

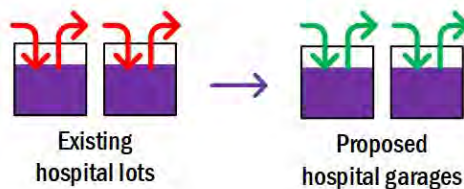
### Trip Generation Methodology for Academic and Hospital Trips (3 of 3)

4. For hospital\* trip generation, use parking space-based trip generation rates (adjusted for hospital lots) to relocate all parking demand at the existing hospital to the new hospital site. The relocated trips are a one-for-one swap (no increase or decrease in demand from the old to the new site).

AM peak hour: 1.10 (0.55 inbound and 0.55 outbound)

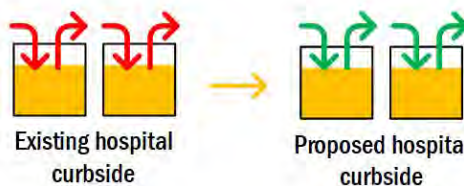
PM peak hour: 1.05 (0.45 inbound and 0.60 outbound)

- Existing parking demand to be relocated
- Removed trips
- Added trips



5. Relocate all hospital\* trips generated by non-parking curbside vehicles (TNC, ambulance, delivery, etc.) from the existing hospital to the new hospital site. These trip quantities are based on video data collected at the existing hospital and are a one-for-one swap (no increase or decrease in demand from the old to the new site).

- Existing curbside activity to be relocated
- Removed trips
- Added trips



\* For both the existing and new sites, "hospital" includes the hospital itself and all associated medical office and educational buildings.

Figure 25: Trip Generation Methodology for Academic and Hospital Trips (3 of 3)



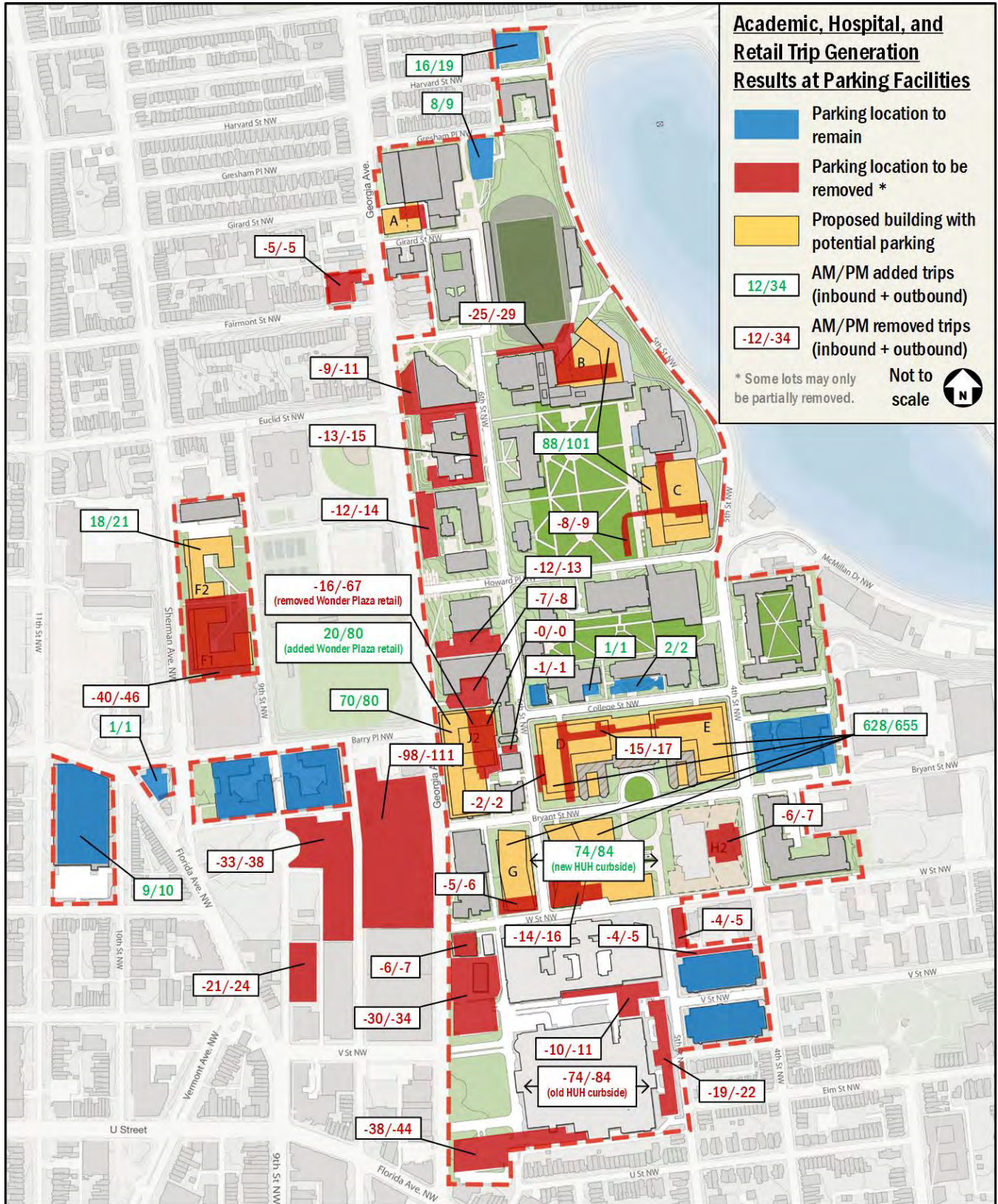


Figure 26: Academic, Hospital, and Retail Trip Generation Results at Parking Facilities

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## ***Traffic Operations***

This chapter provides an analysis of the existing and future roadway capacity surrounding the site. Included is an analysis of potential vehicular impacts of the Campus Plan and a discussion of potential mitigations.

The purpose of the capacity analysis is to:

- Determine the existing capacity of the study area roadways;
- Determine the overall impact of the proposed development on the study area roadways; and
- Discuss any potential improvements and mitigation measures to accommodate the additional vehicular trips.

This analysis was accomplished by determining the traffic volumes and roadway capacity for Existing Conditions, Background Conditions, and Total Future Conditions. The scope of the capacity analysis was developed based on DDOT guidelines and agreed to by DDOT staff.

The capacity analysis focuses on the weekday morning and weekday afternoon commuter peak hours, as determined by the existing traffic volumes in the study area.

Based on DDOT standards, the proposed development is considered to have an impact at an intersection within the study area if any of the following conditions are met:

- The capacity analyses show a LOS E or F at an intersection or along an approach in the future with conditions with the project where one does not exist in the background conditions;
- There is an increase in delay at any approach or overall intersection operating under LOS E or F of greater than 5 percent when compared to the background conditions;
- The 95<sup>th</sup> percentile queues exceed storage along an approach in the future conditions with the project where one does not exist in the background scenario; or
- There is an increase in the 95<sup>th</sup> percentile queues by more than 150 feet along an approach in that exceeds storage in the background scenario.

The following conclusions are reached within this chapter:

- Under Existing Conditions, five (5) study intersections operate at unacceptable levels of service, indicating areas of concern along Georgia Avenue NW, 4<sup>th</sup> Street NW, and Harvard Street NW.
- The addition of trips generated by background developments and inherent growth on the study area roadways slightly increase the levels of delay and queueing, but not to unacceptable levels.
- The addition and redistribution of site generated trips does not significantly affect the delays or queueing at most intersections.
- 10 intersections meet DDOT's threshold for mitigation measures as a result of minor impacts to delay created by the proposed development.
- Mitigations in the form of minor signal timing adjustments and changes to lane configurations are recommended at selected intersections. The Campus Plan also recommends the one- to two-way conversion of Bryant Street NW and W Street NW between Georgia Avenue and 4<sup>th</sup> Street NW.
- Overall, this report concludes that the proposed project will not have a detrimental impact to the surrounding vehicular network, with the implementation of all recommended site design elements, TDM, and mitigation measures.

## ***Study Area, Scope, and Methodology***

This section outlines the vehicular trips generated in the study area and defines the analysis assumptions.

The scope of the analysis contained within this report was discussed with and agreed upon by DDOT. The general methodology of the analysis follows national and DDOT guidelines on the preparation of transportation impact evaluations of site development.

### Capacity Analysis Scenarios

The vehicular capacity analyses were performed to determine whether the Campus Plan will lead to adverse impacts on traffic operations. This is accomplished by comparing two future scenarios:

- Without the development (referred to as the Background conditions); and
- With the development (referred to as the Total Future conditions).

Specifically, the roadway capacity analysis examined the following scenarios:

- Existing conditions (2019 Existing);
- Future conditions without the development (2030 Background);
- Future conditions with the development (2030 Total Future);
- Future conditions with the development, development-related recommendations, and mitigations (2030 Total Future with Recommendations and Mitigations); and
- Future conditions with the development and the old HUH site development (2035 Total Future).

### Study Area

The study area of the analysis is a set of intersections where detailed capacity analyses were performed for the scenarios listed above. The set of intersections decided upon during the study scoping process with DDOT are those intersections most likely to have potential impacts or require changes to traffic operations to accommodate the proposed development. Although it is possible that impacts will occur outside of the study area, those impacts are neither significant enough to be considered a material adverse impact nor worthy of mitigation measures.

Based on the projected future trip generation and the location of the site access points, the following intersections were selected and agreed upon by DDOT for analysis:

1. Georgia Avenue & Harvard Street NW
2. Harvard Street & 5<sup>th</sup> Street NW
3. Georgia Avenue & Girard Street NW (north)
4. Georgia Avenue & Girard Street NW (south)
5. Georgia Avenue & Fairmont Street NW (north)
6. Georgia Avenue & Fairmont Street NW (south)
7. Fairmont Street & 6<sup>th</sup> Street NW
8. Georgia Avenue & Euclid Street NW
9. Georgia Avenue & Howard Place NW
10. 6<sup>th</sup> Street & Howard Place NW
11. 5<sup>th</sup> Street/4<sup>th</sup> Street & Howard Place NW
12. Sherman Avenue & Barry Place NW
13. Georgia Avenue & Barry Place NW



14. 6<sup>th</sup> Street & College Street NW
15. 4<sup>th</sup> Street & College Street NW
16. Georgia Avenue & Bryant Street NW
17. 6<sup>th</sup> Street & Bryant Street NW
18. 4<sup>th</sup> Street & Bryant Street NW
19. Georgia Avenue & W Street NW
20. 6<sup>th</sup> Street & W Street NW
21. 4<sup>th</sup> Street & W Street NW
22. Georgia Avenue & V Street/HU Hospital NW
23. Georgia Avenue & HU Hospital NW
24. Georgia Avenue/7<sup>th</sup> Street & Florida Avenue NW
25. Georgia Ave & Gresham PI NW
26. 10<sup>th</sup> St/ Barry PI & Florida Ave NW
27. 9<sup>th</sup> St & Barry PI NW
28. 4<sup>th</sup> St & V St NW
29. 5<sup>th</sup> St & Oakdale PI NW
30. 5<sup>th</sup> St & V St NW

Figure 29 shows a map of the study area intersections.

### **Geometry and Operations Assumptions**

The following section reviews the roadway geometry and operations assumptions made and the methodologies used in the roadway capacity analyses.

#### 2019 Existing Geometry and Operations Assumptions

Gorove Slade conducted observations and confirmed the existing lane configurations and traffic controls at the intersections within the study area. Existing signal timings and offsets were obtained from DDOT.

The lane configurations and traffic controls for the 2019 Existing Conditions are shown on Figure 33.

#### 2030 Background Geometry and Operations Assumptions

Following national and DDOT methodologies, a background improvement must meet the following criteria to be incorporated into the analysis:

- Be funded; and
- Have a construction completion date prior or close to the project.

Based on these criteria, the following improvement was assumed:

- The planned extensions of Bryant Street and W Street between Georgia Avenue and Florida Avenue.

The lane configurations and traffic controls for the 2030 Background Conditions are shown in Figure 34.

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### 2030 Total Future Geometry and Operations Assumptions

The configurations and traffic controls for the 2030 Total Future Conditions are the same as those of the 2030 Background Conditions, as the Campus Plan as analyzed in this scenario does not propose any of its own roadway reconfigurations.

The lane configurations and traffic controls for the 2030 Total Future Conditions are shown in Figure 35.

### 2030 Total Future with Recommendations and Mitigations Geometry and Operations Assumptions

The configurations and traffic controls for the 2030 Total Future with Recommendations and Mitigations Conditions are the same as those of the 2030 Total Future Conditions, except with the following roadway modifications that are identified as potential improvements accompanying the proposed Howard University Hospital:

- The conversion of Bryant Street between Georgia Avenue and 4<sup>th</sup> Street to two-way operations;
- The conversion of W Street between Georgia Avenue and 4<sup>th</sup> Street to two-way operations;
- The modification of traffic signals at Georgia Avenue and Bryant Street, and Georgia Avenue and W Street, to accommodate two-way traffic on Bryant Street and W Street.

This scenario also includes mitigation measures proposed in the Vehicular Analysis Results section of this report.

The lane configurations and traffic controls for the 2030 Total Future with Recommendation and Mitigations Conditions are shown in Figure 36.

### 2035 Total Future Geometry and Operations Assumptions

The configurations and traffic controls for the 2035 Total Future Conditions are the same as those of the 2030 Total Future Conditions. The roadways internal the old HUH site development are currently under design. This scenario does not include mitigation measures proposed in the Vehicular Analysis Results section of this report.

The lane configurations and traffic controls for the 2035 Total Future Conditions are shown in Figure 37.

## **Traffic Volume Assumptions**

The following section reviews the traffic volume assumptions and methodologies used in the roadway capacity analyses.

### 2019 Existing Traffic Volumes

The existing traffic volumes are comprised of turning movement count data, which was collected on Wednesday, October 23, 2019 and Thursday, October 24, 2019 from 6:30 to 9:30 AM and 4:00 to 7:00 PM. The results of the traffic counts are included in the Technical Attachments. For all intersections, the system morning and afternoon peak hours were used. The existing system peak hour traffic volumes are shown in Figure 38.

### 2030 Background Traffic Volumes (Without the Development)

The traffic projections for the 2030 Background Conditions consist of the existing volumes with three (3) additions:

- Trips generated by developments expected to be completed prior to the project (known as background developments);
- Trips generated by inherent growth on roadways (known as regional traffic growth); and
- Trips rerouted based on planned roadway layout changes.

These factors are presented in detail below.

### *Background Developments*

Following national and DDOT methodologies, a background development must meet the following criteria to be incorporated into the analysis:

- Be located in the study area, defined as having an origin or destination point within the cluster of study area intersections;
- Have entitlements; and
- Have a construction completion date prior or close to the future analysis year of 2030.

Based on these criteria, and as discussed with and agreed upon by DDOT, seven (7) developments were determined to meet the above criteria. These developments are shown on Figure 30 and include the following:

- **Effingham Apartments**, a mixed-use development containing approximately 128 dwelling units and 4,000 square feet of retail;
- **East Towers Parking Lot**, a mixed-use development containing approximately 250 dwelling units and 30,000 square feet of retail;
- **9<sup>th</sup> and V Street Parking Lot**, a mixed-use development containing approximately 300 dwelling units and 30,000 square feet of retail;
- **Parking Lot Three**, a mixed-use development containing approximately 400 dwelling units and 70,000 square feet of retail;
- **Bond Bread Factory and WRECO Building**, a mixed-use development containing approximately 450 dwelling units, 74,000 square feet of retail, and 156 hotel rooms;
- **901W**, a mixed-use development containing approximately 97 dwelling units and 20,000 square feet of retail; and
- **The Wren**, a mixed-use development containing approximately 433 dwelling units and 49,156 square feet of grocery retail.

Mode split assumptions for these background developments were based on census data at the tract and Transportation Analysis Zone (TAZ) level for residents that live near the site and employees that work near the site, the District of Columbia’s 2019 State of the Commute survey, and data contained in the WMATA Ridership Survey. This data is provided in the Technical Attachments.

Table 18 provides a summary of mode split assumptions for all land uses included in the background developments.

**Table 18: Background Development Mode Split Assumptions**

Land Use	Mode			
	Drive	Transit	Bike	Walk
Residential	30%	40%	5%	25%
Retail (including grocery)	35%	15%	5%	45%
Hotel	45%	45%	2%	8%

These mode splits were used to calculate vehicular trip generation for each background development using the methodology outlined in the Institute of Transportation Engineers’ (ITE) *Trip Generation*, 10<sup>th</sup> Edition. For each background development residential trips were calculated using ITE land 221 (Multifamily Housing, Mid-Rise, 3-10 floors), retail trips were calculated using ITE land use 820 (Shopping Center), grocery store trips were calculated using ITE land use 850 (Supermarket), and hotel trips were calculated using ITE land use 310 (Hotel).

According to this methodology, the seven (7) background developments included in this study generated 395 trips in the AM peak hour (163 inbound, 232 outbound) and 632 trips in the PM peak hour (340 inbound, 292 outbound). This information is summarized in Table 19.

**Table 19: Vehicular Trip Generation Summary for Background Developments**

Project	AM Peak Hour (veh/hr)			PM Peak Hour (veh/hr)		
	In	Out	Total	In	Out	Total
Effingham Apartments	4	11	15	13	9	22
East Towers Parking Lot	13	24	37	39	34	73
9th and V Street Parking Lots	14	28	42	44	36	80
Parking Lot Three	25	41	66	77	69	146
Bond Bread/WRECO	48	57	105	104	96	200
901W	7	10	17	21	18	39
The Wren	52	61	113	42	30	72
<b>Total</b>	<b>163</b>	<b>232</b>	<b>395</b>	<b>340</b>	<b>292</b>	<b>632</b>

Trip distribution for background development-generated trips was determined based on journey to work travel flow data provided by the Census Transportation Planning Products (CTPP) program.

*Regional Traffic Growth*

While the background developments represent local traffic changes, regional traffic growth is typically accounted for using growth rates. The growth rates used in this analysis are derived using the Metropolitan Washington Council of Government’s (MWCOC) currently adopted regional transportation model, comparing the difference between the year 2019 and 2030 model scenarios as vetted and agreed to by DDOT. The growth rates observed in this model served as a basis for analysis assumptions. Where negative growth was observed, a conservative 0.10% annual growth rate was applied to the roadway. Maximum growth rates of 0.5% in the peak direction and 2.0% in the non-peak direction were also applied. On roadway segments where MWCOC data was not available, DDOT’s historical AADT traffic counts were used to determine growth rates.

The applied growth rates for the 2030 Background and 2030 Total Future scenarios are shown in Table 20.

**Table 20: Applied Annual and Total Growth Rates for 2030 Background and 2030 Total Future Scenarios**

Roadway	Direction	Proposed Annual Growth Rate Between 2019 and 2030		Proposed Total Growth Between 2019 and 2030	
		AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Georgia Ave between Columbia Rd and Gresham Pl	Northbound	0.50%	0.20%	5.64%	2.22%
	Southbound	0.20%	0.10%	2.22%	1.11%
Georgia Ave between Gresham Pl and Euclid St	Northbound	0.50%	0.20%	5.64%	2.22%
	Southbound	0.20%	0.10%	2.22%	1.11%
Georgia Ave between Euclid St and Bryant St	Northbound	0.90%	0.10%	10.36%	1.11%
	Southbound	0.20%	0.70%	2.22%	7.98%
Georgia Ave between Bryant St and W St	Northbound	0.60%	0.10%	6.80%	1.11%
	Southbound	0.20%	0.30%	2.22%	3.35%
Georgia Ave between W St and Florida Ave	Northbound	0.20%	0.10%	2.22%	1.11%
	Southbound	0.10%	0.10%	1.11%	1.11%
Euclid St between 9 <sup>th</sup> St and Georgia Ave	Eastbound	0.10%	0.50%	1.11%	5.64%
	Westbound	0.50%	0.10%	5.64%	1.11%
Florida Ave between 8 <sup>th</sup> St and 7 <sup>th</sup> St	Eastbound	0.30%	0.10%	3.35%	1.11%
	Westbound	0.10%	0.30%	1.11%	3.35%
Florida Ave between 7 <sup>th</sup> St and 6 <sup>th</sup> St	Eastbound	0.50%	0.30%	5.64%	3.35%
	Westbound	0.30%	0.50%	3.35%	5.64%
	Northbound	0.10%	0.10%	1.11%	1.11%



Roadway	Direction	Proposed Annual Growth Rate Between 2019 and 2030		Proposed Total Growth Between 2019 and 2030	
		AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
4 <sup>th</sup> 5 <sup>th</sup> St between Michigan Ave and Howard Pl	Southbound	0.10%	0.10%	1.11%	1.11%
4 <sup>th</sup> St between Howard Pl and Bryant St	Northbound	0.10%	0.10%	1.11%	1.11%
	Southbound	0.10%	0.10%	1.11%	1.11%
4 <sup>th</sup> St between Bryant St and Elm St	Northbound	0.10%	0.10%	1.11%	1.11%
	Southbound	0.20%	0.10%	2.22%	1.11%
Bryant St between Georgia Ave and 4 <sup>th</sup> St	Eastbound	1.40%	0.50%	16.52%	5.64%
	Westbound	0.50%	1.40%	5.64%	16.52%
Bryant St between 4 <sup>th</sup> St and 1 <sup>st</sup> St	Eastbound	0.10%	0.50%	1.11%	5.64%
	Westbound	0.50%	1.00%	5.64%	11.57%
Harvard St	Eastbound	0.40%	0.40%	4.49%	4.49%
	Westbound	0.40%	0.40%	4.49%	4.49%
Barry Pl	Eastbound	1.90%	0.50%	23.00%	5.64%
	Westbound	0.50%	1.90%	5.64%	23.00%
Sherman Ave	Northbound	0.10%	0.10%	1.11%	1.11%
	Southbound	0.10%	0.10%	1.11%	1.11%
Girard St	Eastbound	0.50%	0.50%	5.64%	5.64%
	Westbound	0.50%	0.50%	5.64%	5.64%
Fairmont St	Eastbound	0.50%	0.50%	5.64%	5.64%
	Westbound	0.50%	0.50%	5.64%	5.64%
6 <sup>th</sup> St	Northbound	0.50%	0.50%	5.64%	5.64%
	Southbound	0.50%	0.50%	5.64%	5.64%
Howard Pl	Eastbound	0.50%	0.50%	5.64%	5.64%
	Westbound	0.50%	0.50%	5.64%	5.64%
College St	Eastbound	0.50%	0.50%	5.64%	5.64%
	Westbound	0.50%	0.50%	5.64%	5.64%
W St	Eastbound	0.50%	0.50%	5.64%	5.64%
	Westbound	0.50%	0.50%	5.64%	5.64%

*Roadway Layout Changes*

In addition to background developments and regional traffic growth, volumes are expected to be rerouted due to the planned extensions of Bryant Street and W Street between Georgia Avenue and Florida Avenue.

The existing peak hour volumes, presented in Figure 38, were combined with the peak hour volumes generated by background developments, regional growth, and roadway layout changes to establish the 2030 Background traffic volumes, which are shown in Figure 39.

2030 Total Future Traffic Volumes (with the Project)

The 2030 Total Future traffic volumes consist of the following:

- Existing volumes, shown in Figure 38;
- Trips generated by background developments, regional growth, and roadway layout changes; shown combined with existing volumes in Figure 39; and

- Net new trips generated by the Campus Plan.

Trip distribution for the Campus Plan-generated trips was determined using the home ZIP codes from Howard University's 2019 Travel Demand Market Survey, which are shown on Figure 31.

Based on the trip generation methodologies outlined above, the Campus Plan-generated inbound and outbound trips were distributed through the study area intersections. Distribution assumptions for the Campus Plan are provided in Figure 32. The 2030 Total Future traffic volumes are shown on Figure 40.

#### 2030 Total Future with Recommendations and Mitigations Traffic Volumes (with the Project)

The 2030 Total Future with Mitigations and Recommendations traffic volumes consist of the following:

- Existing volumes, shown in Figure 38;
- Trips generated by background developments, regional growth, and roadway layout changes; shown combined with existing volumes in Figure 39;
- Net new trips generated by the Campus Plan, shown on Figure 40; and
- Existing, background, and Campus Plan-generated trips rerouted due to the recommended roadway modifications proposed for the new Howard University Hospital area.

This scenario also includes mitigation measures proposed in the Vehicular Analysis Results section appearing later in this chapter. The 2030 Total Future with Recommendations and Mitigations traffic volumes are shown on Figure 41.

#### *Recommended Roadway Modifications at New Howard University Hospital*

One of the Campus Plan's transportation strategies is to develop a transportation and access scheme for the new Howard University Hospital that meets the facility's needs while maintaining a safe, orderly, and pleasant environment for all modes on the roadways surrounding the hospital. This scheme, informed by transportation data collected at the old hospital site, is to include ride-hailing pick-up/drop-off operations, shuttle operations, parking access, loading access, and ambulance/emergency access.

To that end, this section recommends several modifications at the existing roadways surrounding the proposed Howard University Hospital and Medical Office Building sites. Figure 27 shows existing roadway operations and curbside designations on the existing roads surrounding the proposed hospital site. Figure 28 overlays the proposed hospital buildings and their potential access and circulation locations onto the existing street grid, along with the recommended modifications. The recommended modifications are also outlined below by street segment:

- *Bryant Street between Georgia Avenue and 4<sup>th</sup> Street*

Remove all parking from the north curb and convert Bryant Street from its current one-way eastbound operations to two-way operations from Georgia Avenue to 4<sup>th</sup> Street with an 11-foot travel lane in each direction. Remove parking from the south curb near the proposed loading dock and parking access locations. This will eliminate the need for circuitous travel paths for vehicles entering the employee parking and loading locations from North Capitol Street to the east, as well as vehicles exiting these locations heading west towards Georgia Avenue.

- *W Street between Georgia Avenue and 4<sup>th</sup> Street*

Remove all parking from the south curb and convert W Street from its current one-way westbound operations to two-way operations from Georgia Avenue to 4<sup>th</sup> Street with an 11-foot travel lane in each direction. This will eliminate the need for circuitous travel paths for ambulances arriving from Georgia Avenue to the east.

Convert a series of undesignated parking spaces on the north curb of W Street west of 6<sup>th</sup> Street to 4-hour parking. This will better match the increased parking demand around the new hospital.

- *5<sup>th</sup> Street between W Street and V Street*

Convert a series of undesignated parking spaces on the west curb of 5th Street south of W Street to 4-hour parking. This will better match the increased parking demand around the new hospital.

- *6<sup>th</sup> Street between Bryant Street and W Street*

Remove all parking from the east curb, allowing an unobstructed 11-foot travel lane in each direction.

On the west curb, convert the current unrestricted parking to car-sharing spaces (which will have been relocated from Bryant Street), 4-hour parking, and a pick-up/drop-off area for the Medical Office Building. This will better match the increased parking demand and need for orderly pick-up/drop-off operations.

Install a new mid-block crosswalk with a curb extension on the west curb between the Medical Office Building and hospital.

- *Alley west of Proposed Medical Office Building between Bryant Street and W Street*

Widen the alley from 16 feet to 20 feet using space on the east curb along the proposed Medical Office Building. This will allow more space for loading vehicle turns entering and existing the Medical Office Building loading area.

- *Intersections of Georgia Avenue and Bryant Street, Georgia Avenue and W Street*

Modify traffic signals to accommodate two-way traffic on Bryant Street and W Street. If possible, consolidate this modification with the one needed for the planned extensions of Bryant Street and W Street west of Georgia Avenue.

These recommendations are only a starting point for a forthcoming transportation and access scheme for the new hospital. Greater detail about these proposals, or new proposals, will be provided during Further Processing for the hospital facilities.

#### *Other Transportation Network Improvements*

#### **DC Circulator Rosslyn-Dupont Route Extension**

This proposal, appearing in the DC Circulator 2017 Transit Development Plan, proposes a termination of the route near the HU campus by circling the blocks bounded by Vermont Avenue, Florida Avenue, Barry Place, and 8<sup>th</sup> Street in a clockwise direction.

Since no detailed design documents showing potential roadway configuration changes are available at this time, no vehicular impacts due to this project are considered as part of this analysis.

#### **Neighborhood Streetscape Improvements: U Street from Florida Avenue to 14<sup>th</sup> Street NW**

This project includes improvements to multi-modal transportation accessibility on the 14th Street NW corridor, from Thomas Circle to Florida Avenue. It includes pedestrian and bicycle safety improvements with new bus islands, bicycle lanes and upgrades of streetscape elements. Additionally, there are new ADA compliant sidewalk and crosswalks, upgrades of traffic signals, signage, LID facilities, and landscaping.

While this project is close to the Howard University campus, the study intersections included in this analysis do not include any impacted by this project; therefore, no vehicular impacts due to this project are considered as part of this analysis.

#### **S Street Revitalization Project**

This project aims to address safety concerns along the S Street NW corridor between 7<sup>th</sup> Street and Florida Avenue and to promote neighborhood connectivity and mobility along the corridor. The project goals are to enhance pedestrian safety, improve bicycle connectivity and safety, and upgrade lighting and other streetscape elements. This project will also assess the

configuration of S Street NW within the “triangle” formed by the intersections of New Jersey Avenue NW, Florida Avenue NW, and Rhode Island Avenue NW.

While this project is close to the Howard University campus, the study intersections included in this analysis do not include any impacted by this project; therefore, no vehicular impacts due to this project are considered as part of this analysis.

**Lower Georgia Avenue Transportation and Streetscape Improvements**

This 2007 study focuses on transportation improvements for pedestrians, bicycles, transit, and vehicles in order to improve multimodal mobility along the Georgia Avenue and Sherman Avenue corridors between Florida Avenue and New Hampshire Avenue. Right-of-way options are defined in the Plan to improve bus service along the corridor and prepare for the Streetcar. Additionally, pedestrian facilities, including bulb-outs, high visibility crosswalks, and sidewalk extensions, are included in the Plan, as well as bicycle facilities, including signed bicycle routes and bike lanes. In order to improve vehicular travel, signal coordination and transit signal prioritization are suggested, as well as left-turn pockets at intersections where pedestrian bulb-outs are not planned.

Many of the recommendations from the 2007 study, including the dedicated bus lanes, have already been implemented and are included in the 2019 Existing Conditions scenario. Since there are no other roadway configuration changes relating to this project included in currently available design documents, no vehicular impacts due to this project are considered as part of the 2030 Background, 2030 Future, or 2035 Future scenarios. However, all proposed buildings in the Campus Plan will include an updated review of planned roadway changes as part of their Further Processing, including any planned roadway modifications resulting from the Lower Georgia Avenue Transportation and Streetscape Improvements project.

2035 Total Future Traffic Volumes (with the Project)

The 2035 Total Future traffic volumes consist of the following:

- Existing volumes, shown in Figure 38;
- Trips generated by background developments, regional growth, and roadway layout changes; shown combined with existing volumes in Figure 39;
- Net new trips generated by the Campus Plan; and
- New trips generated by the development of the old HUH site, as shown in Figure 42.

The speculative development program for the **old HUH site development** is planned to be a mixed-use development containing approximately 2,600 dwelling units, 200,000 square feet of retail, and 100,000 square feet of office.

Mode split assumptions for these background developments were based on census data at the tract and Transportation Analysis Zone (TAZ) level for residents that live near the site and employees that work near the site, the District of Columbia’s 2019 State of the Commute survey, and data contained in the WMATA Ridership Survey. This data is provided in the Technical Attachments.

Table 21 provides a summary of mode split assumptions for all land uses included in the old HUH site development.

**Table 21: Old HUH Site Development Mode Split Assumptions**

Land Use	Mode			
	Drive	Transit	Bike	Walk
Residential	30%	40%	5%	25%
Retail	35%	15%	5%	45%
Office	55%	40%	2%	3%



These mode splits were used to calculate vehicular trip generation using the methodology outlined in the Institute of Transportation Engineers' (ITE) *Trip Generation*, 10<sup>th</sup> Edition. Residential trips were calculated using ITE land 221 (Multifamily Housing, Mid-Rise, 3-10 floors), retail trips were calculated using ITE land use 820 (Shopping Center), and office trips were calculated using ITE land use 710 (General Office Building).

According to this methodology, the old HUH site development generates approximately 411 trips in the AM peak hour (169 inbound, 242 outbound) and 673 trips in the PM peak hour (347 inbound, 326 outbound). Trip distribution for old HUH site development-generated trips was determined based on journey to work travel flow data provided by the Census Transportation Planning Products (CTPP) program.

*Relation to Campus Plan Transportation Strategies*

There are several ways the above proposed actions support the overall transportation strategies identified in the Campus Plan. These are outlined in Table 22.

**Table 22: How Roadway Proposals Support Campus Plan Transportation Strategies**

Campus Plan Transportation Strategy	How Roadway Proposals Support the Strategy
<b>1. Ensure there is no net increase in parking supply.</b>	N/A
<b>2. Improve pedestrian conditions and connectivity.</b>	The recommended roadway modifications around the new hospital will include safe, generous pedestrian facilities.
<b>3. Increase multimodal access and facilities in the campus core.</b>	N/A
<b>4. Provide safe, efficient access to the new Howard University Hospital.</b>	The recommended roadway modifications around the new hospital will include safe, efficient facilities for all modes of travel.
<b>5. Be a good transportation neighbor.</b>	The recommended roadway modifications around the new hospital will ensure a safe and orderly transportation scheme that allows the hospital to be a good neighbor.



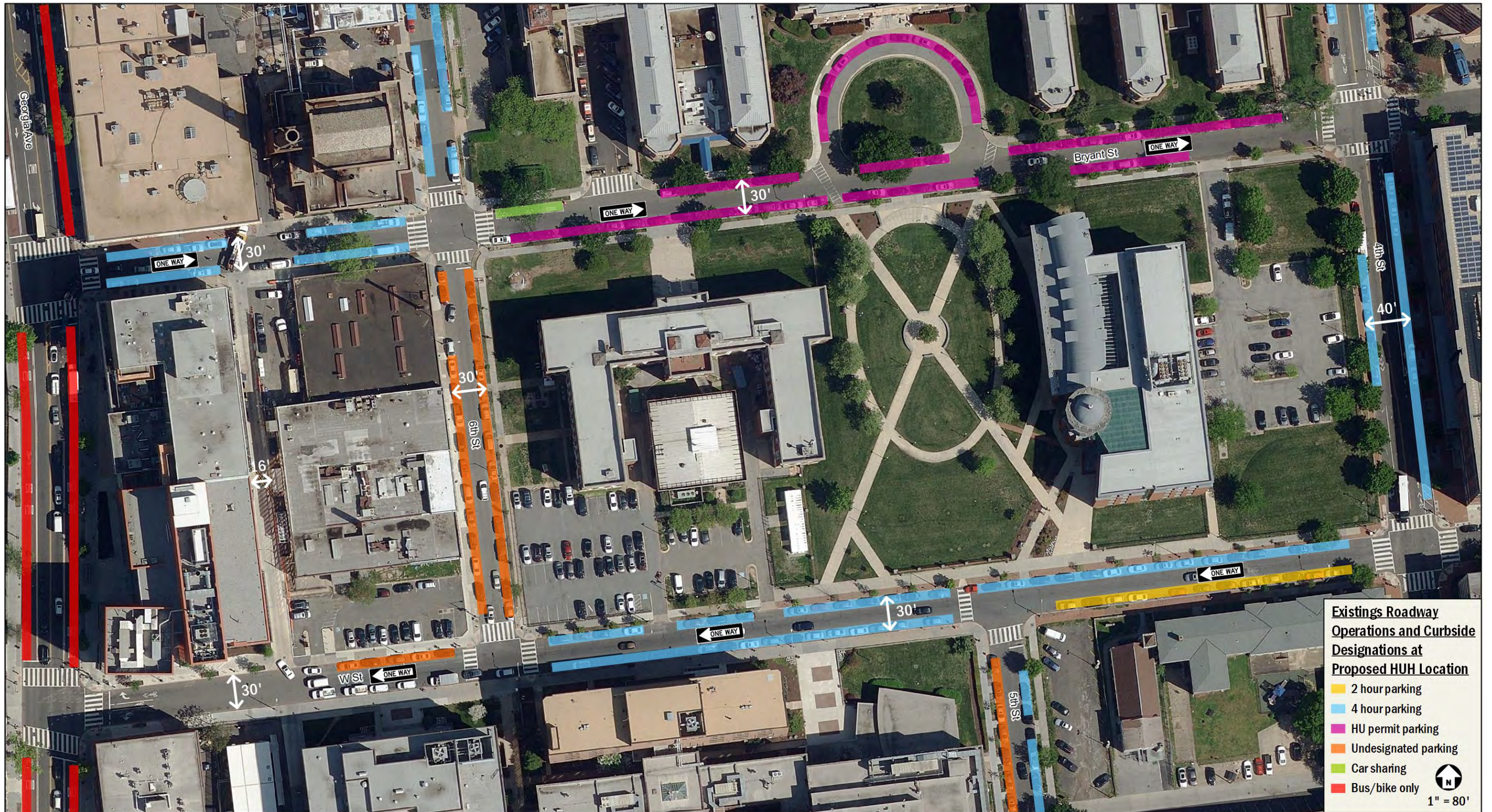


Figure 27: Existing Roadway Operations and Curbside Designations at Proposed HUH Location



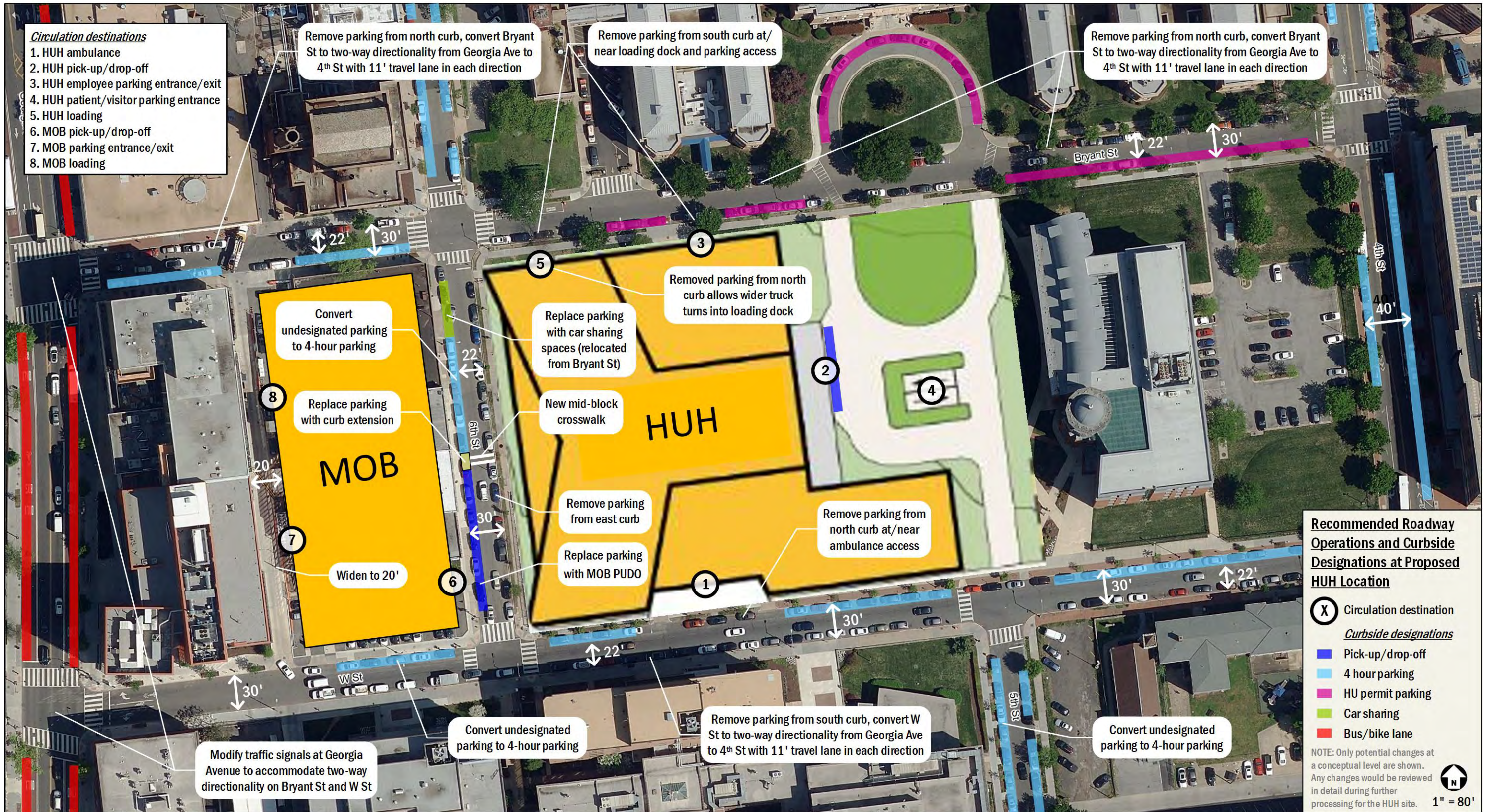


Figure 28: Recommended Roadway Operations and Curbside Designations at Proposed HUH Location



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## Vehicular Analysis Results

### Intersection Capacity Analysis

Intersection capacity analyses were performed for the three (3) scenarios outlined previously at the intersections contained within the study area during the morning and afternoon peak hours. Synchro version 10 was used to analyze the study intersections based on the Highway Capacity Manual (HCM) 2000 methodology.

The results of the capacity analyses are expressed in level of service (LOS) and delay (seconds per vehicle) for each approach. A LOS grade is a letter grade based on the average delay (in seconds) experienced by motorists traveling through an intersection. LOS results range from “A” being the best to “F” being the worst. LOS D is typically used as the acceptable LOS threshold in the District, although LOS E or F is sometimes accepted in urban areas if vehicular improvements would be a detriment to safety or non-auto modes of transportation.

The LOS capacity analyses were based on: (1) the intersection peak hour traffic volumes; (2) the lane use and traffic controls; and (3) the HCM methodologies (using Synchro software). The average delay of each approach and LOS is shown for the signalized intersections in addition to the overall average delay and intersection LOS grade. The HCM does not give guidelines for calculating the average delay for a two-way stop-controlled intersection, as the approaches without stop signs would technically have no delay. Detailed LOS descriptions and the analysis worksheets are contained in the Technical Attachments.

Table 23 shows the results of the capacity analyses, including LOS and average delay per vehicle (in seconds) for the Existing, 2030 Background, and 2030 Total Future scenarios. Table 25 shows the results of the capacity analyses, including LOS and average delay per vehicle (in seconds) for the 2035 Total Future scenario.

As shown in Table 23, five (5) of the study intersections operate at unacceptable conditions or have one or more approaches operating at unacceptable levels under existing conditions:

- Harvard Street & 5<sup>th</sup> Street, NW
  - Overall (AM)
  - Westbound (AM)
  - Southbound (AM/PM)
- Georgia Avenue & Barry Place, NW
  - Eastbound (PM)
- 4<sup>th</sup> Street & Bryant Street, NW
  - Eastbound (AM/PM)
- Georgia Avenue/7<sup>th</sup> Street & Florida Avenue, NW
  - Northbound (AM/PM)
- Georgia Avenue & Gresham Place, NW
  - Westbound (AM)

The introduction of trips from background developments and improvements results in seven (7) study intersections that operate at unacceptable conditions or have one or more approaches operating at unacceptable levels under background conditions:

- Harvard Street & 5<sup>th</sup> Street, NW
  - Overall (AM)



- 
- Westbound (AM)
    - Southbound (AM/PM)
  - Georgia Avenue & Barry Place, NW
    - Eastbound (PM)
    - Southbound (AM)
  - 4<sup>th</sup> Street & Bryant Street, NW
    - Eastbound (PM)
    - Westbound (AM)
  - Georgia Avenue & W Street, NW
    - Westbound (AM)
  - Georgia Avenue & V Street.HU Hospital, NW
    - Overall (AM)
    - Eastbound (PM)
    - Northbound (AM)
  - Georgia Avenue/7<sup>th</sup> Street & Florida Avenue, NW
    - Northbound (AM/PM)
  - Georgia Avenue & Gresham Place, NW
    - Westbound (AM)

The introduction of Campus Plan-generated trips results in additional delays that meet DDOT's mitigation threshold at seven (7) study intersections where an approach delay was increased to unacceptable levels or an unacceptable delay increased by over five (5) percent as compared to background conditions:

- Harvard Street & 5<sup>th</sup> Street, NW
  - Overall (AM)
  - Westbound (AM)
- Georgia Avenue & Barry Place, NW
  - Overall (AM)
  - Southbound (AM)
- 4<sup>th</sup> Street & College Street, NW
  - Overall (PM)
  - Eastbound (PM)
- 4<sup>th</sup> Street & Bryant Street, NW
  - Eastbound (AM/PM)

- 
- Georgia Avenue & W Street, NW
    - Overall (PM)
    - Westbound (AM/PM)
  - Georgia Avenue & V Street.HU Hospital, NW
    - Overall (AM/PM)
    - Northbound (AM/PM)
  - Georgia Avenue/7<sup>th</sup> Street & Florida Avenue, NW
    - Overall (PM)
    - Westbound (PM)

Measures mitigating vehicular capacity concerns at these intersections are discussed below.

As shown in Table 25, the introduction of the trips generated by the development of the old HUH site results in 10 study intersections that operate at unacceptable conditions or have one or more approaches operating at unacceptable levels under 2035 Total Future conditions:

- Georgia Avenue & Harvard Street, NW
  - Southbound (AM)
- Harvard Street & 5<sup>th</sup> Street, NW
  - Overall (AM)
  - Eastbound (PM)
  - Westbound (AM)
  - Southbound (AM/PM)
- Georgia Avenue & Barry Place, NW
  - Overall (AM)
  - Eastbound (AM/PM)
  - Southbound (AM/PM)
- 4<sup>th</sup> Street & College Street, NW
  - Overall (PM)
  - Eastbound (PM)
- Georgia Avenue & Bryant Street, NW
  - Overall (PM)
  - Northbound (PM)
  - Southbound (PM)
- 4<sup>th</sup> Street & Bryant Street, NW

- Eastbound (AM/PM)
- Westbound (AM)
- Georgia Avenue & W Street, NW
  - Overall (PM)
  - Westbound (AM/PM)
- Georgia Avenue & V Street.HU Hospital, NW
  - Overall (AM/PM)
  - Northbound (AM/PM)
  - Southbound (AM/PM)
- Georgia Avenue/7<sup>th</sup> Street & Florida Avenue, NW
  - Northbound (AM/PM)
- Georgia Avenue & Gresham Place, NW
  - Westbound (AM)

No recommendations or mitigation measures are based on the results of the 2035 Total Future scenario capacity analysis.

#### Queueing Analysis

In addition to the capacity analyses presented above, a queueing analysis was performed at each of the study intersections. The queueing analysis was performed using Synchro software. The 50<sup>th</sup> percentile and 95<sup>th</sup> percentile maximum queue lengths are shown for each lane group at the study area signalized intersections. The 50<sup>th</sup> percentile maximum queue is the maximum back of queue on a typical cycle. The 95<sup>th</sup> percentile queue is the maximum back of queue with 95<sup>th</sup> percentile traffic volumes. For unsignalized intersections, the 95<sup>th</sup> percentile queue is reported for each lane group (including free-flowing left turns and stop-controlled movements) based on the HCM calculations.

Table 24 shows the queueing results for the study area intersections for the Existing, 2030 Background, and 2030 Total Future scenarios. Table 26 shows the queueing results for the study area intersections for the 2035 Total Future scenario.

Eleven (11) of the study intersections exhibit one or more lane group that exceeds the given storage length during the existing conditions:

- Georgia Avenue & Harvard Street, NW
  - Northbound Thru/Right (AM/PM)
  - Southbound Left/Thru (AM)
- Harvard Street & 5<sup>th</sup> Street, NW
  - Westbound Left (AM)
  - Northbound Right (PM)
- Georgia Avenue & Fairmont Street, NW (north)
  - Southbound Thru/Right (AM/PM)
- Georgia Avenue & Euclid Street

- 
- Eastbound Right (AM/PM)
  - Sherman Avenue & Barry Place, NW
    - Eastbound Left/Thru/Right (AM/PM)
  - Georgia Avenue & Barry Place, NW
    - Eastbound Left/Right (PM)
    - Southbound Thru (AM/PM)
  - Georgia Avenue & Bryant Street, NW
    - Northbound Thru (AM/PM)
  - Georgia Avenue & W Street, NW
    - Southbound Thru (AM)
  - 4<sup>th</sup> Street & W Street, NW
    - Northbound Left/Thru/Right (PM)
  - Georgia Avenue & V Street/HU Hospital, NW
    - Southbound Left/Thru (AM)
  - Georgia Avenue/7<sup>th</sup> Street & Florida Avenue, NW
    - Westbound Thru/Right (AM/PM)
    - Northbound Thru/Right (AM/PM)
    - Southbound Left (AM/PM)

The introduction of trips from background developments and improvements results in 11 study intersections that exhibit one or more lane group that exceeds the given storage length:

- Georgia Avenue & Harvard Street, NW
  - Northbound Thru/Right (AM/PM)
  - Southbound Left/Thru (AM/PM)
- Harvard Street & 5<sup>th</sup> Street, NW
  - Westbound Left (AM)
  - Northbound Right (PM)
- Georgia Avenue & Fairmont Street, NW (north)
  - Southbound Thru/Right (AM/PM)
- Georgia Avenue & Fairmont Street, NW (south)
  - Northbound Thru (PM)
- Georgia Avenue & Euclid Street
  - Eastbound Right (AM/PM)



- 
- Sherman Avenue & Barry Place, NW
    - Eastbound Left/Thru/Right (AM/PM)
  - Georgia Avenue & Barry Place, NW
    - Eastbound Left/Right (PM)
    - Southbound Thru (AM/PM)
  - Georgia Avenue & Bryant Street, NW
    - Northbound Thru (AM/PM)
  - 4<sup>th</sup> Street & W Street, NW
    - Northbound Left/Thru/Right (PM)
  - Georgia Avenue & V Street/HU Hospital, NW
    - Eastbound Left/Thru/Right (PM)
    - Northbound Left/Thru (AM)
    - Southbound Left/Thru (AM)
  - Georgia Avenue/7<sup>th</sup> Street & Florida Avenue, NW
    - Westbound Thru/Right (AM/PM)
    - Northbound Thru/Right (AM/PM)
    - Southbound Left (AM/PM)

The introduction of the Campus Plan-generated trips results in seven (7) additional study intersections exhibiting a queue which exceeds the storage length or increases a queue exceeding storage in the background scenario by 150 feet:

- Georgia Avenue & Harvard Street, NW
  - Southbound Left/Thru (AM)
- Georgia Avenue & Bryant Street, NW
  - Northbound Thru (PM)
- 4<sup>th</sup> Street & Bryant Street, NW
  - Southbound Left/Thru (PM)
- Georgia Avenue & W Street, NW
  - Westbound Left (AM/PM)
  - Westbound Thru/Right (PM)
- 4<sup>th</sup> Street & W Street, NW
  - Southbound Right (PM)
- Georgia Avenue & V Street/HU Hospital, NW
  - Northbound Left/Thru (PM)

- 
- Georgia Avenue/7<sup>th</sup> Street & Florida Avenue, NW
    - Southbound Left (PM)

Measures mitigating queueing concerns at these intersections are discussed below.

As shown in Table 26, the introduction of trips generated by the development of the old HUH site results in 12 study intersections that exhibit one or more lane group that exceeds the given storage length under 2035 Total Future conditions:

- Georgia Avenue & Harvard Street, NW
  - Northbound Thru/Right (AM/PM)
  - Southbound Left/Thru (AM/PM)
- Harvard Street & 5<sup>th</sup> Street, NW
  - Westbound Left (AM/PM)
  - Northbound Right (PM)
- Georgia Avenue & Fairmont Street, NW (north)
  - Southbound Thru/Right (AM/PM)
- Georgia Avenue & Euclid Street
  - Eastbound Right (AM/PM)
- Sherman Avenue & Barry Place, NW
  - Eastbound Left/Thru/Right (AM/PM)
- Georgia Avenue & Barry Place, NW
  - Eastbound Left/Right (AM/PM)
  - Southbound Thru (AM/PM)
- Georgia Avenue & Bryant Street, NW
  - Northbound Thru (AM/PM)
  - Southbound Left (AM/PM)
- 4<sup>th</sup> Street & Bryant Street, NW
  - Southbound Left/Thru (PM)
- Georgia Avenue & W Street, NW
  - Westbound Left (AM/PM)
  - Westbound Thru/Right (PM)
- 4<sup>th</sup> Street & W Street, NW
  - Northbound Left/Thru/Right (PM)
  - Southbound Left/Thru (PM)
- Georgia Avenue & V Street/HU Hospital, NW

- Eastbound Left/Thru/Right (PM)
- Northbound Left/Thru (AM/PM)
- Southbound Left/Thru (AM/PM)
- Georgia Avenue/7<sup>th</sup> Street & Florida Avenue, NW
  - Westbound Thru/Right (AM/PM)
  - Northbound Thru/Right (AM/PM)
  - Southbound Left (AM/PM)

No recommendations or mitigation measures are based on the results of the 2035 Total Future scenario queueing analysis.

### Recommendations and Mitigation Measures

Based on DDOT standards, the proposed development is considered to have an impact at an intersection within the study area if any of the following conditions are met:

- The capacity analyses show a LOS E or F at an intersection or along an approach in the future with conditions with the project where one does not exist in the background conditions;
- There is an increase in delay at any approach or overall intersection operating under LOS E or F of greater than 5% when compared to the background conditions;
- The 95<sup>th</sup> percentile queues exceed storage along an approach in the future conditions with the project where one does not exist in the background scenario; or
- There is an increase in the 95<sup>th</sup> percentile queues by more than 150 feet along an approach in that exceeds storage in the background scenario.

Following these guidelines, the following intersections are impacted by the proposed development:

- Georgia Avenue & Harvard Street, NW
- Harvard Street & 5<sup>th</sup> Street, NW
- Georgia Avenue & Barry Place, NW
- 4<sup>th</sup> Street & College Street, NW
- Georgia Avenue & Bryant Street, NW
- 4<sup>th</sup> Street & Bryant Street, NW
- Georgia Avenue & W Street, NW
- 4<sup>th</sup> Street & W Street, NW
- Georgia Avenue & V Street/HU Hospital, NW
- Georgia Avenue/7<sup>th</sup> Street & Florida Avenue, NW

### Project Impact and Recommendations

This section summarizes the results of the capacity analyses for the intersections with movements or approaches that operate at unacceptable conditions and lists the scenarios for which this occurs. Impact associated with the Campus Plan is noted where delays for failing approaches or intersections increase by five percent or more or where an intersection or approach go from an

acceptable LOS to an unacceptable one as compared between Background and Total Future conditions. Finally, recommendations for improvements at each intersection are discussed. The mitigated results include the recommended one- to two-way conversion of Bryant Street NW and W Street NW, as part of the Campus Plan. The capacity analysis and queueing analysis results incorporating these recommendations and improvements are shown in Table 23 and Table 24, respectively.

#### *Georgia Avenue & Harvard Street, NW*

During the morning peak hour, the 95<sup>th</sup> percentile queue length for the southbound left/thru movement exceeds the storage length and increases by more than 150 feet over the Background conditions.

Queueing for the southbound left/thru movement can be reduced to levels comparable to those seen in Background conditions through minor signal timing adjustments to increase the green time for the northbound and southbound phases. This report recommends coordination with DDOT to optimize signal timings at this intersection to ensure the most efficient operation in the future following the implementation of the Campus Plan.

#### *Harvard Street & 5th Street, NW*

During the morning peak hour, the overall intersection and westbound approach experience unacceptable delays in the Background and Total Future conditions. Delays for the overall intersection and westbound approach increase by over five (5) percent between Background and Total Future conditions as a result of the Campus Plan's added and redistributed traffic volumes.

Delays for the overall intersection and westbound approach can be reduced to levels comparable to those seen in Background conditions through minor signal timing adjustments to increase the green time for the northbound and westbound phases. This report recommends coordination with DDOT to optimize signal timings at this intersection to ensure the most efficient operation in the future following the implementation of the Campus Plan.

#### *Georgia Avenue & Barry Place, NW*

During the morning peak hour, the overall intersection experiences unacceptable delays in the Total Future conditions. The overall intersection increases to a LOS E from LOS D between Background and Total Future conditions.

Delays for the overall intersection can be reduced to levels comparable to those seen in Background conditions by converting on-street parking into a 100-foot eastbound right-turn lane and through minor signal timing adjustments to increase the green time for the northbound and southbound phases. This report recommends coordination with DDOT to optimize signal timings at this intersection to ensure the most efficient operation in the future following the implementation of the Campus Plan.

During the afternoon peak hour, the southbound approach experiences unacceptable delays in the Background and Total Future conditions. Delays for the southbound approach increase by over five (5) percent between Background and Total Future conditions as a result of the Campus Plan's added and redistributed traffic volumes.

Delays for the southbound approach can be reduced to levels comparable to those seen in Background conditions by converting on-street parking into a 100-foot eastbound right-turn lane. This report recommends coordination with DDOT to optimize signal timings at this intersection to ensure the most efficient operation in the future following the implementation of the Campus Plan.

#### *4th Street & College Street, NW*

During the afternoon peak hour, the overall intersection and eastbound approach experience unacceptable delays in the Total Future conditions. The overall intersection increases to a LOS F from LOS A and the eastbound approach increases to a LOS F from LOS D between Background and Total Future conditions.

Delays for the overall intersection and eastbound approach can be reduced to levels comparable to those seen in Background conditions through minor signal timing adjustments to increase the green time for the eastbound and westbound phases. This



report recommends coordination with DDOT to optimize signal timings at this intersection to ensure the most efficient operation in the future following the implementation of the Campus Plan.

#### *Georgia Avenue & Bryant Street, NW*

During the afternoon peak hour, the 95<sup>th</sup> percentile queue length for the northbound thru movement exceeds the storage length and increases by more than 150 feet over the Background conditions.

The Campus Plan recommends converting Bryant Street NW from one- to two-way between Georgia Avenue and 4<sup>th</sup> Street NW. Signal phasing and timings were reconfigured to incorporate the added westbound left/thru/right movement. Queueing for the northbound thru movement can be reduced to levels comparable to those seen in Background conditions through minor signal timing adjustments to increase the green time for the eastbound and westbound phases. This report recommends coordination with DDOT to optimize signal timings at this intersection to ensure the most efficient operation in the future following the implementation of the Campus Plan.

#### *4th Street & Bryant Street, NW*

During the morning peak hour, the eastbound approach experiences unacceptable delays in the Total Future conditions. The eastbound approach increases to a LOS F from LOS D between Background and Total Future conditions.

The Campus Plan recommends converting Bryant Street NW from one- to two-way between Georgia Avenue and 4<sup>th</sup> Street NW. Signal phasing and timings were reconfigured to incorporate the added westbound thru, northbound left, and southbound right movements. Delays for the eastbound approach can be reduced to levels comparable to those seen in Background conditions by converting on-street parking into a 75-foot eastbound right-turn lane. Minor signal timing adjustments were also made to increase the green time for the eastbound and westbound phases, further reducing intersection delays. This report recommends coordination with DDOT to optimize signal timings at this intersection to ensure the most efficient operation in the future following the implementation of the Campus Plan.

During the afternoon peak hour, the 95<sup>th</sup> percentile queue length for the northbound thru movement exceeds the storage length over the Background conditions. Additionally, the eastbound approach experiences unacceptable delays in the Background and Total Future conditions. Delays for the eastbound approach increase by over five (5) percent between Background and Total Future conditions as a result of the Campus Plan's added and redistributed traffic volumes.

The Campus Plan recommends converting Bryant Street NW from one- to two-way between Georgia Avenue and 4<sup>th</sup> Street NW. Signal phasing and timings were reconfigured to incorporate the added westbound thru, northbound left, and southbound right movements. Queueing for the northbound thru movement and delays for the eastbound approach can be reduced to levels comparable to those seen in Background conditions by converting on-street parking into a 75-foot eastbound right-turn lane. Minor signal timing adjustments were also made to increase the green time for the northbound and southbound phases, further reducing intersection delays. This report recommends coordination with DDOT to optimize signal timings at this intersection to ensure the most efficient operation in the future following the implementation of the Campus Plan.

#### *Georgia Avenue & W Street, NW*

During the morning peak hour, the 95<sup>th</sup> percentile queue length for the westbound left movement exceeds the storage length over the Background conditions. Additionally, the westbound approach experiences unacceptable delays in the Background and Total Future conditions. Delays for the eastbound approach increase by over five (5) percent between Background and Total Future conditions as a result of the Campus Plan's added and redistributed traffic volumes.

The Campus Plan recommends converting W Street NW from one- to two-way between Georgia Avenue and 4<sup>th</sup> Street NW. Signal phasing and timings were reconfigured to incorporate the added northbound right and southbound left movements. Queueing for the westbound left movement and delays for the westbound approach can be reduced to levels comparable to those seen in Background conditions through minor signal timing adjustments to increase the green time for the westbound

phase. This report recommends coordination with DDOT to optimize signal timings at this intersection to ensure the most efficient operation in the future following the implementation of the Campus Plan.

During the afternoon peak hour, the 95<sup>th</sup> percentile queue length for the westbound left and westbound thru/right movements exceeds the storage length over the Background conditions. Additionally, the overall intersection and westbound approach experiences unacceptable delays in the Total Future conditions. The overall intersection increases to a LOS F from LOS B and the eastbound approach increases to a LOS F from LOS D between Background and Total Future conditions.

The Campus Plan recommends converting W Street NW from one- to two-way between Georgia Avenue and 4<sup>th</sup> Street NW. Signal phasing and timings were reconfigured to incorporate the added northbound right and southbound left movements. Queueing for the westbound left and westbound thru/right movements and delays for the overall intersection and westbound approach can be reduced to levels comparable to those seen in Background conditions through minor signal timing adjustments to increase the green time for the westbound phase. This report recommends coordination with DDOT to optimize signal timings at this intersection to ensure the most efficient operation in the future following the implementation of the Campus Plan.

#### *4th Street & W Street, NW*

During the afternoon peak hour, the 95<sup>th</sup> percentile queue length for the southbound right movement exceeds the storage length over the Background conditions.

The Campus Plan recommends converting W Street NW from one- to two-way between Georgia Avenue and 4<sup>th</sup> Street NW. Signal phasing and timings were reconfigured to incorporate the added eastbound left/thru/right movement. The conversion from one- to two-way results in a shift in traffic patterns, reducing the queueing for the southbound right movement to levels comparable to those seen in Background conditions. This report recommends coordination with DDOT to optimize signal timings at this intersection to ensure the most efficient operation in the future following the implementation of the Campus Plan.

#### *Georgia Avenue & V Street/HU Hospital, NW*

During the morning peak hour, the overall intersection and northbound approach experience unacceptable delays in the Background and Total Future conditions. Delays for the overall intersection and westbound approach increase by over five (5) percent between Background and Total Future conditions as a result of the Campus Plan's added and redistributed traffic volumes.

Delays for the overall intersection and northbound approach can be reduced to levels comparable to those seen in Background conditions through minor signal timing adjustments to increase the green time for the northbound and southbound phases. This report recommends coordination with DDOT to optimize signal timings at this intersection to ensure the most efficient operation in the future following the implementation of the Campus Plan.

During the afternoon peak hour, the 95<sup>th</sup> percentile queue length for the northbound left/thru movement exceeds the storage length over the Background conditions. Additionally, the overall intersection and northbound approach experiences unacceptable delays in the Total Future conditions. The overall intersection increases to a LOS E from LOS D and the northbound approach increases to a LOS F from LOS B between Background and Total Future conditions.

Queueing for the northbound left/thru movement and delays for the overall intersection and northbound approach can be reduced to levels comparable to those seen in Background conditions through minor signal timing adjustments to increase the green time for the northbound and southbound phases. This report recommends coordination with DDOT to optimize signal timings at this intersection to ensure the most efficient operation in the future following the implementation of the Campus Plan.

#### *Georgia Avenue/7th Street & Florida Avenue, NW*

During the afternoon peak hour, the 95<sup>th</sup> percentile queue length for the southbound left movement exceeds the storage length and increases by more than 150 feet over the Background conditions. Additionally, the overall intersection and westbound

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approach experiences unacceptable delays in the Total Future conditions. The overall intersection increases to a LOS E from LOS D and the northbound approach increases to a LOS E from LOS D between Background and Total Future conditions.

Queueing for the southbound left movement and delays for the overall intersection and westbound approach can be reduced to levels comparable to those seen in Background conditions through minor signal timing adjustments to increase the green time for the eastbound and westbound phases. This report recommends coordination with DDOT to optimize signal timings at this intersection to ensure the most efficient operation in the future following the implementation of the Campus Plan.

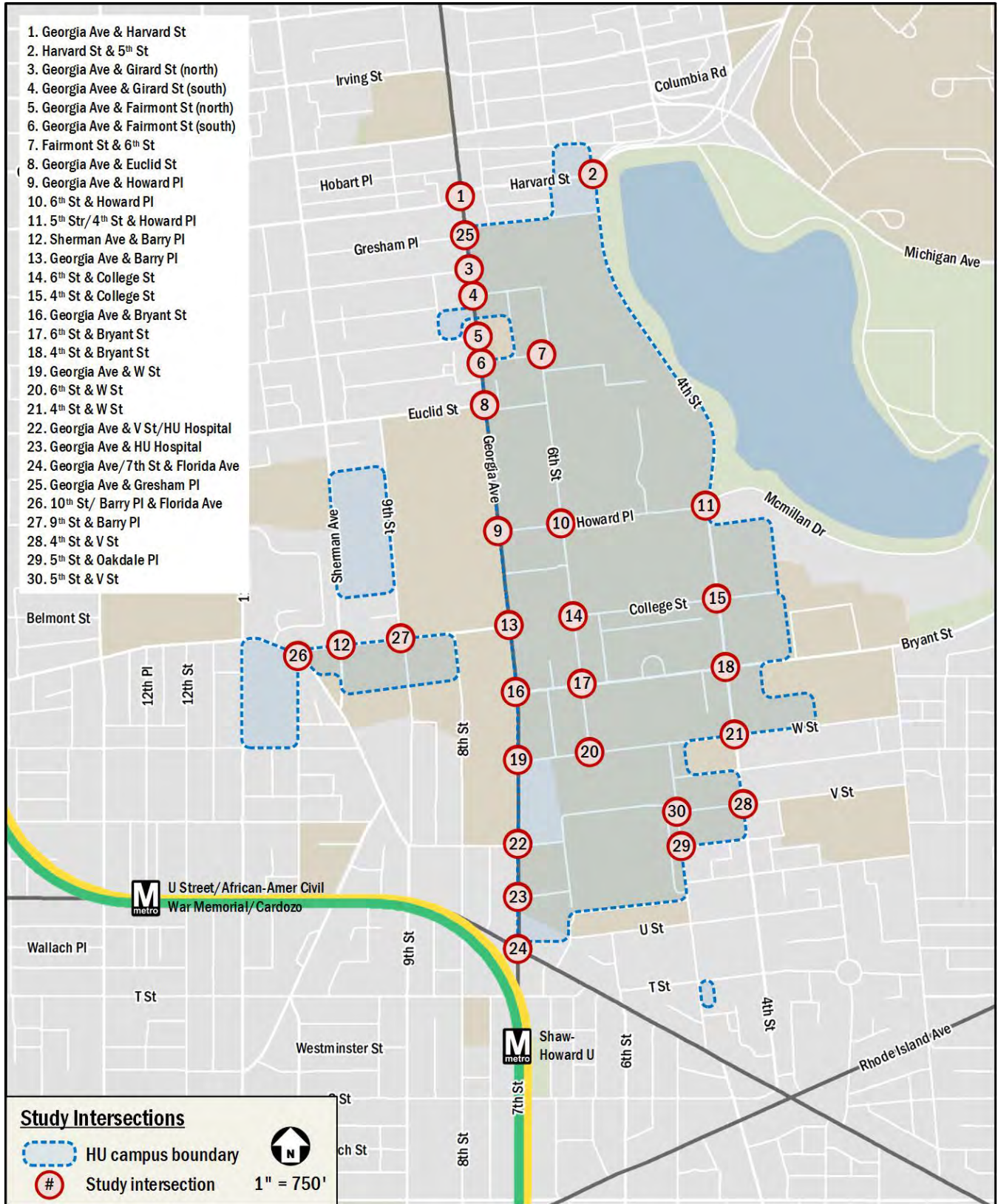


Figure 29: Study Area Intersections



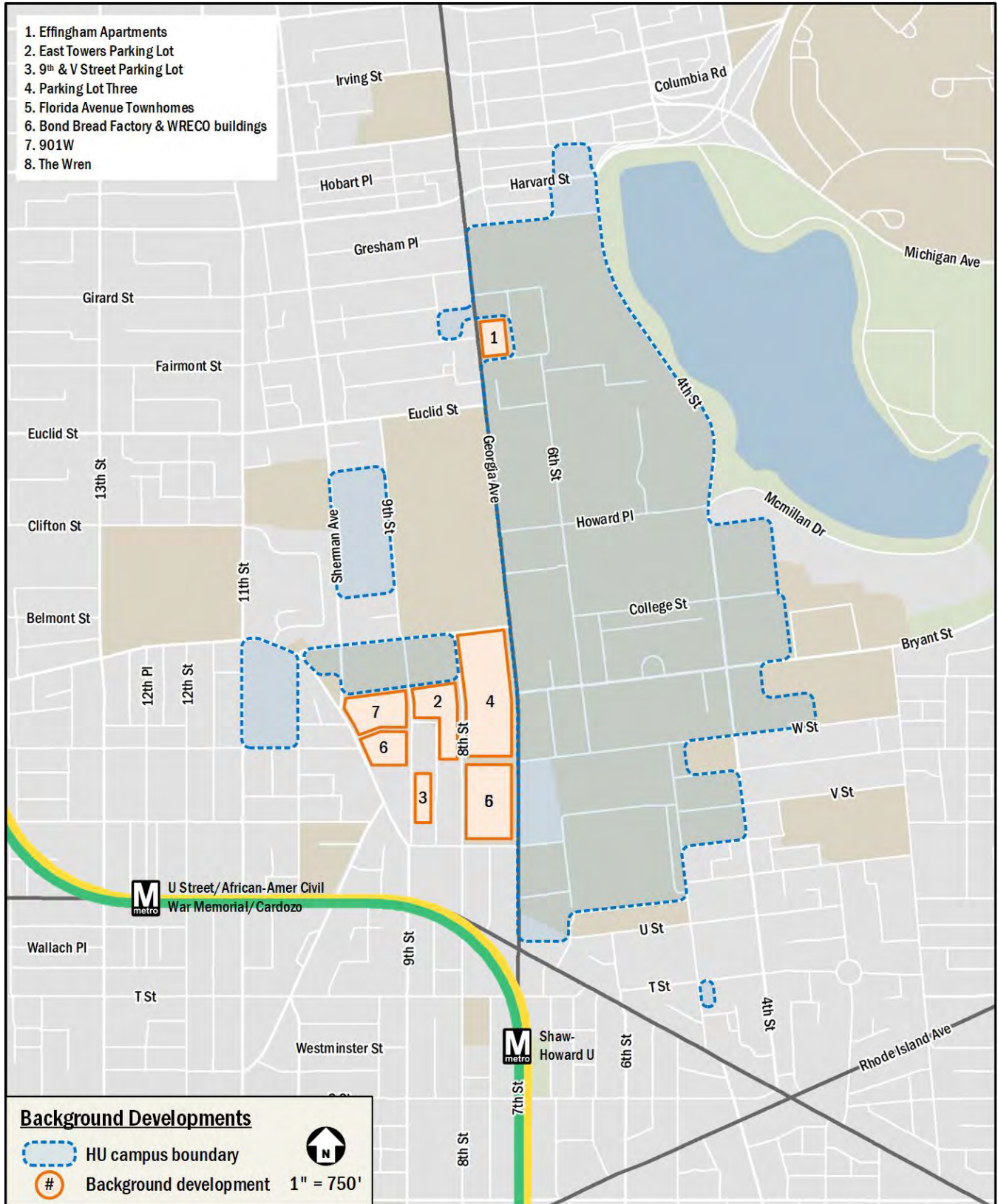


Figure 30: Background Developments



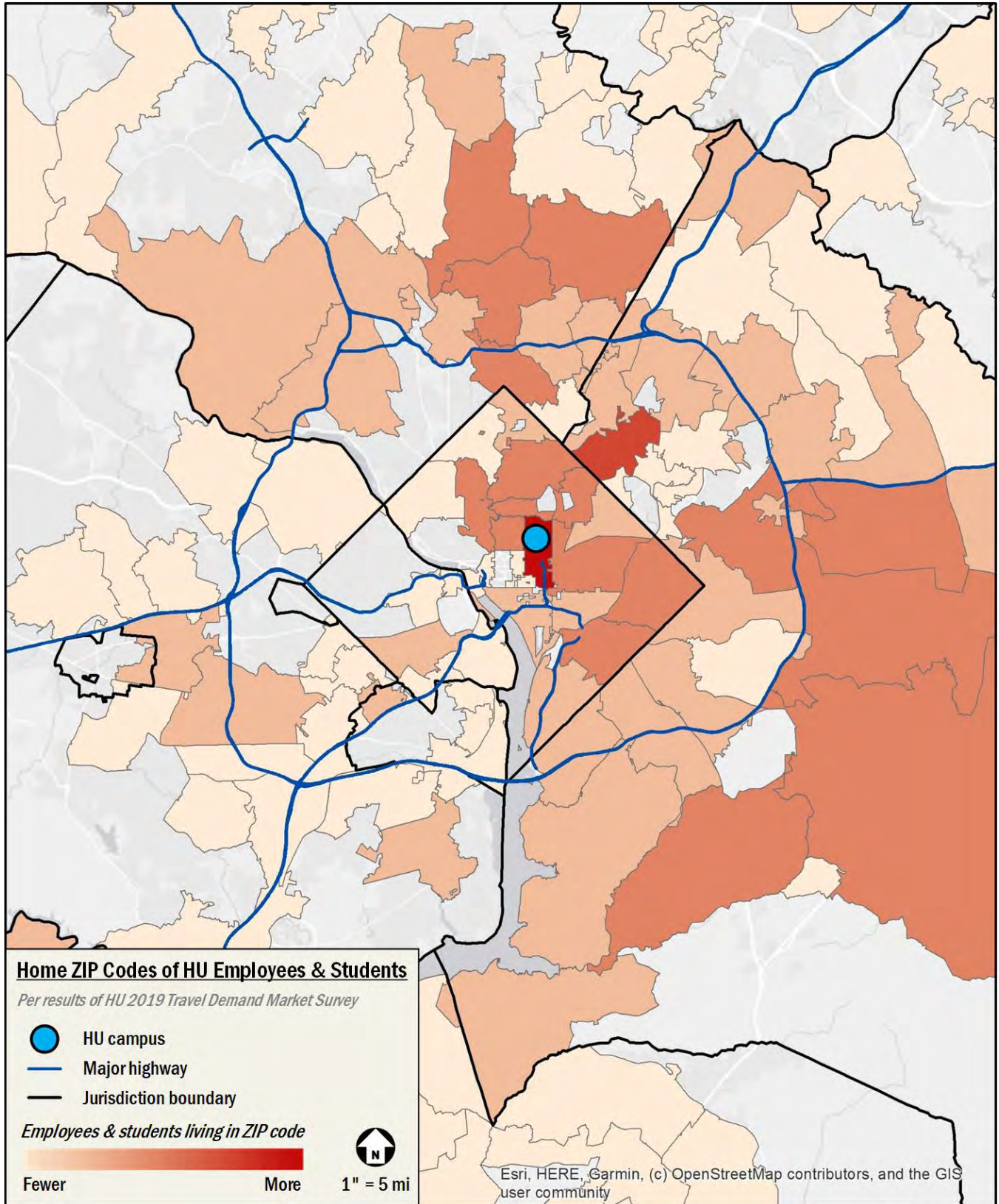


Figure 31: Home ZIP Codes of HU Employees and Students

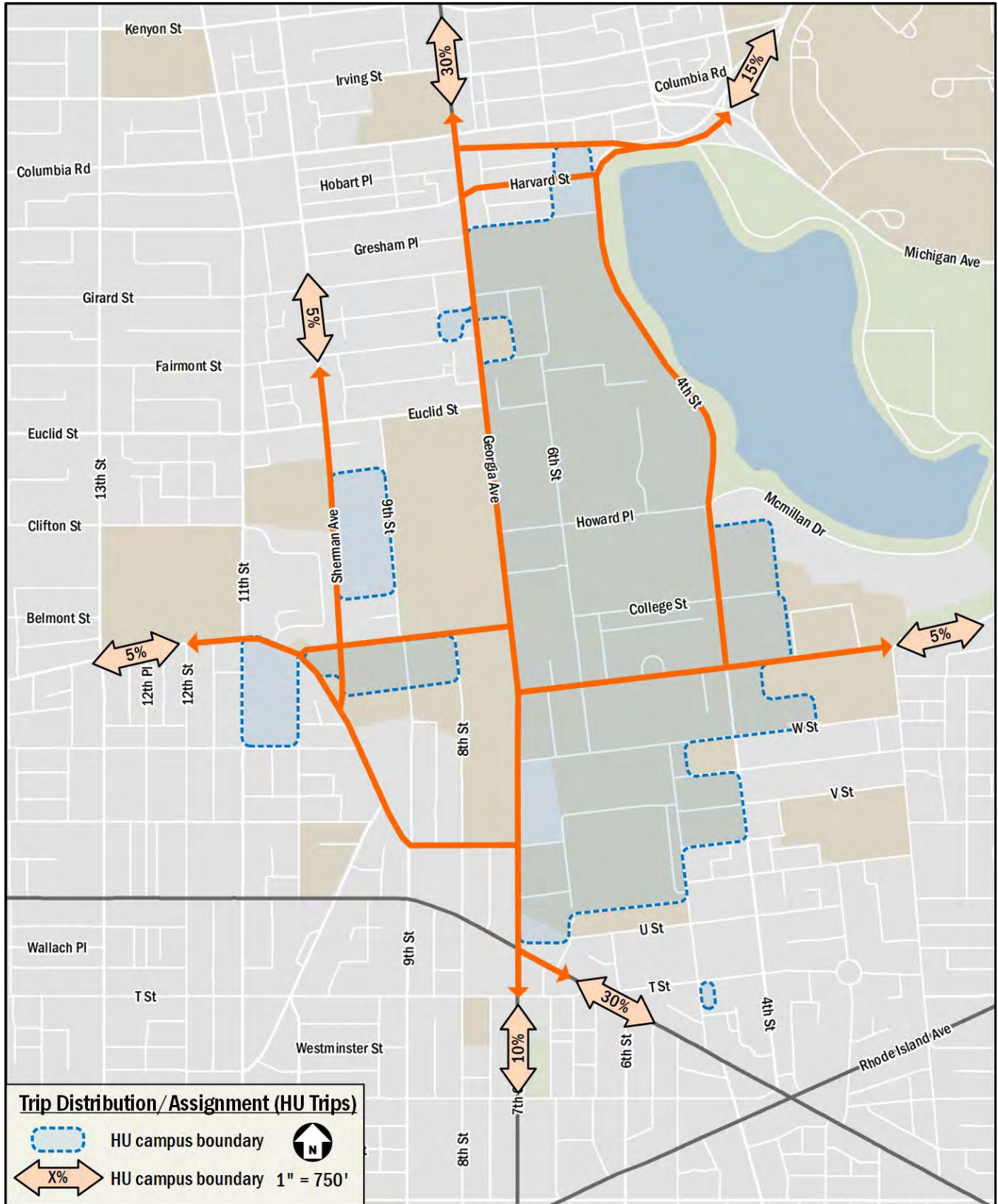


Figure 32: Distribution of HU Campus Trips



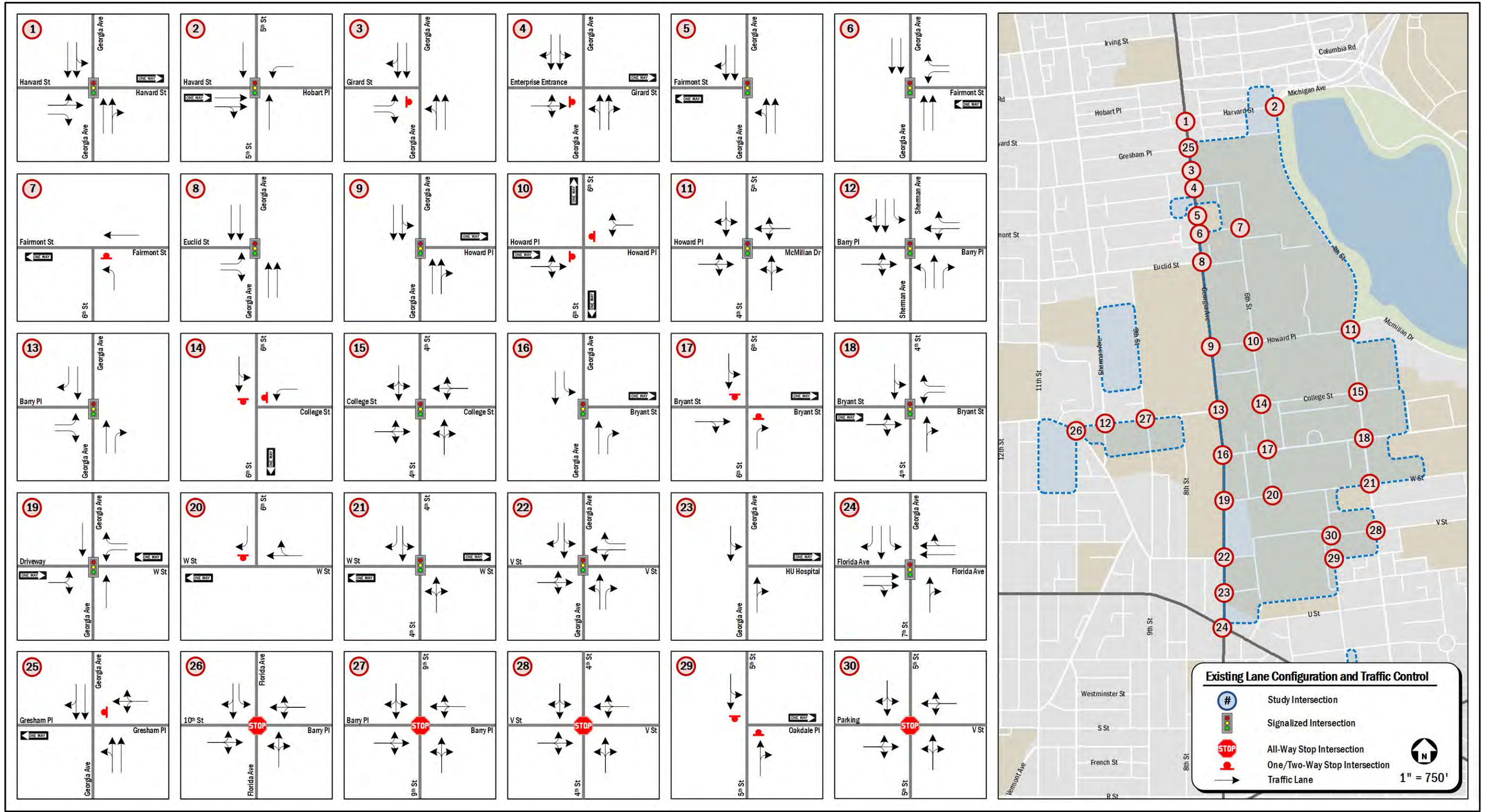


Figure 33: 2019 Existing Lane Configurations and Traffic Control



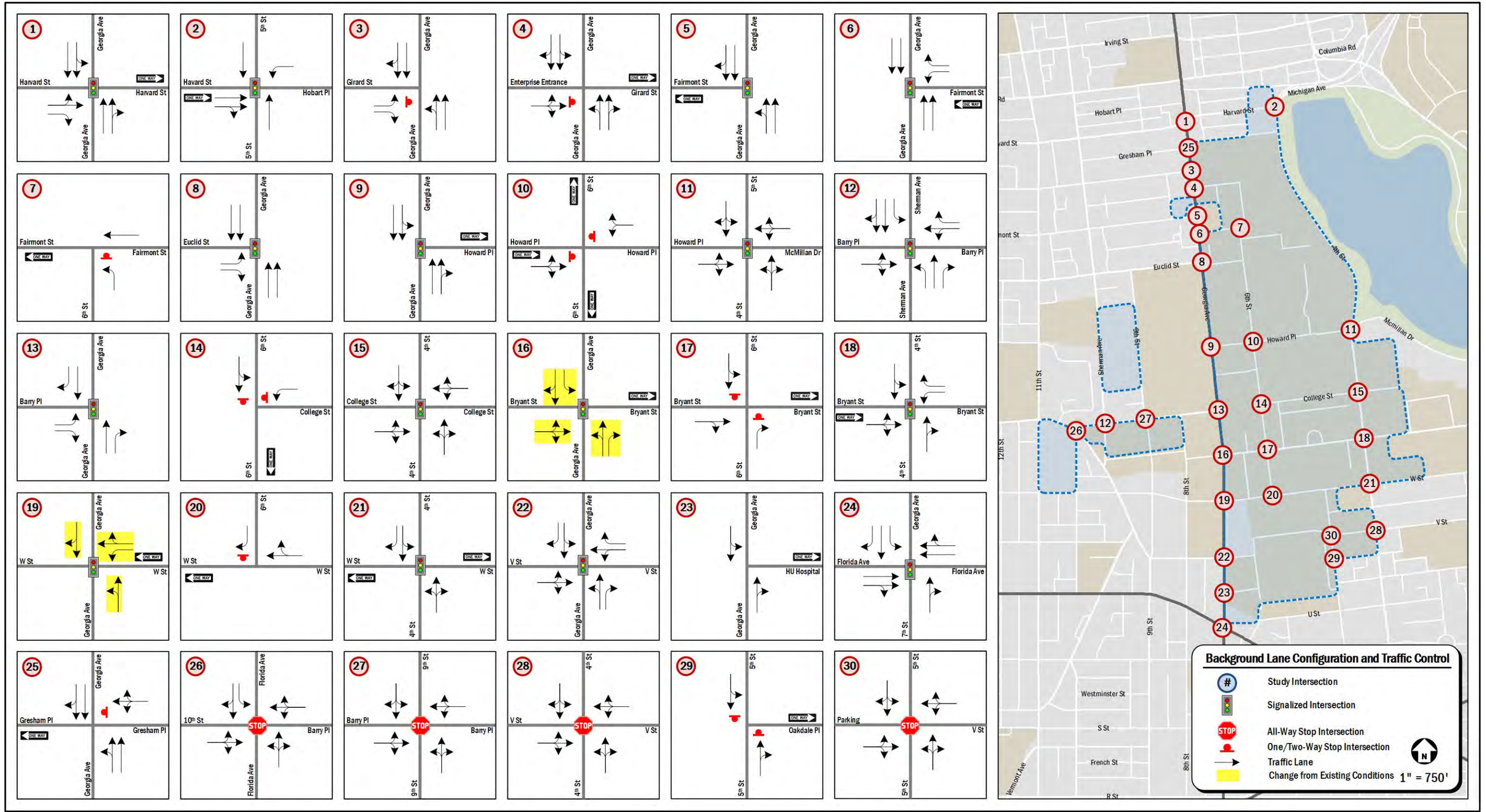


Figure 34: 2030 Background Lane Configurations and Traffic Control



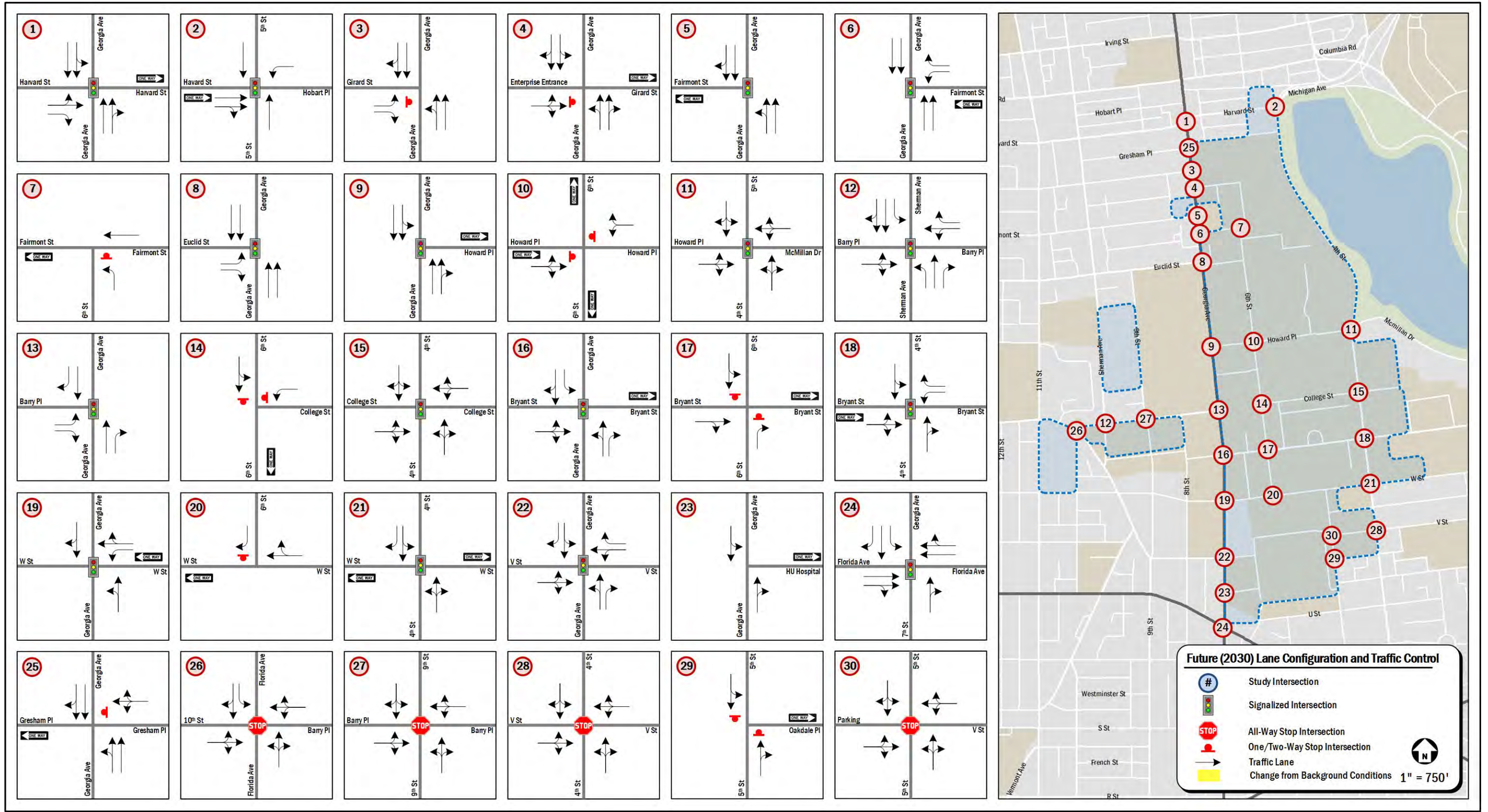


Figure 35: 2030 Total Future Lane Configurations and Traffic Control



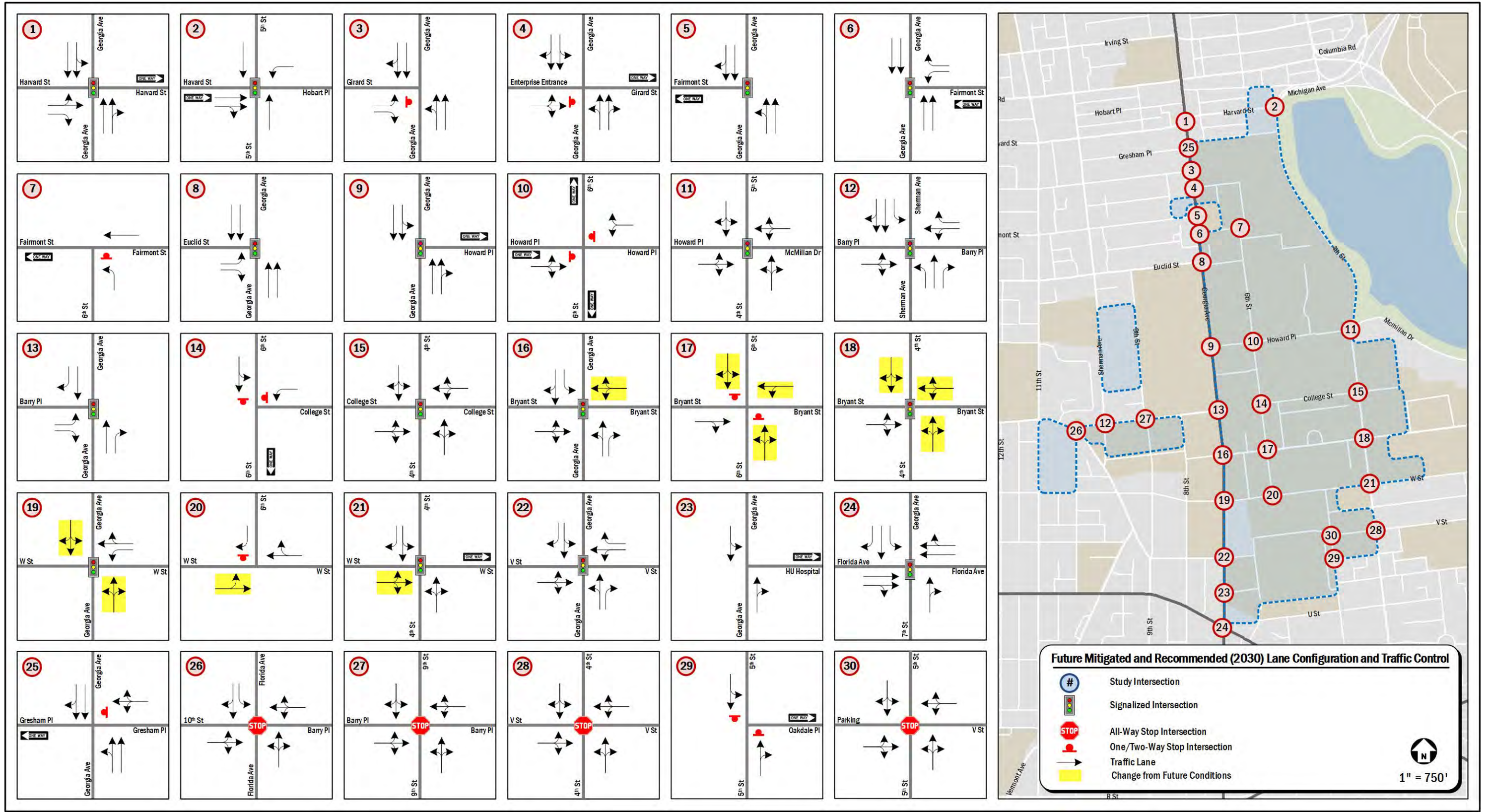


Figure 36: 2030 Total Future with Mitigations and Recommendations Lane Configurations and Traffic Control



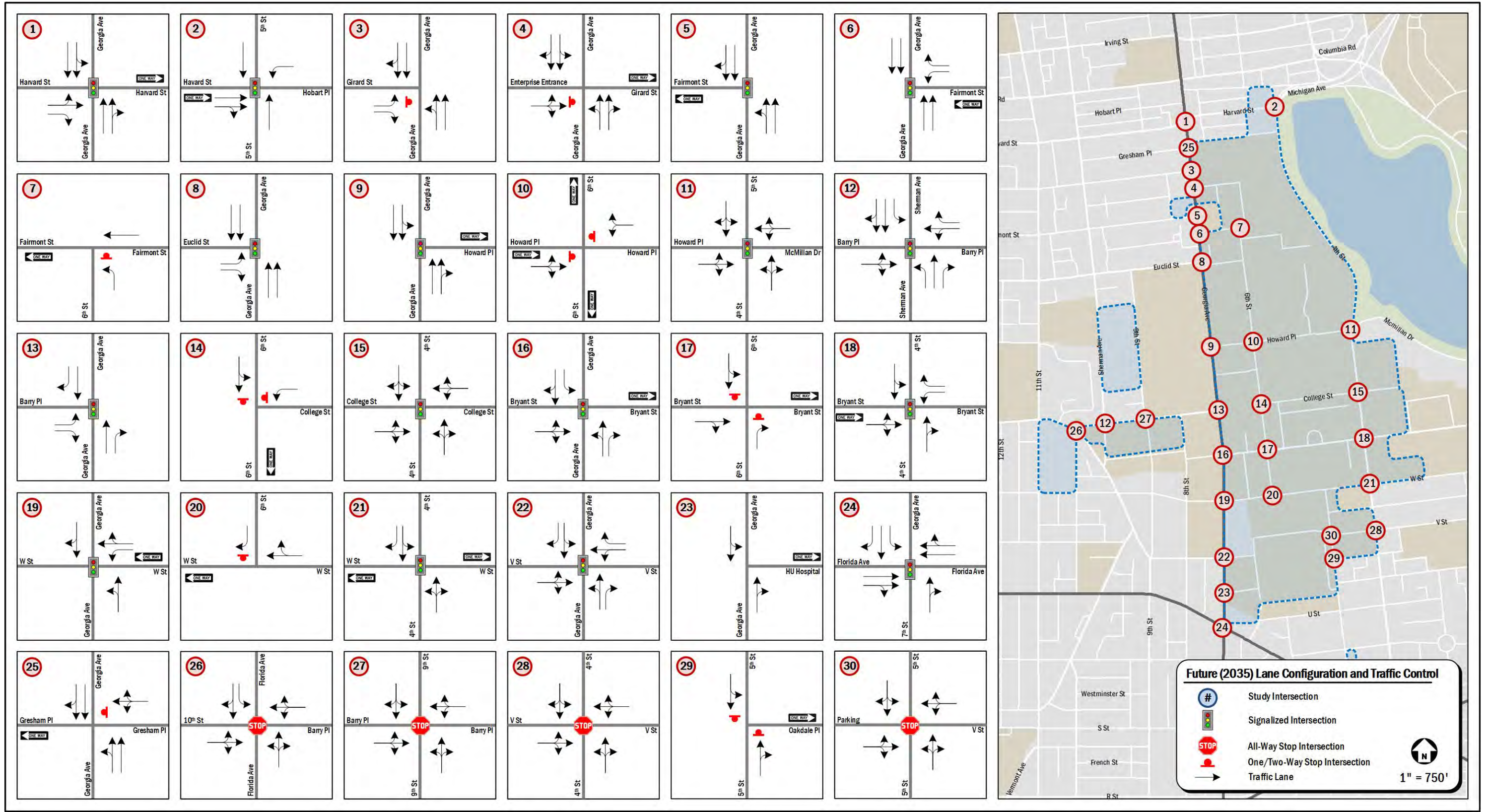


Figure 37: 2035 Total Future Lane Configurations and Traffic Control



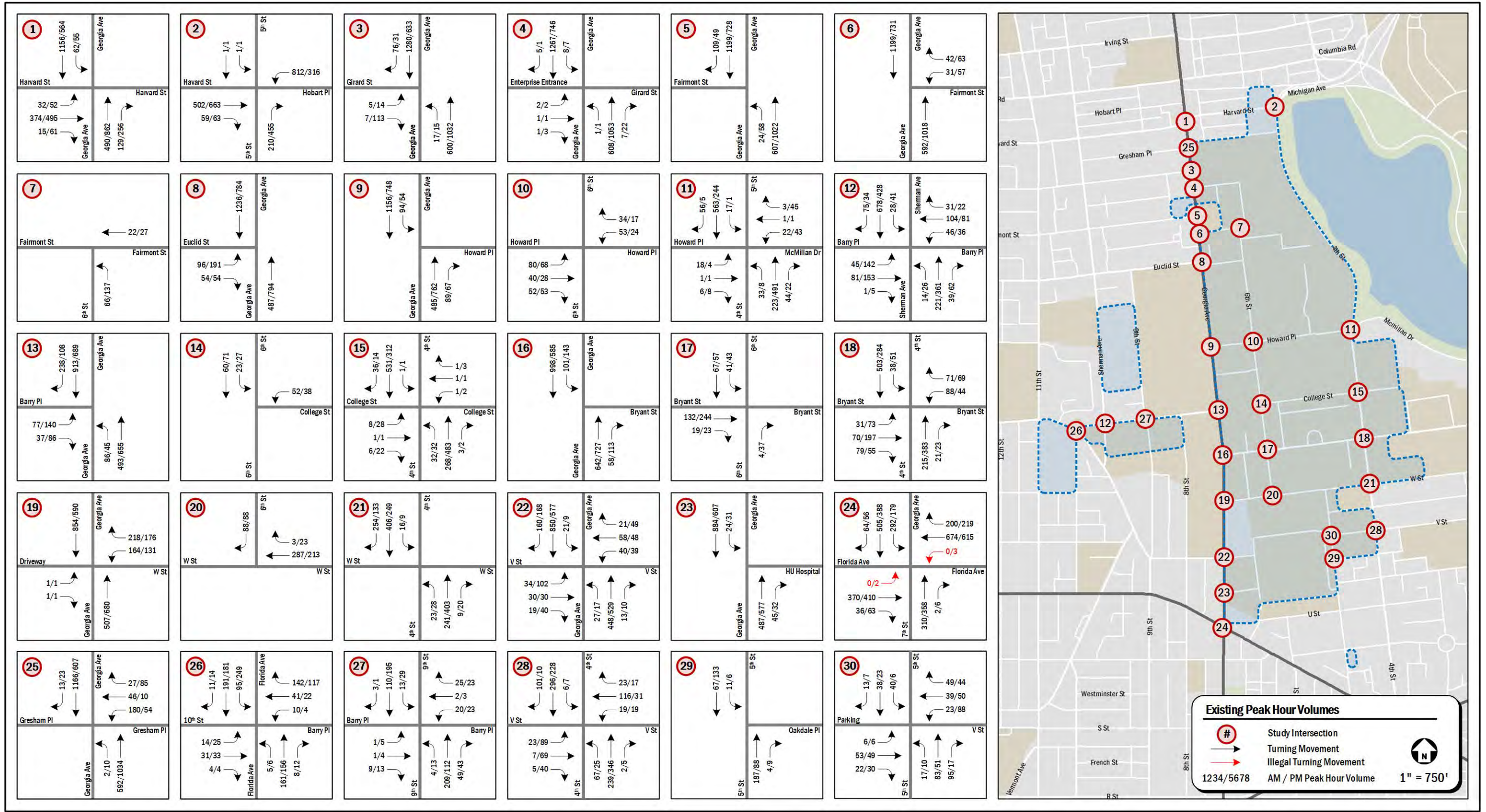


Figure 38: 2019 Existing Peak Hour Traffic Volumes



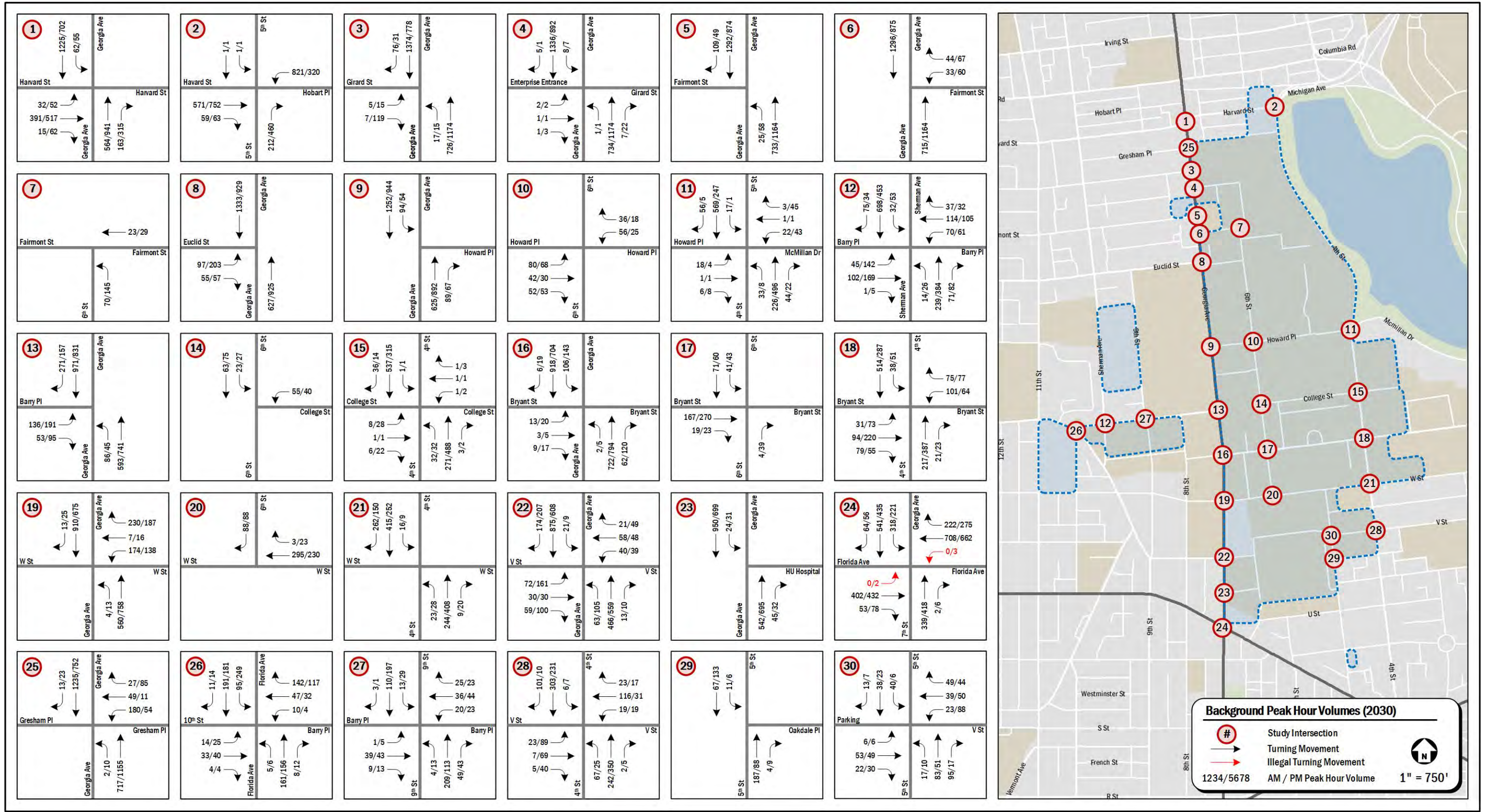


Figure 39: 2030 Background Peak Hour Traffic Volumes



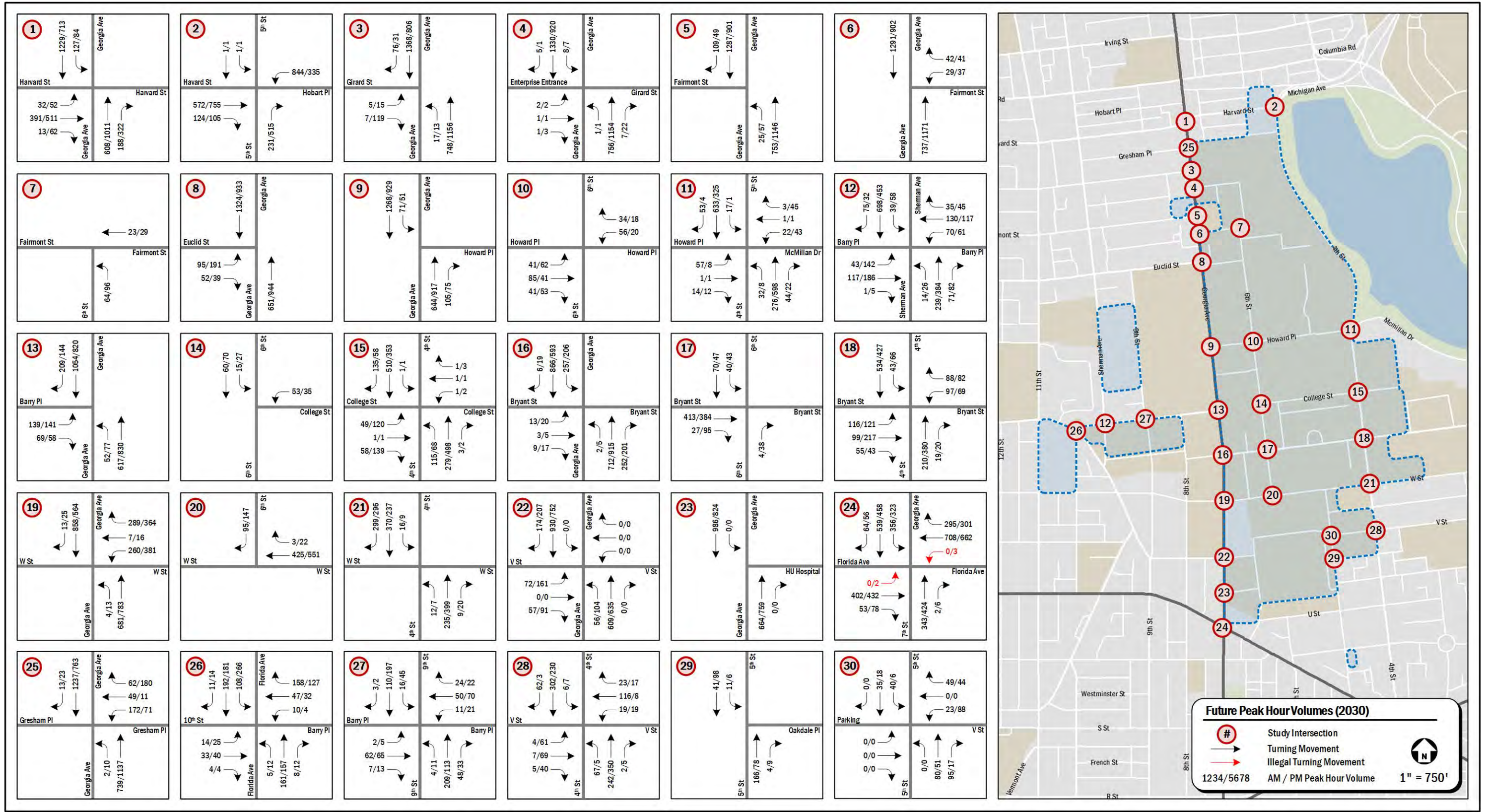


Figure 40: 2030 Total Future Peak Hour Traffic Volumes



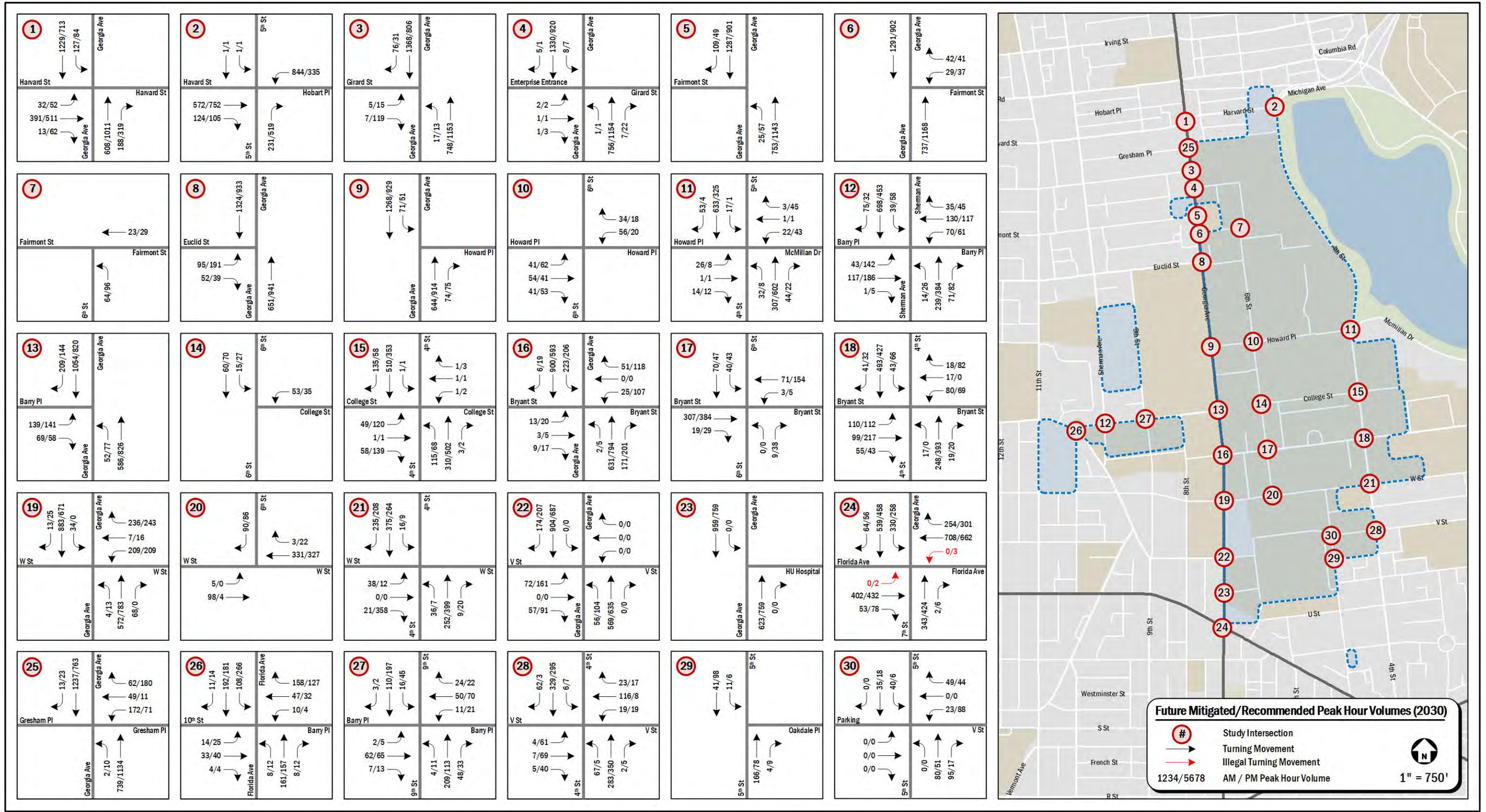


Figure 41: 2030 Total Future with Mitigations and Recommendations Peak Hour Traffic Volumes



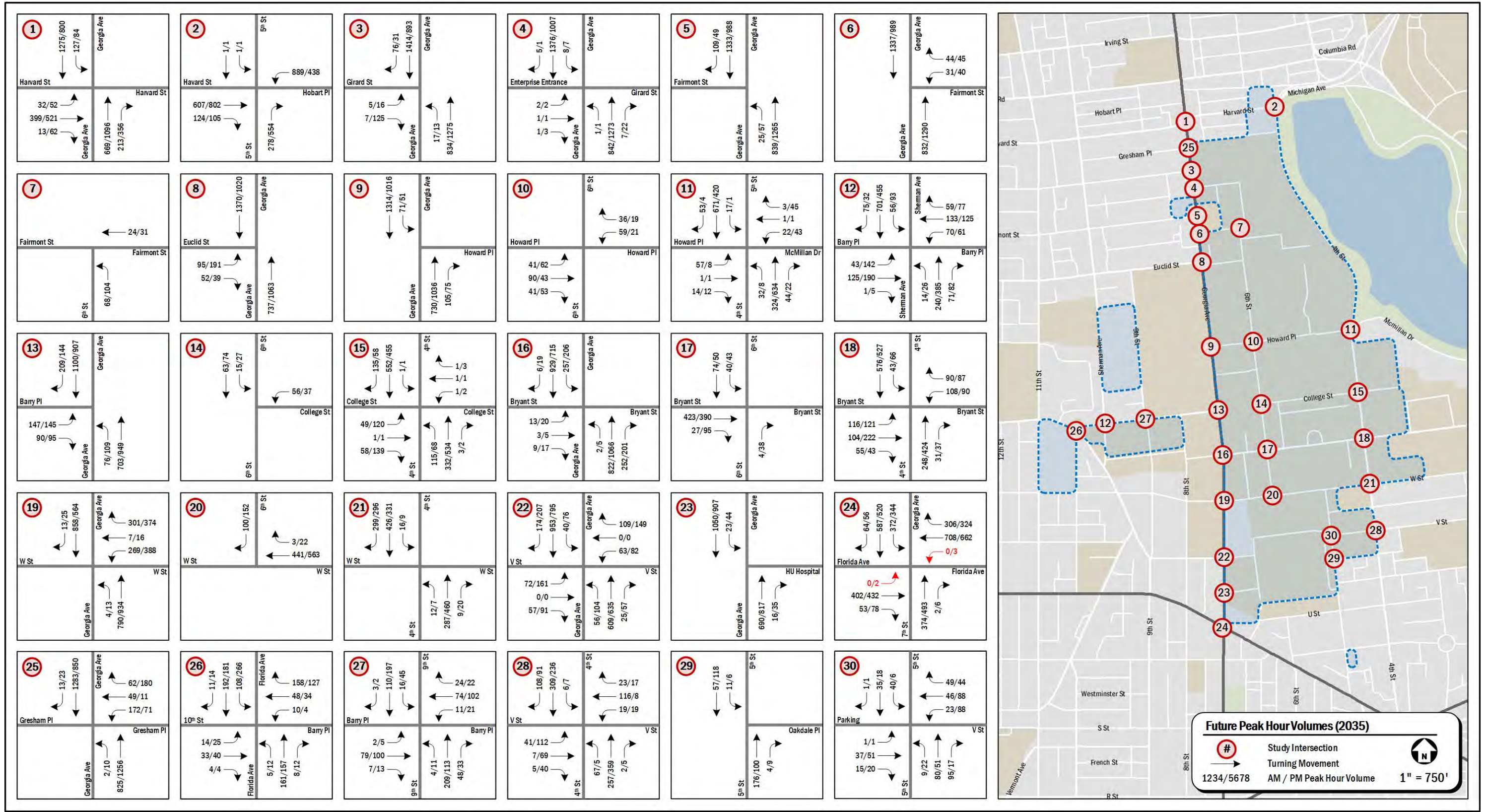


Figure 42: 2035 Total Future Peak Hour Traffic Volumes



**Table 23: LOS Results (2030)**

Intersection and Approach	Existing (2019)				Background (2030)				Future (2030)				Future (2030) with Mitigations			
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
<b>1. Georgia Avenue &amp; Harvard Street, NW</b>																
<b>Overall</b>	17.7	B	20.5	C	19.2	B	23.0	C	36.1	D	23.8	C	31.1	C	<b>NO MITIGATIONS</b>	
Eastbound	31.7	C	24.4	C	32.2	C	24.8	C	31.5	C	24.2	C	33.1	C		
Northbound	9.1	A	20.4	C	9.9	A	23.9	C	9.8	A	22.9	C	9.1	A		
Southbound	17.2	B	16.7	B	20.2	C	20.0	B	53.0	D	25.0	C	43.4	D		
<b>2. Harvard Street &amp; 5th Street, NW</b>																
<b>Overall</b>	62.4	E	30.1	C	64.6	E	33.4	C	70.8	E	36.5	D	67.8	E	<b>NO MITIGATIONS</b>	
Eastbound	36.4	D	38.7	D	38.9	D	43.9	D	42.9	D	49.1	D	44.7	D		
Westbound	92.6	F	21.3	C	97.2	F	21.4	C	109.1	F	21.8	C	101.3	F		
Northbound	15.3	B	22.5	C	15.5	B	22.9	C	15.8	B	25.1	C	15.3	B		
Southbound	56.3	E	56.3	E	56.3	E	56.3	E	56.3	E	56.3	E	56.3	E		
<b>3. Georgia Avenue &amp; Girard Street, NW (North)</b>																
Eastbound	18.4	C	12.5	B	19.2	C	12.5	B	17.3	C	10.9	B	<b>NO MITIGATIONS</b>			
Northbound	0.5	A	0.2	A	0.5	A	0.2	A	0.4	A	0.2	A				
Southbound	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A				
<b>4. Georgia Avenue &amp; Girard Street, NW (South)</b>																
Eastbound	26.4	D	20.6	C	28.0	D	21.3	C	25.5	D	18.2	C	<b>NO MITIGATIONS</b>			
Northbound	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A				
Southbound	0.1	A	0.2	A	0.1	A	0.2	A	0.1	A	0.2	A				
<b>5. Georgia Avenue &amp; Fairmont Street, NW (North)</b>																
<b>Overall</b>	15.1	B	8.4	A	16.2	B	9.6	A	14.1	B	8.8	A	<b>NO MITIGATIONS</b>			
Northbound	3.1	A	4.6	A	3.1	A	5.7	A	2.8	A	4.4	A				
Southbound	20.9	C	13.6	B	23.3	C	14.9	B	20.5	C	14.4	B				
<b>6. Georgia Avenue &amp; Fairmont Street, NW (South)</b>																
<b>Overall</b>	2.7	A	7.2	A	2.6	A	7.1	A	2.4	A	5.7	A	<b>NO MITIGATIONS</b>			
Westbound	37.6	D	38.2	D	37.8	D	38.5	D	37.5	D	36.1	D				
Northbound	2.1	A	8.3	A	1.9	A	8.5	A	1.6	A	7.7	A				
Southbound	0.9	A	0.5	A	0.9	A	0.6	A	0.9	A	0.5	A				
<b>7. Fairmont Street &amp; 6th Street, NW</b>																
Westbound	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	<b>NO MITIGATIONS</b>			
Northbound	9.4	A	10.6	B	9.4	A	10.7	B	9.0	A	9.2	A				
<b>8. Georgia Avenue &amp; Euclid Street, NW</b>																
<b>Overall</b>	9.2	A	10.8	B	10.4	B	11.0	B	9.6	A	10.1	B	<b>NO MITIGATIONS</b>			
Eastbound	31.0	C	37.0	D	31.2	C	37.5	D	30.6	C	36.1	D				
Northbound	10.1	B	10.3	B	11.1	B	11.3	B	11.0	B	11.0	B				
Southbound	6.2	A	3.1	A	7.6	A	3.3	A	6.5	A	2.8	A				
<b>9. Georgia Avenue &amp; Howard Place, NW</b>																
<b>Overall</b>	8.4	A	4.7	A	9.6	A	5.5	A	7.8	A	5.2	A	<b>NO MITIGATIONS</b>			
Northbound	4.8	A	3.4	A	4.1	A	3.6	A	4.1	A	3.7	A				

Intersection and Approach	Existing (2019)				Background (2030)				Future (2030)				Future (2030) with Mitigations			
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Southbound	10.0	B	6.0	A	12.5	B	7.4	A	9.9	A	6.8	A				
<b>10. 6th Street &amp; Howard Place, NW</b>																
Eastbound	11.5	B	17.1	C	11.5	B	17.2	C	9.8	A	9.5	A	<b>NO MITIGATIONS</b>			
Westbound	11.3	B	12.6	B	11.4	B	12.6	B	9.7	A	9.1	A				
<b>11. 5th Street/4th Street &amp; Howard Place, NW</b>																
<b>Overall</b>	<b>9.1</b>	<b>A</b>	<b>10.8</b>	<b>B</b>	<b>9.2</b>	<b>A</b>	<b>10.8</b>	<b>B</b>	<b>11.4</b>	<b>B</b>	<b>11.2</b>	<b>B</b>	<b>NO MITIGATIONS</b>			
Eastbound	43.1	D	40.2	D	43.1	D	40.2	D	53.8	D	41.1	D				
Westbound	44.5	D	49.4	D	44.5	D	49.4	D	46.2	D	53.5	D				
Northbound	4.6	A	5.8	A	4.7	A	5.8	A	4.3	A	6.7	A				
Southbound	8.5	A	6.0	A	8.6	A	6.0	A	9.4	A	6.6	A				
<b>12. Sherman Avenue &amp; Barry Place, NW</b>																
<b>Overall</b>	<b>15.4</b>	<b>B</b>	<b>19.8</b>	<b>B</b>	<b>16.5</b>	<b>B</b>	<b>21.7</b>	<b>C</b>	<b>17.0</b>	<b>B</b>	<b>23.0</b>	<b>C</b>	<b>NO MITIGATIONS</b>			
Eastbound	30.5	C	37.8	D	31.4	C	44.3	D	31.8	C	48.9	D				
Westbound	32.0	C	25.3	C	35.3	D	28.0	C	36.8	D	28.4	C				
Northbound	9.7	A	14.1	B	9.7	A	14.4	B	9.7	A	14.4	B				
Southbound	11.2	B	12.6	B	11.3	B	12.8	B	11.3	B	12.8	B				
<b>13. Georgia Avenue &amp; Barry Place, NW</b>																
<b>Overall</b>	<b>34.3</b>	<b>C</b>	<b>27.0</b>	<b>C</b>	<b>45.7</b>	<b>D</b>	<b>53.4</b>	<b>D</b>	<b>67.8</b>	<b>E</b>	<b>32.4</b>	<b>C</b>	<b>46.1</b>	<b>D</b>	<b>32.4</b>	<b>C</b>
Eastbound	39.8	D	100.1	F	51.8	D	182.4	F	50.9	D	57.0	E	50.1	D	39.7	D
Northbound	11.4	B	4.7	A	12.0	B	6.0	A	10.1	B	6.9	A	11.3	B	10.6	B
Southbound	45.2	D	25.8	C	63.2	E	53.9	D	101.1	F	51.2	D	63.0	E	51.2	D
<b>14. 6th Street &amp; College Street, NW</b>																
Westbound	7.7	A	7.6	A	7.7	A	7.6	A	7.7	A	7.6	A	<b>NO MITIGATIONS</b>			
Southbound	7.6	A	7.7	A	7.7	A	7.7	A	7.6	A	7.7	A				
<b>15. 4th Street &amp; College Street, NW</b>																
<b>Overall</b>	<b>5.0</b>	<b>A</b>	<b>7.6</b>	<b>A</b>	<b>5.0</b>	<b>A</b>	<b>7.6</b>	<b>A</b>	<b>9.5</b>	<b>A</b>	<b>114.8</b>	<b>F</b>	<b>NO MITIGATIONS</b>		<b>35.3</b>	<b>D</b>
Eastbound	36.3	D	39.7	D	36.3	D	39.7	D	52.5	D	525.8	F			<b>86.0</b>	<b>F</b>
Westbound	35.3	D	34.7	C	35.3	D	34.7	C	35.3	D	34.6	C			18.7	B
Northbound	1.3	A	5.4	A	1.2	A	5.5	A	2.9	A	5.9	A			25.5	C
Southbound	5.9	A	5.6	A	6.0	A	5.6	A	6.2	A	6.2	A			17.0	B
<b>16. Georgia Avenue &amp; Bryant Street, NW</b>																
<b>Overall</b>	<b>13.2</b>	<b>B</b>	<b>12.7</b>	<b>B</b>	<b>12.7</b>	<b>B</b>	<b>13.1</b>	<b>B</b>	<b>15.6</b>	<b>B</b>	<b>31.5</b>	<b>C</b>	<b>NO MITIGATIONS</b>		<b>24.5</b>	<b>C</b>
Eastbound	--	--	--	--	34.4	C	34.9	C	34.5	C	35.4	D			32.4	C
Westbound	--	--	--	--	--	--	--	--	--	--	--	--			52.1	D
Northbound	23.0	C	19.9	B	20.9	C	20.3	C	17.3	B	37.3	D			23.2	C
Southbound	6.1	A	4.4	A	6.0	A	4.3	A	13.8	B	23.5	C			18.6	B
<b>17. 6th Street &amp; Bryant Street, NW</b>																
Eastbound	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	<b>NO MITIGATIONS</b>			
Westbound	--	--	--	--	--	--	--	--	--	--	--	--				
Northbound	9.5	A	12.1	B	9.7	A	12.4	B	11.4	B	11.9	B				

Intersection and Approach	Existing (2019)				Background (2030)				Future (2030)				Future (2030) with Mitigations			
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Southbound	12.2	B	23.0	C	12.8	B	24.8	C	15.7	C	16.4	C				
<b>18. 4th Street &amp; Bryant Street, NW</b>																
Overall	21.8	C	24.0	C	23.8	C	28.0	C	34.5	C	41.9	D	30.7	C	26.3	C
Eastbound	55.8	E	60.2	E	50.0	D	69.4	E	96.6	F	111.6	F	54.0	D	52.9	D
Westbound	46.4	D	28.0	C	58.8	E	34.9	C	51.1	D	39.9	D	30.0	C	54.1	D
Northbound	3.4	A	1.6	A	3.4	A	1.6	A	4.7	A	2.0	A	19.1	B	2.3	A
Southbound	11.3	B	14.6	B	11.6	B	14.7	B	12.1	B	21.1	C	25.9	C	17.7	B
<b>19. Georgia Avenue &amp; W Street, NW</b>																
Overall	27.6	C	10.4	B	17.9	B	12.4	B	28.2	C	90.2	F	24.9	C	15.3	B
Eastbound	23.3	C	29.5	C	--	--	--	--	--	--	--	--	--	--	--	--
Westbound	50.2	D	24.6	C	57.1	E	49.3	D	86.1	F	248.6	F	56.5	E	40.5	D
Northbound	19.1	B	10.1	B	9.2	A	5.5	A	10.6	B	4.2	A	10.4	B	8.9	A
Southbound	22.6	C	3.3	A	5.8	A	2.2	A	4.9	A	1.7	A	19.5	B	5.8	A
<b>20. 6th Street &amp; W Street, NW</b>																
Eastbound	--	--	--	--	--	--	--	--	--	--	--	--				
Westbound	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A				
Southbound	11.7	B	11.9	B	11.7	B	12.1	B	12.8	B	17.3	C				
<b>21. 4th Street &amp; W Street, NW</b>																
Overall	22.5	C	36.6	D	22.9	C	37.7	D	18.0	B	34.2	C				
Eastbound	--	--	--	--	--	--	--	--	--	--	--	--				
Northbound	45.5	D	37.8	D	46.0	D	38.5	D	39.4	D	29.5	C				
Southbound	13.3	B	35.3	D	13.7	B	36.9	D	10.0	B	37.9	D				
<b>22. Georgia Avenue &amp; V Street/HU Hospital, NW</b>																
Overall	25.0	C	15.6	B	71.0	E	35.4	D	135.8	F	60.2	E	20.8	C	26.9	C
Eastbound	31.9	C	48.1	D	40.2	D	145.5	F	35.0	C	66.6	E	52.6	D	105.4	F
Westbound	30.9	C	32.6	C	31.0	C	32.8	C	0.0	A	0.0	A	0.0	A	0.0	A
Northbound	20.7	C	9.0	A	156.0	F	16.6	B	308.1	F	116.3	F	27.5	C	21.4	C
Southbound	25.7	C	10.0	B	37.0	D	12.3	B	43.8	D	15.4	B	13.2	B	9.3	A
<b>23. Georgia Ave NW &amp; HU Hospital</b>																
Northbound	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A				
Southbound	0.8	A	1.3	A	1.0	A	1.7	A	0.0	A	0.0	A				
<b>24. Georgia Avenue/7th Street &amp; Florida Avenue, NW</b>																
Overall	31.1	C	36.9	D	35.2	D	47.1	D	37.3	D	63.0	E			46.8	D
Eastbound	21.9	C	27.5	C	22.6	C	27.8	C	22.6	C	28.5	C			26.0	C
Westbound	31.4	C	44.2	D	33.8	C	54.6	D	39.0	D	78.1	E			50.6	D
Northbound	69.4	E	57.2	E	87.9	F	91.0	F	90.9	F	95.0	F			85.9	F
Southbound	21.3	C	22.5	C	23.3	C	25.0	C	23.3	C	50.3	D			34.2	C
<b>25. Georgia Avenue &amp; Gresham Place, NW</b>																
Westbound	88.7	F	27.1	D	121.7	F	27.5	D	85.9	F	21.3	C				
Northbound	0.0	A	0.1	A	0.0	A	0.1	A	0.0	A	0.1	A				

Intersection and Approach	Existing (2019)				Background (2030)				Future (2030)				Future (2030) with Mitigations			
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Southbound	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A				
<b>26. 10th Street/Barry Place &amp; Florida Avenue, NW</b>																
Eastbound	9.1	A	9.6	A	9.2	A	9.7	A	9.3	A	9.8	A	<b>NO MITIGATIONS</b>			
Westbound	9.9	A	9.6	A	10.1	B	9.9	A	10.4	B	10.1	B				
Northbound	10.2	B	10.2	B	10.3	B	10.4	B	10.4	B	10.5	B				
Southbound	9.8	A	11.0	B	9.9	A	11.2	B	10.0	B	11.7	B				
<b>27. 9th Street &amp; Barry Place, NW</b>																
Eastbound	7.6	A	7.9	A	8.3	A	8.5	A	8.6	A	8.9	A	<b>NO MITIGATIONS</b>			
Westbound	8.0	A	8.1	A	8.5	A	8.7	A	8.6	A	9.1	A				
Northbound	9.3	A	8.5	A	9.8	A	8.9	A	10.0	A	9.2	A				
Southbound	8.4	A	9.3	A	8.8	A	9.9	A	8.9	A	10.4	B				
<b>28. 4th Street &amp; V Street, NW</b>																
Eastbound	9.8	A	11.9	B	9.8	A	11.9	B	9.2	A	10.8	B	<b>NO MITIGATIONS</b>			
Westbound	11.1	B	10.0	A	11.2	B	10.0	A	10.8	B	9.3	A				
Northbound	13.0	B	15.5	C	13.1	B	15.7	C	12.5	B	13.6	B				
Southbound	15.0	B	12.1	B	15.3	C	12.2	B	13.5	B	11.3	B				
<b>29. 5th Street &amp; Oakdale Place, NW</b>																
Northbound	14.3	B	10.9	B	14.3	B	10.9	B	10.0	B	9.4	A	<b>NO MITIGATIONS</b>			
Southbound	12.7	B	11.7	B	12.7	B	11.7	B	9.5	A	9.7	A				
<b>30. 5th Street &amp; V Street, NW</b>																
Eastbound	8.3	A	7.9	A	8.3	A	7.9	A	0.0	A	0.0	A	<b>NO MITIGATIONS</b>			
Westbound	8.4	A	8.8	A	8.4	A	8.8	A	7.7	A	8.0	A				
Northbound	8.8	A	8.2	A	8.8	A	8.2	A	7.9	A	7.6	A				
Southbound	8.4	A	8.0	A	8.4	A	8.0	A	7.9	A	7.6	A				

**Table 24: Queuing Results (2030)**

Intersection and Lane Group	Storage Length (ft)	Existing (2019)				Background (2030)				Future (2030)				Future (2030) with Mitigations			
		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
		50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th
<b>1. Georgia Avenue &amp; Harvard Street, NW</b>																	
Eastbound Left	60	16	41	21	47	16	41	21	47	16	40	21	47	17	41	<b>NO MITIGATIONS</b>	
Eastbound TR	760	118	167	136	187	124	175	144	196	123	172	140	191	126	176		
Northbound TR	100	87	120	258	342	111	151	317	421	121	162	333	432	114	153		
Southbound LT	200	298	402	128	180	342	465	176	246	~543	#680	206	298	~475	#665		
<b>2. Harvard Street &amp; 5th Street, NW</b>																	
Eastbound TR	630	206	272	280	360	241	313	331	#422	273	355	358	#488	277	360	<b>NO MITIGATIONS</b>	
Westbound Left	315	633	#1064	143	263	651	#1082	146	267	~727	#1122	155	282	~686	#1112		
Northbound Right	150	7	50	123	265	15	62	136	284	22	75	175	354	22	75		
Southbound LT	90	2	11	2	11	2	11	2	11	2	11	2	11	2	11		
<b>3. Georgia Avenue &amp; Girard Street, NW (North)</b>																	
Eastbound LR	760	--	3	--	21	--	4	--	22	--	3	--	18	<b>NO MITIGATIONS</b>			
Northbound LT	100	--	3	--	1	--	3	--	2	--	3	--	1				
Southbound TR	130	--	0	--	0	--	0	--	0	--	0	--	0				
<b>4. Georgia Avenue &amp; Girard Street, NW (South)</b>																	
Eastbound LTR	300	--	2	--	2	--	2	--	2	--	2	--	2	<b>NO MITIGATIONS</b>			
Northbound LTR	165	--	0	--	0	--	0	--	0	--	0	--	0				
Southbound LTR	100	--	1	--	1	--	1	--	1	--	1	--	1				
<b>5. Georgia Avenue &amp; Fairmont Street, NW (North)</b>																	
Northbound LT	80	27	31	38	37	28	31	52	48	25	32	48	37	<b>NO MITIGATIONS</b>			
Southbound TR	100	387	486	163	210	443	558	210	266	412	510	212	264				
<b>6. Georgia Avenue &amp; Fairmont Street, NW (South)</b>																	
Westbound LR	260	20	63	49	104	22	66	53	111	19	61	22	64	<b>NO MITIGATIONS</b>			
Northbound Thru	160	11	28	87	151	11	28	93	188	11	24	87	101				
Southbound Thru	80	2	3	1	1	3	3	1	1	3	3	1	1				
<b>7. Fairmont Street &amp; 6th Street, NW</b>																	
Westbound Thru	360	--	0	--	0	--	0	--	0	--	0	--	0	<b>NO MITIGATIONS</b>			
Northbound Left	860	--	7	--	19	--	8	--	20	--	6	--	10				
<b>8. Georgia Avenue &amp; Euclid Street, NW</b>																	
Eastbound Left	500	60	106	129	203	61	108	138	216	59	104	127	198	<b>NO MITIGATIONS</b>			
Eastbound Right	25	10	42	19	53	15	49	21	56	5	37	14	42				
Northbound Thru	610	90	120	150	191	125	164	187	237	130	167	188	236				
Southbound Thru	160	60	70	32	41	65	100	36	44	63	73	26	33				
<b>9. Georgia Avenue &amp; Howard Place, NW</b>																	
Northbound TR	430	47	62	42	m75	54	66	66	m90	58	69	83	m78	<b>NO MITIGATIONS</b>			
Southbound LT	610	222	302	99	132	273	383	143	191	238	318	133	175				
<b>10. 6th Street &amp; Howard Place, NW</b>																	
Eastbound LTR	260	--	26	--	39	--	26	--	40	--	19	--	16	<b>NO MITIGATIONS</b>			
Westbound LTR	715	--	13	--	7	--	14	--	7	--	10	--	3				



Intersection and Lane Group	Storage Length (ft)	Existing (2019)				Background (2030)				Future (2030)				Future (2030) with Mitigations				
		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		
		50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	
<b>11. 5th Street/4th Street &amp; Howard Place, NW</b>																		
Eastbound LTR	1900	12	40	4	21	12	40	4	21	45	96	6	29	<b>NO MITIGATIONS</b>				
Westbound LTR	715	15	43	42	92	15	43	42	92	15	44	43	95					
Northbound LTR	425	20	76	45	88	20	78	44	87	30	81	113	m172					
Southbound LTR	1650	185	265	63	89	188	268	64	90	219	313	89	121					
<b>12. Sherman Avenue &amp; Barry Place, NW</b>														<b>NO MITIGATIONS</b>				
Eastbound LTR	120	71	125	184	292	84	143	203	#353	93	155	220	#386					
Westbound LT	230	87	151	60	107	113	190	90	155	125	208	98	167					
Westbound Right	100	0	23	0	17	0	25	0	21	0	24	0	25					
Northbound Left	110	4	13	8	22	4	13	8	22	4	13	8	22					
Northbound Thru	315	68	108	142	210	75	117	154	227	75	117	154	227					
Northbound Right	100	0	13	0	19	0	17	2	24	0	17	2	24					
Southbound Left	95	8	20	13	32	9	22	18	40	11	26	19	43					
Southbound TR	1100	135	175	84	115	140	181	90	122	140	181	90	121					
<b>13. Georgia Avenue &amp; Barry Place, NW</b>																		
Eastbound LR	240	57	115	156	#324	115	#217	~257	#434	124	#228	131	#250		--	--	--	--
Eastbound Left	240	--	--	--	--	--	--	--	--	--	--	--	--		94	#164	93	159
Eastbound Right	100	--	--	--	--	--	--	--	--	--	--	--	--		0	42	0	39
Northbound Left	125	15	m20	3	m3	20	m30	3	m4	8	m11	6	m6		12	m15	9	m13
Northbound Thru	280	79	m112	38	m51	84	m126	44	m67	90	m133	61	m62		263	m235	106	m143
Southbound Thru	430	~722	#969	435	#697	~810	#1049	~691	#938	~938	#1194	~674	#917		~826	#1089	~674	#917
Southbound Right	430	4	m18	0	16	7	m32	4	25	7	m21	4	24		13	m64	4	24
<b>14. 6th Street &amp; College Street, NW</b>														<b>NO MITIGATIONS</b>				
Westbound Left	705	--	--	--	--	--	--	--	--	--	--	--	--					
Southbound LT	425	--	--	--	--	--	--	--	--	--	--	--	--					
<b>15. 4th Street &amp; College Street, NW</b>														<b>NO MITIGATIONS</b>				
Eastbound LTR	705	6	26	20	56	6	26	20	56	43	#121	~299	#440		180	#337		
Westbound LTR	290	1	9	2	13	1	9	2	13	1	9	2	13		1	9		
Northbound LTR	295	6	5	78	m131	5	m5	90	m128	18	m6	124	m128		184	m#386		
Southbound LTR	420	103	123	72	94	104	124	73	95	95	117	95	122	148	187			
<b>16. Georgia Avenue &amp; Bryant Street, NW</b>														<b>NO MITIGATIONS</b>				
Eastbound LTR		--	--	--	--	10	34	16	48	9	32	14	45		14	43		
Westbound LTR		--	--	--	--	--	--	--	--	--	--	--	--		97	m40		
Northbound Thru	285	97	#687	164	#702	395	#715	395	#770	382	#573	~644	m#939		478	#796		
Northbound Right	100	8	m27	24	m41	12	m27	26	m44	54	98	53	m75		48	m80		
Southbound Left	125	4	m3	1	m2	5	m4	3	m3	61	m36	~89	m85		61	m61		
Southbound Thru	280	33	m29	6	m11	52	m36	25	m22	51	m35	13	m10	17	m24			
<b>17. 6th Street &amp; Bryant Street, NW</b>														<b>NO MITIGATIONS</b>				
Eastbound TR	260	--	0	--	0	--	0	--	0	--	0	--	0					
Westbound LT		--	--	--	--	--	--	--	--	--	--	--	--					

Intersection and Lane Group	Storage Length (ft)	Existing (2019)				Background (2030)				Future (2030)				Future (2030) with Mitigations			
		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
		50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th
Northbound Right	315	--	0	--	6	--	0	--	7	--	1	--	6				
Northbound LR	315	--	--	--	--	--	--	--	--	--	--	--	--				
Southbound LT	300	--	19	--	42	--	21	--	47	--	28	--	25				
Southbound LTR	300	--	--	--	--	--	--	--	--	--	--	--	--				
<b>18. 4th Street &amp; Bryant Street, NW</b>																	
Eastbound LTR	700	103	177	242	#438	107	#205	256	#470	~217	m#324	~345	m#480	--	--	--	--
Eastbound LT	700	--	--	--	--	--	--	--	--	--	--	--	--	170	254	244	m#407
Eastbound Right	75	--	--	--	--	--	--	--	--	--	--	--	--	7	m45	0	m20
Westbound LR	830	72	#177	23	79	89	#222	54	132	93	#216	63	#159	--	--	--	--
Westbound LTR	830	--	--	--	--	--	--	--	--	--	--	--	--	79	160	70	#196
Northbound TR	295	0	m0	0	m0	0	m0	0	m0	0	1	0	0	--	--	--	--
Northbound LTR	295	--	--	--	--	--	--	--	--	--	--	--	--	229	317	4	5
Southbound LT	295	150	189	75	206	152	192	76	207	184	235	292	m311	--	--	--	--
Southbound LTR	295	--	--	--	--	--	--	--	--	--	--	--	--	388	#594	143	m226
<b>19. Georgia Avenue &amp; W Street, NW</b>																	
Eastbound LR	235	0	0	0	0	--	--	--	--	--	--	--	--	--	--	--	--
Westbound Left	300	99	m170	71	m120	118	m199	90	m157	~208	#377	~421	#616	146	m#275	119	m#241
Westbound TR	190	--	--	--	--	24	m93	10	m85	31	101	82	#270	32	m84	47	130
Westbound Right	190	21	m78	4	m39	--	--	--	--	--	--	--	--	--	--	--	--
Northbound Thru	360	204	230	120	328	195	m155	136	m181	245	m149	159	m114	201	m222	229	m230
Southbound Thru	280	76	#873	35	52	70	m70	9	14	29	m70	8	13	354	m#452	89	129
<b>20. 6th Street &amp; W Street, NW</b>																	
Eastbound LT		--	--	--	--	--	--	--	--	--	--	--	--				
Westbound Thru	350	--	0	--	0	--	0	--	0	--	0	--	0				
Westbound TR	350	--	--	--	--	--	--	--	--	--	--	--	--				
Southbound Right	300	--	14	--	15	--	14	--	15	--	17	--	43				
Southbound LR	300	--	--	--	--	--	--	--	--	--	--	--	--				
<b>21. 4th Street &amp; W Street, NW</b>																	
Eastbound LTR		--	--	--	--	--	--	--	--	--	--	--	--				
Northbound LTR	300	181	#283	306	#480	183	#292	311	#489	162	252	264	376				
Southbound LT	300	182	270	182	m285	190	m278	189	m287	166	m218	174	m257				
Southbound Right	105	8	m15	28	m59	7	m18	36	m64	1	m5	83	m125				
<b>22. Georgia Avenue &amp; V Street/HU Hospital, NW</b>																	
Eastbound LTR	215	41	87	104	#199	90	168	~239	#415	59	122	160	#314	72	#153	~173	#345
Westbound LT	170	59	107	51	97	59	107	51	98	0	0	0	0	0	0	0	0
Westbound Right	170	0	16	0	30	0	16	0	30	0	0	0	0	0	0	0	0
Northbound LT	430	201	m274	135	m153	~504	m#599	173	m172	~697	m#733	~673	m#611	336	m387	194	m194
Northbound Right	115	0	m1	0	m0	0	m1	0	m0	0	0	0	0	0	0	0	0
Southbound LT	360	563	m#806	142	223	~758	m#1009	218	298	~801	m#985	366	m347	432	m666	226	287
Southbound Right	150	3	m2	2	16	5	m13	6	20	11	m21	26	m34	3	m2	3	m12

Intersection and Lane Group	Storage Length (ft)	Existing (2019)				Background (2030)				Future (2030)				Future (2030) with Mitigations					
		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak			
		50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th		
<b>23. Georgia Ave NW &amp; HU Hospital</b>																			
Northbound TR	195	--	0	--	0	--	0	--	0	--	0	--	0	<b>NO MITIGATIONS</b>					
Southbound LT	190	--	2	--	4	--	2	--	5	--	0	--	0						
<b>24. Georgia Avenue/7th Street &amp; Florida Avenue, NW</b>																			
Eastbound TR	225	101	141	149	200	115	158	161	214	115	158	164	219	<b>NO MITIGATIONS</b>					
Westbound TR	160	275	357	324	#444	303	392	379	#517	342	#475	-443	#564					156	207
Northbound TR	150	218	#386	271	#451	246	#438	-367	#563	-252	#444	-376	#572					-367	#563
Southbound Left	100	96	m103	86	119	119	m123	102	m171	143	m139	-216	m#371					134	m#259
Southbound Thru	430	152	m158	202	236	190	m196	207	m254	162	m158	176	m284					195	m253
Southbound Right	160	4	m6	5	m16	5	m5	2	m11	5	m6	0	m13					2	m11
<b>25. Georgia Avenue &amp; Gresham Place, NW</b>																			
Westbound LTR	630	--	241	--	63	--	285	--	65	--	259	--	83	<b>NO MITIGATIONS</b>					
Northbound LT	130	--	0	--	1	--	0	--	1	--	0	--	1						
Southbound TR	100	--	0	--	0	--	0	--	0	--	0	--	0						
<b>26. 10th Street/Barry Place &amp; Florida Avenue, NW</b>																			
Eastbound LTR	400	--	--	--	--	--	--	--	--	--	--	--	--	<b>NO MITIGATIONS</b>					
Westbound LTR	125	--	--	--	--	--	--	--	--	--	--	--	--						
Northbound LTR	215	--	--	--	--	--	--	--	--	--	--	--	--						
Southbound Left	150	--	--	--	--	--	--	--	--	--	--	--	--						
Southbound TR	225	--	--	--	--	--	--	--	--	--	--	--	--						
<b>27. 9th Street &amp; Barry Place, NW</b>																			
Eastbound LTR	230	--	--	--	--	--	--	--	--	--	--	--	--	<b>NO MITIGATIONS</b>					
Westbound LTR	225	--	--	--	--	--	--	--	--	--	--	--	--						
Northbound LTR	200	--	--	--	--	--	--	--	--	--	--	--	--						
Southbound LTR	1115	--	--	--	--	--	--	--	--	--	--	--	--						
<b>28. 4th Street &amp; V Street, NW</b>																			
Eastbound LTR	300	--	--	--	--	--	--	--	--	--	--	--	--	<b>NO MITIGATIONS</b>					
Westbound LTR	820	--	--	--	--	--	--	--	--	--	--	--	--						
Northbound LTR	120	--	--	--	--	--	--	--	--	--	--	--	--						
Southbound LTR	300	--	--	--	--	--	--	--	--	--	--	--	--						
<b>29. 5th Street &amp; Oakdale Place, NW</b>																			
Northbound TR	250	--	39	--	14	--	39	--	14	--	19	--	10	<b>NO MITIGATIONS</b>					
Southbound LT	130	--	13	--	23	--	13	--	23	--	5	--	12						
<b>30. 5th Street &amp; V Street, NW</b>																			
Eastbound LTR	200	--	--	--	--	--	--	--	--	--	--	--	--	<b>NO MITIGATIONS</b>					
Westbound LTR	300	--	--	--	--	--	--	--	--	--	--	--	--						
Northbound LTR	130	--	--	--	--	--	--	--	--	--	--	--	--						
Southbound LTR	250	--	--	--	--	--	--	--	--	--	--	--	--						

# 95th percentile volume exceeds capacity, queue may be longer.  
m Volume for 95th percentile queue is metered by upstream signal.  
~ Volume exceeds capacity, queue is theoretically infinite.

**Table 25: LOS Results (2035)**

Intersection and Approach		Future (2035)			
		AM Peak		PM Peak	
		Delay	LOS	Delay	LOS
1.	<b>Georgia Avenue &amp; Harvard Street, NW</b>				
	<b>Overall</b>	<b>49.6</b>	<b>D</b>	<b>28.7</b>	<b>C</b>
	Eastbound	31.7	C	24.3	C
	Northbound	10.4	B	26.9	C
	Southbound	79.9	E	34.8	C
2.	<b>Harvard Street &amp; 5th Street, NW</b>				
	<b>Overall</b>	<b>82.7</b>	<b>F</b>	<b>40.6</b>	<b>D</b>
	Eastbound	45.3	D	56.1	E
	Westbound	134.1	F	25.6	C
	Northbound	16.7	B	27.1	C
	Southbound	56.3	E	56.3	E
3.	<b>Georgia Avenue &amp; Girard Street, NW (North)</b>				
	Eastbound	17.4	C	10.9	B
	Northbound	0.4	A	0.2	A
	Southbound	0.0	A	0.0	A
4.	<b>Georgia Avenue &amp; Girard Street, NW (South)</b>				
	Eastbound	26.4	D	18.9	C
	Northbound	0.0	A	0.0	A
	Southbound	0.1	A	0.2	A
5.	<b>Georgia Avenue &amp; Fairmont Street, NW (North)</b>				
	<b>Overall</b>	<b>14.5</b>	<b>B</b>	<b>9.8</b>	<b>A</b>
	Northbound	2.8	A	5.6	A
	Southbound	21.5	C	15.2	B
6.	<b>Georgia Avenue &amp; Fairmont Street, NW (South)</b>				
	<b>Overall</b>	<b>2.4</b>	<b>A</b>	<b>5.6</b>	<b>A</b>
	Westbound	37.7	D	36.3	D
	Northbound	1.5	A	7.4	A
	Southbound	0.9	A	0.6	A
7.	<b>Fairmont Street &amp; 6th Street, NW</b>				
	Westbound	0.0	A	0.0	A
	Northbound	9.1	A	9.3	A
8.	<b>Georgia Avenue &amp; Euclid Street, NW</b>				
	<b>Overall</b>	<b>10.2</b>	<b>B</b>	<b>10.4</b>	<b>B</b>
	Eastbound	30.6	C	36.1	D
	Northbound	11.6	B	12.0	B
	Southbound	7.2	A	3.1	A
9.	<b>Georgia Avenue &amp; Howard Place, NW</b>				
	<b>Overall</b>	<b>8.3</b>	<b>A</b>	<b>5.4</b>	<b>A</b>
	Northbound	4.1	A	3.4	A



Intersection and Approach	Future (2035)			
	AM Peak		PM Peak	
	Delay	LOS	Delay	LOS
Southbound	10.8	B	7.5	A
<b>10. 6th Street &amp; Howard Place, NW</b>				
Eastbound	9.8	A	9.5	A
Westbound	9.7	A	9.1	A
<b>11. 5th Street/4th Street &amp; Howard Place, NW</b>				
<b>Overall</b>	<b>11.9</b>	<b>B</b>	<b>11.3</b>	<b>B</b>
Eastbound	53.8	D	41.1	D
Westbound	46.2	D	53.5	D
Northbound	5.9	A	7.2	A
Southbound	9.9	A	7.4	A
<b>12. Sherman Avenue &amp; Barry Place, NW</b>				
<b>Overall</b>	<b>17.4</b>	<b>B</b>	<b>23.5</b>	<b>C</b>
Eastbound	32.2	C	51.3	D
Westbound	36.4	D	28.1	C
Northbound	9.7	A	14.4	B
Southbound	11.3	B	13.0	B
<b>13. Georgia Avenue &amp; Barry Place, NW</b>				
<b>Overall</b>	<b>77.5</b>	<b>E</b>	<b>53.5</b>	<b>D</b>
Eastbound	60.1	E	89.1	F
Northbound	11.3	B	14.1	B
Southbound	120.1	F	85.0	F
<b>14. 6th Street &amp; College Street, NW</b>				
Westbound	7.7	A	7.6	A
Southbound	7.6	A	7.7	A
<b>15. 4th Street &amp; College Street, NW</b>				
<b>Overall</b>	<b>9.4</b>	<b>A</b>	<b>104.5</b>	<b>F</b>
Eastbound	52.5	D	525.8	F
Westbound	35.3	D	34.6	C
Northbound	3.2	A	6.3	A
Southbound	6.5	A	7.3	A
<b>16. Georgia Avenue &amp; Bryant Street, NW</b>				
<b>Overall</b>	<b>32.9</b>	<b>C</b>	<b>73.1</b>	<b>E</b>
Eastbound	34.5	C	35.4	D
Westbound	--	--	--	--
Northbound	27.6	C	86.8	F
Southbound	37.6	D	56.1	E
<b>17. 6th Street &amp; Bryant Street, NW</b>				
Eastbound	0.0	A	0.0	A
Westbound	--	--	--	--
Northbound	11.5	B	12.0	B