21.3	29.2		3.7	0.5
LOS	C		D	В				С	C		Α	1
Approach Delay	25.7			18.4					16.1			0.5
Approach LOS	С			В					В			1
Intersection Summary												
Area Type:	Other											
Cycle Length: 110												
Actuated Cycle Length: 11	۸											

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	>	4	6	4	1		
Lane Group	SER	SER2	SWL2	SWL	SWR	08	
Larte Configurations				M	W.73778176	7074	
Traffic Volume (vph)	23	10	3	0	1		
uture Volume (vph)	23	10	3	0	1		
deal Flow (vphpl)	1900	1900	1900	1900	1900		
ane Width (ft)	14	14	10	10	10		
Satd. Flow (prot)	0	0	0	826	0		
It Permitted		12		0.964			
Satd. Flow (perm)	0	0	0	826	0		
Right Turn on Red		Yes		020			
Satd. Flow (RTOR)							
ink Speed (mph)				15			
ink Distance (ft)				362			
ravel Time (s)				16.5			
Confl. Peds. (#/hr)		73					
Confl. Bikes (#hr)	8	8					
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95		
Heavy Vehicles (%)	40%	0%	100%	100%	100%		
Shared Lane Traffic (%)	4070	070	10070	10070	10070		
ane Group Flow (vph)	0	0	0	4	0		
Furn Type			Perm	Prot			
Protected Phases			i oilii	9		8	
Permitted Phases			9				
Detector Phase			9	9			
Switch Phase							
Minimum Initial (s)			5.0	5.0		5.0	
Minimum Split (s)			12.0	12.0		32.0	
Total Split (s)			12.0	12.0		32.0	
Fotal Split (%)			10.9%	10.9%		29%	
rellow Time (s)			4.0	4.0		4.0	
NI-Red Time (s)			3.0	3.0		6.5	
ost Time Adjust (s)			5.0	0.0		0.0	
Fotal Lost Time (s)				7.0			
_ead/Lag				7.0			
Lead-Lag Optimize?							
Recall Mode			None	None		None	
Act Effet Green (s)			NONE	5.0		140116	
Actuated g/C Ratio				0.05			
v/c Ratio				0.03			
Control Delay				56.8			
Queue Delay				0.0			
Total Delay				56.8			
_OS				50.0 E			
Approach Delay				56.8			
Approach LOS				50.6 E			
				100			

2: 12th St SW & Independence Ave SW & 12th St Ramp & Loading Dock SI South Campus Master Plan - Loading Dock Analysis

#2 #3 # 1 ø5 2030 Build PMPeak Hour

Control Type: Actuated-Coordinated		
Vaximum v/c Ratio: 0.93		
ntersection Signal Delay: 19.9	Intersection LOS: B	
ntersection Capacity Utilization 116.5%	ICU Level of Service H	
knalysis Period (min) 15		
Phase conflict between lane groups.		
Splits and Phases: 2: 12th St SW & Independence	Ave SW & 12th St Ramp & Loading Dock	
#2 #3	#2 #3	#2
The state of the s		

3: 12th St SW SI South Campus Master Plan - Loading Dock Analysis

	1	•	†	-	/	ţ					
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø2	04	ø5	ø8	ø9
Lane Configurations	ሻ	7	11			^					
Traffic Volume (vph)	0	0	671	0	0	499					
Future Volume (vph)	0	0	671	0	0	499					
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900					
Lane Width (ft)	10	11	11	11	10	10					
Satd. Flow (prot)	1739	1801	4916	0	0	3303					
Flt Permitted											
Satd. Flow (perm)	1739	1801	4916	0	0	3303					
Right Turn on Red		Yes		Yes							
Satd. Flow (RTOR)											
Link Speed (mph)	20		30			30					
Link Distance (ft)	188		380			162					
Travel Time (s)	6.4		8.6			3.7					
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95					
Shared Lane Traffic (%)											
Lane Group Flow (vph)	0	0	706	0	0	525					
Turn Type	Prot	Perm	NA			NA					
Protected Phases	6!	7.7	8.5			2 4!	2	4	5	8	9
Permitted Phases		6									
Detector Phase	6	6	85			24					
Switch Phase		17.1									
Minimum Initial (s)	10.0	10.0					10.0	7.0	5.0	5.0	5.0
Minimum Split (s)	39.0	39.0					60.0	32.0	21.0	32.0	12.0
Total Split (s)	39.0	39.0					66.0	32.0	27.0	32.0	12.0
Total Split (%)	35.5%	35.5%					60%	29%	25%	29%	11%
Yellow Time (s)	4.0	4.0					4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5					2.5	3.0	2.5	6.5	3.0
Lost Time Adjust (s)	-1.5	-1.5					2.0	0.0	2.0	0.0	0.0
Total Lost Time (s)	5.0	5.0									
Lead/Lag	Lead	Lead							Lag		
Lead-Lag Optimize?	Yes	Yes							Yes		
Recall Mode	C-Max	C-Max					C-Max	Max	Max	None	None
Act Effet Green (s)	O-IVIAX	O-IVIAX	50.0			106.6	O-IVIAX	IVICA	WIGA	TWOTIE	None
Actuated g/C Ratio			0.45			0.97					
v/c Ratio			0.32			0.16					
Control Delay			19.6			0.10					
Queue Delay			0.1			0.0					
Total Delay			19.7			0.0					
LOS			19.7 B			Ο.1					
Approach Delay			19.7			0.1					
Approach LOS			19.7 B			Ο.1					
Approach LOS			Б			A					

Intersection Summary

Other

Area Type: Cycle Length: 110

Actuated Cycle Length: 110
Offset: 22 (20%), Referenced to phase 2:WBTL and 6:EBT, Start of Green

Natural Cycle: 105 Control Type: Actuated-Coordinated Maximum v/c Ratio: 0.93

Stantec 2030_bpm.syn Lanes, Volumes, Timings Page 7

SI South Campus Master Plan - Loading Dock Analysis

Intersection Signal Delay. 11.3 Intersection Capacity Utilization 20.5% Analysis Period (min) 15 ! Phase conflict between lane groups. Intersection LOS: B
ICU Level of Service A Splits and Phases: 3: 12th St SW #2 #3 Ø5

	→	•	1	•	1	-		
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	ø3	
Lane Configurations	1117-			ना	ሻ	7	100000	
Traffic Volume (vph)	1274	62	57	1845	259	63		
Future Volume (vph)	1274	62	57	1845	259	63		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Lane Width (ft)	10	10	10	10	12	12		
Storage Length (ft)	10	0	0	10	0	210		
Storage Lanes		0	0		1	1		
Taper Length (ft)			25		25			
Satd. Flow (prot)	5843	0	0	5860	1805	1615		
Fit Permitted	0040		·	0.801	0.950	1010		
Satd. Flow (perm)	5843	0	0	4697	1368	1572		
Right Turn on Red	3043	Yes	0	4037	1500	Yes		
Satd. Flow (RTOR)	13	165				60		
Link Speed (mph)	35			35	20	00		
	590			1087	758			
Link Distance (ft)	11.5			21.2	25.8			
Travel Time (s)	11.0	00	00	21.2				
Confl. Peds. (#/hr)		28	28		176	8		
Confl. Bikes (#hr)	0.00	17	0.00	0.00	0.00	6		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90		
Heavy Vehicles (%)	3%	3%	4%	4%	0%	0%		
Shared Lane Traffic (%)	4105			0116	000	70		
Lane Group Flow (vph)	1485	0	0	2113	288	70		
Turn Type	NA		pm+pt	NA	Prot	pm+ov		
Protected Phases	2		9	6	4	9	3	
Permitted Phases			6			4		
Minimum Split (s)	58.5		13.5	58.5	30.0	13.5	4.0	
Total Split (s)	61.5		13.5	61.5	31.0	13.5	4.0	
Total Split (%)	55.9%		12.3%	55.9%	28.2%	12.3%	4%	
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0	2.0	
All-Red Time (s)	2.5		1.0	2.5	1.5	1.0	0.0	
Lost Time Adjust (s)	-1.5			-1.5	-1.0	-1.0		
Total Lost Time (s)	5.0			5.0	4.5	4.0		
Lead/Lag					Lag		Lead	
Lead-Lag Optimize?					Yes		Yes	
Act Effct Green (s)	56.5			65.0	26.5	36.5		
Actuated g/C Ratio	0.51			0.59	0.24	0.33		
v/c Ratio	0.49			0.74	0.66	0.12		
Control Delay	11.7			16.4	46.2	8.0		
Queue Delay	0.0			0.0	0.0	0.0		
Total Delay	11.7			16.4	46.2	8.0		
LOS	В			В	D	A		
Approach Delay	11.7			16.4	38.7	્લ		
Approach LOS	11.7 B			10.4 B	30.7 D			
Approach Loo	٥			٥	J			

Intersection Summary

Area Type: Cycle Length: 110

Actuated Cycle Length: 110
Offset: 29 (26%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 110

Stantec 2030_bpm.syn Lanes, Volumes, Timings Page 9

4: L'Enfant Plaza & Independence Ave SW SI South Campus Master Plan - Loading Dock Analysis

2030 Build PMPeak Hour

4 s 31 s	13.5 s
#Rp 104	√ €ø9
nce Ave SW	
ICU Level of Service D	
Intersection LOS: B	
	ICU Level of Service D nce Ave SW

Startec Lanes, Volumes, Timings 2030_bpm.syn Page 10

APPENDIX D: LOADING ALTERNATIVES



MEMORANDUM

DATE: January 18, 2017

TO: Bjarke Ingels Group, Smithsonian FROM: Jonathan Parker, Kleinfelder

SUBJECT: South Mall Master Plan - Loading Dock Design Vehicle

For Kleinfelder's report in February 2014, the geometric proof-of-concept for the proposed materials management design for the South Mall Master Plan was based on the movement of the largest truck and the movement of the largest object expected to come and go from any of the museums. The largest vehicle is expected to be a long-haul semi-truck like those used by specialty art shipping companies. The conceptual ramp, truck apron, and loading dock layout was based on a WB-67. The question has recently been raised as to whether it is possible to plan around a vehicle other than a WB-67. The reduction

Operational Reductions

Operationally, moving to a smaller design vehicle would exclude receiving large art delivery trucks for Collections in the loading dock. These deliveries would need to continue to be made on the street. Though infrequent, they are valuable deliveries. Delivery on the street exposes collections to greater risk for security, screening, handling, and environmental conditions. It is difficult to quantify the potential cost of not making improvements to materials handling for Collections.





Fig 1. Collections Delivery on Independence Ave Fig 2. Collections Delivery down Quad ramp from http://artists-in-dialogue2.blogspot.com/2011/01/welcome-arrivals.html

It is possible that food service would take advantage of the accommodation of large vehicles in the below-grade dock as well and employee WB-67s or WB-50s for occasional delivery.

If the design-vehicle were reduced, it would be to a WB-40, which is referred to as a city sized semi, and typically used by food service operators and vendors such as Sysco, Sodexho, Coca-Cola, Frito-Lay, and Poland Springs. The tractor and trailer typically measure 45' long.

The operational implications of the smaller design vehicle should be weighed against the dimensional implications of planning for a smaller design vehicle.

Dimensional Reductions - the Ramp

The ramp requirements for smaller delivery vehicles is equivalent to those for a WB-67. The slope of the ramp would not be reduced by reducing the size of the design vehicle. The overall length of the ramp to achieve desired dock elevation would not be reduced. With the traffic on Independence Avenue

and the likely length of the ramp, we would strongly recommend maintaining two-way traffic for all but the WB-67 on the ramp, therefore the width of the truck ramp would not be reduced either. The radius of the turn in the ramp to accommodate two-way traffic of WB-40s and large box trucks is adequate to accommodate the one-way at-a-time turning of a WB-67 on the ramp. (See Figures 3 and 4)

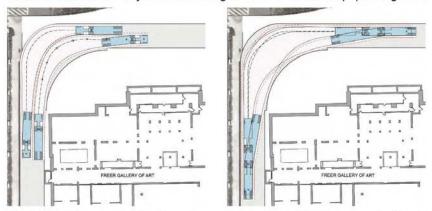


Fig 3. WB-40 two-way traffic at turn in ramp.

Fig 4. WB-67 one-way traffic at turn in ramp.

Dimensional Reductions - the Truck Apron and Loading Dock

The additional dimensional requirements for accommodating a large semi over a small semi are partially achieved by overlapping with space that is already being provided for smaller vehicles.

The width of the truck apron that is provided in order to accommodate roll-off vehicle pickup of compactors is adequate to accommodate the wide swings in the 3-point turning of a WB-67. (See dimension A in Figure 5)

A program for sizing the required number of delivery and recycling bays for materials management has not been developed, so it is unknown whether the truck apron length to accommodate the total number of recommended bays would be shorter or longer than the truck apron length needed for a WB-67. (See dimension B1 and B2 in Figure 5)

The square footage at the dock for unloading large semis would be removed, but square footage, equipment, and distribution paths would need to be added to accommodate receiving art deliveries atgrade and transporting them horizontally and vertically to collections receiving. (See C in Figure 5)

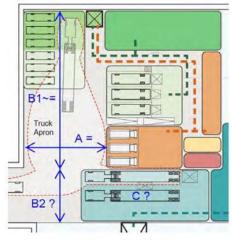


Fig 5. Truck Apron and Loading Dock

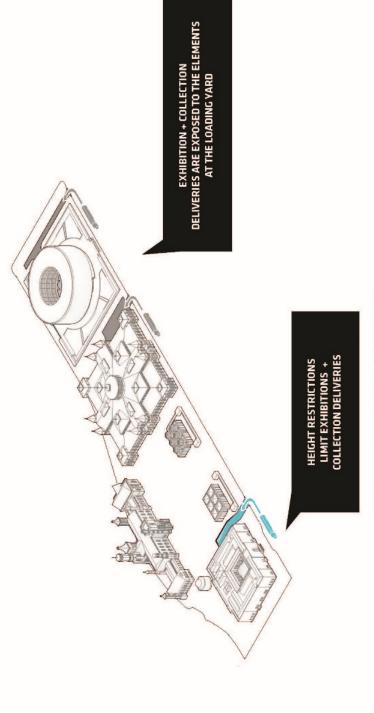
Conclusions

The footprint and dimensions of the ramp would see little if any reduction from switching from a WB-67 for the design vehicle to a WB-40. The size of the truck apron below-grade may see some moderate reduction, but that would depend on a more detailed programming effort also showing a need for fewer delivery, service, and recycling bays. The square footage for the large bays themselves would result in a reduction, however square footage, equipment, and distribution paths would need to be added to accommodate receiving art deliveries at-grade and transporting them horizontally and vertically to collections receiving.

The value of substantially improving the handling and receiving of collections by accommodating large semi-trucks in the below-grade dock should be weighed against the minimal to moderate potential reductions in footprint and dimensions of not designing for a WB-67.

SMITHSONIAN SOUTH CAMPUS LOADING FACILITIES

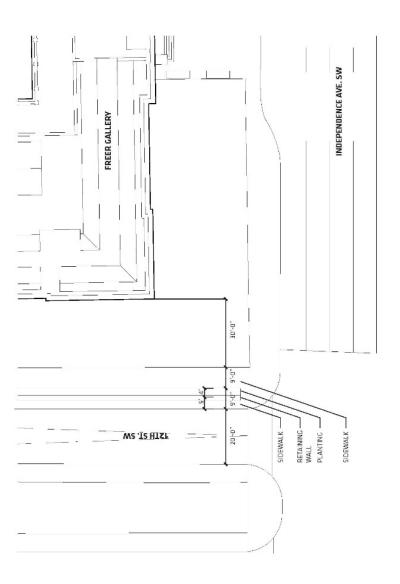
EXISTING CURB CUTS & LOADING FACILITIES



EXISTING CURB CUTS AND LOADING FACILITIES

The 3 existing loading facilities require large vehicles to back in from the street because of limited turn around area. The largest vehicles and deliveries must unload on the street because they do not fit into the dock.

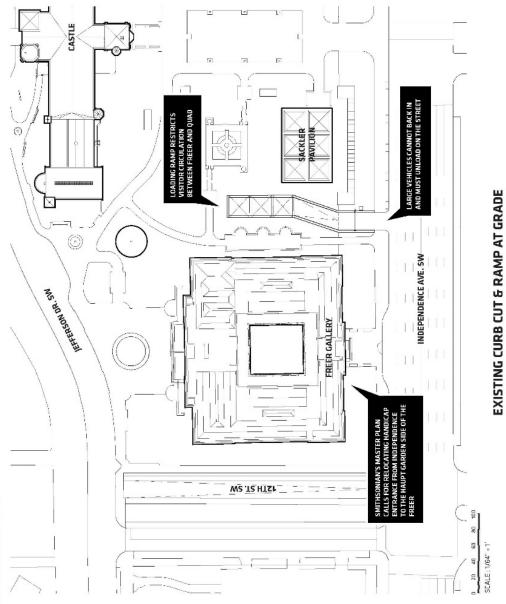
EXISTING CURB CUT | LOADING FACILITIES: QUAD COMPLEX



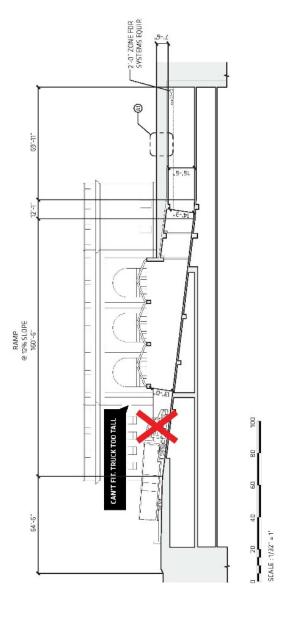
EXISTING CURB CUT | LOADING FACILITIES: QUAD COMPLEX



PERSPECTIVE @ 12TH ST. SW & INDEPENDENCE AVE. SW



EXISTING CURB CUT | LOADING FACILITIES: QUAD COMPLEX

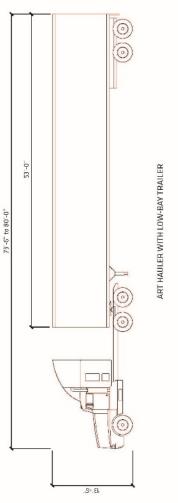


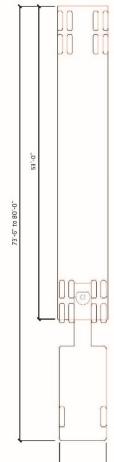
 Clearance requirements not met with current scheme. WB 67 truck type will be the basis of future loading dock design with a height 15' minimum required for passage.

EXISTING LOADING FACILITIES SECTION

(A1) R00FT0P DETAIL SCALE: 1/2" = 1'

SECTION DETAIL @ A1

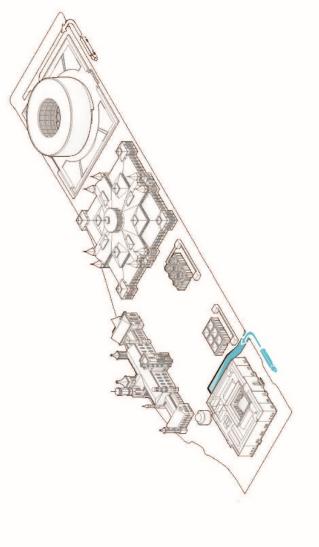




..0-,8

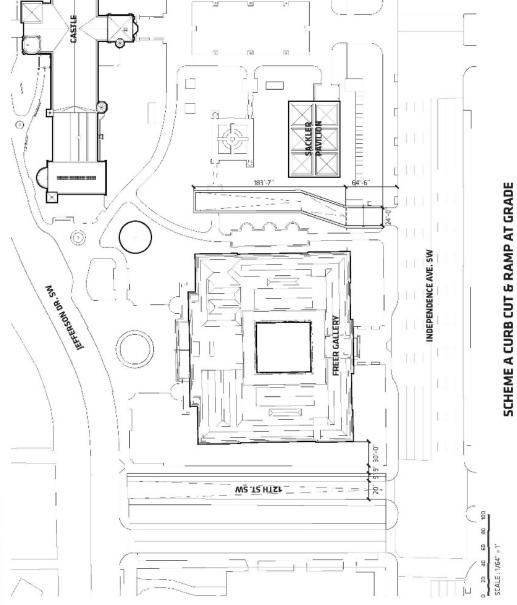
ART HAULER WITH LOW-BAY TRAILER

SCHEME A

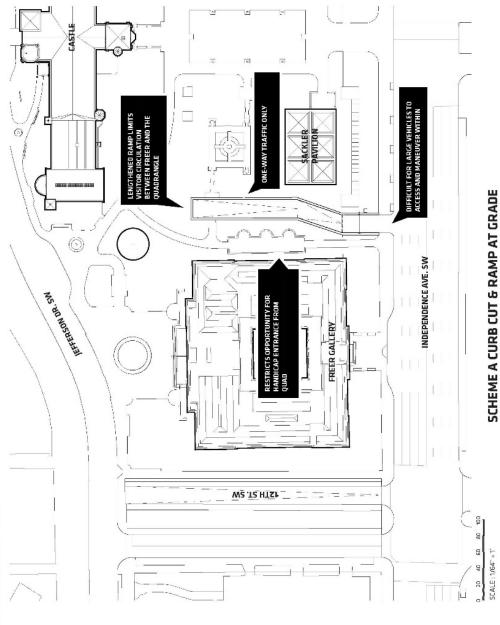


SCHEME A CURB CUT AND LOADING FACILITY

Reuse of the existing curb cut and ramp requires an expansion of the ramp and
expansion of the below grade loading complex. Scheme A would limit vehicle traffic
to one-way, and interfere with the Master Plan's East/West circulation.



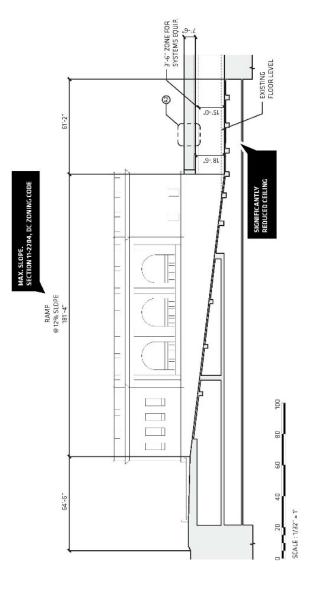
SCHEME A CURB CUT | LOADING FACILITIES: QUAD COMPLEX



SCHEME A CURB CUT | LOADING FACILITIES: QUAD COMPLEX

SCHEME A RAMP & LOADING FACILITY BELOW GRADE





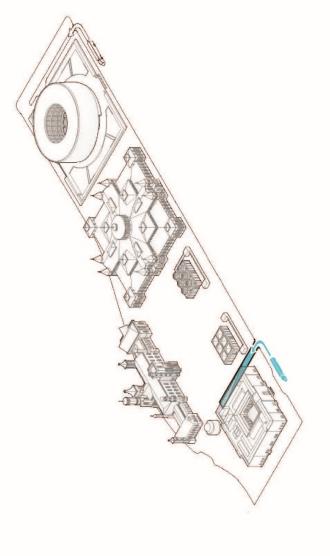
Scheme A requires the expansion of below grade loading support areas
to provide increased maneuvering clearance. The floor of the loading
dock will need to be lowered. The alteration will greatly reduce the ceiling height in floor level below loading dock

SCHEME A LOADING FACILITY SECTION

(A2) ROOFTOP DETAIL SCALE: 1/2" = 1'

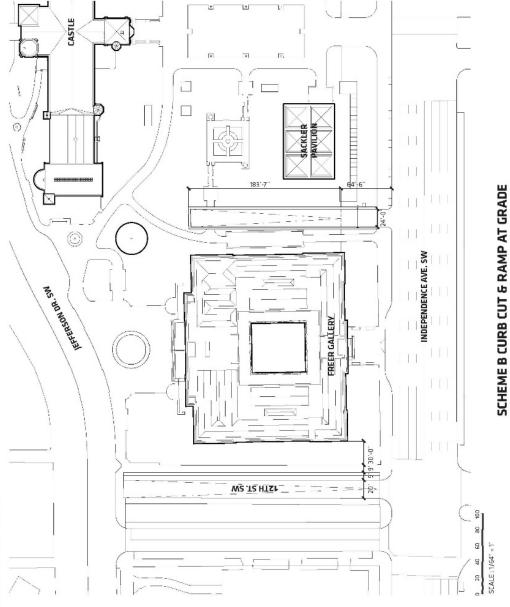
SECTION DETAIL @ A2

SCHEME B



SCHEME B CURB CUT AND LOADING FACILITY

 Widening of the existing curb cut and new ramp would maintain approximate location of existing curb cut. The new ramp would allow for two-way traffic, but require an expansion of below grade complex.



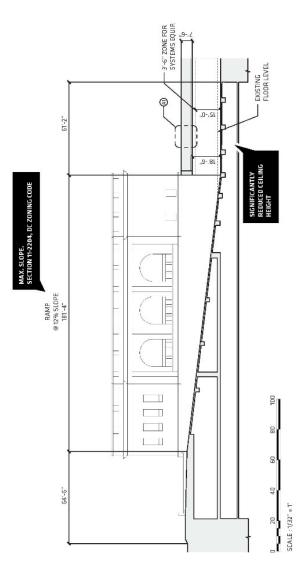
SCHEME B CURB CUT | LOADING FACILITIES: QUAD COMPLEX

SCHEME B CURB CUT | LOADING FACILITIES: QUAD COMPLEX

SCHEME B CURB CUT & RAMP AT GRADE

SCHEME B RAMP & LOADING FACILITY BELOW GRADE

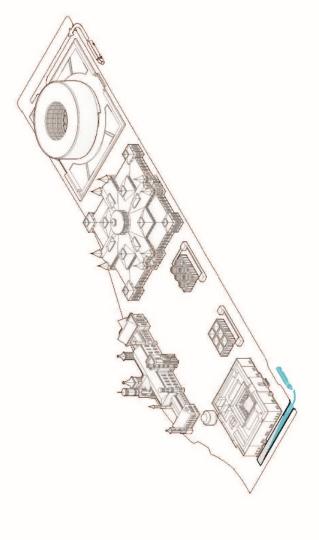




Scheme B requires the expansion of below grade loading support areas
to provide increased maneuvering clearance. The floor of the loading
dock will need to be lowered. The alteration will greatly reduce the ceiling height in floor level below loading dock

SCHEME B LOADING FACILITY SECTION

FREER RAMP



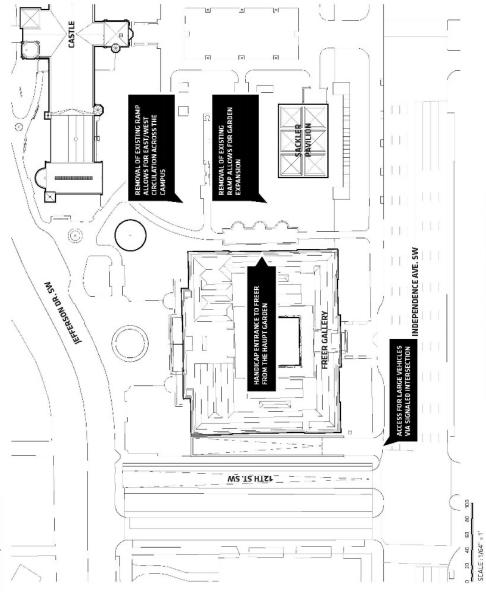
FREER CURB CUT AND LOADING FACILITY

 A new curb cut and ramp would allow for the consolidation of existing curb cuts and loading facilities and allow two-way traffic. Scheme allows for East/West circulation across the Campus

FREER CURB CUT | LOADING FACILITIES: QUAD COMPLEX

PROPOSED DIMENSIONS

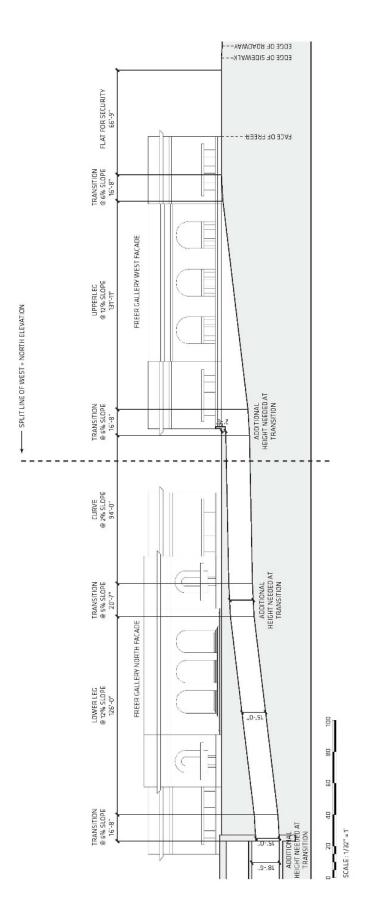
FREER CURB CUT & RAMP AT GRADE



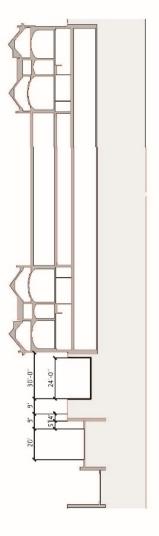
FREER CURB CUT | LOADING FACILITIES: QUAD COMPLEX





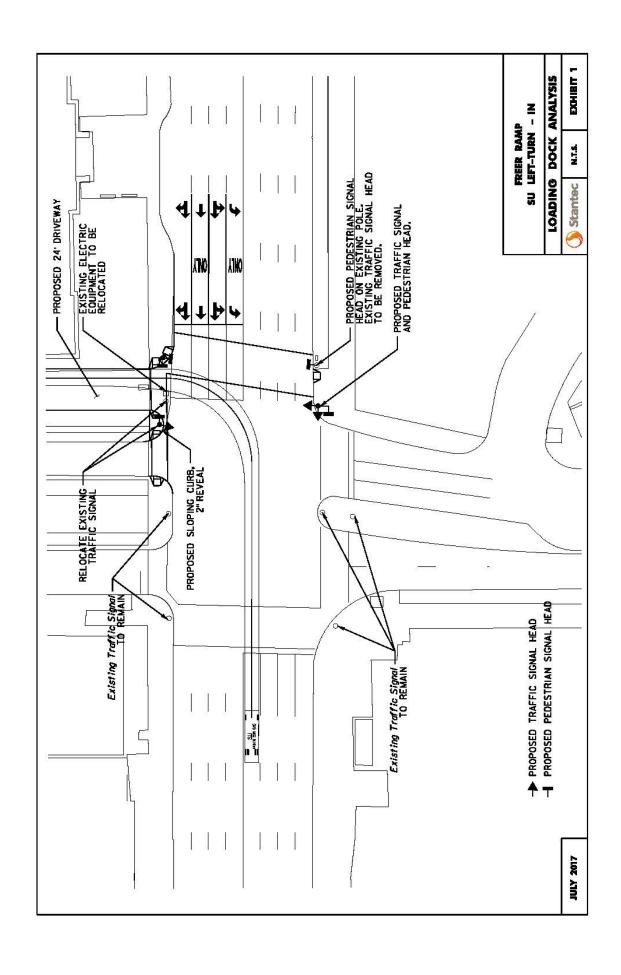


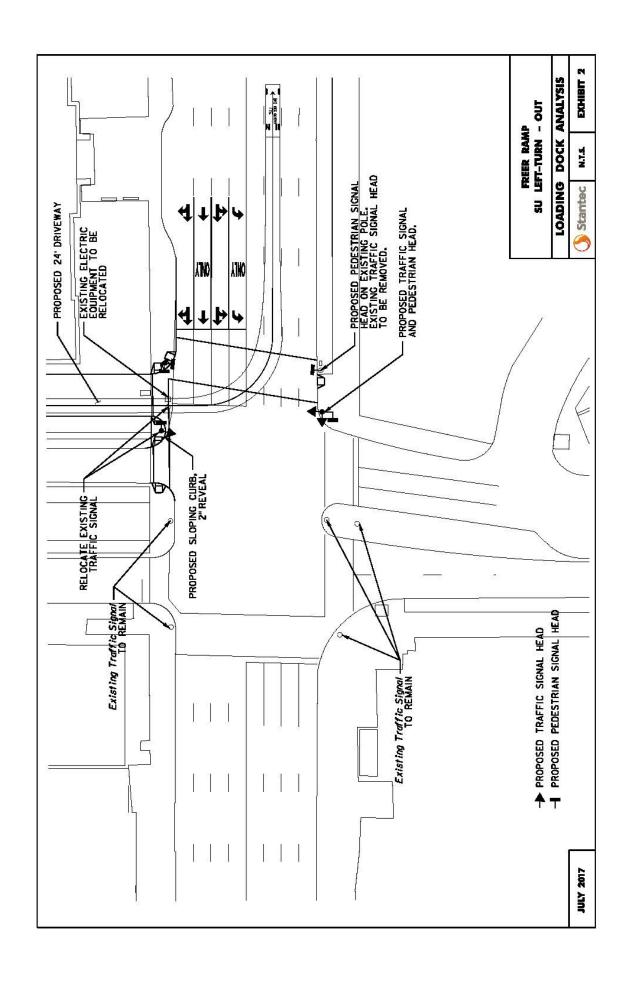
FREER LOADING FACILITY SECTION

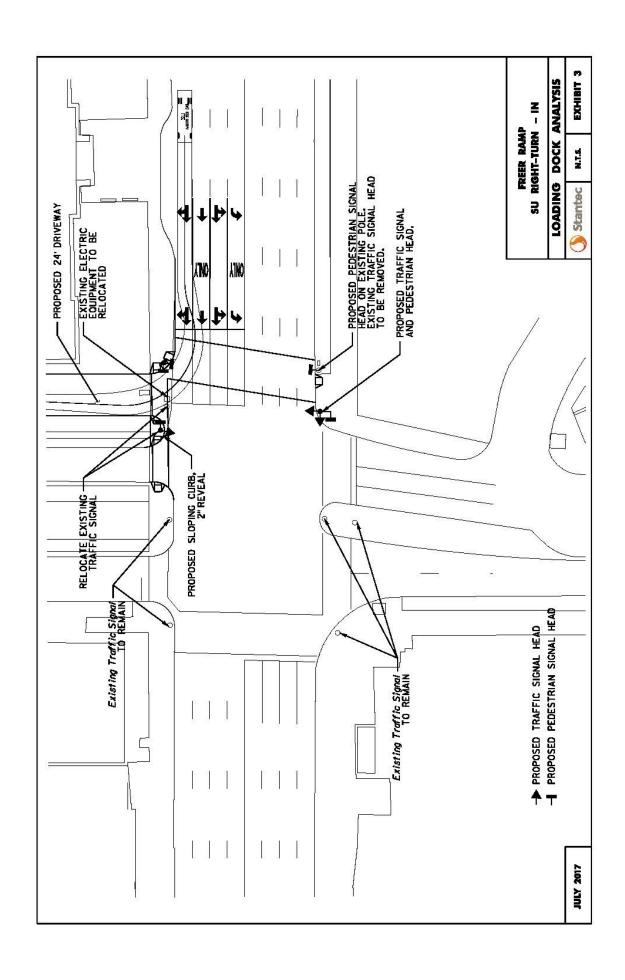


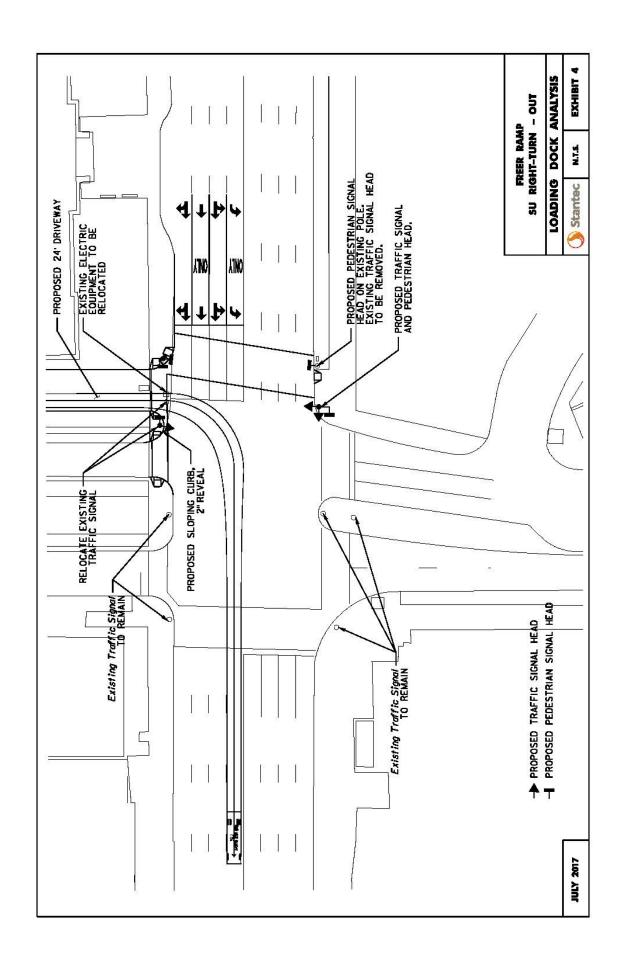
0 20 40 60 80 10 SCALE:1/32"=1'

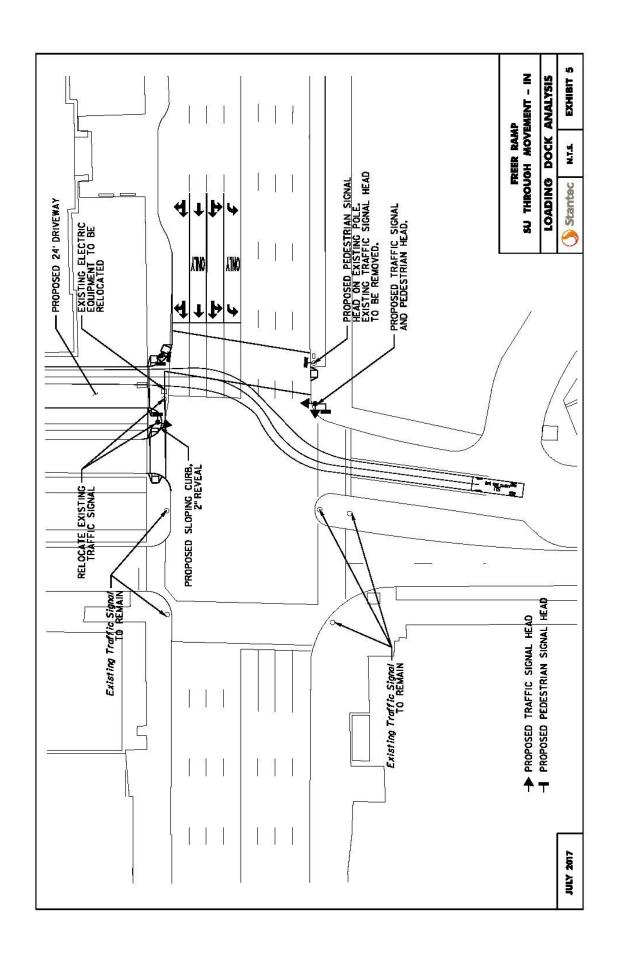
APPENDIX E:
INTERSECTION CONCEPT
WITH TRUCK TURNING
DIAGRAMS

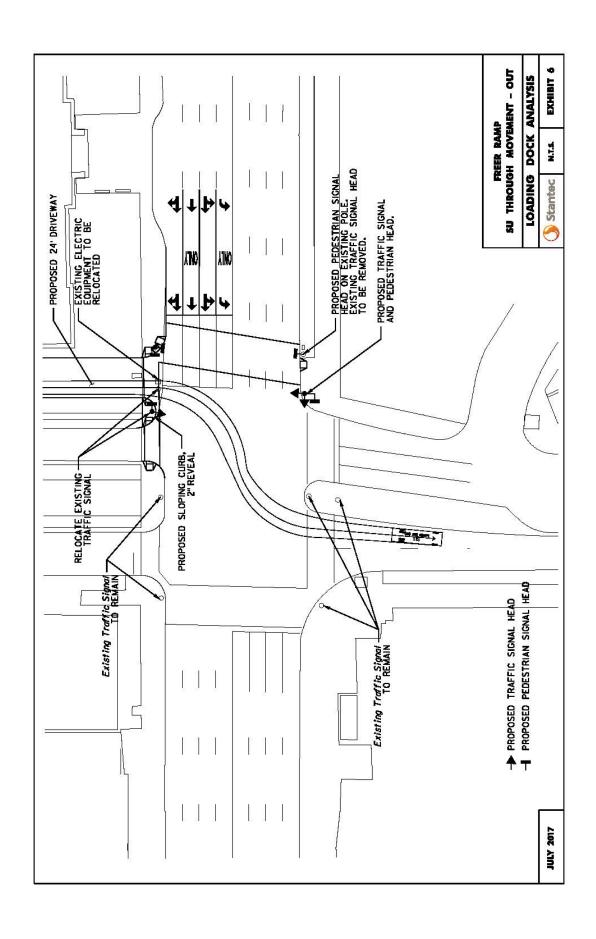


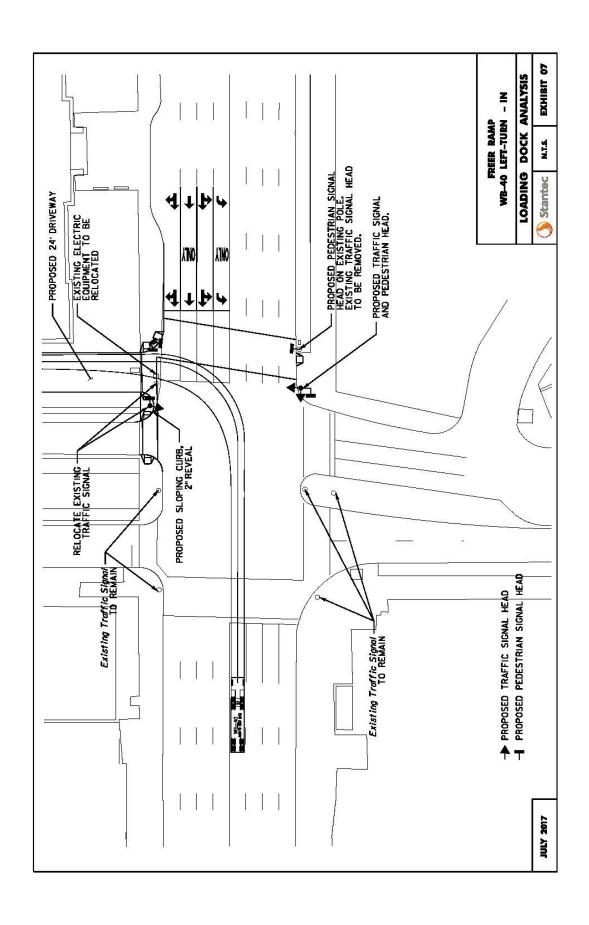


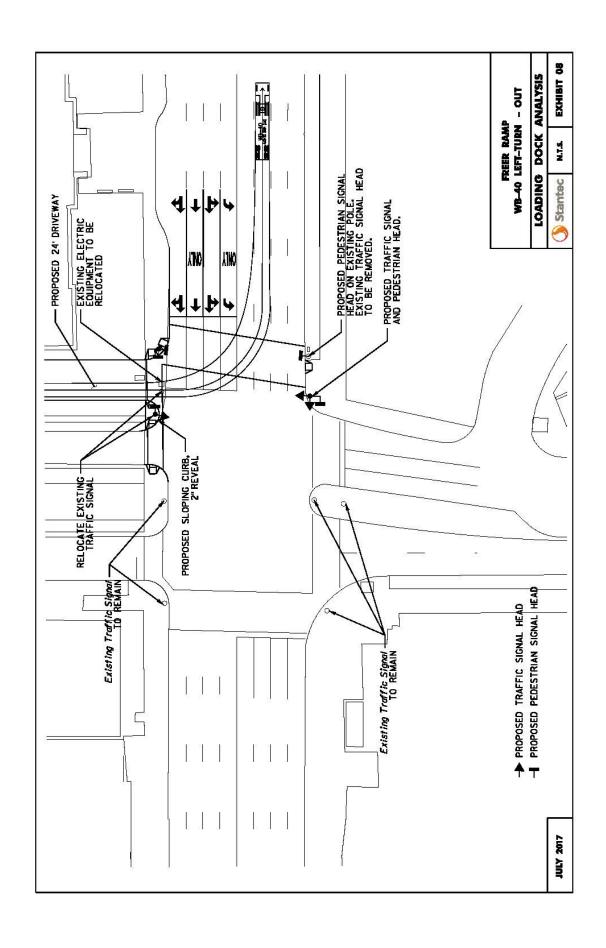


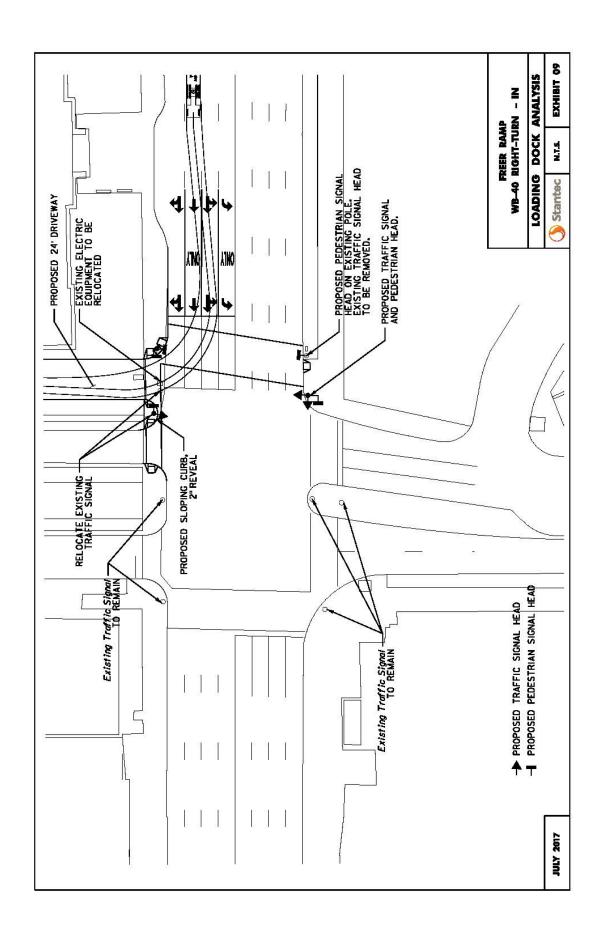


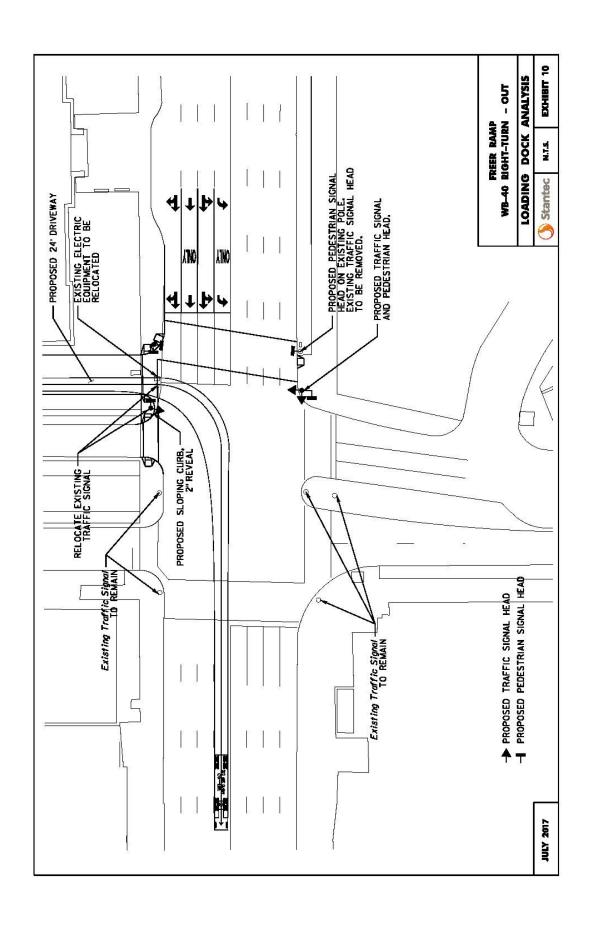


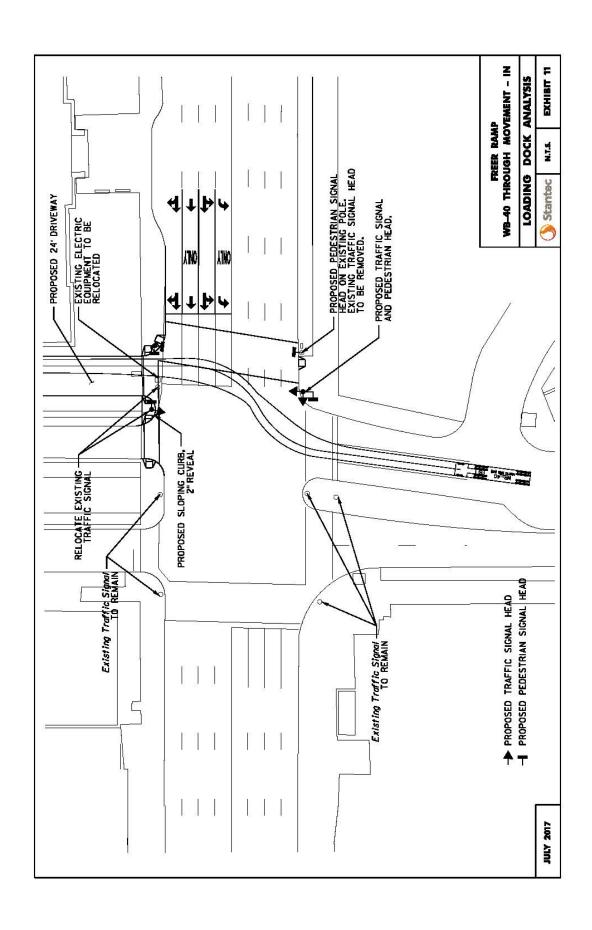


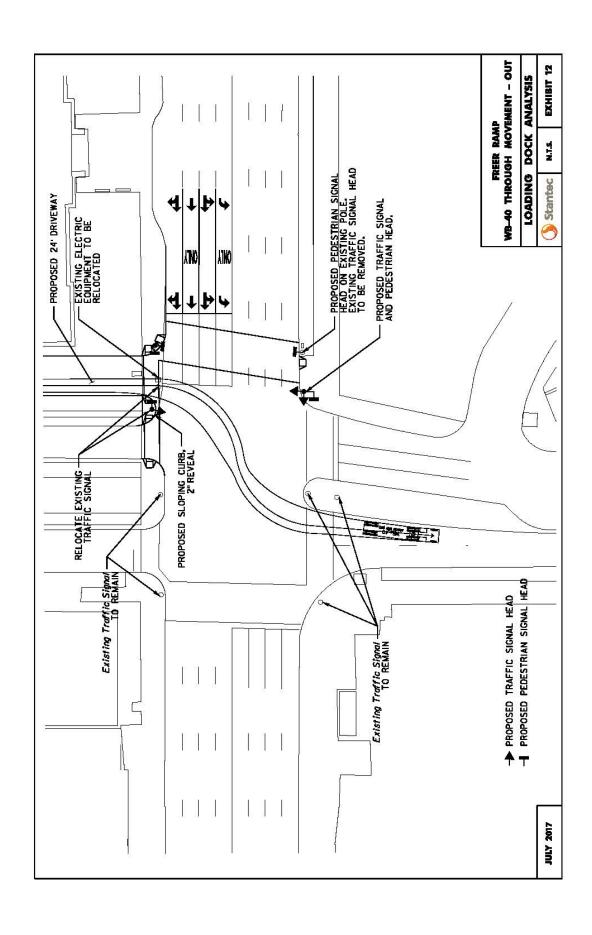


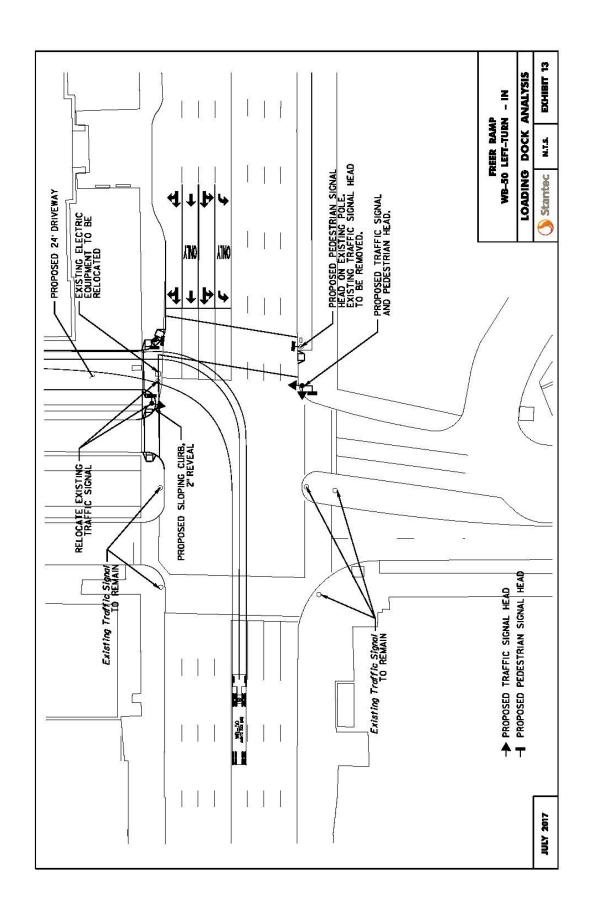


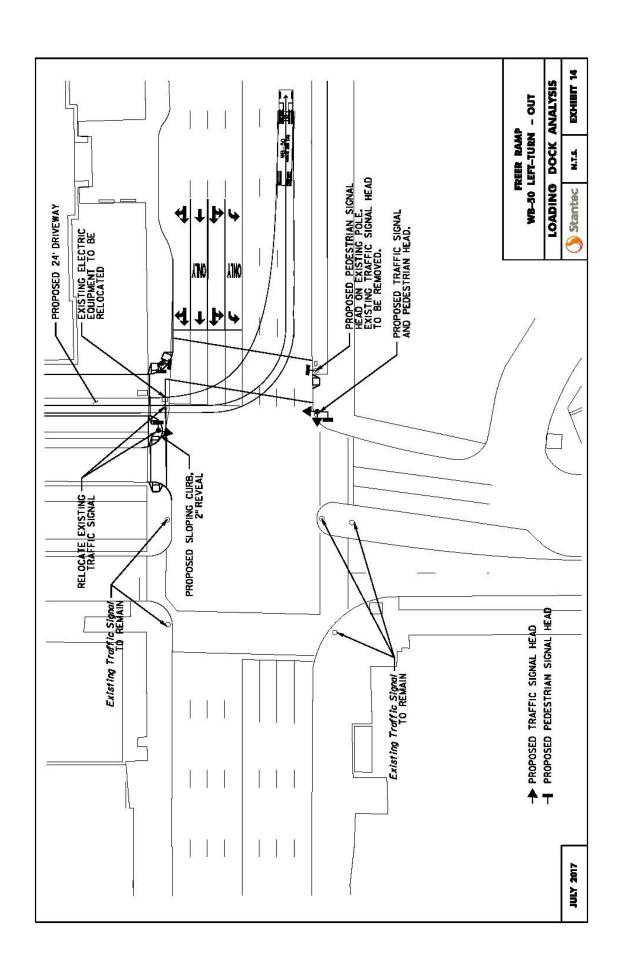


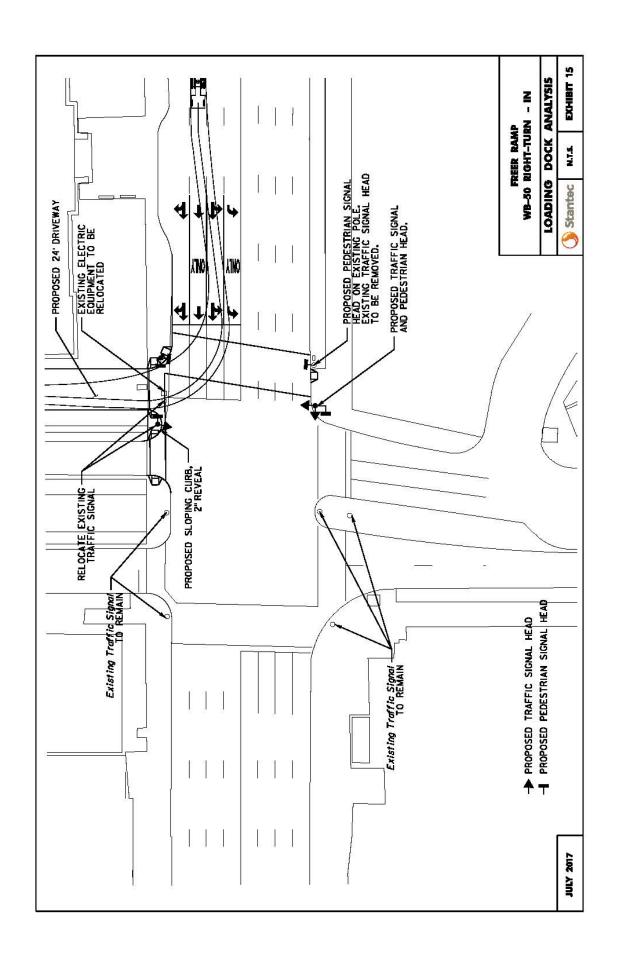


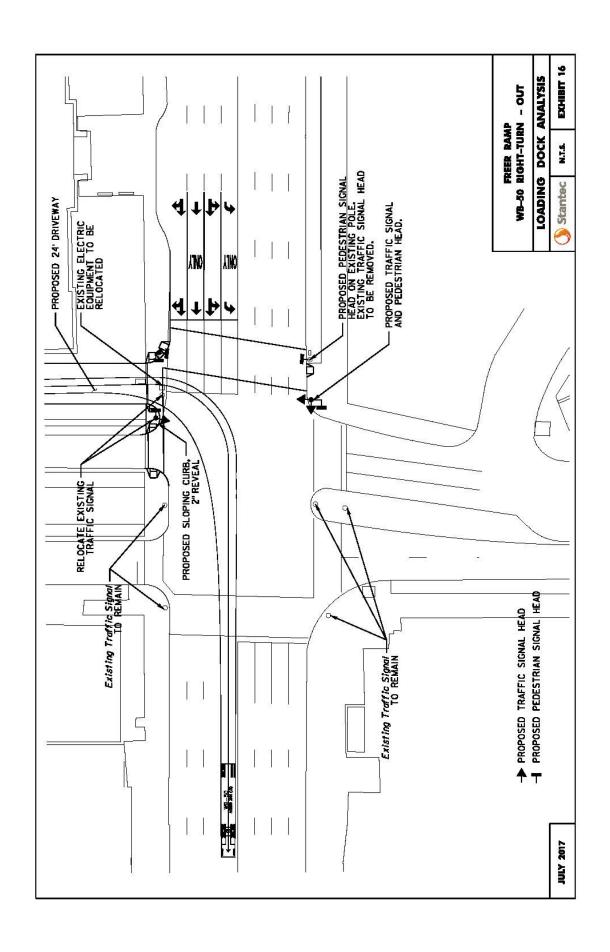


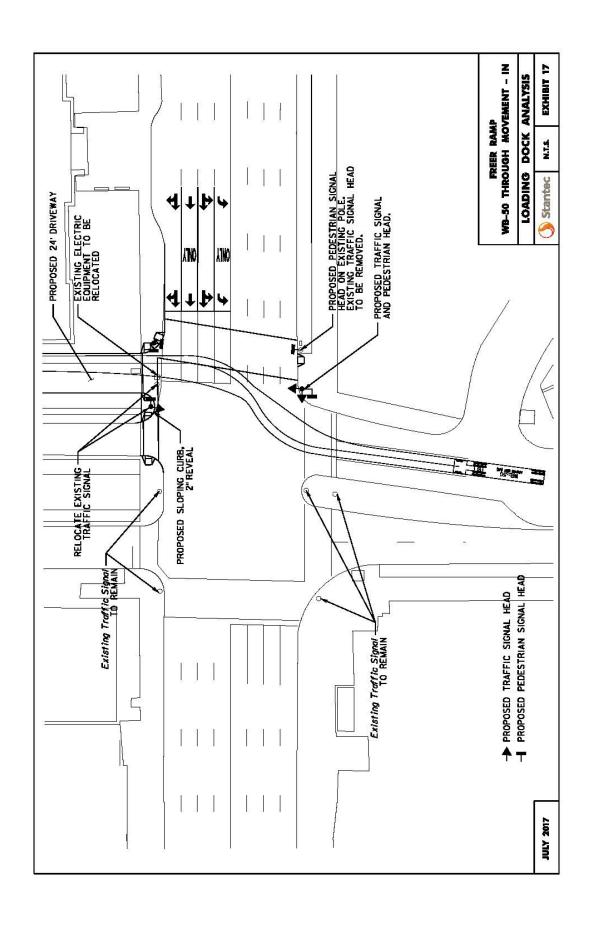


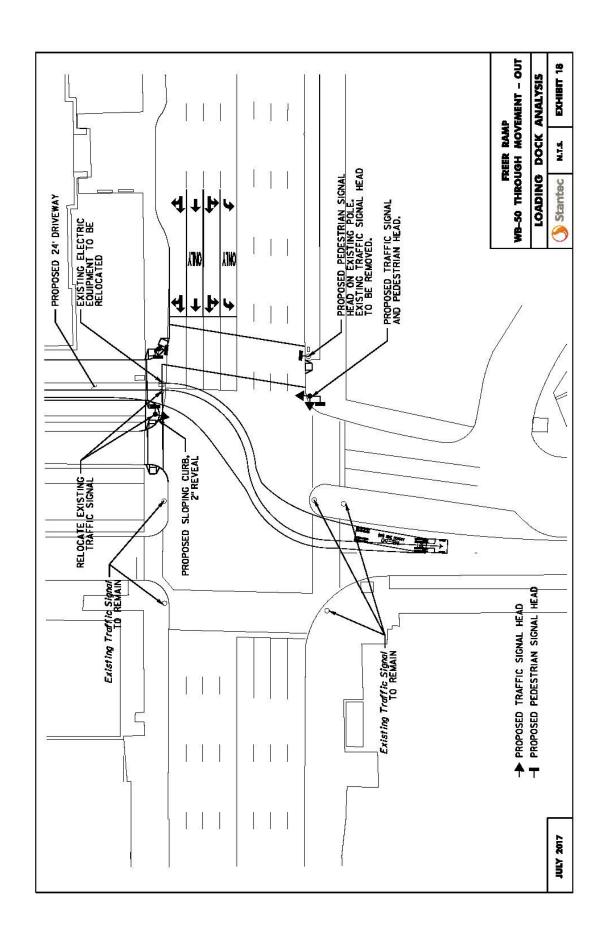


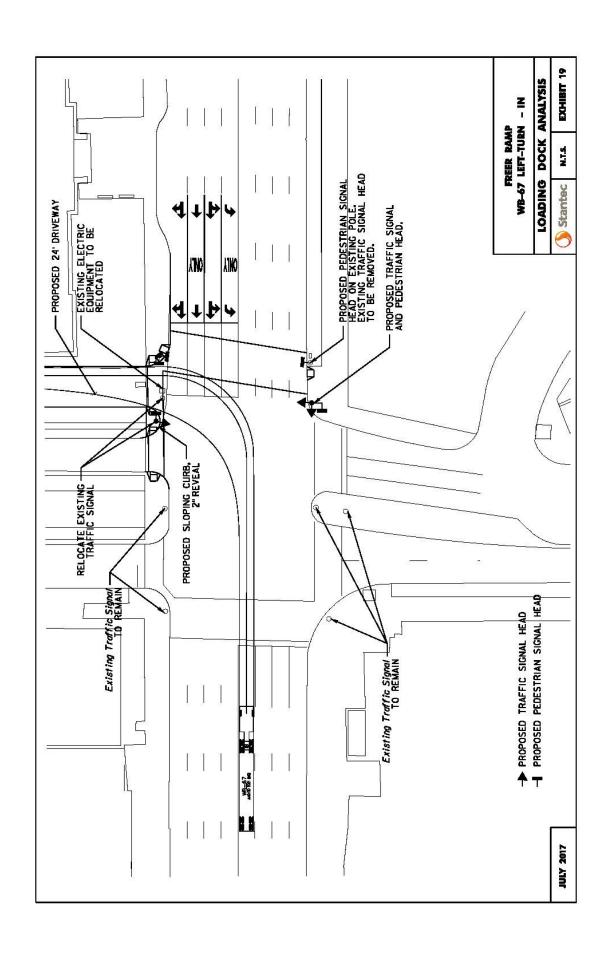


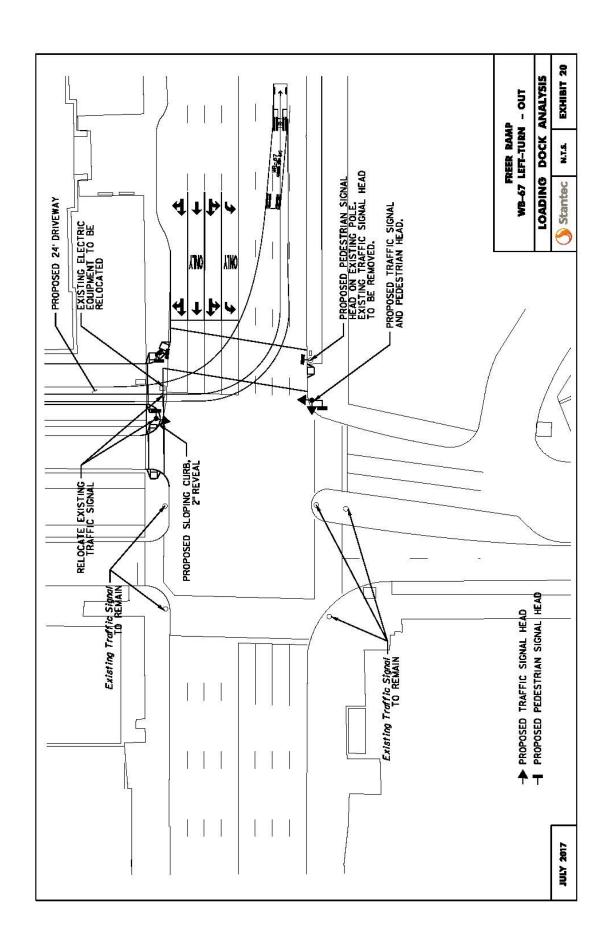


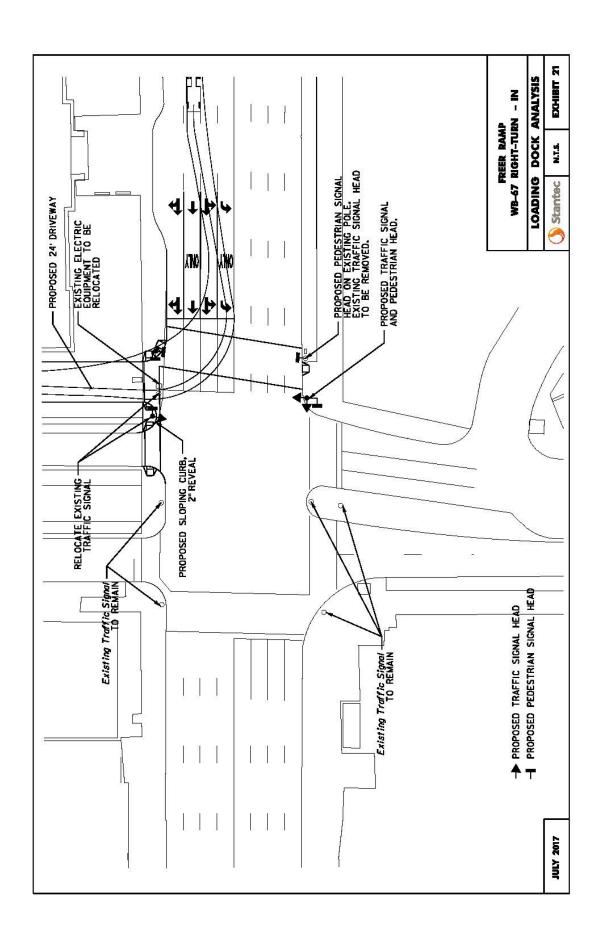


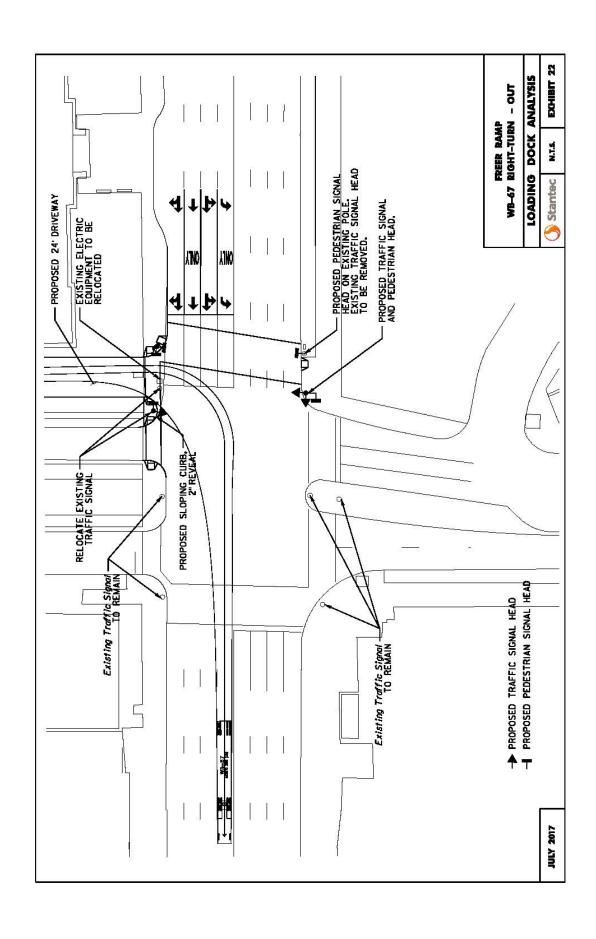


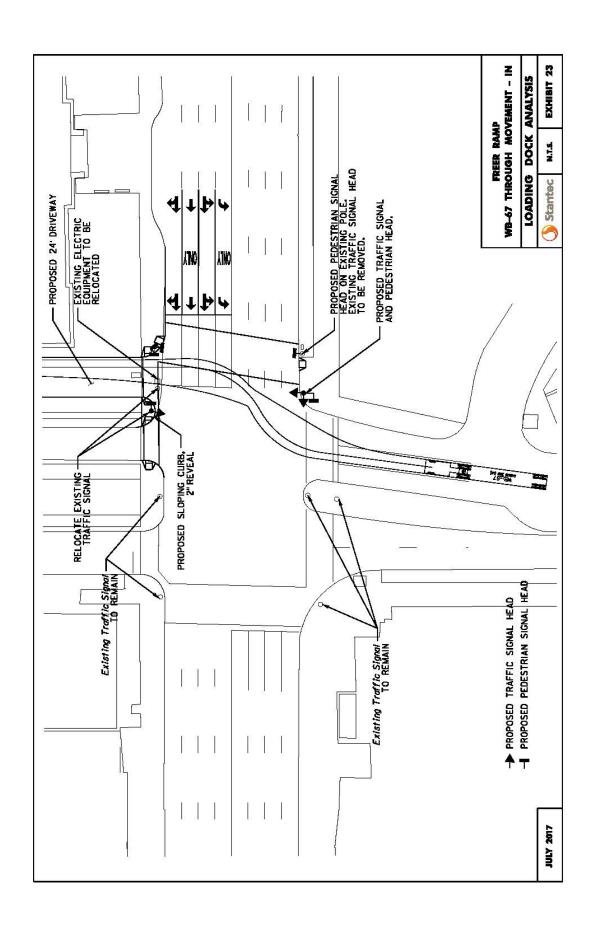












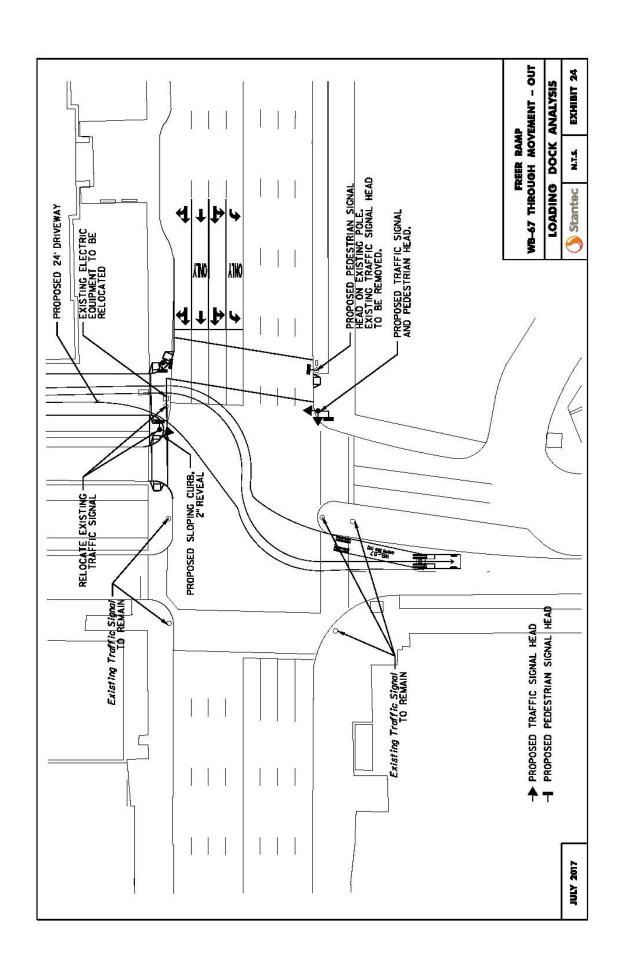
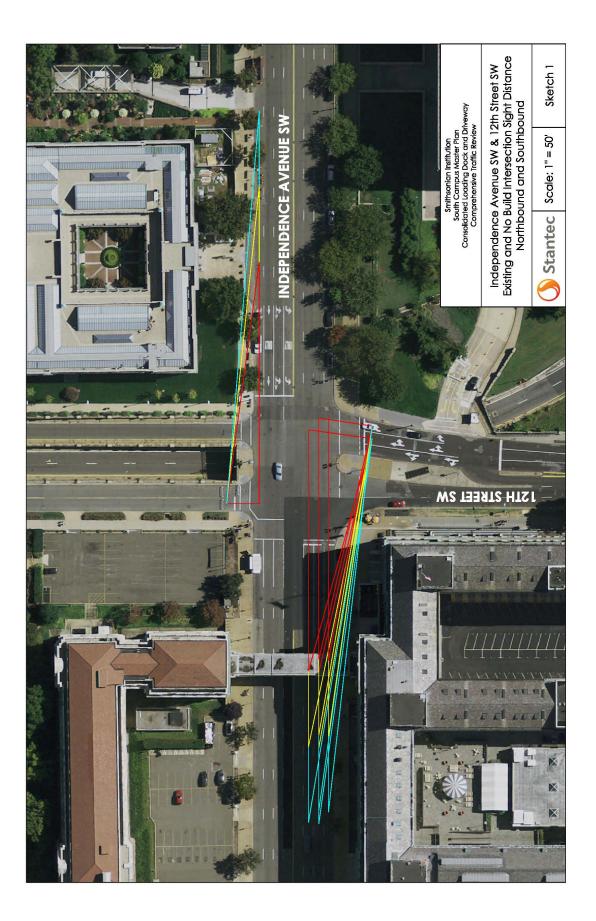


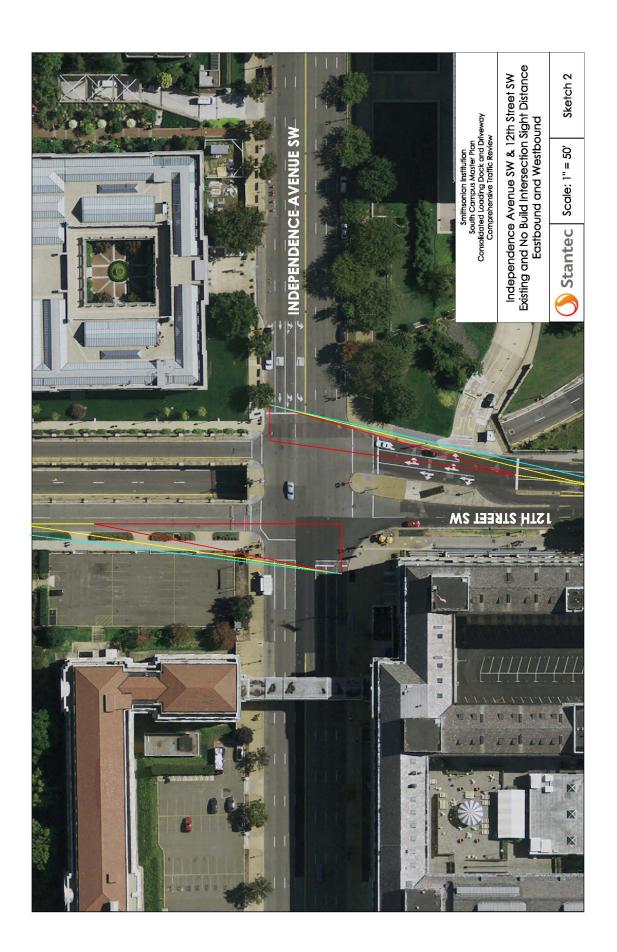


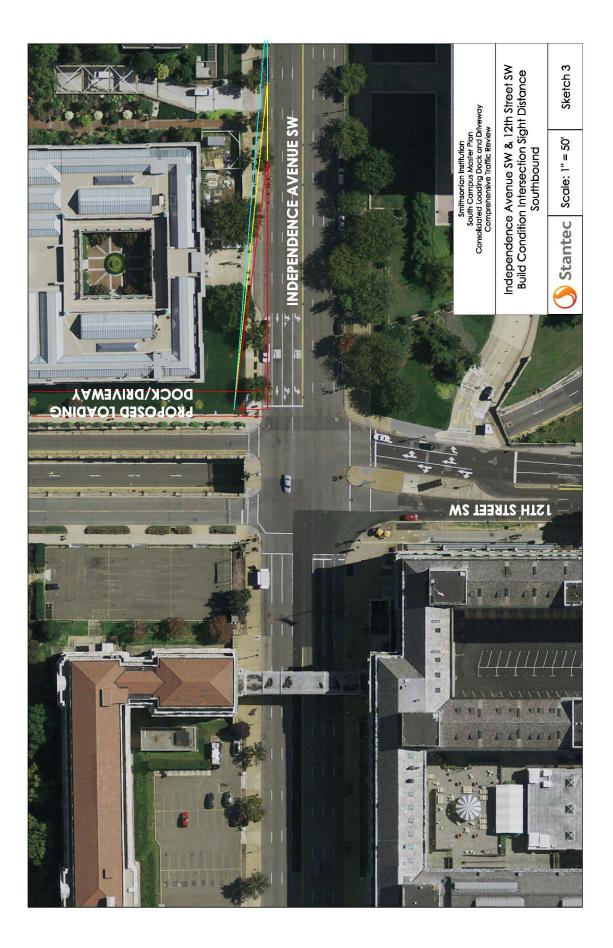
Exhibit 17 Smithsonian Institution, South Campus Master Plan Parking Inventory Tuesday, December 08, 2015

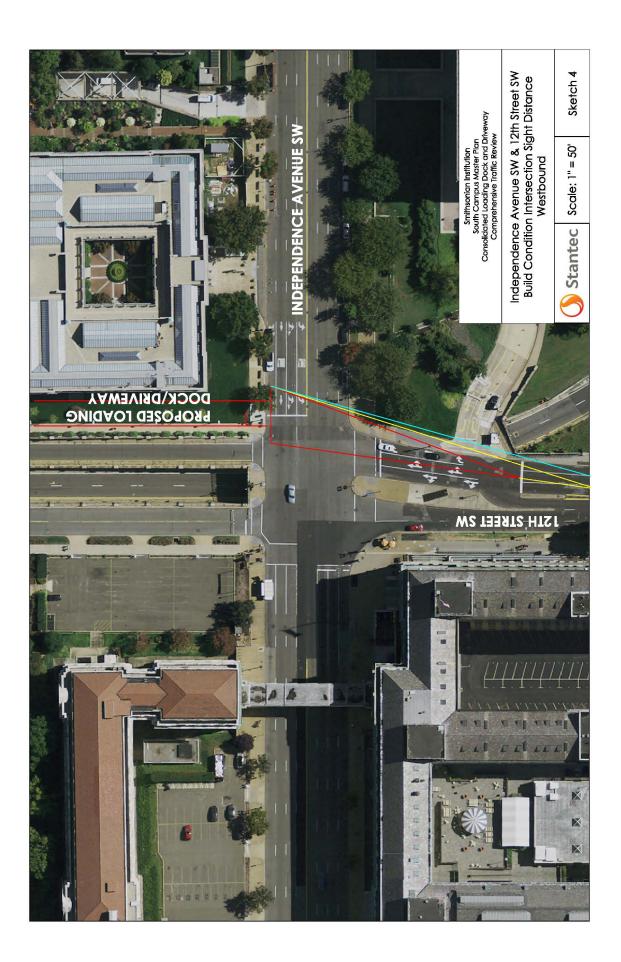
	Segment	Total # On-street # of Permit # of Metered # of ADA	# of Permit	# of Metered	# of ADA	Parking Regulations
	IS.	Parking Spaces	Spaces	Spaces	Spaces	
						1. No Parking Monday - Street Cleaning
1	Independence WB b/w 7th and 9th	15	3 Vendor	0	0	2. Tow Away/No Standing or Parking 7-9:30AM, 4-6:30PM M-F
						3. No Parking Bus Zone
,	the state of the s	r,	ď	**		1. Tow Away/No Standing or Parking 7-9:30AM, 4-6:30PM M-F
7	independence WB b/w 9th and L'enfant	1/	0	1/	0	2. Snow Emergency Route - Tow Away
3	Independence WB b/w L'Enfant and 12th	21	0	18	0	1. Tow Away/No Standing or Parking 7-9:30AM, 4-6:30PM M-F
						1. Tow Away/No Standing or Parking 7-9:30AM, 4-6:30PM M-F
					277	2. No Parking 9:30-11:30AM - Street Cleaning Tuesday
4	Independence WB b/w 12th and 14th	15	0	15	0	3. Metro Bus
						4. Snow Emergency Route - Tow Away
					(12.50)	5. Vendor Stand
		22				1. Tow Away/No Standing or Parking 7-9:30AM, 4-6:30PM M-F
2	Independence EB b/w 14th and 12th	17	0	17	0	2. No Parking 9:30-11:30AM - Street Cleaning Tuesday
						3. Tow Away - Metro Bus Zone
						1. Tow Away/No Standing or Parking 7-9:30AM, 4-6:30PM M-F
,	A STATE OF THE PARTY OF THE PAR	00	(90	2577	2. 2-Hour Parking 9:30AM-4PM, M-F, 7AM-6:30PM Saturday
٥	independence EB b/w 12th and L'Enfant	07	0	07	5	3. Pay by Phone
						4. No Parking 10PM - SAM - Street Cleaning Tuesday
7	Independence EB b/w L'Enfant and 9th	12	0	12	0	Has 3 main Signs
						1. ADA Parking
		•	(;		2. Tow Away/No Standing or Parking 7-9:30AM, 4-6:30PM M-F
0	True of we by we stand independence	ħŢ.	>	ΡŢ	7	3. 2-Hour Parking 9:30AM-4PM, M-F, 7AM-6:30PM Saturday
						4. Snow Emergency Route - Tow Away
	10 to	c	¢	c		1. Snow Emergency Route - Tow Away
ת	12th St SB B/W C St and Independence	'n	0	ת	0	2. 2-Hour Parking 9:30AM-4PM, M-Sat
10	14th St NB b/w C St and Independence	3	0	0	0	1. 15-min Tour Bus Stand 9:30AM-4PM, No Parking All Other Times
						1. No Standing or Parking Metro Bus Zones
11	14th St SB b/w C St and Independence	4	4	0	0	2. Snow Emergency Route - Tow Away
						3. Special Permit Parking (all times)
12	14th St NB b/w Independence and Jefferson	0	0	0	0	1. Snow Emergency Route - Tow Away
13		0	c	c	0121	1. Snow Emergency Route - Tow Away
13	14th 3t 3b b/w independence and Jerrerson	۰	5	,	5	2. Tow Away/No Standing or Parking 7-9:30AM, 4-6:30PM M-F

APPENDIX G: SAFETY









Accident Summary Report (R-7)

Time Per	riod Covered:	From 01/01/20	12 To 12/31	/2014 Prepa	red By:	admin TARAS	Prepa	ared Date	12/8/2015
Total Nur	mber of Accident		62	Collision Type	#ACC	%	Collision	Type #	ACC %
Total Nur	mber of Fatalities	s:	0	Right Angle:	3	4.8%	Fixed Obje	ect: 1	1.6%
Total Nur	mber of Injuries:		12	Left Turn:	0	0.0%	Ran Off R		1.6%
	nber of Disabling	njuries:	0	Right Turn:	4	6.5%	Ped. Invol		1.6%
	mber of NonDisa		4	Rear End:	17	27.4%	Backing:	C	
	mber of Pedestria	The state of the s	1	Side Swiped:	31	50.0%	Non Collis	ion: 0	
	mber of Bicycles		1	Head On:	0	0.0%	Under/Ove		
Total Nur	mber of Motorcyo	cles involved:	1	Parked:	0	0.0%	Unspecifie		
Time of I	Day	#ACC	%			Day o fweek		#ACC	: %
07:30 ~ 0	9:30:	7	11.3%			Sunday:		6	9.7%
09:30 ~ 1	1:30:	12	19.4%			Monday:		8	12.9%
11:30 ~ 1	3:30:	7	11.3%			Tuesday:		8	12.9%
13:30 ~ 1	6:00:	12	19.4%			Wednesday:		13	21.0%
16:00 ~1	8:30:	8	12.9%			Thursday:		11	17.7%
18:30 ~ 0		16	25.8%			Friday:		9	14.5%
Unspecifi		0	0.0%			Saturday:		7	11.3%
Weather	Condition	#ACC	%			Surface Cond	ition	#ACC	: %
Clear:		54	87.1%			Dry:		54	87.1%
Rain:		5	8.1%			Wet:		5	8.1%
Snow:		1	1.6%			Snow/Ice:		0	0.0%
Sleet/Hai	l:	0	0.0%			Slush:		0	0.0%
Fog/Mist:		0	0.0%			Water/Sand:		0	0.0%
	d/Blowing Sand:	1	1.6%			Repairing:		0	0.0%
Unspecifi		1	1.6%			Unspecified:		3	4.8%
Type of	Vehicle	#VEH	%			Accident Sev	erity Type	#ACC	: %
Passenge	er Car:	68	55.3%			Fatal Collision:	350 7000	0	0.0%
Bus:		20	16.3%			Injury Collision	:	11	17.7%
Truck:		8	6.5%			PDO Collision:		51	82.3%
Taxi:		12	9.8%						
Minivan:		0	0.0%			Light Condition	on	#ACC	
Police/En	nergency Vehicle	e: 2	1.6%			Daylight:		46	74.2%
	le/Moped:	1	0.8%			Dawn/Dusk:		1	1.6%
Bicycle:	3.5	1	0.8%			Dark(Lighted):		11	17.7%
Fixed Ob	iect:	0	0.0%			Dark(Not Light		1	1.6%
Unspecifi		11	8.9%			Dark(Unknown	Lighting):	0	0.0%
						Unspecified:		3	4.8%
	iting Factor	#VEH	%			Pedestrian Ad		#ACC	
Driver: Sp		0	0.0%			In Crosswalk w		1	100.0%
	cohol/Drug:	2	1.6%			In Crosswalk a	gainst Signal:	0	0.0%
Driver: El	ectronic Device:		0.0%			In Crosswalk n	o Signal:	0	0.0%
Driver: O	thers:	22	17.9%			In Unmarked C	crosswalk:	0	0.0%
Vehicle:		0	0.0%			Not in Crosswa	alk:	0	0.0%
Roadway	r.	1	0.8%			From Between	Parked Cars:	0	0.0%
Unspecifi	ed:	98	79.7%			Unspecified:		0	0.0%
Year	Accidents	Fatalities	Injurie	s Disabli	ng Injurie			iles I	Motorcycles
2012	19	0	3		3	0	1		0
2013	19	0	2		1	0	0		1
2014	24	0	7		0	1	0		0

¹ Records are not approved as of 12/8/2015 8:18:44 AM

Accident Summary Report (R-7)

Intersec	tion: INDEPE	NDENCE AVE	and TWELF1	H ST, SW					
Time Pe	riod Covered:	From 01/01/20	12 To 12/31	2014 Prepar	red By:	admin TARAS	Prepa	red Date:	12/8/201
Total Nur	mber of Accident	ti	53	Collision Type	#ACC	%	Collision 7	Type ##	ACC 9
Total Nur	mber of Fatalities	5:	0	Right Angle:	7	13.2%	Fixed Obje	ct: 0	0.09
Total Nur	mber of Injuries:		24	Left Turn:	6	11.3%	Ran Off Ro	oad: 0	0.09
Total Nur	mber of Disabling	g Injuries:	3	Right Turn:	2	3.8%	Ped. Involv	red: 4	7.59
Total Nur	mber of NonDisa	bling Injuries:	9	Rear End:	10	18.9%	Backing:	1	1.99
Total Nur	mber of Pedestri	ans Involved:	5	Side Swiped:	19	35.8%	Non Collisi	on: 1	1.99
Total Nur	mber of Bicycles	Involved:	2	Head On:	1	1.9%	Under/Ove	r Ride: 0	0.09
Total Nur	mber of Motorcy	cles involved:	2	Parked:	1	1.9%	Unspecified	d: 1	1.99
Time of	Day	#ACC	%			Day o fweek		#ACC	9
07:30 ~ 0	9:30:	5	9.4%			Sunday:		2	3.89
09:30 ~ 1	11:30:	3	5.7%			Monday:		9	17.09
11:30 ~ 1	13:30:	10	18.9%			Tuesday:		7	13.29
13:30 ~ 1		11	20.8%			Wednesday:		8	15.19
16:00 ~1		16	30.2%			Thursday:		14	26.49
18:30 ~ 0		8	15.1%			Friday:		6	11.39
Unspecif		0	0.0%			Saturday:		7	13.29
Weather	Condition	#ACC	%			Surface Condi	tion	#ACC	9
Clear:		45	84.9%			Dry:		45	84.99
Rain:		8	15.1%			Wet:		8	15.19
Snow:		0	0.0%			Snow/Ice:		0	0.0
Sleet/Hai	le.	0	0.0%			Slush:		0	0.0
Fog/Mist		0	0.0%			Water/Sand:		0	0.0
	d/Blowing Sand		0.0%			Repairing:		0	0.09
Unspecif	Contraction of the contraction o	0	0.0%			Unspecified:		0	0.09
Type of	Vehicle	#VEH	%			Accident Seve	rity Type	#ACC	0
Passeng		58	57.4%			Fatal Collision:		0	0.0
Bus:		15	14.9%			Injury Collision:		18	34.09
Truck:		3	3.0%			PDO Collision:		35	66.09
Taxi:		19	18.8%						
Minivan:		0	0.0%			Light Condition	n	#ACC	
	mergency Vehicle		1.0%			Daylight:		45	84.9
	le/Moped:	2	2.0%			Dawn/Dusk:		0	0.0
Bicycle:	телиореа.	2	2.0%			Dark(Lighted):		7	13.29
Fixed Ob	iect:	ō	0.0%			Dark(Not Lighte	d):	0	0.0
Unspecifi		1	1.0%			Dark(Unknown	Lighting):	0	0.0
Onspecia		•	1.070			Unspecified:		1	1.99
Contribu	iting Factor	#VEH	%			Pedestrian Act	ions	#ACC	,
Driver: S	peed:	1	1.0%			In Crosswalk wi	th Signal:	3	60.09
Driver: A	lcohol/Drug:	0	0.0%			In Crosswalk ag	gainst Signal:	0	0.0
Driver: E	lectronic Device:	0	0.0%			In Crosswalk no	Signal:	0	0.0
Driver: O	thers:	21	20.8%			In Unmarked Cr	osswalk:	0	0.0
Vehicle:		0	0.0%			Not in Crosswal	k:	1	20.09
Roadway	<i>f</i> :	0	0.0%			From Between	Parked Cars:	0	0.0
Unspecif		79	78.2%			Unspecified:		1	20.09
Year	Accidents	Fatalities	Injurie	s Disablir	ng Injurie			les M	lotorcycles
2012	20	0	7		3	2	0		1
2013	16	0	6		3	2	0		1
2014	17	0	11		3	1	2		0

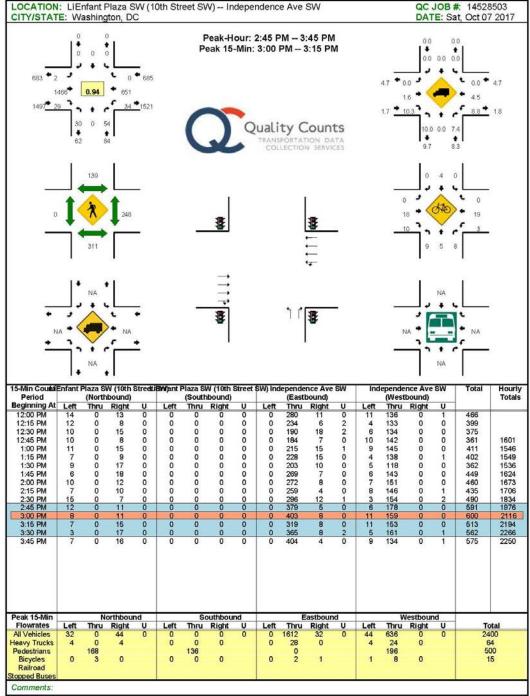
⁰ Records are not approved as of 12/8/2015 8:17:02 AM

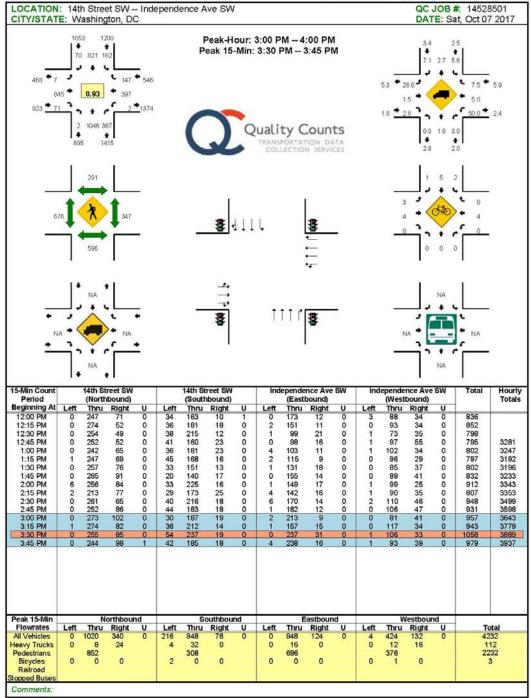
Accident Summary Report (R-7)

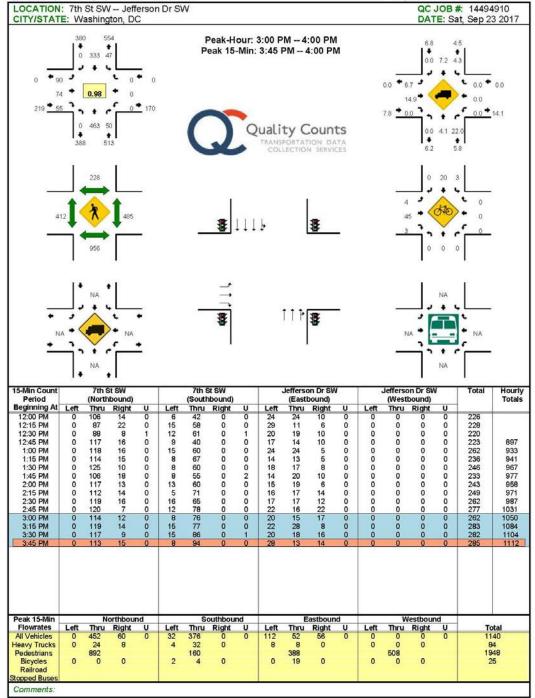
Time Per	riod Covered:	From 01/01/20	12 To 12/31	/2014 Prepa	red By:	admin TARAS	Prepar	ed Date:	12/8/2015
Total Nun	nber of Accident		8	Collision Type	#ACC	: %	Collision T	vpe #/	ACC %
Total Nun	nber of Fatalities	:	0	Right Angle:	0	0.0%	Fixed Object	et: 0	0.0%
Total Nun	nber of Injuries:		3	Left Turn:	1	12.5%	Ran Off Ro	ad: 0	0.09
Total Nun	nber of Disabling	Injuries:	0	Right Turn:	0	0.0%	Ped. Involv	ed: 0	0.0%
	nber of NonDisal		0	Rear End:	1	12.5%	Backing:	0	0.0%
	nber of Pedestria		0	Side Swiped:	3	37.5%	Non Collisio	on: 0	0.0%
	nber of Bicycles		0	Head On:	1	12.5%	Under/Over		0.0%
	nber of Motorcyc		0	Parked:	2	25.0%	Unspecified		0.0%
Time of D	Day	#ACC	%			Day o fweek		#ACC	9/
07:30 ~ 0	9:30:	0	0.0%			Sunday:		0	0.0%
09:30 ~ 1		1	12.5%			Monday:		0	0.0%
11:30 ~ 1		3	37.5%			Tuesday:		2	25.0%
13:30 ~ 1		2	25.0%			Wednesday:		1	12.5%
16:00 ~18		0	0.0%			Thursday:		1	12.5%
18:30 ~ 0		2	25.0%			Friday:		2	25.0%
Unspecifi		0	0.0%			Saturday:		2	25.0%
Weather	Condition	#ACC	%			Surface Condition	on.	#ACC	9/
Clear:		8	100.0%			Dry:		8	100.0%
Rain:		0	0.0%			Wet:		0	0.0%
Snow:		o	0.0%			Snow/Ice:		0	0.0%
Sleet/Hail		o	0.0%			Slush:		0	0.0%
Fog/Mist:		0	0.0%			Water/Sand:		0	0.09
	d/Blowing Sand:		0.0%			Repairing:		0	0.0%
Unspecifi	All the second s	0	0.0%			Unspecified:		0	0.0%
Type of	Vehicle	#VEH	%			Accident Severi	ty Tyne	#ACC	%
Passenge		10	62.5%			Fatal Collision:	, .,,-	0	0.0%
Bus:		3	18.8%			Injury Collision:		2	25.0%
Truck:		1	6.3%			PDO Collision:		6	75.0%
Taxi:		i	6.3%			1 DO COMBION.			10.07
Minivan:		o	0.0%			Light Condition		#ACC	9/
	nergency Vehicle		6.3%			Daylight:		6	75.0%
	le/Moped:	0	0.0%			Dawn/Dusk:		1	12.5%
-	ie/iviopeu.	0	0.0%			Dark(Lighted):		1	12.5%
Bicycle:	COL	0				Dark(Not Lighted):	0	0.0%
Fixed Obj		0	0.0%			Dark(Unknown Li		0	0.0%
Unspecifi	ea.	U	0.0%			Unspecified:		0	0.0%
Contribu	ting Factor	#VEH	%			Pedestrian Actio	ons	#ACC	%
Driver: Sp		2	12.5%			In Crosswalk with	Signal:	0	0.0%
	cohol/Drug:	0	0.0%			In Crosswalk aga		0	0.0%
Driver: El	ectronic Device:	0	0.0%			In Crosswalk no	Signal:	0	0.0%
Driver: Ot		3	18.8%			In Unmarked Cro	100	0	0.0%
Vehicle:		0	0.0%			Not in Crosswalk		0	0.0%
Roadway	:	0	0.0%			From Between Pa		0	0.0%
Unspecifi		11	68.8%			Unspecified:		0	0.09
Year	Accidents	Fatalities	Injurie	es Disabli	ng Injurie			es N	lotorcycles
2013	2	0	0		0	0	0		0
2014	6	0	3		0	0	0		0

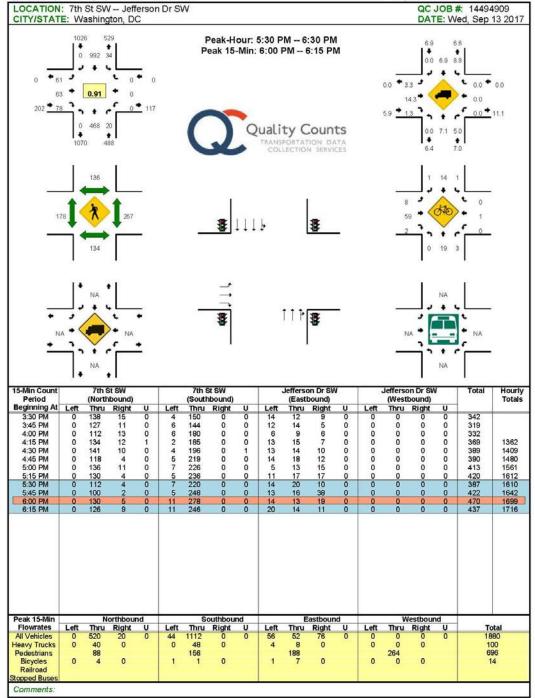
⁰ Records are not approved as of 12/8/2015 8:22:05 AM

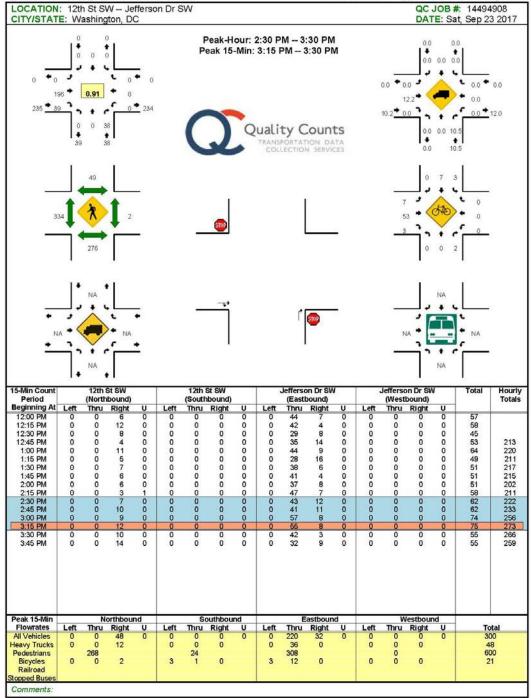
APPENDIX B: STUDY AREA DATA

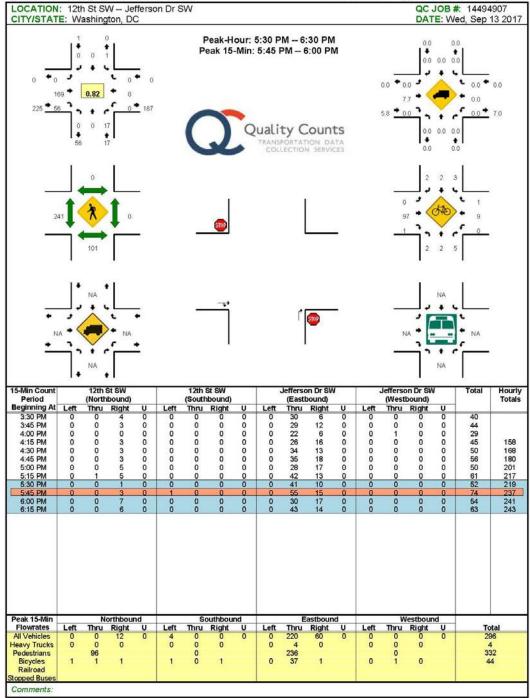


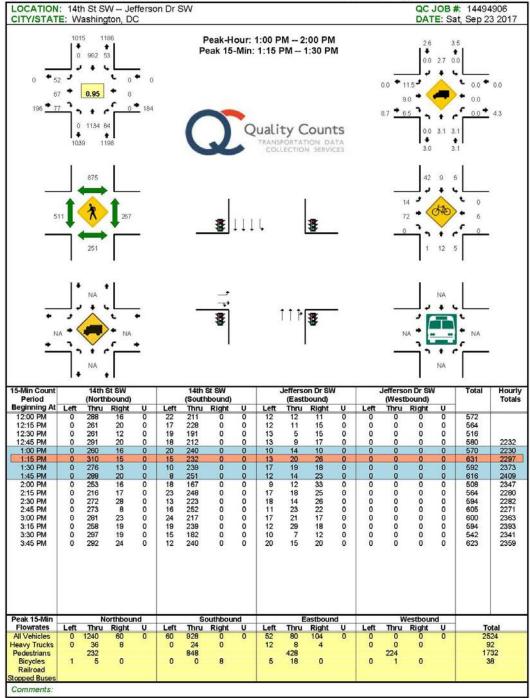


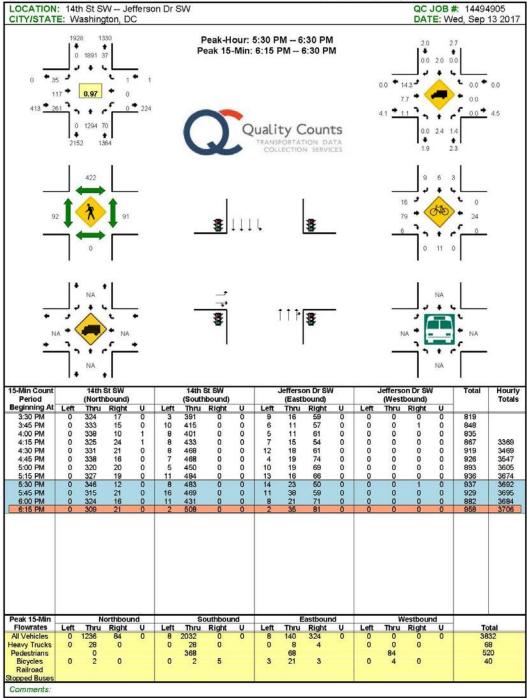


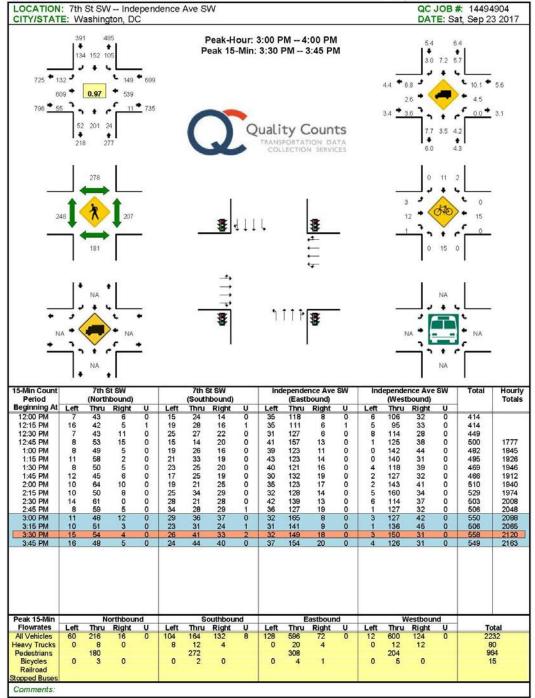


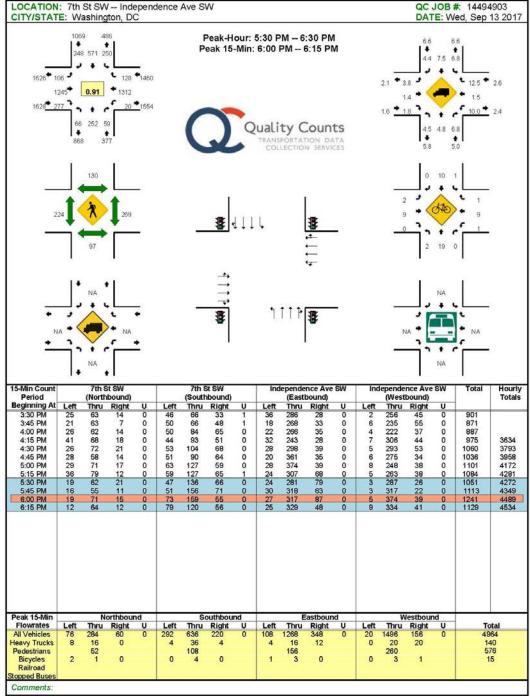












Passenger Cars

Start Date: 12/8/2015 Start Time: 7:00:00 AM Site Code: Independence Ave, SW at 14th St, SW

SW		Right	58	37	7	35	48	99	92	6	8	99	33	4	230	23	22	20	32	27	30	22	27	23	22	19	22	5	43	29	23	90
ndependence Ave.	Vestbound	Thru	79	8	106	117	143	150	162	142	126	104	8	116	262	112	83	118	154	245	281	189	204	210	229	207	226	123	213	172	148	010
Independ	- W	Left	0	•	0	0	_	0	0	0	0	0	~	_	₹	~	_	0	က	က	2	0	2	•	0	0	7	က	7	က	7	c
SW		Right	ω	9	19	4	14	<u>ග</u>	7	4	2	12	9	7	48	10	7	2	S	7	4	က	4	12	S	9	13	7	က	ω	4	Ç
ndependence Ave.	Eastbound	Thru	245	326	263	353	361	408	370	396	377	414	365	280	1535	80	117	99	72	89	101	117	8	117	127	130	66	92	96	106	88	410
Independ	- Еа	Left	0	0	0	0	0	0	0	0	0	· V	0	2	0	0	_	~	0	_	0	0	0	0	0	~	0	0	0	0	•	7
		Right	9	က	က	က	•	വ	2	7	က	0	က	Ŋ	15	8	10	Ŋ	9	∞	9	9	က	~	9	0	4	∞	7	7	о	Č
4th St. SW	Southbound	Thru	122	156	110	145	118	126	103	127	146	26	82	103	474	261	286	307	331	362	457	344	314	331	360	332	421	422	356	400	395	7777
141	Sou	Left	15	22	21	20	35	31	33	23	34	36	27	26	122	29	35	27	43	52	51	26	39	34	38	26	38	29	23	32	17	400
		Right	62	29	71	64	25	99	90	8	43	59	30	42	184	26	49	99	22	24	92	95	87	92	87	77	96	8	54	20	43	250
h St. SW	rthbound	Thru	470	474	537	558	277	657	546	206	552	494	512	445	2286	257	306	184	189	281	370	366	356	358	373	368	370	389	326	309	230	1 160
14	ō N	Left	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	c
3		Start Time	07:00	07:15	07:30	07:45	08:00	08:15	08:30	08:45	00:60	09:15	06:30	09:45	Peak Hour	15:00	15:15	15:30	15:45	16:00	16:15	16:30	16:45	17:00	17:15	17:30	17:45	18:00	18:15	18:30	18:45	Dank

Heavy Vehicles

Start Date: 12/8/2015 Start Time: 7:00:00 AM Site Code: Independence Ave, SW at 14th St, SW

	SW	Right	7	က	∞	4	4	7	S	4	_	9	•	4	15	2	2	2	S	7	<u></u>	2	4	S	~	က	9	τ-	7	S	_	15
		Lhru	_	_	0	•	7	0	0	7	_		0	က	4	7	Ŋ	_	7	က	7	က	∞	15	9	വ	4	0	7	0	2	30
	Independence Ave, Westbound	eft	_	0	•	_	_	0	က	0	•	0	7	_	4	0	0	•	က	7	4	7	-	7	7	2	5	4	0	က	2	11
		jt L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	~	0	0	0	0	0	T	0	0	0	0	0	0	_
- 1	e Ave, SW Jund	u Righ	0	•	_	က	<u>. </u>	7	_	7	4	2	က		9	0	0	•	_	7	က	7	က	7	Υ.	က		7	~	_	0	2
	Independence Ave, Eastbound	Thr	0	0	_	2	0	_	က	7		0	_	0	9	0	2	0	_	0	•	က	7		2	0	<u>. </u>	2	_	2	0	4
	<u>ē</u>	Left	0	_	_	0	_	0	_	0	0	_	0	_	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	o <	Right	200																												42504	
۲į	14th St, SW Southbound	Thru	6	80	9	13	Ŋ	9	0	Ŋ	0	9	∞	3	25	9	က	4	က	4	c	00	8		80	1	7	9	8	2	9	26
SW at	e o	Left	က	က	4	4	9	4	∞	S	4	4	Ŋ	က	23	2	2	S	0	2	S	က	4	0	•	က	4	2	0	က	2	80
ce Ave,		Right	2	හ	က	~	7	က	က	က	0	ෆ	•	7	17	2	•	2	0	<u>-</u>	2	7	7	က	~	7	7	7	τ-	ς-	3	80
ndependen	14th St, SW Northbound	hru F	9	တ	7	7	∞	4	S	9	က	0	က	9	23	က	Ŋ	က	7	4	S	∞	က	7	7	4	<u>. </u>	7	က	4	-	14
ge.	North	# T	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2 2 2 2 2		le Lef																														
		Start Time	07:00	07:15	07:30	07:45	08:00	08:15	08:30	08:45	00:60	09:15	06:30	09:45	Peak Hour	15:00	15:15	15:30	15:45	16:00	16:15	16:30	16:45	17:00	17:15	17:30	17:45	18:00	18:15	18:30	18:45	Peak Hour

Start Date: 12/8/2015 Start Time: 7:00:00 AM Site Code: Independence

			Total	1065	1215	1169	1345	1380	1520	1360	1351	1391	1285	1173	1091	5611	0.923	%0.0	829	943	785	889	1134	1433	1177	1147	1220	1277	1198	1322	1198	1140	1141	286	5017	0.949	0.0%
	MS		Right	36	8	29	36	25	28	20	92	82	72	34	4	245	0.875	6.1%	25	24	22	37	29	39	8	ઝ	78	23	22	28	25	45	34	24	101	0.902	14.9%
	Independence Ave. SW	Westbound	Thru	80	9	106	118	145	150	162	144	127	105	8	119	601	0.927	%2'0	119	94	125	161	248	288	192	212	225	235	212	230	123	215	172	150	305	0.960	3.3%
	Indepen	Š	Left	_	~	~		2	0	က	0	~	0	က	2	ည	0.417	80.0%	~	~	_	9	5	9	7	က	က	7	7	7	7	7	9	4	14	0.500	78.6%
	MS	:	Right	8	10	10	14	14	တ	Ξ	14	Ŋ	12	9	7	48	0.857	%0.0	10	2	2	9	7	4	ო	4	12	9	9	13	7	ო	ω	4	37	0.712	2.7%
	Independence Ave. SW	Eastbound	Thru	245	327	264	356	362	410	371	398	381	416	368	281	1541	0.940	0.4%	80	117	29	73	70	104	119	84	119	128	133	10	29	26	107	98	480	0.902	1.5%
	Independ	E E	Left	0	0	~	2	0	•	က	7	_	~	~	2	9	0.500	100.0%	0	က	•	~	~	•	ო	2	_	7	~	•	7	~	7	_	2	0.625	80.0%
7			Right	9	4	4	က	2	2	က	7	က	9	က	9	17	0.607	11.8%	ω	10	2	10	∞	9	9	က	=	9	0	4	80	~	Σ	6	21	0.477	%0.0
SM at 14th St SM	14th St SW	Southbound	Thru	131	164	116	158	123	132	112	132	155	103	06	106	499	0.945	2.0%	267	289	311	334	366	460	352	317	332	368	342	428	428	359	402	401	1470	0.859	1.8%
SW at 14	4 A A	S	Left	18	25	25	24	4	35	4	28	38	40	32	29	145	0.884	15.9%	31	37	32	43	22	99	29	43	34	39	29	42	33	23	35	19	144	0.857	2.6%
			Right	64	70	74	65	24	29	33	49	43	32	3	44	195	0.826	2.6%	28	20	32	22	28	94	29	88	92	88	79	88	87	52	51	46	360	0.918	2.2%
denender	14th St. SW	Northbound	Thru	476	483	539	265	585	661	551	512	555	494	515	451	2309	0.873	1.0%	260	311	187	196	285	375	374	328	360	380	372	371	391	329	313	231	1483	0.976	%6.0
Start Time: 7.00.00 AM Site Code: Independence Ave	14	- 2	Left	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0i	#DIV/0i	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0i	#DIV/0i
กั)		Start Time	00:20	07:15	07:30	07:45	08:00	08:15	08:30	08:45	00:60	09:15	06:30	09:45	Peak Total	出	NH%	15:00	15:15	15:30	15:45	16:00	16:15	16:30	16:45	17:00	17:15	17:30	17:45	18:00	18:15	18:30	18:45	Peak Total	PH-	>H%

Bicycles and Peds

	Peds	22	40	54	20	09	54	47	54	42	28	26	တ	215	24	22	ര	o	27	30	œ	1	14	œ	14	4	7	4	~ .	·	40
Ave, SW	lpt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	0	0	-	-	0 (0	7
Independence Ave,	hru hru		7	~	τ-	7	0	-	-	τ-		0	0	4	0	7	0	~	က	က	7	_	∞	က	ဖ	ဖ	4	-	~ (2	23
lapul	-eff	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 (0	0
	Peds		4	က	သ	က	က	9	œ	10	7	7	F	24	9	4	9	16	15	9	37	7	4	Ξ	တ	က	7	ဖ	ဖ ·	4	27
ve, SW	aht		7	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 (0	0
Independence Ave, SW	hru R		7	2	9	-	ო	2	7	0	4	-	7	11	0	0	0	0	-	-	0	0	0	-	0	0	-	0	- (2	-
dapul	Left	0	0	0	0	0	0	0	-	0	0	0	•	۲	0	0	0	0	0	0	0	0	0	0	0	0	0	0	- (0	0
	Peds	11	9	12	20	œ	2	S	2	œ	လ	13	7	23	17	7	7	ო	-	-	9	14	12	9	တ	7	=	4	5 .	9	46
> 7	ht		-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.	-	0	0	0	0 (0	7
14th St, SW	hru Ri		က	0	0	_	ო	0	0	-	-	0	0	4	0	-	0	0	0	7	-	-	0	-	-	0	0	-	0 (0	7
St, SW	Left T	0	7	0	-	0	0	-	0	7	0	0	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 (0	0
SW at 14th St,	Peds Li		\$	15	21	15	ω	12	7	9	ო	0	4	42	34	27	12	28	22	75	47	49	56	66	44	22	38	32	7 :	10	194
Ave,	ht		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0 (0	-
	Thru Rig	0	0	0	0	0	-	0	0	0	0	0		-	0	0	0	-	0	0	2	-	0	_	-	0	0	0	← (0	7
12/8 7:00 Inde	F	0	•	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0		0	7	0 (0	₩.
Start Date: Start Time: Site Code:	ime													<u> </u>																	
	Start Til	02:00	07:15	07:30	07:45	08:00	08:15	08:30	08:45	00:60	09:15	08:30	09:45	Peak Tota	15:00	15:15	15:30	15:45	16:00	16:15	16:30	16:45	17:00	17:15	17:30	17:45	18:00	18:15	18:30	18:45	Peak Tota

Start Date: 9/29/2015 Start Time: 7:00:00 AM Site Code: Independence Ave at 12th St, SW

		Total	629	719	714	640	802	707	714	724	771	687	672	603	2947	0.919	290	551	809	594	592	699	762	843	839	277	811	774	781	724	700	228	3200	0.954
>		Right	21	24	20	32	3	35	8	32	38	38	23	23	128	0.914	33	33	71	26	26	14	24	34	99	43	34	49	48	36	29	17	165	0.842
MS ave annahulandul	Westbound	Thru	153	198	142	160	180	160	168	142	155	174	157	102	029	0.903	160	169	183	179	184	226	249	262	348	307	278	294	322	270	257	216	1227	0.881
Indeper		Left	40	30	32	36	33	32	37	37	32	47	30	30	139	0.939	34	30	44	35	51	56	69	78	73	84	83	84	94	101	96	55	334	0.898
		Right	49	45	38	49	37	32	4	25	22	28	15	19	134	0.838	14	12	24	15	9	80	14	10	ဖ	∞	က	Ŋ	0	2	0	0	22	0.688
ndenendence	Eastbound	Thru	324	361	326	285	328	324	308	351	357	281	284	276	1342	0.935	209	192	184	213	221	229	243	242	217	196	238	215	156	205	179	156	998	0.910
abul	Ĭ	Left	13	9	15	2	13	7	Ξ	17	4	10	13	S	48	0.706	80	9	∞	က	က	က	7	2	0	0	0	0	2	4	24	10	0	#DIV/0i
_		Right	0	_	2	0	-	2	2	က	-	4	4	_	ω	0.667	2	2	7	S	က	0	2	∞	4	2	က	0	2	2	2	_	ı	0.563 #
2th St NW	Southbound	Thru	0	က	4	2	2	2	2	4	4	4	က	4	13	0.650	9	2	_	က	Ŋ	0	τ-	9	Ŋ	D.	4	9	7	4	_	0	20	0.833
121		Left	0	0	0	0	က	2	2	က	•	0	0	S	10	0.833	~	4	က	•	က	<u> </u>	0	က	4	က	7	က	τ-	_	_	0	12	0.750
_		Right	13	∞	20	22	34	21	23	34	ස	49	42	48	109	0.801	61	55	83	25	34	55	71	88	78	26	54	26	72	44	63	23	244	0.782
12th St NIW	Northbound	Thru	27	30	09	32	8	44	44	32	99	21	31	24	200	0.625	39	24	40	36	31	47	43	29	32	47	84	42	61	58	29	30	208	0.619
10000	<u>i</u> 2	Left	19	13	22	7	32	46	44	44	49	31	29	36	166	0.902	25	17	29	26	25	30	44	51	30	25	18	20	21	26	19	21	93	0.775
		Start Time	00:20	07:15	07:30	07:45	08:00	08:15	08:30	08:45	00:60	09:15	06:30	09:45	Peak Total	PHF	15:00	15:15	15:30	15:45	16:00	16:15	16:30	16:45	17:00	17:15	17:30	17:45	18:00	18:15	18:30	18:45	Peak Total	HH

Bicycles and Peds

	Ave SW	Right P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Independence Ave Westbound	Thru F	2	9	ო	∞	7	-	S	2	7	2	2	ည	10	-	7	က	က	~	, ,	-	∞	S	ო	4	ო	ო	2	-/	0	15
	lnde		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Peds	20	89	9/	102	06 6	121	102	104	8	33	72	28	417	37	21	49	99	26	သ	8	12	32	Ξ	12	4	9	23	-	0	29
	lence und	Right	0	0	0	2	0	0	0	τ-	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Independence Eastbound	Thru	-	4	ည	9	0	S	7	4	4	•	2	0	16	4	21	∞	10	0	-	0	-	_	14	0	•	-	0	0	0	16
		Left	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Peds	33	9	31	21	35	22	32	24	26	Ξ	∞	16	116	22	27	32	24	∞	0	2	23	9	12	70	5	_	2	0	0	51
	NN pund	Right	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12th St, NW Southbound	Thru	Ţ	4	ო	တ	က	ည	ಧ	თ	9	∞	9	τ-	30	2	~	0	_	_	0	0	0	0	4	0	က	0	0	0	0	7
MS.		Left	0	0	0	0	_	0	0	0	τ-	0	0	0	Υ-	0	~	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
at 12th St		Peds	0	0	0	0	0	0	0	7	ო	0	0	0	2	0	0	2	0	0	0	က	0	0	0	0	0	0	0	0	0	0
1 nce Ave	NN Nud	Right	0	က	0	0	-	0	0	0	7	0	0	0	•	0	0	0	0	0	0	4	9	က	_	2	2	သ	0	0	0	∞
9/29/2015 7:00:00 AM Independer	12th St, NW Northbound	Thru	0	0	τ-	0	0	0	•	7	0	0	0	0	8	-	0	0	0	0	0	0	0	-	τ-	-	•	τ-	~	-	0	4
Start Date: 9/29/2015 Start Time: 7:00:00 AM Site Code: Independence Ave at 12th St		Left	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	-	0	0	~	0	0	0	0	0	0	0	0	0	0
Sta Star Site		rt Time			-	16	6	16	_	10	-	15	_	16	Total	_	16	_	15	_	15	_	10	_	16	-	16	_		_		Total
		Start	07:00	07:15	07:30	07:45	08:00	08:15	08:30	08:45	00:60	09:15	09:30	09:45	Peak Tota	15:00	15:15	15:30	15:45	16:00	16:15	16:30	16:45	17:00	17:15	17:30	17:45	18:00	18:15	18:30	18:45	Peak Tota

Vehicles

Start Date: 9/29/2015 Start Time: 7:00:00 AM Site Code: PEAK-HOUR COUNT AT L'ENFANT

		Total	581	658	598	595	662	674	604	684	699	616	541	484	2624	0.959	525	503	260	533	222	662	701	720	816	734	714	682	736	699	989	515	2946	0.903
Ave	$\boldsymbol{\sigma}$	Thru To	218	245	180	223	216	235	229	200	204	224	186	145	v	0.936	218	204	248	231	252	323	316	353	412	381	365	346	419	369	362			0.913
Independence Ave	Westbound	Left T	12	19	20	17	18	19	7	22	15	18	4	2	99	0.750	1	4	15	12	7	15	17	89	18	12	တ	7	ω	4	9	2	20	0.694
_	pc pc	Right	42	14	37	4	23	15	27	20	25	13	17	16	85	0.787	6	16	25	23	22	17	15	22	20	10	14	10	10	5	ო	က	54	0.675
Independence Ave	Eastbound	Thru	293	349	332	305	361	348	300	376	377	317	310	294	1385	0.921	252	238	231	236	242	271	303	299	286	261	259	251	226	255	245	203	1057	0.924
_	pur	Right	ω	2	19	23	33	4	24	20	29	26	21	17	152	0.760	16	15	20	16	19	တ	18	15	34	4	13	4	4	7	9	S	22	0.404
L'Enfant Plaza	Northbound	Left	ω	10	10	13	-	12	17	16	19	18	က	7	56	0.824	10	16	7	15	15	27	32	23	46	99	54	09	29	25	14	တ	226	0.856
		Start Time	07:00	07:15	07:30	07:45	08:00	08:15	08:30	08:45	00:60	09:15	06:30	09:45	Peak Total	PHF	15:00	15:15	15:30	15:45	16:00	16:15	16:30	16:45	17:00	17:15	17:30	17:45	18:00	18:15	18:30	18:45	Peak Total	PHF

Bicycles and Peds

		Peds	0	4	28	21	14	17	22	13	9	2	0	0	69	16	2	31	<u></u>	က	0	7	> '	0	S.	2	0	0	0	0 0	1	,
	e Ave	Right	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 (> '	0	0	0	0	0	0	0 (0
30	Independence Ave Westbound	Thru	0	ო	9	Ø	ည	ო	4	œ	4	2	0	0	20	2	2	2	က	6	~	2 1	ο :	4	2	-	0	0	0	0 (ומ	_
		Left	0	0	_	7	-	0	0	0	0	0	0	0	F	0	0	0	0	4	0	က	v)	0	သ	2	4	~	0	0 0	o ;	Ξ
		Peds	0	0	7	7	∞	တ	24	12	ည	12	8	34	53	42	28	28	ඉ	8	83	8 8	જ :	8	133	æ	22	14	3	7	= ;	154
9	se Ave	Right	0	_	0	0	-	~	2	0	ო	0	0	0	4	0	-	0	0	0	0	0 (o :	0	0	0	0	0	0	0 0	0	>
	independence Ave Eastbound	Thru	0	0	7	2	-	7	က	က	7	2	0	0	ნ	5	2	က	9	-	ო	0 (7	7	က	7	4	-	0	0 0	0 9	5
<u> </u>	ui .	Left	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 (> '	0	0	0	0	0	0	0 0		>
U U		Peds	0	7	13	16	-	_	19	5	τ-	0	7	0	40	œ	35	36	26	17	_	91 0	7 ;	20	55	∞	7	0	0	0 0	0 (20
PENDEN	11	Right F	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 (o 1	0	0	0	0	0	0	0 0		0
ND INDE	L'Enfant Plaza Southbound	Thru F	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 (> '	0	0	0	0	0	0	0 0	0	o
IR COUNT AT L'ENFANT AND INDEPENDENCE		_	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 (o :	0	0	0	0	0	0	0 0	0	>
T AT L'E		Peds	0	7	9	20	0	Ξ	တ	7	∞	35	7	10	27	4	4	27	12	20	4	20 31	57	က	သ	-	-	-	က	0	٥	2
R COUN	\$	Right	0	0	0	2	0	-	0	0	0	0	0	0	•	0	0	0	0	0	0	0 (o ·	-	0	0	0	0	0	0 4	-	
	L'Enfant PI Northboui	Thru F	0	0	0	0	2	0	-	2	0	0	0	0	5	0	0	~	~	0	0	τ,	-		0	-	က	0	0	0 (0	ဂ
Start Date: 9/29/2015 Start Time: 7:00:00 AN Site Code: PEAK-HOL		Left 1	0	0	0	-	0	0	0	τ-	0	0	0	0		0	0	0	0	0	0	0 (7 -	0	0	0	0	0	0	o •	4 (0
Sta Sta Sit		Start Time	00:20	07:15	07:30	07:45	08:00	08:15	08:30	08:45	00:60	09:15	06:30	09:45	Peak Total	15:00	15:15	15:30	15:45	16:00	16:15	16:30	16:45	17:00	17:15	17:30	17:45	18:00	18:15	18:30	18:40	Peak Total

Ronald Catterton

Intersection: 14th Street and Independence Ave

Date: 12/8/15

Time	Approach	Vehicles in Queue at Start of Green	Vehicles Left in Queue at End of Green	Comments
	NB	62	3	tight terms left
7:15 AM	SB	26	0	
7:13 AIVI	ЕВ	28	0	
	WB	12	ð	#
	NB	60	14	U-TURN MESSER UPTRAFFIC
7.20 484	SB	21	4	left have left
7:30 AM	ЕВ	32	0	
	WB	12	0	
	NB	58	2	right turnes
7:45 AM	SB	13	0	9
7:45 AIVI	EB	20	0	
	WB	13	0	
9.00 AB4	NB	50	6	
8:00 AM	SB	15	4	the annut the

7:00 Am 10 seconds -> Signal - SB Lead 8:00 Am 12 seconds > Left fine

		1		T
	EB	16	0	
	WB	15	0	
	NB	45	6	
0.45 404	SB	16	i.f	left Turn left
8:15 AM	EB	10	0	
	WB	20	0	
	NB	43	6	
9.30 ABA	SB	19	9	left Tuno left.
8:30 AM	EB	10	0	
	WB	3 (0	
	NB	45	0	
0.45.484	SB	15	3	left Turns left
8:45 AM	EB	12	0	
	WB	30	0	
	NB	45	0	
9:00 AM	SB			tt n vi
	EB	15	0	
	WB	29	0	

Intersection: 14th Street and Independence Ave

Date:_

Time	Approach	Vehicles in Queue at Start of Green	Vehicles Left in Queue at End of Green	Comments
Laure	NB	15		
4:15 PM	SB	13	0	
4.13 FW	EB		0	
	WB	33	0	
	NB	16	0	
4:30 PM	SB	16	0	
4.30 PW	EB	2	0	
	WB	25	0	
	NB	23	0	
4:45 PM	SB	18	0	
4:43 PIVI	EB	4	0	
	WB	38	0	
5:00 PM	NB	30	0	
3.00 FIVE	SB	24	0	

4:00 pm 18 sec. > Signal SB Lead 5:00 pm 18 sec. > Left time

	EB	6	0	
	WB	33	0	
	NB	15	0	
5:15 PM	SB	21	٥	
3.13 PW	EB	2	0	
	WB	32	0	
	NB	18	0	
5:30 PM	SB	27	0	
3.30 F W	EB	6	0	
	WB	32	0	
	NB	8	0	
5:45 PM	SB	11	0	
3.43 FIVI	EB	6 .	0	
	WB	38	0	
	NB	16	0	
6:00 PM	SB	30	0	
	EB	4	0	
	WB	31	0	

Babinda Lanor

Intersection: 12th Street and Independence Ave

Date: 0 8 15

Time	Approach	Vehicles in Queue at Start of Green	Vehicles Left in Queue at End of Green	Comments
	NB	3	0	
7.45 ABA	SB	0	0	
7:15 AM	EB	24	Ò	
	WB	2	Ò	
	NB	5	D	
7.20.414	SB	0	0	
7:30 AM	EB	7	0	
	WB	1-1	0	
	NB	0	0	
	SB	0	0	
7:45 AM	EB	(0	
	WB	(0	0	
	NB	(0)	0	
8:00 AM	SB	1	0	

12 me Independence

	ЕВ	17	0	
	WB	4	0	
	NB	3	0	
	SB	0	6	
8:15 AM	EB	12	6	All remaining were Left trins in queue
	WB	9	0	
	NB	٦	0	
	SB	0	0	
8:30 AM	EB	28	1	One left turn Vehicle remaining
	WB	6	0	Vehicle fernaming All lefts were the quest All west
	NB	17	0	
	SB	0	0	
8:45 AM	EB	36		one through did not got through both were lefts and got through
-	WB	36	0	both were letts and got through
	NB	2	\bigcirc	
9:00 AM	SB	4	9	
3.00 AIVI	EB	8	0	
	WB	4	0	

Intersection: 12th Street and Independence Ave

Date: 2 8 13

Time	Approach	Vehicles in Queue at Start of Green	Vehicles Left in Queue at End of Green	Comments
	NB	5	\Diamond	
	SB	0	0	
4:15 PM	EB	25	0	
	WB	14	D	
	NB	10	0	
	SB)	6	
4:30 PM	EB	30	2	The remaining were right behind a stopped bus
	WB	19	0	
	NB	6	0	
	SB	0	0	
4:45 PM	EB	40	0	
	WB	22	0	
F 00 DE 5	NB	10	0	
5:00 PM	SB	0	Ò	

12ms+@Independence

	EB	13	l	Bus stopped in right lane
	WB	20	0	
	NB	6	0	
5:15 PM	SB)	0	
2:12 bivi	EB	17	Чанальный	Bus Stopped Right Lone
	WB	16	0	
	NB	4	G	
F-20 D84	SB	O	0	
5:30 PM	EB	28	\	Uber in right lane
	WB	19	0	
	NB	5	0	
5:45 PM	SB	Ò	6	
5:45 PIVI	EB	15	0	
	WB	19	0	
6:00 PM	NB	3	0	
	SB	0	0	
3.001111	EB	14	0	
	WB	16	\Diamond	

Bounda Conno-

Intersection: L'Enfant Plaza and Independence Ave

Date: 12 8 15

Time	Approach	Vehicles in Queue at Start of Green	Vehicles Left in Queue at End of Green	Comments
	NB	0	0	
7:15 AM	SB	0		A CAMPAN
7:15 AIVI	EB	4	0	
	WB	18	0	
	NB	.0	0	2 mude 115hts on real
7:30 AM	SB	0		>_
7:30 AIVI	EB	5	0	
	WB	21	0	
	NB	8	0	
7.45 004	SB			>
7:45 AM	EB	11	G	
	WB	12	2	All Left tring -
8:00 AM -	NB	6	0	£ 117/11/2
	SB	-	X	4

Exfort@Ind.

	ЕВ	3	0	
	WB	22	0	
	NB		0	
0.45 484	SB	>	>	><
8:15 AM	EB	6	0	
	WB	33	a range	Vehicle
	NB	4	9	
8:30 AM	SB	> /	>	
8.30 AIVI	EB	4	0	
	WB	28	\Diamond	
	NB	6	0	
8:45 AM	SB	\times	>	4
6:45 AIVI	EB	2	0	
	WB	24	\bigcirc	
	NB	白優	0	
9:00 AM	SB	7	7	×
	EB	7	0	
	WB	18		



Intersection: L'Enfant Plaza and Independence Ave

Date: 12/8/15

Time	Approach	Vehicles in Queue at Start of Green	Vehicles Left in Queue at End of Green	Comments
	NB	0		
4.45.004	SB		>	
4:15 PM	EB	21	0	
	WB	2	0	
	NB	9	0	
4.20 004	SB		7	>
4:30 PM	EB	11		
	WB	15		
	NB	5		
4.45 004	SB	7	1	7
4:45 PM	EB	5	0	
	WB	1	0	
5:00 PM	NB	H	0	
	SB	7	7	7

La Enfant Drodofendera

				1
	EB	4		
	WB	18	0	
	NB	7	0	
5:15 PM	SB	>	/	7
J.13 FIVI	ЕВ	\$ 4	0	
	WB	28	0	
	NB	@ 1	0	
5:30 PM	SB		7	>
3.30 PW	EB	5	0	
	WB	· ·	0	
	NB	0	0	
5:45 PM	SB	7	~/	
3.43 PIVI	EB	6	0	1
	WB	8	9	
	NB	3	0	
6:00 PM	SB	7	7	7
	EB	7		
	WB	5	\bigcirc	

APPENDIX C – CAPACITY ANALYSIS

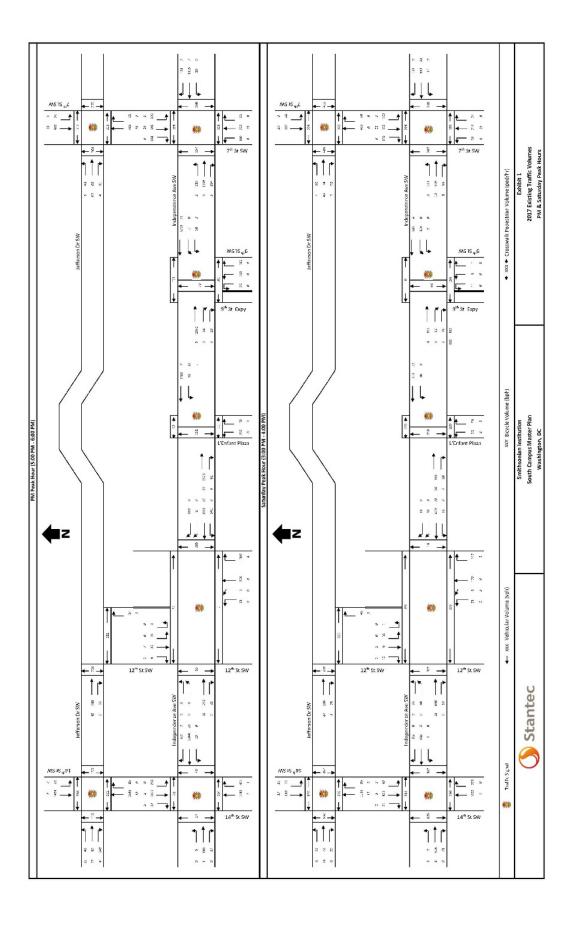


Exhibit 2 PM Peak Hour (5:00 PM - 6:00 PM) Capacity Analysis Results

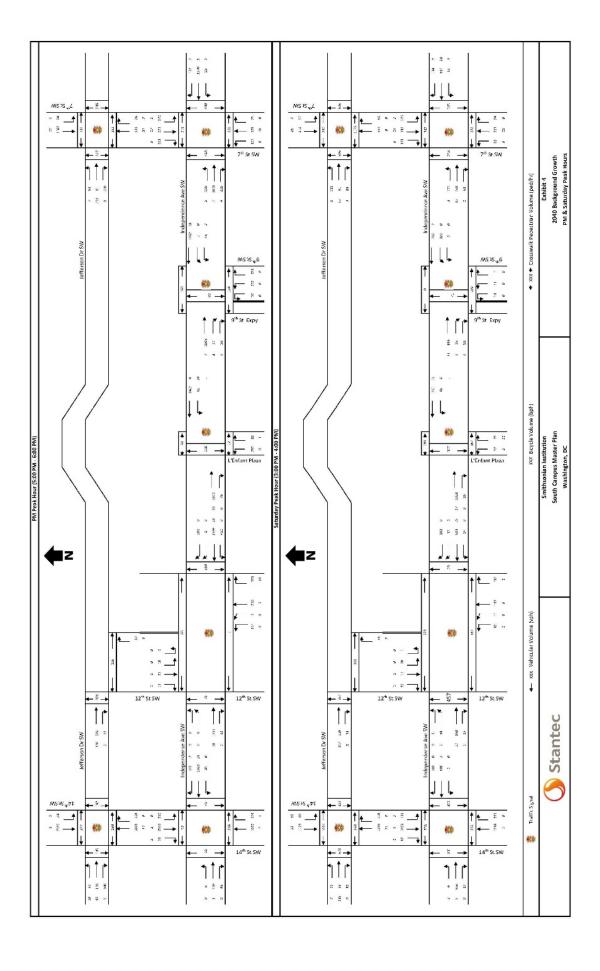
							l												The state of the s	
				Level	Soth	95th			Level	50th 5	95th			Level	4:	95th	_	Leve	el soth	95th
	LANE	٥/٥		ъ	Queue	Queue	o/c		5	Queue	Quene	٥/٥		5	Queue	Onene v	٨/د	6	Quene	Queue
Intersection	GROUP	Ratio	Delay	Service	(#)	(ft)	\rightarrow		Service			-		Service	-	-		Se		£
	T-83	0.15	30.7	Ü	25	26	0.20	31.6	U	32	33	0.20	31.7	O	32	99	0.20 39.4	4 0	43	88
o mo or or or	EB-TR	0.88	61.5	Е	235	404	1.09	114.9	160	341	537	1.13	125.7	新	352	547 1	1.09 118.6	9 P	469	688
Sin Legans at	NB-TR	0.54	11.2	В	11	271	0.67	57.6	Е	523	577	0.63	57.4	ш	537	577 0.	0.78 6.7	7 A	23	62
Svy Jerrerson Drive	7-8S	0.35	20.6	O	21	44	0.79	80.3	F.	23	89	0.82	97.2	F	25	99	0.42 25.0	0 0	13	48
Signonzed	SB-T	99.0	14.4	В	1	346	0.81	18.6	8	437	808	0.81	18.6	8	437	508 0.	0.82 26.3	3 C	637	702
	Intersection	,	17.4	80	,	,	9	43.7	Q		7		44.5	Q		,	- 26.3	3 C		,
12th Street SW &	EB-TR			101	3	n.		9.		a.	101	101				. 0	0.37 9.1	1 A	36	
SW Jefferson Drive	NB-R	0.03	11.0	20		2	0.04	12.0	100		m	0.21	19.1	U		7	0.02 6.3	o o	320	5
Unsignalized	Intersection	,	0.7	A	,		,	0.7	⋖		,		1.2	A			- 8.9	9 A		1
	EB-L	0.12	27.7	0	21	41	0.16	31.2	C	8	44	91.0	31.5	C	30	45 0.	0.11 28.0	0 0	31	43
4	EB-T	0.16	27.8	Ü	34	09	0.20	31.4	٥	45	99	0.20	31.7	Ü	45	65 0.	0.13 28.0	0 0	46	29
7 Street SW &	# #	0.29	18.6	В	23	54	0.38	25.7	O	8	59	0.50	30.3	O	25	90	0.34 26.5	S C	H	96
SW Jefferson Drive	NB-TR	0.18	4.9	Ā	29	92	0.22	5.6	⋖	59	- 99	0.22	5.6	∢	59	65 0.	0.26 13.9	B 6	104	113
Signonzed	SB-LT	0.29	7.9	٩	11	94	0.36	8.5	ď	101	120	98'0	8.5	₫	101	120 0.	0.43 20.6	2	200	230
	Intersection	×	8.8	⋖	,	÷	,	10.0	Ø		1	ī	10.5	8		,	- 19.4	4 B	1	4
	EB-LTR	09.0	35.7	٥	156	200	0.82	43.4	٥	215	270	0.82	43.4	۵	215	270 0.	0.76 51.1	1 0	290	347
	WB-LTR	1.13	86.0	4	425	400	1.52	527.8	the .	299	384	1.59	297.6	1	299	764 1.	1.49 253.2	12	915	517
144L Canada City 0	NB-L	0.34	2.7	٩	2	2	0,46	3.2	⋖	6	0	0.47	12.6	8	36	96	0.49 15.8	8 B	134	54
Independent Amount Car	NB-TR	62'0	32.1	Э	357	420	26.0	86.8	4	Н	623	76.0	86.9	4	201	Н	0.98 57.0	0 E	707	828
Muchanice Avenue 3vv	NB-R	92'0	29.6	Ü	239	386	0.95	50.4	Q	359	809	0.95	50.7	Q	360	609	1.00 73.4	4 E	551	825
Signatured	SB-L	76'0	74.8	E	142	296	1.23	151.1	11.	237	340	1.23	151.0	4	237	339 1	1.17 136.6	9	339	469
	SB-TR	0.74	10.3	B	188	199	0.91	16.1	80	235	327	0.91	16.1	8	235	326 0.	0.90 16.5	5.5	830	564
	Intersection		37.4	٥	·	÷		94.1	1L		-	-	102.9	4			- 88.5	5		
	EB-LTR	0.72	30.5	O	250	305	06'0	35.1	D	Н	375	1.03	79.2	į.		Н	0.99 56.9	9	516	523
	WB·L	1.10	108.8	+	320	522	1.38	212.8	12	+	623	1.00	94.9	ú.	-	\dashv	1.24 155.4	4	603	\dashv
	WB-TR	1.05	26.7	4	312	388	+	231.7	ts.		\dashv	1.28	158.2	F		+		14 F	1117	-
12th Street SW &	NB-UL	0.25	28.6	U	82	106	0.33	30.9	υ	+		\dashv	93.6	4	+	\dashv	+	9	116	193
Independence Avenue SW	NB-TR	0.75	54.7	۵	197	331	0.94	77.1	9	-		+	115.8	· E	-	+	+	.7 E	529	329
Signolized	NB-R	0.43	3.9	∢	00	9	0.54	5.5	⋖	18	25	19:0	13.6	8	149	223 0.	0.66 9.3	Ø	107	166
	SB-LTR	0.13	2.7		0	2	0.16	88 6	∢,	0	2	+	8 8	⋖	0	+	+	7 A	0	2
	SWB-LTR		Movem	ent	otexist			MovementDoes	CDoes No.	Notexist		0.15	82.5		4	18 0	0.11 76.2	2 E	4	18
	Intersection co. To	. 020	T'/6	2	. 000	0.40	. 04.0	230.2		+	404	0.40	7307		. 900	. 000	1330	0 0	100	100
9 MS amond acceptant of	_	65.0	45.7	ه د	170	107	0.00	100	+	25.4	+	+	400	J 0		+	+	Ŧ	+	250
L'Enfant Diagn	_	0.65	47.2	۵ د	164	DSG.	0.00	56.7	0	+	+	+	26.7	0	+	+	+	+	+	272
Signafized	NP.B	0.14	10.8	ο α	12	44	0.16	141	α α	+	+	+	141	a	+	+	+	1	+	8
	Intersection	,	19.5	0				23.7	0		╁	╁	23.0	0	,	╁	╀	-	H	-
	EB-LTR	0.62	22.2	Ü	227	266	0.77	25.6	O	312	361	0.78	25.7	O	313	362 0	0.89 13.2	2	61	72
	WB-LTR	0.52	13.3	80	148	175	0.70	16.6	ω	Н	246	0.75	18.2	0	217	Н	0.80 12.4	4 8		168
9th Street SW &	NB-LT	69.0	46.1	۵	132	232	1.06	111.4	4	198	329	1.13	132.7	1	208	369 0.	0.86 69.6	9	252	428
Independence Avenue Svv	NB-R	0.73	24.1	U	0	24	0.78	24.7	O	0	110	0.78	24.7	Ü	0	110 0.	0.66 16.4	8	0	06
nazanuksa	SB-LTR	00:00	0.0	⊲	0	0	00'0	αO	⋖	0	0	00.0	0.0	⋖	0	0	0.00 0.0	A	0	0
	Intersection	9	20.0	a	50	8	9	592	C	Н	Н	Н	28.9	Ü	Н	Н	Н	4 B	Н	2
	EB-LTR	0.84	27.0	Ü	253	292	1.08	70.6	16	+	\dashv	\dashv	71.4	u.	-	\dashv	\dashv	5	97	792
	WB-LTR	0.65	28.0	O	205	246	0.84	34.3	C	287	339	0.84	34.3	C	287	339 0.	0.82 41.8	9 D	393	445
7th Street SW &	NB·L	0.69	50.7	Е	64	152	Н	292.0	4	Н	Н	Н	318.0	F		Н		8	245	408
Independence Avenue SW	NB-TR	0.27	31.1	ů.	99	88	0.43	33.3	U	+	\dashv	\dashv	33.3	U	+	\dashv	+	-	+	162
Signalized	7-8S	0.62	41.0	۵	120	505	0.85	64.1	+	+	+	+	9.69	ш	-	+	+	4	+	361
	SB-TR	0.48	23.0	u	120	167	0.61	30.0	u	182	229	0.63	30.1	u	187	230 0.	0.61 17.9	60	279	333
	Intersection	c	28.3	ū	C		-	57.0	w		-	-	100	u						

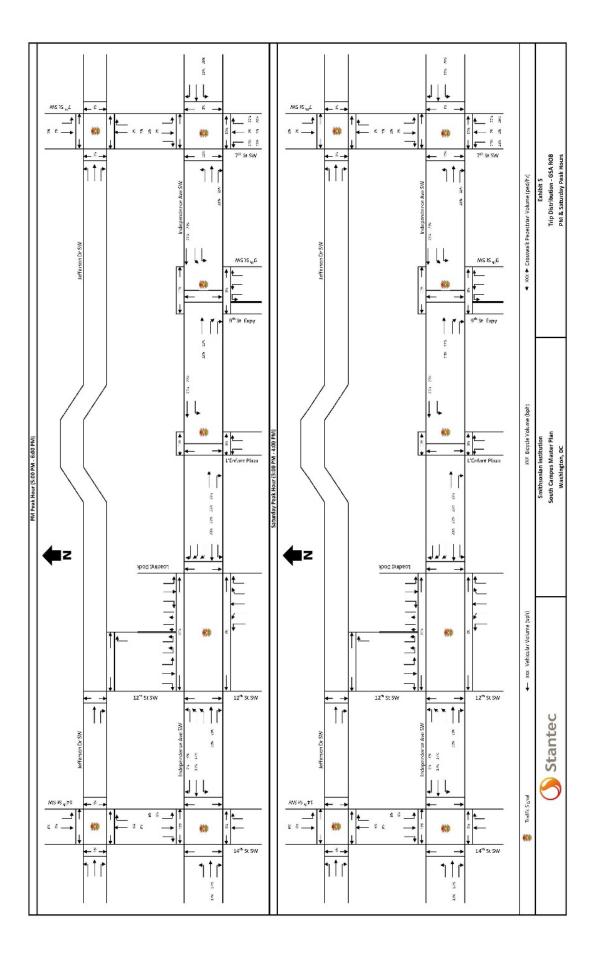
v/c ratio = volume/capacity ratio Source: Synchro 9

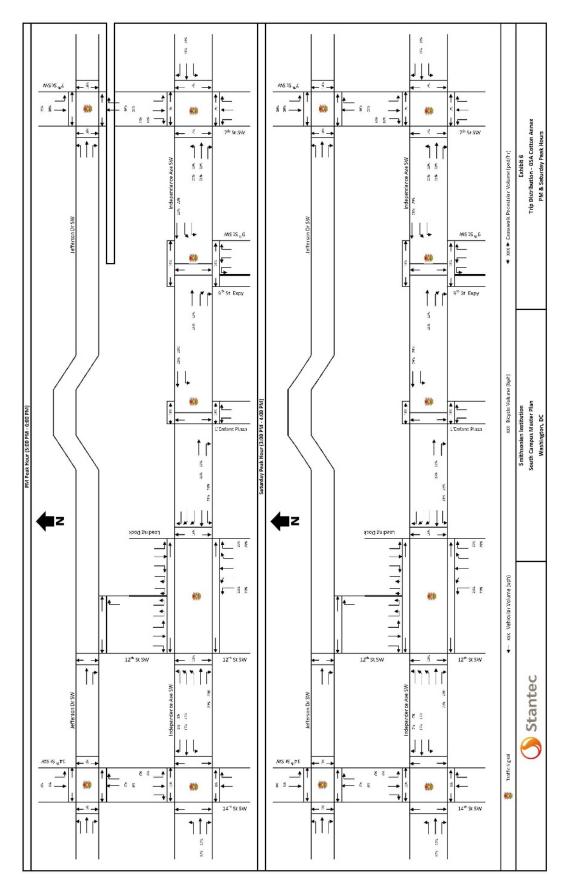
Exhibit 3 Saturday Peak Hour (3:00 PM - 4:00 PM) Capacity Analysis Results

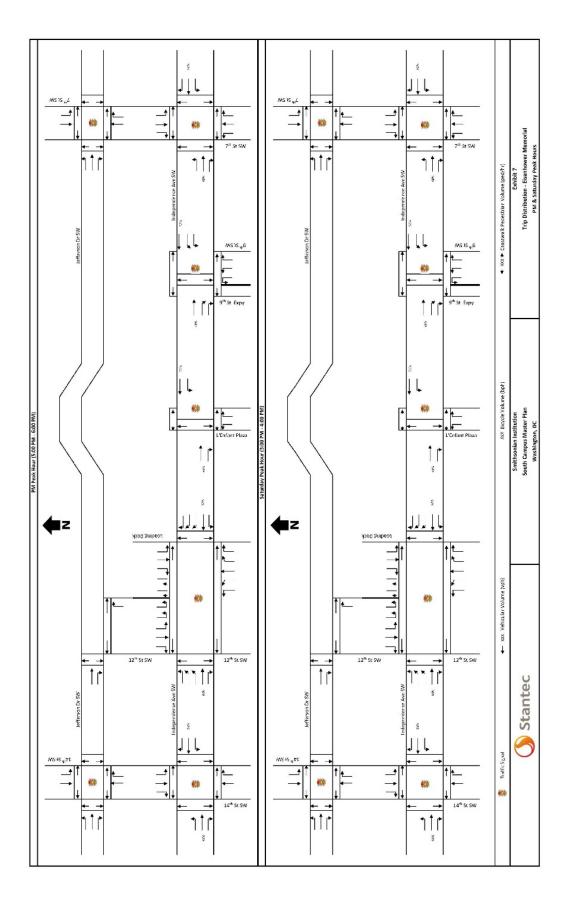
			7707	201/ Existing Condition	dition			2040 No Build Condition	-				20102	2040 Bulla Canaltia	ugu	-	about the	THE REAL PROPERTY.	TOTAL DUTIE WHEN INTERNITY OF THE	1000
				Level	SOth	95th			Level	Soth	95th			Level	Soth	95th	_	Level	⊢	95th
1	LANE	٠/د	i	ъ,	Quene	Queue	۸/د		ъ .	Queue	Quene	٠/٥	_	b .	Queue				0	σ
Intersection	GROUP	Ratio	Delay	Service	(¥)	æ :	Ratio	Delay	Service	£ 8	(£)	Ratio	1	Service	€ 8	(£)	Ratio De	Delay Service	1	€ 8
	1-93 1-93	0.50	4767	, ,	200	00	0.52	S.1.8	, ,	8 8	78	0.50	55.0	, ,	8 8	78	+	+	R S	78
14" Street SW &	NB-TR	0.50	5.4) 4	204	284	250	92.7) 0	R E	387	0.57	100) <	8 66	Ank	0.74	18.0	15.4	215
SW Jefferson Drive	1-85	0.44	20.9	0	23	69	0.81	66.1	C LL	14	147	0.87	803	4	64	159	٠	+	24	62
Signalized	SB-T	0.34	10.0	4	102	127	0.42	10.8	8	135	165	0.42	10.8	8	135	165	+		135	165
	Intersection	5	10.2	60	,		,	13.1	60	4			14.4	00						ľ
12 th Street SW &	EB-TR	a.	13.	9	9	n		,	п		5	9		.,			0.41 10	10.0 A	9	_
SW Jefferson Drive	NB-R	0.14	16.4	O	-	12	0.24	23.0	Ö		8	1.92	624.6	ii.		222	H	7.7 A	8	
Unsignalized	Intersection	,	2.9	A				4.0	∢	,	1		121.6	ш			╀	-	1	Ľ
	1-83	0.28	32.9	O	45	83	98.0	36.2	Q	19	105	0.41	38.1	۵	69	115	0.41 3	34.5 C	98	122
#	EB-T	0.17	30.7	O	36	78	0.20	32.6	υ	64	28	0.20	33.4	υ	64	84	0.20	29.4 C	45	87
7 Street SW &	EB:R	0.21	12.7	В	2	96	0:30	23.7	O	14	25	0.48	33.0	o	41	84	0.48	29.6 C	8	98
SW Jefferson Drive	NB-TR	0.19	2.9	Ā	13	17	0.24	60	∢	16	8	0.24	3.4	∢	16	정	0.24	3.4 A	16	31
Signonzed	SB-LT	0.13	7.6	A	36	37	0.17	7.8	A	ĸ	46	0.17	7.8	A	35	46	71.0	7.8 A	34	8
	Intersection	,	9.3	∢	,		,	10.4	8				12.0	8			- T	11.2 B	*	*
	EB-LTR	0.47	28.3	0	117	153	0.32	30.9	Ç	160	204	0.61	31.1	O	163	Н	0.61 3:	31.1 C	163	207
	WB-LTR	0.32	39.2	Q	100	135	0.42	37.9	D	138	175	0.43	35.7	0	145	167	0.43	35.4 D	142	173
14th Second SW R	NB-L	0.37	19.2	В	48	91	0.48	19.1	9	27	108	0.49	19.2	8	93	76	0.49	19.0 B	8	102
Independence Avenue SW	NB-TR	0.56	22.7	Ü	193	238	0.68	26.1	O	256	309	0.70	26.8	Ü	264	318	0.70	25.5 C	264	31
Signafized	NB-R	0.49	14.5	В	53	126	0.63	20.5	O	88	187	99:0	22.0	Ü	8		-	22.0 C	8	202
	SB-L	98'0	16.3	В	22	37	0.58	28.8	Ų	8	88	0.59	29.8	υ	8	88	+	43.6 D	\$	104
	SB-TR	0.37	8.8	A	71	94	0.46	9.2	⋖	88	101	0.46	3.2	⋖	8	100	0.46 1:	15.6 B	207	258
	Intersection		21.2	O	·		,	23.5	O			÷	23.7	C			- 2	25.2 C	ž	
	EB-LTR	0.54	13.0	В	9	87	0.74	17.1	8	250	313	0.92	31.7	υ	280	362	06.0	30.4 C	280	326
	WB·L	0.46	64.5	3	36	62	0.67	79.4	E	23	131	0.71	89.1	F	38	141	+	76.2 E	88	127
	WB-TR	0.89	18.3	В	55	16	1.14	25.6	u.	104	149	1.79	43.4	4	88	106	1.56 3	39.2 F	8	94
12th Street SW &	NB-UL	0.27	16.9	60	44	87	0.37	18.8	100	93	113	0.53	24.8	υ	77	\dashv	\dashv	25.1 C	77	140
Independence Avenue SW	NB-TR	0.32	15.2	В	7.5	134	0.41	16.1	0	88	167	0.37	17.7	В	88	\dashv	+	18,4 B	25	143
Signalized	NB-R	0.22	9.0	∢ .	w 0	28	0.29	w 4	∢ •	4 (%	0.35	50.00	∢ •	SS C	124	+	5.2 A	\$ 0	11
	SB-LIK	50:0	NAME OF THE PARTY	U.7 A	0	n	0.12	Manage	A A	Nor Eulat	7	9770	8 0	ζ.	0	0 0	4770	800	0	
	Intersection		15.4	33	OLL MOL			20.4	0	- Carrier		0000	808	(0	٠ .	,	+	30.6	3 .	,
	EB-LTR	0.35	7.9	4	33	40	0.45	7.9	A	44	18	0.47	8.0	A	46	15	7 2	8 8	46	12
Independence Avenue SW &	WB-LT	0.33	11.2	В	102	126	0.37	11.5	8	130	171	0.38	12.1	8	131	179		12.2 B	131	17.
L'Enfant Plaza	NB-L	80'0	29.2	0	14	36	60'0	29.4	o	17	24	0.10	29.5	O	17	4	0.10	29.5 C	17	3
Signalized	NB-R	0.10	5.8	٧	2	26	0.13	8.3	A	10	88	0.13	8.8	A	10	41.	0.13 8	8.8 A	12	41
	Intersection	5	9.5	A		4		3.7	A				10.1	8			10	10.0 A	,	7
	EB-LTR	0.41	8.0	∢	132	138	0.53	8.1	⋖	147	156	0.54	8.9	⋖	108			6.8	107	132
Osh Straat CM &	WB-LTR	0.42	10.2	В	09	73	0.58	11.8	0	82	8	0.61	12.6	00	8	88	\dashv	12.6 B	8	86
Independence Avenue SW	NB-LT	0.05	25.6	٥	m	27	0.07	25.8	υ	12	32	80'0	26.0	Ü	12	32	0.08	26.0 C	12	32
Sionofized	NB-R	00'0	0.0	₫	0	0	0.00	0.0	∢	0	0	00'0	0.0	⋖	0	0	0.00	0.0	0	o
and an arrange	SB-LTR	0.00	0.0	A	0	0	00'0	0.0	⋖	0	0	00.0	0.0	٨	0	0	0.00	0.0 A	0	0
	Intersection	9	9.2	A	9	-	9	10.0	A		100		9.7	A		0	6	9.7 A		2.
	EB-LTR	0.37	1.2	4	9	14	0.49	2.0	A	20	20	0.49	1.6	A	O	16	0.49	.S. A	O	15
	WB-LTR	0.38	18.7	В	83	109	0,47	20.5	C	113	143	0.48	50.6	O	113	144	0.48 24	20.6 C	113	144
7th Street SW &	NB-L	0.25	32.1	D	28	63	0.48	39.7	D	8	104	0.49	40.9	0	21	105	200	40.9 D	Z	105
Independence Avenue SW	NB-TR	0.19	28.3	o	43	99	0.27	29.2	U	19	87	0.27	28.2	Ü	19	28	0.27	29.2 C	13	87
Signolized	SB-L	0.30	20.7	0	35	65	0.39	21.8	Ų	45	92	0.39	20.7	U	46	77	0.39	20.7 C	45	77
	SB-TR	0.19	9.3	<	16	29	0.25	11.1	00	Ø	37	0.28	11.1	œ	52	88	0.28 1.	11.2 8	K)	88
	Intersection		12.6	oi.		,		14.5	0		-	-	140	0		-	-		_	

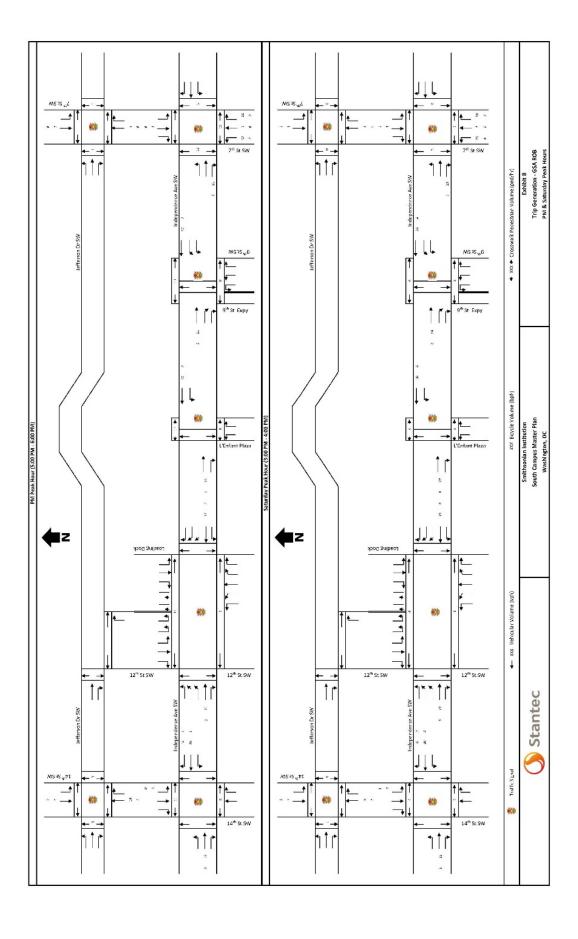
v/cratto = valume/capacity ratio Source: Synchro 9

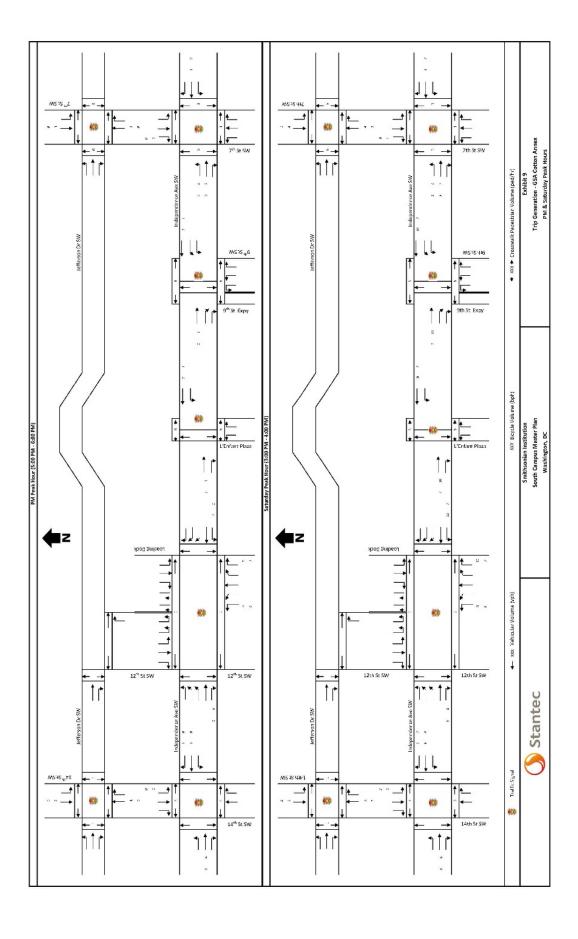


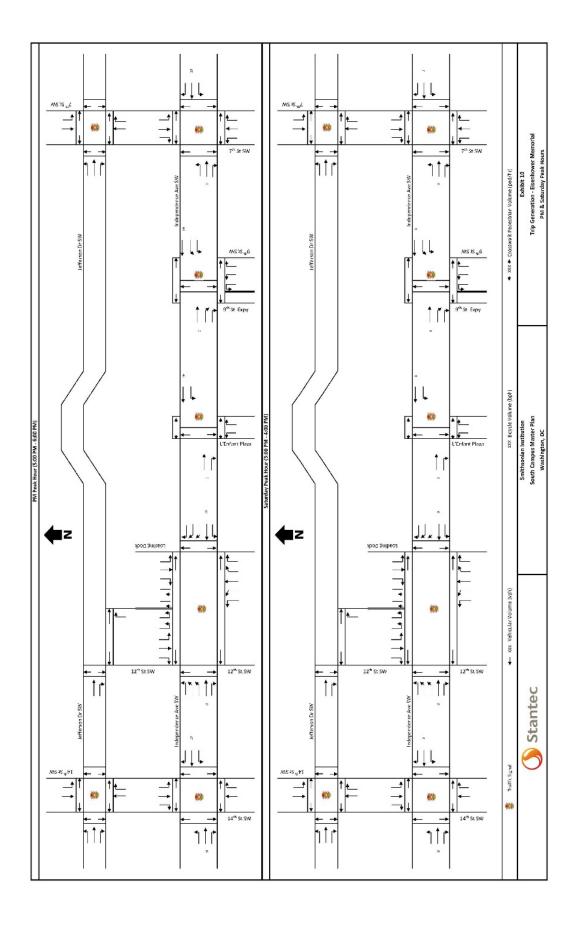


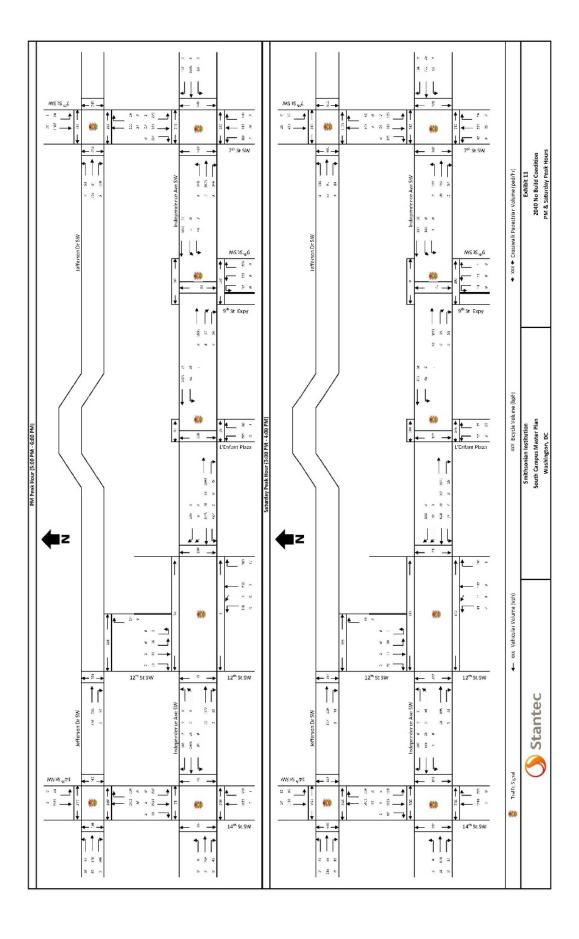


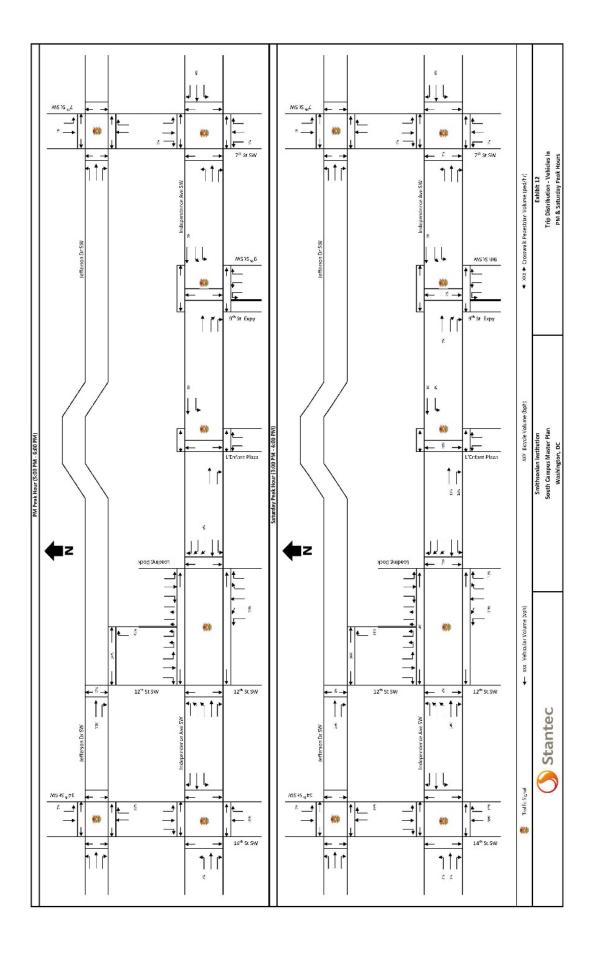


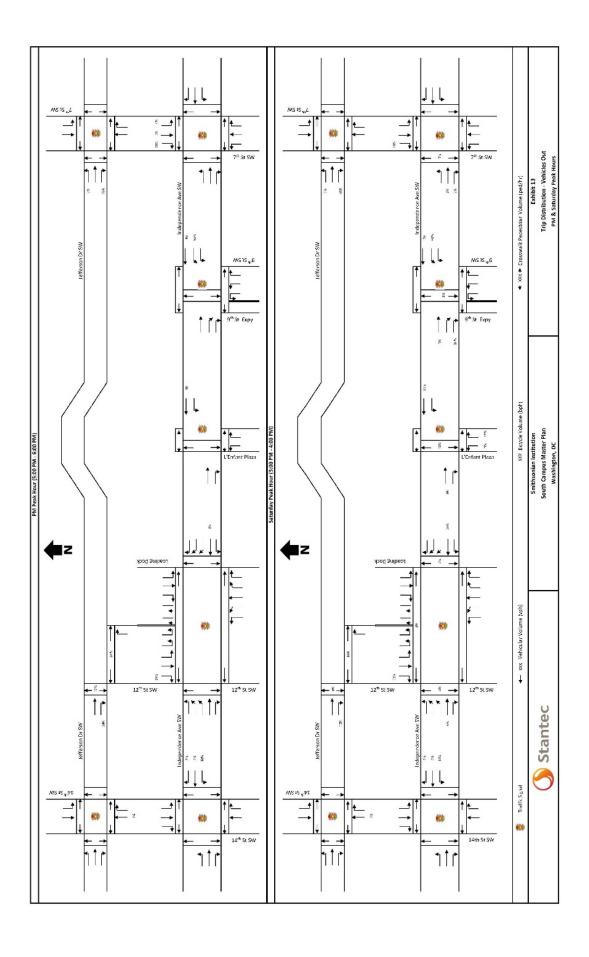


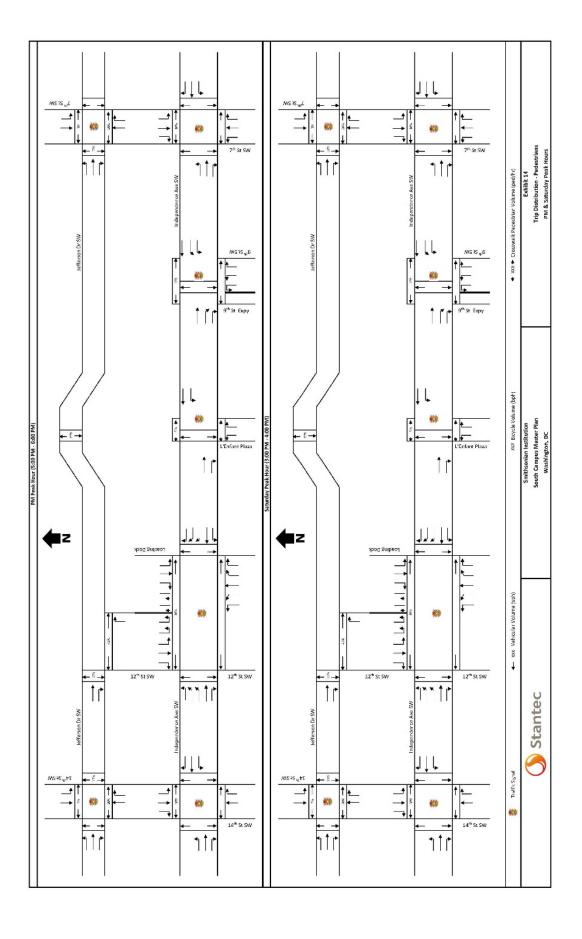


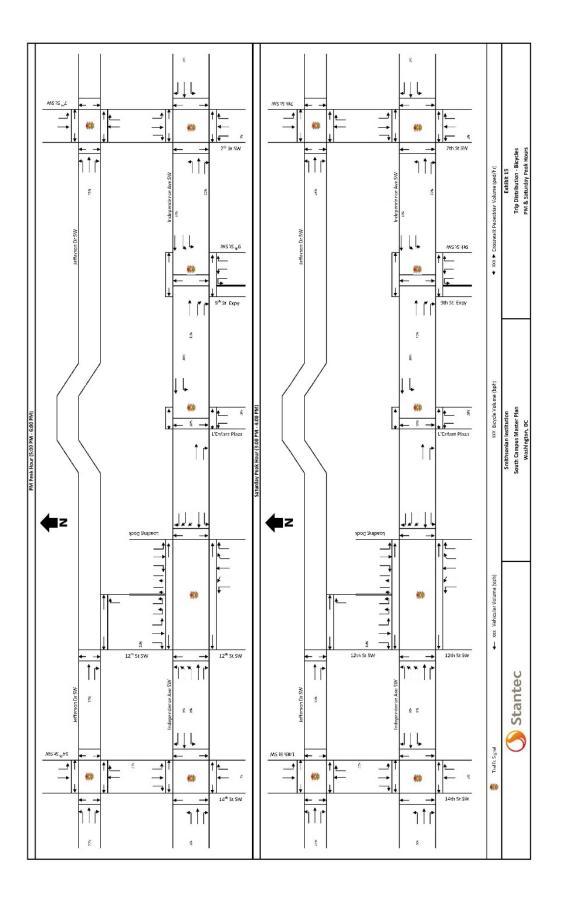


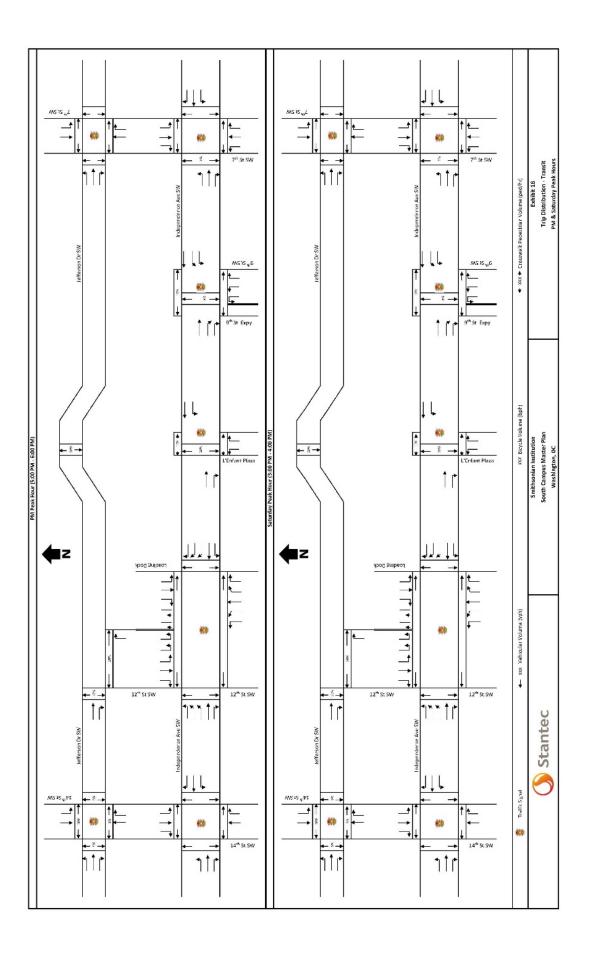


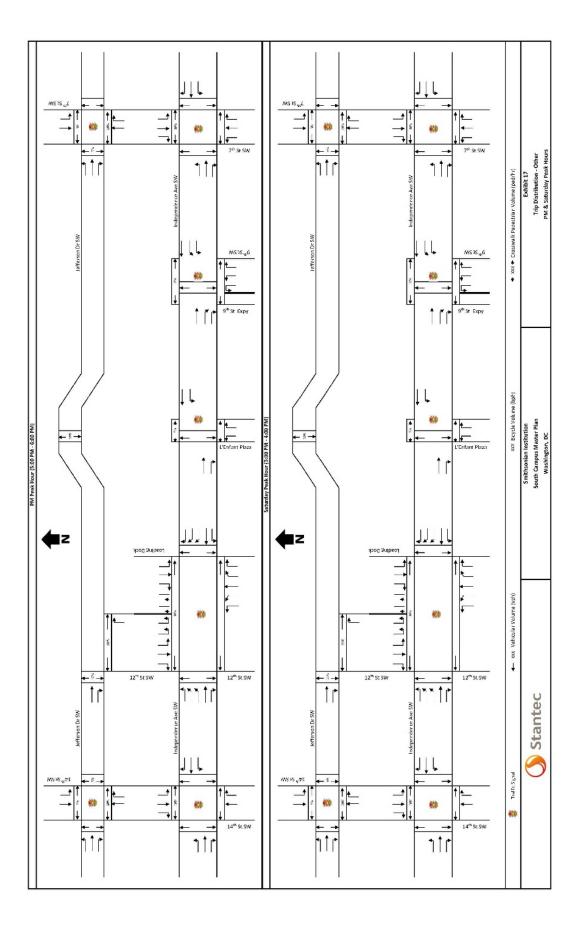


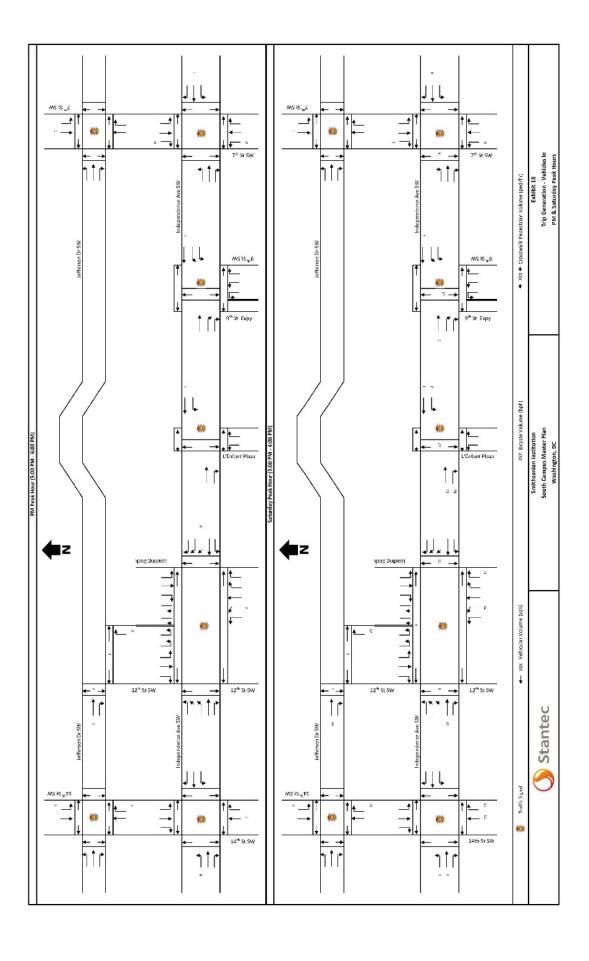


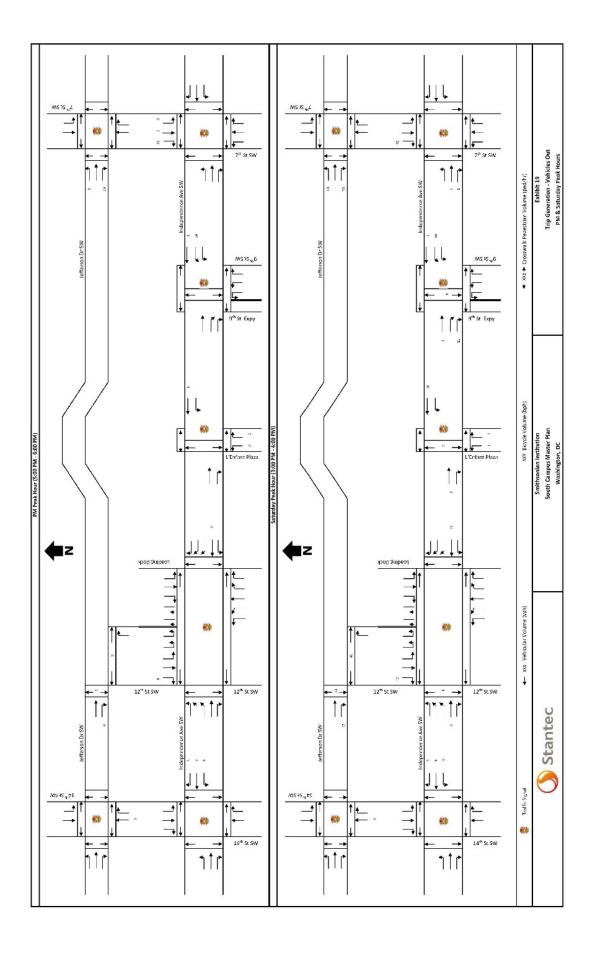


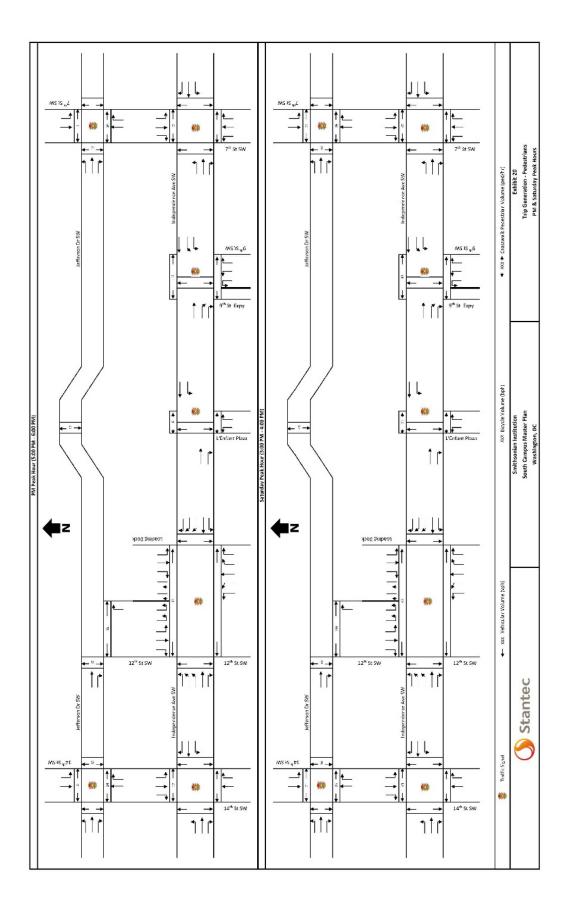


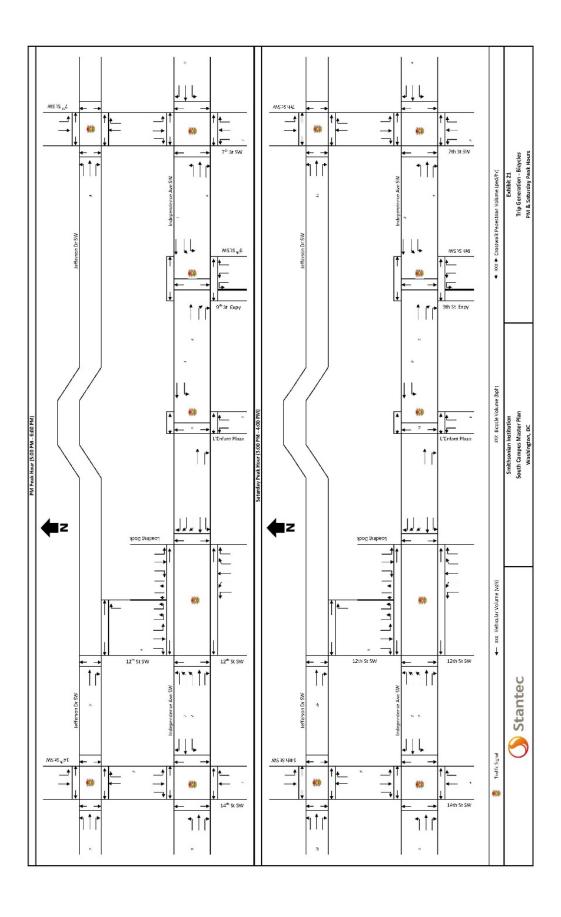


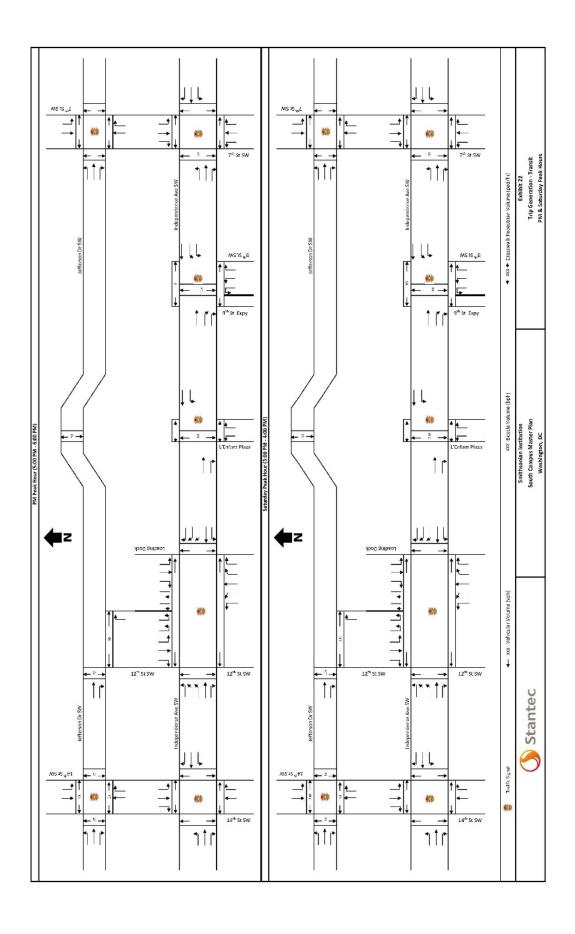


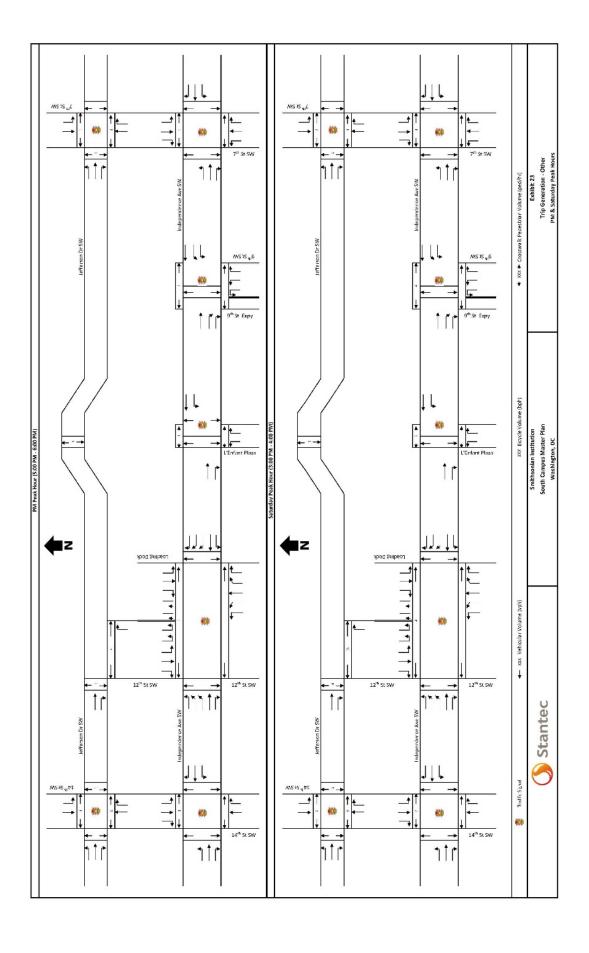


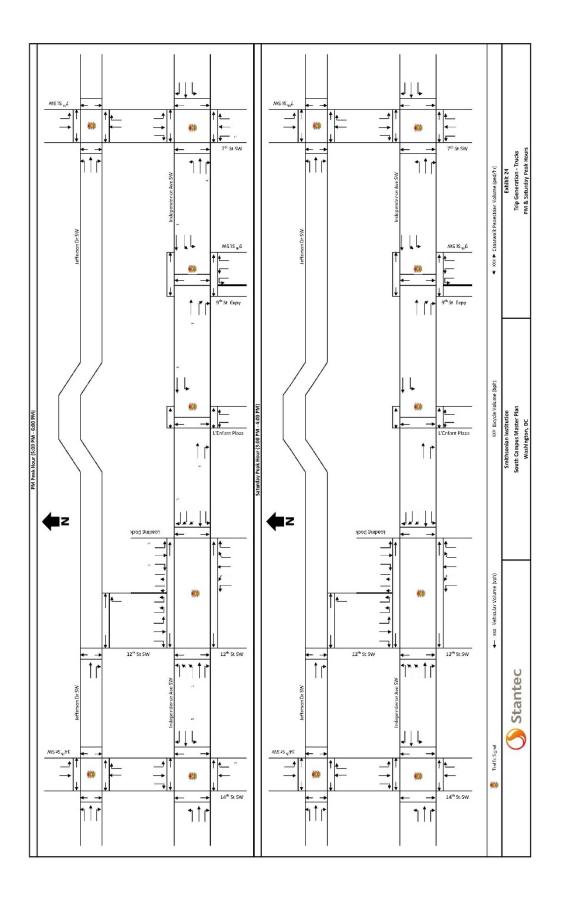


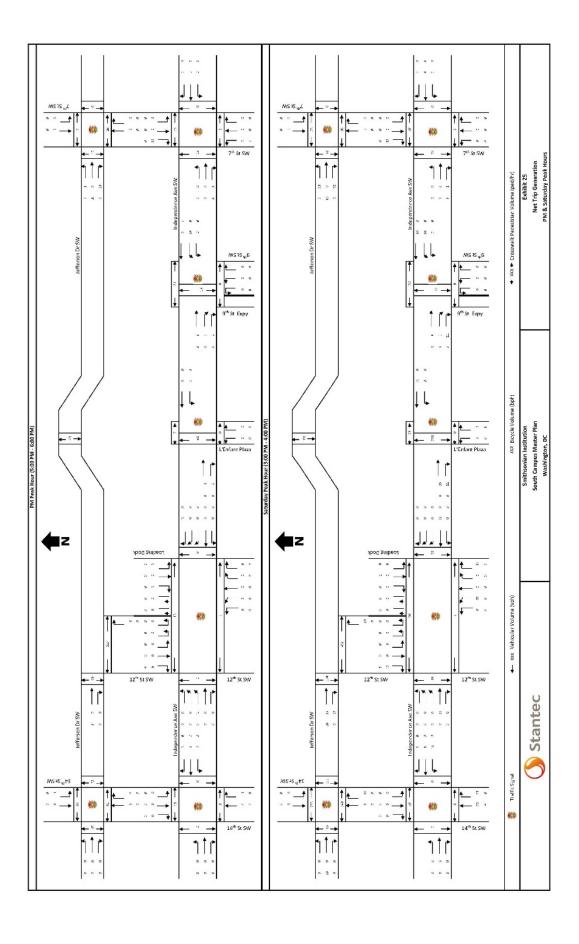


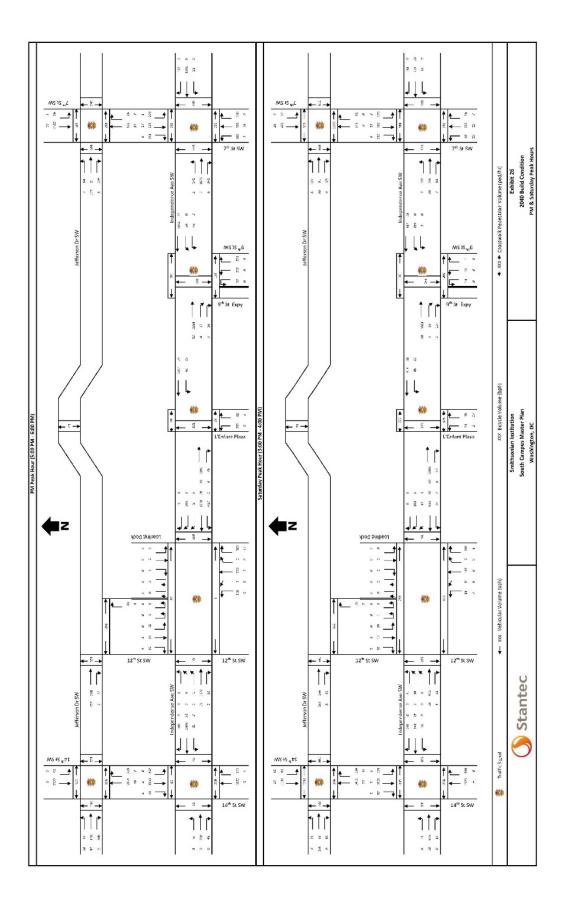












APPENDIX D: SYNCHRO OUTPUTS

Lanes, Volumes, Timings 2: 14th Street SW & Independence Ave SW

	١	→	•	1	•	*	1	†	-	1	ļ	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		414			441	7		^ ^	7	ሻ	^^	
Traffic Volume (vph)	5	601	37	19	1244	140	0	1483	451	236	1915	27
Future Volume (vph)	5	601	37	19	1244	140	0	1483	451	236	1915	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	10	10	10	10	10	10	10	10	10	10
Lane Util. Factor	0.91	0.91	0.91	0.91	0.91	1.00	1.00	0.91	1.00	1.00	0.91	0.91
Ped Bike Factor		0.99			1.00	0.92			0.94		1.00	
Frt		0.991				0.850			0.850		0.998	
Flt Protected					0.999					0.950		
Satd. Flow (prot)	0	4776	0	0	4644	1311	0	4793	1478	1589	4735	0
Flt Permitted		0.851			0.917					0.075		
Satd. Flow (perm)	0	4064	0	0	4259	1209	0	4793	1382	125	4735	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8				154			99		1	
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		370			1104			509			377	
Travel Time (s)		7.2			21.5			11.6			8.6	
Confl. Peds. (#/hr)	46	1.1-2	194	194	7.11	46	27		40	40		27
Confl. Bikes (#hr)			1			23			2			2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	80%	2%	3%	79%	3%	15%	0%	1%	2%	6%	2%	0%
Adj. Flow (vph)	6	668	41	21	1382	156	0	1648	501	262	2128	30
Shared Lane Traffic (%)	3.00	37.7.7		11 E (1)	J. T. C. T. C.	17.55	(6)	JENSTA.	17.76			25/5
Lane Group Flow (vph)	0	715	0	0	1403	156	0	1648	501	262	2158	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0	J		0	J		4	,		10	J
Link Offset(ft)		0			0			5			0	
Crosswalk Width(ft)		20			30			30			26	
Two way Left Turn Lane												
Headway Factor	1.09	1.04	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA	Perm		NA	Perm	pm+pt	NA	- ×
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8			2	6		
Minimum Split (s)	36.5	36.5		36.5	36.5	36.5		31.5	31.5	10.5	31.5	
Total Split (s)	37.0	37.0		37.0	37.0	37.0		53.0	53.0	20.0	73.0	
Total Split (%)	33.6%	33.6%		33.6%	33.6%	33.6%		48.2%	48.2%	18.2%	66.4%	
Maximum Green (s)	30.5	30.5		30.5	30.5	30.5		46.5	46.5	13.5	66.5	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5	2.5		2.5	2.5	2.5	2.5	
Lost Time Adjust (s)		-1.5			-1.5	-1.5		-1.5	-1.5	-1.0	-1.5	
Total Lost Time (s)		5.0			5.0	5.0		5.0	5.0	5.5	5.0	
Lead/Lag		70.00				0.55.5		Lead	Lead	Lag		
Lead-Lag Optimize?								Yes	Yes	Yes		
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		6.0	6.0	100	6.0	
Flash Dont Walk (s)	23.0	23.0		23.0	23.0	23.0		19.0	19.0		19.0	
Pedestrian Calls (#/hr)	0	0		20.0	0	0		0	0		0	
Act Effet Green (s)	J	32.0		J	32.0	32.0		48.0	48.0	67.5	68.0	
Act Elict Oreeli (a)		32.0			02.0	02.0		40.0	40.0	01.0	00.0	

	•	→	•	•	-	•	1	Ť	-	-	↓	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio		0.29			0.29	0.29		0.44	0.44	0.61	0.62	
v/c Ratio		0.60			1.13	0.34		0.79	0.76	0.97	0.74	
Control Delay		35.7			86.0	2.6		30.0	29.6	74.8	10.2	
Queue Delay		0.0			0.0	0.0		2.0	0.0	0.0	0.1	
Total Delay		35.7			86.0	2.7		32.1	29.6	74.8	10.3	
LOS		D			F	Α		С	С	Е	В	
Approach Delay		35.7			77.7			31.5			17.3	
Approach LOS		D			Е			С			В	
Queue Length 50th (ft)		156			~425	2		357	239	142	188	
Queue Length 95th (ft)		200			m#400	m2		420	386	m#296	199	
Internal Link Dist (ft)		290			1024			429			297	
Turn Bay Length (ft)												
Base Capacity (vph)		1187			1238	460		2091	658	269	2927	
Starvation Cap Reductn		0			0	0		0	0	0	135	
Spillback Cap Reductn		0			0	8		289	0	0	0	
Storage Cap Reductn		0			0	0		0	0	0	0	
Reduced v/c Ratio		0.60			1.13	0.35		0.91	0.76	0.97	0.77	
Intersection Summary												
	Other											
Cycle Length: 110												
Actuated Cycle Length: 110												
Offset: 107 (97%), Reference	ed to phase	2:NBT a	and 6:SB	TL, Start	of Green							
Natural Cycle: 90												
Control Type: Pretimed												
Maximum v/c Ratio: 1.13												
Intersection Signal Delay: 37	.4			li.	ntersection	LOS: D						
Intersection Capacity Utilizat	ion 92.0%			10	CU Level o	of Service	F					
Analysis Period (min) 15												
 Volume exceeds capacit 	y, queue is	theoretic	ally infini	te.								
Queue shown is maximur	n after two	cycles.										
# 95th percentile volume e	xceeds cap	pacity, qu	eue may	be longe	er.							
Queue shown is maximur	n after two	cycles.										
m Volume for 95th percent	ile queue is	s metered	l by upstr	eam sigi	nal.							
Splits and Phases: 2: 14th	Street SW	/ & Inden	endence	Ave SW								
Ø2 (R)					ø ₀₁			 Ø4				
53 s					20 s		1	7 s				
								4				
▼ Ø6 (R)						- W		√ Ø8 7 s				

	٠	→	•	1	•	•	1	†	-	-	1	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	4						^		ሻ	^	
Traffic Volume (vph)	48	96	249	0	0	0	0	1543	85	40	1929	0
Future Volume (vph)	48	96	249	0	0	0	0	1543	85	40	1929	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	10	10	10	10	10	12	12	10	10	10
Storage Length (ft)	0		0	0		0	0		20	170		0
Storage Lanes	1		0	0		0	0		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	1.00
Ped Bike Factor	0.67	0.84						0.97				
Frt	101011	0.892						0.992				
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1597	1366	0	0	0	0	0	4818	0	1636	4700	0
Flt Permitted	0.950							10.0		0.105		
Satd. Flow (perm)	1068	1366	0	0	0	0	0	4818	0	181	4700	0
Right Turn on Red	1000	1000	No			Yes	-	1010	Yes	101	11.00	Yes
Satd. Flow (RTOR)			110			,,,,,		15				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		257			1068			377			341	
Travel Time (s)		5.8			24.3			8.6			7.8	
Confl. Peds. (#/hr)	388	0.0	148	148	24.0	388	118	0.0	156	156	7.0	118
Confl. Bikes (#/hr)	000		77	140		000	110		12	100		7
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	13%	9%	2%	0%	0%	0.33	0%	4%	1%	3%	3%	0%
Adj. Flow (vph)	48	97	252	0	0	0	0	1559	86	40	1948	0
Shared Lane Traffic (%)	10		ZOZ					1000	00	10	1010	
Lane Group Flow (vph)	48	349	0	0	0	0	0	1645	0	40	1948	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	Loit	15	ragin	Loit	12	ragin	Loit	0	ragin	Loit	10	ragin
Link Offset(ft)		0			15			ő			5	
Crosswalk Width(ft)		30			35			37			35	
Two way Left Turn Lane		00			00			01			00	
Headway Factor	1.00	1.00	1.09	1.09	1.09	1.09	1.09	1.00	1.00	1.09	1.09	1.09
Turning Speed (mph)	15	1.00	9	15	1.00	9	15	1.00	9	15	1.00	9
Turn Type	Perm	NA	J	10		J	10	NA	J	Perm	NA	J
Protected Phases	1 01111	4						2		1 Gilli	2	
Permitted Phases	4	7								2	_	
Minimum Split (s)	34.5	34.5						20.5		20.5	20.5	
Total Split (s)	37.0	37.0						73.0		73.0	73.0	
Total Split (%)	33.6%	33.6%						66.4%		66.4%	66.4%	
and the manufacture of the form of the control of the Company of t	30.5	30.5						67.5		67.5	67.5	
Maximum Green (s) Yellow Time (s)	4.0	4.0						4.0		4.0	4.0	
All-Red Time (s)	2.5	2.5						1.5		1.5	1.5	
Lost Time Adjust (s)	-1.5	-1.5						-1.5		-1.5	-1.5	
Total Lost Time (s)	5.0	5.0						4.0		4.0	4.0	
Lead/Lag	0.0	5.0						4.0		4.0	4.0	
Commission of the Commission o												
Lead-Lag Optimize?	10.0	10.0						10.0		10.0	10.0	
Walk Time (s)	10.0	10.0						10.0		10.0	10.0	

Lane Group	Ø6	
Lane Configurations	45000 V	
Traffic Volume (vph)		
Future Volume (vph)		
Ideal Flow (vphpl)		
Lane Width (ft)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Ped Bike Factor		
Frt Flt Protected		
Cotd Class (asset)		
Satd. Flow (prot)		
FIt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Confl. Bikes (#hr)		
Peak Hour Factor		
Heavy Vehicles (%)		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Turn Type		
Protected Phases	6	
Permitted Phases		
Minimum Split (s)	22.5	
Total Split (s)	73.0	
Total Split (%)	66%	
Maximum Green (s)	67.5	
Yellow Time (s)	4.0	
All-Red Time (s)	1.5	
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Walk Time (s)	10.0	
- I	- 1.000 A	

4: 14th Street SW & SW Jefferson Drive

	۶	-	7	1	•	•	1	Ť	1	1	Į.	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
Flash Dont Walk (s)	18.0	18.0						5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0						0		0	0	
Act Effct Green (s)	32.0	32.0						69.0		69.0	69.0	
Actuated g/C Ratio	0.29	0.29						0.63		0.63	0.63	
v/c Ratio	0.15	0.88						0.54		0.35	0.66	
Control Delay	30.7	61.5						7.8		20.6	14.4	
Queue Delay	0.0	0.0						3.3		0.0	0.0	
Total Delay	30.7	61.5						11.2		20.6	14.4	
LOS	С	Е						В		С	В	
Approach Delay		57.8						11.2			14.5	
Approach LOS		Е						В			В	
Queue Length 50th (ft)	25	235						378		13	296	
Queue Length 95th (ft)	56	#404						271		44	346	
Internal Link Dist (ft)		177			988			297			261	
Turn Bay Length (ft)										170		
Base Capacity (vph)	310	397						3027		113	2948	
Starvation Cap Reductn	0	0						1255		0	0	
Spillback Cap Reductn	0	0						0		0	0	
Storage Cap Reductn	0	0						0		0	0	
Reduced v/c Ratio	0.15	0.88						0.93		0.35	0.66	
Intersection Summary												
VICTORIA CONTRACTOR	Other											
Cycle Length: 110												
Actuated Cycle Length: 110	l.											
Offset: 13 (12%), Reference	ed to phase	2:NBSB (and 6:Pe	d, Start d	f Green							
Natural Cycle: 70												
Control Type: Pretimed												
Maximum v/c Ratio: 0.88												
Intersection Signal Delay: 13	7.4			Ir	ntersection	LOS: B						
Intersection Capacity Utiliza	ition 70.2%			IC	CU Level (of Service	C					
Analysis Period (min) 15												
# 95th percentile volume e		and the last of th	eue may	be longe	r.							
Queue shown is maximu	ım after two	cycles.										

Splits and Phases: 4: 14th Street SW & SW Jefferson Drive



Lane Group	Ø6
Flash Dont Walk (s)	7.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

	-	•	1	•	1	-	
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	7+					7	
Traffic Volume (vph)	166	55	0	0	0	14	
Future Volume (vph)	166	55	0	0	0	14	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	14	10	10	10	10	13	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor							
Frt	0.966					0.865	
Fit Protected							
Satd. Flow (prot)	1860	0	0	0	0	1698	
Fit Permitted							
Satd. Flow (perm)	1860	0	0	0	0	1698	
Link Speed (mph)	30			30	30		
Link Distance (ft)	1068			661	401		
Travel Time (s)	24.3			15.0	9.1		
Confl. Peds. (#/hr)		2	111		264		
Confl. Bikes (#/hr)		96					
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	
Heavy Vehides (%)	7%	0%	0%	0%	0%	0%	
Adj. Flow (vph)	208	69	0	0	0	18	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	277	0	0	0	0	18	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(ft)	0	11.50		0	0		
Link Offset(ft)	0			0	-2		
Crosswalk Width(ft)	16			16	24		
Two way Left Turn Lane							
Headway Factor	0.92	1.09	1.09	1.09	1.09	0.96	
Turning Speed (mph)		9	15		15	9	
Sign Control	Free			Free	Stop		
Intersection Summary					700		
Area Type: (Other						
Control Type: Unsignalized							
Intersection Capacity Utilizat	ion 22.2%			IC	U Level	of Service A	
Analysis Period (min) 15							

	-	•	1	-	~	•	1	ኘ	†	-	\	>
Lane Group	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR	SEL	SER
Lane Configurations	41114		ሻ	414				Ä	1	7	M	
Traffic Volume (vph)	1262	26	341	1301	2	168	93	1	208	307	15	20
Future Volume (vph)	1262	26	341	1301	2	168	93	1	208	307	15	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	11	11	11	13	10
Lane Util. Factor	0.86	0.86	0.86	0.86	0.91	0.91	1.00	1.00	0.95	0.95	1.00	1.00
Ped Bike Factor	1.00			0.94				0.92	0.92	0.68	0.83	
Frt	0.997			0.983					0.964	0.850	0.912	
Fit Protected			0.950	0.999				0.950			0.983	
Satd. Flow (prot)	5902	0	1393	4066	0	0	0	1678	1493	1426	1250	0
Flt Permitted			0.950	0.875				0.950			0.983	
Satd. Flow (perm)	5902	0	1393	3561	0	0	0	1548	1493	967	1113	0
Right Turn on Red		Yes				Yes				Yes		
Satd. Flow (RTOR)	4			1					14	40	104	
Link Speed (mph)	35			35					30	47	30	
Link Distance (ft)	1104			603					153		401	
Travel Time (s)	21.5			11.7					3.5		9.1	
Confl. Peds. (#/hr)					51	51	59		0.0	285	285	
Confl. Bikes (#/hr)		16			15	15				4	200	7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	4%	4%	0%	4%	4%	0%	4%	4%	40%	40%
Adj. Flow (vph)	1402	29	379	1446	2	187	103	1	231	341	17	22
Shared Lane Traffic (%)		73	10%		- 				7.5	21%	1.55	770
Lane Group Flow (vph)	1431	0	341	1673	0	0	0	104	303	269	49	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Right	Right	Left	Left	Left	Right	Left	Right
Median Width(ft)	0			10	3				56		13	
Link Offset(ft)	0			0					0		40	
Crosswalk Width(ft)	30			25					28		8	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.04	1.04	1.04	0.96	1.09
Turning Speed (mph)		9	15		9	9	15	15		9	15	9
Turn Type	NA	- 5	Prot	NA		- 8	custom	custom	NA	custom	D.Pm	
Protected Phases	6		5	2				5 (10 10 111	4	5		
Permitted Phases							48	48	8	48	48	
Minimum Split (s)	20.0		29.5	72.0					38.0	29.5		
Total Split (s)	42.5		29.5	72.0					38.0	29.5		
Total Split (%)	38.6%		26.8%	65.5%					34.5%	26.8%		
Maximum Green (s)	35.5		23.0	65.5					27.5	23.0		
Yellow Time (s)	4.0		4.0	4.0					4.0	4.0		
All-Red Time (s)	3.0		2.5	2.5					6.5	2.5		
Lost Time Adjust (s)	-1.5		-1.5	-1.5					-1.5	-1.5		
Total Lost Time (s)	5.5		5.0	5.0					9.0	5.0		
Lead/Lag	Lead		Lag	0.0					0.0	Lag		
Lead-Lag Optimize?	Yes		Yes							Yes		
Walk Time (s)	7.0		100	7.0					4.0	100		
Flash Dont Walk (s)	6.0			4.0					21.0			
Pedestrian Calls (#/hr)	0.0			0					0			
	-								U			

SI South Campus Master Plan 10/20/2017 Existing Condition PM Peak Hour Stantec

Synchro 9 Report Page 8



	-	
Lane Group	SER2	Ø8
Lane Configurations		
Traffic Volume (vph)	9	
Future Volume (vph)	9	
Ideal Flow (vphpl)	1900	
Lane Width (ft)	10	
Lane Util. Factor	1.00	
Ped Bike Factor		
Frt		
Fit Protected		
Satd. Flow (prot)	0	
Fit Permitted		
Satd. Flow (perm)	0	
Right Turn on Red	Yes	
Satd. Flow (RTOR)	100	
Link Speed (mph)		
Link Distance (ft)		
A STATE OF THE STA		
Travel Time (s)	59	
Confl. Peds. (#/hr)	59 7	
Confl. Bikes (#hr)		
Peak Hour Factor	0.90	
Heavy Vehicles (%)		
Adj. Flow (vph)	10	
Shared Lane Traffic (%)	0	
Lane Group Flow (vph)	0	
Enter Blocked Intersection	No	
Lane Alignment	Right	
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor	1.09	
Turning Speed (mph)	9	
Turn Type		
Protected Phases		8
Permitted Phases		
Minimum Split (s)		38.0
Total Split (s)		38.0
Total Split (%)		35%
Maximum Green (s)		31.5
Yellow Time (s)		4.0
All-Red Time (s)		2.5
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Walk Time (s)		
Flash Dont Walk (s)		
Pedestrian Calls (#/hr)		
Act Effct Green (s)		
The second secon		

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Lane Group	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR	SEL	SER
Actuated g/C Ratio	0.34		0.22	0.61				0.26	0.26	0.52	0.26	
v/c Ratio	0.72		1.10	1.05				0.25	0.75	0.43	0.13	
Control Delay	30.5		108.8	56.7				22.3	36.8	3.5	2.7	
Queue Delay	0.0		0.0	0.0				6.3	17.8	0.4	0.0	
Total Delay	30.5		108.8	56.7				28.6	54.7	3.9	2.7	
LOS	С		F	Е				С	D	Α	Α	
Approach Delay	30.5			65.5					30.5		2.7	
Approach LOS	С			Е					С		Α	
Queue Length 50th (ft)	250		~320	~312				58	197	8	0	
Queue Length 95th (ft)	m305		#522	#398				106	#331	40	m2	
Internal Link Dist (ft)	1024			523					73		321	
Turn Bay Length (ft)												
Base Capacity (vph)	1987		310	1586				408	403	626	370	
Starvation Cap Reductn	0		0	0				253	91	98	0	
Spillback Cap Reductn	0		0	0				0	0	0	0	
Storage Cap Reductn	0		0	0				0	0	0	0	
Reduced v/c Ratio	0.72		1.10	1.05				0.67	0.97	0.51	0.13	

Intersection Summary

Area Type: Other

Cycle Length: 110 Actuated Cycle Length: 110

Offset: 4 (4%), Referenced to phase 2:WBT and 6:EBTL, Start of Green

Natural Cycle: 110

Control Type: Pretimed

Maximum v/c Ratio: 1.10

Intersection Signal Delay. 47.1 Intersection Capacity Utilization 111.4% Intersection LOS: D ICU Level of Service H

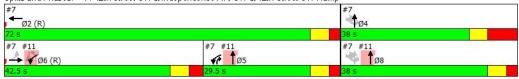
Analysis Period (min) 15

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

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

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

Splits and Phases: 7: 12th Street SW & Independence Ave SW & 12th Street SW Ramp





Lane Group	SER2	Ø8	
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

	→	•	•	•	1	-		
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø3	
Lane Configurations	tttp-		Volume	ना	ሻ	7	1000	
Traffic Volume (vph)	1523	61	51	1580	232	70		
Future Volume (vph)	1523	61	51	1580	232	70		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Storage Length (ft)	15.5.5	0	0	07,0,0	0	210		
Storage Lanes		0	0		1	1		
Taper Length (ft)		18	100		100			
Lane Util. Factor	0.86	0.86	0.86	0.86	1.00	1.00		
Ped Bike Factor	1.00	0.00	0.00	0.00	0.78	0.98		
Frt	0.994					0.850		
Fit Protected	0.000			0.998	0.950			
Satd. Flow (prot)	5872	0	0	5854	1685	1507		
Flt Permitted	0012			0.790	0.950	1001		
Satd. Flow (perm)	5872	0	0	4634	1321	1475		
Right Turn on Red	JUIL	Yes	J	.501	, 52 1	Yes		
Satd. Flow (RTOR)	10	, 00				49		
Link Speed (mph)	35			35	25	10		
Link Distance (ft)	603			540	714			
Travel Time (s)	11.7			10.5	19.5			
Confl. Peds. (#/hr)	11.7	10	10	10.0	157	7		
Confl. Bikes (#/hr)		13	10		101	,		
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91		
Heavy Vehicles (%)	3%	3%	4%	4%	0.91	0.91		
Adj. Flow (vph)	1674	67	56	1736	255	77		
Shared Lane Traffic (%)	10/4	07	50	1730	200	11		
ALTERNATION OF THE PROPERTY OF	1741	0	0	1792	255	77		
Lane Group Flow (vph) Enter Blocked Intersection	No	No	No	No	No	No		
Lane Alignment	Left		Left	Left	Left	Right		
Median Width(ft)	Leit	Right	Leit	Leit	60	rigitt		
Link Offset(ft)	0			0	-10			
	30			10	16			
Crosswalk Width(ft)	30			10	16			
Two way Left Turn Lane	1.09	1.09	1.09	1.09	1.00	1.09		
Headway Factor	1.09	1.09		1.09	1.09	1.09		
Turning Speed (mph)	NIA	9	15	NIA				
Turn Type	NA		pm+pt	NA	Prot	pm+ov	-	
Protected Phases	2		9	6	4	9	3	
Permitted Phases	50.5		6	50.5	200	4		
Minimum Split (s)	58.5		13.5	58.5	30.0	13.5	4.0	
Total Split (s)	60.5		15.5	60.5	30.0	15.5	4.0	
Total Split (%)	55.0%		14.1%	55.0%	27.3%	14.1%	4%	
Maximum Green (s)	54.0		10.5	54.0	24.5	10.5	2.0	
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0	2.0	
All-Red Time (s)	2.5		1.0	2.5	1.5	1.0	0.0	
Lost Time Adjust (s)	-1.5			-1.5	-1.0	-1.0		
Total Lost Time (s)	5.0			5.0	4.5	4.0		
Lead/Lag					Lag		Lead	
Lead-Lag Optimize?	11.412.00				Yes		Yes	
Walk Time (s)	10.0				6.0		0,0	
Flash Dont Walk (s)	4.0				18.0		2.0	

	-	7	1	•	1	1		
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø3	
Pedestrian Calls (#/hr)	0				0		0	
Act Effct Green (s)	55.5			66.0	25.5	37.5		
Actuated g/C Ratio	0.50			0.60	0.23	0.34		
v/c Ratio	0.59			0.62	0.65	0.14		
Control Delay	22.8			12.7	47.3	10.8		
Queue Delay	0.0			0.0	0.0	0.0		
Total Delay	22.8			12.7	47.3	10.8		
LOS	С			В	D	В		
Approach Delay	22.8			12.7	38.8			
Approach LOS	С			В	D			
Queue Length 50th (ft)	338			172	164	12		
Queue Length 95th (ft)	379			197	254	44		
Internal Link Dist (ft)	523			460	634			
Turn Bay Length (ft)						210		
Base Capacity (vph)	2967			2896	390	538		
Starvation Cap Reductn	0			0	0	0		
Spillback Cap Reductn	0			0	0	0		
Storage Cap Reductn	0			0	0	0		
Reduced v/c Ratio	0.59			0.62	0.65	0.14		
Intersection Summary								
Area Type:	Other							
Cycle Length: 110								
Actuated Cycle Length: 11	10							
Offset: 38 (35%), Reference	ced to phase	2:EBT ai	nd 6:WBT	L, Start o	f Green			
Natural Cycle: 110								
Control Type: Pretimed								
Maximum v/c Ratio: 0.65								
Intersection Signal Delay.	19.5			In	tersection	LOS: B		
Intersection Capacity Utiliz	zation 78.9%			IC	ULevelo	of Service I)	
Analysis Period (min) 15								

Splits and Phases: 9: L'Enfant Plaza & Independence Ave SW



	٠	→	•	•	•	•	1	†	-	-	+	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	٦	^	7					**			नाा	
Traffic Volume (vph)	43	66	81	0	0	0	0	483	21	24	946	0
Future Volume (vph)	43	66	81	0	0	0	0	483	21	24	946	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	10	10	10	11	11	11	11	11	11
Storage Length (ft)	200		200	0		0	0		0	0		0
Storage Lanes	1		1	0		0	0		0	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	0.86	0.86	1.00
Ped Bike Factor	0.86		0.68			11.00		0.97			0.99	
Frt			0.850					0.994			-11-12/	
Flt Protected	0.950		0.000					0.00			0.999	
Satd. Flow (prot)	1711	1652	1546	0	0	0	0	4473	0	0	5792	0
Fit Permitted	0.950	TOOL	1010			·		1110			0.909	Ü
Satd. Flow (perm)	1470	1652	1053	0	0	0	0	4473	0	0	5233	0
Right Turn on Red	1470	1002	Yes	U	U	Yes	U	77/0	No	U	0200	Yes
Satd. Flow (RTOR)			33			100			140			103
Link Speed (mph)		30	33		30			35			35	
Link Distance (ft)		454			399			424			394	
		10.3			9.1			8.3			7.7	
Travel Time (s)	111	10.3	213	213	9.1	111	364	0.0	233	233	1.1	364
Confl. Peds. (#/hr)	111		85	213		333	304			233		13
Confl. Bikes (#hr)	0.07	0.07		0.07	0.07	0.07	0.07	0.07	25	0.07	0.07	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	2%	15%	1%	0%	0%	0%	0%	9%	0%	47%	8%	0%
Adj. Flow (vph)	44	68	84	0	0	0	0	498	22	25	975	0
Shared Lane Traffic (%)		00						500			4000	
Lane Group Flow (vph)	44	68	84	0	0	.0	0	520	0	0	1000	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			0			0	
Link Offset(ft)		-15			15			10			-10	
Crosswalk Width(ft)		35			20			35			55	
Two way Left Turn Lane		7000000			2722			70.2020			7100000	
Headway Factor	1.04	1.00	1.04	1.09	1.09	1.09	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	Perm					NA		Perm	NA	
Protected Phases		4						2		41	2	
Permitted Phases	4		4							2		
Minimum Split (s)	32.5	32.5	32.5					20.0		20.0	20.0	
Total Split (s)	32.5	32.5	32.5					77.5		77.5	77.5	
Total Split (%)	29.5%	29.5%	29.5%					70.5%		70.5%	70.5%	
Maximum Green (s)	26.0	26.0	26.0					71.5		71.5	71.5	
Yellow Time (s)	4.0	4.0	4.0					4.0		4.0	4.0	
All-Red Time (s)	2.5	2.5	2.5					2.0		2.0	2.0	
Lost Time Adjust (s)	-1.5	-1.5	-1.5					-1.5			-1.5	
Total Lost Time (s)	5.0	5.0	5.0					4.5			4.5	
Lead/Lag												
Loudred												
Lead-Lag Optimize?												

Lane Group	Ø6	Ø8	
Lane Configurations		100/201	
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Fit Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Confl. Bikes (#hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Enter Blocked Intersection			
Lane Alignment			
Median Width(ft)			
Link Offset(ft)			
Crosswalk Width(ft)			
Two way Left Turn Lane			
Headway Factor			
Turning Speed (mph)			
Turn Type			
Protected Phases	6	8	
Permitted Phases			
Minimum Split (s)	21.0	31.5	
Total Split (s)	77.5	32.5	
Total Split (%)	70%	30%	
Maximum Green (s)	71.5	26.0	
Yellow Time (s)	4.0	4.0	
All-Red Time (s)	2.0	2.5	
Lost Time Adjust (s)	2.0	2.0	
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?	10.0	10.0	
Walk Time (s)	10.0	10.0	

0

0.29

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Flash Dont Walk (s)	16.0	16.0	16.0					4.0		4.0	4.0	
Pedestrian Calls (#/hr)	0	0	0					0		0	0	
Act Effct Green (s)	27.5	27.5	27.5					73.0			73.0	
Actuated g/C Ratio	0.25	0.25	0.25					0.66			0.66	
v/c Ratio	0.12	0.16	0.29					0.18			0.29	
Control Delay	27.7	27.8	18.6					4.9			7.9	
Queue Delay	0.0	0.0	0.0					0.0			0.0	
Total Delay	27.7	27.8	18.6					4.9			7.9	
LOS	С	С	В					А			Α	
Approach Delay		23.8						4.9			7.9	
Approach LOS		С						А			Α	
Queue Length 50th (ft)	21	34	23					67			77	
Queue Length 95th (ft)	m41	m60	m54					m76			94	
Internal Link Dist (ft)		374			319			344			314	
Turn Bay Length (ft)	200		200									
Base Capacity (vph)	367	413	288					2968			3472	
Starvation Cap Reductn	0	0	0					0			0	
Snillhack Can Reductn	Ω	Π	Ω					Ω			Ω	

0

0.29

0

0.16

Reduced v/c Ratio Intersection Summary

Storage Cap Reductn

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:NBSB and 6:Ped, Start of Green

0

0.12

Natural Cycle: 55 Control Type: Pretimed Maximum v/c Ratio: 0.29

Intersection Signal Delay, 8.8 Intersection Capacity Utilization 59.1% Intersection LOS: A ICU Level of Service B

0

0.18

Analysis Period (min) 15

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

Splits and Phases: 10: 7th Street SW & SW Jefferson Drive



Lane Group	Ø6	Ø8
Flash Dont Walk (s)	5.0	15.0
Pedestrian Calls (#/hr)	0	0
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

	1	_	*	4	†	-	-	Į.	لر	*	1	
Lane Group	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER	Ø
Lane Configurations	٦		7		444				77			
Traffic Volume (vph)	0	0	0	0	609	0	0	0	387	0	0	
Future Volume (vph)	0	0	0	0	609	0	0	0	387	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	10	12	10	10	10	10	10	10	10	10	
Storage Length (ft)		0	100	0		0	0		0	0	0	
Storage Lanes		1	1	0		0	0		2	0	0	
Taper Length (ft)		100		100			100			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91	1.00	1.00	0.88	1.00	1.00	
Frt	1.00	1.00	1.00	1.00	0.01	0.01	1.00	1.00	0.850	1.00	1.00	
Fit Protected									0.000			
Satd. Flow (prot)	1863	0	1863	0	4746	0	0	0	2601	0	0	
Flt Permitted	1000	U	1000	U	4740	Ü	U	U	2001	U	U	
Satd. Flow (perm)	1863	0	1863	0	4746	0	0	0	2601	0	0	
Right Turn on Red	1003	U	Yes	U	4/40	Yes	U	U	Yes	U	U	
Satd. Flow (RTOR)			100			100			1920			
400 miles - 100 m - 10		30			30			30	1920	30		
Link Speed (mph)		212			269			153		170		
Link Distance (ft)		4.8			6.1					3.9		
Travel Time (s)	0.00		0.00	0.00		0.00	0.00	3.5	0.00		0.00	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	0	0	0	662	0	0	0	421	0	0	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	662	0	0	0	421	0	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right	
Median Width(ft)		12			0			25		0		
Link Offset(ft)		0			5			3		0		
Crosswalk Width(ft)		16			30			16		16		
Two way Left Turn Lane												
Headway Factor	1.00	1.09	1.00	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	
Turning Speed (mph)	15	15	9	15		9	15		9	15	9	
Turn Type	Prot		Perm		NA				Perm			
Protected Phases	6				58							2
Permitted Phases			6						6			
Minimum Split (s)	20.0		20.0						20.0			72.0
Total Split (s)	42.5		42.5						42.5			72.0
Total Split (%)	38.6%		38.6%						38.6%			65%
Maximum Green (s)	35.5		35.5						35.5			65.5
Yellow Time (s)	4.0		4.0						4.0			4.0
All-Red Time (s)	3.0		3.0						3.0			2.5
Lost Time Adjust (s)	-1.5		-1.5						0.0			
Total Lost Time (s)	5.5		5.5						7.0			
Lead/Lag	Lead		Lead						Lead			
Lead-Lag Optimize?	Yes		Yes						Yes			
Walk Time (s)	7.0		7.0						7.0			7.0
Flash Dont Walk (s)	6.0		6.0						6.0			4.0
Pedestrian Calls (#/hr)	0.0		0.0						0.0			4.0
The American Committee Com	U		U		62.5				35.5			U
Act Effet Green (s)												
Actuated g/C Ratio					0.57				0.32			

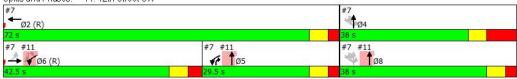
Lane Group	Ø4	Ø5	Ø8
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Fit Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Enter Blocked Intersection			
Lane Alignment			
Median Width(ft)			
Link Offset(ft)			
Crosswalk Width(ft)			
Two way Left Turn Lane			
Headway Factor			
Turning Speed (mph)			
Turn Type			
Protected Phases	4	5	8
Permitted Phases		98.7	11/55
Minimum Split (s)	38.0	29.5	38.0
Total Split (s)	38.0	29.5	38.0
Total Split (%)	35%	27%	35%
Maximum Green (s)	27.5	23.0	31.5
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	6.5	2.5	2.5
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag		Lag	
Lead-Lag Optimize?		Yes	
Walk Time (s)	4.0		
Flash Dont Walk (s)	21.0		
Pedestrian Calls (#/hr)	0		
	U		
Act Effet Green (s)			
Actuated g/C Ratio			

	1	/	•	*	1	1	-	Ţ	لر	*	/	
Lane Group	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER	Ø2
v/c Ratio					0.25				0.20			
Control Delay					12.2				0.4			
Queue Delay					0.0				3.3			
Total Delay					12.2				3.7			
LOS					В				Α			
Approach Delay					12.2			3.7				
Approach LOS					В			А				
Queue Length 50th (ft)					80				0			
Queue Length 95th (ft)					103				m0			
Internal Link Dist (ft)		132			189			73		90		
Turn Bay Length (ft)												
Base Capacity (vph)					2696				2139			
Starvation Cap Reductn					0				1596			
Spillback Cap Reductn					390				0			
Storage Cap Reductn					0				0			
Reduced v/c Ratio					0.29				0.78			
Intersection Summary												
Area Type:	Other											
Cycle Length: 110												
Actuated Cycle Length: 11												
Offset: 4 (4%), Referenced	I to phase 2:	WBTand	16:EBTL,	Start of 0	Green							
Natural Cycle: 110												
Control Type: Pretimed												
Maximum v/c Ratio: 1.10												
Intersection Signal Delay, 8	3.9			Ir	ntersection	LOS: A						
1 1 P A 2 1 1 P P	11 40 400			17	OLLI I	FO :	0					

Analysis Period (min) 15 m. Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 11: 12th Street SW

Intersection Capacity Utilization 19.4%



ICU Level of Service A

Lane Group	Ø4	Ø5	Ø8
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			
Intersection Summary			

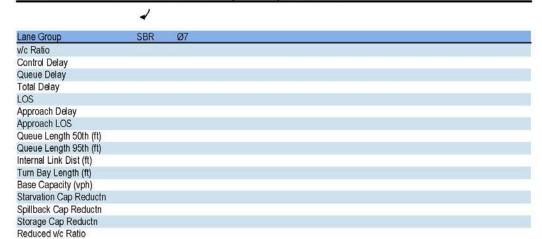
	٠	→	*	1	←	*	₹I	1	†	-	-	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations	300000000000000000000000000000000000000	411h		4040000	नााः				4	7		4
Traffic Volume (vph)	0	1550	43	38	1438	0	26	193	0	186	0	0
Future Volume (vph)	0	1550	43	38	1438	0	26	193	0	186	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.86	0.86	0.86	0.86	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00							
Frt		0.996								0.850		
Flt Protected					0.999				0.950			
Satd. Flow (prot)	0	5930	0	0	5921	0	0	0	1627	1492	0	1773
FIt Permitted					0.830				0.757			
Satd. Flow (perm)	0	5930	0	0	4918	0	0	0	1297	1492	0	1773
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)		7								194		
Link Speed (mph)		35			35				30			15
Link Distance (ft)		540			606				566			305
Travel Time (s)		10.5			11.8				12.9			13.9
Confl. Peds. (#/hr)	133		101	101		133						
Confl. Bikes (#/hr)			6	A15,911		15						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	2%	2%	0%	3%	0%	0%	4%	0%	1%	0%	0%
Adj. Flow (vph)	0	1615	45	40	1498	0	27	201	0	194	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1660	0	0	1538	0	0	0	228	194	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	R NA	Left	Left	Right	Left	Left
Median Width(ft)		0			0				90			0
Link Offset(ft)		0			0				5			-70
Crosswalk Width(ft)		45			20				20			20
Two way Left Turn Lane												77.20
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (mph)	15		9	15		9	9	15		9	15	
Turn Type		NA		pm+pt	NA			Perm	NA	Over		
Protected Phases		2		1	6				8	1		8
Permitted Phases	2			6	180			8		*:	8	
Minimum Split (s)	30.5	30.5		10.5	25.5			30.5	30.5	10.5	30.5	30.5
Total Split (s)	53.0	53.0		11.0	64.0			31.0	31.0	11.0	31.0	31.0
Total Split (%)	53.0%	53.0%		11.0%	64.0%			31.0%	31.0%	11.0%	31.0%	31.0%
Maximum Green (s)	43.5	43.5		5.5	58.5			25.5	25.5	5.5	25.5	25.5
Yellow Time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	5.5	5.5		1.5	1.5			1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	-1.5		1.0	0.0			1.0	0.0	0.0	1.0	0.0
Total Lost Time (s)		8.0			5.5				5.5	5.5		5.5
Lead/Lag	Lead	Lead		Lag	0.0			Lag	Lag	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes				Yes	Yes	Yes	Yes	Yes
Walk Time (s)	10.0	10.0		100	10.0			5.0	5.0	100	5.0	5.0
Flash Dont Walk (s)	10.0	10.0			10.0			20.0	20.0		20.0	20.0
Pedestrian Calls (#/hr)	0	0			0			0	20.0		20.0	0
Act Effet Green (s)	, 0	45.0			58.5				25.5	5.5		U
Actuated g/C Ratio		0.45			0.58				0.26	0.06		
Actualed gro Natio		0.43			0.00				0.20	0.00		



	*	
Lane Group	SBR	Ø7
Land Configurations		10000
Traffic Volume (vph)	0	
Future Volume (vph)	0	
Ideal Flow (vphpl)	1900	
Lane Util, Factor	1.00	
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)	0	
Flt Permitted	•	
Satd. Flow (perm)	0	
Right Turn on Red	Yes	
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor	0.96	
Heavy Vehicles (%)	0%	
Adj. Flow (vph)	0	
Shared Lane Traffic (%)		
Lane Group Flow (vph)	0	
Enter Blocked Intersection	No	
Lane Alignment	Right	
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor	1.09	
Turning Speed (mph)	9	
Turn Type	290	
Protected Phases		7
Permitted Phases		
Minimum Split (s)		5.0
Total Split (s)		5.0
Total Split (%)		5%
Maximum Green (s)		3.0
Yellow Time (s)		2.0
All-Red Time (s)		0.0
Lost Time Adjust (s)		0.0
Total Lost Time (s)		
Lead/Lag		Lead
Lead-Lag Optimize?		Yes
Walk Time (s)		100
Flash Dont Walk (s)		
Pedestrian Calls (#/hr)		
Act Effet Green (s)		
Actuated g/C Ratio		
Actuated gro Natio		

	1	-	7	1	•	•	₽ſ	1	1	-	-	Į.
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
v/c Ratio		0.62			0.52				0.69	0.73		
Control Delay		22.2			13.3				46.1	24.1		
Queue Delay		0.0			0.0				0.0	0.0		
Total Delay		22.2			13.3				46.1	24.1		
LOS		С			В				D	С		
Approach Delay		22.2			13.3				36.0			
Approach LOS		С			В				D			
Queue Length 50th (ft)		227			148				132	0		
Queue Length 95th (ft)		266			175				#232	#94		
Internal Link Dist (ft)		460			526				486			225
Turn Bay Length (ft)												
Base Capacity (vph)		2672			2932				330	265		
Starvation Cap Reductn		0			0				0	0		
Spillback Cap Reductn		0			0				0	0		
Storage Cap Reductn		0			0				0	0		
Reduced v/c Ratio		0.62			0.52				0.69	0.73		
Intersection Summary												
STATE OF THE STATE	Other											
Cycle Length: 100												
Actuated Cycle Length: 100												
Offset: 3 (3%), Referenced t	o phase 2:	EBTL and	16:WBTL	., Start of	Green							
Natural Cycle: 80												
Control Type: Pretimed												
Maximum v/c Ratio: 0.73												
Intersection Signal Delay, 20).0			In	tersection	LOS: C						
Intersection Capacity Utilizat	ion 69.2%			IC	U Level	of Service	C					
Analysis Period (min) 15												
# 95th percentile volume e	xceeds ca	pacity, qu	eue may	be longe	r.,							
Queue shown is maximu	m after two	cycles.										
Splits and Phases: 14:9th	Street SV	V/S mithso	nian Driv	/eway & li	ndepende	ence Ave	SW					
→ø2 (R)						Fø1						
53 s						5 I I I						





Intersection Summary

	١	→	•	1	←	•	1	†	-	1	1	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		नाक			नाा		4	11		ሻ	444	
Traffic Volume (vph)	113	1359	264	19	1115	124	100	267	61	220	546	261
Future Volume (vph)	113	1359	264	19	1115	124	100	267	61	220	546	261
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	11	11	11	11	11	11
Storage Length (ft)	0		0	0		0	80		0	0		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	0.86	0.86	0.86	0.86	0.86	0.86	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor		0.96			0.97		0.90	0.93		0.80	0.89	
Frt		0.977			0.985			0.972			0.952	
Flt Protected		0.997			0.999		0.950			0.950	05000000	
Satd. Flow (prot)	0	5614	0	0	5646	0	1662	4267	0	1616	3965	0
Flt Permitted		0.717			0.866		0.330			0.477		
Satd. Flow (perm)	0	4030	0	0	4893	0	517	4267	0	652	3965	0
Right Turn on Red		1000	Yes		1000	Yes			No			Yes
Satd. Flow (RTOR)		17			28	.,					130	
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		606			437			393			424	
Travel Time (s)		11.8			8.5			7.7			8.3	
Confl. Peds. (#/hr)	178	, , , ,	168	168	717	178	337	0.00	358	358	5.5	337
Confl. Bikes (#/hr)			6	,		7			15	-		14
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	4%	2%	2%	11%	2%	15%	5%	6%	10%	8%	9%	4%
Adj. Flow (vph)	115	1387	269	19	1138	127	102	272	62	224	557	266
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1771	0	0	1284	0	102	334	0	224	823	0
Enter Blocked Intersection	No	No	No									
Lane Alignment	Left	Left	Right									
Median Width(ft)		0			0	,		11			11	
Link Offset(ft)		5			0			-6			5	
Crosswalk Width(ft)		32			30			22			35	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases	5	2		7	6			4		3	8	
Permitted Phases	2			6			4			8		
Minimum Split (s)	10.5	31.5		28.5	28.5		29.5	29.5		10.0	32.5	
Total Split (s)	11.0	60.0		49.0	49.0		36.5	36.5		13.5	50.0	
Total Split (%)	10.0%	54.5%		44.5%	44.5%		33.2%	33.2%		12.3%	45.5%	
Maximum Green (s)	5.5	53.5		42.5	42.5		30.0	30.0		8.5	43.5	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.5	2.5		2.5	2.5		2.5	2.5		1.0	2.5	
Lost Time Adjust (s)	1.0	-1.5		2.0	-1.5		-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)		5.0			5.0		5.0	5.0		3.5	5.0	
Lead/Lag	Lead	0.0		Lag	Lag		Lag	Lag		Lead	0.0	
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes		Yes		
	100											

22: 7th Street SW & Independence Ave SW

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
Flash Dont Walk (s)		18.0		18.0	18.0		19.0	19.0			19.0	
Pedestrian Calls (#/hr)		0		0	0		0	0			0	
Act Effct Green (s)		55.0			44.0		31.5	31.5		46.5	45.0	
Actuated g/C Ratio		0.50			0.40		0.29	0.29		0.42	0.41	
v/c Ratio		0.84			0.65		0.69	0.27		0.62	0.48	
Control Delay		27.0			28.0		60.7	31.1		41.0	23.0	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		27.0			28.0		60.7	31.1		41.0	23.0	
LOS		С			С		Е	С		D	С	
Approach Delay		27.0			28.0			38.1			26.9	
Approach LOS		С			С			D			С	
Queue Length 50th (ft)		253			205		64	66		120	120	
Queue Length 95th (ft)		292			246		#152	93		202	167	
Internal Link Dist (ft)		526			357			313			344	
Turn Bay Length (ft)							80					
Base Capacity (vph)		2109			1974		148	1221		363	1698	
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		0.84			0.65		0.69	0.27		0.62	0.48	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 32 (29%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 80

Control Type: Pretimed Maximum v/c Ratio: 0.84

Intersection Signal Delay, 28.3

Intersection LOS: C Intersection Capacity Utilization 93.4% ICU Level of Service F

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 22: 7th Street SW & Independence Ave SW



	٠	→	•	•	•	•	1	†	-	-	1	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		414			441	7		^	7	ሻ	**	
Traffic Volume (vph)	7	516	71	2	412	154	0	1057	223	97	821	71
Future Volume (vph)	7	516	71	2	412	154	0	1057	223	97	821	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	10	10	10	10	10	10	10	10	10	10
Storage Length (ft)	0		0	0		100	0		0	0		0
Storage Lanes	0		0	0		1	0		1	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	0.91	0.91	0.91	0.91	0.91	1.00	1.00	0.91	1.00	1.00	0.91	0.91
Ped Bike Factor	2222	0.95			1.00	0.70			0.67	0.95	0.97	- Section Co.
Frt		0.982				0.850			0.850		0.988	
Flt Protected		0.999				0.000			0.000	0.950	0.000	
Satd. Flow (prot)	0	4592	0	0	4602	1478	0	4746	1463	1589	4480	0
Flt Permitted	v	0.933	U	U	0.937	1310	U	11-10	1-100	0.178	1100	U
Satd. Flow (perm)	0	4281	0	0	4309	1036	0	4746	982	283	4480	0
Right Turn on Red	U	7201	Yes	U	1000	Yes	U	4740	Yes	200	1100	Yes
Satd. Flow (RTOR)		5	100			166			113		12	100
Link Speed (mph)		35			35	100		30	110		30	
Link Distance (ft)		370			1104			509			377	
Travel Time (s)		7.2			21.5			11.6			8.6	
Confl. Peds. (#/hr)	291	1.2	596	596	21.0	291	676	11.0	347	347	0.0	676
and the contract of the contra	291		4	590		4	0/0		34/	347		5
Confl. Bikes (#hr) Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
	29%	2%	3%	50%	5%	2%	0.93	2%	3%	6%	3%	7%
Heavy Vehicles (%) Adj. Flow (vph)	29%	555	76	2	443	166	0%	1137	240	104	883	76
AND AND AND ASSESSED AND ADDRESS OF A PROPERTY OF A PARTY OF A PAR	0	300	70		443	100	0	1137	240	104	003	70
Shared Lane Traffic (%)	0	639	0	0	445	166	0	1137	240	104	959	0
Lane Group Flow (vph) Enter Blocked Intersection	No	No	No	No	No	No	No	No	No No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			4			10	
Link Offset(ft)		0			0			5			0	
Crosswalk Width(ft)		20			30			30			26	
Two way Left Turn Lane	4.00	4.04	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Headway Factor	1.09	1.04	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (mph)	15	NIA	9	15		9	15	N10	9	15	N.I.A.	9
Turn Type	Perm	NA		Perm	NA	Perm		NA	Perm	pm+pt	NA	
Protected Phases		4			8			2	_	1	6	
Permitted Phases	4			8		8			2	6		
Minimum Split (s)	36.5	36.5		36.5	36.5	36.5		31.5	31.5	10.5	31.5	
Total Split (s)	37.0	37.0		37.0	37.0	37.0		48.0	48.0	15.0	63.0	
Total Split (%)	37.0%	37.0%		37.0%	37.0%	37.0%		48.0%	48.0%	15.0%	63.0%	
Maximum Green (s)	30.5	30.5		30.5	30.5	30.5		41.5	41.5	8.5	56.5	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5	2.5		2.5	2.5	2.5	2.5	
Lost Time Adjust (s)		-1.5			-1.5	-1.5		-1.5	-1.5	-1.0	-1.5	
Total Lost Time (s)		5.0			5.0	5.0		5.0	5.0	5.5	5.0	
Lead/Lag								Lead	Lead	Lag		
Lead-Lag Optimize?								Yes	Yes	Yes		
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		6.0	6.0		6.0	

2: 14th Street SW & Independence Ave SW

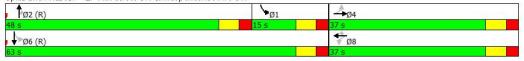
	<u> </u>	→	*	1	-	•	1	Ť	1	-	Į.	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Flash Dont Walk (s)	23.0	23.0		23.0	23.0	23.0		19.0	19.0		19.0	
Pedestrian Calls (#/hr)	0	0		0	0	0		0	0		0	
Act Effct Green (s)		32.0			32.0	32.0		43.0	43.0	57.5	58.0	
Actuated g/C Ratio		0.32			0.32	0.32		0.43	0.43	0.58	0.58	
v/c Ratio		0.47			0.32	0.37		0.56	0.49	0.36	0.37	
Control Delay		28.3			39.2	19.1		22.7	14.5	16.3	8.7	
Queue Delay		0.0			0.0	0.0		0.1	0.0	0.0	0.1	
Total Delay		28.3			39.2	19.1		22.7	14.5	16.3	8.8	
LOS		С			D	В		С	В	В	А	
Approach Delay		28.3			33.7			21.3			9.5	
Approach LOS		С			С			С			Α	
Queue Length 50th (ft)		117			100	48		193	53	22	71	
Queue Length 95th (ft)		153			135	92		238	126	37	84	
Internal Link Dist (ft)		290			1024			429			297	
Turn Bay Length (ft)						100						
Base Capacity (vph)		1373			1378	444		2040	486	286	2603	
Starvation Cap Reductn		0			0	0		0	0	0	503	
Spillback Cap Reductn		0			0	3		110	0	0	0	
Storage Cap Reductn		0			0	0		0	0	0	0	
Reduced v/c Ratio		0.47			0.32	0.38		0.59	0.49	0.36	0.46	
Intersection Summary												
Area Type:	Other											
Cycle Length: 100												
Actuated Cycle Length: 10	00											
Offset: 17 (17%), Referen	iced to phase	2:NBT a	nd 6:SBT	L, Start o	f Green							
Notural Orale: 00												

Natural Cycle: 80 Control Type: Pretimed Maximum v/c Ratio: 0.56

Intersection Signal Delay: 21.2 Intersection LOS: C Intersection Capacity Utilization 83.3% ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 2: 14th Street SW & Independence Ave SW



	١	→	*	1	•	•	1	†	-	>	1	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	1						444		ሻ	^	
Traffic Volume (vph)	59	72	70	0	0	0	0	1133	85	70	919	0
Future Volume (vph)	59	72	70	0	0	0	0	1133	85	70	919	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	10	10	10	10	10	12	12	10	10	10
Storage Length (ft)	0		0	0		0	0		20	170		0
Storage Lanes	- 1		0	0		0	0		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	1.00
Ped Bike Factor	0.58	0.87						0.96		0.93		
Frt	177.7171	0.926						0.990				
FIt Protected	0.950	0.000								0.950		
Satd. Flow (prot)	1517	1398	0	0	0	0	0	4771	0	1620	4700	0
FIt Permitted	0.950	1000								0.172		
Satd. Flow (perm)	875	1398	0	0	0	0	0	4771	0	274	4700	0
Right Turn on Red	0.0	1000	No			Yes		0.11.1.1.1	Yes		11.00	Yes
Satd. Flow (RTOR)			110			, , ,		22				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		257			1068			377			341	
Travel Time (s)		5.8			24.3			8.6			7.8	
Confl. Peds. (#/hr)	855	0.0	202	202	24.0	855	552	0.0	267	267	7.0	552
Confl. Bikes (#/hr)	000		96	202		000	002		17	201		17
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
Heavy Vehicles (%)	19%	15%	3%	0.00	0.00	0.30	0.33	3%	6%	4%	3%	0%
Adj. Flow (vph)	62	76	74	0	0	0	0	1193	89	74	967	0
Shared Lane Traffic (%)	UZ.	7.0		U	U		Ü	1100	00	- / -	507	·
Lane Group Flow (vph)	62	150	0	0	0	0	0	1282	0	74	967	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	Loit	15	ragin	Loit	12	ragin	Loit	0	ragin	Loit	10	ragiit
Link Offset(ft)		0			15			0			5	
Crosswalk Width(ft)		30			35			37			35	
Two way Left Turn Lane		30			30			JI.			30	
Headway Factor	1.00	1.00	1.09	1.09	1.09	1.09	1.09	1.00	1.00	1.09	1.09	1.09
Turning Speed (mph)	1.00	1.00	9	15	1.09	9	1.09	1.00	9	1.09	1.08	9
Turn Type	Perm	NA	9	13		9	10	NA	9	Perm	NA	9
Protected Phases	reilli	4						2		reilli	2	
Permitted Phases	4	4						2		2	2	
	34.5	34.5						20.5		20.5	20.5	
Minimum Split (s)	35.0	35.0						65.0		65.0	65.0	
Total Split (s)												
Total Split (%)	35.0%	35.0%						65.0%		65.0%	65.0%	
Maximum Green (s)	28.5	28.5						59.5		59.5	59.5	
Yellow Time (s)	4.0	4.0						4.0		4.0	4.0	
All-Red Time (s)	2.5	2.5						1.5		1.5	1.5	
Lost Time Adjust (s)	-1.5	-1.5						-1.5		-1.5	-1.5	
Total Lost Time (s)	5.0	5.0						4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?		40.0						40.0		40.0	40.0	
Walk Time (s)	10.0	10.0						10.0		10.0	10.0	

Lane Group	Ø6	
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Ideal Flow (vphpl)		
Lane Width (ft)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Fit Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Speed (mph) Link Distance (ft)		
Travel Time (s)		
BEACH CONTRACTOR OF THE CONTRA		
Confl. Peds. (#/hr)		
Confl. Bikes (#hr) Peak Hour Factor		
Heavy Vehicles (%)		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Turn Type		
Protected Phases	6	
Permitted Phases		
Minimum Split (s)	22.5	
Total Split (s)	65.0	
Total Split (%)	65%	
Maximum Green (s)	59.5	
Yellow Time (s)	4.0	
All-Red Time (s)	1.5	
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Walk Time (s)	10.0	

Lanes, Volumes, Timings 4: 14th Street SW & SW Jefferson Drive

	•	-	*	1	-	•	4	Ť	-	>	Ţ	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
Flash Dont Walk (s)	18.0	18.0						5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0						0		0	0	
Act Effct Green (s)	30.0	30.0						61.0		61.0	61.0	
Actuated g/C Ratio	0.30	0.30						0.61		0.61	0.61	
v/c Ratio	0.24	0.36						0.44		0.44	0.34	
Control Delay	29.4	30.5						5.9		20.9	10.0	
Queue Delay	0.0	0.0						0.5		0.0	0.0	
Total Delay	29.4	30.5						6.4		20.9	10.0	
LOS	C	С						Α		С	А	
Approach Delay		30.2						6.4			10.8	
Approach LOS		С						Α			В	
Queue Length 50th (ft)	30	75						224		23	102	
Queue Length 95th (ft)	65	131						243		69	127	
Internal Link Dist (ft)		177			988			297			261	
Turn Bay Length (ft)										170		
Base Capacity (vph)	262	419						2918		167	2867	
Starvation Cap Reductn	0	0						1071		0	0	
Spillback Cap Reductn	0	0						0		0	0	
Storage Cap Reductn	0	0						0		0	0	
Reduced v/c Ratio	0.24	0.36						0.69		0.44	0.34	
Intersection Summary												
Area Type:	Other											
Cycle Length: 100												
Actuated Cycle Length: 100												
Offset: 31 (31%), Reference	ed to phase	2:NBSB 8	and 6:Pe	d, Start of	Green							
Natural Cycle: 70												
Control Type: Pretimed												
Maximum v/c Ratio: 0.44												
Intersection Signal Delay: 10	0.2			In	tersection	LOS: B						
Intersection Capacity Utiliza	tion 66.9%			IC	ULevelo	f Service	C					
Analysis Period (min) 15												
Splits and Phases: 4: 14tl	h Street SV	1 & SWL 14	efferson f)rive								



Lane Group	Ø6		
Flash Dont Walk (s)	7.0		
Pedestrian Calls (#/hr)	0		
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			
Intersection Summary			

	→	•	1	•	1	-	
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	7+					7	
Traffic Volume (vph)	186	28	0	0	0	45	
Future Volume (vph)	186	28	0	0	0	45	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	14	10	10	10	10	13	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor							
Frt	0.982					0.865	
Flt Protected							
Satd. Flow (prot)	1846	0	0	0	0	1587	
Flt Permitted							
Satd. Flow (perm)	1846	0	0	0	0	1587	
Link Speed (mph)	30			30	30		
Link Distance (ft)	1068			661	401		
Travel Time (s)	24.3			15.0	9.1		
Confl. Peds. (#/hr)		320					
Confl. Bikes (#/hr)		87					
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	
Heavy Vehicles (%)	9%	0%	2%	2%	0%	7%	
Adj. Flow (vph)	216	33	0	0	0	52	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	249	0	0	0	0	52	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(ft)	0	11.50		0	0		
Link Offset(ft)	0			0	-2		
Crosswalk Width(ft)	16			16	24		
Two way Left Turn Lane							
Headway Factor	0.92	1.09	1.09	1.09	1.09	0.96	
Turning Speed (mph)		9	15		15	9	
Sign Control	Free			Free	Stop		
Intersection Summary							
The state of the s	O46						
The state of the s	Other						
Control Type: Unsignalized	i 00 00/			10	III accel	of Comics A	
Intersection Capacity Utilizat	uon 23.3%			IC	U Level	of Service A	
Analysis Period (min) 15							

Lane Group Lane Configurations Traffic Volume (vph) Future Volume (vph) Ideal Flow (vphpl) Lane Width (ft) Storage Length (ft) Storage Lanes Taper Length (ft) Lane Util. Factor Ped Bike Factor Frt Fit Protected Satd. Flow (prot) Fit Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (mph)	25 25 1900 10 0.91	44 44 1900 10 0 0 100 0.91	EBT 	69 69 1900 10 0 0 0.91	52 52 1900 10 0 1 100 0.86 0.89	WBT 479 479 1900 10 0.86 0.86 0.972	30 30 1900 10 100 1 0.91	83 83 1900 10	73 73 1900 10	NBL 9 9 1900 11 0 1 100 1.00 0.67	NBT 120 120 1900 11 0.95 0.99	NBR 147 147 1900 11 0 1 0.95 0.97
Traffic Volume (vph) Future Volume (vph) Ideal Flow (vphpl) Lane Width (ft) Storage Length (ft) Storage Lanes Taper Length (ft) Lane Util. Factor Ped Bike Factor Frt Frt Frt Frotected Satd. Flow (prot) Fit Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (mph)	25 1900 10 0.91	44 1900 10 0 0 100 0.91	698 698 1900 10 0.91 0.95 0.988 0.996 4608	69 1900 10 0 0	52 52 1900 10 0 1 100 0.86 0.89	479 479 1900 10 0.86 0.86	30 1900 10 100 1	83 1900 10	73 1900 10	9 1900 11 0 1 100 1.00	120 120 1900 11 0.95 0.99	147 147 1900 11 0 1 0.95 0.97
Traffic Volume (vph) Future Volume (vph) Ideal Flow (vphpl) Lane Width (ft) Storage Length (ft) Storage Lanes Taper Length (ft) Lane Util. Factor Ped Bike Factor Frt Frt Frt Frotected Satd. Flow (prot) Fit Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (mph)	25 1900 10 0.91	44 1900 10 0 0 100 0.91	0.91 0.95 0.988 0.996 4608	69 1900 10 0 0	52 1900 10 0 1 100 0.86 0.89	479 1900 10 0.86 0.86	30 1900 10 100 1	83 1900 10	73 1900 10	9 1900 11 0 1 100 1.00	120 1900 11 0.95 0.99	147 1900 11 0 1 0.95 0.97
Future Volume (vph) Ideal Flow (vphpl) Lane Width (ft) Storage Length (ft) Storage Lanes Taper Length (ft) Lane Util. Factor Ped Bike Factor Frt Fit Protected Satd. Flow (prot) Fit Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (mph)	25 1900 10 0.91	44 1900 10 0 0 100 0.91	0.91 0.95 0.988 0.996 4608	69 1900 10 0 0	52 1900 10 0 1 100 0.86 0.89	479 1900 10 0.86 0.86	30 1900 10 100 1	83 1900 10	73 1900 10	9 1900 11 0 1 100 1.00	120 1900 11 0.95 0.99	147 1900 11 0 1 0.95 0.97
Ideal Flow (vphpl) Lane Width (ft) Storage Length (ft) Storage Lanes Taper Length (ft) Lane Util. Factor Ped Bike Factor Frt Fit Protected Satd. Flow (prot) Fit Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (mph)	1900 10 0.91	1900 10 0 0 100 0.91	0.91 0.95 0.988 0.996 4608	1900 10 0 0	1900 10 0 1 100 0.86 0.89	1900 10 0.86 0.86	1900 10 100 1	1900 10	1900 10	1900 11 0 1 100 1.00	1900 11 0.95 0.99	1900 11 0 1 0.95 0.97
Lane Width (ft) Storage Length (ft) Storage Lanes Taper Length (ft) Lane Util. Factor Ped Bike Factor Frt Fit Protected Satd. Flow (prot) Fit Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (mph)	0.91	10 0 0 100 0.91	0.91 0.95 0.988 0.996 4608	10 0 0 0.91	10 0 1 100 0.86 0.89	0.86 0.86	10 100 1	10	10	11 0 1 100 1.00	0.95 0.99	0.95 0.97
Storage Length (ft) Storage Lanes Taper Length (ft) Lane Util. Factor Ped Bike Factor Frt Fit Protected Satd. Flow (prot) Fit Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (mph)	0.91	0 0 100 0.91	0.91 0.95 0.988 0.996 4608	0 0 0.91	0 1 100 0.86 0.89	0.86	100			0 1 100 1.00	0.95 0.99	0.95 0.97
Storage Lanes Taper Length (ft) Lane Util. Factor Ped Bike Factor Frt Fit Protected Satd. Flow (prot) Fit Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (mph)	0	0 100 0.91	0.95 0.988 0.996 4608	0.91	1 100 0.86 0.89	0.86	1	0.91	1.00	1 100 1.00	0.99	0.95 0.97
Taper Length (ft) Lane Util. Factor Ped Bike Factor Frt Fit Protected Satd. Flow (prot) Fit Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (mph)	0	100 0.91	0.95 0.988 0.996 4608	0.91	100 0.86 0.89	0.86		0.91	1.00	100 1.00	0.99	0.95 0.97
Lane Util. Factor Ped Bike Factor Frt Fit Protected Satd. Flow (prot) Fit Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (mph)	0	0.91	0.95 0.988 0.996 4608		0.86 0.89 0.950	0.86	0.91	0.91	1.00	1.00	0.99	0.97
Ped Bike Factor Frt Fit Protected Satd. Flow (prot) Fit Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (mph)	0	0	0.95 0.988 0.996 4608		0.89	0.86	0.01	0.01	1.00		0.99	0.97
Frt Fit Protected Satd. Flow (prot) Fit Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (mph)			0.988 0.996 4608	0	0.950					0.01		
Fit Protected Satd. Flow (prot) Fit Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (mph)			0.996 4608	0		0.072					0.976	0.850
Satd. Flow (prot) Fit Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (mph)			4608	0						0.950	0.370	0.000
Fit Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (mph)				U	1449	3818	0	0	0	1745	1680	1483
Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (mph)	0	0	0.007		0.950	0.935	U	U	0	0.950	1000	1400
Right Turn on Red Satd. Flow (RTOR) Link Speed (mph)	U	U	3648	0	1292	3568	0	0	0	1170	1680	1432
Satd. Flow (RTOR) Link Speed (mph)			3040	Yes	1232	3300	U	Yes	U	1170	1000	Yes
Link Speed (mph)			19	163		48		163			9	44
			35			35					30	44
Link Distance (ft)			1104			603					153	
Travel Time (s)	400	400	21.5	000	000	11.7	400	400	070		3.5	40
Confl. Peds. (#/hr)	186	186		299	299		186	186	372			19
Confl. Bikes (#hr)				18			20	20				
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehides (%)	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%
Adj. Flow (vph)	27	47	751	74	56	515	32	89	78	10	129	158
Shared Lane Traffic (%)					10%							15%
Lane Group Flow (vph)	0	0	899	0	50	642	0	0	0	88	153	134
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Left	Right	Right	Left	Left	Left	Right
Median Width(ft)			0			10					56	
Link Offset(ft)			0			0					0	
Crosswalk Width(ft)			30			25					28	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.04	1.04	1.04
Turning Speed (mph)	15	15		9	15		9	9	15	15		9
Turn Type	Perm	Perm	NA		Prot	NA			custom	custom	NA	custom
Protected Phases			6		5	2					4	5
Permitted Phases	6	6							48	48	8	48
Minimum Split (s)	20.0	20.0	20.0		12.5	63.0					37.0	12.5
Total Split (s)	50.5	50.5	50.5		12.5	63.0					37.0	12.5
	50.5%	50.5%	50.5%		12.5%	63.0%					37.0%	12.5%
Maximum Green (s)	43.5	43.5	43.5		6.0	56.5					26.5	6.0
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0					4.0	4.0
All-Red Time (s)	3.0	3.0	3.0		2.5	2.5					6.5	2.5
Lost Time Adjust (s)	9.0	0.0	-1.5		-1.5	-1.5					-1.5	-1.5
Total Lost Time (s)			5.5		5.0	5.0					9.0	5.0
Lead/Lag	Lead	Lead	Lead		Lag	3.0					0.0	Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes							Yes
Walk Time (s)	7.0	7.0	7.0		100	7.0					4.0	100

SI South Campus Master Plan 10/20/2017 2036 No Build Condition Saturday Peak Ho Stantec

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3	•	\	>	4			
Lane Group	SEL2	SEL	SER	SER2	Ø8		
Lane Configurations		M					
Traffic Volume (vph)	1	16	9	19			
Future Volume (vph)	1	16	9	19			
Ideal Flow (vphpl)	1900	1900	1900	1900			
Lane Width (ft)	10	13	10	10			
Storage Length (ft)		0	0				
Storage Lanes		1	0				
Taper Length (ft)		100					
Lane Util. Factor	1.00	1.00	1.00	1.00			
Ped Bike Factor	2017/22	0.78	1117.7	i di			
Frt		0.916					
Fit Protected		0.982					
Satd. Flow (prot)	0	1396	0	0			
Fit Permitted	U	0.982	J	, U			
Satd. Flow (perm)	0	1384	0	0			
Right Turn on Red	U	1004	U	Yes			
Satd. Flow (RTOR)		115		163			
Link Speed (mph)		30					
Link Speed (mpn) Link Distance (ft)		401					
		9.1					
Travel Time (s)		19		270			
Confl. Peds. (#/hr)		19		372			
Confl. Bikes (#hr)	0.00	0.00	0.00	2			
Peak Hour Factor	0.93	0.93	0.93	0.93			
Heavy Vehicles (%)	0%	0%	0%	0%			
Adj. Flow (vph)	1	17	10	20			
Shared Lane Traffic (%)			_				
Lane Group Flow (vph)	0	48	0	0			
Enter Blocked Intersection	No	No	No	No			
Lane Alignment	Left	Left	Right	Right			
Median Width(ft)		13					
Link Offset(ft)		40					
Crosswalk Width(ft)		8					
Two way Left Turn Lane		2020					
Headway Factor	1.09	0.96	1.09	1.09			
Turning Speed (mph)	15	15	9	9			
Turn Type	D.Pm	D.Pm			550111		
Protected Phases					8		
Permitted Phases	48	48					
Minimum Split (s)					37.0		
Total Split (s)					37.0		
Total Split (%)					37%		
Maximum Green (s)					30.5		
Yellow Time (s)					4.0		
All-Red Time (s)					2.5		
Lost Time Adjust (s)							
Total Lost Time (s)							
Lead/Lag							
Lead-Lag Optimize?							
Walk Time (s)							

#7 #11 #7 Ø6 (R)

	>	1	-	*	1	-	*_	•	1	ኘ	Ť	~
Lane Group	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR
Flash Dont Walk (s)	6.0	6.0	6.0			4.0					21.0	
Pedestrian Calls (#/hr)	0	0	0			0					0	
Act Effct Green (s)			45.0		7.5	58.0				28.0	28.0	39.5
Actuated g/C Ratio			0.45		0.08	0.58				0.28	0.28	0.40
v/c Ratio			0.54		0.46	0.89dr				0.27	0.32	0.22
Control Delay			13.0		64.5	18.3				13.9	12.2	2.7
Queue Delay			0.0		0.0	0.0				2.9	3.0	0.8
Total Delay			13.0		64.5	18.3				16.9	15.2	3.5
LOS			В		Е	В				В	В	А
Approach Delay			13.0			21.6					11.4	
Approach LOS			В			С					В	
Queue Length 50th (ft)			65		36	55				44	75	5
Queue Length 95th (ft)			87		79	91				87	134	58
Internal Link Dist (ft)			1024			523					73	
Turn Bay Length (ft)												
Base Capacity (vph)			1652		108	1199				327	476	596
Starvation Cap Reductn			0		0	0				160	231	258
Spillback Cap Reductn			0		0	0				0	0	0
Storage Cap Reductn			0		0	0				0	0	0
Reduced v/c Ratio			0.54		0.46	0.54				0.53	0.62	0.40
Intersection Summary												
	Other											
Cycle Length: 100												
Actuated Cycle Length: 100												
Offset: 96 (96%), Reference	d to phase	2:WBT a	nd 6:EBT	L, Start o	f Green							
Natural Cycle: 100												
Control Type: Pretimed												
Maximum v/c Ratio: 0.54												
Intersection Signal Delay, 15						n LOS: B	-20					
Intersection Capacity Utiliza	tion 93.5%			IC	:U Level	of Service	H					
Analysis Period (min) 15	3 97											
dr Defacto Right Lane, Re	ecode with	1 though	lane as a	nght lane	€.							
Splits and Phases: 7: 12tl	n Street SV	/ & Indep	endence	Ave SW	& 12th S	treet SW F	Ramp					
#7							#7					
Ø2 (R)							†ø	4				

#7 #11

#7 #11 Ø8

SI South Campus Master Plan 10/20/2017 2036 No Build Condition Saturday Peak Ho Stantec

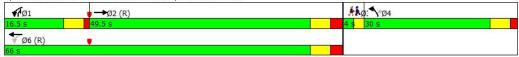
Lanes, Volumes, Timings 7: 12th Street SW & Independence Ave SW & 12th Street SW Ramp

	•	1	•	4			
Lane Group	SEL2	SEL	SER	SER2	Ø8		
Flash Dont Walk (s)							
Pedestrian Calls (#/hr)							
Act Effct Green (s)		28.0					
Actuated g/C Ratio		0.28					
v/c Ratio		0.10					
Control Delay		0.9					
Queue Delay		0.0					
Total Delay		0.9					
LOS		Α					
Approach Delay		0.9					
Approach LOS		Α					
Queue Length 50th (ft)		0					
Queue Length 95th (ft)		3					
Internal Link Dist (ft)		321					
Turn Bay Length (ft)							
Base Capacity (vph)		470					
Starvation Cap Reductn		0					
Spillback Cap Reductn		0					
Storage Cap Reductn		0					
Reduced v/c Ratio		0.10					

	-	•	•	•	1	1		
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø3	
Lane Configurations	tttp-		Valtomoni	ተተኩ	ሻ	۴		_
Traffic Volume (vph)	833	28	36	618	26	59		
Future Volume (vph)	833	28	36	618	26	59		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Storage Length (ft)	1000	0	0	1000	0	210		
Storage Lanes		0	0		1	1		
Taper Length (ft)		18	100		100			
Lane Util. Factor	0.86	0.86	0.91	0.91	1.00	1.00		
Ped Bike Factor	0.98	0.00	0.01	0.99	0.70	1.00		
Frt	0.995			0.00	0.10	0.850		
Fit Protected	-1.00			0.997	0.950	0.000		
Satd. Flow (prot)	5812	0	0	4624	1404	1396		
Flt Permitted	0012	- 0	7	0.858	0.950	. 500		
Satd. Flow (perm)	5812	0	0	3953	979	1396		
Right Turn on Red	0012	Yes	U	0000	010	Yes		
Satd. Flow (RTOR)	8	100				58		
Link Speed (mph)	35			35	25	~		
Link Distance (ft)	603			540	714			
Travel Time (s)	11.7			10.5	19.5			
Confl. Peds. (#/hr)	11.7	299	299	10.0	250			
Confl. Bikes (#hr)		14	299		200			
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94		
	2%	11%	11%	4%	20%	8%		
Heavy Vehicles (%)	886	30	38	657	20%	63		
Adj. Flow (vph)	000	30	36	00/	26	03		
Shared Lane Traffic (%)	010	0	0	695	28	63		
Lane Group Flow (vph)	916		(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)	100,700				
Enter Blocked Intersection	No	No	No	No	No	No		
Lane Alignment	Left	Right	Left	Left	Left	Right		
Median Width(ft)	0			0	60			
Link Offset(ft)	0			0	-10			
Crosswalk Width(ft)	30			10	16			
Two way Left Turn Lane			4.00	4.00		4.00		
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09		
Turning Speed (mph)	99,500	9	15	10,000	15	9		
Turn Type	NA		pm+pt	NA	Prot	pm+ov		
Protected Phases	2		1	6	4	1	3	
Permitted Phases	14.6		6			4		
Minimum Split (s)	20.5		10.0	16.5	30.0	10.0	4.0	
Total Split (s)	49.5		16.5	66.0	30.0	16.5	4.0	
Total Split (%)	49.5%		16.5%	66.0%	30.0%	16.5%	4%	
Maximum Green (s)	43.0		11.5	59.5	24.5	11.5	2.0	
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0	2.0	
All-Red Time (s)	2.5		1.0	2.5	1.5	1.0	0.0	
Lost Time Adjust (s)	-1.5			-1.5	-1.0	-1.0		
Total Lost Time (s)	5.0			5.0	4.5	4.0		
Lead/Lag	Lag		Lead		Lag	Lead	Lead	
Lead-Lag Optimize?	Yes		Yes		Yes	Yes	Yes	
Walk Time (s)	10.0				6.0			
Flash Dont Walk (s)	4.0				18.0			

	→	7	1	-	1	-	
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø3
Pedestrian Calls (#/hr)	0				0		
Act Effct Green (s)	44.5			61.0	25.5	42.5	
Actuated g/C Ratio	0.44			0.61	0.26	0.42	
v/c Ratio	0.35			0.28	0.08	0.10	
Control Delay	7.9			11.2	29.2	5.8	
Queue Delay	0.0			0.0	0.0	0.0	
Total Delay	7.9			11.2	29.2	5.8	
LOS	А			В	С	Α	
Approach Delay	7.9			11.2	13.0		
Approach LOS	Α			В	В		
Queue Length 50th (ft)	33			102	14	2	
Queue Length 95th (ft)	40			126	36	26	
Internal Link Dist (ft)	523			460	634		
Turn Bay Length (ft)						210	
Base Capacity (vph)	2590			2488	358	626	
Starvation Cap Reductn	0			0	0	0	
Spillback Cap Reductn	0			0	0	0	
Storage Cap Reductn	0			0	0	0	
Reduced v/c Ratio	0.35			0.28	0.08	0.10	
Intersection Summary							
Area Type:	Other						
Cycle Length: 100							
Actuated Cycle Length: 100)						
Offset: 10 (10%), Reference	ed to phase	2:EBT a	nd 6:WBT	L, Start o	f Green		
Natural Cycle: 65							
Control Type: Pretimed							
Maximum v/c Ratio: 0.35							
Intersection Signal Delay: 9					ersection		
Intersection Capacity Utiliza	ation 43.4%			IC	U Level o	f Service	Ą
Analysis Period (min) 15							

Splits and Phases: 9: L'Enfant Plaza & Independence Ave SW



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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	^	7					11			ना	
Traffic Volume (vph)	90	74	56	0	0	0	0	463	50	46	337	0
Future Volume (vph)	90	74	56	0	0	0	0	463	50	46	337	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	10	10	10	11	11	11	11	11	11
Storage Length (ft)	200		200	0		0	0		0	0		50
Storage Lanes	1		1	0		0	0		0	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	0.86	0.86	1.00
Ped Bike Factor	0.74		0.53					0.93			0.96	
Frt			0.850					0.985				
Flt Protected	0.950		0.000					0.000			0.994	
Satd. Flow (prot)	1631	1652	1561	0	0	0	0	4351	0	0	5889	0
FIt Permitted	0.950	,,,,,	1,0,01					1001			0.839	
Satd. Flow (perm)	1202	1652	825	0	0	0	0	4351	0	0	4770	0
Right Turn on Red			Yes			Yes	-	100.1	No			Yes
Satd. Flow (RTOR)			57			, 00			1.10			
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		454			399			424			394	
Travel Time (s)		10.3			9.1			8.3			7.7	
Confl. Peds. (#/hr)	228	10.0	956	956	0.1	228	485	0.0	412	412		485
Confl. Bikes (#/hr)	LLU		45	000		LLO	100		712	7.12		20
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	7%	15%	0%	0%	0%	0%	0%	4%	22%	4%	7%	0%
Adj. Flow (vph)	92	76	57	0	0	0	0	472	51	47	344	0
Shared Lane Traffic (%)	UZ.	,,	O,					11.2	0.	- 17	011	- č
Lane Group Flow (vph)	92	76	57	0	0	0	0	523	0	0	391	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	Leit	11	ragin	Leit	11	ragiit	Leit	0	ragiit	Leit	0	ragiit
Link Offset(ft)		-15			15			10			-10	
Crosswalk Width(ft)		35			20			35			55	
Two way Left Turn Lane		00			20			00			00	
Headway Factor	1.04	1.00	1.04	1.09	1.09	1.09	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15	1.00	9	15	1.00	9	15	1.01	9	15	1.01	9
Turn Type	Perm	NA	Perm	13		3	10	NA	3	Perm	NA	9
Protected Phases	Leilli	4	FOILI					2		I CIIII	2	
Permitted Phases	4		4					2		2	2	
Minimum Split (s)	32.5	32.5	32.5					20.0		20.0	20.0	
Total Split (s)	32.5	32.5	32.5					67.5		67.5	67.5	
	32.5%	32.5%	32.5%					67.5%		67.5%	67.5%	
Total Split (%)	26.0	26.0	26.0					61.5		61.5	61.5	
Maximum Green (s)	4.0	4.0	4.0					4.0		4.0	4.0	
Yellow Time (s)												
All-Red Time (s)	2.5	2.5	2.5					2.0		2.0	2.0	
Lost Time Adjust (s)	-1.5	-1.5	-1.5					-1.5			-1.5	
Total Lost Time (s)	5.0	5.0	5.0					4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?	40.0	10.0	40.0					10.0		40.0	10.0	
Walk Time (s)	10.0	10.0	10.0					10.0		10.0	10.0	

Lane Group	Ø6	Ø8	
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Fit Protected			
Satd. Flow (prot)			
Fit Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Confl. Bikes (#/hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Enter Blocked Intersection			
Lane Alignment			
Median Width(ft)			
Link Offset(ft)			
Crosswalk Width(ft)			
Two way Left Turn Lane			
Headway Factor			
Turning Speed (mph)			
Turn Type			
Protected Phases	6	8	
Permitted Phases			
Minimum Split (s)	21.0	28.5	
Total Split (s)	67.5	32.5	
Total Split (%)	68%	33%	
Maximum Green (s)	61.5	26.0	
Yellow Time (s)	4.0	4.0	
All-Red Time (s)	2.0	2.5	
	2.0	2.0	
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?	40.0	7.0	
Walk Time (s)	10.0	7.0	

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Flash Dont Walk (s)	16.0	16.0	16.0					4.0		4.0	4.0	
Pedestrian Calls (#/hr)	0	0	0					0		0	0	
Act Effct Green (s)	27.5	27.5	27.5					63.0			63.0	
Actuated g/C Ratio	0.28	0.28	0.28					0.63			0.63	
v/c Ratio	0.28	0.17	0.21					0.19			0.13	
Control Delay	33.0	30.7	12.6					2.9			7.6	
Queue Delay	0.0	0.0	0.0					0.0			0.0	
Total Delay	33.0	30.7	12.6					2.9			7.6	
LOS	С	С	В					А			А	
Approach Delay		27.1						2.9			7.6	
Approach LOS		С						А			А	
Queue Length 50th (ft)	45	36	2					13			26	
Queue Length 95th (ft)	92	78	35					17			37	
Internal Link Dist (ft)		374			319			344			314	
Turn Bay Length (ft)	200		200									
Base Capacity (vph)	330	454	268					2741			3005	
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	0.28	0.17	0.21					0.19			0.13	
Intersection Summary												
O DECEMBER OF THE OWNER O	Other											
Cycle Length: 100												
Actuated Cycle Length: 100												
Offset: 12 (12%), Reference	ed to phase	2:NBSB	and 6:Pe	d, Start	of Green							
Natural Cycle: 55												
Control Type: Pretimed												
Maximum v/c Ratio: 0.28												
Intersection Signal Delay, 9.					ntersection		_					
Intersection Capacity Utiliza Analysis Period (min) 15	tion 56.7%				CU Level	of Service	В					
	h Street SV	V & SW J	etterson [Orive								
√ ¶ ø2 (R) 67.5 s								→Ø4 32.5 s				
, ÅÅ Ø6 (R)								# k ø8				
112-20 (K)												

Lane Group	Ø6	Ø8
Flash Dont Walk (s)	5.0	15.0
Pedestrian Calls (#/hr)	0	0
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

	1	_	*	*	†	-	-	Ţ	Į.	*	1	
Lane Group	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER	Ø
Lane Configurations	ሻ		7		444				77			
Traffic Volume (vph)	0	0	0	0	349	0	0	0	130	0	0	
Future Volume (vph)	0	0	0	0	349	0	0	0	130	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	10	12	10	10	10	10	10	10	10	10	
Storage Length (ft)		0	100	0		0	0		0	0	0	
Storage Lanes		1	1	0		0	0		2	0	0	
Taper Length (ft)		100		100			100			25	270	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91	1.00	1.00	0.88	1.00	1.00	
Frt	1.00	1.00	1.00	1.00	0.01	0.01	1.00	1.00	0.850	1.00	1.00	
Fit Protected									0.000			
Satd. Flow (prot)	1863	0	1863	0	4746	0	0	0	2601	0	0	
Fit Permitted	1000	U	1000	v	7/10	Ü	v	U	2001	U	U	
Satd. Flow (perm)	1863	0	1863	0	4746	0	0	0	2601	0	0	
Right Turn on Red	1003	U	Yes	U	4/40	Yes	U	U	Yes	U	U	
Satd. Flow (RTOR)			100			100			1920			
		30			30			30	1320	30		
Link Speed (mph)		212			269			153		170		
Link Distance (ft)		4.8			6.1					3.9		
Travel Time (s)	0.00		0.00	0.00		0.00	0.00	3.5	0.00		0.00	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	0	0	0	379	0	0	0	141	0	0	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	379	0	0	0	141	0	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right	
Median Width(ft)		12			0			25		0		
Link Offset(ft)		0			5			3		0		
Crosswalk Width(ft)		16			30			16		16		
Two way Left Turn Lane												
Headway Factor	1.00	1.09	1.00	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	
Turning Speed (mph)	15	15	9	15		9	15		9	15	9	
Turn Type	Prot		Perm		NA				Perm			
Protected Phases	6				58							2
Permitted Phases			6						6			
Minimum Split (s)	20.0		20.0						20.0			63.0
Total Split (s)	50.5		50.5						50.5			63.0
Total Split (%)	50.5%		50.5%						50.5%			63%
Maximum Green (s)	43.5		43.5						43.5			56.5
Yellow Time (s)	4.0		4.0						4.0			4.0
All-Red Time (s)	3.0		3.0						3.0			2.5
Lost Time Adjust (s)	-1.5		-1.5						0.0			
Total Lost Time (s)	5.5		5.5						7.0			
Lead/Lag	Lead		Lead						Lead			
Lead-Lag Optimize?	Yes		Yes						Yes			
Walk Time (s)	7.0		7.0						7.0			7.0
Flash Dont Walk (s)	6.0		6.0						6.0			4.0
Pedestrian Calls (#/hr)	0.0		0.0						0.0			0
. Jajouran Juno (min)	U		U									U
Act Effct Green (s)					44.5				43.5			

Lane Group	Ø4	Ø5	Ø8
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Fit Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Enter Blocked Intersection			
Lane Alignment			
Median Width(ft)			
Link Offset(ft)			
Crosswalk Width(ft)			
Two way Left Turn Lane			
Headway Factor			
Turning Speed (mph)			
Turn Type			
Protected Phases	4	5	8
Permitted Phases	0,740		Ü
Minimum Split (s)	37.0	12.5	37.0
Total Split (s)	37.0	12.5	37.0
Total Split (%)	37.0	13%	37%
			30.5
Maximum Green (s)	26.5	6.0	
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	6.5	2.5	2.5
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag		Lag	
Lead-Lag Optimize?		Yes	
Walk Time (s)	4.0		
Flash Dont Walk (s)	21.0		
Pedestrian Calls (#/hr)	0		
Act Effet Green (s)) O		
Actuated g/C Ratio			
notation gro Mallo			

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Lane Group	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER	Ø2
v/c Ratio					0.18				0.06			
Control Delay					17.0				0.1			
Queue Delay					0.0				0.7			
Total Delay					17.0				0.7			
LOS					В				Α			
Approach Delay					17.0			0.7				
Approach LOS					В			Α				
Queue Length 50th (ft)					52				0			
Queue Length 95th (ft)					72				0			
Internal Link Dist (ft)		132			189			73		90		
Turn Bay Length (ft)												
Base Capacity (vph)					2111				2216			
Starvation Cap Reductn					0				1804			
Spillback Cap Reductn					153				0			
Storage Cap Reductn					0				0			
Reduced v/c Ratio					0.19				0.34			
Intersection Summary												
	Other											
Cycle Length: 100												
Actuated Cycle Length: 100)											
Offset: 96 (96%), Reference	ed to phase	2:WBT a	nd 6:EBT	L, Start o	f Green							
Natural Cycle: 100												
Control Type: Pretimed												
Maximum v/c Ratio: 0.54												
Intersection Signal Delay, 1	2.6			In	tersection	LOS: B						
Intersection Capacity Utiliza	tion 14.2%			IC	U Level o	of Service	А					
Analysis Period (min) 15												
Splits and Phases: 11: 12	2th Street S	MJ≦										
#7	ziii olieei o	00					#7					
<u>676</u>							#7 1 ø4					
Ø2 (R)							1 Ø4 37 s					
#7 #11					#7 #	-11	#7 #1	1				
#/ #11 #/ Ø6 (R)						† ø5		†ø8				
50.5 s					12.5.5		37 s	108				

Lane Group	Ø4	Ø5	Ø8
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			
Intersection Summary			

Lanes, Volumes, Timings 14: 9th Street SW/Smithsonian Driveway & Independence Ave SW

	١	→	•	1	←	•	€l	1	†	-	-	ţ
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations		नाा			444				4	7		4
Traffic Volume (vph)	0	804	88	107	645	0	11	9	0	1	0	0
Future Volume (vph)	0	804	88	107	645	0	11	9	0	1	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		0		0		0	0	
Storage Lanes	0		1	0		0		0		1	0	
Taper Length (ft)	100			100				100			25	
Lane Util. Factor	0.86	0.86	0.86	0.91	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.98			0.99				0.94			
Frt		0.985								0.850		
Flt Protected					0.993				0.950			
Satd. Flow (prot)	0	5709	0	0	4648	0	0	0	1685	1507	0	1773
Flt Permitted					0.704				0.757			
Satd. Flow (perm)	0	5709	0	0	3267	0	0	0	1265	1507	0	1773
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)		31								153		
Link Speed (mph)		35			35				30			15
Link Distance (ft)		540			606				566			305
Travel Time (s)		10.5			11.8				12.9			13.9
Confl. Peds. (#/hr)			156	156				58				
Confl. Bikes (#/hr)			9			6						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	3%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	838	92	111	672	0	11	9	0	1	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	930	0	0	783	0	0	0	20	1	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	RNA	Left	Left	Right	Left	Left
Median Width(ft)		0			0				90			0
Link Offset(ft)		0			0				5			-70
Crosswalk Width(ft)		45			20				20			20
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (mph)	15		9	15		9	9	15		9	15	
Turn Type		NA		pm+pt	NA		Perm	Perm	NA	Over		
Protected Phases		2		1	6				8	1		8
Permitted Phases	2			6			8	8			8	
Minimum Split (s)	29.5	29.5		10.5	25.5		35.5	35.5	35.5	10.5	35.5	35.5
Total Split (s)	47.5	47.5		12.0	59.5		35.5	35.5	35.5	12.0	35.5	35.5
Total Split (%)	47.5%	47.5%		12.0%	59.5%		35.5%	35.5%	35.5%	12.0%	35.5%	35.5%
Maximum Green (s)	38.0	38.0		6.5	54.0		30.0	30.0	30.0	6.5	30.0	30.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	5.5	5.5		1.5	1.5		1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)		-1.5			0.0				0.0	0.0		0.0
Total Lost Time (s)		8.0			5.5				5.5	5.5		5.5
Lead/Lag	Lead	Lead		Lag	0.0		Lag	Lag	Lag	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes	Yes	Yes	Yes	Yes
Walk Time (s)	10.0	10.0		, 00	10.0		10.0	10.0	10.0	, 00	10.0	10.0
	10.0	10.0			, 0, 0		10.0	10.0	10.0			10.0

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	4	
Lane Group	SBR	Ø7
Land Configurations		
Traffic Volume (vph)	0	
Future Volume (vph)	0	
Ideal Flow (vphpl)	1900	
Storage Length (ft)	0	
Storage Lanes	0	
Taper Length (ft)	U	
Lane Util. Factor	1.00	
Ped Bike Factor	1.00	
Frt		
Fit Protected		
	0	
Satd. Flow (prot) Flt Permitted	U	
	^	
Satd. Flow (perm)	0	
Right Turn on Red	Yes	
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)	58	
Confl. Bikes (#hr)		
Peak Hour Factor	0.96	
Heavy Vehicles (%)	0%	
Adj. Flow (vph)	0	
Shared Lane Traffic (%)		
Lane Group Flow (vph)	0	
Enter Blocked Intersection	No	
Lane Alignment	Right	
Median Width(ft)	3	
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor	1.09	
Turning Speed (mph)	9	
Turn Type	9	
Protected Phases		7
Permitted Phases		1
		5.0
Minimum Split (s)		
Total Split (s)		5.0
Total Split (%)		5%
Maximum Green (s)		3.0
Yellow Time (s)		2.0
All-Red Time (s)		0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		Lead
Lead-Lag Optimize?		Yes
Walk Time (s)		
Flash Dont Walk (s)		
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SB1
Pedestrian Calls (#/hr)	0	0			0		0	0	0		0	0
Act Effct Green (s)		39.5			54.0				30.0	6.5		
Actuated g/C Ratio		0.40			0.54				0.30	0.06		
v/c Ratio		0.41			0.42				0.05	0.00		
Control Delay		8.0			10.2				25.6	0.0		
Queue Delay		0.0			0.0				0.0	0.0		
Total Delay		8.0			10.2				25.6	0.0		
LOS		Α			В				С	Α		
Approach Delay		8.0			10.2				24.4			
Approach LOS		Α			В				С			
Queue Length 50th (ft)		132			60				9	0		
Queue Length 95th (ft)		138			73				27	0		
Internal Link Dist (ft)		460			526				486			225
Turn Bay Length (ft)												
Base Capacity (vph)		2273			1853				379	241		
Starvation Cap Reductn		0			0				0	0		
Spillback Cap Reductn		0			0				0	0		
Storage Cap Reductn		0			0				0	0		
Reduced v/c Ratio		0.41			0.42				0.05	0.00		
Intersection Summary												
	Other											
Cycle Length: 100												
Actuated Cycle Length: 100												
Offset: 29 (29%), Reference	d to phase	2:EBTL a	and 6: WE	ITL, Start	of Green							
Natural Cycle: 85												
Control Type: Pretimed												
Maximum v/c Ratio: 0.42												
Intersection Signal Delay: 9.				Ir	ntersection	n LOS: A						
Intersection Capacity Utiliza	tion 72.1%			10	CU Level	of Service	C					
Analysis Period (min) 15												
Splits and Phases: 14: 9th	n Street SV	//S mithso	nian Driv	reway & l	ndepende	ence Ave	SW					
Ø2 (R)					ۯ1		2.00					
47.5 c			100		17.6	(A)						



Lane Group	SBR	Ø7	
Pedestrian Calls (#/hr)			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			
Intersection Summary			

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		नाम			नाा		*	^		7	^	
Traffic Volume (vph)	141	609	55	11	559	158	54	214	24	102	152	139
Future Volume (vph)	141	609	55	11	559	158	54	214	24	102	152	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	11	11	11	11	11	11
Storage Length (ft)	0		75	0		0	80		0	0		50
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	0.86	0.86	0.86	0.86	0.86	0.86	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor		0.97			0.93		0.84	0.97		0.80	0.88	
Frt		0.990			0.967		200000	0.985		V-0.00(0)	0.928	
Flt Protected		0.991			0.999		0.950	0.000		0.950	0.020	
Satd. Flow (prot)	0	5677	0	0	5203	0	1616	4636	0	1646	3900	0
Flt Permitted		0.726			0.914		0.562	1000		0.526		
Satd. Flow (perm)	0	4091	0	0	4756	0	805	4636	0	729	3900	0
Right Turn on Red		1001	Yes	·	1700	Yes	000	1000	No	720	0000	Yes
Satd. Flow (RTOR)		23	100		85	100			140		143	100
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		606			437			393			424	
Travel Time (s)		11.8			8.5			7.7			8.3	
Confl. Peds. (#/hr)	278	11.0	181	181	0.0	278	207	1.1	248	248	0.0	207
Confl. Bikes (#/hr)	210		12	101		15	201		15	240		11
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	7%	3%	4%	0%	4%	10%	8%	3%	4%	6%	7%	3%
Adj. Flow (vph)	145	628	57	11	576	163	56	221	25	105	157	143
Shared Lane Traffic (%)	140	020	- 01	- 11	0/0	100	00	221	20	100	101	140
Lane Group Flow (vph)	0	830	0	0	750	0	56	246	0	105	300	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	Leit	0	Night	Leit	0	ragiit	Leit	11	ragiit	Leit	11	ragiit
Link Offset(ft)		5			0			-6			5	
A STATE OF THE PARTY OF THE PAR		32			30			22			35	
Crosswalk Width(ft)		32			30			22			33	
Two way Left Turn Lane Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.04	1.04	1.04	1.04	1.04	1.04
400 CO 00 40 VOICE TAXA	1.09	1.09	1.09	1.09	1.09	9	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)		NIA	9		NA	9		NA	9		NA	9
Turn Type Protected Phases	pm+pt 5	NA 2		Perm	NA 6		Perm	NA 4		pm+pt 3	NA 8	
2-7-3-17-27-27-27-77	2	2			ь		4	4		8	0	
Permitted Phases		04.5		6	00.5			20.5			00.5	
Minimum Split (s)	10.5	31.5		28.5	28.5		29.5	29.5		10.0	32.5	
Total Split (s)	11.0	57.0		46.0	46.0		32.5	32.5		10.5	43.0	
Total Split (%)	11.0%	57.0%		46.0%	46.0%		32.5%	32.5%		10.5%	43.0%	
Maximum Green (s)	5.5	50.5		39.5	39.5		26.0	26.0		5.5	36.5	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.5	2.5		2.5	2.5		2.5	2.5		1.0	2.5	
Lost Time Adjust (s)		-1.5			-1.5		-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)		5.0			5.0		5.0	5.0		3.5	5.0	
Lead/Lag	Lead			Lag	Lag		Lag	Lag		Lead		
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes		Yes		
Walk Time (s)		7.0		4.0	4.0		4.0	4.0			7.0	

22: 7th Street SW & Independence Ave SW

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Flash Dont Walk (s)		18.0		18.0	18.0		19.0	19.0			19.0	
Pedestrian Calls (#/hr)		0		0	0		0	0			0	
Act Effct Green (s)		52.0			41.0		27.5	27.5		39.5	38.0	
Actuated g/C Ratio		0.52			0.41		0.28	0.28		0.40	0.38	
v/c Ratio		0.37			0.38		0.25	0.19		0.30	0.19	
Control Delay		1.2			18.7		32.1	28.3		20.6	9.3	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		1.2			18.7		32.1	28.3		20.6	9.3	
LOS		Α			В		С	С		С	Α	
Approach Delay		1.2			18.7			29.0			12.2	
Approach LOS		Α			В			С			В	
Queue Length 50th (ft)		6			83		28	43		35	16	
Queue Length 95th (ft)		14			109		63	66		65	29	
Internal Link Dist (ft)		526			357			313			344	
Turn Bay Length (ft)							80					
Base Capacity (vph)		2233			2000		221	1274		352	1570	
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		0.37			0.38		0.25	0.19		0.30	0.19	
Intersection Summary												
Area Type:	Other											
Cycle Length: 100												
Actuated Cycle Length: 10	10											
Official: 51 (51%) Deference	and to phase	2 FRTI	and 6: WE	TI Start	of Green							

Offset: 51 (51%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 80

Control Type: Pretimed Maximum v/c Ratio: 0.38

Intersection Signal Delay: 12.6 Intersection LOS: B Intersection Capacity Utilization 83.3% ICU Level of Service E Analysis Period (min) 15



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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		444			441	7		^ ^	ř	7	444	
Traffic Volume (vph)	6	759	45	24	1593	187	0	1822	554	297	2353	33
Future Volume (vph)	6	759	45	24	1593	187	0	1822	554	297	2353	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	10	10	10	10	10	10	10	10	10	10
Lane Util. Factor	0.91	0.91	0.91	0.91	0.91	1.00	1.00	0.91	1.00	1.00	0.91	0.91
Ped Bike Factor		0.98			1.00	0.89			0.92		1.00	
Frt		0.992				0.850			0.850		0.998	
Flt Protected					0.999					0.950		
Satd. Flow (prot)	0	4769	0	0	4644	1311	0	4793	1478	1589	4734	0
Fit Permitted	200	0.792	-	11.50	0.874	100000		1/12/2020	LILENS.	0.075		-
Satd. Flow (perm)	0	3777	0	0	4059	1167	0	4793	1365	125	4734	0
Right Turn on Red		371/11	Yes	3,70	-1000	Yes			Yes			Yes
Satd. Flow (RTOR)		3	,			160			99			31.00
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		370			1104			509			377	
Travel Time (s)		7.2			21.5			11.6			8.6	
Confl. Peds. (#/hr)	73	, . 	250	250	21.0	73	33	11.0	49	49	0.0	33
Confl. Bikes (#hr)	70		3	200		29	00		2	10		1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	80%	2%	3%	79%	3%	15%	0%	1%	2%	6%	2%	0%
Adj. Flow (vph)	7	843	50	27	1770	208	0	2024	616	330	2614	37
Shared Lane Traffic (%)		0.0	00	-	1110	200		LULI	010	000	2011	0,
Lane Group Flow (vph)	0	900	0	0	1797	208	0	2024	616	330	2651	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	Loit	0	rugin	Lon	0	rugin	Loit	4	rugin	Lon	10	rugin
Link Offset(ft)		0			0			5			0	
Crosswalk Width(ft)		20			30			30			26	
Two way Left Turn Lane												
Headway Factor	1.09	1.04	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (mph)	15	1.01	9	15	1.00	9	15	1.00	9	15	1.00	9
Turn Type	Perm	NA		Perm	NA	Perm		NA	Perm	pm+pt	NA	
Protected Phases	1 01111	4		1.01111	8	1 01111		2	1.04.111	1	6	
Permitted Phases	4	2012		8	•	8		-	2	6		
Minimum Split (s)	36.5	36.5		36.5	36.5	36.5		31.5	31.5	10.5	31.5	
Total Split (s)	37.0	37.0		37.0	37.0	37.0		53.0	53.0	20.0	73.0	
Total Split (%)	33.6%	33.6%		33.6%	33.6%	33.6%		48.2%	48.2%	18.2%	66.4%	
Maximum Green (s)	30.5	30.5		30.5	30.5	30.5		46.5	46.5	13.5	66.5	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5	2.5		2.5	2.5	2.5	2.5	
Lost Time Adjust (s)	2.0	-1.5		2.0	-1.5	-1.5		-1.5	-1.5	-1.0	-1.5	
Total Lost Time (s)		5.0			5.0	5.0		5.0	5.0	5.5	5.0	
Lead/Lag		5.0			5.0	0.0		Lead	Lead	Lag	5.0	
Lead-Lag Optimize?								Yes	Yes	Yes		
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		6.0	6.0	168	6.0	
Flash Dont Walk (s)	23.0	23.0		23.0	23.0	23.0		19.0	19.0		19.0	
Pedestrian Calls (#/hr)	23.0	23.0		23.0	23.0	23.0		19.0	19.0		19.0	
MANAGEMENT AND SOME OF STREET AND SOURCE AND	U	32.0		U	32.0	32.0		48.0		67.5	68.0	
Act Effct Green (s)		32.0			32.0	32.0		48.0	48.0	67.5	08.0	

	•	→	7	1	-	•	4	1	-	1	Į.	1
Lane Group	EBL I	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
Actuated g/C Ratio	(0.29			0.29	0.29		0.44	0.44	0.61	0.62	
v/c Ratio	(0.82			1.52	0.46		0.97	0.95	1.23	0.91	
Control Delay		43.4			257.8	3.2		44.2	50.4	151.1	14.9	
Queue Delay		0.0			0.0	0.1		42.6	0.0	0.0	1.2	
Total Delay		43.4			257.8	3.2		86.8	50.4	151.1	16.1	
LOS		D			F	Α		F	D	F	В	
Approach Delay		43.4			231.4			78.3			31.1	
Approach LOS		D			F			Е			С	
Queue Length 50th (ft)		215			~662	9		499	359	~237	235	
Queue Length 95th (ft)		270			m#384	m0		#623	#608	m#340	m327	
Internal Link Dist (ft)		290			1024			429			297	
Turn Bay Length (ft)												
Base Capacity (vph)	9	1100			1180	452		2091	651	269	2926	
Starvation Cap Reductn		0			0	0		0	0	0	121	
Spillback Cap Reductn		0			0	12		374	0	0	0	
Storage Cap Reductn		0			0	0		0	0	0	0	
Reduced v/c Ratio	(0.82			1.52	0.47		1.18	0.95	1.23	0.95	
Intersection Summary												
Area Type: (Other											
Cycle Length: 110												
Actuated Cycle Length: 110												
Offset: 107 (97%), Reference	ed to phase 2	:NBT a	and 6:SB	TL, Start	of Green							
Natural Cycle: 110												
Control Type: Pretimed												
Maximum v/c Ratio: 1.52												
Intersection Signal Delay, 94	4.1			Ír	ntersection	LOS: F						
Intersection Capacity Utilizat	tion 112.2%			10	CU Level	of Service	Н					
Analysis Period (min) 15												
~ Volume exceeds capacit	y, queue is the	eoretic	ally infini	te.								
Queue shown is maximul	m after two cy	cles.										
# 95th percentile volume e	xceeds capac	ity, qu	eue may	be longe	r.							
Queue shown is maximul	m after two cy	cles.										
m Volume for 95th percent	tile queue is m	netered	t by upsti	reamsig	nal.							
Splits and Phases: 2: 14th	n Street SW &	Indep	endence	Ave SW								
1 ø2 (R)				7	\ø₁			1 Ø4				
53 s					20 s			7 s				
▼ Ø6 (R)								₹ø8				

	١	→	•	1	•	*	1	†	-	1	ļ	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	٦	7						11		ሻ	^ ^	
Traffic Volume (vph)	59	118	306	0	0	0	0	1911	104	49	2377	0
Future Volume (vph)	59	118	306	0	0	0	0	1911	104	49	2377	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	10	10	10	10	10	12	12	10	10	10
Storage Length (ft)	0		0	0		0	0		20	170		0
Storage Lanes	1		0	0		0	0		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	1.00
Ped Bike Factor	0.65	0.83						0.97				
Frt		0.892						0.992				
Flt Protected	0.950	1000								0.950		
Satd. Flow (prot)	1597	1352	0	0	0	0	0	4813	0	1636	4700	0
FIt Permitted	0.950				1. The same of the	-				0.058		
Satd. Flow (perm)	1034	1352	0	0	0	0	0	4813	0	100	4700	0
Right Turn on Red	1001	1002	No			Yes	-	1010	Yes	100	11.00	Yes
Satd. Flow (RTOR)			110			100		14	100			100
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		257			1068			377			341	
Travel Time (s)		5.8			24.3			8.6			7.8	
Confl. Peds. (#/hr)	477	0.0	150	150	24.0	477	149	0.0	196	196	7.0	149
Confl. Bikes (#/hr)	71.1		95	100		711	140		16	100		9
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	13%	9%	2%	0.33	0.33	0.33	0.33	4%	1%	3%	3%	0.33
Adj. Flow (vph)	60	119	309	0	0	0	0	1930	105	49	2401	0.00
Shared Lane Traffic (%)	00	110	000	·	U	· ·	U	1000	100	40	2401	·
Lane Group Flow (vph)	60	428	0	0	0	0	0	2035	0	49	2401	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	Leit	15	ragiit	Leit	12	ragiit	Leit	0	ragiit	Leit	10	ragiii
Link Offset(ft)		0			15			0			5	
Crosswalk Width(ft)		30			35			37			35	
Two way Left Turn Lane		30			30			31			30	
Headway Factor	1.00	1.00	1.09	1.09	1.09	1.09	1.09	1.00	1.00	1.09	1.09	1.09
Turning Speed (mph)	1.00	1.00	9	15	1.00	9	1.03	1.00	9	1.03	1.00	9
Turn Type	Perm	NA	9	15		9	15	NA	9	Perm	NA	9
Protected Phases	reilli	4						2		reilli	2	
Permitted Phases	4	4						2		2	2	
Minimum Split (s)	34.5	34.5						20.5		20.5	20.5	
Total Split (s)	37.0	37.0						73.0		73.0	73.0	
Total Split (%)	33.6%	33.6%						66.4%		66.4%	66.4%	
and the manufacture of the form of the control of the Company of t	30.5	30.5						67.5		67.5	67.5	
Maximum Green (s)	4.0	4.0						4.0		4.0	4.0	
Yellow Time (s)												
All-Red Time (s)	2.5	2.5						1.5		1.5	1.5	
Lost Time Adjust (s)	-1.5	-1.5						-1.5		-1.5	-1.5	
Total Lost Time (s)	5.0	5.0						4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?	40.0	40.0						40.0		40.0	40.0	
Walk Time (s)	10.0	10.0						10.0		10.0	10.0	

Lane Group	Ø6	
Lane Configurations	45000 V	
Traffic Volume (vph)		
Future Volume (vph)		
Ideal Flow (vphpl)		
Lane Width (ft)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Ped Bike Factor		
Frt Flt Protected		
Cotd Class (asst)		
Satd. Flow (prot)		
FIt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Confl. Bikes (#hr)		
Peak Hour Factor		
Heavy Vehicles (%)		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Turn Type		
Protected Phases	6	
Permitted Phases		
Minimum Split (s)	22.5	
Total Split (s)	73.0	
Total Split (%)	66%	
Maximum Green (s)	67.5	
Yellow Time (s)	4.0	
All-Red Time (s)	1.5	
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Walk Time (s)	10.0	
The second secon	- 1.000 A	

4: 14th Street SW & SW Jefferson Drive

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Flash Dont Walk (s)	18.0	18.0						5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0						0		0	0	
Act Effct Green (s)	32.0	32.0						69.0		69.0	69.0	
Actuated g/C Ratio	0.29	0.29						0.63		0.63	0.63	
v/c Ratio	0.20	1.09						0.67		0.79	0.81	
Control Delay	31.6	109.5						9.9		90.3	18.6	
Queue Delay	0.0	5.4						47.7		0.0	0.0	
Total Delay	31.6	114.9						57.6		90.3	18.6	
LOS	C	F						Е		F	В	
Approach Delay		104.7						57.6			20.0	
Approach LOS		F						Е			С	
Queue Length 50th (ft)	32	~341						523		23	437	
Queue Length 95th (ft)	68	#537						m577		#63	508	
Internal Link Dist (ft)		177			988			297			261	
Turn Bay Length (ft)										170		
Base Capacity (vph)	300	393						3024		62	2948	
Starvation Cap Reductn	0	0						1232		0	0	
Spillback Cap Reductn	0	47						0		0	5	
Storage Cap Reductn	0	0						0		0	0	
Reduced v/c Ratio	0.20	1.24						1.14		0.79	0.82	
Intersection Summary												
Area Type:	Other											
Cycle Length: 110												
Actuated Cycle Length: 11	0											
Offset: 13 (12%), Reference	ced to phase	2:NBSB	and 6:Pe	d, Start of	f Green							
Natural Cycle: 90												
Control Type: Pretimed												
Maximum v/c Ratio: 1.09												

Control Type: Pretimed Maximum v/c Ratio: 1.09 Intersection Signal Delay: 43.7

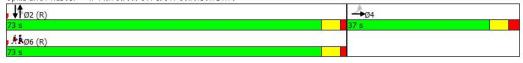
Intersection Signal Delay. 43.7 Intersection LOS: D
Intersection Capacity Utilization 83.6% ICU Level of Service E

Analysis Period (min) 15

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

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

Splits and Phases: 4: 14th Street SW & SW Jefferson Drive



Lane Group	Ø6	
Flash Dont Walk (s)	7.0	
Pedestrian Calls (#/hr)	0	
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

	-	*	1	•	1	-	
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	1+					7	
Traffic Volume (vph)	204	68	0	0	0	17	
Future Volume (vph)	204	68	0	0	0	17	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	14	10	10	10	10	13	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor							
Frt	0.966					0.865	
Fit Protected							
Satd. Flow (prot)	1860	0	0	0	0	1698	
FIt Permitted							
Satd. Flow (perm)	1860	0	0	0	0	1698	
Link Speed (mph)	30			30	30		
Link Distance (ft)	1068			661	401		
Travel Time (s)	24.3			15.0	9.1		
Confl. Peds. (#/hr)		136	136		324		
Confl. Bikes (#/hr)		118					
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	
Heavy Vehides (%)	7%	0%	0%	0%	0%	0%	
Adj. Flow (vph)	255	85	0	0	0	21	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	340	0	0	0	0	21	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(ft)	0	11.50		0	0		
Link Offset(ft)	0			0	-2		
Crosswalk Width(ft)	16			16	24		
Two way Left Turn Lane							
Headway Factor	0.92	1.09	1.09	1.09	1.09	0.96	
Turning Speed (mph)		9	15		15	9	
Sign Control	Free			Free	Stop		
Intersection Summary					700		
Area Type: (Other						
Control Type: Unsignalized							
Intersection Capacity Utilizat	ion 26.6%			IC	U Level	of Service A	
Analysis Period (min) 15							

Lanes, Volumes, Timings 7: 12th Street SW & Independence Ave SW & 12th Street SW Ramp

	→	•	1	-	*_	•	1	ኘ	†	-	\	>
Lane Group	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR	SEL	SER
Lane Configurations	41114		ሻ	414				Ä	1	7	M	
Traffic Volume (vph)	1572	38	427	1675	2	206	118	1	256	383	18	25
Future Volume (vph)	1572	38	427	1675	2	206	118	1	256	383	18	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	11	11	11	13	10
Lane Util. Factor	0.86	0.86	0.86	0.86	0.91	0.91	1.00	1.00	0.95	0.95	1.00	1.00
Ped Bike Factor	1.00		1.00	0.94				0.90	0.92	0.66	0.82	
Frt	0.996		7.00000	0.984					0.963	0.850	0.910	
Fit Protected			0.950	0.999				0.950			0.984	
Satd. Flow (prot)	5893	0	1393	4059	0	0	0	1678	1479	1426	1232	0
Fit Permitted			0.950	0.803				0.950	1110	1120	0.984	-
Satd. Flow (perm)	5893	0	1391	3263	0	0	0	1514	1479	943	1096	0
Right Turn on Red	0000	Yes	1001	0200		Yes	v	1014	1410	Yes	1000	v
Satd. Flow (RTOR)	4	100				100			15	40	104	
Link Speed (mph)	35			35					30	70	30	
Link Distance (ft)	1104			603					153		401	
Travel Time (s)	21.5			11.7					3.5		9.1	
Confl. Peds. (#/hr)	21.0	8	8	11.7	74	74	74		5.5	350	350	
Confl. Bikes (#hr)		21	Ü		20	20	74			5	300	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	4%	4%	0.90	4%	4%	0.90	4%	4%	40%	40%
	1747		474		2			1		426		
Adj. Flow (vph)	1/4/	42		1861	2	229	131		284		20	28
Shared Lane Traffic (%)	4700	0	10%	0420	0	0	0	400	070	22%	00	0
Lane Group Flow (vph)	1789	0	427	2139	0	0	0	132	378	332	60	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Right	Right	Left	Left	Left	Right	Left	Right
Median Width(ft)	0			10					56		13	
Link Offset(ft)	0			0					0		40	
Crosswalk Width(ft)	30			25					28		8	
Two way Left Turn Lane	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.04	4.04	101	0.00	4.00
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.04	1.04	1.04	0.96	1.09
Turning Speed (mph)		9	15		9	9	15	15		9	15	9
Turn Type	NA		Prot	NA			custom	custom	NA	custom	D.Pm	
Protected Phases	6		5	2			10.00	1000000	4	5	2727	
Permitted Phases							48	48	8	48	48	
Minimum Split (s)	20.0		29.5	72.0					38.0	29.5		
Total Split (s)	42.5		29.5	72.0					38.0	29.5		
Total Split (%)	38.6%		26.8%	65.5%					34.5%	26.8%		
Maximum Green (s)	35.5		23.0	65.5					27.5	23.0		
Yellow Time (s)	4.0		4.0	4.0					4.0	4.0		
All-Red Time (s)	3.0		2.5	2.5					6.5	2.5		
Lost Time Adjust (s)	-1.5		-1.5	-1.5					-1.5	-1.5		
Total Lost Time (s)	5.5		5.0	5.0					9.0	5.0		
Lead/Lag	Lead		Lag							Lag		
Lead-Lag Optimize?	Yes		Yes							Yes		
Walk Time (s)	7.0			7.0					4.0			
Flash Dont Walk (s)	6.0			4.0					21.0			
Pedestrian Calls (#/hr)	0			0					0			
Act Effct Green (s)	37.0		24.5	67.0				29.0	29.0	57.5	29.0	

SI South Campus Master Plan 10/20/2017 2040 No Build Condition PM Peak Hour Stantec

Synchro 9 Report Page 8



	*7		
Lane Group	SER2	Ø8	
Lane Configurations			
Traffic Volume (vph)	11		
Future Volume (vph)	11		
Ideal Flow (vphpl)	1900		
Lane Width (ft)	10		
Lane Util. Factor	1.00		
Ped Bike Factor	1.00		
Frt			
Fit Protected			
Satd. Flow (prot)	0		
Fit Permitted	• •		
Satd. Flow (perm)	0		
Right Turn on Red	Yes		
Satd. Flow (RTOR)	160		
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)	70		
Confl. Peds. (#/hr)	73 9		
Confl. Bikes (#/hr)	-		
Peak Hour Factor	0.90		
Heavy Vehicles (%)	0%		
Adj. Flow (vph)	12		
Shared Lane Traffic (%)			
Lane Group Flow (vph)	0		
Enter Blocked Intersection	No		
Lane Alignment	Right		
Median Width(ft)			
Link Offset(ft)			
Crosswalk Width(ft)			
Two way Left Turn Lane			
Headway Factor	1.09		
Turning Speed (mph)	9		
Turn Type			
Protected Phases		8	
Permitted Phases			
Minimum Split (s)		38.0	
Total Split (s)		38.0	
Total Split (%)		35%	
Maximum Green (s)		31.5	
Yellow Time (s)		4.0	
All-Red Time (s)		2.5	
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Walk Time (s)			
Flash Dont Walk (s)			
Pedestrian Calls (#/hr)			
Act Effet Green (s)			
, iot Ellot Grooti (a)			

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Lane Group	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR	SEL	SER
Actuated g/C Ratio	0.34		0.22	0.61				0.26	0.26	0.52	0.26	
v/c Ratio	0.90		1.38	1.46				0.33	0.94	0.54	0.16	
Control Delay	35.1		212.5	231.7				23.2	60.5	5.1	3.8	
Queue Delay	0.0		0.2	0.0				7.7	16.6	0.3	0.0	
Total Delay	35.1		212.8	231.7				30.9	77.1	5.5	3.8	
LOS	D		F	F				С	Е	Α	Α	
Approach Delay	35.1			228.6					41.6		3.8	
Approach LOS	D			F					D		Α	
Queue Length 50th (ft)	357		~460	~793				75	266	18	0	
Queue Length 95th (ft)	m375		m#623	#901				132	#467	57	m2	
Internal Link Dist (ft)	1024			523					73		321	
Turn Bay Length (ft)												
Base Capacity (vph)	1984		310	1469				399	400	619	365	
Starvation Cap Reductn	0		0	0				222	30	53	0	
Spillback Cap Reductn	0		6	6				0	0	0	3	
Storage Cap Reductn	0		0	0				0	0	0	0	
Reduced wc Ratio	0.90		1.40	1.46				0.75	1.02	0.59	0.17	

Intersection Summary

Area Type: Other

Cycle Length: 110 Actuated Cycle Length: 110

Offset: 4 (4%), Referenced to phase 2:WBT and 6:EBTL, Start of Green

Natural Cycle: 140

Control Type: Pretimed

Maximum v/c Ratio: 1.46

Intersection Signal Delay: 130.2 Intersection Capacity Utilization 127.0% Intersection LOS: F

ICU Level of Service H

Analysis Period (min) 15

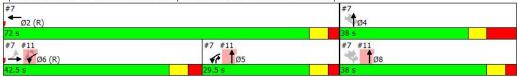
Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

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

Splits and Phases: 7: 12th Street SW & Independence Ave SW & 12th Street SW Ramp





Lane Group	SER2	Ø8	
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

3	→	•	•	-	1	~		
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø3	
Lane Configurations	1117-		0.0.0.0.0.0.0	ना	*	7		
Traffic Volume (vph)	1898	75	62	2025	285	86		
Future Volume (vph)	1898	75	62	2025	285	86		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Storage Length (ft)		0	0	377337/	0	210		
Storage Lanes		0	0		1	1		
Taper Length (ft)		18	100		100			
Lane Util. Factor	0.86	0.86	0.86	0.86	1.00	1.00		
Ped Bike Factor	1.00	0.00	0.00	0.00	0.73	1.00		
Frt	0.994					0.850		
Fit Protected	0.00			0.999	0.950	0.000		
Satd. Flow (prot)	5858	0	0	5860	1685	1507		
Flt Permitted	0000		9	0.748	0.950	1007		
Satd. Flow (perm)	5858	0	0	4387	1226	1507		
Right Turn on Red	0000	Yes	J	.50/	LLU	Yes		
Satd. Flow (RTOR)	10					42		
Link Speed (mph)	35			35	25	12		
Link Distance (ft)	603			540	714			
Travel Time (s)	11.7			10.5	19.5			
Confl. Peds. (#/hr)	11.7	26	26	10.0	198			
Confl. Bikes (#hr)		18	20		100			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91		
Heavy Vehicles (%)	3%	3%	4%	4%	0.91	0%		
Adj. Flow (vph)	2086	82	68	2225	313	95		
Shared Lane Traffic (%)	2000	02	00	2223	313	90		
Lane Group Flow (vph)	2168	0	0	2293	313	95		
Enter Blocked Intersection	No	No	No	No No	No	No No		
Lane Alignment	Left	Right	Left	Left	Left	Right		
Median Width(ft)	Leit 0	Rigill	Leit	Leit	60	rigit		
Link Offset(ft)	0			0	-10			
Secretary and the second second	30			10	-10			
Crosswalk Width(ft)	30			10	10			
Two way Left Turn Lane	1.00	1.00	1.00	1.00	1.00	1.00		
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09		
Turning Speed (mph)	NIA	9	15	A14	15			
Turn Type	NA		pm+pt	NA	Prot	pm+ov	2	
Protected Phases	2		9	6	4	9	3	
Permitted Phases	50.5		6		00.0	4		
Minimum Split (s)	58.5		13.5	58.5	30.0	13.5	4.0	
Total Split (s)	60.5		15.5	60.5	30.0	15.5	4.0	
Total Split (%)	55.0%		14.1%	55.0%	27.3%	14.1%	4%	
Maximum Green (s)	54.0		10.5	54.0	24.5	10.5	2.0	
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0	2.0	
All-Red Time (s)	2.5		1.0	2.5	1.5	1.0	0.0	
Lost Time Adjust (s)	-1.5			-1.5	-1.0	-1.0		
Total Lost Time (s)	5.0			5.0	4.5	4.0		
Lead/Lag					Lag		Lead	
Lead-Lag Optimize?					Yes		Yes	
Walk Time (s)	10.0				6.0		0.0	
Flash Dont Walk (s)	4.0				18.0		2.0	

	-	*	1	+	4	-		
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø3	
Pedestrian Calls (#/hr)	0				0		0	
Act Effct Green (s)	55.5			66.0	25.5	41.5		
Actuated g/C Ratio	0.50			0.60	0.23	0.38		
v/c Ratio	0.73			0.83	0.80	0.16		
Control Delay	24.8			18.2	56.7	14.1		
Queue Delay	0.3			0.0	0.0	0.0		
Total Delay	25.1			18.2	56.7	14.1		
LOS	С			В	Е	В		
Approach Delay	25.1			18.2	46.8			
Approach LOS	С			В	D			
Queue Length 50th (ft)	445			251	209	24		
Queue Length 95th (ft)	m484			284	#347	60		
Internal Link Dist (ft)	523			460	634			
Turn Bay Length (ft)						210		
Base Capacity (vph)	2960			2772	390	594		
Starvation Cap Reductn	269			0	0	0		
Spillback Cap Reductn	0			0	0	0		
Storage Cap Reductn	0			0	0	0		
Reduced v/c Ratio	0.81			0.83	0.80	0.16		
Intersection Summary								
the control of the control	Other							
Cycle Length: 110								
Actuated Cycle Length: 110								
Offset: 38 (35%), Reference	ed to phase	2:EBT ar	nd 6:WBT	L, Start o	f Green			
Natural Cycle: 110								
Control Type: Pretimed								
Maximum v/c Ratio: 0.83								
Intersection Signal Delay. 2					tersection	100000		
Intersection Capacity Utiliza	ation 87.0%			IC	ULevel	of Service I	E	
Analysis Period (min) 15								
# 95th percentile volume of			ieue may	be longer				
Queue shown is maximu		manufacture of the second seco						
m Volume for 95th percer	itile queue i	s metere	d by upstr	eamsign	al.			
Splits and Phases: 9: L'E	nfant Plaza	& Indepe	endence A	√ve SW				
→ø2 (R)						HOY	Ø4	€ Ø9

₩ Ø6 (R)

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	^	7					11			नाा	
Traffic Volume (vph)	53	81	100	0	0	0	0	600	26	29	1167	0
Future Volume (vph)	53	81	100	0	0	0	0	600	26	29	1167	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	10	10	10	11	11	11	11	11	11
Storage Length (ft)	200		200	0		0	0		0	0		0
Storage Lanes	1		1	0		0	0		0	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	0.86	0.86	1.00
Ped Bike Factor	0.83	1.00	0.64					0.97			0.99	
Frt			0.850					0.994			5.55	
Flt Protected	0.950		0.000					0.001			0.999	
Satd. Flow (prot)	1711	1652	1546	0	0	0	0	4465	0	0	5793	0
Fit Permitted	0.950	TOOL	1010				U	1100			0.901	Ŭ
Satd. Flow (perm)	1415	1652	993	0	0	0	0	4465	0	0	5194	0
Right Turn on Red	1410	1002	Yes	U	J	Yes	U	4400	No	U	0104	Yes
Satd. Flow (RTOR)			30			100			140			100
Link Speed (mph)		30	30		30			35			35	
Link Distance (ft)		454			399			424			394	
Travel Time (s)		10.3			9.1			8.3			7.7	
Confl. Peds. (#/hr)	136	10.5	262	262	3.1	136	454	0.0	293	293	1.1	545
and the state of t	100		104	202		130	404		31	290		16
Confl. Bikes (#hr) Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
	2%	15%	1%	0.97	0.97	0.97	0.97	9%	0.97	47%	8%	0.97
Heavy Vehicles (%) Adj. Flow (vph)	55	84	103	0%	0%	0%	0%	619	27	30	1203	0%
	33	04	103	U	U	U	0	019	21	30	1203	Ü
Shared Lane Traffic (%)	55	84	103	0	0	0	0	646	0	0	1233	0
Lane Group Flow (vph)	No	No No	No	No	No	No	No	No	No	No	No	
Enter Blocked Intersection												No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			0			0	
Link Offset(ft)		-15			15			10			-10	
Crosswalk Width(ft)		35			20			35			55	
Two way Left Turn Lane	4.04	4.00	4.04	4.00	4.00	4.00	4.04	4.04	4.04	4.04	101	4.04
Headway Factor	1.04	1.00	1.04	1.09	1.09	1.09	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15	N14	9	15	NIA	9
Turn Type	Perm	NA	Perm					NA		Perm	NA	
Protected Phases		4						2			2	
Permitted Phases	4	20.5	4							2		
Minimum Split (s)	32.5	32.5	32.5					20.0		20.0	20.0	
Total Split (s)	32.5	32.5	32.5					77.5		77.5	77.5	
Total Split (%)	29.5%	29.5%	29.5%					70.5%		70.5%	70.5%	
Maximum Green (s)	26.0	26.0	26.0					71.5		71.5	71.5	
Yellow Time (s)	4.0	4.0	4.0					4.0		4.0	4.0	
All-Red Time (s)	2.5	2.5	2.5					2.0		2.0	2.0	
Lost Time Adjust (s)	-1.5	-1.5	-1.5					-1.5			-1.5	
Total Lost Time (s)	5.0	5.0	5.0					4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	10.0	10.0	10.0					10.0		10.0	10.0	

Lane Group	Ø6	Ø8	
Lane Configurations		100/201	
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Fit Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Confl. Bikes (#hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Enter Blocked Intersection			
Lane Alignment			
Median Width(ft)			
Link Offset(ft)			
Crosswalk Width(ft)			
Two way Left Turn Lane			
Headway Factor			
Turning Speed (mph)			
Turn Type			
Protected Phases	6	8	
Permitted Phases			
Minimum Split (s)	21.0	31.5	
Total Split (s)	77.5	32.5	
Total Split (%)	70%	30%	
Maximum Green (s)	71.5	26.0	
Yellow Time (s)	4.0	4.0	
All-Red Time (s)	2.0	2.5	
Lost Time Adjust (s)	2.0	2.0	
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?	10.0	10.0	
Walk Time (s)	10.0	10.0	

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Flash Dont Walk (s)	16.0	16.0	16.0					4.0		4.0	4.0	
Pedestrian Calls (#/hr)	0	0	0					0		0	0	
Act Effct Green (s)	27.5	27.5	27.5					73.0			73.0	
Actuated g/C Ratio	0.25	0.25	0.25					0.66			0.66	
v/c Ratio	0.16	0.20	0.38					0.22			0.36	
Control Delay	31.2	31.4	25.7					5.6			8.5	
Queue Delay	0.0	0.0	0.0					0.0			0.0	
Total Delay	31.2	31.4	25.7					5.6			8.5	
LOS	С	С	С					А			Α	
Approach Delay		28.9						5.6			8.5	
Approach LOS		С						Α			Α	
Queue Length 50th (ft)	29	45	39					59			101	
Queue Length 95th (ft)	m44	m66	m65					m65			120	
Internal Link Dist (ft)		374			319			344			314	
Turn Bay Length (ft)	200		200									
Base Capacity (vph)	353	413	270					2963			3446	
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	0.16	0.20	0.38					0.22			0.36	
Intersection Summary												
Area Type:	Other											
Cycle Length: 110												
Actuated Cycle Length: 11	0											
Offset: 0 (0%), Referenced	to phase 2:	NBSB an	d 6:Ped,	Start of G	reen							

Natural Cycle: 55 Control Type: Pretimed Maximum v/c Ratio: 0.38 Intersection Signal Delay: 10.0

Intersection LOS: A Intersection Capacity Utilization 63.2% ICU Level of Service B

Analysis Period (min) 15 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: 7th Street SW & SW Jefferson Drive



Lane Group	Ø6	Ø8		
Flash Dont Walk (s)	5.0	15.0		
Pedestrian Calls (#/hr)	0	0		
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (ft)				
Queue Length 95th (ft)				
Internal Link Dist (ft)				
Turn Bay Length (ft)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				
Intersection Summary				

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Lane Group	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER	Ø2
Lane Configurations	ሻ		7		444				77			
Traffic Volume (vph)	0	0	0	0	758	0	0	0	490	0	0	
Future Volume (vph)	0	0	0	0	758	0	0	0	490	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	10	12	10	10	10	10	10	10	10	10	
Storage Length (ft)		0	100	0		0	0		0	0	0	
Storage Lanes		1	1	0		0	0		2	0	0	
Taper Length (ft)		100		100			100			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91	1.00	1.00	0.88	1.00	1.00	
Frt									0.850			
Fit Protected												
Satd. Flow (prot)	1863	0	1863	0	4746	0	0	0	2601	0	0	
Flt Permitted												
Satd. Flow (perm)	1863	0	1863	0	4746	0	0	0	2601	0	0	
Right Turn on Red			Yes			Yes			Yes			
Satd. Flow (RTOR)									1920			
Link Speed (mph)		30			30			30		30		
Link Distance (ft)		212			269			153		170		
Travel Time (s)		4.8			6.1			3.5		3.9		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	0	0	0	824	0	0	0	533	0	0	
Shared Lane Traffic (%)					021							
Lane Group Flow (vph)	0	0	0	0	824	0	0	0	533	0	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right	
Median Width(ft)		12	3		0			25	3	0		
Link Offset(ft)		0			5			3		0		
Crosswalk Width(ft)		16			30			16		16		
Two way Left Turn Lane		1070			17.7							
Headway Factor	1.00	1.09	1.00	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	
Turning Speed (mph)	15	15	9	15		9	15		9	15	9	
Turn Type	Prot		Perm	4.56	NA		,,,,,		Perm	1,0	4.5.i.	
Protected Phases	6				58							2
Permitted Phases			6		7070				6			- ī
Minimum Split (s)	20.0		20.0						20.0			72.0
Total Split (s)	42.5		42.5						42.5			72.0
Total Split (%)	38.6%		38.6%						38.6%			65%
Maximum Green (s)	35.5		35.5						35.5			65.5
Yellow Time (s)	4.0		4.0						4.0			4.0
All-Red Time (s)	3.0		3.0						3.0			2.5
Lost Time Adjust (s)	-1.5		-1.5						0.0			
Total Lost Time (s)	5.5		5.5						7.0			
Lead/Lag	Lead		Lead						Lead			
Lead-Lag Optimize?	Yes		Yes						Yes			
Walk Time (s)	7.0		7.0						7.0			7.0
Flash Dont Walk (s)	6.0		6.0						6.0			4.0
Pedestrian Calls (#/hr)	0.0		0.0						0.0			0
Act Effet Green (s)	v		U		62.5				35.5			U
Actuated g/C Ratio					0.57				0.32			

Lane Group	Ø4	Ø5	Ø8
Lane Configurations	-		
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Fit Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Enter Blocked Intersection			
Lane Alignment			
Median Width(ft)			
Link Offset(ft)			
Crosswalk Width(ft)			
Two way Left Turn Lane			
Headway Factor			
Turning Speed (mph)			
Turn Type			
Protected Phases	4	5	8
Permitted Phases		98.7	11/55
Minimum Split (s)	38.0	29.5	38.0
Total Split (s)	38.0	29.5	38.0
Total Split (%)	35%	27%	35%
Maximum Green (s)	27.5	23.0	31.5
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	6.5	2.5	2.5
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag		Lag	
Lead-Lag Optimize?		Yes	
Walk Time (s)	4.0		
Flash Dont Walk (s)	21.0		
Pedestrian Calls (#/hr)	0		
	U		
Act Effet Green (s)			
Actuated g/C Ratio			

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Lane Group	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER	Ø2
v/c Ratio					0.31				0.25			
Control Delay					12.8				1.7			
Queue Delay					0.0				12.8			
Total Delay					12.8				14.6			
LOS					В				В			
Approach Delay					12.8			14.6				
Approach LOS					В			В				
Queue Length 50th (ft)					105				9			
Queue Length 95th (ft)					131				m0			
Internal Link Dist (ft)		132			189			73		90		
Turn Bay Length (ft)												
Base Capacity (vph)					2696				2139			
Starvation Cap Reductn					0				1582			
Spillback Cap Reductn					393				0			
Storage Cap Reductn					0				0			
Reduced v/c Ratio					0.36				0.96			
Intersection Summary												
Area Type:	Other											
Cycle Length: 110												
Actuated Cycle Length: 110)											
Offset: 4 (4%), Referenced	to phase 2:	WBT and	6:EBTL,	Start of 0	Green							
Natural Cycle: 140												
Control Type: Pretimed												
Maximum v/c Ratio: 1.46												
Intersection Signal Delay, 1	3.5			Ir	ntersection	LOS: B						
Intersection Capacity Utiliza	ation 23.0%			10	CU Level o	of Service .	A					

Intersection Capacity Utilization 23.0% ICU
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 11: 12th Street SW



Lane Group	Ø4	Ø5	Ø8
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			
Intersection Summary			

Lanes, Volumes, Timings 14: 9th Street SW/Smithsonian Driveway & Independence Ave SW

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations		411P		4940000	नाक				र्भ	7		4
Traffic Volume (vph)	0	1931	53	46	1850	0	32	237	0	229	0	0
Future Volume (vph)	0	1931	53	46	1850	0	32	237	0	229	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.86	0.86	0.86	0.86	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99			1.00				0.80			
Frt		0.996								0.850		
Flt Protected					0.999				0.950			
Satd. Flow (prot)	0	5923	0	0	5921	0	0	0	1627	1492	0	1773
Flt Permitted					0.792				0.757			
Satd. Flow (perm)	0	5923	0	0	4693	0	0	0	1032	1492	0	1773
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)		7								239		
Link Speed (mph)		35			35				30			15
Link Distance (ft)		540			606				566			305
Travel Time (s)		10.5			11.8				12.9			13.9
Confl. Peds. (#/hr)	175		134	134		175	85	85				
Confl. Bikes (#hr)			9			21						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	2%	2%	0%	3%	0%	0%	4%	0%	1%	0%	0%
Adj. Flow (vph)	0	2011	55	48	1927	0	33	247	0	239	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2066	0	0	1975	0	0	0	280	239	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	R NA	Left	Left	Right	Left	Left
Median Width(ft)		0			0				90			0
Link Offset(ft)		0			0				5			-70
Crosswalk Width(ft)		45			20				20			20
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (mph)	15		9	15		9	9	15		9	15	-
Turn Type		NA		pm+pt	NA			Perm	NA	Over		
Protected Phases		2		1	6				8	1		8
Permitted Phases	2			6				8			8	
Minimum Split (s)	30.5	30.5		10.5	25.5			30.5	30.5	10.5	30.5	30.5
Total Split (s)	53.0	53.0		11.0	64.0			31.0	31.0	11.0	31.0	31.0
Total Split (%)	53.0%	53.0%		11.0%	64.0%			31.0%	31.0%	11.0%	31.0%	31.0%
Maximum Green (s)	43.5	43.5		5.5	58.5			25.5	25.5	5.5	25.5	25.5
Yellow Time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	5.5	5.5		1.5	1.5			1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)		-1.5			0.0				0.0	0.0		0.0
Total Lost Time (s)		8.0			5.5				5.5	5.5		5.5
Lead/Lag	Lead	Lead		Lag				Lag	Lag	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes				Yes	Yes	Yes	Yes	Yes
Walk Time (s)	10.0	10.0			10.0			5.0	5.0		5.0	5.0
Flash Dont Walk (s)	10.0	10.0			10.0			20.0	20.0		20.0	20.0
Pedestrian Calls (#/hr)	0	0			0			0	0		0	0
Act Effct Green (s)		45.0			58.5				25.5	5.5		
Actuated g/C Ratio		0.45			0.58				0.26	0.06		

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	4	
Lane Group	SBR	Ø7
Land Configurations		40000
Traffic Volume (vph)	0	
Future Volume (vph)	0	
Ideal Flow (vphpl)	1900	
Lane Util, Factor	1.00	
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)	0	
Flt Permitted		
Satd. Flow (perm)	0	
Right Turn on Red	Yes	
Satd. Flow (RTOR)	100	
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor	0.96	
Heavy Vehicles (%)	0.96	
Adj. Flow (vph)	076	
Shared Lane Traffic (%)	U	
Lane Group Flow (vph)	0	
Enter Blocked Intersection	No	
Lane Alignment	Right	
SERVICE SERVIC	rugiit	
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane	1.09	
Headway Factor	1.09	
Turning Speed (mph)	9	
Turn Type		7
Protected Phases		7
Permitted Phases		5.0
Minimum Split (s)		5.0
Total Split (s)		5.0
Total Split (%)		5%
Maximum Green (s)		3.0
Yellow Time (s)		2.0
All-Red Time (s)		0.0
Lost Time Adjust (s)		
Total Lost Time (s)		-
Lead/Lag		Lead
Lead-Lag Optimize?		Yes
Walk Time (s)		
Flash Dont Walk (s)		
Pedestrian Calls (#/hr)		
Act Effct Green (s)		
Actuated g/C Ratio		

14: 9th Street SW/Smithsonian Driveway & Independence Ave SW

	•	-	*	1	-	•	₽	1	Ť	1	1	Į.
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
v/c Ratio		0.77			0.70				1.06	0.78		
Control Delay		25.6			16.6				111.4	24.7		
Queue Delay		0.0			0.0				0.0	0.0		
Total Delay		25.6			16.6				111.4	24.7		
LOS		С			В				F	С		
Approach Delay		25.6			16.6				71.5			
Approach LOS		С			В				Е			
Queue Length 50th (ft)		312			212				~198	0		
Queue Length 95th (ft)		361			246				#359	#110		
Internal Link Dist (ft)		460			526				486			225
Turn Bay Length (ft)												
Base Capacity (vph)		2669			2812				263	307		
Starvation Cap Reductn		0			0				0	0		
Spillback Cap Reductn		0			0				0	0		
Storage Cap Reductn		0			0				0	0		
Reduced v/c Ratio		0.77			0.70				1.06	0.78		
Intersection Summary	Other											

Other

Area Type: Cycle Length: 100

Actuated Cycle Length: 100

Offset: 3 (3%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 90 Control Type: Pretimed

Maximum v/c Ratio: 1.06 Intersection Signal Delay: 26.9

Intersection Capacity Utilization 83.4%

Intersection LOS: C ICU Level of Service E

Analysis Period (min) 15

Volume exceeds capacity, queue is theoretically infinite.

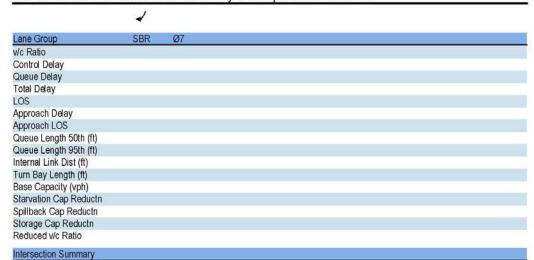
Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 14: 9th Street SW/S mithsonian Driveway & Independence Ave SW





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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		नाा			नााः		7	^^		ሻ	**	
Traffic Volume (vph)	141	1673	346	23	1392	152	180	333	141	270	673	324
Future Volume (vph)	141	1673	346	23	1392	152	180	333	141	270	673	324
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	11	11	11	11	11	11
Storage Length (ft)	0		0	0		0	80		0	0		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	0.86	0.86	0.86	0.86	0.86	0.86	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor		0.95			0.97		0.92	0.89		0.84	0.88	- National
Frt		0.976			0.985			0.955			0.951	
Flt Protected		0.997			0.999		0.950			0.950	2000	
Satd. Flow (prot)	0	5532	0	0	5629	0	1662	3966	0	1616	3924	0
Flt Permitted	17.00	0.707			0.837		0.269			0.372		
Satd. Flow (perm)	0	3919	0	0	4716	0	431	3966	0	532	3924	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		5	100		27	, , ,			1.10		126	
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		606			437			393			424	
Travel Time (s)		11.8			8.5			7.7			8.3	
Confl. Peds. (#/hr)	219	11.0	222	222	0.0	219	429	5.55	444	444	0.0	429
Confl. Bikes (#/hr)	210		7	666		9	120		18	· · · · · · · · · · · · · · · · · · ·		17
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	4%	2%	2%	11%	2%	15%	5%	6%	10%	8%	9%	4%
Parking (#/hr)	170	2/0	270	1170	270	1070	070	070	1070	070	070	0
Adj. Flow (vph)	144	1707	353	23	1420	155	184	340	144	276	687	331
Shared Lane Traffic (%)	134	1707	000	20	1120	100	101	010	1.1.1	210	007	001
Lane Group Flow (vph)	0	2204	0	0	1598	0	184	484	0	276	1018	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	Lon	0	rugin	Lon	0	rugin	Lon	11	ragin	Lon	11	rugin
Link Offset(ft)		5			0			-6			5	
Crosswalk Width(ft)		32			30			22			35	
Two way Left Turn Lane		OZ.			00			22			00	
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15	1.00	9	15	1.00	9	15	1.04	9	15	1.04	9
Turn Type	pm+pt	NA	9	Perm	NA	~	Perm	NA	J	pm+pt	NA	~
Protected Phases	5	2		1 01111	6		1 61111	4		3	8	
Permitted Phases	2	2		6	U		4	7		8	Ü	
Minimum Split (s)	10.5	31.5		28.5	28.5		29.5	29.5		10.0	32.5	
Total Split (s)	11.0	60.0		49.0	49.0		36.5	36.5		13.5	50.0	
Total Split (%)	10.0%	54.5%		44.5%	44.5%		33.2%	33.2%		12.3%	45.5%	
Maximum Green (s)	5.5	53.5		42.5	42.5		30.0	30.0		8.5	43.5	
Yellow Time (s)	4.0	4.0		4.0	42.0		4.0	4.0		4.0	43.5	
All-Red Time (s)	1.5	2.5		2.5	2.5		2.5	2.5		1.0	2.5	
Lost Time Adjust (s)	1.3	-1.5		2.0	-1.5		-1.5	-1.5		-1.5	-1.5	
		5.0			5.0		5.0	5.0		3.5	5.0	
Total Lost Time (s)	Lond	0.0		1							0.0	
Lead/Lag	Lead			Lag	Lag		Lag	Lag		Lead		
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes		Yes		

22: 7th Street SW & Independence Ave SW

	•	-	•	1	-	•	4	Ť	1	-	Ţ	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Walk Time (s)		7.0		4.0	4.0		4.0	4.0			7.0	
Flash Dont Walk (s)		18.0		18.0	18.0		19.0	19.0			19.0	
Pedestrian Calls (#/hr)		0		0	0		0	0			0	
Act Effct Green (s)		55.0			44.0		31.5	31.5		46.5	45.0	
Actuated g/C Ratio		0.50			0.40		0.29	0.29		0.42	0.41	
v/c Ratio		1.08			0.84		1.50	0.43		0.85	0.61	
Control Delay		70.6			34.3		292.0	33.3		64.1	29.8	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.2	
Total Delay		70.6			34.3		292.0	33.3		64.1	30.0	
LOS		Е			С		F	С		Е	С	
Approach Delay		70.6			34.3			104.6			37.3	
Approach LOS		Е			С			F			D	
Queue Length 50th (ft)		~418			287		~180	101		170	182	
Queue Length 95th (ft)		#541			339		#323	136		#261	229	
Internal Link Dist (ft)		526			357			313			344	
Turn Bay Length (ft)							80					
Base Capacity (vph)		2049			1902		123	1135		323	1679	
Starvation Cap Reductn		0			0		0	0		0	128	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		1.08			0.84		1.50	0.43		0.85	0.66	
English on a garden season of the control of												

Intersection Summary

Area Type:

Other

Cycle Length: 110
Actuated Cycle Length: 110

Offset: 32 (29%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 100
Control Type: Pretimed
Maximum v/c Ratio: 1.50

Intersection Signal Delay: 57.0 Intersection LOS: E Intersection Capacity Utilization 107.3% ICU Level of Service G

Analysis Period (min) 15

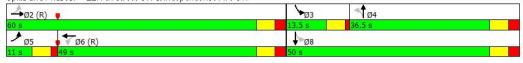
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 22: 7th Street SW & Independence Ave SW



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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		444			441	7		†	7	ሻ	444	
Traffic Volume (vph)	9	670	87	2	543	197	0	1299	275	128	1009	87
Future Volume (vph)	9	670	87	2	543	197	0	1299	275	128	1009	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	10	10	10	10	10	10	10	10	10	10
Storage Length (ft)	0		0	0		100	0		0	0		0
Storage Lanes	0		0	0		1	0		1	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	0.91	0.91	0.91	0.91	0.91	1.00	1.00	0.91	1.00	1.00	0.91	0.91
Ped Bike Factor		0.95			1.00	0.68			0.65	0.97	0.96	Nation Co.
Frt		0.983				0.850			0.850		0.988	
Flt Protected		0.999							00000	0.950	2000	
Satd. Flow (prot)	0	4590	0	0	4604	1478	0	4746	1463	1589	4466	0
Fit Permitted	-	0.930			0.937				- 199	0.114		,
Satd. Flow (perm)	0	4266	0	0	4312	1000	0	4746	955	185	4466	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				186			109		3	
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		370			1104			509			377	
Travel Time (s)		7.2			21.5			11.6			8.6	
Confl. Peds. (#/hr)	366	1.2	738	738	21.0	366	831	11.0	426	426	0.0	831
Confl. Bikes (#/hr)	000		14	7.00		13	001		720	120		6
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	29%	2%	3%	50%	5%	2%	0%	2%	3%	6%	3%	7%
Adj. Flow (vph)	10	720	94	2	584	212	0	1397	296	138	1085	94
Shared Lane Traffic (%)	10	720	5-1		004	212	U	1007	200	100	1000	54
Lane Group Flow (vph)	0	824	0	0	586	212	0	1397	296	138	1179	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	Leit	0	ragiit	Leit	0	ragiit	Leit	4	ragiit	Leit	10	ragiit
Link Offset(ft)		0			0			5			0	
Crosswalk Width(ft)		20			30			30			26	
Two way Left Turn Lane		20			30			30			20	
Headway Factor	1.09	1.04	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (mph)	1.09	1.04	9	1.09	1.09	9	1.09	1.08	9	1.09	1.08	1.09
Turn Type	Perm	NA	9	Perm	NA	Perm	15	NA	Perm	pm+pt	NA	9
Protected Phases	reilli	4		reilli	8	reilli		2	reilli	1	6	
Permitted Phases	4	4		8	0	8		2	2	6	0	
	36.5	36.5		36.5	36.5	36.5		31.5	31.5	10.5	31.5	
Minimum Split (s)	37.0	37.0		37.0	37.0	37.0		48.0	48.0	15.0	63.0	
Total Split (s)												
Total Split (%)	37.0%	37.0% 30.5		37.0% 30.5	37.0% 30.5	37.0% 30.5		48.0%	48.0%	15.0%	63.0%	
Maximum Green (s)	30.5			75777				41.5	41.5	8.5	56.5	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5	2.5		2.5	2.5	2.5	2.5	
Lost Time Adjust (s)		-1.5			-1.5	-1.5		-1.5	-1.5	-1.0	-1.5	
Total Lost Time (s)		5.0			5.0	5.0		5.0	5.0	5.5	5.0	
Lead/Lag								Lead	Lead	Lag		
Lead-Lag Optimize?								Yes	Yes	Yes		
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		6.0	6.0		6.0	

2: 14th Street SW & Independence Ave SW

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Flash Dont Walk (s)	23.0	23.0		23.0	23.0	23.0		19.0	19.0		19.0	
Pedestrian Calls (#/hr)	0	0		0	0	0		0	0		0	
Act Effct Green (s)		32.0			32.0	32.0		43.0	43.0	57.5	58.0	
Actuated g/C Ratio		0.32			0.32	0.32		0.43	0.43	0.58	0.58	
v/c Ratio		0.60			0.42	0.48		0.68	0.63	0.58	0.46	
Control Delay		30.9			37.9	19.0		25.2	20.5	28.8	9.1	
Queue Delay		0.0			0.0	0.1		0.9	0.0	0.0	0.1	
Total Delay		30.9			37.9	19.1		26.1	20.5	28.8	9.2	
LOS		С			D	В		С	С	С	А	
Approach Delay		30.9			32.9			25.1			11.2	
Approach LOS		С			С			С			В	
Queue Length 50th (ft)		160			138	57		256	89	28	89	
Queue Length 95th (ft)		204			175	m108		309	187	86	101	
Internal Link Dist (ft)		290			1024			429			297	
Turn Bay Length (ft)						100						
Base Capacity (vph)		1365			1379	446		2040	472	239	2591	
Starvation Cap Reductn		0			0	0		0	0	0	289	
Spillback Cap Reductn		0			0	13		347	0	0	0	
Storage Cap Reductn		0			0	0		0	0	0	0	
Reduced v/c Ratio		0.60			0.42	0.49		0.83	0.63	0.58	0.51	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 17 (17%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

Natural Cycle: 80 Control Type: Pretimed Maximum v/c Ratio: 0.68

Intersection Signal Delay: 23.5 Intersection LOS: C Intersection Capacity Utilization 87.6% ICU Level of Service E

Analysis Period (min) 15

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

Splits and Phases: 2: 14th Street SW & Independence Ave SW



	•	→	*	1	•		1	†	-	-	1	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	7.		200000000				^^		ሻ	^ ^	
Traffic Volume (vph)	73	88	86	0	0	0	0	1401	104	86	1138	0
Future Volume (vph)	73	88	86	0	0	0	0	1401	104	86	1138	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	10	10	10	10	10	12	12	10	10	10
Storage Length (ft)	0		0	0		0	0		20	170		0
Storage Lanes	1		0	0		0	0		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	1.00
Ped Bike Factor	0.53	0.84						0.96		0.96		
Frt		0.926						0.990				
Flt Protected	0.950	2012								0.950		
Satd. Flow (prot)	1517	1357	0	0	0	0	0	4759	0	1620	4700	0
FIt Permitted	0.950				10-20-11					0.113		
Satd. Flow (perm)	811	1357	0	0	0	0	0	4759	0	186	4700	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)								21				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		257			1068			377			341	
Travel Time (s)		5.8			24.3			8.6			7.8	
Confl. Peds. (#/hr)	1051	1,515	248	248	= 0.5/	1051	680	7:51	329	329	,,,,	680
Confl. Bikes (#hr)	,,,,,		118	2.10					25	020		24
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
Heavy Vehicles (%)	19%	15%	3%	0%	0%	0%	0%	3%	6%	4%	3%	0%
Adj. Flow (vph)	77	93	91	0	0	0	0	1475	109	91	1198	0
Shared Lane Traffic (%)					151	- 5		1.11/3				
Lane Group Flow (vph)	77	184	0	0	0	0	0	1584	0	91	1198	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	Lon	15	rugiit	Lon	12	, agiit	Lon	0	rugiii	Lon	10	, ag.ii
Link Offset(ft)		0			15			0			5	
Crosswalk Width(ft)		30			35			37			35	
Two way Left Turn Lane		00			00			01			00	
Headway Factor	1.00	1.00	1.09	1.09	1.09	1.09	1.09	1.00	1.00	1.09	1.09	1.09
Turning Speed (mph)	15	1.00	9	15	1.00	9	15	1.00	9	15	1.00	9
Turn Type	Perm	NA		10				NA	, i	Perm	NA	Ĭ
Protected Phases	1 01111	4						2		1 01111	2	
Permitted Phases	4									2	_	
Minimum Split (s)	34.5	34.5						20.5		20.5	20.5	
Total Split (s)	35.0	35.0						65.0		65.0	65.0	
Total Split (%)	35.0%	35.0%						65.0%		65.0%	65.0%	
Maximum Green (s)	28.5	28.5						59.5		59.5	59.5	
Yellow Time (s)	4.0	4.0						4.0		4.0	4.0	
All-Red Time (s)	2.5	2.5						1.5		1.5	1.5	
Lost Time Adjust (s)	-1.5	-1.5						-1.5		-1.5	-1.5	
Total Lost Time (s)	5.0	5.0						4.0		4.0	4.0	
Lead/Lag	0.0	0.0						4.0		4.0	4.0	
Lead/Lag Optimize?												
Walk Time (s)	10.0	10.0						10.0		10.0	10.0	
Many Time (9)	10.0	10.0						10.0		10.0	10.0	

Lane Group	Ø6	
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Ideal Flow (vphpl)		
Lane Width (ft)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Fit Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Speed (mph) Link Distance (ft)		
Travel Time (s)		
. Bellevia de la companione de la compan		
Confl. Peds. (#/hr)		
Confl. Bikes (#hr) Peak Hour Factor		
Heavy Vehicles (%)		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Turn Type		
Protected Phases	6	
Permitted Phases		
Minimum Split (s)	22.5	
Total Split (s)	65.0	
Total Split (%)	65%	
Maximum Green (s)	59.5	
Yellow Time (s)	4.0	
All-Red Time (s)	1.5	
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Walk Time (s)	10.0	

Lanes, Volumes, Timings 4: 14th Street SW & SW Jefferson Drive

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Flash Dont Walk (s)	18.0	18.0						5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0						0		0	0	
Act Effct Green (s)	30.0	30.0						61.0		61.0	61.0	
Actuated g/C Ratio	0.30	0.30						0.61		0.61	0.61	
v/c Ratio	0.32	0.45						0.54		0.81	0.42	
Control Delay	31.6	32.7						7.3		66.1	10.8	
Queue Delay	0.0	0.0						1.4		0.0	0.0	
Total Delay	31.6	32.7						8.7		66.1	10.8	
LOS	С	С						Α		Е	В	
Approach Delay		32.4						8.7			14.7	
Approach LOS		С						А			В	
Queue Length 50th (ft)	38	95						311		41	135	
Queue Length 95th (ft)	81	161						387		#147	165	
Internal Link Dist (ft)		177			988			297			261	
Turn Bay Length (ft)										170		
Base Capacity (vph)	243	407						2911		113	2867	
Starvation Cap Reductn	0	0						1050		0	0	
Spillback Cap Reductn	0	0						0		0	0	
Storage Cap Reductn	0	0						0		0	0	
Reduced v/c Ratio	0.32	0.45						0.85		0.81	0.42	
Intersection Summary												
Area Type:	Other											
Cycle Length: 100												
Actuated Cycle Length: 10	00											
Offset: 31 (31%), Referen	ced to phase	2:NBSB	and 6:Pe	d, Start o	f Green							
Natural Cycle: 90												
Control Type: Pretimed												
Maximum v/c Ratio: 0.81												
Intersection Signal Delay:	13.1			Ir	tersection	LOS: B						
Intersection Capacity Utilia	zation 72.5%			IC	U Level	of Service	C					
Analysis Period (min) 15												
# 95th percentile volume			eue may	be longe	r.							
Queue shown is maxin	num after two	cycles.										

Splits and Phases: 4: 14th Street SW & SW Jefferson Drive



Lane Group	Ø6		
Flash Dont Walk (s)	7.0		
Pedestrian Calls (#/hr)	0		
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			
Intersection Summary			

	-	*	1	•	1	-	
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	1.					7	
Traffic Volume (vph)	229	34	0	0	0	55	
Future Volume (vph)	229	34	0	0	0	55	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	14	10	10	10	10	13	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor							
Frt	0.982					0.865	
FIt Protected							
Satd. Flow (prot)	1846	0	0	0	0	1587	
FIt Permitted							
Satd. Flow (perm)	1846	0	0	0	0	1587	
Link Speed (mph)	30			30	30		
Link Distance (ft)	1068			661	401		
Travel Time (s)	24.3			15.0	9.1		
Confl. Peds. (#/hr)		393					
Confl. Bikes (#/hr)		107					
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	
Heavy Vehides (%)	9%	0%	2%	2%	0%	7%	
Adj. Flow (vph)	266	40	0	0	0	64	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	306	0	0	0	0	64	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(ft)	0			0	0		
Link Offset(ft)	0			0	-2		
Crosswalk Width(ft)	16			16	24		
Two way Left Turn Lane							
Headway Factor	0.92	1.09	1.09	1.09	1.09	0.96	
Turning Speed (mph)		9	15		15	9	
Sign Control	Free			Free	Stop		
and the second							
Intersection Summary	S.II.						
	Other						
Control Type: Unsignalized							
Intersection Capacity Utilizat	ion 25.4%			IC	U Level	of Service A	
Analysis Period (min) 15							

	3	•	-	•	•	•	*_	•	1	ኘ	†	-
Lane Group	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR
Lane Configurations			414		ሻ	444				ħ	7	7
Traffic Volume (vph)	31	54	895	93	74	624	37	102	98	11	147	191
Future Volume (vph)	31	54	895	93	74	624	37	102	98	11	147	191
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	11	11	11
Storage Length (ft)		0		0	0		100			0		0
Storage Lanes		0		0	1		1			1		1
Taper Length (ft)		100			100		-			100		
Lane Util. Factor	0.91	0.91	0.91	0.91	0.86	0.86	0.91	0.91	1.00	1.00	0.95	0.95
Ped Bike Factor	0.01	0.01	0.95	0.01	0.92	0.85	0.01	0.01	1.00	0.65	0.99	0.96
Frt			0.987		0.02	0.973				0.00	0.973	0.850
Flt Protected			0.996		0.950	0.070				0.950	0.070	0.000
Satd. Flow (prot)	0	0	4582	0	1449	3780	0	0	0	1745	1672	1483
Fit Permitted	U	U	0.759	U	0.950	0.930	U	U		0.950	1072	1400
Satd. Flow (perm)	0	0	3433	0	1329	3514	0	0	0	1135	1672	1425
Right Turn on Red	U	U	3433	Yes	1323	3314	U	Yes	U	1133	10/2	Yes
			20	168		45		162			44	
Satd. Flow (RTOR)			20 35			35					11	44
Link Speed (mph)											30	
Link Distance (ft)			1104			603					153	
Travel Time (s)	000	000	21.5	070	070	11.7	000	000	467		3.5	
Confl. Peds. (#/hr)	233	233		370	370		233	233	457			23
Confl. Bikes (#/hr)	100000			27		li de li este	30	30				
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%
Adj. Flow (vph)	33	58	962	100	80	671	40	110	105	12	158	205
Shared Lane Traffic (%)					10%							17%
Lane Group Flow (vph)	0	0	1153	0	72	829	0	0	0	117	193	170
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Left	Right	Right	Left	Left	Left	Right
Median Width(ft)			0			10					56	
Link Offset(ft)			0			0					0	
Crosswalk Width(ft)			30			25					28	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.04	1.04	1.04
Turning Speed (mph)	15	15		9	15		9	9	15	15		9
Turn Type	Perm	Perm	NA		Prot	NA			custom	custom	NA	custom
Protected Phases			6		5	2					4	5
Permitted Phases	6	6							48	48	8	48
Minimum Split (s)	20.0	20.0	20.0		12.5	63.0					37.0	12.5
Total Split (s)	50.5	50.5	50.5		12.5	63.0					37.0	12.5
Total Split (%)	50.5%	50.5%	50.5%		12.5%	63.0%					37.0%	12.5%
Maximum Green (s)	43.5	43.5	43.5		6.0	56.5					26.5	6.0
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0					4.0	4.0
All-Red Time (s)	3.0	3.0	3.0		2.5	2.5					6.5	2.5
Lost Time Adjust (s)	0.0	0.0	-1.5		-1.5	-1.5					-1.5	-1.5
Total Lost Time (s)			5.5		5.0	5.0					9.0	5.0
Lead/Lag	Lead	Lead	Lead		Lag	0.0					3.0	Lag
Lead/Lag Optimize?	Yes	Yes	Yes		Yes							Yes
THE COLUMN TWO IS NOT THE WAY AND THE PARTY OF THE PARTY			7.0		168	7.0					4.0	168
Walk Time (s)	7.0	7.0	7.0			7.0					4.0	

SI South Campus Master Plan 10/20/2017 2040 No Build Condition Saturday Peak Ho Stantec

Synchro 9 Report Page 8

	•	\	>	4		
Lane Group	SEL2	SEL	SER	SER2	Ø8	
Lane Configurations		M				
Traffic Volume (vph)	1	20	11	20		
Future Volume (vph)	1	20	11	20		
Ideal Flow (vphpl)	1900	1900	1900	1900		
Lane Width (ft)	10	13	10	10		
Storage Length (ft)	10	0	0	10		
Storage Lanes		1	0			
Taper Length (ft)		100	Ü			
Lane Util. Factor	1.00	1.00	1.00	1.00		
Ped Bike Factor	1.00	0.77	1.00	1.00		
Frt		0.919				
Fit Protected		0.980				
Satd. Flow (prot)	0	1394	0	0		
Fit Permitted	U	0.980	U	U		
Satd. Flow (perm)	0	1368	0	0		
Right Turn on Red	U	1300	U	Yes		
Satd. Flow (RTOR)		115		163		
Link Speed (mph)		30				
Link Distance (ft)		401				
Travel Time (s)		9.1				
BIQUOSONA VIRADA PARA VIRADA PARA VIRADA VIR	23	9.1		457		
Confl. Peds. (#/hr)	23			457		
Confl. Bikes (#hr)	0.93	0.02	0.03	0.93		
Peak Hour Factor	0.93	0.93	0.93	0.93		
Heavy Vehicles (%)						
Adj. Flow (vph)	1	22	12	22		
Shared Lane Traffic (%)	^	57		0		
Lane Group Flow (vph)	0	57 No.	0	0		
Enter Blocked Intersection	No	No	No	No		
Lane Alignment	Left	Left	Right	Right		
Median Width(ft)		13				
Link Offset(ft)		40				
Crosswalk Width(ft)		8				
Two way Left Turn Lane	4.00	0.00	4.00	4.00		
Headway Factor	1.09	0.96	1.09	1.09		
Turning Speed (mph)	15	15	9	9		
Turn Type	D.Pm	D.Pm			2411	
Protected Phases					8	
Permitted Phases	48	48			07.0	
Minimum Split (s)					37.0	
Total Split (s)					37.0	
Total Split (%)					37%	
Maximum Green (s)					30.5	
Yellow Time (s)					4.0	
All-Red Time (s)					2.5	
Lost Time Adjust (s)						
Total Lost Time (s)						
Lead/Lag						
Lead-Lag Optimize?						
Walk Time (s)						

7: 12th Street SW & Independence Ave SW & 12th Street SW Ramp

	3	٠	-	*	1	+	*_	•	1	ኘ	1	~
Lane Group	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR
Flash Dont Walk (s)	6.0	6.0	6.0			4.0					21.0	
Pedestrian Calls (#/hr)	0	0	0			0					0	
Act Effct Green (s)			45.0		7.5	58.0				28.0	28.0	39.5
Actuated g/C Ratio			0.45		0.08	0.58				0.28	0.28	0.40
v/c Ratio			0.74		0.67	1.14dr				0.37	0.41	0.29
Control Delay			17.1		79.4	25.6				15.7	13.3	3.6
Queue Delay			0.0		0.0	0.0				3.1	2.8	0.7
Total Delay			17.1		79.4	25.6				18.8	16.1	4.3
LOS			В		Е	С				В	В	Α
Approach Delay			17.1			29.9					12.6	
Approach LOS			В			С					В	
Queue Length 50th (ft)			250		53	104				60	98	4
Queue Length 95th (ft)			313		#131	149				113	167	86
Internal Link Dist (ft)			1024			523					73	
Turn Bay Length (ft)												
Base Capacity (vph)			1555		108	1167				317	476	593
Starvation Cap Reductn			0		0	0				122	186	206
Spillback Cap Reductn			0		0	0				0	0	0
Storage Cap Reductn			0		0	0				0	0	0
Reduced v/c Ratio			0.74		0.67	0.71				0.60	0.67	0.44
Intersection Summary												
Area Type:	Other											
A L. L H- 100												

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 96 (96%), Referenced to phase 2: WBT and 6: EBTL, Start of Green

Natural Cycle: 100 Control Type: Pretimed

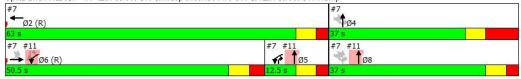
Maximum v/c Ratio: 0.74

Intersection Signal Delay, 20.4 Intersection Capacity Utilization 101.1% Intersection LOS: C ICU Level of Service G

Analysis Period (min) 15

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

Splits and Phases: 7: 12th Street SW & Independence Ave SW & 12th Street SW Ramp



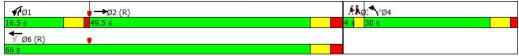
Lanes, Volumes, Timings 7: 12th Street SW & Independence Ave SW & 12th Street SW Ramp

	•	\	7	4				
Lane Group	SEL2	SEL	SER	SER2	Ø8			
Flash Dont Walk (s)								
Pedestrian Calls (#/hr)								
Act Effct Green (s)		28.0						
Actuated g/C Ratio		0.28						
v/c Ratio		0.12						
Control Delay		1.3						
Queue Delay		0.0						
Total Delay		1.3						
LOS		Α						
Approach Delay		1.3						
Approach LOS		Α						
Queue Length 50th (ft)		0						
Queue Length 95th (ft)		m2						
Internal Link Dist (ft)		321						
Turn Bay Length (ft)								
Base Capacity (vph)		465						
Starvation Cap Reductn		0						
Spillback Cap Reductn		0						
Storage Cap Reductn		0						
Reduced v/c Ratio		0.12						
Intersection Summary								

	→	•	•	-	1	~		
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø3	
Lane Configurations	tttp-		Valtomoni	ተተኩ	ሻ	7		_
Traffic Volume (vph)	1071	35	43	805	32	73		
Future Volume (vph)	1071	35	43	805	32	73		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Storage Length (ft)	1000	0	0	1000	0	210		
Storage Lanes		0	0		1	1		
Taper Length (ft)			100		100			
Lane Util. Factor	0.86	0.86	0.91	0.91	1.00	1.00		
Ped Bike Factor	0.98	0.00	0.01	1.00	0.68	1.00		
Frt	0.995			1.00	0.00	0.850		
Fit Protected	0.000			0.997	0.950	0.000		
Satd. Flow (prot)	5807	0	0	4625	1404	1396		
Flt Permitted	0001		7	0.827	0.950	. 500		
Satd. Flow (perm)	5807	0	0	3821	959	1396		
Right Turn on Red	5501	Yes	J	UJL I	500	Yes		
Satd. Flow (RTOR)	8	, 00				51		
Link Speed (mph)	35			35	25	01		
Link Distance (ft)	603			540	714			
Travel Time (s)	11.7			10.5	19.5			
Confl. Peds. (#/hr)	113	375	375	10.0	307			
Confl. Bikes (#hr)		30	0/0		001			
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94		
Heavy Vehicles (%)	2%	11%	11%	4%	20%	8%		
Adj. Flow (vph)	1139	37	46	856	34	78		
Shared Lane Traffic (%)	1139	31	40	000	34	10		
ALTERNATION AND PROTOCOLOGICAL SECURIORISM	1176	0	0	902	34	78		
Lane Group Flow (vph)	No	No	No	No No	No No	No		
Enter Blocked Intersection			Left	Left	Left			
Lane Alignment	Left 0	Right	Left	Len 0	60	Right		
Median Width(ft)				1,100				
Link Offset(ft)	0			0	-10			
Crosswalk Width(ft)	30			10	16			
Two way Left Turn Lane	4.00	4.00	4.00	4.00	4.00	4.00		
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09		
Turning Speed (mph)		9	15		15	9		
Turn Type	NA		pm+pt	NA	Prot	pm+ov		
Protected Phases	2		1	6	4	1	3	
Permitted Phases	00.7		6			4		
Minimum Split (s)	20.5		10.0	16.5	30.0	10.0	4.0	
Total Split (s)	49.5		16.5	66.0	30.0	16.5	4.0	
Total Split (%)	49.5%		16.5%	66.0%	30.0%	16.5%	4%	
Maximum Green (s)	43.0		11.5	59.5	24.5	11.5	2.0	
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0	2.0	
All-Red Time (s)	2.5		1.0	2.5	1.5	1.0	0.0	
Lost Time Adjust (s)	-1.5			-1.5	-1.0	-1.0		
Total Lost Time (s)	5.0			5.0	4.5	4.0		
Lead/Lag	Lag		Lead		Lag	Lead	Lead	
Lead-Lag Optimize?	Yes		Yes		Yes	Yes	Yes	
Walk Time (s)	10.0				6.0			
Flash Dont Walk (s)	4.0				18.0			

	-	7	1	•	1	~	
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø3
Pedestrian Calls (#/hr)	0				0		
Act Effct Green (s)	44.5			61.0	25.5	42.5	
Actuated g/C Ratio	0.44			0.61	0.26	0.42	
v/c Ratio	0.45			0.37	0.09	0.13	
Control Delay	7.9			11.5	29.4	8.3	
Queue Delay	0.0			0.0	0.0	0.0	
Total Delay	7.9			11.5	29.4	8.3	
LOS	А			В	С	Α	
Approach Delay	7.9			11.5	14.7		
Approach LOS	А			В	В		
Queue Length 50th (ft)	44			130	17	10	
Queue Length 95th (ft)	56			171	42	38	
Internal Link Dist (ft)	523			460	634		
Turn Bay Length (ft)						210	
Base Capacity (vph)	2588			2423	358	622	
Starvation Cap Reductn	0			0	0	0	
Spillback Cap Reductn	0			0	0	0	
Storage Cap Reductn	0			0	0	0	
Reduced v/c Ratio	0.45			0.37	0.09	0.13	
Intersection Summary							
Area Type:	Other						
Cycle Length: 100							
Actuated Cycle Length: 10							
Offset: 10 (10%), Referen	ced to phase	2:EBT a	nd 6:WBT	L, Start o	f Green		
Natural Cycle: 65							
Control Type: Pretimed							
Maximum v/c Ratio: 0.45							
Intersection Signal Delay.					tersection		
Intersection Capacity Utiliz	zation 50.7%			IC	ULevel	of Service A	4
Analysis Period (min) 15							

Splits and Phases: 9: L'Enfant Plaza & Independence Ave SW



	٠	→	•	1	-	•	1	†	1	>	ļ	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	^	7					11			ना	
Traffic Volume (vph)	111	91	69	0	0	0	0	575	61	57	421	0
Future Volume (vph)	111	91	69	0	0	0	0	575	61	57	421	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	10	10	10	11	11	11	11	11	11
Storage Length (ft)	200		200	0		0	0		0	0		50
Storage Lanes	1		1	0		0	0		0	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	0.86	0.86	1.00
Ped Bike Factor	0.70		0.49			11.00		0.93			0.97	
Frt	0.10		0.850					0.986			0.01	
Flt Protected	0.950		0.000					0.000			0.994	
Satd. Flow (prot)	1631	1652	1561	0	0	0	0	4338	0	0	5889	0
Fit Permitted	0.950	, JUL	1001			U	J	1000	J	J	0.818	J
Satd. Flow (perm)	1138	1652	764	0	0	0	0	4338	0	0	4677	0
Right Turn on Red	1100	1002	Yes	U	U	Yes	U	4000	No	U	4077	Yes
Satd. Flow (RTOR)			34			100			140			100
Link Speed (mph)		30	34		30			35			35	
Link Distance (ft)		454			399			424			394	
Travel Time (s)		10.3			9.1			8.3			7.7	
Confl. Peds. (#/hr)	270	10.0	1133	270	3.1	1133	580	0.0	493	493	1.1	580
and the second s	210		53	210		1100	300		493	490		24
Confl. Bikes (#hr) Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
	7%	15%	0.90	0.90	0.90	0.90	0.90	4%	22%	4%	7%	0.90
Heavy Vehicles (%) Adj. Flow (vph)	113	93	70	0%	0%	0%	0%	587	62	58	430	0%
	113	93	70	U	U	U	0	307	02	50	450	Ü
Shared Lane Traffic (%)	113	93	70	0	0	0	0	649	0	0	488	0
Lane Group Flow (vph)	No	No	No.	No	No	No	No	No No	No	No	No No	
Enter Blocked Intersection												No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			0			0	
Link Offset(ft)		-15			15			10			-10	
Crosswalk Width(ft)		35			20			35			55	
Two way Left Turn Lane		4.00	4.04	4.00	4.00	4.00		404	4.04			
Headway Factor	1.04	1.00	1.04	1.09	1.09	1.09	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	Perm					NA		Perm	NA	
Protected Phases		4						2			2	
Permitted Phases	4		4							2		
Minimum Split (s)	32.5	32.5	32.5					20.0		20.0	20.0	
Total Split (s)	32.5	32.5	32.5					67.5		67.5	67.5	
Total Split (%)	32.5%	32.5%	32.5%					67.5%		67.5%	67.5%	
Maximum Green (s)	26.0	26.0	26.0					61.5		61.5	61.5	
Yellow Time (s)	4.0	4.0	4.0					4.0		4.0	4.0	
All-Red Time (s)	2.5	2.5	2.5					2.0		2.0	2.0	
Lost Time Adjust (s)	-1.5	-1.5	-1.5					-1.5			-1.5	
Total Lost Time (s)	5.0	5.0	5.0					4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	10.0	10.0	10.0					10.0		10.0	10.0	

Lane Group	Ø6	Ø8	
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Fit Protected			
Satd. Flow (prot)			
Fit Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Confl. Bikes (#hr)			
Peak Hour Factor			
Heavy Vehides (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Enter Blocked Intersection			
Lane Alignment			
Median Width(ft)			
Link Offset(ft)			
Crosswalk Width(ft)			
Two way Left Turn Lane			
Headway Factor			
Turning Speed (mph)			
Turn Type			
Protected Phases	6	8	
Permitted Phases			
Minimum Split (s)	21.0	28.5	
Total Split (s)	67.5	32.5	
Total Split (%)	68%	33%	
Maximum Green (s)	61.5	26.0	
Yellow Time (s)	4.0	4.0	
All-Red Time (s)	2.0	2.5	
Lost Time Adjust (s)	2.0	2.0	
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?	40.0	7.0	
Walk Time (s)	10.0	7.0	

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Flash Dont Walk (s)	16.0	16.0	16.0					4.0		4.0	4.0	
Pedestrian Calls (#/hr)	0	0	0					0		0	0	
Act Effct Green (s)	27.5	27.5	27.5					63.0			63.0	
Actuated g/C Ratio	0.28	0.28	0.28					0.63			0.63	
v/c Ratio	0.36	0.20	0.30					0.24			0.17	
Control Delay	36.2	32.6	23.7					3.3			7.8	
Queue Delay	0.0	0.0	0.0					0.0			0.0	
Total Delay	36.2	32.6	23.7					3.3			7.8	
LOS	D	С	С					А			А	
Approach Delay		31.8						3.3			7.8	
Approach LOS		С						А			Α	
Queue Length 50th (ft)	61	49	14					16			34	
Queue Length 95th (ft)	m105	m87	m52					30			46	
Internal Link Dist (ft)		374			319			344			314	
Turn Bay Length (ft)	200		200									
Base Capacity (vph)	312	454	234					2732			2946	
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	0.36	0.20	0.30					0.24			0.17	
Intersection Summary												
Area Type:	Other											
Cycle Length: 100												
Actuated Cycle Length: 10												
Offset: 12 (12%), Referen	ced to phase	2:NBSB	and 6:Pe	d, Start o	f Green							
Natural Cycle: 55												
Control Type: Pretimed												
Maximum v/c Ratio: 0.36												
Interpostion Cianal Dolov	10.4			le-	tomostic	ALOC: D						

Analysis Period (min) 15 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: 7th Street SW & SW Jefferson Drive

Intersection Signal Delay: 10.4

Intersection Capacity Utilization 58.4%



Intersection LOS: B

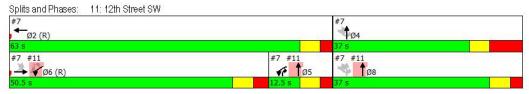
ICU Level of Service B

Lane Group	Ø6	Ø8
Flash Dont Walk (s)	5.0	15.0
Pedestrian Calls (#/hr)	0	0
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

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Lane Group	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER	Ø2
Lane Configurations	ň		7		444				77			
Traffic Volume (vph)	0	0	0	0	447	0	0	0	178	0	0	
Future Volume (vph)	0	0	0	0	447	0	0	0	178	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	10	12	10	10	10	10	10	10	10	10	
Storage Length (ft)		0	100	0		0	0		0	0	0	
Storage Lanes		1	1	0		0	0		2	0	0	
Taper Length (ft)		100		100			100			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91	1.00	1.00	0.88	1.00	1.00	
Frt									0.850			
Flt Protected												
Satd. Flow (prot)	1863	0	1863	0	4746	0	0	0	2601	0	0	
Flt Permitted												
Satd. Flow (perm)	1863	0	1863	0	4746	0	0	0	2601	0	0	
Right Turn on Red			Yes		1000	Yes	(47)	170	Yes	1.70		
Satd. Flow (RTOR)									1920			
Link Speed (mph)		30			30			30	1020	30		
Link Distance (ft)		212			269			153		170		
Travel Time (s)		4.8			6.1			3.5		3.9		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	0	0	0	486	0	0	0.02	193	0	0	
Shared Lane Traffic (%)					100	·			100			
Lane Group Flow (vph)	0	0	0	0	486	0	0	0	193	0	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right	
Median Width(ft)	Lon	12	r ugin	Lon	0	, ugint	Lon	25	, agin	0		
Link Offset(ft)		0			5			3		0		
Crosswalk Width(ft)		16			30			16		16		
Two way Left Turn Lane		58.50			(0.00)							
Headway Factor	1.00	1.09	1.00	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	
Turning Speed (mph)	15	15	9	15	1100	9	15	11.00	9	15	9	
Turn Type	Prot		Perm	4.90	NA		,,,,,		Perm	1,0		
Protected Phases	6				58							2
Permitted Phases			6						6			
Minimum Split (s)	20.0		20.0						20.0			63.0
Total Split (s)	50.5		50.5						50.5			63.0
Total Split (%)	50.5%		50.5%						50.5%			63%
Maximum Green (s)	43.5		43.5						43.5			56.5
Yellow Time (s)	4.0		4.0						4.0			4.0
All-Red Time (s)	3.0		3.0						3.0			2.5
Lost Time Adjust (s)	-1.5		-1.5						0.0			2.0
Total Lost Time (s)	5.5		5.5						7.0			
Lead/Lag	Lead		Lead						Lead			
Lead-Lag Optimize?	Yes		Yes						Yes			
Walk Time (s)	7.0		7.0						7.0			7.0
Flash Dont Walk (s)	6.0		6.0						6.0			4.0
Pedestrian Calls (#/hr)	0.0		0.0						0.0			0
Act Effet Green (s)	U		U		44.5				43.5			U
Actuated g/C Ratio					0.44				0.44			

Lane Group	Ø4	Ø5	Ø8
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
And the state of t			
Ideal Flow (vphpl)			
Lane Width (ft)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Fit Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Enter Blocked Intersection			
Lane Alignment			
Median Width(ft)			
Link Offset(ft)			
Crosswalk Width(ft)			
Two way Left Turn Lane			
Headway Factor			
Turning Speed (mph)			
Turn Type	25 .		
Protected Phases	4	5	8
Permitted Phases	1222000	(Marie 1	1910.00
Minimum Split (s)	37.0	12.5	37.0
Total Split (s)	37.0	12.5	37.0
Total Split (%)	37%	13%	37%
Maximum Green (s)	26.5	6.0	30.5
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	6.5	2.5	2.5
Lost Time Adjust (s)	- 30.00	1000	20000
Total Lost Time (s)			
Lead/Lag		Lag	
Lead-Lag Optimize?	4.0	Yes	
Walk Time (s)	4.0		
Flash Dont Walk (s)	21.0		
Pedestrian Calls (#/hr)	0		
Act Effct Green (s)			
Actuated g/C Ratio			

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Lane Group	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER	Ø2
v/c Ratio					0.23				0.09			
Control Delay					17.5				0.1			
Queue Delay					0.0				1.1			
Total Delay					17.5				1.1			
LOS					В				А			
Approach Delay					17.5			1.1				
Approach LOS					В			А				
Queue Length 50th (ft)					68				0			
Queue Length 95th (ft)					92				m0			
Internal Link Dist (ft)		132			189			73		90		
Turn Bay Length (ft)												
Base Capacity (vph)					2111				2216			
Starvation Cap Reductn					0				1796			
Spillback Cap Reductn					163				0			
Storage Cap Reductn					0				0			
Reduced v/c Ratio					0.25				0.46			
Intersection Summary												
Area Type:	Other											
Cycle Length: 100												
Actuated Cycle Length: 100)											
Offset: 96 (96%), Reference	ed to phase	2:WBT a	ind 6:EBT	L, Start o	of Green							
Natural Cycle: 100												
Control Type: Pretimed												
Maximum v/c Ratio: 0.74												
Intersection Signal Delay, 1	2.9			Ir	ntersection	LOS: B						
Intersection Capacity Utiliza	ation 14.2%			IC	CU Level o	of Service	Α					
Analysis Period (min) 15												
m Volume for 95th percer	ntile queue i	s metere	d by upstr	eamsign	nal.							



Lane Group	Ø4	Ø5	Ø8
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			
Intersection Summary			

Lanes, Volumes, Timings 14: 9th Street SW/Smithsonian Driveway & Independence Ave SW

•	→	•	1	←	•	€l	1	†	-	-	ţ
EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
	नाक			444				र्स	7		4
0	1036	108	131	837	0	14	11	0	1	0	0
0	1036	108	131	837	0	14	11	0	1	0	0
1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
0		50	0		0		0		0	0	
0		1	0		0		0		1	0	
100			100				100			25	
0.86	0.86	0.86	0.91	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
	0.97			0.99				0.93			
	0.986								0.850		
				0.993				0.950			
0	5682	0	0	4647	0	0	0	1685	1507	0	1773
			1070	0.652				0.757		0.50	
0	5682	0	0		0	0	0		1507	0	1773
- 377		Yes	19		Yes		70				
	29								153		
	-			35				30			15
	540			606				566			305
	10.5			11.8				12.9			13.9
9		200	200		9		71				
							100				
0.96	0.96		0.96	0.96		0.96	0.96	0.96	0.96	0.96	0.96
											0%
									1		0
											-
0	1192	0	0	1008	0	0	0	26	1	0	0
No	No	No	No	No	No	No	No	No	No	No	No
Left	Left		Left	Left		RNA	Left	Left		Left	Left
			77.7								0
											-70
	165/11							20			20
	-3.0.70.1			177.7							
1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
		9				100000000					
	NA			NA				NA			
			1						1		8
2	-		6	180		8	8	-		8	_
29.5	29.5		10.5	25.5		35.5	35.5	35.5	10.5	35.5	35.5
0.000	77777		10,565,000	TT TO 17 A			100000000000000000000000000000000000000	77.000.000	10.500	100000000	35.5
											35.5%
											30.0
											4.0
											1.5
350.50											0.0
											5.5
Lead			Lan	0.0		Lan	Lan			Lag	Lag
75 75 75 75										-	Yes
10.0	10.0		100	10.0		10.0	10.0	10.0	100	10.0	10.0
						10.0				10.0	10.0
	9 0.96 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	EBL EBT 4111- 0 1036 0 1036 1900 1900 0 0 0 100 0.86 0.86 0.97 0.986 0 5682 0 5682 29 35 540 10.5 9 0.96 0.96 0% 3% 0 1079 0 1192 No No Left Left 0 0 45 1.09 1.09 15 NA 2 2 29.5 29.5 47.5 47.5 47.5% 38.0 38.0 4.0 4.0 5.5 5.5 -1.5 8.0 Lead Lead Yes Yes	EBL EBT EBR 4111- 0 1036 108 0 1036 108 1900 1900 1900 0 50 0 1 100 0.86 0.86 0.86 0.97 0.986 0 5682 0 0 5682 0 Yes 29 35 540 10.5 9 200 24 0.96 0.96 0.96 0% 3% 0% 0 1079 113 0 1192 0 No No No Left Left Right 0 0 45 1.09 1.09 1.09 15 9 NA 2 2 29.5 29.5 47.5 47.5 47.5% 47.5% 38.0 38.0 4.0 4.0 5.5 5.5 -1.5 8.0 Lead Lead Yes Yes	EBL EBT EBR WBL 4111- 0 1036 108 131 0 1036 108 131 1900 1900 1900 1900 0 50 0 0 1 00 0 100 0.86 0.86 0.86 0.91 0.97 0.986 0 5682 0 0 0 7es 29 35 540 10.5 9 200 200 24 0.96 0.96 0.96 0.96 0% 3% 0% 0% 0 1079 113 136 0 1192 0 0 No No No No No Left Left Right Left 0 0 0 45 1.09 1.09 1.09 1.09 15 9 15 NA pm+pt 2 1 2 6 29.5 29.5 10.5 47.5 47.5 12.0 47.5% 47.5% 12.0% 38.0 38.0 6.5 4.0 4.0 4.0 5.5 5.5 1.5 -1.5 -8.0 Lead Lead Lag Yes Yes	BBL BBR BBR	BBL BBT BBR WBL WBT WBR	BBL BBT BBR WBL WBT WBR NBU	BBL BBT BBR WBL WBR NBU NBL	BEL EBT EBR WBL WBT WBR NBU NBL NBT	BEL BBT BBR WBL WBT WBR NBU NBL NBT NBR WBT WBR NBU NBL NBT TF	BBL



	4	
Lane Group	SBR	Ø7
Land Configurations	ODIT	APP (
Traffic Volume (vph)	0	
Future Volume (vph)	0	
Ideal Flow (vphpl)	1900	
Storage Length (ft)	0	
Storage Length (it)	0	
Taper Length (ft)	U	
Lane Util. Factor	1.00	
Ped Bike Factor	1.00	
Frt		
18101		
Fit Protected	0	
Satd. Flow (prot)	U	
Flt Permitted	0	
Satd. Flow (perm)	0	
Right Turn on Red	Yes	
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)	71	
Confl. Bikes (#hr)		
Peak Hour Factor	0.96	
Heavy Vehides (%)	0%	
Adj. Flow (vph)	0	
Shared Lane Traffic (%)		
Lane Group Flow (vph)	0	
Enter Blocked Intersection	No	
Lane Alignment	Right	
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor	1.09	
Turning Speed (mph)	9	
Turn Type		
Protected Phases		7
Permitted Phases		
Minimum Split (s)		5.0
Total Split (s)		5.0
Total Split (%)		5%
Maximum Green (s)		3.0
Yellow Time (s)		2.0
All-Red Time (s)		0.0
Lost Time Adjust (s)		3.5
Total Lost Time (s)		
Lead/Lag		Lead
Lead-Lag Optimize?		Yes
Walk Time (s)		1 63
Flash Dont Walk (s)		
riddii Dolit Frait (5)		

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Pedestrian Calls (#/hr)	0	0			0		0	0	0		0	0
Act Effct Green (s)		39.5			54.0				30.0	6.5		
Actuated g/C Ratio		0.40			0.54				0.30	0.06		
v/c Ratio		0.53			0.58				0.07	0.00		
Control Delay		8.1			11.8				25.8	0.0		
Queue Delay		0.0			0.0				0.0	0.0		
Total Delay		8.1			11.8				25.8	0.0		
LOS		Α			В				С	Α		
Approach Delay		8.1			11.8				24.8			
Approach LOS		Α			В				С			
Queue Length 50th (ft)		147			82				12	0		
Queue Length 95th (ft)		156			89				32	0		
Internal Link Dist (ft)		460			526				486			225
Turn Bay Length (ft)												
Base Capacity (vph)		2261			1741				374	241		
Starvation Cap Reductn		0			0				0	0		
Spillback Cap Reductn		0			0				0	0		
Storage Cap Reductri		0			0				0	0		
Reduced v/c Ratio		0.53			0.58				0.07	0.00		
Intersection Summary												
Area Type: Oth	er											
Cycle Length: 100												
Actuated Cycle Length: 100												
Offset: 29 (29%), Referenced to	phase	2:EBIL 8	and 6: VVE	FIL, Start	of Green							
Natural Cycle: 85												
Control Type: Pretimed												
Maximum v/c Ratio: 0.58												
Intersection Signal Delay, 10.0					tersection		_					
Intersection Capacity Utilization	77.2%			10	CU Level	of Service	D					
Analysis Period (min) 15												
Splits and Phases: 14: 9th St	reet SV	//S mithso	nian Driv	/eway & l	ndepende	ence Ave	SW					
→Ø2 (R)					ۯ1							





Lane Group	SBR	Ø7	
Pedestrian Calls (#/hr)			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			
Intersection Summary			

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		नाम			नाा		7	^		7	^	
Traffic Volume (vph)	177	763	97	14	701	194	92	265	59	125	190	175
Future Volume (vph)	177	763	97	14	701	194	92	265	59	125	190	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	11	11	11	11	11	11
Storage Length (ft)	0		75	0		0	80		0	0		50
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	0.86	0.86	0.86	0.86	0.86	0.86	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor		0.96			0.93		0.82	0.94		0.82	0.85	
Frt		0.986			0.968		201000	0.973		VE.070	0.928	
Flt Protected		0.992			0.999		0.950	0.010		0.950	000000	
Satd. Flow (prot)	0	5595	0	0	5194	0	1616	4441	0	1646	3770	0
Flt Permitted	100.0	0.715			0.904		0.520	V. S. S. S. S.		0.476		
Satd. Flow (perm)	0	3984	0	0	4696	0	727	4441	0	672	3770	0
Right Turn on Red		0001	Yes	U	1000	Yes	121	200.00	No	012	0//0	Yes
Satd. Flow (RTOR)		36	100		83	100			140		141	100
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		606			437			393			424	
Travel Time (s)		11.8			8.5			7.7			8.3	
Confl. Peds. (#/hr)	342	11.0	230	230	0.0	342	262	1.1	308	308	0.3	262
and the state of t	342		20	230		25	202		19	300		14
Confl. Bikes (#hr) Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	7% 182	3% 787	4% 100	0% 14	4% 723	10%	8% 95	3% 273	4% 61	6% 129	7% 196	3% 180
Adj. Flow (vph)	102	101	100	14	123	200	95	213	01	129	190	100
Shared Lane Traffic (%)	0	1069	0	0	937	0	95	334	0	129	376	0
Lane Group Flow (vph) Enter Blocked Intersection	No	No	No	No	No No	No	No	No No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			11			11	
Link Offset(ft)		5			0			-6			5	
Crosswalk Width(ft)		32			30			22			35	
Two way Left Turn Lane	4.00	4.00	4.00	4.00	4.00	4.00		404	4.04			4.04
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases	5	2			6			4		3	8	
Permitted Phases	2			6			4			8		
Minimum Split (s)	10.5	31.5		28.5	28.5		29.5	29.5		10.0	32.5	
Total Split (s)	11.0	57.0		46.0	46.0		32.5	32.5		10.5	43.0	
Total Split (%)	11.0%	57.0%		46.0%	46.0%		32.5%	32.5%		10.5%	43.0%	
Maximum Green (s)	5.5	50.5		39.5	39.5		26.0	26.0		5.5	36.5	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.5	2.5		2.5	2.5		2.5	2.5		1.0	2.5	
Lost Time Adjust (s)		-1.5			-1.5		-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)		5.0			5.0		5.0	5.0		3.5	5.0	
Lead/Lag	Lead			Lag	Lag		Lag	Lag		Lead		
				140934555	900 1900		1556 (47) (50)	550585007		17474		
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes		Yes		

22: 7th Street SW & Independence Ave SW

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Flash Dont Walk (s)		18.0		18.0	18.0		19.0	19.0			19.0	
Pedestrian Calls (#/hr)		0		0	0		0	0			0	
Act Effct Green (s)		52.0			41.0		27.5	27.5		39.5	38.0	
Actuated g/C Ratio		0.52			0.41		0.28	0.28		0.40	0.38	
v/c Ratio		0.49			0.47		0.48	0.27		0.39	0.25	
Control Delay		2.0			20.5		39.7	29.2		21.8	11.1	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		2.0			20.5		39.7	29.2		21.8	11.1	
LOS		А			С		D	С		С	В	
Approach Delay		2.0			20.5			31.5			13.8	
Approach LOS		А			С			С			В	
Queue Length 50th (ft)		20			113		50	61		45	23	
Queue Length 95th (ft)		20			143		104	87		76	37	
Internal Link Dist (ft)		526			357			313			344	
Turn Bay Length (ft)							80					
Base Capacity (vph)		2185			1974		199	1221		333	1520	
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		0.49			0.47		0.48	0.27		0.39	0.25	
Intersection Summary												

Intersection Summan

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 51 (51%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 80

Control Type: Pretimed Maximum v/c Ratio: 0.49

Intersection Signal Delay, 14.2 Intersection Capacity Utilization 83.3% Intersection LOS: B ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 22: 7th Street SW & Independence Ave SW



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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		444			441	7		^ ^	7	7	444	
Traffic Volume (vph)	6	759	45	31	1596	190	0	1826	555	297	2353	33
Future Volume (vph)	6	759	45	31	1596	190	0	1826	555	297	2353	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	10	10	10	10	10	10	10	10	10	10
Lane Util. Factor	0.91	0.91	0.91	0.91	0.91	1.00	1.00	0.91	1.00	1.00	0.91	0.91
Ped Bike Factor		0.98			1.00	0.88			0.92		1.00	
Frt		0.992				0.850			0.850		0.998	
Fit Protected					0.999					0.950		
Satd. Flow (prot)	0	4769	0	0	4631	1311	0	4793	1478	1589	4734	0
Fit Permitted	200	0.792	-	11.50	0.846	100000		1/12/2020	intrative.	0.075	100000000000000000000000000000000000000	-
Satd. Flow (perm)	0	3777	0	0	3917	1147	0	4793	1364	125	4734	0
Right Turn on Red		371/11	Yes	3,70		Yes			Yes			Yes
Satd. Flow (RTOR)		3	,			162			99			31.00
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		370			1104			509			377	
Travel Time (s)		7.2			21.5			11.6			8.6	
Confl. Peds. (#/hr)	86	1.1 .	250	250	21.0	86	33	11.0	49	49	0.0	33
Confl. Bikes (#hr)	- 00		3	200		31	00		3	10		2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	80%	2%	3%	79%	3%	15%	0%	1%	2%	6%	2%	0%
Adj. Flow (vph)	7	843	50	34	1773	211	0	2029	617	330	2614	37
Shared Lane Traffic (%)		010	00	01	1110	211		2020	017	000	2014	O,
Lane Group Flow (vph)	0	900	0	0	1807	211	0	2029	617	330	2651	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	Lon	0	, again	Lon	0	i ugini	Loit	4	149.11	Lon	10	109
Link Offset(ft)		0			0			5			0	
Crosswalk Width(ft)		20			30			30			26	
Two way Left Turn Lane												
Headway Factor	1.09	1.04	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (mph)	15	1.01	9	15	1,00	9	15	1.00	9	15	1.00	9
Turn Type	Perm	NA		Perm	NA	Perm		NA	Perm	pm+pt	NA	
Protected Phases	1 01111	4		1.01111	8	1 51111		2	1 01111	1	6	
Permitted Phases	4			8		8		-	2	6		
Minimum Split (s)	36.5	36.5		36.5	36.5	36.5		31.5	31.5	10.5	31.5	
Total Split (s)	37.0	37.0		37.0	37.0	37.0		53.0	53.0	20.0	73.0	
Total Split (%)	33.6%	33.6%		33.6%	33.6%	33.6%		48.2%	48.2%	18.2%	66.4%	
Maximum Green (s)	30.5	30.5		30.5	30.5	30.5		46.5	46.5	13.5	66.5	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5	2.5		2.5	2.5	2.5	2.5	
Lost Time Adjust (s)	2.0	-1.5		2.0	-1.5	-1.5		-1.5	-1.5	-1.0	-1.5	
Total Lost Time (s)		5.0			5.0	5.0		5.0	5.0	5.5	5.0	
Lead/Lag		0.0			0.0	0.0		Lead	Lead	Lag	0.0	
Lead-Lag Optimize?								Yes	Yes	Yes		
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		6.0	6.0	163	6.0	
Flash Dont Walk (s)	23.0	23.0		23.0	23.0	23.0		19.0	19.0		19.0	
Pedestrian Calls (#/hr)	23.0	23.0		23.0	23.0	23.0		19.0	0.81		19.0	
Act Effet Green (s)	U	32.0		U	32.0	32.0		48.0	48.0	67.5	68.0	
Act Linct Green (s)		32.0			32.0	32.0		40.0	40.0	07.5	00.0	

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio		0.29			0.29	0.29		0.44	0.44	0.61	0.62	
v/c Ratio		0.82			1.59	0.47		0.97	0.95	1.23	0.91	
Control Delay		43.4			297.6	12.6		44.6	50.7	151.0	14.8	
Queue Delay		0.0			0.0	0.1		42.3	0.0	0.0	1.2	
Total Delay		43.4			297.6	12.6		86.9	50.7	151.0	16.1	
LOS		D			F	В		F	D	F	В	
Approach Delay		43.4			267.8			78.5			31.0	
Approach LOS		D			F			Е			С	
Queue Length 50th (ft)		215			~667	26		501	360	~237	235	
Queue Length 95th (ft)		270			#764	95		#627	#609	m#339	m326	
Internal Link Dist (ft)		290			1024			429			297	
Turn Bay Length (ft)												
Base Capacity (vph)		1100			1139	448		2091	651	269	2926	
Starvation Cap Reductn		0			0	0		0	0	0	121	
Spillback Cap Reductn		0			0	12		369	0	0	0	
Storage Cap Reductn		0			0	0		0	0	0	0	
Reduced v/c Ratio		0.82			1.59	0.48		1.18	0.95	1.23	0.95	
Intersection Summary												
	Other											
Cycle Length: 110												
Actuated Cycle Length: 110												
Offset: 107 (97%), Reference	ed to phase	e 2:NBT a	and 6:SB	TL, Start	of Green							
Natural Cycle: 110												
Control Type: Pretimed												
Maximum v/c Ratio: 1.59												
Intersection Signal Delay: 10	02.9			Ir	ntersection	LOS: F						
Intersection Capacity Utilizat	tion 117.5%	6		JC	CU Level	of Service	Н					
Analysis Period (min) 15												
 Volume exceeds capacit 	y, queue is	theoretic	ally infini	te.								
Queue shown is maximu												
# 95th percentile volume e	xceeds cap	pacity, qu	eue may	be longe	r.							
Queue shown is maximu												
m Volume for 95th percent	tile queue is	s metered	d by upstr	ream sigr	nal.							
Splits and Phases: 2: 14th	n Street SW	/ & Inden	endence	Ave SW								
Ø2 (R)		. Samay			V _{Ø1}			Åø4				
53 s					20 s			7 s				
					Interest Conference			₹ø8				
▼ Ø6 (R)						At a		∜ Ø8 7.s				

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	1						444		ሻ	^	
Traffic Volume (vph)	59	118	306	0	0	0	0	1914	108	50	2377	0
Future Volume (vph)	59	118	306	0	0	0	0	1914	108	50	2377	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	10	10	10	10	10	12	12	10	10	10
Storage Length (ft)	0		0	0		0	0		20	170		0
Storage Lanes	- 1		0	0		0	0		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	1.00
Ped Bike Factor	0.63	0.80						0.97				
Frt	1212.51	0.892						0.992				
Flt Protected	0.950	0.000								0.950		
Satd. Flow (prot)	1597	1302	0	0	0	0	0	4802	0	1636	4700	0
FIt Permitted	0.950		,		95.0					0.058		Ů
Satd. Flow (perm)	1010	1302	0	0	0	0	0	4802	0	100	4700	0
Right Turn on Red	10.10		No			Yes	-		Yes			Yes
Satd. Flow (RTOR)			110			, , ,		15				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		257			1068			377			341	
Travel Time (s)		5.8			24.3			8.6			7.8	
Confl. Peds. (#/hr)	543	0.0	191	191	24.0	543	164	0.0	228	228	7.0	164
Confl. Bikes (#hr)	040		97	101		040	104		16	220		9
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	13%	9%	2%	0.00	0%	0%	0.33	4%	1%	3%	3%	0%
Adj. Flow (vph)	60	119	309	0	0	0	0	1933	109	51	2401	0
Shared Lane Traffic (%)	00	110	000	U	U	- v		1000	100	01	2401	·
Lane Group Flow (vph)	60	428	0	0	0	0	0	2042	0	51	2401	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	Loit	15	ragin	Loit	12	ragin	Loit	0	ragin	Loit	10	ragin
Link Offset(ft)		0			15			0			5	
Crosswalk Width(ft)		30			35			37			35	
Two way Left Turn Lane		30			30			31			30	
Headway Factor	1.00	1.00	1.09	1.09	1.09	1.09	1.09	1.00	1.00	1.09	1.09	1.09
Turning Speed (mph)	1.00	1.00	9	15	1.03	9	15	1.00	9	1.03	1.00	9
Turn Type	Perm	NA	9	13		3	13	NA	9	Perm	NA	9
Protected Phases	reilli	4						2		reilli	2	
Permitted Phases	4	4						2		2	2	
	34.5	34.5						20.5		20.5	20.5	
Minimum Split (s)	37.0	37.0						73.0		73.0	73.0	
Total Split (s)												_
Total Split (%)	33.6%	33.6%						66.4%		66.4%	66.4%	
Maximum Green (s)	30.5	30.5						67.5		67.5	67.5	
Yellow Time (s)	4.0	4.0						4.0		4.0	4.0	
All-Red Time (s)	2.5	2.5						1.5		1.5	1.5	
Lost Time Adjust (s)	-1.5	-1.5						-1.5		-1.5	-1.5	
Total Lost Time (s)	5.0	5.0						4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?		40.0						40.0		40.0	40.0	
Walk Time (s)	10.0	10.0						10.0		10.0	10.0	

Lane Group	Ø6	
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
deal Flow (vphpl)		
Lane Width (ft)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
FIt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor		
Heavy Vehides (%)		
Adj. Flow (vph)		
Shared Lane Traffic (%) Lane Group Flow (vph)		
ACRES AS TRANSPORTED IN CONTRACTOR AND ASSESSMENT ASSESSMENT AND ASSESSMENT ASSESSMENT AND ASSESSMENT ASSE		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Turn Type		
Protected Phases	6	
Permitted Phases	00.5	
Minimum Split (s)	22.5	
Total Split (s)	73.0	
Total Split (%)	66%	
Maximum Green (s)	67.5	
Yellow Time (s)	4.0	
All-Red Time (s)	1.5	
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Walk Time (s)	10.0	

4: 14th Street SW & SW Jefferson Drive

	•	→	*	1	•	•	1	Ť	-	>	Ţ	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Flash Dont Walk (s)	18.0	18.0						5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0						0		0	0	
Act Effct Green (s)	32.0	32.0						69.0		69.0	69.0	
Actuated g/C Ratio	0.29	0.29						0.63		0.63	0.63	
v/c Ratio	0.20	1.13						0.68		0.82	0.81	
Control Delay	31.8	124.4						9.4		97.2	18.6	
Queue Delay	0.0	1.3						47.7		0.0	0.0	
Total Delay	31.8	125.7						57.1		97.2	18.6	
LOS	C	F						Е		F	В	
Approach Delay		114.2						57.1			20.2	
Approach LOS		F						Е			С	
Queue Length 50th (ft)	32	~352						537		25	437	
Queue Length 95th (ft)	68	#547						m577		#66	508	
Internal Link Dist (ft)		177			988			297			261	
Turn Bay Length (ft)										170		
Base Capacity (vph)	293	378						3017		62	2948	
Starvation Cap Reductn	0	0						1226		0	0	
Spillback Cap Reductn	0	45						0		0	5	
Storage Cap Reductn	0	0						0		0	0	
Reduced v/c Ratio	0.20	1.29						1.14		0.82	0.82	
Intersection Summary												
TO A STATE OF THE PARTY OF THE	Other											
Cycle Length: 110												
Actuated Cycle Length: 110	Ď.											

Offset: 13 (12%), Referenced to phase 2:NBSB and 6:Ped, Start of Green

Natural Cycle: 90 Control Type: Pretimed Maximum v/c Ratio: 1.13

Intersection Signal Delay: 44.5 Intersection Capacity Utilization 84.0% Intersection LOS: D ICU Level of Service E

Analysis Period (min) 15

Volume exceeds capacity, queue is theoretically infinite.

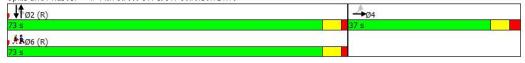
Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 4: 14th Street SW & SW Jefferson Drive



Lane Group	Ø6
Flash Dont Walk (s)	7.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

	→	•	1	-	1	-	
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	1					7	
Traffic Volume (vph)	206	77	0	0	0	19	
Future Volume (vph)	206	77	0	0	0	19	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	14	10	10	10	10	13	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor							
Frt	0.963					0.865	
Flt Protected							
Satd. Flow (prot)	1857	0	0	0	0	1698	
Flt Permitted							
Satd. Flow (perm)	1857	0	0	0	0	1698	
Link Speed (mph)	30			30	30		
Link Distance (ft)	1068			661	401		
Travel Time (s)	24.3			15.0	9.1		
Confl. Peds. (#/hr)		373	263		373		
Confl. Bikes (#/hr)		122					
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	
Heavy Vehicles (%)	7%	0%	0%	0%	0%	0%	
Adj. Flow (vph)	258	96	0	0	0	24	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	354	0	0	0	0	24	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(ft)	0			0	0		
Link Offset(ft)	0			0	-2		
Crosswalk Width(ft)	16			16	24		
Two way Left Turn Lane							
Headway Factor	0.92	1.09	1.09	1.09	1.09	0.96	
Turning Speed (mph)		9	15		15	9	
Sign Control	Free			Free	Stop		
Intersection Summary							
	Other						
Control Type: Unsignalized							
Intersection Capacity Utilizat	ion 28.0%			IC	U Level	of Service A	4
Analysis Period (min) 15							

	#	→	•	1	-	*	•	1	ኘ	Ť	1	\
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR2	SEL
Lane Configurations		41114		*	41474				Ä	1	7	Y
Traffic Volume (vph)	1	1572	38	427	1678	2	209	118	2	256	383	18
Future Volume (vph)	1	1572	38	427	1678	2	209	118	2	256	383	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	11	11	11	13
Lane Util, Factor	0.86	0.86	0.86	0.86	0.86	0.91	0.91	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00	37.03	1.00	0.93		27/17/200	100,707.0	0.56	13.55	0.63	0.72
Frt		0.996			0.984						0.850	0.904
Flt Protected				0.950	0.999				0.950			0.986
Satd. Flow (prot)	0	5892	0	1393	4017	0	0	0	1679	1766	1501	1098
Flt Permitted	0.50	0.931		0.950	0.757		11.50	1151	0.950			0.986
Satd. Flow (perm)	0	5485	0	1390	3044	0	0	0	943	1766	943	983
Right Turn on Red		0100	Yes	1000	3311	-	W.W.	-	0.10		Yes	
Satd. Flow (RTOR)		3	,,,,,,								96	113
Link Speed (mph)		35			35					30	00	30
Link Distance (ft)		1104			603					153		401
Travel Time (s)		21.5			11.7					3.5		9.1
Confl. Peds. (#/hr)	87	21.0	8	8	11.4	87	87	73	73	0.0	350	350
Confl. Bikes (#/hr)	O1		21	U		20	20	10	10		5	000
Peak Hour Factor	0.92	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	3%	3%	4%	4%	0.90	4%	4%	0.90	4%	4%	40%
Adj. Flow (vph)	1	1747	42	474	1864	2	232	131	2	284	426	20
20000000000000000000000000000000000000	- 1	1/4/	42	10%	1004	2	232	131	2	204	420	20
Shared Lane Traffic (%) Lane Group Flow (vph)	0	1790	0	427	2145	0	0	0	133	284	426	70
Enter Blocked Intersection	No	No	No	No No	No	No	No	No	No	No.	No	No
		W. P. Etc.)			4.00					1000		5,000
Lane Alignment	Left	Left 0	Right	Left	Left	Right	Right	Left	Left	Left	Right	Left
Median Width(ft)		0			10					56 0		13
Link Offset(ft)												40
Crosswalk Width(ft)		30			25					28		20
Two way Left Turn Lane	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.04	4.04	1.04	0.00
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.04	1.04	1.04	0.96
Turning Speed (mph)	15	A.I.A	9	15	A14	9	9	15	15	NIA	9	15
Turn Type	Perm	NA		Prot	NA			custom	custom	NA	custom	D.Pm
Protected Phases	^	6		5	2			4.0	4.0	4	5	4.0
Permitted Phases	6	00.0		07.0	00.0			48	48	8	48	4 8
Minimum Split (s)	20.0	20.0		27.0	66.0					32.0	27.0	
Total Split (s)	53.0	53.0		51.0	104.0					36.0	51.0	
Total Split (%)	35.3%	35.3%		34.0%	69.3%					24.0%	34.0%	
Maximum Green (s)	46.0	46.0		44.5	97.5					29.0	44.5	
Yellow Time (s)	4.0	4.0		4.0	4.0					4.0	4.0	
All-Red Time (s)	3.0	3.0		2.5	2.5					3.0	2.5	
Lost Time Adjust (s)		-1.5		-1.5	-1.5					-1.5	-1.5	
Total Lost Time (s)	I programa and	5.5		5.0	5.0					5.5	5.0	
Lead/Lag	Lag	Lag		Lead							Lead	
Lead-Lag Optimize?	Yes	Yes		Yes							Yes	
Walk Time (s)	7.0	7.0			7.0					4.0		
Flash Dont Walk (s)	6.0	6.0			4.0					21.0		
Pedestrian Calls (#/hr)	0	0			0					0		
Act Effct Green (s)		47.5		46.0	99.0				30.5	30.5	77.0	30.5

SI South Campus Master Plan 10/20/2017 2040 Build Condition PM Peak Hour Stantec

Synchro 9 Report Page 8

St.	>	4	4	6	~		
Lane Group	SER	SER2	SWL2	SWL	SWR	Ø8	
Lane Configurations				M	-0.000		
Traffic Volume (vph)	25	20	3	0	1		
Future Volume (vph)	25	20	3	0	1		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900		
Lane Width (ft)	10	10	10	10	10		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		
Ped Bike Factor	1.00	1.00	1.00	1.00	1.00		
Frt				0.966			
Flt Protected				0.964			
Satd. Flow (prot)	0	0	0	826	0		
Fit Permitted	U	U	U	0.964	U		
Satd. Flow (perm)	0	0	0	826	0		
	U		U	020	U		
Right Turn on Red		Yes					
Satd. Flow (RTOR)				00			
Link Speed (mph)				30			
Link Distance (ft)				296			
Travel Time (s)	-			6.7			
Confl. Peds. (#/hr)	73	73					
Confl. Bikes (#/hr)	9	9					
Peak Hour Factor	0.90	0.90	0.92	0.92	0.92		
Heavy Vehicles (%)	40%	0%	100%	100%	100%		
Adj. Flow (vph)	28	22	3	0	1		
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	0	4	0		
Enter Blocked Intersection	No	No	No	No	No		
Lane Alignment	Right	Right	Left	Left	Right		
Median Width(ft)		~		10	×		
Link Offset(ft)				0			
Crosswalk Width(ft)				0			
Two way Left Turn Lane							
Headway Factor	1.09	1.09	1.09	1.09	1.09		
Turning Speed (mph)	9	9	15	15	9		
Turn Type	3	9	Perm	Prot	v		
Protected Phases			i Gilli	9		8	
Permitted Phases			9	3		J	
			10.0	10.0		32.0	
Minimum Split (s)							
Total Split (s)			10.0	10.0		36.0	
Total Split (%)			6.7%	6.7%		24%	
Maximum Green (s)			5.0	5.0		29.5	
Yellow Time (s)			3.0	3.0		4.0	
All-Red Time (s)			2.0	2.0		2.5	
Lost Time Adjust (s)				0.0			
Total Lost Time (s)				5.0			
Lead/Lag							
Lead-Lag Optimize?							
Walk Time (s)							
Flash Dont Walk (s)							
Pedestrian Calls (#/hr)							
Act Effct Green (s)				5.0			

SI South Campus Master Plan 10/20/2017 2040 Build Condition PM Peak Hour Stantec

Lanes, Volumes, Timings

7: 12th Street SW & Independence Ave SW & 12th Street SW Ramp & Loading Dock 10/20/2017

	#	-	*	1	•	*	•	1	ሻ	Ť	1	\
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR2	SEL
Actuated g/C Ratio		0.32		0.31	0.66				0.20	0.20	0.51	0.20
v/c Ratio		1.03		1.00	1.28				0.70	0.79	0.61	0.24
Control Delay		79.2		94.9	158.2				61.0	58.9	13.4	3.3
Queue Delay		0.0		0.0	0.0				38.6	56.9	0.3	0.0
Total Delay		79.2		94.9	158.2				99.6	115.8	13.6	3.3
LOS		Е		F	F				F	F	В	Α
Approach Delay		79.2			147.7					61.6		3.3
Approach LOS		Е			F					Е		Α
Queue Length 50th (ft)		~542		487	~856				61	267	149	0
Queue Length 95th (ft)		#619		#758	#953				#217	#403	223	8
Internal Link Dist (ft)		1024			523					73		321
Turn Bay Length (ft)												
Base Capacity (vph)		1738		427	1671				191	359	701	289
Starvation Cap Reductn		0		0	0				59	110	38	0
Spillback Cap Reductn		0		0	0				0	0	0	0
Storage Cap Reductn		0		0	0				0	0	0	0
Reduced v/c Ratio		1.03		1.00	1.28				1.01	1.14	0.64	0.24

Intersection Summary
Area Type: Other

Cycle Length: 150 Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBTL, Start of Green

Natural Cycle: 150 Control Type: Pretimed

Maximum v/c Ratio: 1.28 Intersection Signal Delay: 108.7

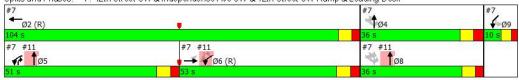
Intersection Signal Delay. 108.7 Intersection LOS: F
Intersection Capacity Utilization 126.2% ICU Level of Service H

Analysis Period (min) 15

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

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

Splits and Phases: 7: 12th Street SW & Independence Ave SW & 12th Street SW Ramp & Loading Dock



Lanes, Volumes, Timings 7: 12th Street SW & Independence Ave SW & 12th Street SW Ramp & Loading Dock 10/20/2017

	•	4	6	•	4		
Lane Group	SER	SER2	SWL2	SWL	SWR	Ø8	
Actuated g/C Ratio				0.03			
v/c Ratio				0.15			
Control Delay				82.5			
Queue Delay				0.0			
Total Delay				82.5			
LOS				F			
Approach Delay				82.5			
Approach LOS				F			
Queue Length 50th (ft)				4			
Queue Length 95th (ft)				18			
Internal Link Dist (ft)				216			
Turn Bay Length (ft)							
Base Capacity (vph)				27			
Starvation Cap Reductn				0			
Spillback Cap Reductn				0			
Storage Cap Reductn				0			
Reduced v/c Ratio				0.15			
Intersection Summary							

	\rightarrow	•	1	-	1	-			
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø3		
Lane Configurations	4111			4111	ሻ	7			_
Traffic Volume (vph)	1901	75	62	2031	285	86			
Future Volume (vph)	1901	75	62	2031	285	86			
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900			
Storage Length (ft)		0	0		0	210			
Storage Lanes		0	0		1	1			
Taper Length (ft)			100		100				
Lane Util. Factor	0.86	0.86	0.86	0.86	1.00	1.00			
Ped Bike Factor	1.00	0.00			0.69				
Frt	0.994					0.850			
Flt Protected				0.999	0.950				
Satd. Flow (prot)	5858	0	0	5860	1685	1507			
Flt Permitted				0.748	0.950	1001			
Satd. Flow (perm)	5858	0	0	4387	1159	1507			
Right Turn on Red	0000	Yes	J	1007	1100	Yes			
Satd. Flow (RTOR)	10	100				42			
Link Speed (mph)	35			35	25	74			
Link Distance (ft)	603			540	714				
Travel Time (s)	11.7			10.5	19.5				
Confl. Peds. (#/hr)	11.7	26	26	10.0	261				
Confl. Bikes (#/hr)		18	20		201				
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91			
Heavy Vehides (%)	3%	3%	4%	4%	0.91	0.91			
Adj. Flow (vph)	2089	82	68	2232	313	95			
	2009	02	00	2232	313	90			
Shared Lane Traffic (%)	2171	0	0	2300	313	95			
Lane Group Flow (vph)						- 7.7			
Enter Blocked Intersection	No	No	No	No Left	No	No			
Lane Alignment	Left	Right	Left		Left	Right			
Median Width(ft)	0			0	60				
Link Offset(ft)	0			0	-10				
Crosswalk Width(ft)	30			10	16				
Two way Left Turn Lane	4.00	4.00	4.00	4.00	4.00	4.00			
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09			
Turning Speed (mph)	12.72	9	15		15	9			
Turn Type	NA		pm+pt	NA	Prot	pm+ov	200		
Protected Phases	2		9	6	4	9	3		
Permitted Phases			6			4			
Minimum Split (s)	58.5		13.5	58.5	30.0	13.5	4.0		
Total Split (s)	60.5		15.5	60.5	30.0	15.5	4.0		
Total Split (%)	55.0%		14.1%	55.0%	27.3%	14.1%	4%		
Maximum Green (s)	54.0		10.5	54.0	24.5	10.5	2.0		
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0	2.0		
All-Red Time (s)	2.5		1.0	2.5	1.5	1.0	0.0		
Lost Time Adjust (s)	-1.5			-1.5	-1.0	-1.0			
Total Lost Time (s)	5.0			5.0	4.5	4.0			
Lead/Lag					Lag		Lead		
Lead-Lag Optimize?					Yes		Yes		
Walk Time (s)	10.0				6.0		0.0		
Flash Dont Walk (s)	4.0				18.0		2.0		

	→	7	•	+	1	~		
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø3	
Pedestrian Calls (#/hr)	0				0		0	
Act Effct Green (s)	55.5			66.0	25.5	41.5		
Actuated g/C Ratio	0.50			0.60	0.23	0.38		
v/c Ratio	0.73			0.83	0.80	0.16		
Control Delay	23.2			18.3	56.7	14.1		
Queue Delay	0.2			0.0	0.0	0.0		
Total Delay	23.4			18.3	56.7	14.1		
LOS	С			В	Е	В		
Approach Delay	23.4			18.3	46.8			
Approach LOS	С			В	D			
Queue Length 50th (ft)	336			252	209	24		
Queue Length 95th (ft)	382			286	#347	60		
Internal Link Dist (ft)	523			460	634			
Turn Bay Length (ft)						210		
Base Capacity (vph)	2960			2772	390	594		
Starvation Cap Reductn	204			0	0	0		
Spillback Cap Reductn	0			0	0	0		
Storage Cap Reductn	0			0	0	0		
Reduced v/c Ratio	0.79			0.83	0.80	0.16		
Intersection Summary								
Area Type:	Other							
Cycle Length: 110								
Actuated Cycle Length: 11								
Offset: 38 (35%), Referen	ced to phase	2:EBT a	nd 6:WBT	L, Start o	f Green			
Natural Cycle: 110								
Control Type: Pretimed								
Maximum v/c Ratio: 0.83								
Intersection Signal Delay.					tersection	10000		
Intersection Capacity Utiliz	zation 87.1%			IC	U Level	of Service		
Analysis Period (min) 15								
# 95th percentile volume	e exceeds ca	pacity, qu	ieue may	be longer	r.			
Queue shown is maxin	num after two	cycles.						

Splits and Phases: 9: L'Enfant Plaza & Independence Ave SW



	*	\rightarrow	•	•	-	•	1	†	~	-	Ţ	4
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	7	†	7					444			ना	
Traffic Volume (vph)	54	81	129	0	0	0	0	600	26	29	1167	0
Future Volume (vph)	54	81	129	0	0	0	0	600	26	29	1167	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	10	10	10	11	11	11	11	11	11
Storage Length (ft)	200		200	0		0	0		0	0		0
Storage Lanes	1		1	0		0	0		0	0		0
Taper Length (ft)	100			100			100		250	100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	0.86	0.86	1.00
Ped Bike Factor	0.82		0.63					0.97			0.99	
Frt			0.850					0.994				
Fit Protected	0.950		0.000								0.999	
Satd. Flow (prot)	1711	1652	1546	0	0	0	0	4465	0	0	5793	0
Fit Permitted	0.950										0.901	- i
Satd. Flow (perm)	1400	1652	979	0	0	0	0	4465	0	0	5194	0
Right Turn on Red	1,19.5.	1002	Yes	1.000		Yes	11.50	1,100	No			Yes
Satd. Flow (RTOR)			30						110			100
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		454			399			424			394	
Travel Time (s)		10.3			9.1			8.3			7.7	
Confl. Peds. (#/hr)	143	10.0	288	288	0.1	143	469	0.0	293	293	1.4	469
Confl. Bikes (#/hr)	110		112	200					31	200		16
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	2%	15%	1%	0%	0%	0%	0%	9%	0%	47%	8%	0%
Adj. Flow (vph)	56	84	133	0	0	0	0	619	27	30	1203	0
Shared Lane Traffic (%)			100					0,0			1200	
Lane Group Flow (vph)	56	84	133	0	0	0	0	646	0	0	1233	0
Enter Blocked Intersection	No	No.	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	Lon	11	ragin	Lon	11	rugiic	Loit	0	rugiit	Loit	0	rugiit
Link Offset(ft)		-15			15			10			-10	
Crosswalk Width(ft)		35			20			35			55	
Two way Left Turn Lane		00			20			00			UU	
Headway Factor	1.04	1.00	1.04	1.09	1.09	1.09	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15	1.00	9	15	1.00	9	15	1,04	9	15	1.04	9
Turn Type	Perm	NA	Perm	10		,	10	NA	3	Perm	NA	J
Protected Phases	1 Citi	4	1 Gilli					2		Cilli	2	
Permitted Phases	4		4							2		
Minimum Split (s)	32.5	32.5	32.5					20.0		20.0	20.0	
Total Split (s)	32.5	32.5	32.5					77.5		77.5	77.5	
Total Split (%)	29.5%	29.5%	29.5%					70.5%		70.5%	70.5%	
Maximum Green (s)	26.0	26.0	26.0					71.5		71.5	71.5	
Yellow Time (s)	4.0	4.0	4.0					4.0		4.0	4.0	
	2.5	2.5	2.5					2.0		2.0	2.0	
All-Red Time (s) Lost Time Adjust (s)	-1.5	-1.5	-1.5					-1.5		2.0	-1.5	
Total Lost Time (s)	5.0	5.0	-1.5 5.0					-1.5 4.5			4.5	
A STATE OF THE PARTY OF THE PAR	5.0	5.0	5.0					4.5			4,5	
Lead/Lag												
Lead-Lag Optimize?	40.0	10.0	10.0					10.0		10.0	10.0	
Walk Time (s)	10.0	10.0	10.0					10.0		10.0	10.0	

Lane Group	Ø6	Ø8	
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
deal Flow (vphpl)			
Lane Width (ft)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Fit Protected			
Satd. Flow (prot)			
Fit Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Confl. Bikes (#/hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Enter Blocked Intersection			
Lane Alignment			
Median Width(ft)			
Link Offset(ft)			
Crosswalk Width(ft)			
Two way Left Turn Lane			
Headway Factor			
Turning Speed (mph)			
Turn Type			
Protected Phases	6	8	
Permitted Phases	· ·	Ü	
	21.0	31.5	
Minimum Split (s)	77.5	32.5	
Total Split (s)	70%	30%	
Total Split (%)			
Maximum Green (s)	71.5	26.0	
Yellow Time (s)	4.0	4.0	
All-Red Time (s)	2.0	2.5	
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Walk Time (s)	10.0	10.0	

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Flash Dont Walk (s)	16.0	16.0	16.0					4.0		4.0	4.0	
Pedestrian Calls (#/hr)	0	0	0					0		0	0	
Act Effct Green (s)	27.5	27.5	27.5					73.0			73.0	
Actuated g/C Ratio	0.25	0.25	0.25					0.66			0.66	
v/c Ratio	0.16	0.20	0.50					0.22			0.36	
Control Delay	31.5	31.7	30.3					5.6			8.5	
Queue Delay	0.0	0.0	0.0					0.0			0.0	
Total Delay	31.5	31.7	30.3					5.6			8.5	
LOS	С	С	С					Α			А	
Approach Delay		31.0						5.6			8.5	
Approach LOS		С						Α			А	
Queue Length 50th (ft)	30	45	57					59			101	
Queue Length 95th (ft)	m45	m65	m90					m65			120	
Internal Link Dist (ft)		374			319			344			314	
Turn Bay Length (ft)	200		200									
Base Capacity (vph)	350	413	267					2963			3446	
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	0.16	0.20	0.50					0.22			0.36	

Reduced v/c Ratio Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:NBSB and 6:Ped, Start of Green

Natural Cycle: 55 Control Type: Pretimed

Maximum v/c Ratio: 0.50

Intersection Signal Delay, 10.5 Intersection Capacity Utilization 63.2% Intersection LOS: B ICU Level of Service B

Analysis Period (min) 15

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

Splits and Phases: 10: 7th Street SW & SW Jefferson Drive



Lane Group	Ø6	Ø8
Flash Dont Walk (s)	5.0	15.0
Pedestrian Calls (#/hr)	0	0
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

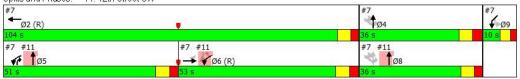
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Lane Group	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER	Ø2
Lane Configurations	7		7		444				77			
Traffic Volume (vph)	0	0	0	0	759	0	0	0	498	0	0	
Future Volume (vph)	0	0	0	0	759	0	0	0	498	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	10	12	10	10	10	10	10	10	10	10	
Storage Length (ft)		0	100	0		0	0		0	0	0	
Storage Lanes		1	1	0		0	0		2	0	0	
Taper Length (ft)		100		100			100			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91	1.00	1.00	0.88	1.00	1.00	
Frt									0.850			
Fit Protected												
Satd, Flow (prot)	1863	0	1863	0	4746	0	0	0	2601	0	0	
Flt Permitted												
Satd, Flow (perm)	1863	0	1863	0	4746	0	0	0	2601	0	0	
Right Turn on Red			Yes			Yes			Yes			
Satd. Flow (RTOR)									1920			
Link Speed (mph)		30			30			30		30		
Link Distance (ft)		212			269			153		170		
Travel Time (s)		4.8			6.1			3.5		3.9		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	0	0	0	825	0	0	0	541	0	0	
Shared Lane Traffic (%)							-					
Lane Group Flow (vph)	0	0	0	0	825	0	0	0	541	0	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right	
Median Width(ft)		12			0	,		25	,	0		
Link Offset(ft)		0			5			3		0		
Crosswalk Width(ft)		16			30			16		16		
Two way Left Turn Lane		1.5						2.70				
Headway Factor	1.00	1.09	1.00	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	
Turning Speed (mph)	15	15	9	15	1.00	9	15	1.00	9	15	9	
Turn Type	Prot		Perm		NA				Perm			
Protected Phases	6				58				1 01111			2
Permitted Phases			6						6			
Minimum Split (s)	20.0		20.0						20.0			66.0
Total Split (s)	53.0		53.0						53.0			104.0
Total Split (%)	35.3%		35.3%						35.3%			69%
Maximum Green (s)	46.0		46.0						46.0			97.5
Yellow Time (s)	4.0		4.0						4.0			4.0
All-Red Time (s)	3.0		3.0						3.0			2.5
Lost Time Adjust (s)	-1.5		-1.5						0.0			2.0
Total Lost Time (s)	5.5		5.5						7.0			
Lead/Lag	Lag		Lag						Lag			
Lead-Lag Optimize?	Yes		Yes						Yes			
Walk Time (s)	7.0		7.0						7.0			7.0
Flash Dont Walk (s)	6.0		6.0						6.0			4.0
Pedestrian Calls (#/hr)	0.0		0.0						0.0			0
Act Effet Green (s)	U		U		77.0				46.0			U
HOLLING OLCCII (a)					11.0				40.0			

Lane Group	Ø4	Ø5	Ø8	Ø9	
Lane Configurations					
Traffic Volume (vph)					
Future Volume (vph)					
deal Flow (vphpl)					
Lane Width (ft)					
Storage Length (ft)					
Storage Lanes					
Taper Length (ft)					
ane Util. Factor					
rt					
It Protected					
Satd. Flow (prot)					
It Permitted					
Satd. Flow (perm)					
Right Turn on Red					
Satd. Flow (RTOR)					
ink Speed (mph)					
ink Distance (ft)					
Fravel Time (s)					
Peak Hour Factor					
Adj. Flow (vph)					
Shared Lane Traffic (%)					
ane Group Flow (vph)					
Enter Blocked Intersection					
Lane Alignment					
Median Width(ft)					
_ink Offset(ft)					
Crosswalk Width(ft)					
Two way Left Turn Lane					
Headway Factor					
Furning Speed (mph)					
Furn Type		-		0	
Protected Phases	4	5	8	9	
Permitted Phases	00.0	07.0	00.0	40.0	
Minimum Split (s)	32.0	27.0	32.0	10.0	
Total Split (s)	36.0	51.0	36.0	10.0	
Total Split (%)	24%	34%	24%	7%	
Maximum Green (s)	29.0	44.5	29.5	5.0	
/ellow Time (s)	4.0	4.0	4.0	3.0	
All-Red Time (s)	3.0	2.5	2.5	2.0	
ost Time Adjust (s)					
Total Lost Time (s)					
_ead/Lag		Lead			
_ead-Lag Optimize?		Yes			
Walk Time (s)	4.0				
lash Dont Walk (s)	21.0				
Pedestrian Calls (#/hr)	0				
Act Effet Green (s)					

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Lane Group	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER	Ø2
v/c Ratio					0.34				0.25			
Control Delay					14.9				0.1			
Queue Delay					0.1				4.1			
Total Delay					15.0				4.2			
LOS					В				А			
Approach Delay					15.0			4.2				
Approach LOS					В			А				
Queue Length 50th (ft)					132				0			
Queue Length 95th (ft)					157				m0			
Internal Link Dist (ft)		132			189			73		90		
Turn Bay Length (ft)												
Base Capacity (vph)					2436				2128			
Starvation Cap Reductn					0				1485			
Spillback Cap Reductn					434				0			
Storage Cap Reductn					0				0			
Reduced v/c Ratio					0.41				0.84			
Intersection Summary												
Area Type:	Other											
Cycle Length: 150												
Actuated Cycle Length: 15												
Offset: 0 (0%), Referenced	l to phase 2:	WBTand	16:EBTL,	Start of 0	Green							
Natural Cycle: 150												
Control Type: Pretimed												
Maximum v/c Ratio: 1.28												
Intersection Signal Delay:					ntersection							
Intersection Capacity Utiliz	ation 23.3%			10	CU Level o	of Service	A					

Intersection Capacity Utilization 23.3% ICU
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 11: 12th Street SW



Lane Group	Ø4	Ø5	Ø8	Ø9
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (ft)				
Queue Length 95th (ft)				
Internal Link Dist (ft)				
Turn Bay Length (ft)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				
Intersection Summary				

	•	→	•	•	←	•	₹î	4	†	-	-	Į.
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations		वाक			नाक				4	7		4
Traffic Volume (vph)	0	1934	53	70	1856	0	32	237	0	229	0	0
Future Volume (vph)	0	1934	53	70	1856	0	32	237	0	229	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.86	0.86	0.86	0.86	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99			1.00				0.75			
Frt		0.996								0.850		
Flt Protected					0.998				0.950			
Satd. Flow (prot)	0	5922	0	0	5917	0	0	0	1627	1492	0	1773
Flt Permitted					0.744				0.757			
Satd. Flow (perm)	0	5922	0	0	4410	0	0	0	976	1492	0	1773
Right Turn on Red			Yes			Yes				Yes		Service at
Satd. Flow (RTOR)		7								239		
Link Speed (mph)		35			35				30			15
Link Distance (ft)		540			606				566			305
Travel Time (s)		10.5			11.8				12.9			13.9
Confl. Peds. (#/hr)	201		138	138		201	103	103				
Confl. Bikes (#/hr)			12			22						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	2%	2%	0%	3%	0%	0%	4%	0%	1%	0%	0%
Adj. Flow (vph)	0	2015	55	73	1933	0	33	247	0	239	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2070	0	0	2006	0	0	0	280	239	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	R NA	Left	Left	Right	Left	Left
Median Width(ft)		0			0				90			0
Link Offset(ft)		0			0				5			-70
Crosswalk Width(ft)		45			20				20			20
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (mph)	15		9	15		9	9	15		9	15	- Colonia
Turn Type		NA		pm+pt	NA		Perm	Perm	NA	Over		
Protected Phases		2		1	6				8	1		8
Permitted Phases	2			6			8	8			8	
Minimum Split (s)	30.5	30.5		10.5	25.5		30.5	30.5	30.5	10.5	30.5	30.5
Total Split (s)	53.0	53.0		11.0	64.0		31.0	31.0	31.0	11.0	31.0	31.0
Total Split (%)	53.0%	53.0%		11.0%	64.0%		31.0%	31.0%	31.0%	11.0%	31.0%	31.0%
Maximum Green (s)	43.5	43.5		5.5	58.5		25.5	25.5	25.5	5.5	25.5	25.5
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	5.5	5.5		1.5	1.5		1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)		-1.5			0.0				0.0	0.0		0.0
Total Lost Time (s)		8.0			5.5				5.5	5.5		5.5
Lead/Lag	Lead	Lead		Lag			Lag	Lag	Lag	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes	Yes	Yes	Yes	Yes
Walk Time (s)	10.0	10.0			10.0		5.0	5.0	5.0		5.0	5.0
Flash Dont Walk (s)	10.0	10.0			10.0		20.0	20.0	20.0		20.0	20.0
Pedestrian Calls (#/hr)	0	0			0		0	0	0		0	0
Act Effct Green (s)	- 3	45.0			58.5		Ž.		25.5	5.5	12	
Actuated g/C Ratio		0.45			0.58				0.26	0.06		

Lanes, Volumes, Timings 14: 9th Street SW/Smithsonian Driveway & Independence Ave SW

	4	
Lane Group	SBR	Ø7
Lant Configurations		
Traffic Volume (vph)	0	
Future Volume (vph)	0	
Ideal Flow (vphpl)	1900	
Lane Util. Factor	1.00	
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)	0	
Flt Permitted		
Satd. Flow (perm)	0	
Right Turn on Red	Yes	
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor	0.96	
Heavy Vehides (%)	0%	
Adj. Flow (vph)	0	
Shared Lane Traffic (%)		
Lane Group Flow (vph)	0	
Enter Blocked Intersection	No	
Lane Alignment	Right	
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor	1.09	
Turning Speed (mph)	9	
Turn Type		
Protected Phases		7
Permitted Phases		
Minimum Split (s)		5.0
Total Split (s)		5.0
Total Split (%)		5%
Maximum Green (s)		3.0
Yellow Time (s)		2.0
All-Red Time (s)		0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		Lead
Lead-Lag Optimize?		Yes
Walk Time (s)		
Flash Dont Walk (s)		
Pedestrian Calls (#/hr)		
Act Effct Green (s)		
Actuated g/C Ratio		

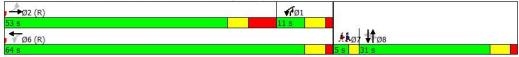
14: 9th Street SW/Smithsonian Driveway & Independence Ave SW

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
v/c Ratio		0.78			0.75				1.13	0.78		
Control Delay		25.7			18.2				132.7	24.7		
Queue Delay		0.0			0.0				0.0	0.0		
Total Delay		25.7			18.2				132.7	24.7		
LOS		С			В				F	С		
Approach Delay		25.7			18.2				83.0			
Approach LOS		С			В				F			
Queue Length 50th (ft)		313			217				~208	0		
Queue Length 95th (ft)		362			252				#369	#110		
Internal Link Dist (ft)		460			526				486			225
Turn Bay Length (ft)												
Base Capacity (vph)		2668			2662				248	307		
Starvation Cap Reductn		0			0				0	0		
Spillback Cap Reductn		0			0				0	0		
Storage Cap Reductn		0			0				0	0		
Reduced v/c Ratio		0.78			0.75				1.13	0.78		
Intersection Summary												
Area Type:	Other											
Cycle Length: 100												
Actuated Cycle Length: 10												
Offset: 3 (3%), Referenced	l to phase 2:	EBTL and	16:WBTL	., Start of	Green							
Natural Cycle: 90												
Control Type: Pretimed												
Maximum v/c Ratio: 1.13												
Intersection Signal Delay, 2					tersection		_					
Intersection Capacity Utiliz	ation 87.8%			IC	CU Level o	of Service	E					
Analysis Period (min) 15	10 70											
 Volume exceeds capac 			ally infini	te.								
Queue shown is maxim	um atter two	cycles.										

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

Queue shown is maximum after two cycles.

Splits and Phases: 14: 9th Street SW/S mithsonian Driveway & Independence Ave SW





Lane Group	SBR	Ø7
v/c Ratio	JDN	WI
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Internation Communication		
Intersection Summary		

	•	\rightarrow	•	1	←	•	1	†	~	-	Ţ	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		नाक			नााः		1	^^		7	444	
Traffic Volume (vph)	141	1673	349	23	1392	152	183	333	141	272	673	351
Future Volume (vph)	141	1673	349	23	1392	152	183	333	141	272	673	351
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	11	11	11	11	11	11
Storage Length (ft)	0		0	0		0	80		0	0		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	0.86	0.86	0.86	0.86	0.86	0.86	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor	0,00	0.95	0.00		0.97	0.00	0.92	0.89	0.01	0.84	0.88	0.0.
Frt		0.976			0.985			0.955		. 4.14.0	0.949	
Fit Protected		0.997			0.999		0.950			0.950		
Satd. Flow (prot)	0	5530	0	0	5627	0	1662	3966	0	1616	3886	0
Flt Permitted		0.707			0.837		0.262			0.372		
Satd. Flow (perm)	0	3917	0	0	4714	0	420	3966	0	532	3886	0
Right Turn on Red	U	0017	Yes	U		Yes	720	0000	No	002	0000	Yes
Satd. Flow (RTOR)		5	100		27	100			110		126	100
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		606			437			393			424	
Travel Time (s)		11.8			8.5			7.7			8.3	
Confl. Peds. (#/hr)	232	11.0	222	222	0.0	232	444	1.1	444	444	0.0	444
Confl. Bikes (#hr)	232		7	222		9	444		18	444		17
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	4%	2%	2%	11%	2%	15%	5%	6%	10%	8%	9%	4%
Adj. Flow (vph)	144	1707	356	23	1420	155	187	340	144	278	687	358
Shared Lane Traffic (%)	144	1707	330	23	1420	100	107	340	144	2/0	007	300
Lane Group Flow (vph)	0	2207	0	0	1598	0	187	484	0	278	1045	0
	No	No	No	No	No	No	No	No	No	No	No	No
Enter Blocked Intersection				1000								and the second second
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0 5			0			11			11	
Link Offset(ft)					0			-6			5	
Crosswalk Width(ft)		32			30			22			35	
Two way Left Turn Lane	4.00	4.00	4.00	4.00	4.00	4.00	4.04	4.04	4.04	4.04	4.04	4.04
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15	A14	9	15	N/A	9	15	NIA	9	15	A I A	9
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases	5	2			6			4		3	8	
Permitted Phases	2			6			4			8		
Minimum Split (s)	10.5	31.5		28.5	28.5		29.5	29.5		10.0	32.5	
Total Split (s)	11.0	60.0		49.0	49.0		36.5	36.5		13.5	50.0	
Total Split (%)	10.0%	54.5%		44.5%	44.5%		33.2%	33.2%		12.3%	45.5%	
Maximum Green (s)	5.5	53.5		42.5	42.5		30.0	30.0		8.5	43.5	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.5	2.5		2.5	2.5		2.5	2.5		1.0	2.5	
Lost Time Adjust (s)		-1.5			-1.5		-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)	210 (11)	5.0		-	5.0		5.0	5.0		3.5	5.0	
Lead/Lag	Lead			Lag	Lag		Lag	Lag		Lead		
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes		Yes		
Walk Time (s)		7.0		4.0	4.0		4.0	4.0			7.0	

22: 7th Street SW & Independence Ave SW

	•	-	7	1	-	•	1	1	-	-	Į.	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Flash Dont Walk (s)		18.0		18.0	18.0		19.0	19.0			19.0	
Pedestrian Calls (#/hr)		0		0	0		0	0			0	
Act Effct Green (s)		55.0			44.0		31.5	31.5		46.5	45.0	
Actuated g/C Ratio		0.50			0.40		0.29	0.29		0.42	0.41	
v/c Ratio		1.08			0.84		1.56	0.43		0.86	0.63	
Control Delay		71.4			34.3		318.0	33.3		63.6	29.9	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.2	
Total Delay		71.4			34.3		318.0	33.3		63.6	30.1	
LOS		Е			С		F	С		Е	С	
Approach Delay		71.4			34.3			112.7			37.1	
Approach LOS		Е			С			F			D	
Queue Length 50th (ft)		~420			287		~187	101		166	187	
Queue Length 95th (ft)		#544			339		#330	136		#261	230	
Internal Link Dist (ft)		526			357			313			344	
Turn Bay Length (ft)							80					
Base Capacity (vph)		2048			1901		120	1135		323	1664	
Starvation Cap Reductn		0			0		0	0		0	113	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		1.08			0.84		1.56	0.43		0.86	0.67	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 32 (29%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 100 Control Type: Pretimed Maximum v/c Ratio: 1.56

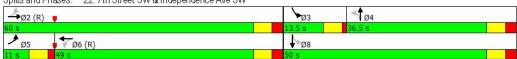
Intersection Signal Delay: 58.1 Intersection LOS: E Intersection Capacity Utilization 108.3% ICU Level of Service G

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 22: 7th Street SW & Independence Ave SW



Lanes, Volumes, Timings 2: 14th Street SW & Independence Ave SW

	•	→	•	1	-	•	1	†	~	-	ļ	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		444			444	7		444	7	7	444	
Traffic Volume (vph)	6	759	45	31	1596	190	0	1826	555	297	2353	33
Future Volume (vph)	6	759	45	31	1596	190	0	1826	555	297	2353	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	10	10	10	10	10	10	10	10	10	10
Lane Util. Factor	0.91	0.91	0.91	0.91	0.91	1.00	1.00	0.91	1.00	1.00	0.91	0.91
Ped Bike Factor		0.98	0.01		1.00	0.84	,,,,,	0.01	0.90		1.00	
Frt		0.992			1.00	0.850			0.850		0.998	
Flt Protected		0.002			0.999	0.000			0.000	0.950	0.000	
Satd. Flow (prot)	0	4758	0	0	4631	1311	0	4793	1478	1589	4733	0
Fit Permitted	U	0.795	v	v	0.837	1011	U	4700	1470	0.057	4700	U
Satd. Flow (perm)	0	3783	0	0	3876	1107	0	4793	1330	95	4733	0
Right Turn on Red	U	3/03	Yes	U	3070	Yes	U	4133	Yes	30	4/00	Yes
All and the second state to the format of the second state of the		3	163			123			73			1 63
Satd. Flow (RTOR)		35			35	123		30	13		30	
Link Speed (mph)												
Link Distance (ft)		370			1104			509			377	
Travel Time (s)		7.2	050	050	21.5		00	11.6	40	40	8.6	
Confl. Peds. (#/hr)	86		250	250		86	33		49	49		33
Confl. Bikes (#/hr)			3			31			3			2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	80%	2%	3%	79%	3%	15%	0%	1%	2%	6%	2%	0%
Adj. Flow (vph)	7	843	50	34	1773	211	0	2029	617	330	2614	37
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	900	0	0	1807	211	0	2029	617	330	2651	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			4			10	
Link Offset(ft)		0			0			5			0	
Crosswalk Width(ft)		20			30			30			26	
Two way Left Turn Lane												
Headway Factor	1.09	1.04	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA	Perm		NA	Perm	pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8			2	6		
Minimum Split (s)	36.5	36.5		36.5	36.5	36.5		31.5	31.5	10.5	31.5	
Total Split (s)	52.0	52.0		52.0	52.0	52.0		70.0	70.0	28.0	98.0	
Total Split (%)	34.7%	34.7%		34.7%	34.7%	34.7%		46.7%	46.7%	18.7%	65.3%	
Maximum Green (s)	45.5	45.5		45.5	45.5	45.5		63.5	63.5	21.5	91.5	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5	2.5		2.5	2.5	2.5	2.5	
ATTURNOS OF THE STREET, AND ADDRESS OF THE STREE	2.0	-1.5		2.0	-1.5	-1.5		-1.5	-1.5	-1.0	-1.5	
Lost Time Adjust (s) Total Lost Time (s)		5.0			5.0	5.0		5.0	5.0	5.5	5.0	
Lead/Lag		5.0			5.0	0.0		Lead	Lead		5.0	
James - Control Contro								Yes	Yes	Lag Yes		
Lead-Lag Optimize?	7.0	7.0		7.0	7.0	7.0		11777		res	60	
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		6.0	6.0		6.0	
Flash Dont Walk (s)	23.0	23.0		23.0	23.0	23.0		19.0	19.0		19.0	
Pedestrian Calls (#/hr)	0	0		0	0	0		0	0	00.5	0	
Act Effct Green (s)		47.0			47.0	47.0		65.0	65.0	92.5	93.0	

	•	→	7	1	•	•	1	1	-	>	↓	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio		0.31			0.31	0.31		0.43	0.43	0.62	0.62	
v/c Ratio		0.76			1.49	0.49		0.98	1.00	1.17	0.90	
Control Delay		51.1			253.2	15.8		56.7	73.4	136.6	15.0	
Queue Delay		0.0			0.0	0.0		0.3	0.0	0.0	1.5	
Total Delay		51.1			253.2	15.8		57.0	73.4	136.6	16.5	
LOS		D			F	В		Е	Е	F	В	
Approach Delay		51.1			228.3			60.8			29.8	
Approach LOS		D			F			Е			С	
Queue Length 50th (ft)		290			~915	134		707	551	~339	830	
Queue Length 95th (ft)		347			m#517	m54		#828	#825	m#469	m564	
Internal Link Dist (ft)		290			1024			429			297	
Turn Bay Length (ft)												
Base Capacity (vph)		1187			1214	431		2076	617	282	2934	
Starvation Cap Reductn		0			0	0		0	0	0	140	
Spillback Cap Reductn		0			0	0		4	0	0	0	
Storage Cap Reductn		0			0	0		0	0	0	0	
Reduced v/c Ratio		0.76			1.49	0.49		0.98	1.00	1.17	0.95	
Intersection Summary												
	Other											
Cycle Length: 150												
Actuated Cycle Length: 150												
Offset: 147 (98%), Reference	ed to phase	e 2:NBT a	and 6:SB	TL, Start	of Green							
Natural Cycle: 110												
Control Type: Pretimed												
Maximum v/c Ratio: 1.49												
Intersection Signal Delay: 88	3.5			li li	ntersection	LOS: F						
Intersection Capacity Utilizat	ion 117.5%	6		10	CU Level	of Service	Н					
Analysis Period (min) 15												
 Volume exceeds capacit 	y, queue is	theoretic	ally infini	ite.								
Queue shown is maximui	m after two	cycles.										
# 95th percentile volume e	xceeds cap	pacity, qu	eue may	be longe	er.							
Queue shown is maximui	m after two	cycles.										
m Volume for 95th percent	ile queue is	s metered	d by upstr	ream sigi	nal.							
Splits and Phases: 2: 14th	Street SW	/ & Indep	endence	Ave SW								
Ø2 (R)	_				Ø1			▶ Ø4				
70 s				2	8 s		52					
₩ Ø6 (R)				114			+	Ø8				10
90 c							52					

	•	→	*	1	-	•	1	†	~	>	1	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4	1						444		7	^	
Traffic Volume (vph)	59	118	306	0	0	0	0	1914	108	50	2377	0
Future Volume (vph)	59	118	306	0	0	0	0	1914	108	50	2377	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	10	10	10	10	10	12	12	10	10	10
Storage Length (ft)	0		0	0		0	0		20	170		0
Storage Lanes	1		0	0		0	0		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	1.00
Ped Bike Factor	0.59	0.75						0.97				
Frt		0.892						0.992				
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1597	1229	0	0	0	0	0	4786	0	1636	4700	0
Flt Permitted	0.950									0.047		
Satd. Flow (perm)	935	1229	0	0	0	0	0	4786	0	81	4700	0
Right Turn on Red	787.7.7.	100000000000000000000000000000000000000	No	10.000	A(\$700)	Yes	17.70	12.6545550	Yes	765	10000000	Yes
Satd. Flow (RTOR)								9				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		257			1068			377			341	
Travel Time (s)		5.8			24.3			8.6			7.8	
Confl. Peds. (#/hr)	543	0.0	191	191	21.0	543	164	0.0	228	228	1.0	164
Confl. Bikes (#/hr)	010		97	101		0.10	101		16			9
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	13%	9%	2%	0%	0%	0%	0%	4%	1%	3%	3%	0%
Adj. Flow (vph)	60	119	309	0	0	0	0	1933	109	51	2401	0
Shared Lane Traffic (%)		110						1000	100		2101	
Lane Group Flow (vph)	60	428	0	0	0	0	0	2042	0	51	2401	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	Lon	15	ragin	Lon	12	rugine	Loit	0	rugiit	Lon	10	rugin
Link Offset(ft)		0			15			0			5	
Crosswalk Width(ft)		30			35			37			35	
Two way Left Turn Lane		50			00			37			00	
Headway Factor	1.00	1.00	1.09	1.09	1.09	1.09	1.09	1.00	1.00	1.09	1.09	1.09
Turning Speed (mph)	15	1.00	9	15	1.00	9	15	1.00	9	15	1.00	9
Turn Type	Perm	NA						NA		pm+pt	NA	·
Protected Phases	1 Giiii	4						6		5	2	
Permitted Phases	4									2		
Minimum Split (s)	34.5	34.5						20.5		10.5	20.5	
Total Split (s)	53.0	53.0						86.0		11.0	97.0	
Total Split (%)	35.3%	35.3%						57.3%		7.3%	64.7%	
Maximum Green (s)	46.5	46.5						80.5		5.5	91.5	
Yellow Time (s)	4.0	4.0						4.0		4.0	4.0	
All-Red Time (s)	2.5	2.5						1.5		1.5	1.5	
Lost Time Adjust (s)	-1.5	-1.5						-1.5		-1.5	-1.5	
Total Lost Time (s)	5.0	5.0						4.0		4.0	4.0	
Lead/Lag	0.0	0.0						Lag		Lead	4.0	
Lead-Lag Optimize?								Yes		Yes		

4: 14th Street SW & SW Jefferson Drive

	•	-	7	1	-	•	1	1	1	-	1	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Flash Dont Walk (s)	18.0	18.0						5.0			5.0	
Pedestrian Calls (#/hr)	0	0						0			0	
Act Effct Green (s)	48.0	48.0						82.0		93.0	93.0	
Actuated g/C Ratio	0.32	0.32						0.55		0.62	0.62	
v/c Ratio	0.20	1.09						0.78		0.42	0.82	
Control Delay	39.4	118.6						3.9		25.0	25.3	
Queue Delay	0.0	0.0						2.9		0.0	1.0	
Total Delay	39.4	118.6						6.8		25.0	26.3	
LOS	D	F						А		С	С	
Approach Delay		108.8						6.8			26.2	
Approach LOS		F						Α			С	
Queue Length 50th (ft)	43	~469						55		19	637	
Queue Length 95th (ft)	83	#688						m61		48	702	
Internal Link Dist (ft)		177			988			297			261	
Turn Bay Length (ft)										170		
Base Capacity (vph)	299	393						2620		122	2914	
Starvation Cap Reductn	0	0						454		0	0	
Spillback Cap Reductn	0	0						0		0	256	
Storage Cap Reductn	0	0						0		0	0	
Reduced v/c Ratio	0.20	1.09						0.94		0.42	0.90	

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBT, Start of Green

Natural Cycle: 90

Control Type: Pretimed

Maximum v/c Ratio: 1.09

Intersection Signal Delay, 26.3 Intersection Capacity Utilization 84.0% Intersection LOS: C ICU Level of Service E

Analysis Period (min) 15

Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 4: 14th Street SW & SW Jefferson Drive



	\rightarrow	•	1	←	1	-	
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	1					7	
Traffic Volume (vph)	206	77	0	0	0	19	
Future Volume (vph)	206	77	0	0	0	19	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	14	10	10	10	10	13	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor							
Frt	0.963					0.865	
Flt Protected							
Satd. Flow (prot)	1857	0	0	0	0	1698	
FIt Permitted							
Satd. Flow (perm)	1857	0	0	0	0	1698	
Link Speed (mph)	30			30	30		
Link Distance (ft)	1068			661	401		
Travel Time (s)	24.3			15.0	9.1		
Confl. Peds. (#/hr)		373	263		373		
Confl. Bikes (#/hr)		122					
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	
Heavy Vehides (%)	7%	0%	0%	0%	0%	0%	
Adj. Flow (vph)	258	96	0	0	0	24	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	354	0	0	0	0	24	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(ft)	0			0	0		
Link Offset(ft)	0			0	-2		
Crosswalk Width(ft)	16			16	24		
Two way Left Turn Lane							
Headway Factor	0.92	1.09	1.09	1.09	1.09	0.96	
Turning Speed (mph)		9	15		15	9	
Sign Control	Stop			Stop	Stop		
Intersection Summary							
	Other						
Control Type: Unsignalized							
Intersection Capacity Utilizat	ion 28.0%			IC	U Level	of Service A	
Analysis Period (min) 15							

SI South Campus Master Plan 10/20/2017 2040 Build Condition PM Peak Hour Stantec

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR2	SEL
Lane Configurations		वीकि	3-3-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2	1	444				ă	1	7	Y
Traffic Volume (vph)	1	1572	38	427	1678	2	209	118	2	256	383	18
Future Volume (vph)	1	1572	38	427	1678	2	209	118	2	256	383	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	11	11	11	13
Lane Util. Factor	0.86	0.86	0.86	0.86	0.86	0.91	0.91	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00	0.00	1.00	0.93	0.0.	0.01		0.56		0.63	0.72
Frt		0.996		1.00	0.984				0.00		0.850	0.904
Fit Protected		0.000		0.950	0.999				0.950		0.000	0.986
Satd. Flow (prot)	0	5892	0	1393	4017	0	0	0	1679	1766	1501	1100
Fit Permitted	U	0.908	U	0.950	0.764	U	U	U	0.950	17 00	1001	0.986
Satd. Flow (perm)	0	5350	0	1390	3072	0	0	0	943	1766	943	985
Right Turn on Red	U	0000	Yes	1000	0012	U	U	U	340	1700	Yes	300
Satd. Flow (RTOR)		3	103								93	113
Link Speed (mph)		35			35					30	90	30
Link Distance (ft)		1104			603					153		401
Travel Time (s)		21.5			11.7					3.5		9.1
The second secon	87	21.0	8	8	11.7	87	87	73	73	3.3	350	350
Confl. Peds. (#/hr)	0/		21	0		20	20	13	13		5	300
Confl. Bikes (#/hr)	0.00	0.00		0.00	0.00			0.00	0.00	0.00		0.00
Peak Hour Factor	0.92	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	3%	3%	4%	4%	0%	4%	4%	0%	4%	4%	40%
Adj. Flow (vph)	1	1747	42	474	1864	2	232	131	2	284	426	20
Shared Lane Traffic (%)		4700	^	10%	0445			^	400	004	400	70
Lane Group Flow (vph)	0	1790	0	427	2145	0	.0	0	133	284	426	70
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Right	Left	Left	Left	Right	Left
Median Width(ft)		0			10					56		13
Link Offset(ft)		0			0					0		40
Crosswalk Width(ft)		30			25					28		20
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.04	1.04	1.04	0.96
Turning Speed (mph)	15	22.5	9	15	o lostes 1	9	9	15	15		9	15
Turn Type	Perm	NA		Prot	NA			custom	custom	NA	custom	D.Pm
Protected Phases		6		5	2					4	5	
Permitted Phases	6	unamen v		0.0000000000000000000000000000000000000	West and the second			48	48	8	48	48
Minimum Split (s)	20.0	20.0		27.0	66.0					32.0	27.0	
Total Split (s)	56.0	56.0		42.0	98.0					42.0	42.0	
Total Split (%)	37.3%	37.3%		28.0%	65.3%					28.0%	28.0%	
Maximum Green (s)	49.0	49.0		35.5	91.5					35.0	35.5	
Yellow Time (s)	4.0	4.0		4.0	4.0					4.0	4.0	
All-Red Time (s)	3.0	3.0		2.5	2.5					3.0	2.5	
Lost Time Adjust (s)		-1.5		-1.5	-1.5					-1.5	-1.5	
Total Lost Time (s)		5.5		5.0	5.0					5.5	5.0	
Lead/Lag	Lead	Lead		Lag							Lag	
Lead-Lag Optimize?	Yes	Yes		Yes							Yes	
Walk Time (s)	7.0	7.0			7.0					4.0		
Flash Dont Walk (s)	6.0	6.0			4.0					21.0		
Pedestrian Calls (#/hr)	0	0			0					0		
Act Effct Green (s)		50.5		37.0	93.0				36.5	36.5	74.0	36.5

SI South Campus Master Plan 10/20/2017 2040 Build Condition PM Peak Hour Stantec

Synchro 9 Report Page 6

	>	4	6	4	~		
Lane Group	SER	SER2	SWL2	SWL	SWR	Ø8	
Larre Configurations				M			
Traffic Volume (vph)	25	20	3	0	1		
Future Volume (vph)	25	20	3	0	1		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900		
Lane Width (ft)	10	10	10	10	10		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		
Ped Bike Factor	1.00	1.00	1.00	1.00	1.00		
Frt				0.966			
Fit Protected				0.964			
Satd. Flow (prot)	0	0	0	826	0		
Fit Permitted	U	U	U	0.964	U		
	0	0	0	826	0		
Satd. Flow (perm)	U		U	826	U		
Right Turn on Red		Yes					
Satd. Flow (RTOR)							
Link Speed (mph)				30			
Link Distance (ft)				296			
Travel Time (s)				6.7			
Confl. Peds. (#/hr)	73	73					
Confl. Bikes (#/hr)	9	9					
Peak Hour Factor	0.90	0.90	0.92	0.92	0.92		
Heavy Vehicles (%)	40%	0%	100%	100%	100%		
Adj. Flow (vph)	28	22	3	0	1		
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	0	4	0		
Enter Blocked Intersection	No	No	No	No	No		
Lane Alignment	Right	Right	Left	Left	Right		
Median Width(ft)		J		10	,		
Link Offset(ft)				0			
Crosswalk Width(ft)				0			
Two way Left Turn Lane							
Headway Factor	1.09	1.09	1.09	1.09	1.09		
Turning Speed (mph)	9	9	15	15	9		
Turn Type			Perm	Prot	Ü		
Protected Phases			1.01111	9		8	
Permitted Phases			9	,		v	
Minimum Split (s)			10.0	10.0		32.0	
Total Split (s)			10.0	10.0		42.0	
			6.7%	6.7%		28%	
Total Split (%)			5.0	5.0		35.5	
Maximum Green (s)			1,000			00.0	
Yellow Time (s)			3.0	3.0		4.0	
All-Red Time (s)			2.0	2.0		2.5	
Lost Time Adjust (s)				-1.5			
Total Lost Time (s)				3.5			
Lead/Lag							
Lead-Lag Optimize?							
Walk Time (s)							
Flash Dont Walk (s)							
Pedestrian Calls (#/hr)							
Act Effct Green (s)				6.5			

SI South Campus Master Plan 10/20/2017 2040 Build Condition PM Peak Hour Stantec

Lanes, Volumes, Timings

7: 12th Street SW & Independence Ave SW & 12th Street SW Ramp & Loading Dock 10/20/2017

	#	\rightarrow	7	1	-	*	•	4	ሻ	†	1	\
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR2	SEL
Actuated g/C Ratio		0.34		0.25	0.62				0.24	0.24	0.49	0.24
v/c Ratio		0.99		1.24	1.46				0.58	0.66	0.66	0.22
Control Delay		58.0		155.3	233.9				41.2	39.4	8.9	2.7
Queue Delay		1.1		0.1	0.4				15.5	24.3	0.4	0.0
Total Delay		59.1		155.4	234.4				56.6	63.7	9.3	2.7
LOS		Е		F	F				Е	Е	Α	Α
Approach Delay		59.1			221.2					35.1		2.7
Approach LOS		Ε			F					D.		Α
Queue Length 50th (ft)		516		~603	~1117				116	253	107	0
Queue Length 95th (ft)		m#523		m#733	#1215				193	359	166	8
Internal Link Dist (ft)		1024			523					73		321
Turn Bay Length (ft)												
Base Capacity (vph)		1803		343	1465				229	429	649	325
Starvation Cap Reductn		0		0	163				77	142	37	0
Spillback Cap Reductn		9		3	3				0	0	0	2
Storage Cap Reductn		0		0	0				0	0	0	0
Reduced v/c Ratio		1.00		1.26	1.65				0.88	0.99	0.70	0.22

Intersection Summary

Area Type: Other

Cycle Length: 150 Actuated Cycle Length: 150

Offset: 141 (94%), Referenced to phase 2:WBT and 6:EBTL, Start of Green

Natural Cycle: 150

Control Type: Pretimed

Maximum v/c Ratio: 1.46

Intersection Signal Delay: 133.5

Intersection LOS: F ICU Level of Service H

Intersection Capacity Utilization 125.4%

Analysis Period (min) 15

Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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



Lanes, Volumes, Timings 7: 12th Street SW & Independence Ave SW & 12th Street SW Ramp & Loading Dock 10/20/2017

	-	4	6	4	~		
Lane Group	SER	SER2	SWL2	SWL	SWR	Ø8	
Actuated g/C Ratio				0.04			
v/c Ratio				0.11			
Control Delay				76.2			
Queue Delay				0.0			
Total Delay				76.2			
LOS				Е			
Approach Delay				76.3			
Approach LOS				E			
Queue Length 50th (ft)				4			
Queue Length 95th (ft)				18			
Internal Link Dist (ft)				216			
Turn Bay Length (ft)							
Base Capacity (vph)				35			
Starvation Cap Reductn				0			
Spillback Cap Reductn				0			
Storage Cap Reductn				0			
Reduced v/c Ratio				0.11			
Intersection Summary							

	-	•	1	-	1	-		
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø3	
Lane Configurations	4111			4111	ሻ	7	120000	
Traffic Volume (vph)	1901	75	62	2031	285	86		
Future Volume (vph)	1901	75	62	2031	285	86		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Storage Length (ft)	1000	0	0	1000	0	210		
Storage Lanes		0	0		1	1		
Taper Length (ft)			100		100	*		
Lane Util. Factor	0.86	0.86	0.86	0.86	1.00	1.00		
Ped Bike Factor	0.99	0.00	0.00	0.00	0.66	1.00		
Frt	0.994				0.00	0.850		
Fit Protected	0.001			0.999	0.950	0.000		
Satd. Flow (prot)	5850	0	0	5860	1685	1507		
Flt Permitted			~	0.726	0.950	1001		
Satd. Flow (perm)	5850	0	0	4258	1115	1507		
Right Turn on Red	5000	Yes	,	1200	.,,,,	Yes		
Satd. Flow (RTOR)	7	, 00				31		
Link Speed (mph)	35			35	25	01		
Link Distance (ft)	603			540	714			
Travel Time (s)	11.7			10.5	19.5			
Confl. Peds. (#/hr)	1.00	26	26	10.0	261			
Confl. Bikes (#/hr)		18	20		ZUI			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91		
Heavy Vehicles (%)	3%	3%	4%	4%	0.51	0%		
Adi. Flow (vph)	2089	82	68	2232	313	95		
Shared Lane Traffic (%)	2000	02	~	2202	010			
Lane Group Flow (vph)	2171	0	0	2300	313	95		
Enter Blocked Intersection	No	No	No	No	No	No		
Lane Alignment	Left	Right	Left	Left	Left	Right		
Median Width(ft)	0	ragiit	LOIL	0	60	ragin		
Link Offset(ft)	0			0	-10			
Crosswalk Width(ft)	30			10	16			
Two way Left Turn Lane	50			10	10			
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09		
Turning Speed (mph)	1.09	1.09	1.09	1.03	1.09	9		
Turn Type	NA	9	pm+pt	NA	Prot	pm+ov		
Protected Phases	2		рпп+рt 9	NA 6	4	9	3	
Permitted Phases			6	0	4	4	0	
	58.5		13.5	58.5	30.0	13.5	4.0	
Minimum Split (s) Total Split (s)	83.0		13.5	83.0	49.5	13.5	4.0	
Total Split (%)	55.3%		9.0%	55.3%	33.0%	9.0%	3%	
ENVENTORS IN THE STATE OF THE S	76.5		8.5	76.5	44.0	8.5	2.0	
Maximum Green (s)			4.0	4.0	44.0	4.0	2.0	
Yellow Time (s)	4.0 2.5		1.0	2.5	1.5	1.0	0.0	
All-Red Time (s)	-1.5		1.0	-1.5	-1.0	-1.0	0.0	
Lost Time Adjust (s)	-1.5 5.0			-1.5 5.0	-1.0 4.5	4.0		
Total Lost Time (s)	5.0			5.0		4.0	Lead	
Lead/Lag					Lag			
Lead-Lag Optimize?	10.0				Yes		Yes	
Walk Time (s)	10.0				6.0		0.0	
Flash Dont Walk (s)	4.0				18.0		2.0	

SI South Campus Master Plan 10/20/2017 2040 Build Condition PM Peak Hour Stantec

	-	7	1	•	1	~		
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø3	
Pedestrian Calls (#/hr)	0				0		0	
Act Effct Green (s)	78.0			86.5	45.0	59.0		
Actuated g/C Ratio	0.52			0.58	0.30	0.39		
v/c Ratio	0.71			0.90	0.62	0.16		
Control Delay	8.5			16.7	51.5	20.4		
Queue Delay	1.4			3.4	0.0	0.0		
Total Delay	9.8			20.1	51.5	20.4		
LOS	Α			С	D.	С		
Approach Delay	9.8			20.1	44.2			
Approach LOS	А			С	D			
Queue Length 50th (ft)	101			179	264	40		
Queue Length 95th (ft)	m109			250	373	82		
Internal Link Dist (ft)	523			460	634			
Turn Bay Length (ft)						210		
Base Capacity (vph)	3045			2546	505	611		
Starvation Cap Reductn	615			1	0	0		
Spillback Cap Reductn	31			175	0	0		
Storage Cap Reductn	0			0	0	0		
Reduced v/c Ratio	0.89			0.97	0.62	0.16		
Intersection Summary								
Section Control of the Control	Other							
Cycle Length: 150								
Actuated Cycle Length: 150								
Offset: 143 (95%), Reference	ced to phase	e 2:EBT a	and 6:WB	TL, Start	of Green			
Natural Cycle: 110								
Control Type: Pretimed								
Maximum v/c Ratio: 0.90								
Intersection Signal Delay. 1					ersection			
Intersection Capacity Utiliza	ition 87.1%			IC	ULevelo	of Service		
Analysis Period (min) 15								
m Volume for 95th percen	itile queue i	s metered	d by upstr	eamsign	al.			
Splits and Phases: 9: L'E	nfant Plaza	& Indepe	endence A	Ave SW				
→ Ø2 (R)					2,472	AK V	34	√ rø9

	•	\rightarrow	•	•	+	•	1	†	~	-	Į.	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	7	↑	7"					^^			ना	
Traffic Volume (vph)	54	81	129	0	0	0	0	600	26	29	1167	0
Future Volume (vph)	54	81	129	0	0	0	0	600	26	29	1167	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	10	10	10	11	11	11	11	11	11
Storage Length (ft)	200		200	0		0	0		0	0		0
Storage Lanes	1		1	0		0	0		0	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	0.86	0.86	1.00
Ped Bike Factor	0.75		0.63	1,00			1.00	0.97	0.01	0.00	0.99	
Frt			0.850					0.994				
Flt Protected	0.950										0.999	
Satd. Flow (prot)	1711	1652	1546	0	0	0	0	4449	0	0	5793	0
Flt Permitted	0.950									_	0.895	
Satd. Flow (perm)	1287	1652	969	0	0	0	0	4449	0	0	5161	0
Right Turn on Red	1201	1002	Yes			Yes		1110	No		0101	Yes
Satd. Flow (RTOR)			22			100			110			100
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		454			399			424			394	
Travel Time (s)		10.3			9.1			8.3			7.7	
Confl. Peds. (#/hr)	143	10.0	288	288	0.1	143	469	0.0	293	293	1.1	469
Confl. Bikes (#/hr)	140		112	200		140	400		31	200		16
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehides (%)	2%	15%	1%	0%	0.07	0.97	0%	9%	0.0%	47%	8%	0%
Adj. Flow (vph)	56	84	133	0.00	0	0,0	0	619	27	30	1203	0.0
Shared Lane Traffic (%)	00	04	100	U	U	, o	U	013	21	00	1200	Ü
Lane Group Flow (vph)	56	84	133	0	0	0	0	646	0	0	1233	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	Leit	11	Nyiit	Leit	11	rigit	Leit	0	rigiit	Leit	0	rigit
Link Offset(ft)		-15			15			10			-10	
Crosswalk Width(ft)		35			20			35			55	
Two way Left Turn Lane		33			20			33			55	
Headway Factor	1.04	1.00	1.04	1.09	1.09	1.09	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15	1.00	9	15	1.03	9	15	1,04	9	15	1.04	9
Turn Type	Perm	NA	Perm	15		Э	15	NA	9	Perm	NA	Э
Protected Phases	reiiii	4	raili					2		Pellil	2	
Permitted Phases	4	- 4	4					2		2	2	
Minimum Split (s)	32.5	32.5	32.5					20.0		20.0	20.0	
Total Split (s)	63.0	63.0	63.0					87.0		87.0	87.0	
Total Split (%)	42.0%	42.0%	42.0%					58.0%		58.0%	58.0%	
AND THE RESIDENCE OF THE PARTY			56.5									
Maximum Green (s) Yellow Time (s)	56.5 4.0	56.5 4.0	4.0					81.0 4.0		81.0 4.0	81.0 4.0	
	2.5									2.0		
All-Red Time (s)	-	2.5	2.5					2.0		2.0	2.0	
Lost Time Adjust (s)	-1.5	-1.5	-1.5					-1.5			-1.5	
Total Lost Time (s)	5.0	5.0	5.0					4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?	40.0	40.0	40.0					40.0		40.0	40.0	
Walk Time (s)	10.0	10.0	10.0					10.0		10.0	10.0	

Lane Group	Ø6	Ø8	
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Fit Protected			
Satd. Flow (prot)			
Fit Permitted			
1010010200000223			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Confl. Bikes (#/hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Enter Blocked Intersection			
Lane Alignment			
Median Width(ft)			
Link Offset(ft)			
Crosswalk Width(ft)			
Two way Left Turn Lane			
Headway Factor			
Turning Speed (mph)			
Turn Type			
Protected Phases	6	8	
Permitted Phases			
Minimum Split (s)	21.0	31.5	
Total Split (s)	87.0	63.0	
Total Split (%)	58%	42%	
Maximum Green (s)	81.0	56.5	
Yellow Time (s)	4.0	4.0	
All-Red Time (s)	2.0	2.5	
Lost Time Adjust (s)	2.0	2.0	
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Walk Time (s)	10.0	10.0	
www. Time (a)	10.0	10.0	

	•	-	7	1	•	•	1	Ť	1	-	Į.	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Flash Dont Walk (s)	16.0	16.0	16.0					4.0		4.0	4.0	
Pedestrian Calls (#/hr)	0	0	0					0		0	0	
Act Effct Green (s)	58.0	58.0	58.0					82.5			82.5	
Actuated g/C Ratio	0.39	0.39	0.39					0.55			0.55	
v/c Ratio	0.11	0.13	0.34					0.26			0.43	
Control Delay	30.4	30.5	29.9					13.9			20.6	
Queue Delay	0.0	0.0	0.0					0.0			0.0	
Total Delay	30.4	30.5	29.9					13.9			20.6	
LOS	C	С	С					В			С	
Approach Delay		30.2						13.9			20.6	
Approach LOS		С						В			С	
Queue Length 50th (ft)	35	53	76					104			200	
Queue Length 95th (ft)	68	93	136					m1 13			230	
Internal Link Dist (ft)		374			319			344			314	
Turn Bay Length (ft)	200		200									
Base Capacity (vph)	497	638	388					2446			2838	
Starvation Cap Reductn	0	0	0					0			0	
Spillback Cap Reductn	0	0	0					0			61	
Storage Cap Reductn	0	0	0					0			0	
Reduced v/c Ratio	0.11	0.13	0.34					0.26			0.44	
Intersection Summary												
Area Type:	Other											
Cycle Length: 150												
Actuated Cycle Length: 150)											
Offset: 66 (44%), Reference	ed to phase	2:NBSB	and 6:Pe	d, Start o	f Green							
Natural Cycle: 55												
Control Type: Pretimed												
Maximum v/c Ratio: 0.43												
Intersection Signal Delay. 1					tersection							
Intersection Capacity Utiliza	ation 63.2%			IC	U Level	of Service	В					

Analysis Period (min) 15 m Volume for 95th percentile queue is metered by upstream signal.

 Splits and Phases:
 10: 7th Street SW & SW Jefferson Drive

 ♣ Ø2 (R)
 ♣ Ø4

 63 s
 ♠ Å Ø8

 ♣ Å Ø6 (R)
 ♠ Å Ø8

 87 s
 63 s

 63 s
 ♠ Ø8

Lane Group	Ø6	Ø8
Flash Dont Walk (s)	5.0	15.0
Pedestrian Calls (#/hr)	0	0
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

	1	~	•	*	†	1	>	↓	Į.	*	1	
Lane Group	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER	Ø2
Lane Configurations	7		7		*				77			
Traffic Volume (vph)	0	0	0	0	759	0	0	0	498	0	0	
Future Volume (vph)	0	0	0	0	759	0	0	0	498	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	10	12	10	10	10	10	10	10	10	10	
Storage Length (ft)		0	100	0		0	0		0	0	0	
Storage Lanes		1	1	0		0	0		2	0	0	
Taper Length (ft)		100		100			100			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91	1.00	1.00	0.88	1.00	1.00	
Frt									0.850			
Flt Protected												
Satd. Flow (prot)	1863	0	1863	0	4746	0	0	0	2601	0	0	
Flt Permitted												
Satd. Flow (perm)	1863	0	1863	0	4746	0	0	0	2601	0	0	
Right Turn on Red	0,5,5,5,5	100	Yes	0.72	01 0000	Yes		0750	Yes			
Satd. Flow (RTOR)									1920			
Link Speed (mph)		30			30			30		30		
Link Distance (ft)		212			269			153		170		
Travel Time (s)		4.8			6.1			3.5		3.9		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	0	0	0	825	0	0	0	541	0	0	
Shared Lane Traffic (%)		-										
Lane Group Flow (vph)	0	0	0	0	825	0	0	0	541	0	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right	
Median Width(ft)		12			0			25		0		
Link Offset(ft)		0			5			3		0		
Crosswalk Width(ft)		16			30			16		16		
Two way Left Turn Lane												
Headway Factor	1.00	1.09	1.00	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	
Turning Speed (mph)	15	15	9	15		9	15		9	15	9	
Turn Type	Prot		Perm		NA				Perm			
Protected Phases	6				58							2
Permitted Phases			6						6			
Minimum Split (s)	20.0		20.0						20.0			66.0
Total Split (s)	56.0		56.0						56.0			98.0
Total Split (%)	37.3%		37.3%						37.3%			65%
Maximum Green (s)	49.0		49.0						49.0			91.5
Yellow Time (s)	4.0		4.0						4.0			4.0
All-Red Time (s)	3.0		3.0						3.0			2.5
Lost Time Adjust (s)	-1.5		-1.5						0.0			
Total Lost Time (s)	5.5		5.5						7.0			
Lead/Lag	Lead		Lead						Lead			
Lead-Lag Optimize?	Yes		Yes						Yes			
Walk Time (s)	7.0		7.0						7.0			7.0
Flash Dont Walk (s)	6.0		6.0						6.0			4.0
Pedestrian Calls (#/hr)	0		0						0			0
Act Effct Green (s)					79.0				49.0			
Actuated g/C Ratio					0.53				0.33			

Lane Group	Ø4	Ø5	Ø8	Ø9
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Ideal Flow (vphpl)				
Lane Width (ft)				
Storage Length (ft)				
Storage Lanes				
Taper Length (ft)				
Lane Util. Factor				
Frt				
Fit Protected				
Satd. Flow (prot)				
FIt Permitted				
Satd. Flow (perm)				
Right Turn on Red				
Satd. Flow (RTOR)				
Link Speed (mph)				
Link Distance (ft)				
Travel Time (s)				
Peak Hour Factor				
Adj. Flow (vph)				
Shared Lane Traffic (%)				
Lane Group Flow (vph)				
Enter Blocked Intersection				
Lane Alignment				
Median Width(ft)				
Link Offset(ft)				
Crosswalk Width(ft)				
Two way Left Turn Lane				
Headway Factor				
Turning Speed (mph)				
Turn Type				
Protected Phases	4	5	8	9
Permitted Phases				
Minimum Split (s)	32.0	27.0	32.0	10.0
Total Split (s)	42.0	42.0	42.0	10.0
Total Split (%)	28%	28%	28%	7%
	35.0		35.5	5.0
Maximum Green (s)	4.0	35.5 4.0	4.0	3.0
Yellow Time (s)			0.555	17777
All-Red Time (s)	3.0	2.5	2.5	2.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag		Lag		
Lead-Lag Optimize?		Yes		
Walk Time (s)	4.0			
Flash Dont Walk (s)	21.0			
Pedestrian Calls (#/hr)	0			
	U			
Act Effet Green (s)				
Actuated g/C Ratio				

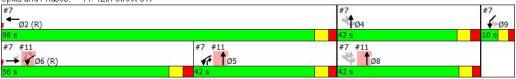
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Lane Group	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER	Ø2
v/c Ratio					0.33				0.25			
Control Delay					20.8				1.3			
Queue Delay					0.1				14.4			
Total Delay					20.9				15.8			
LOS					С				В			
Approach Delay					20.9			15.8				
Approach LOS					С			В				
Queue Length 50th (ft)					165				0			
Queue Length 95th (ft)					196				m0			
Internal Link Dist (ft)		132			189			73		90		
Turn Bay Length (ft)												
Base Capacity (vph)					2499				2142			
Starvation Cap Reductn					0				1583			
Spillback Cap Reductn					414				0			
Storage Cap Reductn					0				0			
Reduced v/c Ratio					0.40				0.97			
Intersection Summary												
Area Type:	Other											
Cycle Length: 150												
Actuated Cycle Length: 150												
Offset: 141 (94%), Referen	ced to phas	e 2:WBT	and 6:EB	ITL, Start	of Green							
Natural Cycle: 150												
Control Type: Pretimed												
Maximum v/c Ratio: 1.46												
Intersection Signal Delay: 1	8.8			Ir	ntersection	LOS: B						
Intersection Capacity Utiliza	ation 23.3%			10	CU Level o	of Service	Α					
Analysis Period (min) 15												

Analysis Period (min) 15 m. Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 11: 12th Street SW



Lane Group	Ø4	Ø5	Ø8	Ø9
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (ft)				
Queue Length 95th (ft)				
Internal Link Dist (ft)				
Turn Bay Length (ft)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				
Intersection Summary				

	•	→	•	•	←	•	₹î	4	†	-	-	Ţ
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations		वाकि			नाक				4	7		4
Traffic Volume (vph)	0	1934	53	70	1856	0	32	237	0	229	0	0
Future Volume (vph)	0	1934	53	70	1856	0	32	237	0	229	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.86	0.86	0.86	0.86	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99							0.69			
Frt		0.996								0.850		
Flt Protected					0.998				0.950			
Satd. Flow (prot)	0	5907	0	0	5917	0	0	0	1627	1492	0	1773
Flt Permitted					0.723				0.757			
Satd. Flow (perm)	0	5907	0	0	4287	0	0	0	889	1492	0	1773
Right Turn on Red			Yes			Yes				Yes		and the same
Satd. Flow (RTOR)		4								239		
Link Speed (mph)		35			35				30			15
Link Distance (ft)		540			606				566			305
Travel Time (s)		10.5			11.8				12.9			13.9
Confl. Peds. (#/hr)	201		138	138		201	103	103				
Confl. Bikes (#/hr)			12			22						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	2%	2%	0%	3%	0%	0%	4%	0%	1%	0%	0%
Adj. Flow (vph)	0	2015	55	73	1933	0	33	247	0	239	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2070	0	0	2006	0	0	0	280	239	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	R NA	Left	Left	Right	Left	Left
Median Width(ft)		0			0				90			0
Link Offset(ft)		0			0				5			-70
Crosswalk Width(ft)		45			20				20			20
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (mph)	15		9	15		9	9	15		9	15	(0.55)
Turn Type		NA		pm+pt	NA		Perm	Perm	NA	Over		
Protected Phases		2		1	6			- 1.77	8	1		8
Permitted Phases	2			6			8	8			8	
Minimum Split (s)	30.5	30.5		10.5	25.5		30.5	30.5	30.5	10.5	30.5	30.5
Total Split (s)	67.0	67.0		19.0	86.0		59.0	59.0	59.0	19.0	59.0	59.0
Total Split (%)	44.7%	44.7%		12.7%	57.3%		39.3%	39.3%	39.3%	12.7%	39.3%	39.3%
Maximum Green (s)	57.5	57.5		13.5	80.5		53.5	53.5	53.5	13.5	53.5	53.5
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	5.5	5.5		1.5	1.5		1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	-1.5			-1.5				-1.5	-1.5	1.0	-1.5
Total Lost Time (s)		8.0			4.0				4.0	4.0		4.0
Lead/Lag	Lead	Lead		Lag			Lag	Lag	Lag	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes	Yes	Yes	Yes	Yes
Walk Time (s)	10.0	10.0		100	10.0		5.0	5.0	5.0	100	5.0	5.0
Flash Dont Walk (s)	10.0	10.0			10.0		20.0	20.0	20.0		20.0	20.0
Pedestrian Calls (#/hr)	0	0.0			0.0		0	0	0		0	0
Act Effet Green (s)	U	59.0			82.0		J	0	55.0	15.0	U	U
Actuated g/C Ratio		0.39			0.55				0.37	0.10		
Actuated gro Natio		0.39			0.00				0.37	0.10		

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Lane Group	SBR	Ø7
Land Configurations		
Traffic Volume (vph)	0	
Future Volume (vph)	0	
Ideal Flow (vphpl)	1900	
Lane Util. Factor	1.00	
Ped Bike Factor	1.00	
Frt		
Flt Protected		
Satd. Flow (prot)	0	
Fit Permitted	v	
Satd. Flow (perm)	0	
Right Turn on Red	Yes	
Satd. Flow (RTOR)	100	
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor	0.96	
Heavy Vehicles (%)	0.90	
Adj. Flow (vph)	0	
Shared Lane Traffic (%)		
Lane Group Flow (vph)	0	
Enter Blocked Intersection	No	
Lane Alignment	Right	
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor	1.09	
Turning Speed (mph)	9	
Turn Type		
Protected Phases		7
Permitted Phases		
Minimum Split (s)		5.0
Total Split (s)		5.0
Total Split (%)		3%
Maximum Green (s)		3.0
Yellow Time (s)		2.0
All-Red Time (s)		0.0
Lost Time Adjust (s)		3.0
Total Lost Time (s)		
Lead/Lag		Lead
Lead-Lag Optimize?		Yes
Walk Time (s)		100
Flash Dont Walk (s)		
Pedestrian Calls (#/hr)		
Act Effet Green (s)		
Actuated g/C Ratio		
Actuatou gro Natio		

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
v/c Ratio		0.89			0.80				0.86	0.66		
Control Delay		12.7			12.0				69.6	16.4		
Queue Delay		0.5			0.4				0.0	0.0		
Total Delay		13.2			12.4				69.6	16.4		
LOS		В			В				Е	В		
Approach Delay		13.2			12.4				45.1			
Approach LOS		В			В				D			
Queue Length 50th (ft)		61			162				252	0		
Queue Length 95th (ft)		72			m168				#428	90		
Internal Link Dist (ft)		460			526				486			225
Turn Bay Length (ft)												
Base Capacity (vph)		2325			2506				325	364		
Starvation Cap Reductn		56			141				0	0		
Spillback Cap Reductn		0			0				0	0		
Storage Cap Reductn		0			0				0	0		
Reduced v/c Ratio		0.91			0.85				0.86	0.66		
Intersection Summary	es es e											
and the state of t	Other											
Cycle Length: 150												
Actuated Cycle Length: 150			LOWER		_							
Offset: 3 (2%), Referenced t	o phase 2:	EBIL and	16:WBII	_, Start of	Green							
Natural Cycle: 90												
Control Type: Pretimed												
Maximum v/c Ratio: 0.89					rosson sore	100 B						
Intersection Signal Delay, 16					tersection		_					
Intersection Capacity Utilizat	110N 85.3%			IC	CU Level	of Service	'E					
Analysis Period (min) 15				6 - 6								
# 95th percentile volume e			eue may	be longe	F							
Queue shown is maximum		Section of the section of										
m Volume for 95th percent	me quede i	2 meretec	a by upst	ream sign	idi.							

Splits and Phases: 14: 9th Street SW/S mithsonian Driveway & Independence Ave SW





Lane Group	SBR	Ø7
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

	1	→	•	•	←	•	1	†	~	-	Ţ	4
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		नाक			नाक		ሻ	444		7	444	
Traffic Volume (vph)	141	1673	349	23	1392	152	183	333	141	272	673	351
Future Volume (vph)	141	1673	349	23	1392	152	183	333	141	272	673	351
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	11	11	11	11	11	11
Storage Length (ft)	0		0	0		0	80		0	0		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	100			100			100		270	100		
Lane Util. Factor	0.86	0.86	0.86	0.86	0.86	0.86	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor		0.95			0.97		0.92	0.87	7.17.1	0.83	0.86	
Frt		0.976			0.985		0.02	0.955		0.00	0.949	
Flt Protected		0.997			0.999		0.950	0.000		0.950	0.010	
Satd. Flow (prot)	0	5506	0	0	5613	0	1662	3908	0	1616	3826	0
Fit Permitted		0.701	·		0.806		0.232	0000		0.391	0020	·
Satd. Flow (perm)	0	3871	0	0	4529	0	373	3908	0	552	3826	0
Right Turn on Red	U	307 1	Yes	U	4023	Yes	3/3	0300	No	002	3020	Yes
Satd. Flow (RTOR)		7	100		21	100			110		75	100
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		606			437			393			424	
Travel Time (s)		11.8			8.5			7.7			8.3	
Confl. Peds. (#/hr)	232	11.0	222	222	0.0	232	444	1.1	444	444	0.0	444
Confl. Bikes (#hr)	232		222	222		9	444		18	444		17
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
	4%	2%	2%	11%	2%	15%	5%	6%	10%	8%	9%	4%
Heavy Vehicles (%)	144	1707	356		1420	155	187	340	144	278	687	358
Adj. Flow (vph)	144	1707	330	23	1420	100	107	340	144	2/0	007	330
Shared Lane Traffic (%)	0	0007	0	0	1598	^	187	40.4	^	278	4045	0
Lane Group Flow (vph) Enter Blocked Intersection	No	2207 No	No	No	No	0 No	No	484 No	0 No	No No	1045	No
											No	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			11			11	
Link Offset(ft)		5			0			-6			5	
Crosswalk Width(ft)		32			30			22			35	
Two way Left Turn Lane	4.00	4.00	4.00	4.00	4.00	4.00	4.04	4.04	4.04	4.04	4.04	4.04
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15	A14	9	15	LIA.	9	15	NIA	9	15	A14	9
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases	5	2			6			4		3	8	
Permitted Phases	2			6			4			8		
Minimum Split (s)	10.5	31.5		28.5	28.5		29.5	29.5		10.0	32.5	
Total Split (s)	11.0	80.0		69.0	69.0		58.0	58.0		12.0	70.0	
Total Split (%)	7.3%	53.3%		46.0%	46.0%		38.7%	38.7%		8.0%	46.7%	
Maximum Green (s)	5.5	73.5		62.5	62.5		51.5	51.5		7.0	63.5	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.5	2.5		2.5	2.5		2.5	2.5		1.0	2.5	
Lost Time Adjust (s)		-1.5			-1.5		-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)		5.0			5.0		5.0	5.0		3.5	5.0	
Lead/Lag	Lag			Lead	Lead		Lag	Lag		Lead		
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes		Yes		
Walk Time (s)		7.0		4.0	4.0		4.0	4.0			7.0	

SI South Campus Master Plan 10/20/2017 2040 Build Condition PM Peak Hour Stantec

22: 7th Street SW & Independence Ave SW

And the second s	18.0 0	EBR	WBL	WBT	WBR		57780.575	100000000	and the same of th		
Flash Dont Walk (s)	12/2/27		VI. TO CO. 10. 10. 10. 10. 10. 10. 10. 10. 10. 10		MOR	NBL	NBT	NBR	SBL	SBT	SBR
ridori Dork vydik (b)	0		18.0	18.0		19.0	19.0			19.0	
Pedestrian Calls (#/hr)			0	0		0	0			0	
Act Effct Green (s)	75.0			64.0		53.0	53.0		66.5	65.0	
Actuated g/C Ratio	0.50			0.43		0.35	0.35		0.44	0.43	
v/c Ratio 1.	13dl			0.82		1.43	0.35		0.91	0.61	
Control Delay	63.5			41.8		266.8	36.7		53.2	17.9	
Queue Delay	0.0			0.0		0.0	0.0		0.0	0.1	
Total Delay	63.5			41.8		266.8	36.7		53.2	18.0	
LOS	Е			D		F	D		D	В	
Approach Delay	63.5			41.8			100.8			25.4	
Approach LOS	Е			D			F			С	
Queue Length 50th (ft)	~97			393		~246	127		192	279	
Queue Length 95th (ft) #	¥792			445		#408	162		#361	331	
Internal Link Dist (ft)	526			357			313			344	
Turn Bay Length (ft)						80					
(MAL) (100 CO TO (100 CO) (100 CO TO (100 CO) (100 CO TO (100 CO) (100 C	2004			1944		131	1380		305	1700	
Starvation Cap Reductn	0			0		0	0		0	75	
Spillback Cap Reductn	0			0		0	0		0	0	
Storage Cap Reductn	0			0		0	0		0	0	
Reduced v/c Ratio	1.10			0.82		1.43	0.35		0.91	0.64	

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 10 (7%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 110 Control Type: Pretimed Maximum v/c Ratio: 1.43

Intersection Signal Delay: 53.2 Intersection LOS: D
Intersection Capacity Utilization 108.3% ICU Level of Service G

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 22: 7th Street SW & Independence Ave SW



	•	→	•	•	-	•	1	†	~	-	Ţ	4
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		444			444	7		^	7	7	444	
Traffic Volume (vph)	13	673	87	2	548	202	0	1325	288	128	1009	87
Future Volume (vph)	13	673	87	2	548	202	0	1325	288	128	1009	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	10	10	10	10	10	10	10	10	10	10
Storage Length (ft)	0		0	0	,,,	100	0		0	0		0
Storage Lanes	0		0	0		1	0		1	1		0
Taper Length (ft)	100			100			100			100		Ĩ
Lane Util. Factor	0.91	0.91	0.91	0.91	0.91	1.00	1.00	0.91	1.00	1.00	0.91	0.91
Ped Bike Factor	0.01	0.95	0.01	0.01	1.00	0.67	1.00	0.01	0.65	0.97	0.96	0.01
Frt		0.983			1.00	0.850			0.850	0.01	0.988	
Flt Protected		0.999				0.000			0.000	0.950	0.000	
Satd. Flow (prot)	0	4586	0	0	4604	1478	0	4746	1463	1589	4466	0
Fit Permitted	U	0.924		U	0.937	1470	U	4740	1400	0.109	4400	Ū
Satd. Flow (perm)	0	4233	0	0	4312	985	0	4746	954	177	4466	0
Right Turn on Red	U	4200	Yes	U	4012	Yes	U	4/40	Yes	111	4400	Yes
Satd. Flow (RTOR)		1	100			186			109		2	100
Link Speed (mph)		35			35	100		30	109		30	
Link Distance (ft)		370			1104			509			377	
		7.2			21.5			11.6			8.6	
Travel Time (s)	413	1.2	738	738	21.0	413	831	11.0	426	426	0.0	024
Confl. Peds. (#/hr)	413		14	/30			031		420	420		831
Confl. Bikes (#/hr)	0.00	0.00		0.00	0.00	16	0.00	0.00		0.00	0.00	97
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	29%	2%	3%	50%	5%	2%	0%	2%	3%	6%	3%	7%
Adj. Flow (vph)	14	724	94	2	589	217	0	1425	310	138	1085	94
Shared Lane Traffic (%)		000			504	047		4.405	040	400	4470	
Lane Group Flow (vph)	0	832	0	0	591	217	0	1425	310	138	1179	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			4			10	
Link Offset(ft)		0			0			5			0	
Crosswalk Width(ft)		20			30			30			26	
Two way Left Turn Lane	4.00		4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Headway Factor	1.09	1.04	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA	Perm		NA	Perm	pm+pt	NA	
Protected Phases		4			8			2	-	1	6	
Permitted Phases	4			8		8			2	6		
Minimum Split (s)	36.5	36.5		36.5	36.5	36.5		31.5	31.5	10.5	31.5	
Total Split (s)	37.0	37.0		37.0	37.0	37.0		48.0	48.0	15.0	63.0	
Total Split (%)	37.0%	37.0%		37.0%	37.0%	37.0%		48.0%	48.0%	15.0%	63.0%	
Maximum Green (s)	30.5	30.5		30.5	30.5	30.5		41.5	41.5	8.5	56.5	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5	2.5		2.5	2.5	2.5	2.5	
Lost Time Adjust (s)		-1.5			-1.5	-1.5		-1.5	-1.5	-1.0	-1.5	
Total Lost Time (s)		5.0			5.0	5.0		5.0	5.0	5.5	5.0	
Lead/Lag								Lead	Lead	Lag		
Lead-Lag Optimize?								Yes	Yes	Yes		
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		6.0	6.0		6.0	

2: 14th Street SW & Independence Ave SW

	1	-	7	1	-	•	1	1	1	-	1	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Flash Dont Walk (s)	23.0	23.0		23.0	23.0	23.0		19.0	19.0		19.0	
Pedestrian Calls (#/hr)	0	0		0	0	0		0	0		0	
Act Effct Green (s)		32.0			32.0	32.0		43.0	43.0	57.5	58.0	
Actuated g/C Ratio		0.32			0.32	0.32		0.43	0.43	0.58	0.58	
v/c Ratio		0.61			0.43	0.49		0.70	0.66	0.59	0.46	
Control Delay		31.1			35.7	19.1		25.5	22.0	29.8	9.1	
Queue Delay		0.0			0.0	0.1		1.3	0.0	0.0	0.1	
Total Delay		31.1			35.7	19.2		26.8	22.0	29.8	9.2	
LOS		С			D	В		С	С	С	Α	
Approach Delay		31.1			31.3			26.0			11.3	
Approach LOS		С			С			С			В	
Queue Length 50th (ft)		163			144	68		264	99	28	90	
Queue Length 95th (ft)		207			m167	m97		318	205	89	100	
Internal Link Dist (ft)		290			1024			429			297	
Turn Bay Length (ft)						100						
Base Capacity (vph)		1355			1379	441		2040	472	235	2591	
Starvation Cap Reductn		0			0	0		0	0	0	289	
Spillback Cap Reductn		0			0	14		382	0	0	0	
Storage Cap Reductn		0			0	0		0	0	0	0	
Reduced v/c Ratio		0.61			0.43	0.51		0.86	0.66	0.59	0.51	

Intersection Summary

Area Type: Other

Cycle Length: 100 Actuated Cycle Length: 100

Offset: 17 (17%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

Natural Cycle: 80 Control Type: Pretimed Maximum v/c Ratio: 0.70

Intersection Signal Delay: 23.7 Intersection LOS: C
Intersection Capacity Utilization 88.1% ICU Level of Service E

Analysis Period (min) 15

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

Splits and Phases: 2: 14th Street SW & Independence Ave SW



	*	→	•	•	•	•	1	†	-	-	+	4
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	7	7						444		7	^	
Traffic Volume (vph)	73	88	86	0	0	0	0	1406	134	92	1138	0
Future Volume (vph)	73	88	86	0	0	0	0	1406	134	92	1138	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	10	10	10	10	10	12	12	10	10	10
Storage Length (ft)	0		0	0		0	0		20	170		0
Storage Lanes	1		0	0		0	0		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	1.00
Ped Bike Factor	0.48	0.81						0.94				
Frt		0.926						0.987				
Fit Protected	0.950									0.950		
Satd. Flow (prot)	1517	1313	0	0	0	0	0	4654	0	1620	4700	0
FIt Permitted	0.950									0.107		
Satd. Flow (perm)	735	1313	0	0	0	0	0	4654	0	182	4700	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)								16				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		257			1068			377			341	
Travel Time (s)		5.8			24.3			8.6			7.8	
Confl. Peds. (#/hr)	1284		396	396		1284	733		440	440		733
Confl. Bikes (#/hr)			136						25			24
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
Heavy Vehicles (%)	19%	15%	3%	0%	0%	0%	0%	3%	6%	4%	3%	0%
Adj. Flow (vph)	77	93	91	0	0	0	0	1480	141	97	1198	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	77	184	0	0	0	0	0	1621	0	97	1198	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		15	Constitution of		12			0			10	The Carlotte
Link Offset(ft)		0			15			0			5	
Crosswalk Width(ft)		30			35			37			35	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.09	1.09	1.09	1.09	1.09	1.00	1.00	1.09	1.09	1.09
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		4						2			2	
Permitted Phases	4									2		
Minimum Split (s)	34.5	34.5						20.5		20.5	20.5	
Total Split (s)	35.0	35.0						65.0		65.0	65.0	
Total Split (%)	35.0%	35.0%						65.0%		65.0%	65.0%	
Maximum Green (s)	28.5	28.5						59.5		59.5	59.5	
Yellow Time (s)	4.0	4.0						4.0		4.0	4.0	
All-Red Time (s)	2.5	2.5						1.5		1.5	1.5	
Lost Time Adjust (s)	-1.5	-1.5						-1.5		-1.5	-1.5	
Total Lost Time (s)	5.0	5.0						4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	10.0	10.0						10.0		10.0	10.0	
* *												

Lane Group	Ø6	
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Ideal Flow (vphpl)		
Lane Width (ft)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
Fit Protected		
Satd. Flow (prot)		
Fit Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Confl. Bikes (#hr)		
Peak Hour Factor		
Heavy Vehicles (%)		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Turn Type		
Protected Phases	6	
Permitted Phases		
Minimum Split (s)	22.5	
Total Split (s)	65.0	
Total Split (%)	65%	
Maximum Green (s)	59.5	
Yellow Time (s)	4.0	
All-Red Time (s)	1.5	
Lost Time Adjust (s)	1,0	
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Walk Time (s)	10.0	
stay time (a)	10.0	

Lanes, Volumes, Timings 4: 14th Street SW & SW Jefferson Drive

	٦	→	7	1	+	4	1	t	~	/	1	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Flash Dont Walk (s)	18.0	18.0						5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0						0		0	0	
Act Effct Green (s)	30.0	30.0						61.0		61.0	61.0	
Actuated g/C Ratio	0.30	0.30						0.61		0.61	0.61	
v/c Ratio	0.35	0.47						0.57		0.87	0.42	
Control Delay	33.0	33.3						8.0		80.3	10.8	
Queue Delay	0.0	0.0						2.0		0.0	0.0	
Total Delay	33.0	33.3						10.0		80.3	10.8	
LOS	С	С						В		F	В	
Approach Delay		33.2						10.0			16.0	
Approach LOS		С						В			В	
Queue Length 50th (ft)	38	95						328		48	135	
Queue Length 95th (ft)	82	163						406		#159	165	
Internal Link Dist (ft)		177			988			297			261	
Turn Bay Length (ft)										170		
Base Capacity (vph)	220	393						2845		111	2867	
Starvation Cap Reductn	0	0						1022		0	0	
Spillback Cap Reductn	0	0						0		0	0	
Storage Cap Reductn	0	0						0		0	0	
Reduced v/c Ratio	0.35	0.47						0.89		0.87	0.42	
Intersection Summary												
Area Type:	Other											-
Cycle Length: 100												
Actuated Cycle Length: 10	00											
Offset: 31 (31%), Referen	ced to phase	2:NBSB	and 6:Pe	d, Start o	f Green							
Natural Cycle: 90												
Control Type: Pretimed												
Maximum v/c Ratio: 0.87												
Intersection Signal Delay.	14.4			Ir	tersection	LOS: B						
Intersection Capacity Utiliz	zation 73.5%			IC	ULevel	of Service	D					
Analysis Period (min) 15												
# 95th percentile volume	e exceeds ca	pacity, qu	eue may	be longe	r,							
Queue shown is maxin	num after two	cycles.	на погра посред Т.	- Constitution of the Cons								

Splits and Phases: 4: 14th Street SW & SW Jefferson Drive



Lane Group	Ø6		
Flash Dont Walk (s)	7.0		
Pedestrian Calls (#/hr)	0		
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			
Intersection Summary			

	\rightarrow	*	1	-	1	1	
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	1					7	
Traffic Volume (vph)	264	46	0	0	0	75	
Future Volume (vph)	264	46	0	0	0	75	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	14	10	10	10	10	13	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor							
Frt	0.980					0.865	
FIt Protected							
Satd. Flow (prot)	1845	0	0	0	0	1587	
Flt Permitted							
Satd. Flow (perm)	1845	0	0	0	0	1587	
ink Speed (mph)	30			30	30		
_ink Distance (ft)	1068			661	401		
Fravel Time (s)	24.3			15.0	9.1		
Confl. Peds. (#/hr)		845			541		
Confl. Bikes (#/hr)		133					
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	
Heavy Vehicles (%)	9%	0%	2%	2%	0%	7%	
Adj. Flow (vph)	307	53	0	0	0	87	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	360	0	0	0	0	87	
Enter Blocked Intersection	No	No	No	No	No	No	
ane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(ft)	0			0	0		
_ink Offset(ft)	0			0	-2		
Crosswalk Width(ft)	16			16	24		
Two way Left Turn Lane							
Headway Factor	0.92	1.09	1.09	1.09	1.09	0.96	
Turning Speed (mph)		9	15		15	9	
Sign Control	Free			Free	Stop		
Intersection Summary							

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 29.7%
Analysis Period (min) 15

ICU Level of Service A

Lanes, Volumes, Timings
7: 12th Street SW & Independence Ave SW & 12th Street SW Ramp & Loading Dock 10/20/2017

Lane Configurations Traffic Volume (vph) Future Volume (vph) Ideal Flow (vphpl) Lane Width (ft) Storage Length (ft) Storage Lanes Taper Length (ft) Lane Util. Factor Ped Bike Factor	31 31 1900 10	54 54 1900 10 0 100 0,91	EBT 911 911 1900 10	93 93 1900 10 0	WBL 74 74 1900	WBT 4↑₽ 636 636	WBR 37	WBR2	NBL2	NBL	↑ NBT	NBR2
Lane Configurations Traffic Volume (vph) Future Volume (vph) Ideal Flow (vphpl) Lane Width (ft) Storage Length (ft) Storage Lanes Taper Length (ft) Lane Util. Factor Ped Bike Factor	31 31 1900 10	54 54 1900 10 0 0	911 911 1900	93 93 1900 10	74 74 74 1900	4 ↑ 1 636 636	37			A	1	7
Traffic Volume (vph) Future Volume (vph) Ideal Flow (vphpt) Lane Width (ft) Storage Length (ft) Storage Lanes Taper Length (ft) Lane Util. Factor Ped Bike Factor	31 1900 10	54 1900 10 0 0	911 911 1900	93 1900 10	74 74 1900	636 636		102	QR			
Future Volume (vph) Ideal Flow (vphpl) Lane Width (ft) Storage Length (ft) Storage Lanes Taper Length (ft) Lane Util. Factor Ped Bike Factor	31 1900 10	54 1900 10 0 0	911 1900	93 1900 10	74 1900	636		102	QQ			
Ideal Flow (vphpl) Lane Width (ft) Storage Length (ft) Storage Lanes Taper Length (ft) Lane Util. Factor Ped Bike Factor	1900	1900 10 0 0 100	1900	1900 10	1900		27		100000	31	147	202
Lane Width (ft) Storage Length (ft) Storage Lanes Taper Length (ft) Lane Util. Factor Ped Bike Factor	10	10 0 0 100		10			37	102	98	31	147	202
Storage Length (ft) Storage Lanes Taper Length (ft) Lane Util. Factor Ped Bike Factor		0 0 100	10		40	1900	1900	1900	1900	1900	1900	1900
Storage Lanes Taper Length (ft) Lane Util. Factor Ped Bike Factor	0.91	0 100		0	10	10	10	10	10	11	11	11
Taper Length (ft) Lane Util. Factor Ped Bike Factor	0.91	100		- 70	0		100			0		
Lane Util. Factor Ped Bike Factor	0.91			0	1		0			1		
Ped Bike Factor	0.91	0.04			100					100		
		0.91	0.91	0.91	0.86	0.86	0.91	0.91	1.00	1.00	1.00	1.00
			0.95		0.92	0.84				0.63		0.91
Frt			0.987			0.973						0.850
Fit Protected			0.996		0.950					0.950		
Satd. Flow (prot)	0	0	4582	0	1449	3733	0	0	0	1745	1818	1561
Flt Permitted			0.735		0.950	0.930				0.950		
Satd. Flow (perm)	0	0	3341	0	1332	3472	0	0	0	1100	1818	1419
Right Turn on Red	V2.00-10	1,000	1070710000	Yes	33.55.55	11 To 11 To 10 To	17.70	N-5-V		,A.O.T.T.	1070170	Yes
Satd. Flow (RTOR)			18	1.00								187
Link Speed (mph)			35			35					30	101
Link Distance (ft)			1104			603					153	
Travel Time (s)			21.5			11.7					3.5	
Confl. Peds. (#/hr)	289		21.0	370	370	11.7	289	289	475		0.0	59
Confl. Bikes (#hr)	203			27	5/0		30	30	410			55
Peak Hour Factor	0.93	0.92	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	1%	0.93
, reprinted to the an Elegante to your construction of the first	33	59	980	100	80	684	40	110	105	33	158	217
Adj. Flow (vph)	33	59	900	100	10%	004	40	110	100	33	100	217
Shared Lane Traffic (%)	0	0	4470	0		0.40	0	0	0	138	450	047
Lane Group Flow (vph)			1172		72	842	-			10.00	158	217
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Left	Right	Right	Left	Left	Left	Right
Median Width(ft)			0			10					56	
Link Offset(ft)			0			0					0	
Crosswalk Width(ft)			30			25					28	
Two way Left Turn Lane			0100			7-22	munician	107121211		1/10/12/12	Hampion	
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.04	1.04	1.04
Turning Speed (mph)	15	15	1000	9	15	10000	9	9	15	15	2017000	9
	Perm	Perm	NA		Prot	NA			custom	custom	NA	custom
Protected Phases			6		5	2					4	5
Permitted Phases	6	6							48	48	8	48
Minimum Split (s)	20.0	20.0	20.0		11.4	54.0					32.5	11.4
Total Split (s)	43.5	43.5	43.5		12.0	55.5					32.5	12.0
Total Split (%)	43.5%	43.5%	43.5%		12.0%	55.5%					32.5%	12.0%
Maximum Green (s)	36.5	36.5	36.5		5.5	49.0					22.0	5.5
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0					4.0	4.0
All-Red Time (s)	3.0	3.0	3.0		2.5	2.5					6.5	2.5
Lost Time Adjust (s)			-1.5		-1.5	-1.5					-1.5	-1.5
Total Lost Time (s)			5.5		5.0	5.0					9.0	5.0
Lead/Lag	Lead	Lead	Lead		Lag						3400	Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes							Yes
Walk Time (s)	7.0	7.0	7.0		, 55	7.0					4.0	100

SI South Campus Master Plan 08/31/2017 2036 Build Condition Saturday Peak Hour Stantec

Synchro 9 Report Page 8

3	4	\	>	4	4	
Lane Group	SEL2	SEL	SER	SER2	SWL	Ø8
Lane Configurations		¥			M	
Traffic Volume (vph)	1	20	11	32	0	
Future Volume (vph)	1	20	11	32	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	
Lane Width (ft)	10	13	10	10	10	
Storage Length (ft)	10	0	0	10	0	
Storage Lanes		1	0		1	
Taper Length (ft)		100			25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor	1.00	0.73	1.00	1.00	1.00	
Frt		0.73				
Fit Protected		0.984				
Satd. Flow (prot)	0	1318	0	0	1739	
Fit Permitted	U	0.984	U	U	1109	
	0	1283	0	0	1739	
Satd. Flow (perm)	U	1283	U	Yes	1739	
Right Turn on Red		404		165		
Satd. Flow (RTOR)		164			20	
Link Speed (mph)		30			30	
Link Distance (ft)		401			276	
Travel Time (s)		9.1		175	6.3	
Confl. Peds. (#/hr)		59		475		
Confl. Bikes (#/hr)	0.00	0.00	0.00	2	0.00	
Peak Hour Factor	0.92	0.93	0.93	0.93	0.92	
Heavy Vehicles (%)	2%	0%	0%	0%	2%	
Adj. Flow (vph)	1	22	12	34	0	
Shared Lane Traffic (%)	- Parket			7.65	790	
Lane Group Flow (vph)	0	69	0	. 0	. 0	
Enter Blocked Intersection	No	No	No	No	No	
Lane Alignment	Left	Left	Right	Right	Left	
Median Width(ft)		13			10	
Link Offset(ft)		40			0	
Crosswalk Width(ft)		20			16	
Two way Left Turn Lane						
Headway Factor	1.09	0.96	1.09	1.09	1.09	
Turning Speed (mph)	15	15	9	9	15	
Turn Type	D.Pm	D.Pm			Prot	
Protected Phases					9	8
Permitted Phases	48	48				
Minimum Split (s)					12.0	11.5
Total Split (s)					12.0	32.5
Total Split (%)					12.0%	33%
Maximum Green (s)					7.5	26.0
Yellow Time (s)					3.5	4.0
All-Red Time (s)					1.0	2.5
Lost Time Adjust (s)					-1.5	2.0
Total Lost Time (s)					3.0	
Lead/Lag					3.0	
Lead-Lag Optimize?						
Walk Time (s)						
MACIV TITLE (9)						

SI South Campus Master Plan 08/31/2017 2036 Build Condition Saturday Peak Hour Stantec

Lanes, Volumes, Timings

7: 12th Street SW & Independence Ave SW & 12th Street SW Ramp & Loading Dock 10/20/2017

	۶	_#	-	*	1	•	*_	*	1	ኘ	1	-
Lane Group	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR2
Flash Dont Walk (s)	6.0	6.0	6.0			4.0					18.0	
Pedestrian Calls (#/hr)	0	0	0			0					0	
Act Effct Green (s)			38.0		7.0	50.5				23.5	23.5	34.5
Actuated g/C Ratio			0.38		0.07	0.50				0.24	0.24	0.34
v/c Ratio			0.92		0.71	1.79dr				0.53	0.37	0.35
Control Delay			31.7		89.1	43.4				21.3	14.3	4.9
Queue Delay			0.0		0.0	0.0				3.5	3.5	0.7
Total Delay			31.7		89.1	43.4				24.8	17.7	5.5
LOS			С		F	D				С	В	Α
Approach Delay			31.7			47.0					14.5	
Approach LOS			С			D					В	
Queue Length 50th (ft)			280		58	99				77	85	59
Queue Length 95th (ft)			#362		#141	#106				142	145	124
Internal Link Dist (ft)			1024			523					73	
Turn Bay Length (ft)												
Base Capacity (vph)			1280		101	988				258	427	621
Starvation Cap Reductn			0		0	0				59	187	176
Spillback Cap Reductn			0		0	0				0	0	0
Storage Cap Reductn			0		0	0				0	0	0
Reduced v/c Ratio			0.92		0.71	0.85				0.69	0.66	0.49
Intersection Summary												
Area Type:	Other											
Cycle Length: 100												
Actuated Cycle Length: 10	10											

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBTL, Start of Green

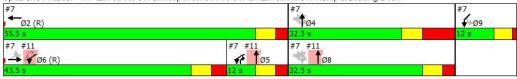
Natural Cycle: 100 Control Type: Pretimed Maximum v/c Ratio: 0.92 Intersection Signal Delay: 32.8

Intersection Signal Delay: 32.8 Intersection LOS: C
Intersection Capacity Utilization 96.7% ICU Level of Service F

Analysis Period (min) 15

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

Splits and Phases: 7: 12th Street SW & Independence Ave SW & 12th Street SW Ramp & Loading Dock



Lanes, Volumes, Timings 7: 12th Street SW & Independence Ave SW & 12th Street SW Ramp & Loading Dock 10/20/2017

	4	1	→	4	4	
Lane Group	SEL2	SEL	SER	SER2	SWL	Ø8
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
Act Effct Green (s)		23.5				
Actuated g/C Ratio		0.24				
v/c Ratio		0.16				
Control Delay		0.9				
Queue Delay		0.0				
Total Delay		0.9				
LOS		Α				
Approach Delay		0.9				
Approach LOS		Α				
Queue Length 50th (ft)		0				
Queue Length 95th (ft)		m0				
Internal Link Dist (ft)		321			196	
Turn Bay Length (ft)						
Base Capacity (vph)		426				
Starvation Cap Reductn		0				
Spillback Cap Reductn		0				
Storage Cap Reductn		0				
Reduced v/c Ratio		0.16				

	-	•	1	-	1	1		
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø3	
Lane Configurations	4111			441	ሻ	7*	100000	
Traffic Volume (vph)	1086	47	45	818	33	78		
Future Volume (vph)	1086	47	45	818	33	78		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Storage Length (ft)	1333	0	0		0	210		
Storage Lanes		0	0		1	1		
Taper Length (ft)			100		100	*		
Lane Util. Factor	0.86	0.86	0.91	0.91	1.00	1.00		
Ped Bike Factor	0.97	0.00	0.01	1.00	0.62	1.00		
Frt	0.994			1.00	0.02	0.850		
Flt Protected	0.001			0.997	0.950	0.003		
Satd. Flow (prot)	5755	0	0	4625	1404	1396		
Fit Permitted	0,00		y	0.820	0.950	,500		
Satd. Flow (perm)	5755	0	0	3789	866	1396		
Right Turn on Red	0/00	Yes	U	0/03	000	Yes		
Satd. Flow (RTOR)	11	100				51		
Link Speed (mph)	35			35	25	UI		
Link Distance (ft)	603			540	714			
Travel Time (s)	11.7			10.5	19.5			
Confl. Peds. (#/hr)	11.7	375	375	10.0	573			
Confl. Bikes (#/hr)		30	3/3		0/0			
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94		
Heavy Vehicles (%)	2%	11%	11%	4%	20%	8%		
Adi. Flow (vph)	1155	50	48	870	35	83		
9388 HV600700 ACAE000	1100	30	40	0/0	33	03		
Shared Lane Traffic (%)	1205	0	0	918	35	83		
Lane Group Flow (vph)	No	No	No	No	No	No No		
Enter Blocked Intersection			Left	Left	Left			
Lane Alignment	Left	Right	Left	Len O	60	Right		
Median Width(ft)	0			70				
Link Offset(ft)	0			0	-10			
Crosswalk Width(ft)	30			10	16			
Two way Left Turn Lane	4.00	4.00	4.00	4.00	4.00	4.00		
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09		
Turning Speed (mph)	*16	9	15		15	9		
Turn Type	NA		pm+pt	NA	Prot	pm+ov		
Protected Phases	2		1	6	4	1	3	
Permitted Phases			6			4		
Minimum Split (s)	20.5		10.0	16.5	30.0	10.0	4.0	
Total Split (s)	49.5		16.5	66.0	30.0	16.5	4.0	
Total Split (%)	49.5%		16.5%	66.0%	30.0%	16.5%	4%	
Maximum Green (s)	43.0		11.5	59.5	24.5	11.5	2.0	
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0	2.0	
All-Red Time (s)	2.5		1.0	2.5	1.5	1.0	0.0	
Lost Time Adjust (s)	-1.5			-1.5	-1.0	-1.0		
Total Lost Time (s)	5.0			5.0	4.5	4.0		
Lead/Lag	Lag		Lead		Lag	Lead	Lead	
Lead-Lag Optimize?	Yes		Yes		Yes	Yes	Yes	
Walk Time (s)	10.0				6.0			
Flash Dont Walk (s)	4.0				18.0			

	-	7	1	•	1	~	
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø3
Pedestrian Calls (#/hr)	0				0		30000
Act Effct Green (s)	44.5			61.0	25.5	42.5	
Actuated g/C Ratio	0.44			0.61	0.26	0.42	
v/c Ratio	0.47			0.38	0.10	0.13	
Control Delay	8.0			12.1	29.5	8.8	
Queue Delay	0.0			0.0	0.0	0.0	
Total Delay	8.0			12.1	29.5	8.8	
LOS	Α			В	С	Α	
Approach Delay	8.0			12.1	14.9		
Approach LOS	А			В	В		
Queue Length 50th (ft)	46			131	17	12	
Queue Length 95th (ft)	m51			179	43	41	
Internal Link Dist (ft)	523			460	634		
Turn Bay Length (ft)						210	
Base Capacity (vph)	2567			2407	358	622	
Starvation Cap Reductn	0			0	0	0	
Spillback Cap Reductn	0			0	0	0	
Storage Cap Reductn	0			0	0	0	
Reduced v/c Ratio	0.47			0.38	0.10	0.13	
Intersection Summary							
Area Type:	Other						
Cycle Length: 100							
Actuated Cycle Length: 100)						
Offset: 10 (10%), Reference	ed to phase	2:EBT ar	nd 6:WBT	L, Start of	f Green		
Natural Cycle: 65							
Control Type: Pretimed							
Maximum v/c Ratio: 0.47							
Intersection Signal Delay. 1	0.1			Int	tersection	LOS: B	
Intersection Capacity Utiliza	ation 51.5%			IC	ULevel	of Service	A
Analysis Period (min) 15							
m Volume for 95th percer	ntile queue i	s metered	d by upstr	eamsign	al.		
Splits and Phases: 9: L'E	nfant Plaza	& Indens	endence A	Ave SW			
Acr	.mant 1 1020	- maope					\$6.4 ×

Ø6 (R)

	1	\rightarrow	•	•	←	•	1	†	~	-	Į.	4
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4	†	7					444			ना	
Traffic Volume (vph)	124	91	105	0	0	0	0	575	61	57	422	0
Future Volume (vph)	124	91	105	0	0	0	0	575	61	57	422	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	10	10	10	11	11	11	11	11	11
Storage Length (ft)	200		200	0		0	0		0	0		50
Storage Lanes	1		1	0		0	0		0	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	0.86	0.86	1.00
Ped Bike Factor	0.69		0.46	1,00			1.00	0.93	0.01	0.00	0.96	,,,,,,
Frt			0.850					0.986				
Fit Protected	0.950										0.994	
Satd. Flow (prot)	1631	1652	1561	0	0	0	0	4332	0	0	5889	0
Fit Permitted	0.950									_	0.818	
Satd. Flow (perm)	1125	1652	717	0	0	0	0	4332	0	0	4675	0
Right Turn on Red	,,,,,	1002	Yes	1.000		Yes	11.50		No		10.0	Yes
Satd. Flow (RTOR)			33			100			110			
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		454			399			424			394	
Travel Time (s)		10.3			9.1			8.3			7.7	
Confl. Peds. (#/hr)	303	10.0	1270	303	0.1	1270	654	0.0	511	511	1.0	654
Confl. Bikes (#/hr)			70	-		12.0			4	-		25
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	7%	15%	0%	0%	0%	0%	0%	4%	22%	4%	7%	0%
Adj. Flow (vph)	127	93	107	0	0	0	0	587	62	58	431	0
Shared Lane Traffic (%)	14.7		101								101	
Lane Group Flow (vph)	127	93	107	0	0	0	0	649	0	0	489	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	Lon	11	ragin	Lon	11	rugine	Loit	0	rugiit	Loit	0	ragint
Link Offset(ft)		-15			15			10			-10	
Crosswalk Width(ft)		35			20			35			55	
Two way Left Turn Lane		00			20			00			UU	
Headway Factor	1.04	1.00	1.04	1.09	1.09	1.09	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15	1.00	9	15	1.00	9	15	1.04	9	15	1.04	9
Turn Type	Perm	NA	Perm	10		,	10	NA	3	Perm	NA	J
Protected Phases	1 OIIII	4	I Gilli					2		Cilli	2	
Permitted Phases	4	-	4							2		
Minimum Split (s)	32.5	32.5	32.5					20.0		20.0	20.0	
Total Split (s)	32.5	32.5	32.5					67.5		67.5	67.5	
Total Split (%)	32.5%	32.5%	32.5%					67.5%		67.5%	67.5%	
Maximum Green (s)	26.0	26.0	26.0					61.5		61.5	61.5	
Yellow Time (s)	4.0	4.0	4.0					4.0		4.0	4.0	
	2.5	2.5	2.5					2.0		2.0	2.0	
All-Red Time (s) Lost Time Adjust (s)	-1.5	-1.5	-1.5					-1.5		2.0	-1.5	
Total Lost Time (s)	5.0	5.0	-1.5 5.0					4.5			4.5	
A STATE OF THE PARTY OF THE PAR	5.0	5.0	5.0					4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?	10.0	10.0	10.0					10.0		10.0	10.0	
Walk Time (s)	10.0	10.0	10.0					10.0		10.0	10.0	

Lane Group	Ø6	Ø8	
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Ped Bike Factor			
A STATE OF THE PARTY OF THE PAR			
Frt			
Fit Protected			
Satd. Flow (prot)			
Fit Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Confl. Bikes (#hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Enter Blocked Intersection			
Lane Alignment			
Median Width(ft)			
Link Offset(ft)			
Crosswalk Width(ft)			
Two way Left Turn Lane			
Headway Factor			
Turning Speed (mph)			
Turn Type			
Protected Phases	6	8	
Permitted Phases			
Minimum Split (s)	21.0	28.5	
Total Split (s)	67.5	32.5	
Total Split (%)	68%	33%	
Maximum Green (s)	61.5	26.0	
Yellow Time (s)	4.0	4.0	
All-Red Time (s)	2.0	2.5	
Lost Time Adjust (s)	2.0	2.0	
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?	10.0	7.0	
Walk Time (s)	10.0	7.0	

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Flash Dont Walk (s)	16.0	16.0	16.0					4.0		4.0	4.0	
Pedestrian Calls (#/hr)	0	0	0					0		0	0	
Act Effct Green (s)	27.5	27.5	27.5					63.0			63.0	
Actuated g/C Ratio	0.28	0.28	0.28					0.63			0.63	
v/c Ratio	0.41	0.20	0.48					0.24			0.17	
Control Delay	38.1	33.4	33.0					3.4			7.8	
Queue Delay	0.0	0.0	0.0					0.0			0.0	
Total Delay	38.1	33.4	33.0					3.4			7.8	
LOS	D	С	С					А			Α	
Approach Delay		35.1						3.4			7.8	
Approach LOS		D						А			Α	
Queue Length 50th (ft)	69	49	41					16			34	
Queue Length 95th (ft)	m1 15	m84	m84					31			46	
Internal Link Dist (ft)		374			319			344			314	
Turn Bay Length (ft)	200		200									
Base Capacity (vph)	309	454	221					2729			2945	
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	0.41	0.20	0.48					0.24			0.17	

Reduced v/c Ratio Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 12 (12%), Referenced to phase 2:NBSB and 6:Ped, Start of Green

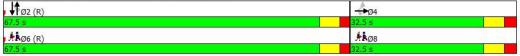
Natural Cycle: 55 Control Type: Pretimed Maximum v/c Ratio: 0.48

Intersection Signal Delay, 12.0 Intersection LOS: B Intersection Capacity Utilization 58.4% ICU Level of Service B

Analysis Period (min) 15

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

Splits and Phases: 10: 7th Street SW & SW Jefferson Drive



Lane Group	Ø6	Ø8
Flash Dont Walk (s)	5.0	15.0
Pedestrian Calls (#/hr)	0	0
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

Lane Configurations Traffic Volume (vph) Future Volume (vph) Ideal Flow (vphpl) Lane Width (ft) Storage Length (ft) Storage Lanes Taper Length (ft) Lane Util. Factor Frt Flt Protected Satd. Flow (prot) Flt Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (mph) Link Distance (ft) Travel Time (s) Peak Hour Factor Adj. Flow (vph)	WBL2 0 0 1900 12 1.00 1863	0 0 1900 10 0 1 100 1,00	WBR 0 0 1900 12 100 1	0 0 1900 10 0 0	NBT ↑↑↓ 478 478 1900 10	0 0 1900	0 0 1900	0 0	SBR 178 178	NEL 0	NER 0	Ø2
Traffic Volume (vph) Future Volume (vph) Ideal Flow (vphpl) Lane Width (ft) Storage Length (ft) Storage Lanes Taper Length (ft) Lane Util. Factor Frt Fit Protected Satd. Flow (prot) Fit Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (mph) Link Distance (ft) Travel Time (s) Peak Hour Factor Adj. Flow (vph)	0 0 1900 12 1.00	0 1900 10 0 1 100	0 0 1900 12 100 1	0 1900 10 0	478 478 1900	0 1900	0	0	178			
Future Volume (vph) Ideal Flow (vphpl) Lane Width (ft) Storage Length (ft) Storage Lanes Taper Length (ft) Lane Util. Factor Frt Fit Protected Satd. Flow (prot) Fit Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (mph) Link Distance (ft) Travel Time (s) Peak Hour Factor Adj. Flow (vph)	1900 12 1.00	0 1900 10 0 1 100	0 1900 12 100 1	0 1900 10 0	478 1900	0 1900	0	0				
Ideal Flow (vphpl) Lane Width (ft) Storage Length (ft) Storage Lanes Taper Length (ft) Lane Util. Factor Frt Fit Protected Satd. Flow (prot) Fit Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (mph) Link Distance (ft) Travel Time (s) Peak Hour Factor Adj. Flow (vph)	1900 12 1.00	1900 10 0 1 100	1900 12 100 1	1900 10 0 0	1900	1900		N	178			
Ideal Flow (vphpl) Lane Width (ft) Storage Length (ft) Storage Lanes Taper Length (ft) Lane Util. Factor Frt Fit Protected Satd. Flow (prot) Fit Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (mph) Link Distance (ft) Travel Time (s) Peak Hour Factor Adj. Flow (vph)	1.00	10 0 1 100	12 100 1	10 0 0			1900	4000		0	0	
Lane Width (ft) Storage Length (ft) Storage Length (ft) Storage Lanes Taper Length (ft) Lane Util. Factor Frt Fit Protected Satd. Flow (prot) Fit Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (mph) Link Distance (ft) Travel Time (s) Peak Hour Factor Adj. Flow (vph)	1.00	0 1 100	100 1	0	10	10	1000	1900	1900	1900	1900	
Storage Length (ft) Storage Lanes Taper Length (ft) Lane Util. Factor Frt Fit Protected Satd. Flow (prot) Fit Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (mph) Link Distance (ft) Travel Time (s) Peak Hour Factor Adj. Flow (vph)	1863	100	1	0		10	10	10	10	10	10	
Storage Lanes Taper Length (ft) Lane Util. Factor Frt Fit Protected Satd. Flow (prot) Fit Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (mph) Link Distance (ft) Travel Time (s) Peak Hour Factor Adj. Flow (vph)	1863	100				0	0		0	0	0	
Taper Length (ft) Lane Util. Factor Frt Flt Protected Satd. Flow (prot) Flt Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (mph) Link Distance (ft) Travel Time (s) Peak Hour Factor Adj. Flow (vph)	1863		1.00			0	0		2	0	0	
Lane Util. Factor Frt Flt Protected Satd. Flow (prot) Flt Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (mph) Link Distance (ft) Travel Time (s) Peak Hour Factor Adj. Flow (vph)	1863	1.00	1.00	100			100			25		
Fit Protected Satd. Flow (prot) Fit Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (mph) Link Distance (ft) Travel Time (s) Peak Hour Factor Adj. Flow (vph)				1.00	0.91	0.91	1.00	1.00	0.88	1.00	1.00	
Satd. Flow (prot) Fit Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (mph) Link Distance (ft) Travel Time (s) Peak Hour Factor Adj. Flow (vph)									0.850			
Satd. Flow (prot) Fit Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (mph) Link Distance (ft) Travel Time (s) Peak Hour Factor Adj. Flow (vph)												
FIt Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (mph) Link Distance (ft) Travel Time (s) Peak Hour Factor Adj. Flow (vph)	1063	0	1863	0	4746	0	0	0	2601	0	0	
Right Turn on Red Satd. Flow (RTOR) Link Speed (mph) Link Distance (ft) Travel Time (s) Peak Hour Factor Adj. Flow (vph)	1062											
Right Turn on Red Satd. Flow (RTOR) Link Speed (mph) Link Distance (ft) Travel Time (s) Peak Hour Factor Adj. Flow (vph)	1003	0	1863	0	4746	0	0	0	2601	0	0	
Satd. Flow (RTOR) Link Speed (mph) Link Distance (ft) Travel Time (s) Peak Hour Factor Adj. Flow (vph)			Yes			Yes			Yes			
Link Speed (mph) Link Distance (ft) Travel Time (s) Peak Hour Factor Adj. Flow (vph)			.1.99						1920			
Link Distance (ft) Travel Time (s) Peak Hour Factor Adj. Flow (vph)		30			30			30		30		
Travel Time (s) Peak Hour Factor Adj. Flow (vph)		212			269			153		170		
Peak Hour Factor Adj. Flow (vph)		4.8			6.1			3.5		3.9		
Adj. Flow (vph)	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
	0	0.02	0.02	0.02	520	0	0.02	0	193	0.02	0.02	
Shared Lane Traffic (%)	•	•	Ť		020				100	· ·		
Lane Group Flow (vph)	0	0	0	0	520	0	0	0	193	0	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right	
Median Width(ft)	Lon	12	1.1911	Lon	0	, agair	Lon	25	, ugin	0	1.18111	
Link Offset(ft)		0			5			3		0		
Crosswalk Width(ft)		16			30			16		16		
Two way Left Turn Lane		10			00			10		10		
Headway Factor	1.00	1.09	1.00	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	
Turning Speed (mph)	15	15	9	15	1.00	9	15	1.00	9	15	9	
Turn Type	Prot	10	Perm	10	NA		10		Perm	10		
Protected Phases	6		r Grill		58				1 OIIII			2
Permitted Phases	· •		6		0.0				6			
Minimum Split (s)	20.0		20.0						20.0			54.0
Total Split (s)	43.5		43.5						43.5			55.5
	43.5%		43.5%						43.5%			56%
Maximum Green (s)	36.5		36.5						36.5			49.0
Yellow Time (s)	4.0		4.0						4.0			4.0
All-Red Time (s)	3.0		3.0						3.0			2.5
Lost Time Adjust (s)	-1.5		-1.5						0.0			2.0
Total Lost Time (s)	5.5		5.5						7.0			
Lead/Lag	Lead		Lead						Lead			
Lead-Lag Optimize?	Yes		Yes						Yes			
Walk Time (s)	7.0		7.0						7.0			7.0
Flash Dont Walk (s)	6.0		6.0						6.0			4.0
Pedestrian Calls (#/hr)	0.0		0.0						0.0			
Act Effet Green (s)									0			0
Actuated g/C Ratio	U		U		39.5				0 36.5			0

Lane Group	Ø4	Ø5	Ø8	Ø9	
Lane Configurations					
Traffic Volume (vph)					
Future Volume (vph)					
Ideal Flow (vphpl)					
Lane Width (ft)					
Storage Length (ft)					
Storage Lanes					
Taper Length (ft)					
Lane Util, Factor					
Frt					
Fit Protected					
Satd. Flow (prot)					
Fit Permitted					
Satd. Flow (perm)					
Right Turn on Red					
Satd. Flow (RTOR)					
ink Speed (mph)					
ink Distance (ft)					
Travel Time (s)					
Peak Hour Factor					
Adj. Flow (vph)					
Shared Lane Traffic (%)					
Lane Group Flow (vph)					
Enter Blocked Intersection					
ane Alignment					
Median Width(ft)					
Link Offset(ft)					
Crosswalk Width(ft)					
Two way Left Turn Lane					
Headway Factor					
Furning Speed (mph)					
Turn Type					
Protected Phases	4	5	8	9	
Permitted Phases		14,777	-	0.5	
Minimum Split (s)	32.5	11.4	11.5	12.0	
Fotal Split (s)	32.5	12.0	32.5	12.0	
Fotal Split (%)	33%	12%	33%	12%	
Maximum Green (s)	22.0	5.5	26.0	7.5	
Yellow Time (s)	4.0	4.0	4.0	3.5	
All-Red Time (s)	6.5	2.5	2.5	1.0	
ost Time Adjust (s)	0.0	2.0	2.0	1.0	
Total Lost Time (s)					
		Lon			
Lead/Lag		Lag			
Lead-Lag Optimize?		Yes			
Walk Time (s)	4.0				
Flash Dont Walk (s)	18.0				
Pedestrian Calls (#/hr)	0				
Act Effct Green (s)					
Actuated g/C Ratio					

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Lane Group	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER	Ø2
v/c Ratio					0.28				0.09			
Control Delay					21.1				0.1			
Queue Delay					0.0				1.4			
Total Delay					21.1				1.5			
LOS					С				А			
Approach Delay					21.1			1.5				
Approach LOS					С			А				
Queue Length 50th (ft)					80				0			
Queue Length 95th (ft)					108				m0			
Internal Link Dist (ft)		132			189			73		90		
Turn Bay Length (ft)												
Base Capacity (vph)					1874				2168			
Starvation Cap Reductn					0				1784			
Spillback Cap Reductn					166				0			
Storage Cap Reductn					0				0			
Reduced v/c Ratio					0.30				0.50			
Intersection Summary												
Area Type:	Other											
Cycle Length: 100												
Actuated Cycle Length: 100)											
Offset: 0 (0%), Referenced	to phase 2:	WBTand	16:EBTL,	Start of (Green							
Natural Cycle: 100												
Control Type: Pretimed												
Maximum v/c Ratio: 0.92												
Intersection Signal Delay, 1	5.8			In	tersection	LOS: B						
Intersection Capacity Utiliza	ation 14.2%			IC	CU Level o	of Service	Α					
0 1 1 D 1 1 C 1 1 1 E												

Analysis Period (min) 15 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 11: 12th Street SW



Lane Group	Ø4	Ø5	Ø8	Ø9
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (ft)				
Queue Length 95th (ft)				
Internal Link Dist (ft)				
Turn Bay Length (ft)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				
Intersection Summary				

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations		नाक			444				4	7		4
Traffic Volume (vph)	0	1044	119	167	847	0	14	11	0	1	0	0
Future Volume (vph)	0	1044	119	167	847	0	14	11	0	1	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		0		0		0	0	
Storage Lanes	0		1	0		0		0		1	0	
Taper Length (ft)	100			100				100			25	
Lane Util. Factor	0.86	0.86	0.86	0.91	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.00	0.97	0.00	0.01	0.99	0.01			0.85			
Frt		0.985								0.850		
Flt Protected					0.992				0.950			
Satd, Flow (prot)	0	5663	0	0	4647	0	0	0	1685	1507	0	1773
Flt Permitted	1.5			-	0.643		W.W.	Ť	0.757	1001	0.50	11.10
Satd. Flow (perm)	0	5663	0	0	2989	0	0	0	1144	1507	0	1773
Right Turn on Red		0000	Yes		2000	Yes				Yes		1110
Satd. Flow (RTOR)		32	100			100				153		
Link Speed (mph)		35			35				30	100		15
Link Distance (ft)		540			606				566			305
Travel Time (s)		10.5			11.8				12.9			13.9
Confl. Peds. (#/hr)	161	10.0	200	200	11.0	161		148	12.0			10.0
Confl. Bikes (#/hr)	101		30	200		28		140				
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0.90	3%	0.30	0.90	4%	0.30	0.90	0.90	0.90	0.90	0.90	0.30
Adj. Flow (vph)	0	1088	124	174	882	0	15	11	0	1	0	0
Shared Lane Traffic (%)	v	1000	124	117	002	v	10		v		U	U
Lane Group Flow (vph)	0	1212	0	0	1056	0	0	0	26	1	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	RNA	Left	Left	Right	Left	Left
Median Width(ft)	LGII	0	ragin	LGIL	0	ragin	NINA	LGIL	90	ragiit	Loit	0
Link Offset(ft)		0			0				5			-70
Crosswalk Width(ft)		45			20				20			20
Two way Left Turn Lane		40			20				20			20
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (mph)	1.03	1.09	9	1.03	1.09	9	9	1.03	1.09	9	1.03	1.09
Turn Type	10	NA	9		NA	9	Perm	Perm	NA	Over	10	
Protected Phases		2		pm+pt 1	6		Pelili	Pelili	8	1		8
Permitted Phases	2	2		6	0		8	8	0		8	0
Minimum Split (s)	29.5	29.5		10.5	25.5		35.5	35.5	35.5	10.5	35.5	35.5
Total Split (s)	47.5	47.5		12.0	59.5		35.5	35.5	35.5	12.0	35.5	35.5
Total Split (%)	47.5%	47.5%		12.0%	59.5%		35.5%	35.5%	35.5%	12.0%	35.5%	35.5%
Maximum Green (s)	38.0	38.0		6.5	54.0		30.0	30.0	30.0	6.5	30.0	30.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
	5.5	5.5		1.5	1.5		1.5	1.5	1.5	1.5	1.5	1.5
All-Red Time (s)	5.5	-1.5		1.0	0.0		1.3	1.3	0.0	0.0	1.0	0.0
Lost Time Adjust (s)		-1.5 8.0			5.5				5.5	5.5		5.5
Total Lost Time (s)	Lead	Lead		Loc	5.5		100	Loc		-	Loc	
Lead/Lag				Lag			Lag	Lag	Lag	Lag	Lag	Lag
Lead-Lag Optimize?	Yes 10.0	Yes 10.0		Yes	10.0		Yes 10.0	Yes 10.0	Yes 10.0	Yes	Yes 10.0	Yes 10.0
Walk Time (s)												
Flash Dont Walk (s)	10.0	10.0			10.0		20.0	20.0	20.0		20.0	20.0

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Lane Group	SBR	Ø7
Lant Configurations		
Traffic Volume (vph)	0	
Future Volume (vph)	0	
Ideal Flow (vphpl)	1900	
Storage Length (ft)	0	
Storage Lanes	0	
Taper Length (ft)	V	
Lane Util, Factor	1.00	
Ped Bike Factor	1.00	
Frt		
Fit Protected		
Satd. Flow (prot)	0	
Flt Permitted	U	
Satd. Flow (perm)	0	
Right Turn on Red	Yes	
Satd. Flow (RTOR)	165	
Link Speed (mph)		
Link Distance (ft) Travel Time (s)		
A CONTROL OF THE CONTROL OF THE CONTROL	148	
Confl. Peds. (#/hr)	140	
Confl. Bikes (#hr) Peak Hour Factor	0.96	
Heavy Vehicles (%)	0% 0	
Adj. Flow (vph)	U	
Shared Lane Traffic (%)	^	
Lane Group Flow (vph)	0	
Enter Blocked Intersection	No	
Lane Alignment	Right	
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane	4.00	
Headway Factor	1.09	
Turning Speed (mph)	9	
Turn Type		-
Protected Phases		7
Permitted Phases		
Minimum Split (s)		5.0
Total Split (s)		5.0
Total Split (%)		5%
Maximum Green (s)		3.0
Yellow Time (s)		2.0
All-Red Time (s)		0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		Lead
Lead-Lag Optimize?		Yes
Walk Time (s)		

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Pedestrian Calls (#/hr)	0	0			0		0	0	0		0	(
Act Effct Green (s)		39.5			54.0				30.0	6.5		
Actuated g/C Ratio		0.40			0.54				0.30	0.06		
v/c Ratio		0.54			0.61				0.08	0.00		
Control Delay		6.8			12.6				26.0	0.0		
Queue Delay		0.0			0.0				0.0	0.0		
Total Delay		6.8			12.6				26.0	0.0		
LOS		Α			В				С	Α		
Approach Delay		6.8			12.6				25.0			
Approach LOS		Α			В				С			
Queue Length 50th (ft)		108			90				12	0		
Queue Length 95th (ft)		134			98				32	0		
Internal Link Dist (ft)		460			526				486			225
Turn Bay Length (ft)												
Base Capacity (vph)		2256			1721				343	241		
Starvation Cap Reductn		0			0				0	0		
Spillback Cap Reductn		0			0				0	0		
Storage Cap Reductn		0			0				0	0		
Reduced v/c Ratio		0.54			0.61				0.08	0.00		
Intersection Summary												
	Other											
Cycle Length: 100												
Actuated Cycle Length: 100												
Offset: 29 (29%), Reference	d to phase	2:EBIL a	and 6: WE	IIL, Start	of Green							
Natural Cycle: 85												
Control Type: Pretimed												
Maximum v/c Ratio: 0.61	_											
Intersection Signal Delay, 9.1					tersection		_					
Intersection Capacity Utilizat	ion /8.5%			1C	:ULevel	of Service	D					
Analysis Period (min) 15												
Splits and Phases: 14:9th	Street SV	//S mithso	nian Driv	reway & Ir	ndepende	nce Ave	SW					
<u></u> Ø2 (R)					√ ø1							
47.5 s					12 s		s 4 +					



Lane Group	SBR	Ø7		
Pedestrian Calls (#/hr)				
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (ft)				
Queue Length 95th (ft)				
Internal Link Dist (ft)				
Turn Bay Length (ft)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		नाक			नाक		7	*		7	444	
Traffic Volume (vph)	177	765	98	14	705	194	92	265	59	125	190	212
Future Volume (vph)	177	765	98	14	705	194	92	265	59	125	190	212
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	11	11	11	11	11	11
Storage Length (ft)	0		75	0		0	80		0	0		50
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	0.86	0.86	0.86	0.86	0.86	0.86	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor		0.96			0.92		0.82	0.94		0.82	0.83	
Frt		0.986			0.968			0.973		1,412.0	0.921	
Flt Protected		0.992			0.999		0.950			0.950		
Satd. Flow (prot)	0	5594	0	0	5180	0	1616	4441	0	1646	3644	0
Fit Permitted		0.715	·		0.904		0.500			0.476	0011	ŭ
Satd. Flow (perm)	0	3982	0	0	4683	0	699	4441	0	672	3644	0
Right Turn on Red	U	0002	Yes	U	4000	Yes	000	7771	No	OIZ	0011	Yes
Satd. Flow (RTOR)		36	100		82	100			110		139	100
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		606			437			393			424	
Travel Time (s)		11.8			8.5			7.7			8.3	
Confl. Peds. (#/hr)	389	11.0	230	230	0.0	389	333	1.3	308	308	0.0	333
Confl. Bikes (#hr)	503		20	250		29	333		19	300		14
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	7%	3%	4%	0%	4%	10%	8%	3%	4%	6%	7%	3%
Adj. Flow (vph)	182	789	101	14	727	200	95	273	61	129	196	219
Shared Lane Traffic (%)	102	703	101	14	121	200	30	210	01	123	130	210
Lane Group Flow (vph)	0	1072	0	0	941	0	95	334	0	129	415	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	Leit	0	right	Leit	0	Nigili	Leit	11	rigit	Leit	11	rigit
Link Offset(ft)		5			0			-6			5	
Crosswalk Width(ft)		32			30			22			35	
Two way Left Turn Lane		32			30			22			33	
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	1.03	1.03	9	1.03	1.03	9	1.04	1,04	9	15	1.04	9
Turn Type	pm+pt	NA	9	Perm	NA	3	Perm	NA	3	pm+pt	NA	9
Protected Phases	рин-рі 5	2		Pellii	1NA 6		Pelli	NA 4		3	NA 8	
Permitted Phases	2	2		6	0		4	-		8	0	
Minimum Split (s)	10.5	31.5		28.5	28.5		29.5	29.5		10.0	32.5	
Total Split (s)	11.0	57.0		46.0	46.0		32.5	32.5		10.5	43.0	
Total Split (%)	11.0%	57.0%		46.0%	46.0%		32.5%	32.5%		10.5%	43.0%	
Maximum Green (s)	5.5	50.5		39.5	39.5		26.0	26.0		5.5	36.5	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
A STATE OF THE PARTY OF THE PAR				2.5			2.5	2.5				
All-Red Time (s)	1.5	2.5		2.5	2.5					1.0	2.5	
Lost Time Adjust (s)		-1.5			-1.5		-1.5	-1.5		-1.5 3.5	-1.5	
Total Lost Time (s)	Land	5.0		Lac	5.0		5.0	5.0			5.0	
Lead/Lag	Lead			Lag	Lag		Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	7.0		Yes	Yes		Yes	Yes		Yes	7.0	
Walk Time (s)		7.0		4.0	4.0		4.0	4.0			7.0	

22: 7th Street SW & Independence Ave SW

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Flash Dont Walk (s)		18.0		18.0	18.0		19.0	19.0			19.0	
Pedestrian Calls (#/hr)		0		0	0		0	0			0	
Act Effct Green (s)		52.0			41.0		27.5	27.5		39.5	38.0	
Actuated g/C Ratio		0.52			0.41		0.28	0.28		0.40	0.38	
v/c Ratio		0.49			0.48		0.49	0.27		0.39	0.28	
Control Delay		1.6			20.6		40.9	29.2		20.7	11.1	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		1.6			20.6		40.9	29.2		20.7	11.1	
LOS		А			С		D	С		С	В	
Approach Delay		1.6			20.6			31.8			13.4	
Approach LOS		Α			С			С			В	
Queue Length 50th (ft)		9			113		51	61		45	25	
Queue Length 95th (ft)		16			144		105	87		71	38	
Internal Link Dist (ft)		526			357			313			344	
Turn Bay Length (ft)							80					
Base Capacity (vph)		2184			1968		192	1221		333	1470	
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		0.49			0.48		0.49	0.27		0.39	0.28	
Intersection Summary												
AND DESCRIPTION OF THE PARTY OF	Other											
Cycle Length: 100												

Area Type: Oth Cycle Length: 100 Actuated Cycle Length: 100

Offset: 51 (51%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 80
Control Type: Pretimed
Maximum v/c Ratio: 0.49
Intersection Signal Delay: 14.0
Intersection Capacity Utilization

Intersection Signal Delay: 14.0 Intersection LOS: B
Intersection Capacity Utilization 83.3% ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 22: 7th Street SW & Independence Ave SW



	•	\rightarrow	•	•	←	*	1	†	~	-	Į.	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		444			444	7		†††	7	7	444	
Traffic Volume (vph)	13	673	87	2	548	202	0	1325	288	128	1009	87
Future Volume (vph)	13	673	87	2	548	202	0	1325	288	128	1009	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	10	10	10	10	10	10	10	10	10	10
Storage Length (ft)	0		0	0		100	0		0	0		0
Storage Lanes	0		0	0		1	0		1	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	0.91	0.91	0.91	0.91	0.91	1.00	1.00	0.91	1.00	1.00	0.91	0.91
Ped Bike Factor	0.01	0.95	0.01	0.01	1.00	0.67	1.00		0.65	0.97	0.96	0.0
Frt		0.983				0.850			0.850		0.988	
Fit Protected		0.999				100000000				0.950		
Satd. Flow (prot)	0	4586	0	0	4604	1478	0	4746	1463	1589	4466	0
Flt Permitted		0.924			0.937					0.109		
Satd. Flow (perm)	0	4233	0	0	4312	985	0	4746	954	177	4466	0
Right Turn on Red		1200	Yes		1012	Yes		11 10	Yes		1100	Yes
Satd. Flow (RTOR)		1	100			186			109		2	100
Link Speed (mph)		35			35	100		30	100		30	
Link Distance (ft)		370			1104			509			377	
Travel Time (s)		7.2			21.5			11.6			8.6	
Confl. Peds. (#/hr)	413	1.2	738	738	21.0	413	831	11.0	426	426	0.0	831
Confl. Bikes (#/hr)	710		14	, 00		16	001		4	720		6
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	29%	2%	3%	50%	5%	2%	0%	2%	3%	6%	3%	7%
Adj. Flow (vph)	14	724	94	2	589	217	0	1425	310	138	1085	94
Shared Lane Traffic (%)	5.75	741	01		000	2.11		1420	010	100	1000	
Lane Group Flow (vph)	0	832	0	0	591	217	0	1425	310	138	1179	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	Leit	0	ragne	Leit	0	ragiit	Loit	4	ragiit	Leit	10	ragin
Link Offset(ft)		0			0			5			0	
Crosswalk Width(ft)		20			30			30			26	
Two way Left Turn Lane		20			30			30			20	
Headway Factor	1.09	1.04	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (mph)	15	1.04	9	15	1.00	9	15	1,00	9	15	1.00	9
Turn Type	Perm	NA	3	Perm	NA	Perm	10	NA	Perm	pm+pt	NA	9
Protected Phases	FCIIII	4		r ciiii	8	raiii		2	FGIII	1	6	
Permitted Phases	4	7		8	0	8			2	6	0	
Minimum Split (s)	36.5	36.5		36.5	36.5	36.5		31.5	31.5	10.5	31.5	
Total Split (s)	37.0	37.0		37.0	37.0	37.0		48.0	48.0	15.0	63.0	
Total Split (%)	37.0%	37.0%		37.0%	37.0%	37.0%		48.0%	48.0%	15.0%	63.0%	
Maximum Green (s)	30.5	30.5		30.5	30.5	30.5		41.5	41.5	8.5	56.5	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0		41.5	41.5	4.0	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5	2.5		2.5	2.5	2.5	2.5	
Lost Time Adjust (s)	2.0	-1.5		2.0	-1.5	-1.5		-1.5	-1.5	-1.0	-1.5	
Total Lost Time (s)		5.0			5.0	5.0		5.0	5.0	5.5	5.0	
Lead/Lag		0.0			0.0	0.0		Lead	Lead		0.0	
Lead-Lag Optimize?								Yes	Yes	Lag Yes		
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		6.0	6.0	168	6.0	
Many Lille (2)	7.0	7.0		7.0	7.0	7.0		0.0	0.0		0.0	

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Synchro 9 Report Page 1

2: 14th Street SW & Independence Ave SW

	1	-	7	1	-	•	1	1	-	-	1	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Flash Dont Walk (s)	23.0	23.0		23.0	23.0	23.0		19.0	19.0		19.0	
Pedestrian Calls (#/hr)	0	0		0	0	0		0	0		0	
Act Effct Green (s)		32.0			32.0	32.0		43.0	43.0	57.5	58.0	
Actuated g/C Ratio		0.32			0.32	0.32		0.43	0.43	0.58	0.58	
v/c Ratio		0.61			0.43	0.49		0.70	0.66	0.59	0.46	
Control Delay		31.1			35.4	19.0		25.5	22.0	43.6	15.0	
Queue Delay		0.0			0.0	0.0		0.0	0.0	0.0	0.5	
Total Delay		31.1			35.4	19.0		25.5	22.0	43.6	15.6	
LOS		С			D	В		С	С	D	В	
Approach Delay		31.1			31.0			24.9			18.5	
Approach LOS		С			С			С			В	
Queue Length 50th (ft)		163			142	66		264	99	54	207	
Queue Length 95th (ft)		207			m173	m102		318	205	104	258	
Internal Link Dist (ft)		290			1024			429			297	
Turn Bay Length (ft)						100						
Base Capacity (vph)		1355			1379	441		2040	472	235	2591	
Starvation Cap Reductn		0			0	0		0	0	0	894	
Spillback Cap Reductn		0			0	0		0	0	0	0	
Storage Cap Reductn		0			0	0		0	0	0	0	
Reduced v/c Ratio		0.61			0.43	0.49		0.70	0.66	0.59	0.69	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 17 (17%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

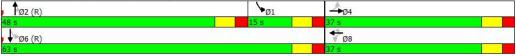
Natural Cycle: 80 Control Type: Pretimed Maximum v/c Ratio: 0.70

Intersection Signal Delay: 25.2 Intersection LOS: C
Intersection Capacity Utilization 88.1% ICU Level of Service E

Analysis Period (min) 15

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

Splits and Phases: 2: 14th Street SW & Independence Ave SW

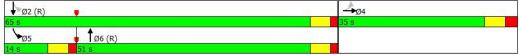


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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	7	1						ተተኩ		7	^	
Traffic Volume (vph)	73	88	86	0	0	0	0	1406	134	92	1138	0
Future Volume (vph)	73	88	86	0	0	0	0	1406	134	92	1138	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	10	10	10	10	10	12	12	10	10	10
Storage Length (ft)	0		0	0		0	0		20	170		0
Storage Lanes	1		0	0		0	0		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	1.00
Ped Bike Factor	0.48	0.81						0.94				
Frt		0.926						0.987				
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1517	1313	0	0	0	0	0	4654	0	1620	4700	0
Flt Permitted	0.950									0.078		
Satd. Flow (perm)	735	1313	0	0	0	0	0	4654	0	133	4700	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)								21				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		257			1068			377			341	
Travel Time (s)		5.8			24.3			8.6			7.8	
Confl. Peds. (#/hr)	1284		396	396		1284	733		440	440		733
Confl. Bikes (#/hr)			136						25			24
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
Heavy Vehicles (%)	19%	15%	3%	0%	0%	0%	0%	3%	6%	4%	3%	0%
Adj. Flow (vph)	77	93	91	0	0	0	0	1480	141	97	1198	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	77	184	0	0	0	0	0	1621	0	97	1198	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		15	6000 0 000		12	A STATE OF THE STA		0	AND STREET		10	a twick of action
Link Offset(ft)		0			15			0			5	
Crosswalk Width(ft)		30			35			37			35	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.09	1.09	1.09	1.09	1.09	1.00	1.00	1.09	1.09	1.09
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA						NA		pm+pt	NA	
Protected Phases		4						6		5	2	
Permitted Phases	4									2		
Minimum Split (s)	34.5	34.5						20.5		10.5	20.5	
Total Split (s)	35.0	35.0						51.0		14.0	65.0	
Total Split (%)	35.0%	35.0%						51.0%		14.0%	65.0%	
Maximum Green (s)	28.5	28.5						45.5		8.5	59.5	
Yellow Time (s)	4.0	4.0						4.0		4.0	4.0	
All-Red Time (s)	2.5	2.5						1.5		1.5	1.5	
Lost Time Adjust (s)	-1.5	-1.5						-1.5		-1.5	-1.5	
Total Lost Time (s)	5.0	5.0						4.0		4.0	4.0	
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?								Yes		Yes		
Walk Time (s)	10.0	10.0						10.0		.876(<u>0</u>)	10.0	

SI South Campus Master Plan 10/20/2017 2036 Build Condition Saturday Peak Ho Stantec

Lanes, Volumes, Timings 4: 14th Street SW & SW Jefferson Drive

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
Flash Dont Walk (s)	18.0	18.0						5.0			5.0	
Pedestrian Calls (#/hr)	0	0						0			0	
Act Effct Green (s)	30.0	30.0						47.0		61.0	61.0	
Actuated g/C Ratio	0.30	0.30						0.47		0.61	0.61	
v/c Ratio	0.35	0.47						0.74		0.42	0.42	
Control Delay	33.0	33.3						18.8		16.8	10.8	
Queue Delay	0.0	0.0						0.0		0.0	0.0	
Total Delay	33.0	33.3						18.8		16.8	10.8	
LOS	С	С						В		В	В	
Approach Delay		33.2						18.8			11.2	
Approach LOS		С						В			В	
Queue Length 50th (ft)	38	95						154		24	135	
Queue Length 95th (ft)	82	163						215		62	165	
Internal Link Dist (ft)		177			988			297			261	
Turn Bay Length (ft)										170		
Base Capacity (vph)	220	393						2198		229	2867	
Starvation Cap Reductn	0	0						4		0	0	
Spillback Cap Reductn	0	0						0		0	15	
Storage Cap Reductn	0	0						0		0	0	
Reduced v/c Ratio	0.35	0.47						0.74		0.42	0.42	
Intersection Summary												
O CONTROL OF PROPERTY	Other											
Cycle Length: 100												
Actuated Cycle Length: 100												
Offset: 0 (0%), Referenced to	to phase 2:	SBTL and	16:NBT,	Start of G	ireen							
Natural Cycle: 80												
Control Type: Pretimed												
Maximum v/c Ratio: 0.74												
Intersection Signal Delay, 10					tersection							
Intersection Capacity Utiliza	tion 70.2%			IC	U Level	of Service	C					
Analysis Period (min) 15												
Splits and Phases: 4: 14t	h Street SV	V&SWJ	efferson (Orive								
₩Ø2 (R)						900	2	Ø4				- 170
CE -							25.					



Lane Group EBT EBR WBL WBT NBL NBR Lane Configurations 1 7
Traffic Volume (vph) 264 46 0 0 0 75 Future Volume (vph) 264 46 0 0 0 75 Ideal Flow (vphpl) 1900 100 100 1.00
Future Volume (vph) 264 46 0 0 0 75 Ideal Flow (vphpl) 1900 1900 1900 1900 1900 1900 1900 Lane Width (ft) 14 10 10 10 10 13 Lane Util. Factor 1.00 1.00 1.00 1.00 1.00 1.00 Ped Bike Factor Frt 0.980 0.865 Fit Protected Satd. Flow (prot) 1845 0 0 0 0 1587 Fit Permitted Satd. Flow (perm) 1845 0 0 0 0 1587 Link Speed (mph) 30 30 30 Link Distance (ft) 1068 661 401 Travel Time (s) 24.3 1500 1900 1900 1900
Ideal Flow (vphpl)
Lane Width (ft) 14 10 10 10 10 13 Lane Util. Factor 1.00 1.00 1.00 1.00 1.00 1.00 1.00 Ped Bike Factor Frt 0.980 0.865 Fit Protected Satd. Flow (prot) 1845 0 0 0 0 1587 Fit Permitted Satd. Flow (perm) 1845 0 0 0 0 1587 Link Speed (mph) 30 30 30 30 30 30 15.0 9.1 Travel Time (s) 24.3 15.0 9.1 9.1 9.1 9.1
Lane Util. Factor 1.00 1.00 1.00 1.00 1.00 1.00 Ped Bike Factor Frt 0.980 0.865 Fit Protected Satd. Flow (prot) 1845 0 0 0 0 1587 Fit Permitted Satd. Flow (perm) 1845 0 0 0 0 1587 Link Speed (mph) 30 30 30 Link Distance (ft) 1068 661 401 Travel Time (s) 24.3 15.0 9.1
Lane Util. Factor 1.00 1.00 1.00 1.00 1.00 1.00 Ped Bike Factor Frt 0.980 0.865 Fit Protected Satd. Flow (prot) 1845 0 0 0 0 1587 Fit Permitted Satd. Flow (perm) 1845 0 0 0 0 1587 Link Speed (mph) 30 30 30 Link Distance (ft) 1068 661 401 Travel Time (s) 24.3 15.0 9.1
Ped Bike Factor Frt 0.980 0.865 Fit Protected Satd. Flow (prot) 1845 0 0 0 1587 Fit Permitted Satd. Flow (perm) 1845 0 0 0 0 1587 Link Speed (mph) 30 30 30 Link Distance (ft) 1068 661 401 Travel Time (s) 24.3 15.0 9.1
Fit Protected Satd. Flow (prot) 1845 0 0 0 0 1587 Fit Permitted Satd. Flow (perm) 1845 0 0 0 0 1587 Link Speed (mph) 30 30 30 Link Distance (ft) 1068 661 401 Travel Time (s) 24.3 15.0 9.1
Satd. Flow (prot) 1845 0 0 0 1587 Fit Permitted Satd. Flow (perm) 1845 0 0 0 0 1587 Link Speed (mph) 30 30 30 Link Distance (ft) 1068 661 401 Travel Time (s) 24.3 15.0 9.1
Fit Permitted Satd. Flow (perm) 1845 0 0 0 0 1587 Link Speed (mph) 30 30 30 Link Distance (ft) 1068 661 401 Travel Time (s) 24.3 15.0 9.1
Satd. Flow (perm) 1845 0 0 0 0 1587 Link Speed (mph) 30 30 30 30 Link Distance (ft) 1068 661 401 Travel Time (s) 24.3 15.0 9.1
Link Speed (mph) 30 30 30 Link Distance (ft) 1068 661 401 Travel Time (s) 24.3 15.0 9.1
Link Distance (ft) 1068 661 401 Travel Time (s) 24.3 15.0 9.1
Travel Time (s) 24.3 15.0 9.1
Confl. Peds. (#/hr) 845 541
Confl. Bikes (#/hr) 133
Peak Hour Factor 0.86 0.86 0.86 0.86 0.86 0.86
Heavy Vehicles (%) 9% 0% 2% 2% 0% 7%
Adj. Flow (vph) 307 53 0 0 87
Shared Lane Traffic (%)
Lane Group Flow (vph) 360 0 0 0 87
Enter Blocked Intersection No No No No No No
Lane Alignment Left Right Left Left Right
Median Width(ft) 0 0 0
Link Offset(ft) 0 0 -2
Crosswalk Width(ft) 16 16 24
Two way Left Turn Lane
Headway Factor 0.92 1.09 1.09 1.09 0.96
Turning Speed (mph) 9 15 15 9
Sign Control Stop Stop Stop
Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 29.7%
Analysis Period (min) 15

ICU Level of Service A

Lanes, Volumes, Timings
7: 12th Street SW & Independence Ave SW & 12th Street SW Ramp & Loading Dock 10/20/2017

	•	_	→	•	1	•	*	•	1	ሻ	†	-
Lane Group	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR2
Lane Configurations			444		ሻ	444				Ä	^	7
Traffic Volume (vph)	31	54	911	93	74	636	37	102	98	31	147	202
Future Volume (vph)	31	54	911	93	74	636	37	102	98	31	147	202
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	11	11	11
Storage Length (ft)		0		0	0		100			0		
Storage Lanes		0		0	1		0			1		
Taper Length (ft)		100			100					100		
Lane Util. Factor	0.91	0.91	0.91	0.91	0.86	0.86	0.91	0.91	1.00	1.00	1.00	1.00
Ped Bike Factor	0.01	0.0	0.95	0.01	0.92	0.84	0.01			0.63	1,00	0.91
Frt			0.987		0.02	0.973				0.00		0.850
Fit Protected			0.996		0.950					0.950		0.000
Satd. Flow (prot)	0	0	4582	0	1449	3733	0	0	0	1745	1818	1561
Fit Permitted			0.738		0.950	0.931				0.950	1010	1001
Satd. Flow (perm)	0	0	3354	0	1332	3475	0	0	0	1100	1818	1419
Right Turn on Red	U	Ü	0001	Yes	1002	0470		Ū	· ·	1100	1010	Yes
Satd. Flow (RTOR)			18	100								131
Link Speed (mph)			35			35					30	101
Link Distance (ft)			1104			603					153	
Travel Time (s)			21.5			11.7					3.5	
Confl. Peds. (#/hr)	289		21.0	370	370	11.7	289	289	475		0.0	59
Confl. Bikes (#hr)	203			27	5/0		30	30	410			55
Peak Hour Factor	0.93	0.92	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	1%	0.93
Adj. Flow (vph)	33	59	980	100	80	684	40	110	105	33	158	217
Shared Lane Traffic (%)	33	59	900	100	10%	004	40	110	100	33	100	217
Lane Group Flow (vph)	0	0	1172	0	72	842	0	0	0	138	158	217
Enter Blocked Intersection	No	No	No	No	No.	No No	No	No	No	No	No	No
	Left				Left	Left					Left	
Lane Alignment	Leit	Left	Left 0	Right	Leit	10	Right	Right	Left	Left	56	Right
Median Width(ft)			0			0					0	
Link Offset(ft)			30			25					28	
Crosswalk Width(ft)			30			25					20	
Two way Left Turn Lane	1.00	4.00	1.00	1.00	4.00	1.00	4.00	1.00	1.00	1.04	1.04	1.04
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.04	1.04	1.04
Turning Speed (mph)	15	15	LIA.	9	15	614	9	9	15	15	114	9
Turn Type	Perm	Perm	NA		Prot	NA			custom	custom	NA	custom
Protected Phases	•		6		5	2				4.0	4	5
Permitted Phases	6	6	00.0			540			48	48	8	48
Minimum Split (s)	20.0	20.0	20.0		11.4	54.0					32.5	11.4
Total Split (s)	44.0	44.0	44.0		13.0	57.0					33.0	13.0
Total Split (%)	44.0%	44.0%	44.0%		13.0%	57.0%					33.0%	13.0%
Maximum Green (s)	37.0	37.0	37.0		6.5	50.5					22.5	6.5
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0					4.0	4.0
All-Red Time (s)	3.0	3.0	3.0		2.5	2.5					6.5	2.5
Lost Time Adjust (s)			-1.5		-1.5	-1.5					-1.5	-1.5
Total Lost Time (s)			5.5		5.0	5.0					9.0	5.0
Lead/Lag	Lead	Lead	Lead		Lag							Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes							Yes
Walk Time (s)	7.0	7.0	7.0			7.0					4.0	

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Synchro 9 Report Page 6

	4	\	>	4	4		
Lane Group	SEL2	SEL	SER	SER2	SWL	Ø8	
Lane Configurations		¥			M		
Traffic Volume (vph)	1	20	11	32	0		
Future Volume (vph)	1	20	11	32	0		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900		
Lane Width (ft)	10	13	10	10	10		
Storage Length (ft)	10	0	0	10	0		
Storage Lanes		1	0		1		
Taper Length (ft)		100			25		
ane Util. Factor	1.00	1.00	1.00	1.00	1.00		
Ped Bike Factor	1.00	0.73	1.00	1.00	1.00		
Frt		0.910					
It Protected		0.984					
Satd. Flow (prot)	0	1318	0	0	1739		
Fit Permitted	U	0.984	U	U	17.09		
Satd. Flow (perm)	0	1283	0	0	1739		
	U	1203	U	Yes	1739		
Right Turn on Red		400		res			
Satd. Flow (RTOR)		169			20		
Link Speed (mph)		30			30		
Link Distance (ft)		401			276		
Travel Time (s)		9.1		475	6.3		
Confl. Peds. (#/hr)		59		475			
Confl. Bikes (#/hr)			172.122	2	12/2/2/2/		
Peak Hour Factor	0.92	0.93	0.93	0.93	0.92		
Heavy Vehicles (%)	2%	0%	0%	0%	2%		
Adj. Flow (vph)	1	22	12	34	0		
Shared Lane Traffic (%)							
ane Group Flow (vph)	0	69	0	0	0		
Enter Blocked Intersection	No	No	No	No	No		
ane Alignment	Left	Left	Right	Right	Left		
Median Width(ft)		13			10		
ink Offset(ft)		40			0		
Crosswalk Width(ft)		20			16		
Two way Left Turn Lane							
Headway Factor	1.09	0.96	1.09	1.09	1.09		
Turning Speed (mph)	15	15	9	9	15		
Turn Type	D.Pm	D.Pm			Prot		
Protected Phases					9	8	
Permitted Phases	48	48					
Minimum Split (s)					10.0	11.5	
Total Split (s)					10.0	33.0	
Total Split (%)					10.0%	33%	
Maximum Green (s)					5.0	26.5	
rellow Time (s)					3.0	4.0	
NI-Red Time (s)					2.0	2.5	
ost Time Adjust (s)					-1.5	2.0	
Fotal Lost Time (s)					3.5		
_ead/Lag					0.0		
Lead-Lag Optimize?							
Lead-Lay Optimizer							

SI South Campus Master Plan 10/20/2017 2036 Build Condition Saturday Peak Ho Stantec

Lanes, Volumes, Timings

7: 12th Street SW & Independence Ave SW & 12th Street SW Ramp & Loading Dock 10/20/2017

	٠	_#	→	7	1	+	*_	•	1	ሻ	1	-
Lane Group	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR2
Flash Dont Walk (s)	6.0	6.0	6.0			4.0					18.0	
Pedestrian Calls (#/hr)	0	0	0			0					0	
Act Effct Green (s)			38.5		8.0	52.0				24.0	24.0	36.0
Actuated g/C Ratio			0.38		0.08	0.52				0.24	0.24	0.36
v/c Ratio			0.90		0.63	1.56dr				0.52	0.36	0.36
Control Delay			30.4		76.2	39.2				21.4	14.7	4.6
Queue Delay			0.0		0.0	0.0				3.7	3.7	0.6
Total Delay			30.4		76.2	39.2				25.1	18.4	5.2
LOS			С		Е	D				С	В	А
Approach Delay			30.4			42.1					14.6	
Approach LOS			С			D					В	
Queue Length 50th (ft)			280		56	94				77	84	49
Queue Length 95th (ft)			#356		#127	94				140	143	111
Internal Link Dist (ft)			1024			523					73	
Turn Bay Length (ft)												
Base Capacity (vph)			1302		115	1035				264	436	606
Starvation Cap Reductn			0		0	0				65	198	159
Spillback Cap Reductn			0		0	0				0	0	0
Storage Cap Reductn			0		0	0				0	0	0
Reduced v/c Ratio			0.90		0.63	0.81				0.69	0.66	0.49
Intersection Summary												
Area Type:	Other											
Cycle Length: 100												

Cycle Length: 100 Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBTL, Start of Green

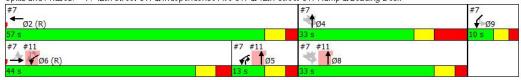
Natural Cycle: 100 Control Type: Pretimed Maximum v/c Ratio: 0.90

Intersection Signal Delay: 30.6 Intersection LOS: C
Intersection Capacity Utilization 96.7% ICU Level of Service F

Analysis Period (min) 15

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

Splits and Phases: 7: 12th Street SW & Independence Ave SW & 12th Street SW Ramp & Loading Dock



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

Lanes, Volumes, Timings 7: 12th Street SW & Independence Ave SW & 12th Street SW Ramp & Loading Dock 10/20/2017

	4	1	>	4	4	
Lane Group	SEL2	SEL	SER	SER2	SWL	Ø8
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
Act Effct Green (s)		24.0				
Actuated g/C Ratio		0.24				
v/c Ratio		0.16				
Control Delay		0.8				
Queue Delay		0.0				
Total Delay		0.8				
LOS		Α				
Approach Delay		0.8				
Approach LOS		Α				
Queue Length 50th (ft)		0				
Queue Length 95th (ft)		0				
Internal Link Dist (ft)		321			196	
Turn Bay Length (ft)						
Base Capacity (vph)		436				
Starvation Cap Reductn		0				
Spillback Cap Reductn		0				
Storage Cap Reductn		0				
Reduced v/c Ratio		0.16				

	→	•	1	-	1	1		
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø3	
Lane Configurations	4111			441	ሻ	7		
Traffic Volume (vph)	1086	47	45	818	33	78		
Future Volume (vph)	1086	47	45	818	33	78		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Storage Length (ft)	1000	0	0	1000	0	210		
Storage Lanes		0	0		1	1		
Taper Length (ft)			100		100	*		
Lane Util, Factor	0.86	0.86	0.91	0.91	1.00	1.00		
Ped Bike Factor	0.97	0,00	0.01	1.00	0.62	1.00		
Frt	0.994			1.00	0.02	0.850		
Fit Protected	0.334			0.997	0.950	0.000		
	5755	0	0	4625	1404	1396		
Satd. Flow (prot)	0/00	U	U	0.820	0.950	1390		
Flt Permitted	5755		^			1200		
Satd. Flow (perm)	5755	0	0	3789	866	1396		
Right Turn on Red		Yes				Yes		
Satd. Flow (RTOR)	11					51		
Link Speed (mph)	35			35	25			
Link Distance (ft)	603			540	714			
Travel Time (s)	11.7			10.5	19.5			
Confl. Peds. (#/hr)		375	375		573			
Confl. Bikes (#/hr)		30						
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94		
Heavy Vehicles (%)	2%	11%	11%	4%	20%	8%		
Adj. Flow (vph)	1155	50	48	870	35	83		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	1205	0	0	918	35	83		
Enter Blocked Intersection	No	No	No	No	No	No		
Lane Alignment	Left	Right	Left	Left	Left	Right		
Median Width(ft)	0			0	60			
Link Offset(ft)	0			0	-10			
Crosswalk Width(ft)	30			10	16			
Two way Left Turn Lane								
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09		
Turning Speed (mph)	1.00	9	15	,,,,,,	15	9		
Turn Type	NA	9	pm+pt	NA	Prot	pm+ov		
Protected Phases	2		1	6	4	1	3	
Permitted Phases			6	U	-	4		
Minimum Split (s)	20.5		10.0	16.5	30.0	10.0	4.0	
Total Split (s)	49.5		16.5	66.0	30.0	16.5	4.0	
	49.5%		16.5%	66.0%	30.0%	16.5%	4%	
Total Split (%)							2.0	
Maximum Green (s)	43.0		11.5	59.5	24.5	11.5	2.0	
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0	1077117	
All-Red Time (s)	2.5		1.0	2.5	1.5	1.0	0.0	
Lost Time Adjust (s)	-1.5			-1.5	-1.0	-1.0		
Total Lost Time (s)	5.0			5.0	4.5	4.0	#1900-000#	
Lead/Lag	Lag		Lead		Lag	Lead	Lead	
Lead-Lag Optimize?	Yes		Yes		Yes	Yes	Yes	
Walk Time (s)	10.0				6.0			
Flash Dont Walk (s)	4.0				18.0			

SI South Campus Master Plan 10/20/2017 2036 Build Condition Saturday Peak Ho Stantec

	-	7	-	-	4	1	
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	23
Pedestrian Calls (#/hr)	0				0		
Act Effct Green (s)	44.5			61.0	25.5	42.5	
Actuated g/C Ratio	0.44			0.61	0.26	0.42	
v/c Ratio	0.47			0.38	0.10	0.13	
Control Delay	7.9			12.2	29.5	8.8	
Queue Delay	0.0			0.0	0.0	0.0	
Total Delay	7.9			12.2	29.5	8.8	
LOS	Α			В	С	Α	
Approach Delay	7.9			12.2	14.9		
Approach LOS	А			В	В		
Queue Length 50th (ft)	46			131	17	12	
Queue Length 95th (ft)	m51			179	43	41	
Internal Link Dist (ft)	523			460	634		
Turn Bay Length (ft)						210	
Base Capacity (vph)	2567			2407	358	622	
Starvation Cap Reductn	0			0	0	0	
Spillback Cap Reductn	0			0	0	0	
Storage Cap Reductn	0			0	0	0	
Reduced v/c Ratio	0.47			0.38	0.10	0.13	
Intersection Summary							
	Other						
Cycle Length: 100							
Actuated Cycle Length: 100							
Offset: 10 (10%), Reference	ed to phase	2:EBT ar	nd 6:WBT	L, Start o	f Green		
Natural Cycle: 65							
Control Type: Pretimed							
Maximum v/c Ratio: 0.47							
Intersection Signal Delay, 10					tersection		
Intersection Capacity Utiliza	ition 51.5%			IC	ULevel	of Service	A
Analysis Period (min) 15							
m Volume for 95th percen	itile queue i	s metered	d by upstr	eamsign	al.		
Splits and Phases: 9: L'E	nfant Plaza	&Indepe	endence A	√ve SW			
¶ø1 →	(D)						#Rp: \04
16.5 s 49.5	Ø2 (R)						4 s 30 s

₩ Ø6 (R)

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4	†	7					444			ना	
Traffic Volume (vph)	124	91	105	0	0	0	0	575	61	57	422	0
Future Volume (vph)	124	91	105	0	0	0	0	575	61	57	422	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	10	10	10	11	11	11	11	11	11
Storage Length (ft)	200		200	0		0	0		0	0		50
Storage Lanes	1		1	0		0	0		0	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	0.86	0.86	1.00
Ped Bike Factor	0.69		0.46	1,00			1.00	0.93	0.01	0.00	0.96	,,,,,,
Frt			0.850					0.986				
Fit Protected	0.950										0.994	
Satd. Flow (prot)	1631	1652	1561	0	0	0	0	4332	0	0	5889	0
Fit Permitted	0.950									_	0.818	
Satd. Flow (perm)	1125	1652	717	0	0	0	0	4332	0	0	4675	0
Right Turn on Red	,,,,,	1002	Yes	1.000		Yes	11.50		No		10.0	Yes
Satd. Flow (RTOR)			33			100			110			
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		454			399			424			394	
Travel Time (s)		10.3			9.1			8.3			7.7	
Confl. Peds. (#/hr)	303	10.0	1270	303	0.1	1270	654	0.0	511	511	1.0	654
Confl. Bikes (#/hr)			70	-		12.0			4	-		25
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	7%	15%	0%	0%	0%	0%	0%	4%	22%	4%	7%	0%
Adj. Flow (vph)	127	93	107	0	0	0	0	587	62	58	431	0
Shared Lane Traffic (%)	144	-	101								101	
Lane Group Flow (vph)	127	93	107	0	0	0	0	649	0	0	489	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	Lon	11	ragin	Lon	11	rugine	Loit	0	rugiit	Loit	0	ragint
Link Offset(ft)		-15			15			10			-10	
Crosswalk Width(ft)		35			20			35			55	
Two way Left Turn Lane		00			20			00			UU	
Headway Factor	1.04	1.00	1.04	1.09	1.09	1.09	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15	1.00	9	15	1.00	9	15	1.04	9	15	1.04	9
Turn Type	Perm	NA	Perm	10		,	10	NA	3	Perm	NA	J
Protected Phases	1 OIIII	4	I Gilli					2		Cilli	2	
Permitted Phases	4	-	4							2		
Minimum Split (s)	32.5	32.5	32.5					20.0		20.0	20.0	
Total Split (s)	32.5	32.5	32.5					67.5		67.5	67.5	
Total Split (%)	32.5%	32.5%	32.5%					67.5%		67.5%	67.5%	
Maximum Green (s)	26.0	26.0	26.0					61.5		61.5	61.5	
Yellow Time (s)	4.0	4.0	4.0					4.0		4.0	4.0	
	2.5	2.5	2.5					2.0		2.0	2.0	
All-Red Time (s) Lost Time Adjust (s)	-1.5	-1.5	-1.5					-1.5		2.0	-1.5	
Total Lost Time (s)	5.0	5.0	-1.5 5.0					4.5			4.5	
A STATE OF THE PARTY OF THE PAR	5.0	5.0	5.0					4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?	10.0	10.0	10.0					10.0		10.0	10.0	
Walk Time (s)	10.0	10.0	10.0					10.0		10.0	10.0	

Lane Group	Ø6	Ø8	
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Fit Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Confl. Bikes (#hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Enter Blocked Intersection			
Lane Alignment			
Median Width(ft)			
Link Offset(ft)			
Crosswalk Width(ft)			
Two way Left Turn Lane			
Headway Factor			
Turning Speed (mph)			
Turn Type			
Protected Phases	6	8	
Permitted Phases			
Minimum Split (s)	21.0	28.5	
Total Split (s)	67.5	32.5	
Total Split (%)	68%	33%	
Maximum Green (s)	61.5	26.0	
Yellow Time (s)	4.0	4.0	
All-Red Time (s)	2.0	2.5	
Lost Time Adjust (s)	2.0	2.0	
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Walk Time (s)	10.0	7.0	
want time (a)	10.0	1.0	

##Ø6 (R)

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Flash Dont Walk (s)	16.0	16.0	16.0					4.0		4.0	4.0	
Pedestrian Calls (#/hr)	0	0	0					0		0	0	
Act Effct Green (s)	27.5	27.5	27.5					63.0			63.0	
Actuated g/C Ratio	0.28	0.28	0.28					0.63			0.63	
v/c Ratio	0.41	0.20	0.48					0.24			0.17	
Control Delay	34.5	29.4	29.6					3.4			7.8	
Queue Delay	0.0	0.0	0.0					0.0			0.0	
Total Delay	34.5	29.4	29.6					3.4			7.8	
LOS	С	С	С					Α			Α	
Approach Delay		31.5						3.4			7.8	
Approach LOS		С						Α			Α	
Queue Length 50th (ft)	66	45	39					16			34	
Queue Length 95th (ft)	122	87	95					31			46	
Internal Link Dist (ft)		374			319			344			314	
Turn Bay Length (ft)	200		200									
Base Capacity (vph)	309	454	221					2729			2945	
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	0.41	0.20	0.48					0.24			0.17	
Intersection Summary												
Area Type:	Other											
Cycle Length: 100												
Actuated Cycle Length: 10												
Offset: 12 (12%), Reference	ed to phase	2:NBSB	and 6:Pe	d, Start of	Green							
Natural Cycle: 55												
Control Type: Pretimed												
Maximum v/c Ratio: 0.48												
Intersection Signal Delay.					tersection							
Intersection Capacity Utiliz	ation 58.4%			IC	ULevel	of Service	В					
Analysis Period (min) 15												
Splits and Phases: 10:7	th Street SV	/ & SW J	efferson (Orive								
↓ †ø2 (R)								4 04				1,000
67.5 s								22.5.6				

#Aø8

Lane Group	Ø6	Ø8
Flash Dont Walk (s)	5.0	15.0
Pedestrian Calls (#/hr)	0	0
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

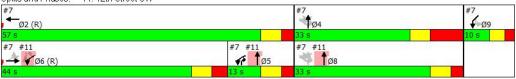
	1	~	•	*	†	1	1	↓	لر	*	1	
Lane Group	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER	Ø2
Lane Configurations	7		7		*				77			
Traffic Volume (vph)	0	0	0	0	478	0	0	0	178	0	0	
Future Volume (vph)	0	0	0	0	478	0	0	0	178	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	10	12	10	10	10	10	10	10	10	10	
Storage Length (ft)		0	100	0		0	0		0	0	0	
Storage Lanes		1	1	0		0	0		2	0	0	
Taper Length (ft)		100		100			100			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91	1.00	1.00	0.88	1.00	1.00	
Frt									0.850			
Flt Protected												
Satd. Flow (prot)	1863	0	1863	0	4746	0	0	0	2601	0	0	
Flt Permitted												
Satd, Flow (perm)	1863	0	1863	0	4746	0	0	0	2601	0	0	
Right Turn on Red	0.7.7.7	100	Yes	0.72	31 350	Yes	77	050.	Yes	- 1		
Satd. Flow (RTOR)									1920			
Link Speed (mph)		30			30			30		30		
Link Distance (ft)		212			269			153		170		
Travel Time (s)		4.8			6.1			3.5		3.9		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	0	0	0	520	0	0	0	193	0	0	
Shared Lane Traffic (%)		-										
Lane Group Flow (vph)	0	0	0	0	520	0	0	0	193	0	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right	
Median Width(ft)		12			0			25		0		
Link Offset(ft)		0			5			3		0		
Crosswalk Width(ft)		16			30			16		16		
Two way Left Turn Lane												
Headway Factor	1.00	1.09	1.00	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	
Turning Speed (mph)	15	15	9	15		9	15		9	15	9	
Turn Type	Prot		Perm		NA				Perm			
Protected Phases	6				58							2
Permitted Phases			6						6			
Minimum Split (s)	20.0		20.0						20.0			54.0
Total Split (s)	44.0		44.0						44.0			57.0
Total Split (%)	44.0%		44.0%						44.0%			57%
Maximum Green (s)	37.0		37.0						37.0			50.5
Yellow Time (s)	4.0		4.0						4.0			4.0
All-Red Time (s)	3.0		3.0						3.0			2.5
Lost Time Adjust (s)	-1.5		-1.5						0.0			
Total Lost Time (s)	5.5		5.5						7.0			
Lead/Lag	Lead		Lead						Lead			
Lead-Lag Optimize?	Yes		Yes						Yes			
Walk Time (s)	7.0		7.0						7.0			7.0
Flash Dont Walk (s)	6.0		6.0						6.0			4.0
Pedestrian Calls (#/hr)	0.0		0.0						0.0			0
Act Effet Green (s)			,		41.0				37.0			v
Actuated g/C Ratio					0.41				0.37			

Lane Group	Ø4	Ø5	Ø8	Ø9	
Lane Configurations					
Traffic Volume (vph)					
Future Volume (vph)					
Ideal Flow (vphpl)					
Lane Width (ft)					
Storage Length (ft)					
Storage Lanes					
Taper Length (ft)					
Lane Util. Factor					
Frt					
Fit Protected					
Satd. Flow (prot)					
Flt Permitted					
Satd. Flow (perm)					
Right Turn on Red					
Satd. Flow (RTOR)					
Link Speed (mph)					
Link Distance (ft)					
Travel Time (s)					
Peak Hour Factor					
Adj. Flow (vph)					
Shared Lane Traffic (%)					
Lane Group Flow (vph)					
Enter Blocked Intersection					
Lane Alignment					
Median Width(ft)					
Link Offset(ft)					
Crosswalk Width(ft)					
Two way Left Turn Lane					
Headway Factor					
Turning Speed (mph)					
Turn Type					
Protected Phases	4	5	8	9	
Permitted Phases	250 5 W	1.3500	~		
Minimum Split (s)	32.5	11.4	11.5	10.0	
Total Split (s)	33.0	13.0	33.0	10.0	
Total Split (%)	33%	13%	33%	10%	
Maximum Green (s)	22.5	6.5	26.5	5.0	
Yellow Time (s)	4.0	4.0	4.0	3.0	
All-Red Time (s)	6.5	2.5	2.5	2.0	
Lost Time Adjust (s)	0.0	2.0	2.0	2.0	
Total Lost Time (s)					
		100			
Lead/Lag		Lag			
Lead-Lag Optimize?	4.0	Yes			
Walk Time (s)	4.0				
Flash Dont Walk (s)	18.0				
Pedestrian Calls (#/hr)	0				
Act Effct Green (s)					
Actuated g/C Ratio					

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Lane Group	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER	Ø2
v/c Ratio					0.27				0.09			
Control Delay					20.0				0.1			
Queue Delay					0.0				1.2			
Total Delay					20.0				1.3			
LOS					C				Α			
Approach Delay					20.0			1.3				
Approach LOS					С			Α				
Queue Length 50th (ft)					78				0			
Queue Length 95th (ft)					105				m0			
Internal Link Dist (ft)		132			189			73		90		
Turn Bay Length (ft)												
Base Capacity (vph)					1945				2171			
Starvation Cap Reductn					0				1771			
Spillback Cap Reductn					182				0			
Storage Cap Reductn					0				0			
Reduced v/c Ratio					0.29				0.48			
Intersection Summary												
Area Type:	Other											
Cycle Length: 100												
Actuated Cycle Length: 10	10											
Offset: 0 (0%), Referenced	d to phase 2:	WBT and	6:EBTL,	Start of 0	Green							
Natural Cycle: 100												
Control Type: Pretimed												
Maximum v/c Ratio: 0.90												
Intersection Signal Delay:	15.0			In	tersection	LOS: B						

Intersection Capacity Utilization 14.2% ICU
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 11: 12th Street SW



ICU Level of Service A

Lane Group	Ø4	Ø5	Ø8	Ø9
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (ft)				
Queue Length 95th (ft)				
Internal Link Dist (ft)				
Turn Bay Length (ft)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				
Intersection Summary				

Lanes, Volumes, Timings 14: 9th Street SW/Smithsonian Driveway & Independence Ave SW

	•	\rightarrow	•	•	-	•	€N	1	†	-	-	ţ
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations		नाक			444				4	7		4
Traffic Volume (vph)	0	1044	119	167	847	0	14	11	0	1	0	0
Future Volume (vph)	0	1044	119	167	847	0	14	11	0	1	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		0		0		0	0	
Storage Lanes	0		1	0		0		0		1	0	
Taper Length (ft)	100			100				100			25	
Lane Util. Factor	0.86	0.86	0.86	0.91	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.97			0.99				0.85			
Frt		0.985								0.850		
Flt Protected					0.992				0.950			
Satd. Flow (prot)	0	5663	0	0	4647	0	0	0	1685	1507	0	1773
Flt Permitted					0.643				0.757			
Satd. Flow (perm)	0	5663	0	0	2989	0	0	0	1144	1507	0	1773
Right Turn on Red	970	15.5.5.5.4	Yes			Yes	7	020		Yes		7,7,7,835
Satd. Flow (RTOR)		32								153		
Link Speed (mph)		35			35				30			15
Link Distance (ft)		540			606				566			305
Travel Time (s)		10.5			11.8				12.9			13.9
Confl. Peds. (#/hr)	161	37370	200	200		161		148				
Confl. Bikes (#/hr)	,		30			28						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	3%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%
Adi, Flow (vph)	0	1088	124	174	882	0	15	11	0	1	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1212	0	0	1056	0	0	0	26	1	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	RNA	Left	Left	Right	Left	Left
Median Width(ft)		0			0				90			0
Link Offset(ft)		0			0				5			-70
Crosswalk Width(ft)		45			20				20			20
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (mph)	15		9	15		9	9	15		9	15	
Turn Type		NA		pm+pt	NA		Perm	Perm	NA	Over		
Protected Phases		2		1	6				8	1		8
Permitted Phases	2			6			8	8			8	
Minimum Split (s)	29.5	29.5		10.5	25.5		35.5	35.5	35.5	10.5	35.5	35.5
Total Split (s)	47.5	47.5		12.0	59.5		35.5	35.5	35.5	12.0	35.5	35.5
Total Split (%)	47.5%	47.5%		12.0%	59.5%		35.5%	35.5%	35.5%	12.0%	35.5%	35.5%
Maximum Green (s)	38.0	38.0		6.5	54.0		30.0	30.0	30.0	6.5	30.0	30.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	5.5	5.5		1.5	1.5		1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	10001001	-1.5		1.07000	0.0		April 1	(000000)	0.0	0.0	2159650	0.0
Total Lost Time (s)		8.0			5.5				5.5	5.5		5.5
Lead/Lag	Lead	Lead		Lag			Lag	Lag	Lag	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes	Yes	Yes	Yes	Yes
Walk Time (s)	10.0	10.0		, 50	10.0		10.0	10.0	10.0	, 00	10.0	10.0
		10.0										

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	2.00	
Lane Group	SBR	Ø7
Lant Configurations		
Traffic Volume (vph)	0	
Future Volume (vph)	0	
Ideal Flow (vphpl)	1900	
Storage Length (ft)	0	
Storage Lanes	0	
Taper Length (ft)		
Lane Util. Factor	1.00	
Ped Bike Factor	1.00	
Frt		
Fit Protected		
Satd. Flow (prot)	0	
	U	
Fit Permitted	^	
Satd. Flow (perm)	0	
Right Turn on Red	Yes	
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)	148	
Confl. Bikes (#/hr)		
Peak Hour Factor	0.96	
Heavy Vehicles (%)	0%	
Adj. Flow (vph)	0	
Shared Lane Traffic (%)		
Lane Group Flow (vph)	0	
Enter Blocked Intersection	No	
Lane Alignment	Right	
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor	1.09	
Turning Speed (mph)	9	
Turn Type		
Protected Phases		7
Permitted Phases		4
Minimum Split (s)		5.0
		5.0
Total Split (s)		5.0
Total Split (%)		
Maximum Green (s)		3.0
Yellow Time (s)		2.0
All-Red Time (s)		0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		Lead
Lead-Lag Optimize?		Yes
Walk Time (s)		
Flash Dont Walk (s)		

₩ Ø6 (R)

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SB
Pedestrian Calls (#/hr)	0	0			0		0	0	0		0	(
Act Effct Green (s)		39.5			54.0				30.0	6.5		
Actuated g/C Ratio		0.40			0.54				0.30	0.06		
v/c Ratio		0.54			0.61				0.08	0.00		
Control Delay		6.8			12.6				26.0	0.0		
Queue Delay		0.0			0.0				0.0	0.0		
Total Delay		6.8			12.6				26.0	0.0		
LOS		Α			В				С	Α		
Approach Delay		6.8			12.6				25.0			
Approach LOS		А			В				С			
Queue Length 50th (ft)		107			90				12	0		
Queue Length 95th (ft)		132			98				32	0		
Internal Link Dist (ft)		460			526				486			225
Turn Bay Length (ft)												
Base Capacity (vph)		2256			1721				343	241		
Starvation Cap Reductn		0			0				0	0		
Spillback Cap Reductn		0			0				0	0		
Storage Cap Reductn		0			0				0	0		
Reduced v/c Ratio		0.54			0.61				0.08	0.00		
Intersection Summary												
Control of the Contro	Other											
Cycle Length: 100												
Actuated Cycle Length: 100												
Offset: 29 (29%), Reference	d to phase	2:EBTL a	and 6:WE	TL, Start	of Green							
Natural Cycle: 85												
Control Type: Pretimed												
Maximum v/c Ratio: 0.61												
Intersection Signal Delay, 9.	7			Ir	ntersection	n LOS: A						
Intersection Capacity Utiliza	tion 78.5%			10	U Level	of Service	D					
Analysis Period (min) 15												
Splits and Phases: 14: 9th	n Street SV	V/Smithso	nian Driv	reway & l	ndepende	ence Ave	sw					
Ø2 (R)	(20)				ۯ1		Activities of the second					
47.5 s					12 s							

SI South Campus Master Plan 10/20/2017 2036 Build Condition Saturday Peak Ho Stantec



Lane Group	SBR	Ø7		
Pedestrian Calls (#/hr)				
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (ft)				
Queue Length 95th (ft)				
Internal Link Dist (ft)				
Turn Bay Length (ft)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				

	•	→	•	•	-	•	1	†	~	-	+	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		नाक			नाक		*	*		7	444	
Traffic Volume (vph)	177	765	98	14	705	194	92	265	59	125	190	212
Future Volume (vph)	177	765	98	14	705	194	92	265	59	125	190	212
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	11	11	11	11	11	11
Storage Length (ft)	0		75	0		0	80		0	0		50
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	0.86	0.86	0.86	0.86	0.86	0.86	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor		0.96			0.92		0.82	0.94		0.82	0.83	
Frt		0.986			0.968			0.973		1,412.0	0.921	
Flt Protected		0.992			0.999		0.950	0.010		0.950		
Satd. Flow (prot)	0	5594	0	0	5180	0	1616	4441	0	1646	3644	0
Fit Permitted		0.715	·		0.904		0.500			0.476	0011	ŭ
Satd. Flow (perm)	0	3982	0	0	4683	0	699	4441	0	672	3644	0
Right Turn on Red	U	0002	Yes	U	4000	Yes	000	7771	No	012	0011	Yes
Satd. Flow (RTOR)		36	100		82	100			110		139	100
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		606			437			393			424	
Travel Time (s)		11.8			8.5			7.7			8.3	
Confl. Peds. (#/hr)	389	11.0	230	230	0.0	389	333	1.3	308	308	0.0	333
Confl. Bikes (#hr)	503		20	250		29	333		19	300		14
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	7%	3%	4%	0%	4%	10%	8%	3%	4%	6%	7%	3%
Adj. Flow (vph)	182	789	101	14	727	200	95	273	61	129	196	219
Shared Lane Traffic (%)	102	703	101	14	121	200	30	210	01	123	130	210
Lane Group Flow (vph)	0	1072	0	0	941	0	95	334	0	129	415	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	Leit	0	right	Leit	0	Nigili	Leit	11	rigit	Leit	11	rigit
Link Offset(ft)		5			0			-6			5	
Crosswalk Width(ft)		32			30			22			35	
Two way Left Turn Lane		32			30			22			33	
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	1.03	1.03	9	1.03	1.03	9	1.04	1,04	9	15	1.04	9
Turn Type	pm+pt	NA	9	Perm	NA	3	Perm	NA	3	pm+pt	NA	9
Protected Phases	рин-рі 5	2		Pellii	1NA 6		Pelli	NA 4		3	NA 8	
Permitted Phases	2	2		6	0		4	-		8	0	
Minimum Split (s)	10.5	31.5		28.5	28.5		29.5	29.5		10.0	32.5	
Total Split (s)	11.0	57.0		46.0	46.0		32.5	32.5		10.5	43.0	
Total Split (%)	11.0%	57.0%		46.0%	46.0%		32.5%	32.5%		10.5%	43.0%	
Maximum Green (s)	5.5	50.5		39.5	39.5		26.0	26.0		5.5	36.5	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
A STATE OF THE PARTY OF THE PAR				2.5			2.5	2.5				
All-Red Time (s)	1.5	2.5		2.5	2.5					1.0	2.5	
Lost Time Adjust (s)		-1.5			-1.5		-1.5	-1.5		-1.5 3.5	-1.5	
Total Lost Time (s)	Land	5.0		Lac	5.0		5.0	5.0			5.0	
Lead/Lag	Lead			Lag	Lag		Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	7.0		Yes	Yes		Yes	Yes		Yes	7.0	
Walk Time (s)		7.0		4.0	4.0		4.0	4.0			7.0	

SI South Campus Master Plan 10/20/2017 2036 Build Condition Saturday Peak Ho Stantec

22: 7th Street SW & Independence Ave SW

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Flash Dont Walk (s)		18.0		18.0	18.0		19.0	19.0			19.0	
Pedestrian Calls (#/hr)		0		0	0		0	0			0	
Act Effct Green (s)		52.0			41.0		27.5	27.5		39.5	38.0	
Actuated g/C Ratio		0.52			0.41		0.28	0.28		0.40	0.38	
v/c Ratio		0.49			0.48		0.49	0.27		0.39	0.28	
Control Delay		1.5			20.6		40.9	29.2		20.7	11.2	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		1.5			20.6		40.9	29.2		20.7	11.2	
LOS		А			С		D	С		С	В	
Approach Delay		1.5			20.6			31.8			13.4	
Approach LOS		А			C			С			В	
Queue Length 50th (ft)		9			113		51	61		45	25	
Queue Length 95th (ft)		15			144		105	87		71	38	
Internal Link Dist (ft)		526			357			313			344	
Turn Bay Length (ft)							80					
Base Capacity (vph)		2184			1968		192	1221		333	1470	
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		0.49			0.48		0.49	0.27		0.39	0.28	
Intersection Summary												
Area Type:	Other											

Area Type: Othe Cycle Length: 100

Actuated Cycle Length: 100

Offset: 51 (51%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 80

Control Type: Pretimed Maximum v/c Ratio: 0.49

Intersection Signal Delay. 14.0 Intersection Capacity Utilization 83.3% Analysis Period (min) 15 Intersection LOS: B ICU Level of Service E

Splits and Phases: 22: 7th Street SW & Independence Ave SW



APPENDIX E – PARKING INVENTORY

Exhibit 1 Smithsonian Institution, South Campus Master Plan Parking Inventory Tuesday December 8th, 2015 & Monday, October 16th, 2017

	Total Number of				
	On-Street Parking Number of Permit	Number of Permit	Number of	Number of ADA	
Segment	Spaces	Spaces	Metered Spaces	Spaces	Parking Regulations
Jefferson Dr EB between 14th St and 12th St	81	∞	20	3	1. 3-hour metered parking 2. USDA pick up/drop-off only 3. No Parking 1-6AM, USDA 6AM-6PM Mon-Frį; 3-hour limit all other
Jefferson Dr EB between 12th St and 7th St	56	16	27	13	1. No Parking 2. Loading zone 3. 3-hour metered parking
7th St SB between Jefferson Dr and Independence Ave	0	0	0	0	1. No Standing or Parking 7AM-9:30AM, 4PM-6:30PM Mon-Fri 2. 2 Hour Parking 9:30AM-4PM Mon-Fri, 7AM-10PM Sat, 3.5 Hour Parking 6:30PM-10PM Mon-Sat
7th St SB between Independence Ave and C St/Maryland Ave	10	0	10	0	 No Parking or Standing Anytime No Standing or Parking 7AM-9:30AM Mon-Fri Lour Parking 9:30AM-6:30PM Mon-Fri, 7AM-6:30PM Sat, 3.5 Hour
7th St SB between C St/Maryland Ave and Virginia Ave	ъ	4 WMATA	0	Т	1. No Parking Metrobus Zone 2. WMATA Employees Only
7th St SB between Virginia Ave and D St	0	0	0	0	1. No Parking
Independence EB b/w 14th and 12th	17	0	17	0	1. Tow Away/No Standing or Parking 7-9:30AM, 4-6:30PM M-F 2. No Parking 9:30-11:30AM - Street Cleaning Tuesday 3. Tow Away - Metro Bus Zone
Independence EB b/w 12th and L'Enfant	20	0	20	0	 Tow Away/No Standing or Parking 7-9:30AM, 4-6:30PM M-F 2-Hour Parking 9:30AM-4PM, M-F, 7AM-6:30PM Saturday Pay by Phone
Independence EB b/w L'Enfant and 9th	12	0	12	0	Has 3 main Signs
Independence Ave EB between 9th St and 7th St	6	0	6	0	1. 2 Hour Parking 9:30AM-4PM Mon-Fri, 7AM-6:30PM Sat, No Time Limit Parking 6:30PM-10PM Mon-Sat
Independence Ave EB between 7th St and 6th St	_∞	0	00	0	 No Parking or Standing 7AM-9:30AM, 4PM-6:30PM Mon-Fri No Parking 10AM-5PM Tuesday Except Holidays, Street Cleaning 2 Hour Parking 9:30AM-4PM Mon-Fri, 7AM-6:30PM Sat, No Time Limit

Exhibit 1 Smithsonian Institution, South Campus Master Plan Parking Inventory Tuesday December 8th, 2015 & Monday, October 16th, 2017

	Total Number of				
	On-Street Parking	On-Street Parking Number of Permit	Number of	Number of ADA	
Segment	Spaces	Spaces	Metered Spaces	Spaces	Parking Regulations
Independence Ave EB between 6th St and	6	0	6	0	 No Parking or Standing 7AM-9:30AM, 4PM-6:30PM Mon-Fri No Parking 10AM-5PM Tuesday Except Holidays, Street Cleaning
Maryland Ave					3. 2 Hour Parking 9:30AM-4PM Mon-Fri, 7AM-6:30PM Sat, No Time Limit
Independence Ave EB between Maryland Ave	5	0	5	0	1. 2 Hour Parking 9:30AM-4PM Mon-Fri, 7AM-6:30PM Sat, No Time Limit Parking 6:30PM-10PM Mon-Sat
Independence Ave EB between 4th St and 3rd St	18	0	18	0	No Standing or Parking 7AM-9:30AM, 4PM-6:30PM Mon-Fri 2.2 Hour Parking 9:30AM-4PM Mon-Fri, 7AM-6:30PM Sat, No Time Limit Parking 6:30PM-10PM Mon-Sat
Maryland Ave EB between 7th St and 6th St	2	0	2	0	 No Parking or Standing Anytime No Standing or Parking 10:30AM-2:30PM Mon-Fri, Mobile Roadway Vending Permit Holders Excepted 10:30AM-2:30PM
Maryland Ave EB between 6th St and Independence Ave	27	0	27	0	1. No Parking 2. 2 Hour 7AM-6:30PM Mon-Fri
Maryland Ave EB between 6th St and 4th St	45	13	32	0	2 Hour Parking 7AM-10PM Mon-Sat
12th St SB b/w C St and Independence	6	0	6	0	1. Snow Emergency Route - Tow Away 2. 2-Hour Parking 9:30AM-4PM, M-Sat
14th St SB b/w CSt and Independence	4	4	0	0	No Standing or Parking Metro Bus Zones Snow Emergency Route - Tow Away Special Permit Parking (all times)
14th St SB b/w Independence and Jefferson	0	0	0	0	1. Snow Emergency Route - Tow Away 2. Tow Away/No Standing or Parking 7-9:30AM, 4-6:30PM M-F
6th St SB between Independence Ave and Maryland Ave	4	0	4	0	1.2 Hour Parking 9:30AM-4PM Mon-Fri, 7AM-6:30PM Sat; 3.5 Hour Parking 6:30PM-10PM Mon-Sat
6th St SB between Maryland Ave and C St	6	0	∞		1. 2 Hour Parking 9:30AM-4PM Mon-Fri, 7AM-6:30PM Sat; 3.5 Hour Parking 6:30PM-10PM Mon-Sat

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Exhibit 1 Smithsonian Institution, South Campus Master Plan Parking Inventory Tuesday December 8th, 2015 & Monday, October 16th, 2017

	Total Number of				
	On-Street Parking	Number of Permit	Number of	Number of ADA	
Segment	Spaces	Spaces	Metered Spaces	Spaces	Parking Regulations
6th St SB hatiwaan C St					1. No Standing or Parking 4-6:30PM Bus Zone Mon-Fri
and Virginia Aug	7	2 URE	4	⊣	2. No Parking
and Virginia Ave					3. 2 Hour Parking 7AM-4PM Mon-Fri, 7AM-6:30PM Sat; 3.5 Hour Parking
6th St SB hatiwagn					1. No Parking
Virginia Ave and D St	0	0	0	0	
4th St SB between					1. No Standing or Parking 7AM-9:30AM Mon-Fri
Independence Ave and C	17	0	17	0	2. 2 Hour Parking 9:30AM-6:30PM Mon-Fri, 7AM-6:30PM Sat, 3.5 Hour
St					Parking 6:30PM-10PM Mon-Sat
4+b C+ CB hotterd C C+					1. No Parking Metro Bus Zone
אוון אר אם מבוון האר אברון הארבון	0	0	10	0	2. No Parking Shuttle Stand
and D St					3. No Standing or Parking 7AM-9:30AM, 4PM-6:30PM, Mon-Fri
3rd St SB between					1. 2 Hour Parking 9:30AM-4PM Mon-Fri, 7AM-6:30PM Sat; 3.5 Hour
Independence Ave and C	20	0	19	Т	Parking 6:30PM-10PM Mon-Sat
St					
3rd St SB hetween C St	3 5	900	I		1. No Standing or Parking 7AM-9:30AM, 4PM-6:30PM Mon-Fri
and D St	11	0	11	0	
10 410 20001104 61 13 0		-			1. Taxi Stand
CSt Eb between oth St	18	4 (8	0	2. 15 Minute Parking
and 4th 5t		ACD 0			3. Government Parking Only
C C+ ED hotmoon 4th C+					1. 2 Hour Parking 7AM-6:30PM Mon-Sat, 3.5 Hour Parking 6:30PM-10PM
באק פרן לינו ארוו ארוו ארוו ארוו אר	16	2 GSA	14	0	Mon-Sat
מות אות אר					2. GSA Official Parking 7AM-10PM Mon-Sat
D C+ EB hotwoon 4+b C+					1. No Parking
and 3rd St	24		23	0	2. 15 Minute Parking GSA Child Development Center Only 6AM-6:30PM

Exhibit 1 Smithsonian Institution, South Campus Master Plan Parking Inventory Tuesday December 8th, 2015 & Monday, October 16th, 2017

	Total Number of				
	On-Street Parking	On-Street Parking Number of Permit	Number of	Number of ADA	
Segment	Spaces	Spaces	Metered Spaces	Spaces	Parking Regulations
Jefferson Dr WB between 7th St and 12th St	0	0	0	0	1. 3 Hour Limit 2. Taxi Stand
Jefferson Dr WB between 12th St and 14th St	0	0	0	0	1.3 Hour Limit 2. Smithsonian Vehicles Only 3. No Parking
7th St NB between D St and Virginia Ave	7	0	7	0	 No Standing or Parking 7AM-9:30AM, 4PM-6:30PM Mon-Fri No Parking Anytime Lour Parking 9:30AM-4PM Mon-Fri, 7AM-6:30PM Sat; 3.5 Hour Parking 6:30PM-10PM Mon-Sat
7th St NB between Virginia Ave and C St/Maryland Ave	0	0	0	0	1. No Parking Metrobus Zone
7th St NB between C St/Maryland Ave and Independence Ave	14	0	14.	0	 No Parking or Standing Anytime No Standing or Parking 7AM-9:30AM Mon-Fri Lour Parking 9:30AM-6:30PM Mon-Fri, 7AM-6:30PM Sat, 3.5 Hour Parking 6:30PM-10PM Mon-Sat
7th St NB between Independence Ave and Jefferson Dr	0	0	0	0	1. No Parking
Independence Ave WB between 3rd St and 4th St	14	0	14.	0	 No Standing or Parking 7AM-9:30AM, 4PM-6:30PM Mon-Fri 2 Hour Parking 9:30AM-4PM Mon-Fri, 7AM-6:30PM Sat, No Time Limit Parking 6:30PM-10PM Mon-Sat No Parking Bus Zone
Independence Ave WB between 4th St and Maryland Ave	10	0	6	1	 No Standing or Parking 7AM-9:30AM, 4PM-6:30PM Mon-Fri No Parking 10AM-5PM Tuesday Except Holidays, Street Cleaning 2 Hour Parking 9:30AM-4PM Mon-Fri, 7AM-6:30PM Sat, No Time Limit Parking 6:30PM-10PM Mon-Sat
Independence Ave WB between Maryland Ave and 6th St	6	0	6	0	1. No Standing or Parking 7AM-9:30AM, 4PM-6:30PM Mon-Fri 2. No Parking Vendor Stand 9:30AM-4PM Mon-Fri, 8AM-10PM Sat-Sun 3. 2 Hour Parking 9:30AM-4PM Mon-Fri, 7AM-6:30PM Sat, No Time Limit Parking 6:30PM-10PM Mon-Sat 4. No Parking Bus Zone

Exhibit 1 Smithsonian Institution, South Campus Master Plan Parking Inventory Tuesday December 8th, 2015 & Monday, October 16th, 2017

	Total Number of				
	On-Street Parking	On-Street Parking Number of Permit	Number of	Number of ADA	
Segment	Spaces	Spaces	Metered Spaces	Spaces	Parking Regulations
Independence Ave WB between 6th St and 7th St	9	0	9	0	1. No Standing or Parking 7AM-9:30AM, 4PM-6:30PM Mon-Fri 2. No Parking 9:30AM-4PM Mon-Fri, 8AM-10PM Sat-Sun, Vendor Stand 3. No Parking 7AM-9:30AM, 4PM-6:30PM Mon-Fri 4. No Parking 10PM-5AM Mon Except Holidays, Street Cleaning 5. 2 Hour Parking 9:30AM-4PM Mon-Fri, 7AM-6:30PM Sat, No Time Limit Parking 6:30PM-10PM Mon-Sat
Independence Ave WB between 7th St and 9th St	м	3 Vendor	0	0	 No Standing or Parking Metrobus Zone No Standing or Parking 7AM-9:30AM, 4PM-6:30PM Mon-Fri No Parking 10PM-5AM Monday, Except Holidays, Street Cleaning No Parking 9:30AM-4PM Mon-Fri, 8AM-10PM Sat-Sun, Vendor Stand No Parking - Entrance No Parking 9:30AM-11:30AM Monday, Except Holidays, Street Cleaning
Independence WB b/w 9th and L'Enfant	17	0	17	0	 Tow Away/No Standing or Parking 7-9:30AM, 4-6:30PM M-F Snow Emergency Route - Tow Away
Independence WB b/w L'Enfant and 12th	18	0	18	0	1. Tow Away/No Standing or Parking 7-9:30AM, 4-6:30PM M-F
Independence WB b/w 12th and 14th	15	0	15	0	 Tow Away/No Standing or Parking 7-9:30AM, 4-6:30PM M-F No Parking 9:30-11:30AM - Street Cleaning Tuesday Metro Bus Snow Emergency Route - Tow Away Vendor Stand
Maryland Ave WB between Independence Ave and 6th St	11	0	10	1	 2 Hour 7AM-6:30PM Mon-Fri No Parking Except Official Government Vehicles 7AM-6:30PM Mon-Fri No Parking No Standing or Parking 7AM-9:30AM, 4PM-6:30PM Mon-Fri
Maryland Ave WB between 6th St and 7th St	28	2 Zipcar 11 GSA	15	0	1. 2 Hour Parking 9:30AM-6:30PM Mon-Fri, 7AM-6:30PM Sat, 3.5 Hour Parking 6:30PM-10PM Mon-Sat
Virginia Ave WB between 6th St and 7th St	23	0	23	0	1. 2 Hour Parking 9:30AM-6:30PM Mon-Fri, 7AM-6:30PM Sat; 3.5 Hour Parking 6:30PM-10PM Mon-Sat

Exhibit 1 Smithsonian Institution, South Campus Master Plan Parking Inventory Tuesday December 8th, 2015 & Monday, October 16th, 2017

	Total Number of				
	On-Street Parking Number of Permit	Number of Permit	Number of	Number of ADA	
Segment	Spaces	Spaces	Metered Spaces	Spaces	Parking Regulations
14th St NB b/w C St and Independence	3	0	0	0	1. 15-min Tour Bus Stand 9:30AM-4PM, No Parking All Other Times
14th St NB b/w Independence and Jefferson	0	0	0	0	1. Snow Emergency Route - Tow Away
14th St SB b/w Independence and Jefferson	8	0	0	0	1. Snow Emergency Route - Tow Away 2. Tow Away/No Standing or Parking 7-9:30AM, 4-6:30PM M-F
12th St NB b/w C St and Independence	14	0	14.	2	 ADA Parking Tow Away/No Standing or Parking 7-9:30AM, 4-6:30PM M-F 2-Hour Parking 9:30AM-4PM, M-F, 7AM-6:30PM Saturday Snow Emergency Route - Tow Away
6th St NB between D St and Virginia Ave	0	0	0	0	1. No Parking
6th St NB between Virginia Ave and C St	Q	0	Z	1	 No Standing or Parking 4-6:30PM Bus Zone Mon-Fri No Parking Lour Parking 7AM-4PM Mon-Fri, 7AM-6:30PM Sat; 3.5 Hour Parking 6:30PM-10PM Mon-Sat
6th St NB between C St and Maryland Ave	8	0	8	0	1. 2 Hour Parking 9:30AM-4PM Mon-Fri, 7AM-6:30PM Sat; 3.5 Hour Parking 6:30PM-10PM Mon-Sat
6th St NB between Maryland Ave and Independence Ave	9	0	9	0	1. 2 Hour Parking 9:30AM-4PM Mon-Fri, 7AM-6:30PM Sat; 3.5 Hour Parking 6:30PM-10PM Mon-Sat
4th St NB between D St and C St	12	0	12	0	1. 2 Hour Parking 7AM-6:30PM Mon-Sat 2. No Parking
4th St NB between C St and Independence Ave	15	0	15	0	1. No Standing or Parking 7AM-9:30AM Mon-Fri 2. 2 Hour Parking 9:30AM-6:30PM Mon-Fri, 7AM-6:30PM Sat, 3.5 Hour Parking 6:30PM-10PM Mon-Sat 3. No Parking Bus Zone
3rd St NB between D St and C St	12	0	12	0	1. No Parking or Standing Anytime 2. SFB Permit Parking Only
3rd St NB between C St and Independence Ave	15	0	15	0	1. 2 Hour Parking 9:30AM-4PM Mon-Fri, 7AM-6:30PM Sat, 3.5 Hour Parking 6:30PM-10PM Mon-Sat

Exhibit 1 Smithsonian Institution, South Campus Master Plan Parking Inventory Tuesday December 8th, 2015 & Monday, October 16th, 2017

	Total Number of				
	On-Street Parking 1	On-Street Parking Number of Permit Number of	Number of	Number of ADA	
Segment	Spaces	Spaces	Metered Spaces	Spaces	Parking Regulations
C St WB between 3rd St and 4th St	17	0	17	0	 2 Hour Parking 7AM-6:30PM Mon-Sat, 3.5 Hour Parking 6:30PM-10:30PM Mon-Sat 2 Hour Parking 7AM-6:30PM Sat, 3.5 Hour Parking 6:30PM-10:30PM Sat 3 No Parking
C St WB between 4th St and 6th St	25	4 GSA	21	0	1. 2 Hour Parking 7AM-6:30PM Mon-Sat, 3.5 Hour Parking 6:30PM- 10:30PM Mon-Sat by permit