

FIGURE 5: BIKE TRAIL (EXISTING AND PROPOSED)

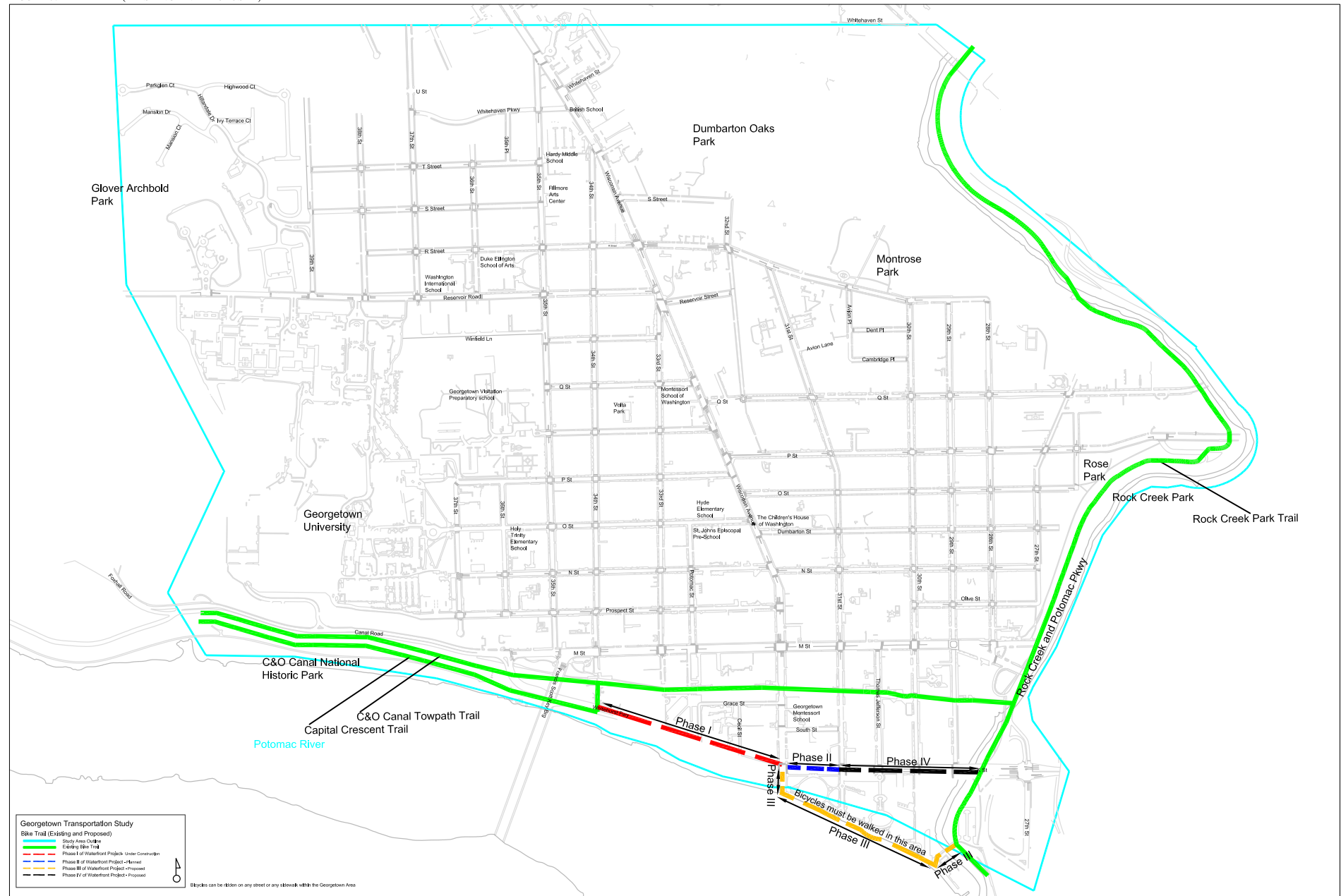


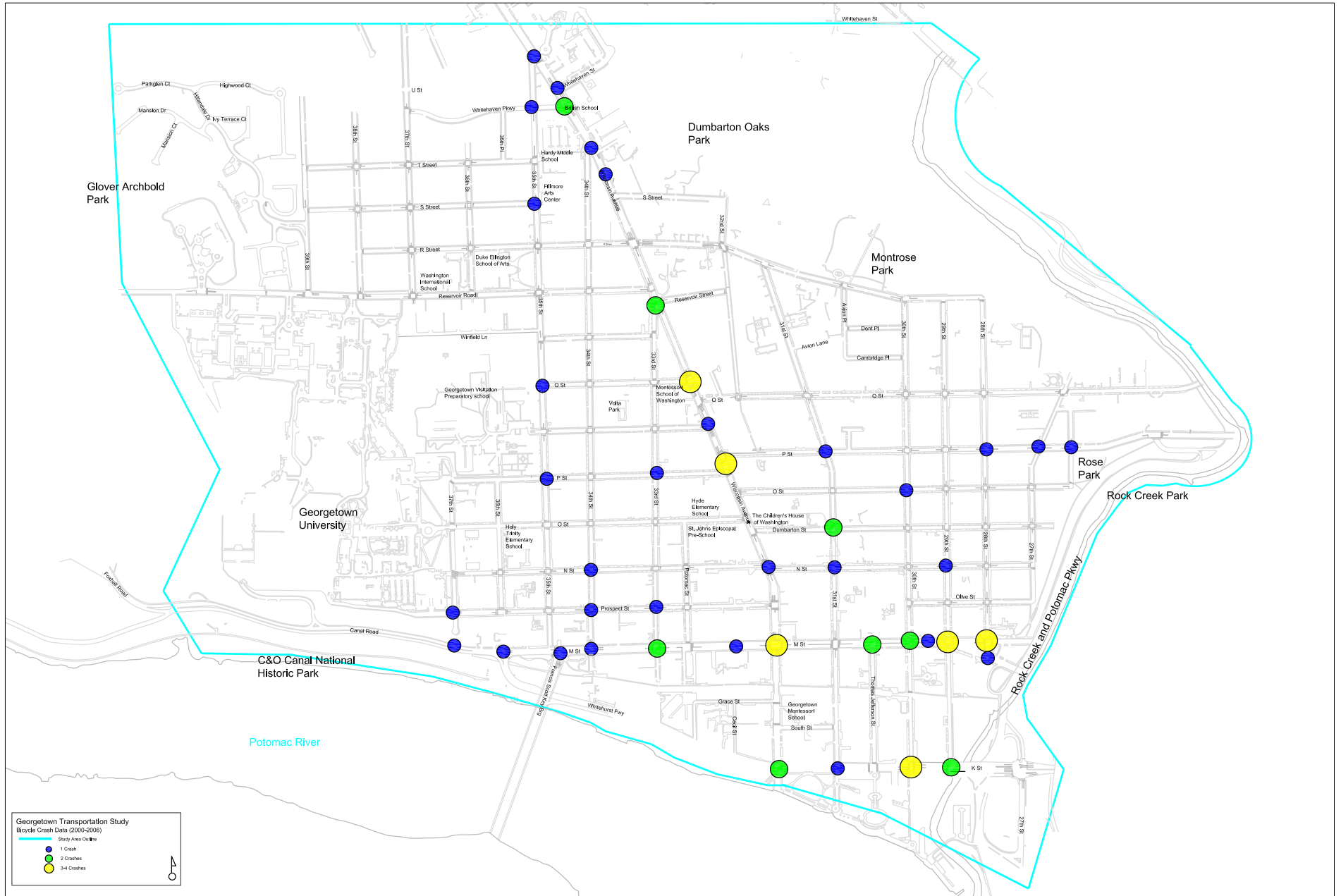
FIGURE 6A: PEAK HOUR PEDESTRIAN/BIKE VOLUME DATA



FIGURE 6B: PEAK HOUR PEDESTRIAN/BIKE VOLUME DATA



FIGURE 7: BICYCLE CRASH DATA





## PEDESTRIAN FACILITIES

Segments of Georgetown have a lot of pedestrian activity due to the close proximity of retail and commercial developments, good transit service, and the presence of Georgetown University. To assist in determining the level of pedestrian activity as well as deficiencies in the pedestrian infrastructure, surveys and assessments were completed. These included:

1. Pedestrian Volumes
2. Sidewalk Assessment
3. Curb Ramp Assessment (for wheelchairs, strollers, persons with impaired vision, etc.)
4. Signs, Road Markings and Signals
5. Pedestrian Crash Assessment

### *Pedestrian Volumes*

To assess the level of pedestrian activity as well as related pedestrian deficiencies in the infrastructure the project team collected pedestrian volumes at 25 locations throughout the study area. The data was collected during the morning and afternoon peak periods on an average weekday as well as from 2:00 to 8:00 PM on Saturdays. The peak hour pedestrian volumes are shown in **Figure 6A and Figure 6B**. The volumes measured pedestrians crossing the intersection at all corners. The following high pedestrian activity corridors emerged:

- **M Street** – The intersection of M Street and Wisconsin Avenue is the focal point of Georgetown with peak hour pedestrian volumes from just under 1,000 pedestrians (average weekday) to well over 3,300 pedestrian per hour on Saturdays. In fact, there are twice as many pedestrians as vehicles on M Street (east of Wisconsin) on weekends.
- **Wisconsin Avenue** – Peak hour pedestrian volumes along Wisconsin Avenue are high. The large pedestrian volumes at the intersection of M Street and Wisconsin Avenue are related to the crossing of two commercial corridors.
- **P Street (between 31<sup>st</sup> and 35<sup>th</sup> Street)** – This area of P Street serves as a major east-west pedestrian corridor between Wisconsin Avenue and Georgetown University, and connects the Georgetown area to the Dupont Circle retail area and Metro station. West of Wisconsin the pedestrian activity is greater during the weekday averaging approximately 50-75 pedestrian per peak hour. On weekends P Street east of Wisconsin Avenue sees an increase of over 300 percent in pedestrian activity due to its proximity to the lower Wisconsin Avenue and M Street commercial area.
- **Reservoir Road (between 35<sup>th</sup> and 39<sup>th</sup> Street)** – The increased pedestrian volumes in this segment of Reservoir Road on weekdays is related to student activity to/from Georgetown University Hospital and local schools.
- **35<sup>th</sup> Street (between P Street and M Street)** – The high pedestrian volumes along this segment of 35<sup>th</sup> Street are related to student activity from Georgetown University, the Holy Trinity Elementary School, and direct access to M Street and the Key Bridge.
- **K Street** – K Street facilitates pedestrian traffic along the waterfront as well as provides Georgetown with walking access to metro-rail across 27<sup>th</sup> Street. As a result north-south streets like Wisconsin Avenue, 30<sup>th</sup> Street and Thomas Jefferson Street have higher than average pedestrian traffic (over 100 pedestrians per hour). As commercial activities continue to grow and the parks and recreational area just south of K Street are completed, these north-south streets will see increased pedestrian traffic.



**M STREET AND WISCONSIN AVENUE**



**K STREET ENVIRONMENT**

As expected, these high pedestrian activity corridors are along routes that lead to or include schools, universities, commercial areas and access to the adjacent metro-rail stations.

## ***Pedestrian Crash Data***

The pedestrian crash data from 2000 to 2006 were plotted by the number of crashes as shown in [Figure 8](#). The crash analysis part of the overall report analyzes the data for the past three years (2004-2006); however, because pedestrian crashes are rare events the project team thought it best to analyze a larger sample of data (2000-2006) to discern any patterns/trends. There were over 80 reported pedestrian crashes within the study area in this time period of which approximately 40 percent resulted in injury. In analyzing the crash data, the following critical corridors emerge:

- M Street
- Prospect Street from 37<sup>th</sup> Street to 34<sup>th</sup> Street
- Reservoir Road from 35<sup>th</sup> Street to 39<sup>th</sup> Street
- Wisconsin Avenue from Whitehaven Parkway to Reservoir Road
- 35<sup>th</sup> Street between Reservoir Road and Q street
- P Street between 28<sup>th</sup> and 31<sup>st</sup> Streets

The crash frequencies throughout the study area are greater along streets with high pedestrian activity, high deficiencies, and a large number of conflicts between pedestrians and vehicles.

## ***Sidewalk Assessment***

An assessment was carried out to determine the sidewalk width as well as other major deficiencies that impede pedestrian travel such as the absence of sidewalks. [Figure 9](#) shows the sidewalk width, missing sidewalks, and brick and/or concrete covered sidewalks. Generally, the study area has a good network of sidewalks with less than one percent of sidewalks either missing or less than four feet wide; four foot wide sidewalks are considered as the minimum acceptable for wheelchair passage.

Brick sidewalks account for over 80 percent of all sidewalks in the study area. However, approximately 30 to 40 percent of the brick sidewalks are in need of repairs or are deficient in other ways. The sidewalks found to be deficient are shown in [Figure 10](#). The deficiencies were classified into three categories:

- General deficiencies – sidewalk that is somewhat accessible but uneven as shown in figure to the right
- Elevated – sidewalk which is elevated by ¼-inch or more which fits the definition of inaccessible. Pedestrians who use wheelchairs have difficulty in maneuvering over sidewalks that have areas that are raised by more than ¼-inch.
- No sidewalk



**COMMON BRICK SIDEWALK  
DETERIORATION**

Overall, there is a good network of sidewalks within the study area. [Appendix B](#) shows the sidewalks, roads, and alleyways scheduled for construction improvements within the 2008-2009 construction years (NOTE: Some improvements listed in [Appendix B](#) have been implemented to date).

## ***Curb Ramp Assessment (for wheelchairs, strollers, persons with impaired vision, etc)***

The curb ramp assessment is particularly important in ensuring that the Georgetown area is accessible to all pedestrians regardless of any disability. Curb ramps are essential to providing sidewalk access to users and others with impaired mobility. The assessment as shown in [Figure 11](#) classified the curb ramp into four categories:

1. Curb Ramp Only
2. Curb Ramp with ADA tactile warning tiles
3. Curb Ramp with brick pattern slope
4. No Curb Ramp

The assessment indicated that curb ramps were present at over 95 percent of all intersections within the study area. Curb ramps should provide some level of contrast; the brick pattern on the curb ramp (observed on about five percent of all ramps) does not achieve this. The brick pattern hinders the ability to distinguish between different surfaces (brick sidewalk and adjoining brick pattern sidewalk) which provide valuable information to vision impaired pedestrians in guiding them safely. The assessment also indicated that as



**CURB RAMP WITH ADA  
TACTILE WARNING TILES**

much as 90 percent of all curb ramps do not have any tactile warnings (see previous figure). A tactile warning is a raised surface located at the base of a ramp that serves to inform pedestrians who are vision impaired that they are about to enter the roadway. While the study area has a good network of sidewalks, these obstacles still make access difficult for all pedestrians regardless of physical ability.

**Signs, Road Markings and Signals**

To assist in assessing the deficiencies in the pedestrian environment, an inventory of pedestrian signs, road markings and pedestrian signals was completed. These are presented in [Figure 12A](#), [Figure 12B](#), [Figure 12C](#), and [Figure 12D](#). Schools within the study area have advanced school warning signs and crosswalks with the exception of Hyde Elementary School, Georgetown Visitation Preparatory School, and Georgetown University access points on 37<sup>th</sup> Street. In addition, the streets around Rose and Volta Parks are deficient in pedestrian signing and road marking.

Most signalized intersections do include pedestrian signals with count-downs as shown in figure to the right. However, a few signalized intersections do not have any pedestrian signals at all, such as:

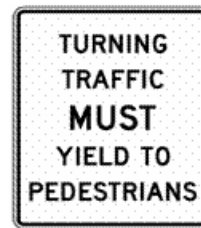
- 28<sup>th</sup> Street and P Street
- 30<sup>th</sup> Street and P Street
- 33<sup>rd</sup> Street and Q Street



**TYPICAL COUNT DOWN PEDESTRIAN SIGNAL**

Pedestrian count-down signals facilitate pedestrians crossing and make for safer usage of crosswalks. Safety is enhanced because the count-down gives a clear indication of when the traffic signals will turn green, reducing the likelihood of a pedestrian crossing on a flashing red-hand signal and either obstructing traffic or getting caught between moving streams.

Currently DDOT has proposed the use of MUTCD R10-15 (see picture to the right) for use at certain intersections. If the proposed signage as shown is approved, this signage could replace some of the proposed pedestrian crosswalk signage as shown in [Figure 12 A-D](#).



Current MUTCD R10-15



Proposed MUTCD R10-15

**Pedestrian Activity and/or Deficiency:**

To assess the pedestrian needs in the infrastructure the Study Team prioritized streets based on the combination of their pedestrian volumes and their deficiencies in pedestrian infrastructure. These were rated high, medium, and low as shown in [Figure 13](#). The categories are consistent with the methodology used in the District of Columbia Draft Pedestrian Master Plan and are summarized as follows:

- High – High pedestrian activity and deficiency corridors are usually found around generators such as universities, schools, commercial areas, metro-rail access routes and where the existing infrastructure does not support the pedestrian demand. These high pedestrian priority corridors include:
  - M Street
  - Wisconsin Avenue
  - K Street
  - Segments of 35<sup>th</sup> Street and Reservoir Road
- Medium – Medium pedestrian activity and deficiency corridors are usually found around pedestrian generators such as parks and high density residential developments and where the existing infrastructure support to some extent the pedestrian demand but significant deficiencies still exist. These medium pedestrian priority corridors include:
  - 33<sup>rd</sup> Street
  - Prospect Street
  - Segments of P, Q, and 35<sup>th</sup> Street
- Low – Low pedestrian activity and deficiency corridors are usually routes that are used by pedestrians to access schools, parks, etc. The existing infrastructure generally supports the level of pedestrian activity but can be improved. These low pedestrian priority corridors include:
  - 28<sup>th</sup> Street
  - 30<sup>th</sup> Street
  - Segments of P Street, Reservoir Road and 34<sup>th</sup> Street



**HIGH PEDESTRIAN ACTIVITY ON M STREET**

This assessment helps to prioritize pedestrian demand within the study area with the need for good road infrastructure.





FIGURE 9: SIDEWALK ASSESSMENT

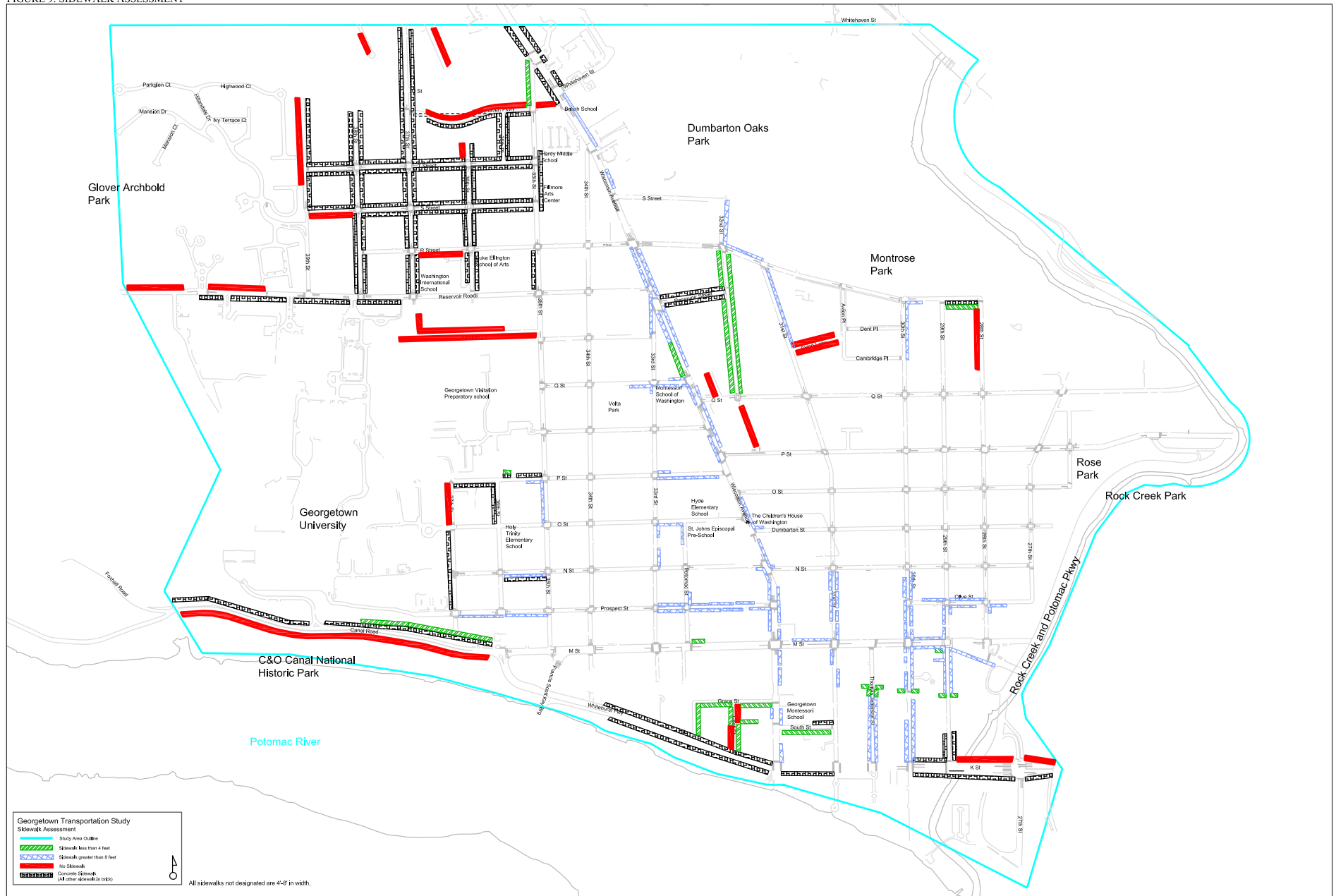




FIGURE 10: SIDEWALK DEFICIENCIES

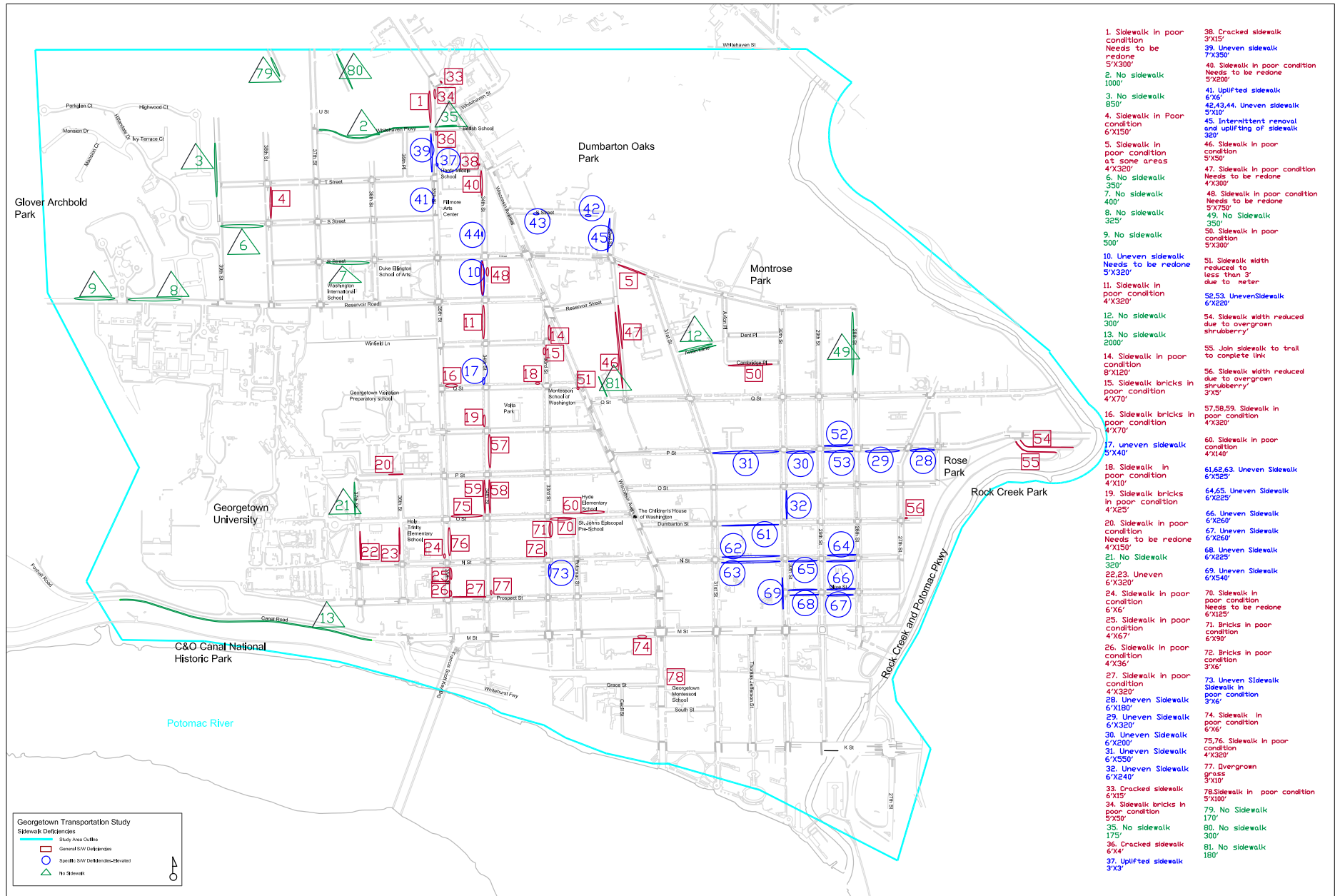


FIGURE 11: CURB RAMP ASSESSMENT

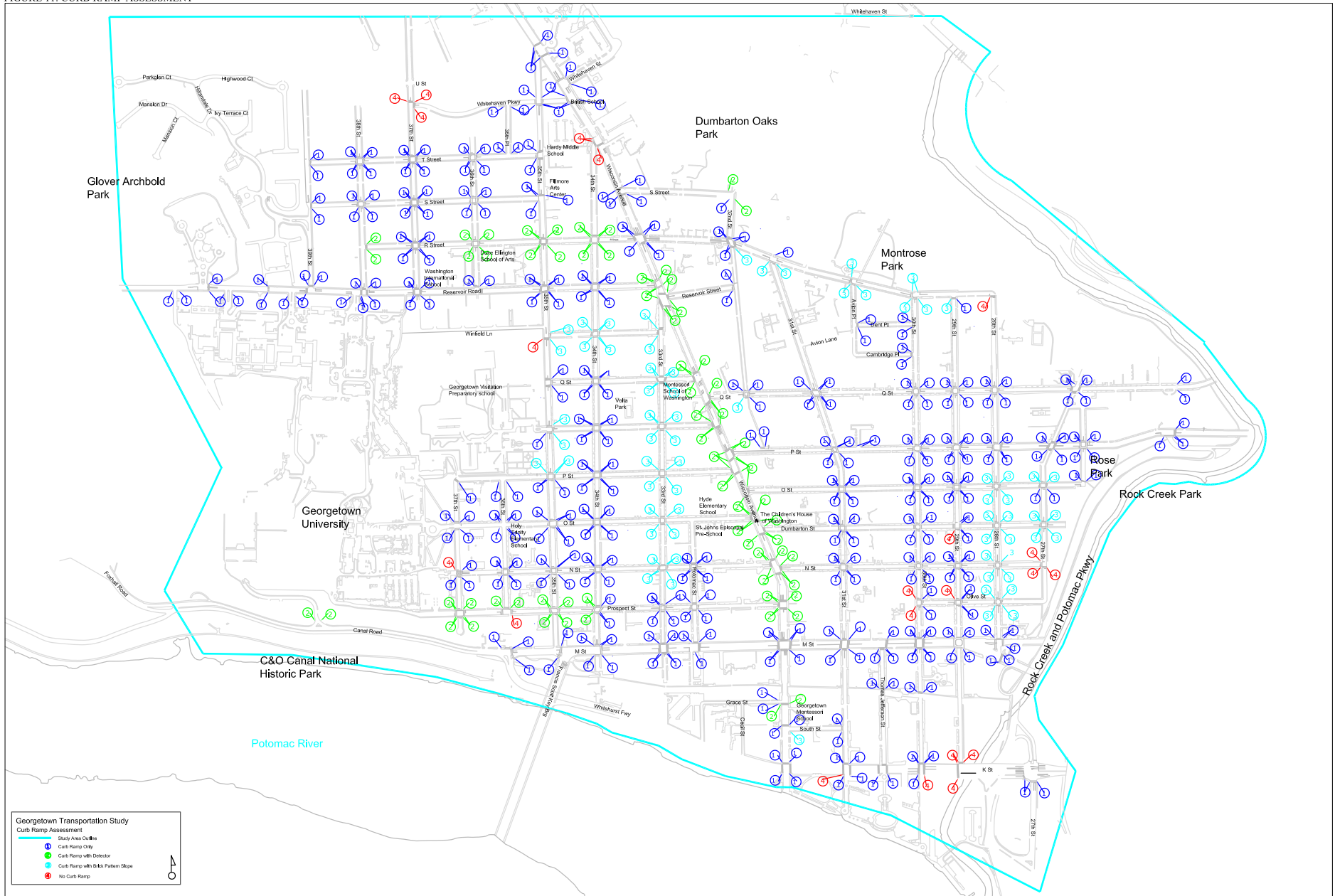
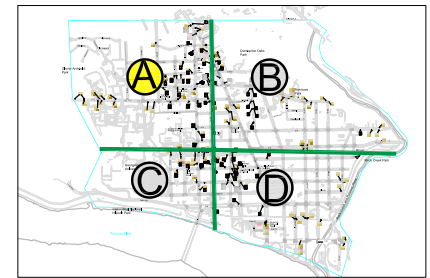
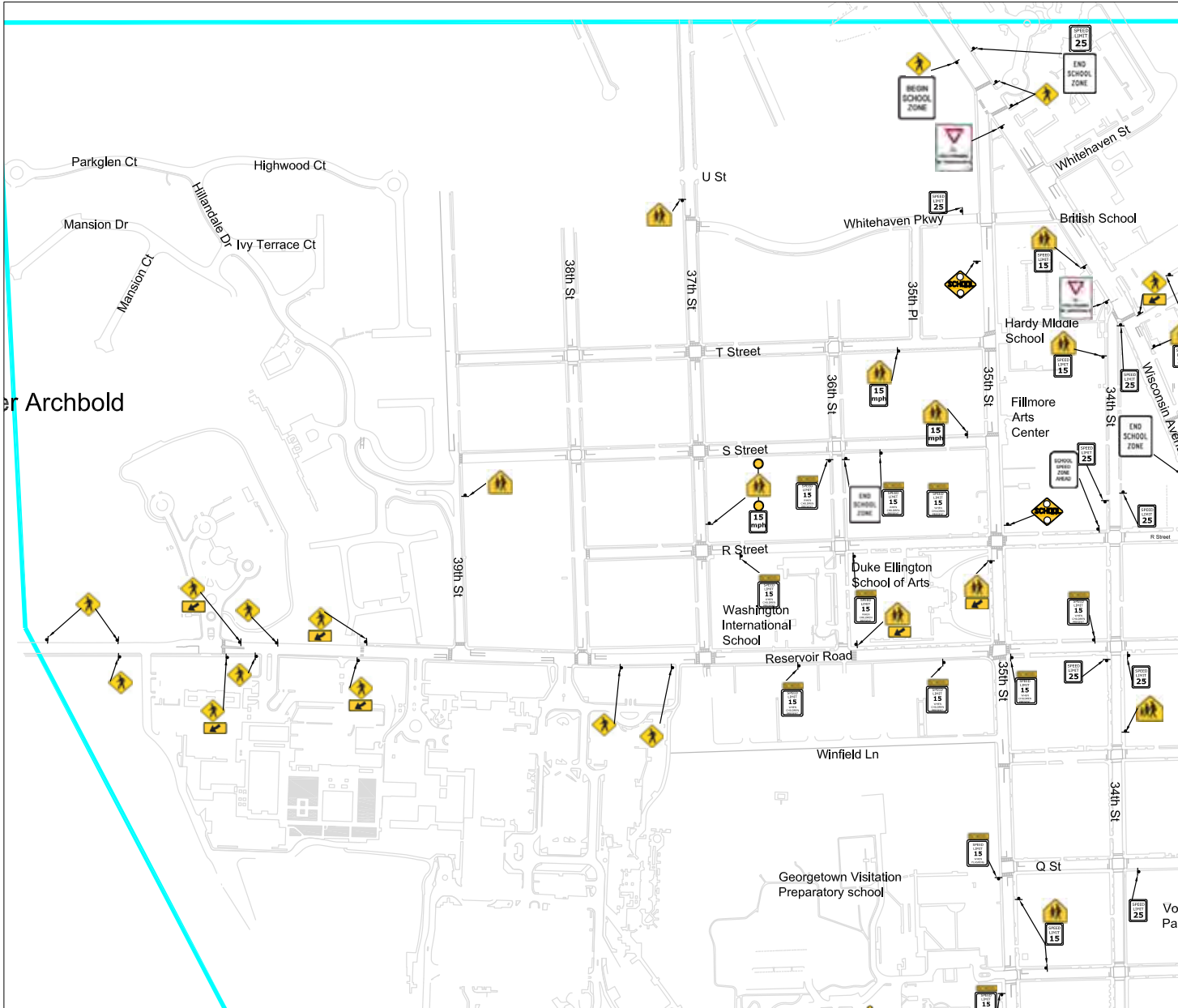


FIGURE 12A: SIGN INVENTORY (PEDESTRIAN AND BIKE RELATED)



Georgetown Transportation Study

Sign Inventory (Pedestrian and School Related)

Study Area Outline

FIGURE 12C: SIGN INVENTORY (PEDESTRIAN AND BIKE RELATED)

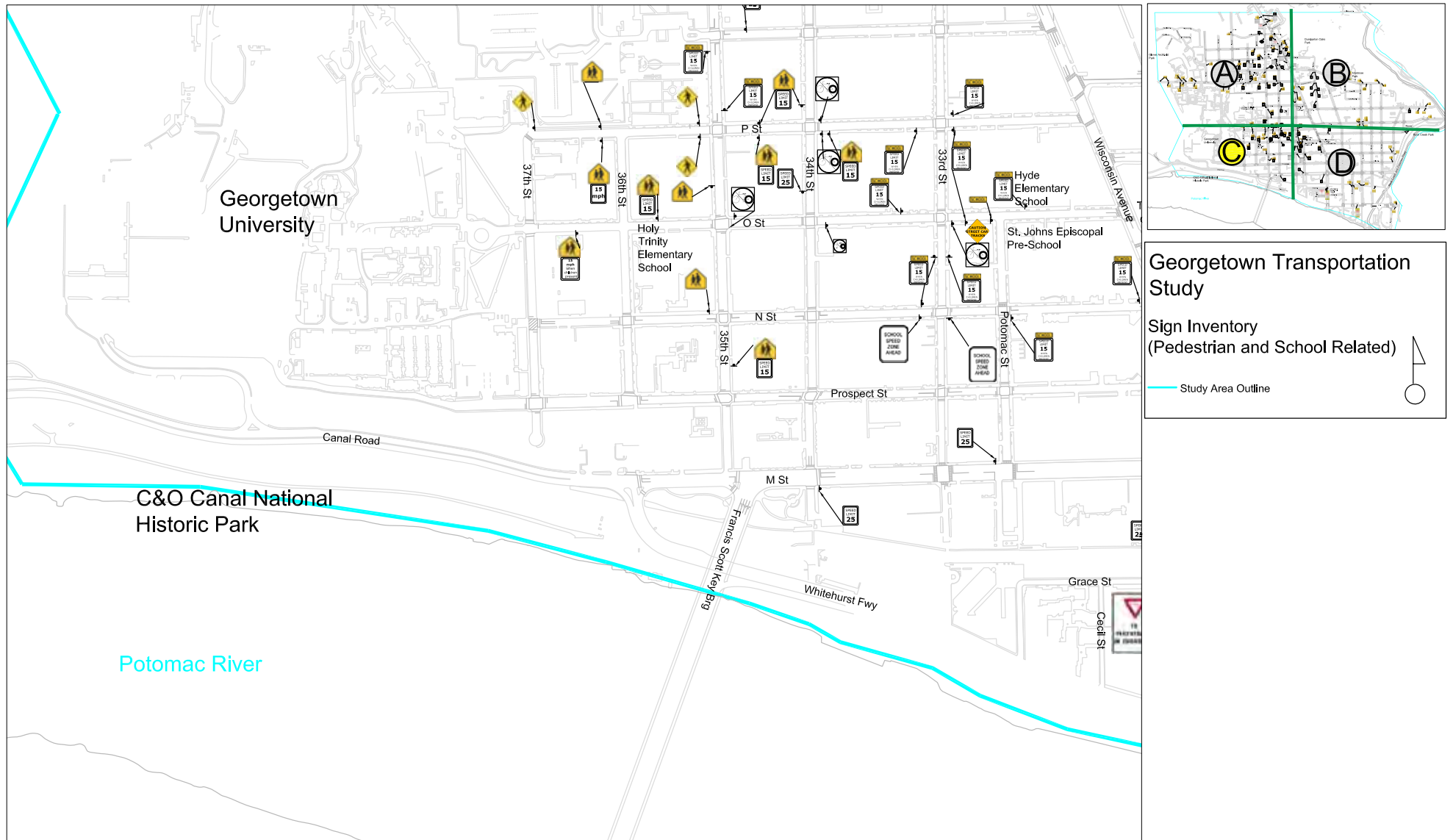


FIGURE 12B: SIGN INVENTORY (PEDESTRIAN AND BIKE RELATED)

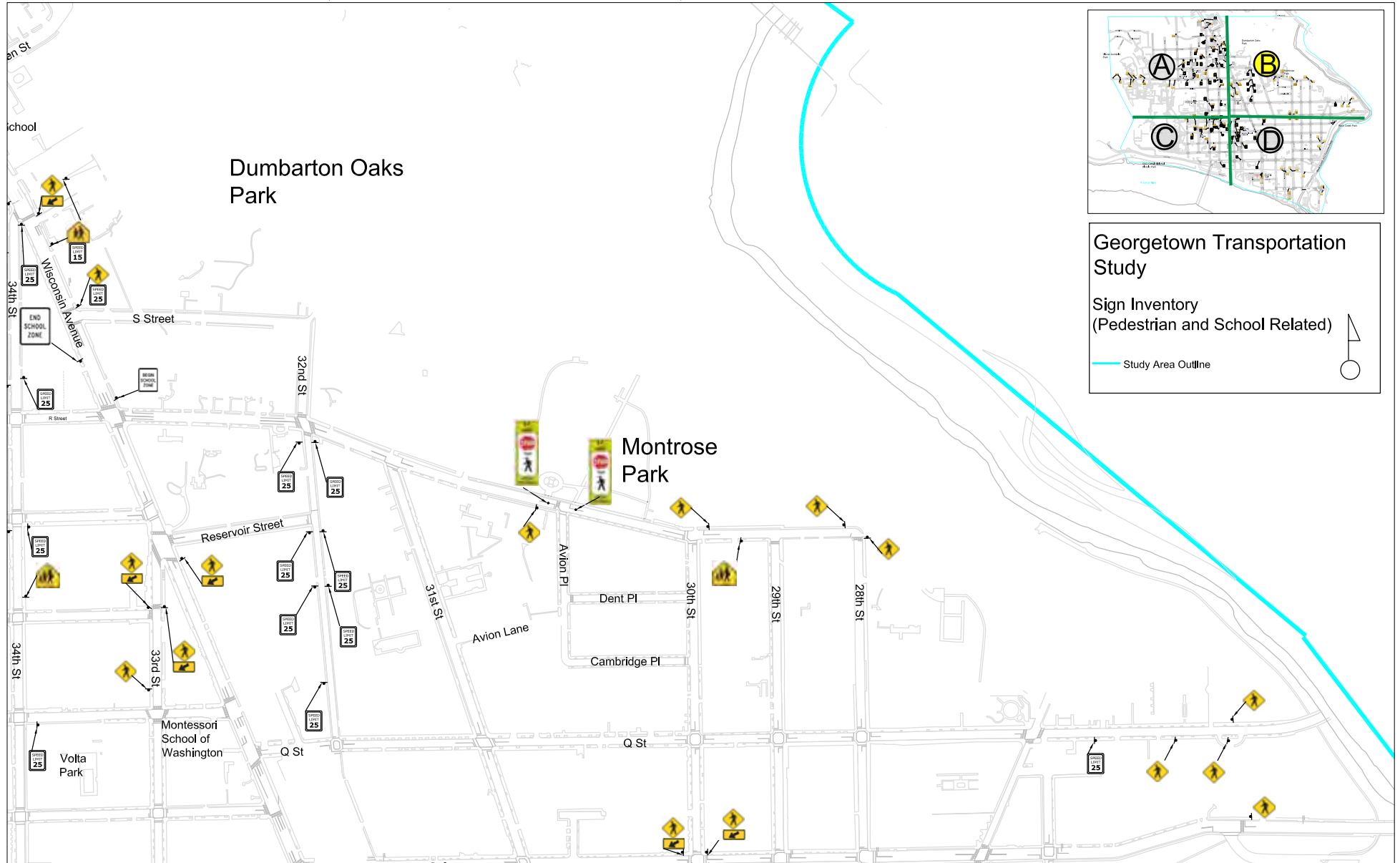
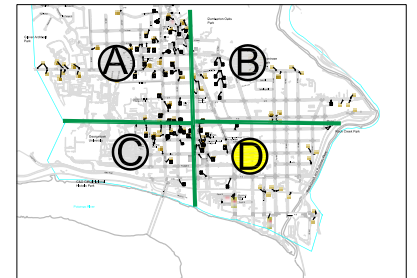
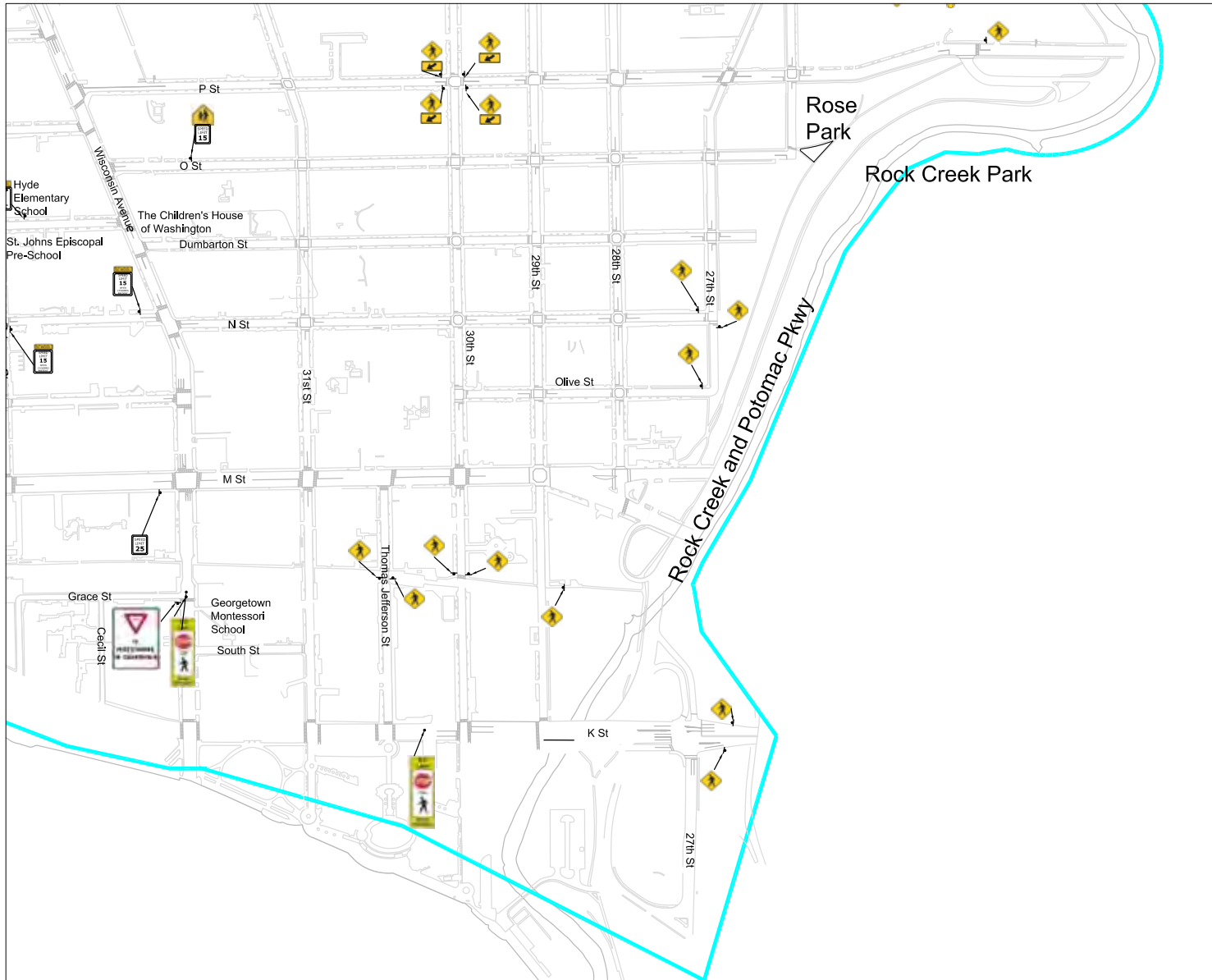




FIGURE 12D: SIGN INVENTORY (PEDESTRIAN AND BIKE RELATED)



Georgetown Transportation Study

Sign Inventory  
(Pedestrian and School Related)

— Study Area Outline


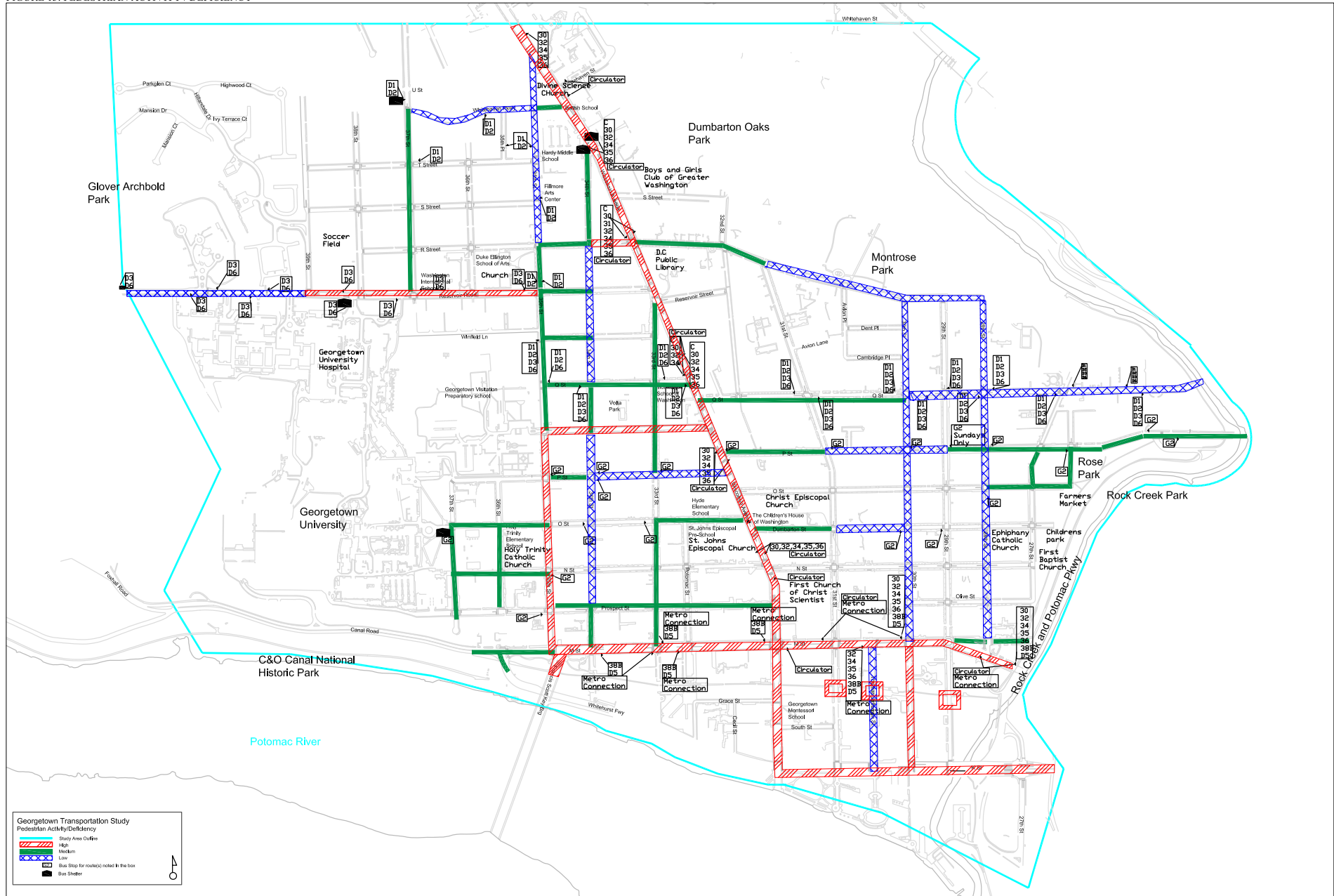




FIGURE 13: PEDESTRIAN ACTIVITY / DEFICIENCY





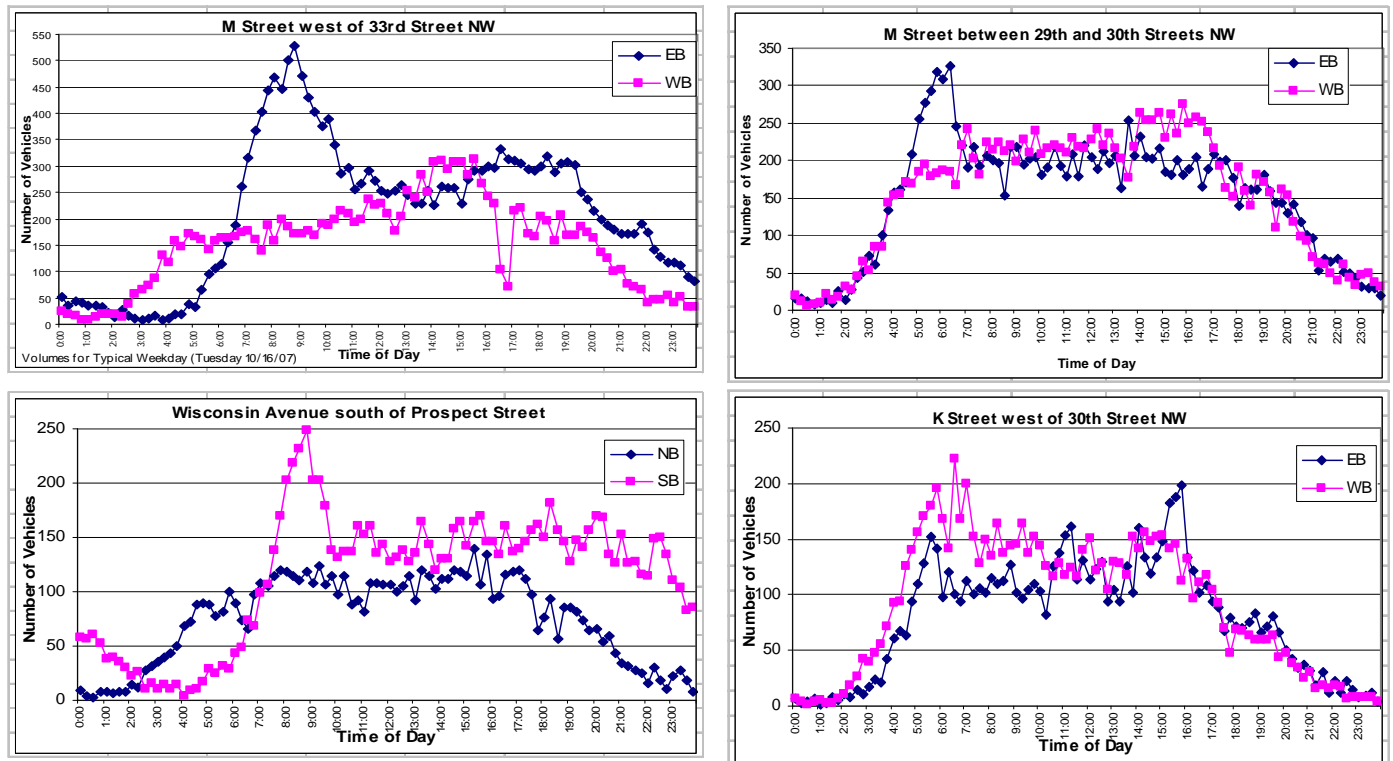
## TRAFFIC VOLUMES

In order to assess the peak hours in the southern commercial core area, the Study Team collected daily traffic volumes using automatic traffic recorders (ATR's) over a 4-day period. These counts were taken from Friday, October 12<sup>th</sup> to Wednesday, October 17<sup>th</sup> at the following locations:

- M Street west of 34<sup>th</sup> Street
- M Street between 29<sup>th</sup> and 30<sup>th</sup> Street
- Wisconsin Avenue south of Prospect
- K Street west of 30<sup>th</sup> Street

**Figure 14** shows the traffic volumes on a typical weekday (for this project that was Tuesday, October 16<sup>th</sup>, 2007) The AM peak volumes are higher than PM peak volumes because people have less flexibility in when they begin their workday. It should be noted that for most roadways in the Study Area, the PM peak period is longer than the AM peak period. The PM peak volumes are sustained for a longer period to take into account not only the influx and outflux of working individuals but also those seeking entertainment and dining options within the study area.

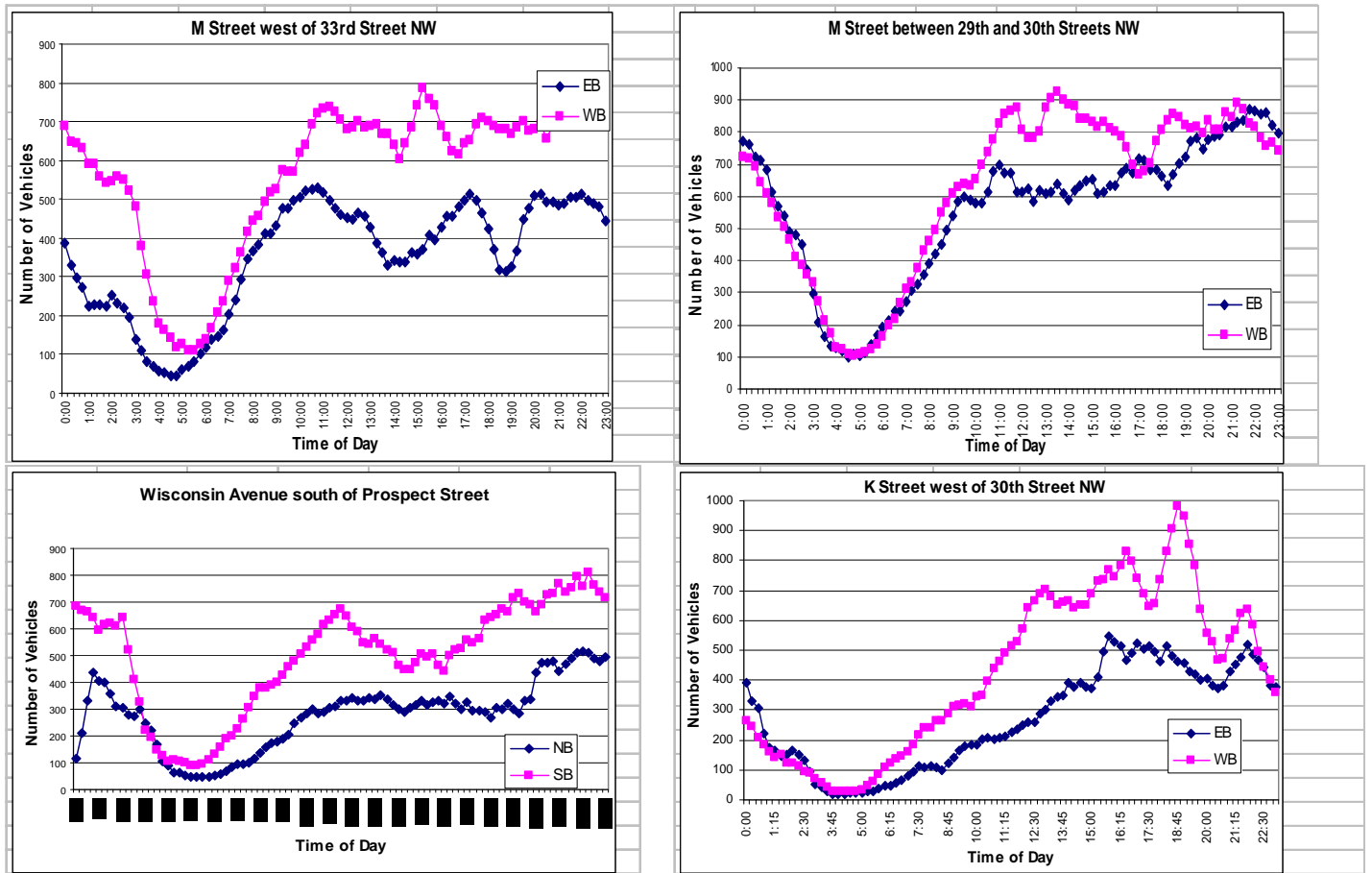
**FIGURE 14: WEEKDAY TRAFFIC VOLUMES ON M STREET, WISCONSIN AVENUE AND K STREET**



NOTE: The difference in NB and SB traffic on Wisconsin Avenue south of Prospect Street may be attributable to the imbalance in the number of lanes in the northbound and southbound directions

Because of the dual nature of Georgetown, serving as a residential and commercial core area, and one of the few connections between Virginia and DC, there was need to determine travel patterns on the weekend. As shown in **Figure 15**, traffic volumes fluctuate throughout the day on Saturday. The AM peak hour on Saturday occurs at approximately 11:00 AM with another peak in the afternoon and a third peak in the late evening. It should be noted that although the PM peak hour on Saturday for Wisconsin Avenue occurs at approximately 10:00 PM, the traffic volumes during this hour are not significantly different from the traffic volumes at 7:00 PM. The Saturday turning movement counts were taken between 2:00PM and 8:00 PM, capturing the majority of peak traffic on all three roadways.

**FIGURE 15: SATURDAY TRAFFIC VOLUMES ON M STREET, WISCONSIN AVENUE AND K STREET**



The Study Team collected available data on existing turning movement counts in the study area from previous studies. Twenty-five intersections (listed below) were studied further. [Figure 16](#) shows lane configurations at each of the intersections. The twenty-five intersections studied further (see [Figure 17](#)) included:

- |   |   |
|---|---|
| 1. K Street & Wisconsin Avenue                    | 14. P Street & 34 <sup>th</sup> Street                        |
| 2. K Street & Thomas Jefferson Street             | 15. P Street & 33 <sup>rd</sup> Street                        |
| 3. K Street & 29 <sup>th</sup> Street             | 16. P Street & 32 <sup>nd</sup> Street                        |
| 4. K Street & 27 <sup>th</sup> Street             | 17. P Street & 29 <sup>th</sup> Street                        |
| 5. Canal Street/Whitehurst Freeway                | 18. Q Street & 35 <sup>th</sup> Street                        |
| 6. M Street & Key Bridge                          | 19. Q Street & 32 <sup>nd</sup> Street                        |
| 7. M Street & 34 <sup>th</sup> Street             | 20. Q Street & 31 <sup>st</sup> Street                        |
| 8. M Street & 33 <sup>rd</sup> Street             | 21. Reservoir Road & 37 <sup>th</sup> Street                  |
| 9. M Street & Wisconsin Avenue                    | 22. Reservoir Road & 35 <sup>th</sup> Street                  |
| 10. M Street & Thomas Jefferson Street            | 23. Reservoir Road & 33 <sup>rd</sup> Street/Wisconsin Avenue |
| 11. Pennsylvania Avenue & 28 <sup>th</sup> Street | 24. R Street & 34 <sup>th</sup> Street                        |
| 12. N Street & 35 <sup>th</sup> Street            | 25. Wisconsin Avenue & 35 <sup>th</sup> Street                |
| 13. P Street & 35 <sup>th</sup> Street            |   |

Additionally, the Study Team manually counted turning movements at each of the selected intersections in the study area (See [Figure 18](#) for counts). At each of the intersections where vehicular counts were taken, the Study Team also counted pedestrians and bicycles crossing each of the intersection legs (shown in [Figure 6A](#) and [Figure 6B](#)). The manual turning movement counts were taken during the morning peak

period, 7:00-10:00 AM, and during the afternoon peak period, 4:00-7:00 PM, on a typical weekday (Tuesday, Wednesday or Thursday), as well as Saturday counts taken from 2:00-8:00 PM to capture the Saturday peak hour.

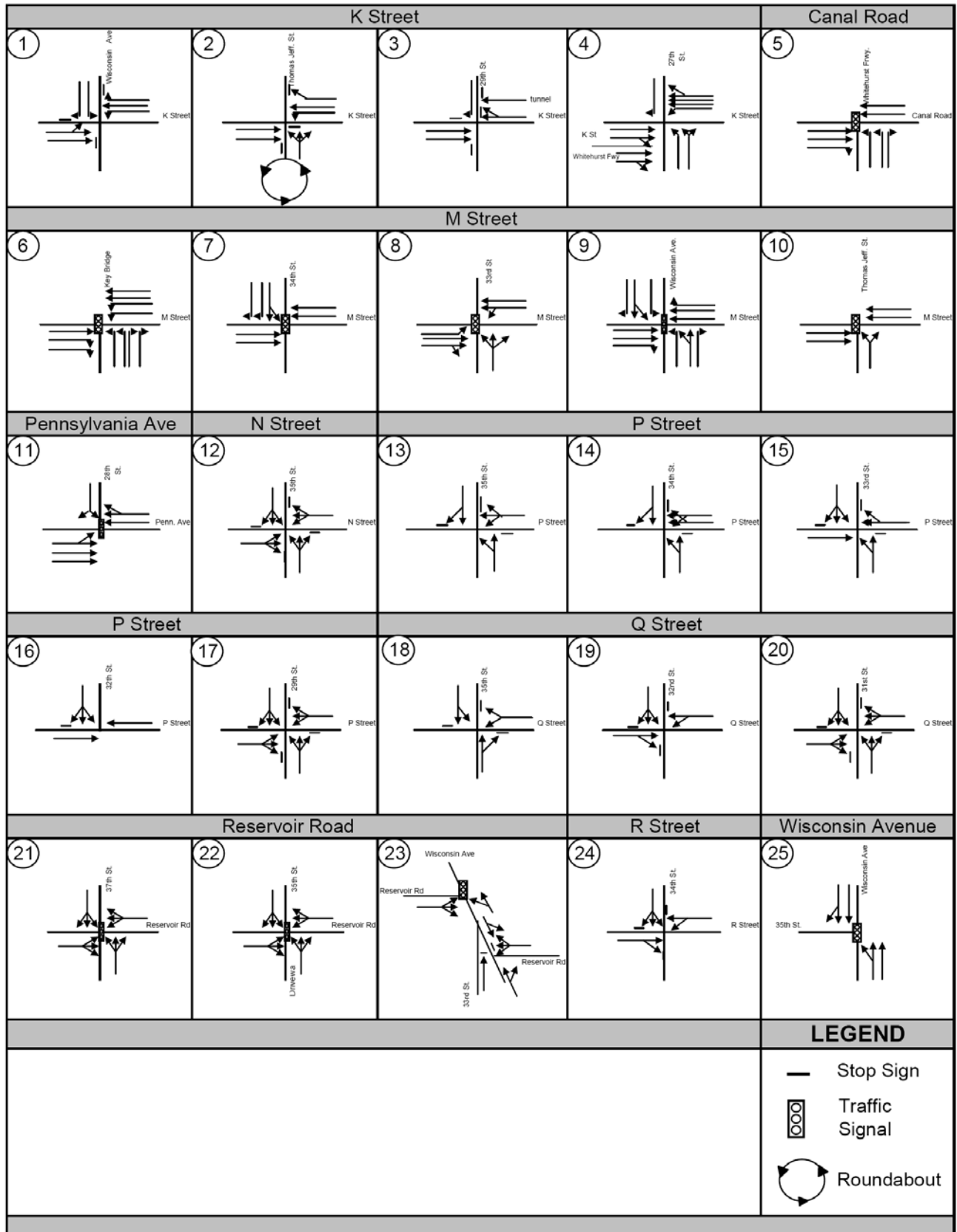
It should be noted that all of the study area intersections were not counted on the same day, thus, there were minor discrepancies in the overall balance of traffic volumes throughout the study area network. The discrepancies are due primarily to traffic variations that occur from day to day. To improve the modeling of the existing traffic conditions, the Study Team applied standard traffic engineering techniques to adjust the turning movement counts at intersections where significant imbalances were found. The existing, 2007, balanced peak hour turning movement counts for the study area are presented in [Figure 18](#).

## **PAVEMENT CONDITION**

The District Department of Transportation (DDOT) maintains a database of the pavement condition of roads within the District. This database is used in conjunction with determining which roadways receive maintenance funds for resurfacing/restructuring of the roadway. [Figure 19](#) shows the DDOT determined pavement condition within the Study Area.

[Appendix B](#) shows the sidewalks, roads, and alleyways scheduled for construction improvements within the 2008-2009 construction years.

**FIGURE 16: STUDY AREA INTERSECTION LANE DIAGRAMS**



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FIGURE 17. STUDY AREA INTERSECTIONS

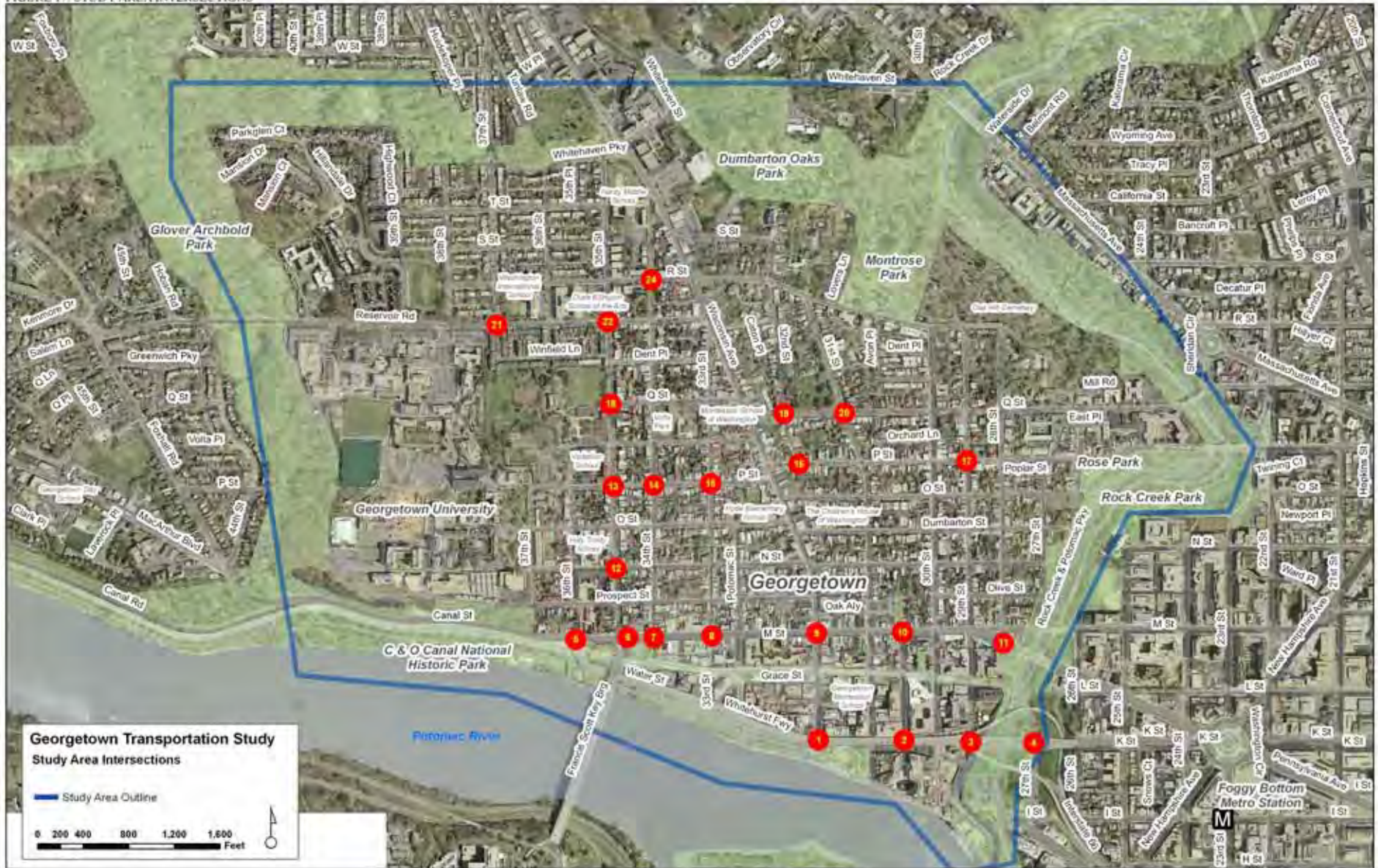




FIGURE 18: EXISTING (2007) AM, PM, and SATURDAY PEAK HOUR VOLUMES AND LEVEL OF SERVICE

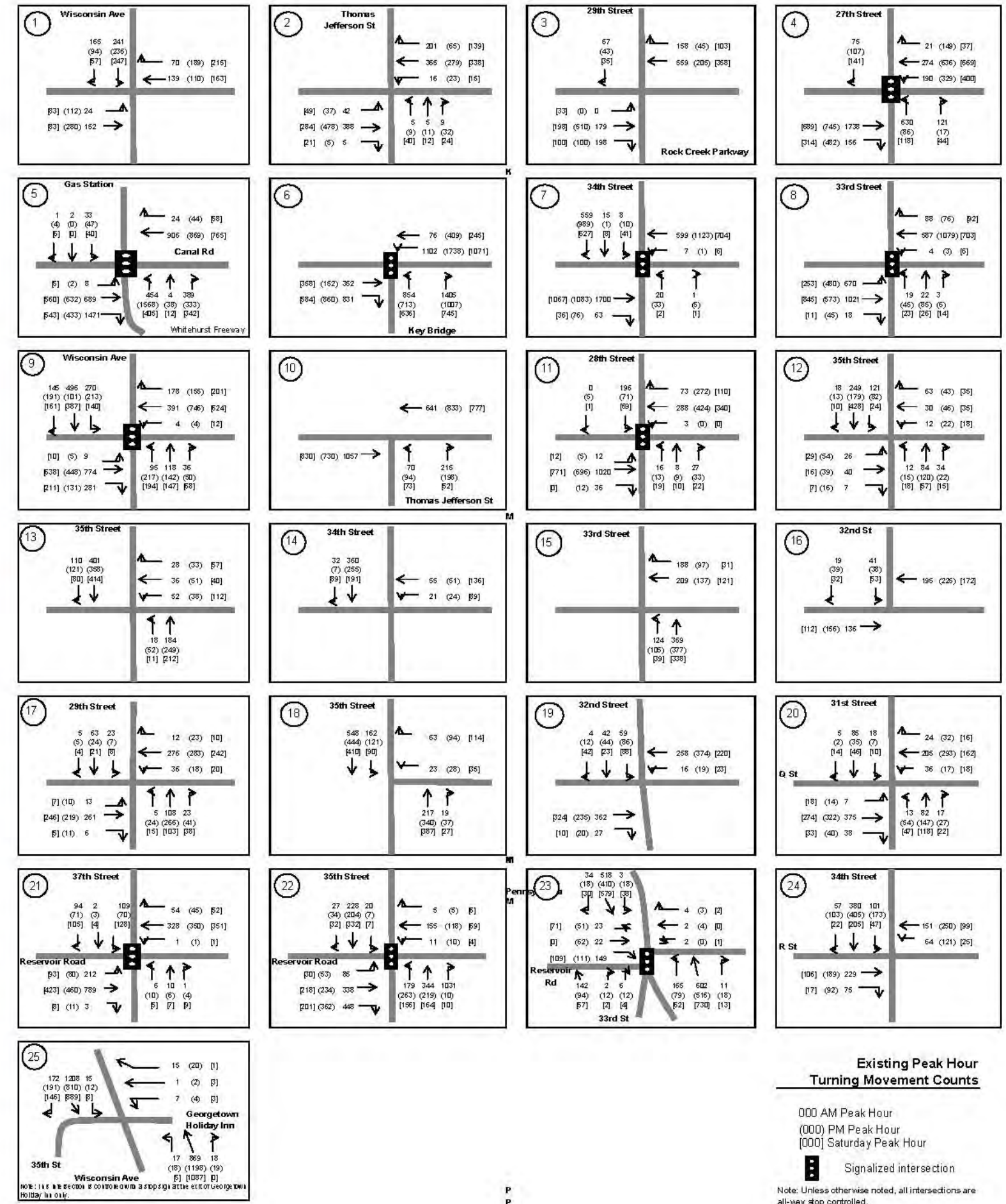
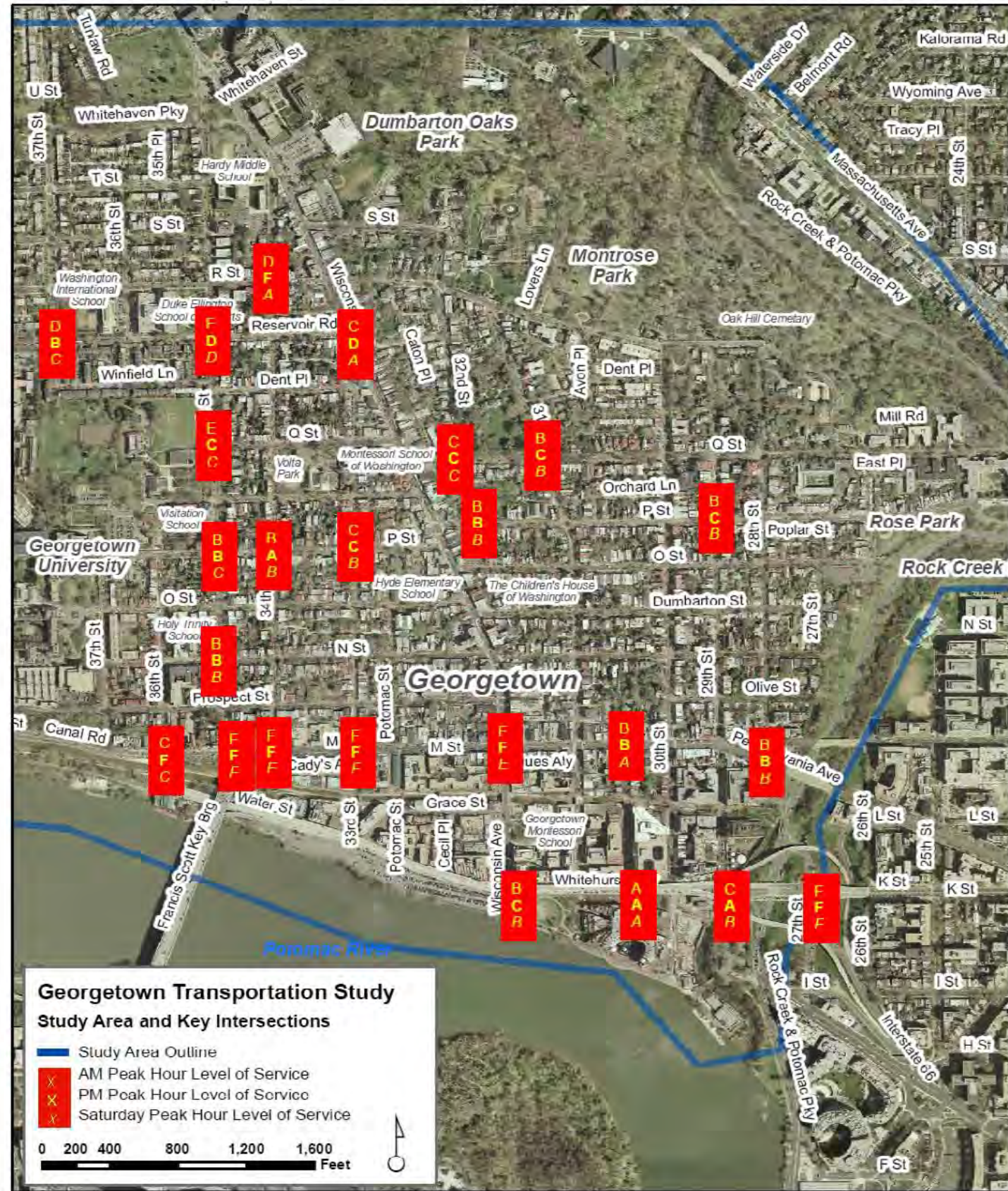
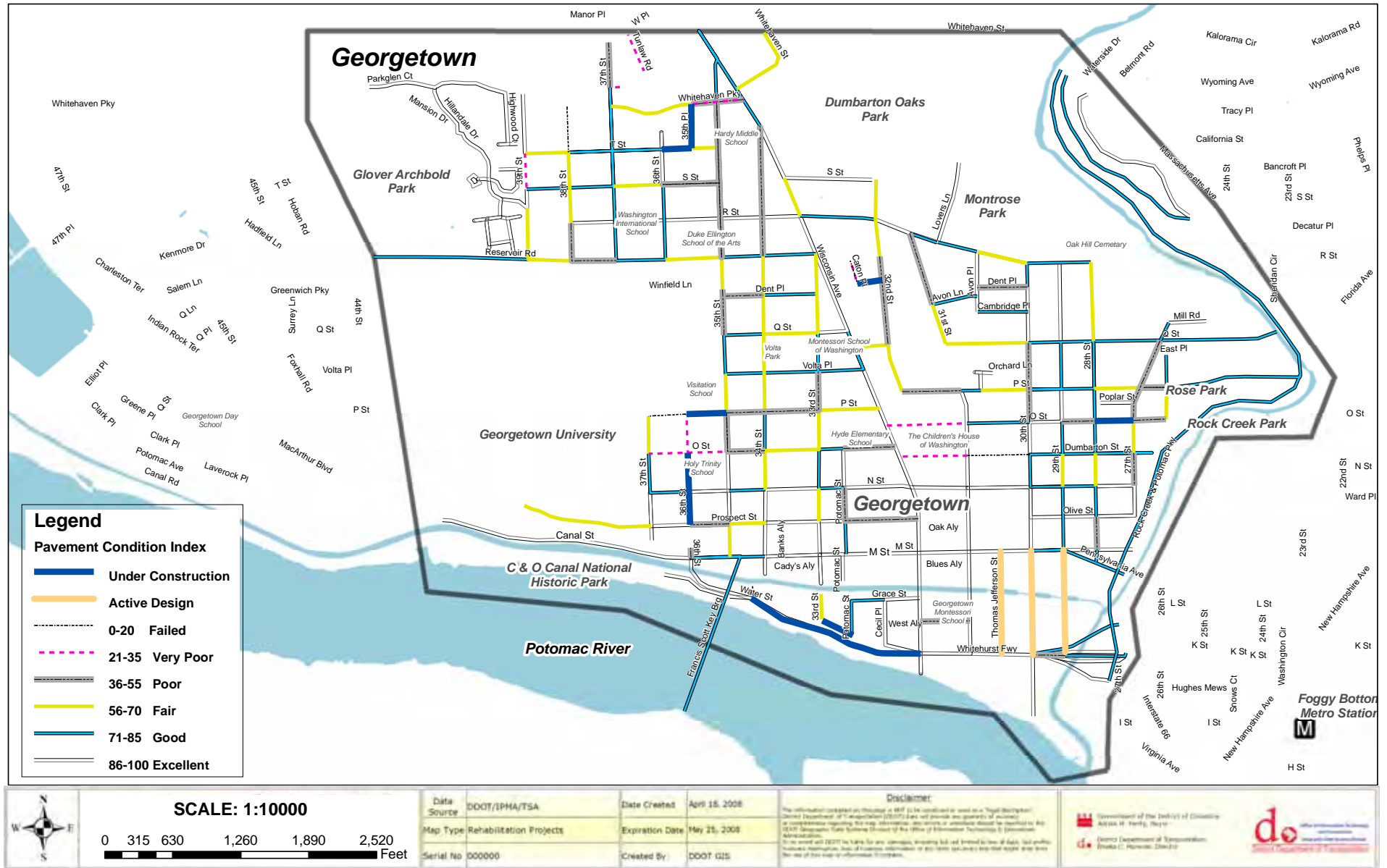




FIGURE 19: GEORGETOWN AREA PAVEMENT CONDITION MAP



SOURCE: DDOT/IPMA/TSA 2008  
Final Report



## TRAFFIC OPERATIONS/CAPACITY ANALYSIS

The traffic data previously discussed and existing signal timings were used to assess the existing operation of key intersections in the study area. A traffic analysis tool (SYNCHRO) was used to determine the Level of Service for each intersection based on the procedures found in the *Highway Capacity Manual (HCM, 2000-Transportation Research Board)*.

A capacity analysis is a quantitative assessment of the operation of an intersection based on a number of factors including peak hour traffic volumes, number of lanes, presence of parking, the length of green time associated with the green phase of the signal (if signalized), etc. The result of a capacity analysis is Level of Service (LOS).

Level of Service (LOS) is an estimate of the performance efficiency and quality of an intersection or roadway as established by the HCM. The HCM methodology measures the degree of delay at intersections using the letter rating “A” for the least amount of delay and letter rating “F” for the most, as shown in [Table 1](#) and [Figure 20](#). A LOS of “D” or better is typically considered to be acceptable for an urban setting during non-peak hours. During peak hours, LOS “E” is predominantly the threshold.





**TABLE 1: LEVEL OF SERVICE STANDARDS FOR INTERSECTIONS**

Level of Service	Signalized Intersections	Unsignalized Intersections	Intersection Capacity Utilization*	Expected Delay to Minor Street Traffic
A	delay < 10 seconds	delay < 10 seconds	> 50%	Little or no delay
B	10 seconds < delay < 20 seconds	10 seconds < delay < 15 seconds	50%-60%	Short traffic delay
C	20 seconds < delay < 35 seconds	15 seconds < delay < 25 seconds	60%-75%	Average traffic delay
D	35 seconds < delay < 55 seconds	25 seconds < delay < 35 seconds	75%-85%	Long traffic delay
E	55 seconds < delay < 80 seconds	35 seconds < delay < 50 seconds	85%-95%	Very long traffic delay
F	80 seconds < delay	50 seconds < delay	95%+	Even longer traffic delays

Source: Highway Capacity Manual, 2000, page 10-16 and 17-32

\* Intersection Capacity Utilization is calculated within the Synchro Traffic Simulation software. Intersection Capacity Utilization is the maximum of the combined times for through and right turn sections, divided by the reference cycle length. It is similar to, but not exactly the same as the intersection volumes to capacity ratio. A value less than 100% indicates that the intersection has extra capacity. A value greater than 100% indicates the intersection is over capacity.

**FIGURE 20: LOS DESIGNATIONS**

A	B	C	D	E	F
Free-Flow Operations	Reasonably Free-Flow	Stable Operations	Borderline Unstable	Extremely Unstable	Breakdown
					
Good			Fair	Poor	Very Poor
Speeds vary from free-flow speed to near free-flow speed. None to minimal restrictions in freedom to maneuver			Speed begins to decline with increasing flow. Freedom to maneuver is more limited	Speeds reduce significantly and turbulence is felt by all drivers. Small changes in demand or disruptions can result in queues	Demands exceeds capacity. Breakdown conditions. Queues form behind breakdown points

Note: Intersections with LOS A-C have additional capacity. These intersections can accommodate increased traffic.

[Table 2](#) below summarizes the HCM analysis results for signalized and unsignalized intersection(s), as well as a measure of delay (seconds per vehicle).

**TABLE 2: CAPACITY ANALYSIS SUMMARY – EXISTING CONDITIONS**

Location	Weekday				Saturday	
	AM Peak		PM peak		Peak	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Q Street and 32nd Street NW	C	21.4	C	23.9	C	21.1
Q Street and 31st Street NW	B	14.4	C	16.0	B	11.7
P Street and 33rd Street NW	C	21.4	C	15.4	B	11.1
P Street and 32nd Street NW	B	11.4	B	11.6	B	12.3
P Street and 29th Street NW	B	12.4	C	15.1	B	10.8
Reservoir Rd NW and Wisconsin Ave	C	22.4	D	31.7	A	8.6
33rd Street and Wisconsin Ave/Reservoir St	A	9.4	A	9.4	A	8.6
34th Street and R Street NW	D	31.9	F	97.6	A	9.8
34th Street and P Street NW	B	10.7	A	9.0	B	10.0
35th Street and N Street NW	B	11.6	B	10.2	B	13.1
35th Street and P Street NW	B	14.7	B	14.6	C	17.0
35th Street and Q Street NW	E	41.9	C	23.2	C	20.1
35th Street and Reservoir Road NW	E	55.8	D	52.1	D	35.6
37th Street and Reservoir Road NW	D	36.1	B	11.6	C	21.7
K Street and Wisconsin Avenue NW	B	13.4	C	17.6	B	13.6
K Street and Thomas Jefferson Street NW	A	9.1	A	8.4	A	9.3
K Street and 29th Street NW	C	17.6	A	9.9	B	10.6
K Street and 27th Street NW	F	>200	F	>200	F	378.5
Whitehurst Freeway and Canal Road	C	47.6	F	120.4	C	31.9
Key Bridge and M Street NW	F	180.2	F	>200	F	161.6
M Street and 34th Street NW	F	103.7	F	133.7	E	96.4
M Street and 33rd Street NW	F	136.9	F	115.8	F	92.7
M Street and Wisconsin Avenue NW	F	119.0	F	106.0	E	67.4
M Street and Thomas Jefferson Street NW	B	13.1	B	13.2	A	8.8
Pennsylvania Avenue and 28th Street NW	B	20.0	B	15.3	B	15.9

\*The intersection of 35<sup>th</sup> Street and Wisconsin Avenue NW was not analyzed because 35<sup>th</sup> Street NW is one-way south. With no movement of traffic from NB 35<sup>th</sup> Street and no stop sign(s) on Wisconsin, the intersection is not able to be analyzed.

NOTE: Red shaded cells represent intersections operating at LOS E or F;  
Green shaded cells represent intersections operating at LOS A or B.



As shown in **Table 2**, during the AM peak hour, several intersections in the study area are operating at LOS E or worse (intersection reaching capacity) or LOS B or better (additional capacity available at the intersection) including:

Intersections operating at LOS E (approaching capacity) or worse

- 35<sup>th</sup> Street and Q Street NW
- 35 Street and Reservoir Road
- K Street and 27<sup>th</sup> Street NW
- Key Bridge and M Street NW
- M Street and 34<sup>th</sup> Street NW
- M Street and 33<sup>rd</sup> Street NW
- M Street and Wisconsin Avenue NW

Intersections operating at LOS B (additional capacity available) or better

- Q Street and 31<sup>st</sup> Street NW
- P Street and 32<sup>nd</sup> Street NW
- P Street and 29<sup>th</sup> Street NW
- 33<sup>rd</sup> Street and Wisconsin Ave/Reservoir Street
- 34<sup>th</sup> Street and P Street NW
- 35<sup>th</sup> Street and N Street NW
- 35<sup>th</sup> Street and P Street NW
- K Street and Wisconsin Avenue NW
- K Street and Thomas Jefferson Street NW
- M Street and Thomas Jefferson Street NW
- Pennsylvania Avenue and 28<sup>th</sup> Street NW

Additionally, as **Table 2** shows, during the PM peak hour, several intersections in the study area are operating at LOS E or worse or LOS B or better including:

Intersections operating at LOS E (approaching capacity) or worse

- 34<sup>th</sup> Street and R Street NW
- K Street and 27<sup>th</sup> Street NW
- Whitehurst Freeway and Canal Road
- Key Bridge and M Street NW
- M Street and 34<sup>th</sup> Street NW
- M Street and 33<sup>rd</sup> Street NW
- M Street and Wisconsin Avenue NW

Intersections operating at LOS B (additional capacity available) or better

- P Street and 32<sup>nd</sup> Street NW
- 33<sup>rd</sup> Street and Wisconsin Ave/Reservoir Street
- 34<sup>th</sup> Street and P Street NW
- 35<sup>th</sup> Street and N Street NW
- 35<sup>th</sup> Street and P Street NW
- 37<sup>th</sup> Street and Reservoir Road NW
- K Street and Thomas Jefferson Street NW
- K Street and 29<sup>th</sup> Street NW
- M Street and Thomas Jefferson Street NW
- Pennsylvania Avenue and 28<sup>th</sup> Street NW

Further, **Table 2** shows that during the Saturday peak hour (between 2-8:00 PM), several intersections in the study area are operating at LOS E or worse including:

Intersections operating at LOS E (approaching capacity) or worse

- Reservoir Road NW and Wisconsin Avenue
- K Street and 27<sup>th</sup> Street NW
- Key Bridge and M Street NW
- M Street and 34<sup>th</sup> Street NW
- M Street and 33<sup>rd</sup> Street NW
- M Street and Wisconsin Avenue

Intersections operating at LOS B (additional capacity available) or better

- Q Street and 31<sup>st</sup> Street NW
- P Street and 33<sup>rd</sup> Street NW
- P Street and 32<sup>nd</sup> Street NW
- P Street and 29<sup>th</sup> Street NW
- 33<sup>rd</sup> Street and Wisconsin Ave/Reservoir Street
- 34<sup>th</sup> Street and R Street NW
- 34<sup>th</sup> Street and P Street NW
- 35<sup>th</sup> Street and N Street NW
- K Street and Wisconsin Avenue NW
- K Street and Thomas Jefferson Street NW
- K Street and 29<sup>th</sup> Street NW
- M Street and Thomas Jefferson Street NW
- Pennsylvania Avenue and 29<sup>th</sup> Street NW

As can be seen with **Table 2**, the intersections of K Street/27<sup>th</sup> Street, Key Bridge/M Street, M Street/34<sup>th</sup> Street, M Street/33<sup>rd</sup> Street, and M Street/Wisconsin Avenue have long delays in the AM, PM, and Saturday peak hour analysis.

## LAND USE AND ZONING

A variety of land uses are included in the study area and are shown in [Figure 21](#). Land uses include the following types:

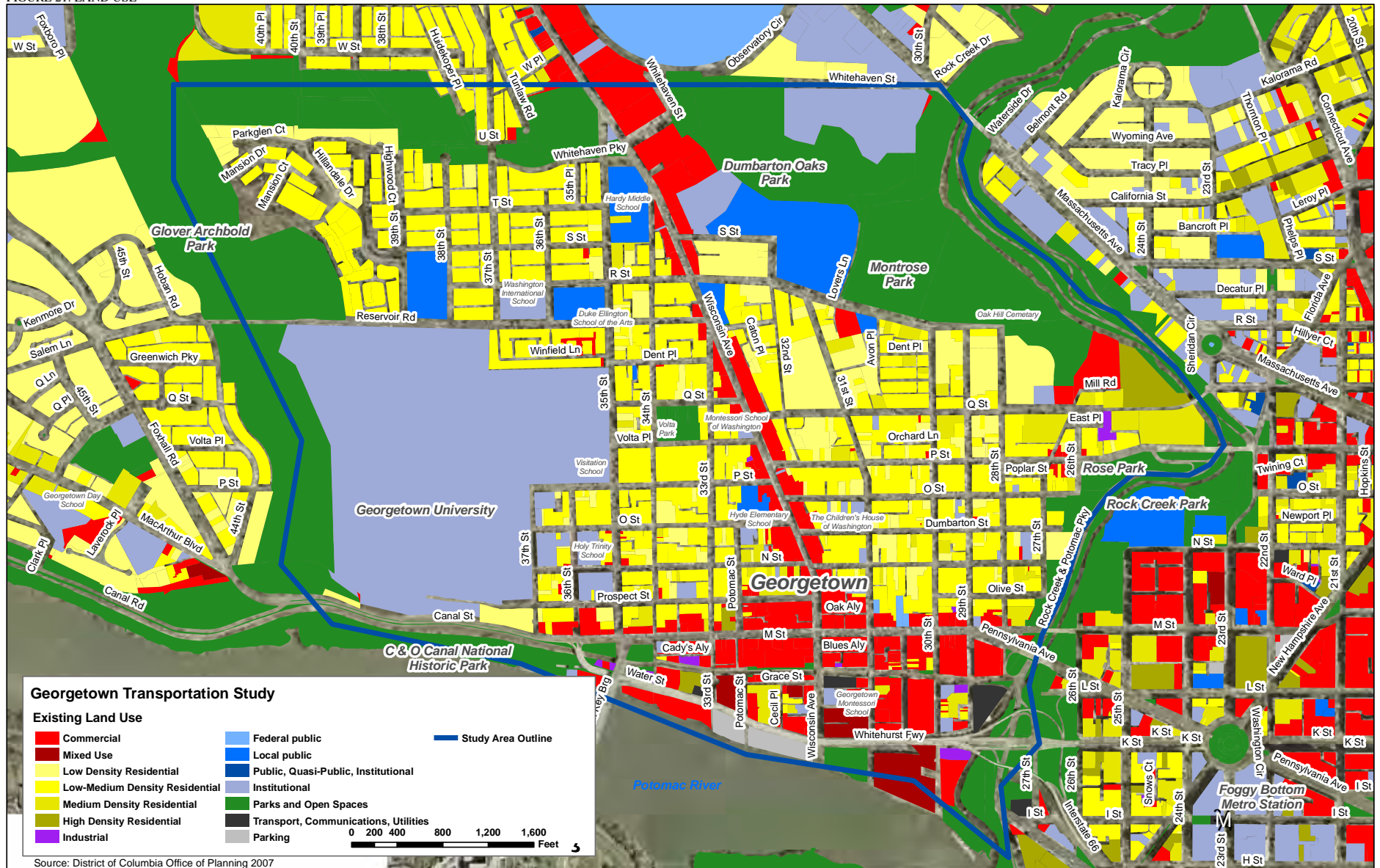
- Residential
- Commercial
- Institutional
- Public
- Open Space

The majority of residential land uses consist of multi-unit dwellings with 20 or more units. They are located throughout Georgetown and include town houses, apartment complexes and condominium buildings. Additionally, commercial land uses include a number of restaurants, shops and mid- to high-priced hotels. There are also a number of properties with institutional uses, notably Georgetown University, Holy Trinity Elementary School, Duke Ellington School of Arts, and Georgetown Visitation School (See [Figure 21](#)).

## PARKING

Parking is regulated throughout most of the study area by the use of on-street parking restrictions (primarily through the residential parking permit program) and parking meters. Parking is an important issue in this area. On-street parking within the Georgetown Transportation Study area is regulated by signs that allow non-resident permit holders to park for a period of one to three hours for free. There is also metered on-street parking, predominantly in the commercial districts and areas surrounding Georgetown University. Parking issues within Georgetown are currently under review by other analyses and are not part of this study. A separate working group is reviewing parking issues within Georgetown. Representatives on the working group include members from the District Department of Transportation (DDOT), the Advisory Neighborhood Commissions (ANC), Georgetown Business Improvement District (BID), Citizens Association of Georgetown (CAG), Georgetown Business Association (GBA), and other community organizations.

FIGURE 21: LAND USE





## CRASH DATA - VEHICLES

The crash analysis was done for the study area, from Whitehaven Parkway in the north to the Potomac River in the south and from Glover Archbold Park in the West to Rock Creek Parkway in the East, by reviewing the crash data for 25 major intersections in the area as listed below:

- Q Street and 32<sup>nd</sup> Street
- Q Street and 31<sup>st</sup> Street
- P Street and 33<sup>rd</sup> Street
- P Street and 32<sup>nd</sup> Street
- P Street and 29<sup>th</sup> Street
- 33<sup>rd</sup> Street and Wisconsin Ave/Reservoir Rd
- 34<sup>th</sup> Street and R Street
- 34<sup>th</sup> Street and P Street
- 35<sup>th</sup> Street and N Street
- 35<sup>th</sup> Street and P Street
- 35<sup>th</sup> Street and Q Street
- 35<sup>th</sup> Street and Reservoir Road
- 35<sup>th</sup> Street and Wisconsin Avenue
- 37<sup>th</sup> Street and Reservoir Road
- K Street and Wisconsin Avenue
- K Street and Thomas Jefferson Street
- K Street and 29<sup>th</sup> Street
- K Street and 27<sup>th</sup> Street
- Whitehurst Freeway and Canal Road
- Key Bridge and M Street
- M Street and 34<sup>th</sup> Street
- M Street and 33<sup>rd</sup> Street
- M Street and Wisconsin Avenue
- M Street and Thomas Jefferson Street
- Pennsylvania Avenue and 28<sup>th</sup> Street

In order to assess safety conditions in the study area, the Study Team obtained accident data of critical intersections from the District Department of Transportation (DDOT) for the last three reportable years (2004 – 2006).

Four fatalities within the Study Area have been reported between 2004 and 2006:

- Whitehurst Freeway/M Street (Canal Road) – February 2005, driver killed in a speed related accident occurring at 2:10 AM
- Wisconsin Avenue/M Street – May, 2005 – pedestrian killed in an accident (“other” contributing factor identified) occurring at 3:45 PM
- Whitehurst Freeway/M Street (Canal Road) – August 2005, motorcycle driver killed in a speed related accident occurring at 1:55 AM
- Winfield Lane/Reservoir Road (3700 block) – October, 2006, driver killed in a speed related accident occurring at 7:15 AM

As **Table 3** indicates, the intersections in the study area with the largest number of accidents in the last three years are:

- M Street/Wisconsin Avenue
- M Street/33<sup>rd</sup> Street
- M Street/34<sup>th</sup> Street

GIS plots were created to visually identify patterns in the data. There were a total of 368 crashes within the study intersections during this three-year period with 78% occurring south of Prospect Street. The total number of injuries reported from these crashes was 84 with almost 70% of those injuries involving crashes at intersections south of Prospect Street.

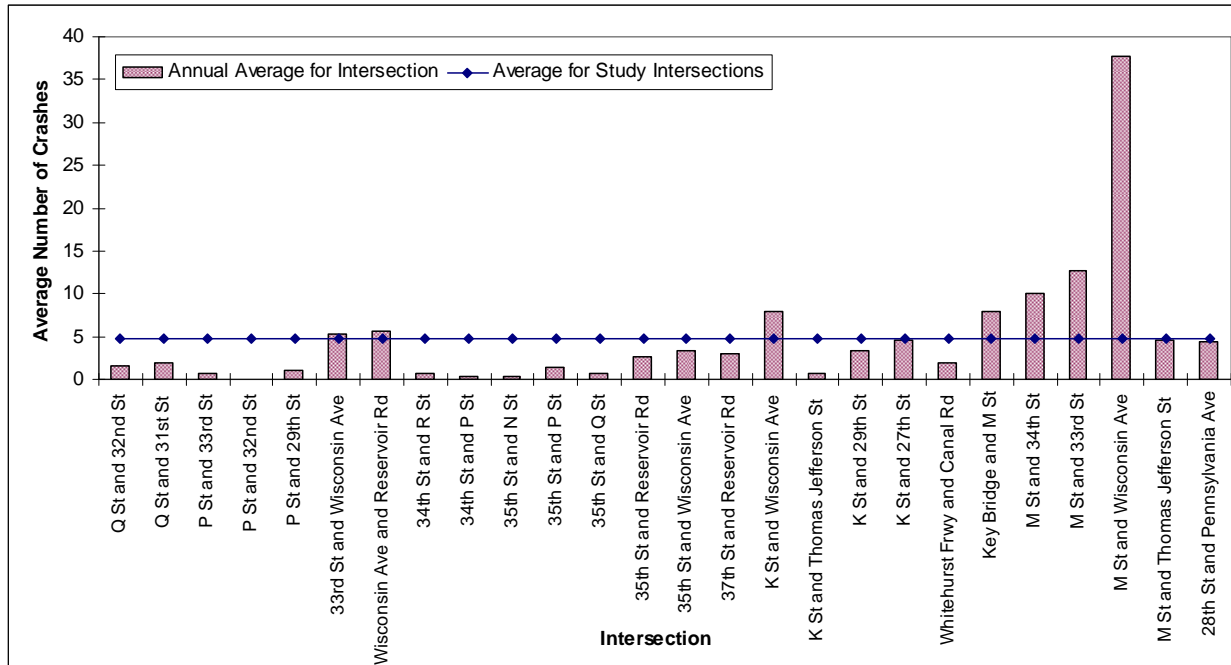
Crash rates were calculated using the average annual number of crashes over the three year period from the crash data provided by DDOT. **Table 3** summarizes the annual average number of crashes for the study intersections.

**TABLE 3: AVERAGE ANNUAL NUMBER OF CRASHES BY INTERSECTION**

Intersection	Annual Average Number of Crashes by Intersection (2004 – 2006)	Intersection	Annual Average Number of Crashes by Intersection (2004 – 2006)
32 <sup>nd</sup> St and Q St	2	37 <sup>th</sup> St and Reservoir Rd	3
31 <sup>st</sup> St and Q St	2	K St and Wisconsin Ave	8
33 <sup>rd</sup> St and P St	1	K St and Thomas Jefferson St	1
32 <sup>nd</sup> St and P St	0	K St and 29 <sup>th</sup> St	3
29 <sup>th</sup> St and P St	1	K St and 27 <sup>th</sup> St	5
33 <sup>rd</sup> /Wisconsin/Reservoir Rd	5	Whitehurst Frwy and Canal Rd	2
34 <sup>th</sup> St and R St	1	M St and Francis Scott Key Bridge	8
34 <sup>th</sup> St and P St	0	M St and 34 <sup>th</sup> St	10
35 <sup>th</sup> St and N St	0	M St and 33 <sup>rd</sup> St	13
35 <sup>th</sup> St and P St	1	M St and Wisconsin Ave	38
35 <sup>th</sup> St and Q St	1	M St and Thomas Jefferson St	5
35 <sup>th</sup> St and Reservoir Rd	3	28 <sup>th</sup> St and Pennsylvania Ave	4
35 <sup>th</sup> St and Wisconsin Ave	3		

The entire study area had an average of five annual crashes per intersection. As seen in **Table 3** and **Figure 22**, the intersections of M Street/Wisconsin Avenue, M Street/33<sup>rd</sup> Street, and M Street/34<sup>th</sup> Street had the highest average annual number of crashes. These three intersections account for almost half (49%) of the study area crashes. The intersections K Street/Wisconsin Avenue and Key Bridge/M Street also had higher average annual number of crashes than the average of all the study intersections.

**FIGURE 22: COMPARISON OF CRASH NUMBERS AT STUDY INTERSECTIONS WITH AVERAGE CRASH NUMBERS FOR THE STUDY AREA**



The crash data was further analyzed by type of crash and the conditions in which it took place. **Appendix C** shows the crash data by type of collision and by year. Not all crash data was available by type, so the total number of crashes by type is less than the total number of crashes that were recorded.



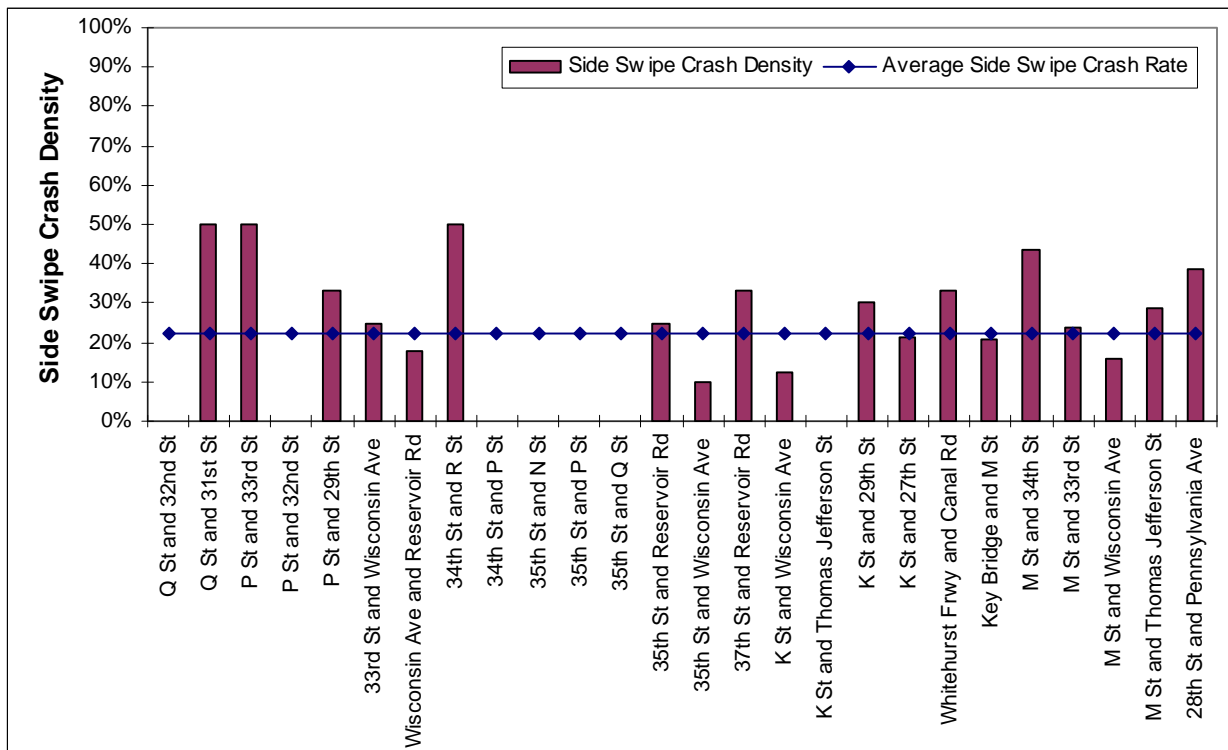
Of the total 368 crashes in the three year period, sideswipe collisions account for 81 crashes with 18 of these 81 sideswipe crashes occurring at M Street/Wisconsin Avenue and 13 occurring at M Street/34<sup>th</sup> Street. Rear-end collisions totaled 78 of the total crashes, 26 crashes involved parked cars, and 44 crashes involved right-turning or left-turning vehicles. The remainder of crashes were attributed to other types. It should be noted that 11 of the total crashes involved pedestrians.

Figures 23-24 show the crash densities<sup>3</sup> for three major crash types: sideswipe, rear-end, and fixed object. These three types of crashes are the types that can be decreased by certain types of improvements as those shown in the recommendations section of the report. As Figure 23 shows, there were 13 intersections with greater than average sideswipe crash densities, making sideswiping the most common type of crash in the study area.

As seen in Figure 24, there are eight intersections with rear-end crash densities higher than the average for the study intersections. The greater number of rear-end crashes at these intersections is likely due to their greater volume, especially during peak hours.

Figure 25 shows that only about half of the study area intersections have a problem with crashes involving parked vehicles, but the parked crash densities at those intersections are relatively high. For the intersections of 34<sup>th</sup> Street/P Street and 35<sup>th</sup> Street/N Street, crashes involving parked vehicles account for all of the crashes recorded incidents during the last three years.

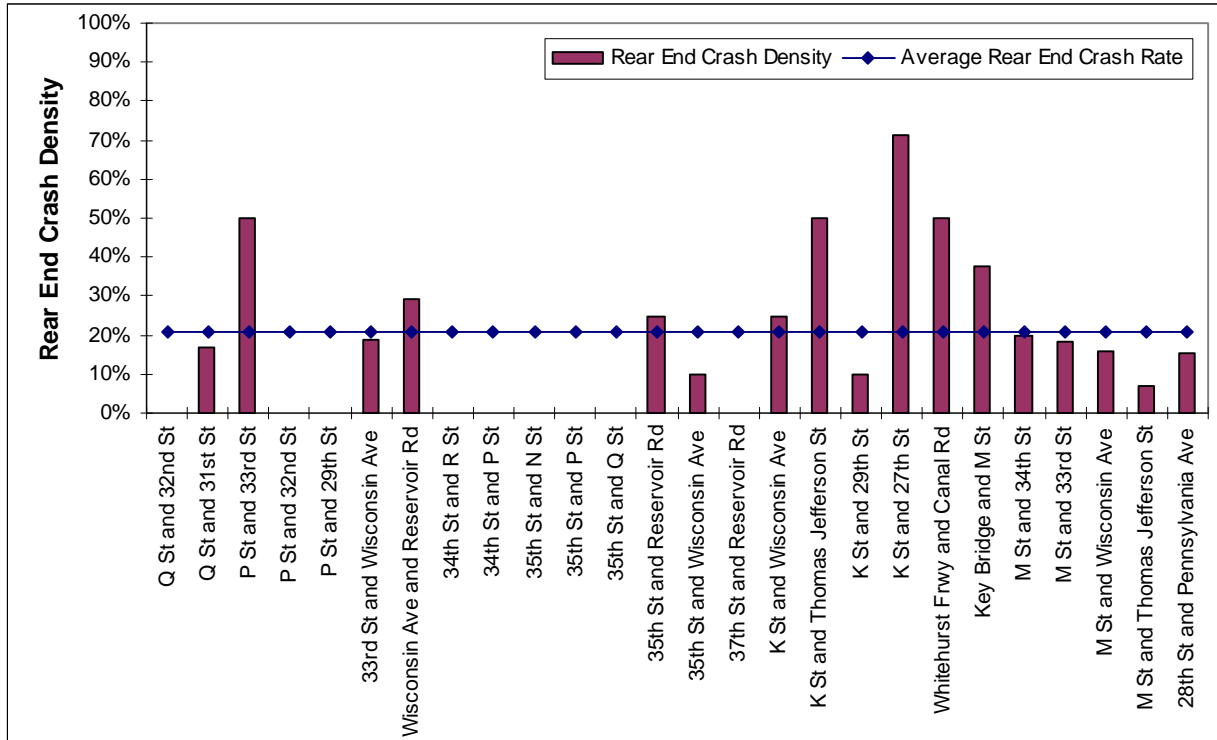
**FIGURE 23: COMPARISON OF SIDESWIPE CRASH DENSITIES FOR INTERSECTIONS WITH AVERAGE SIDESWIPE CRASH DENSITY**



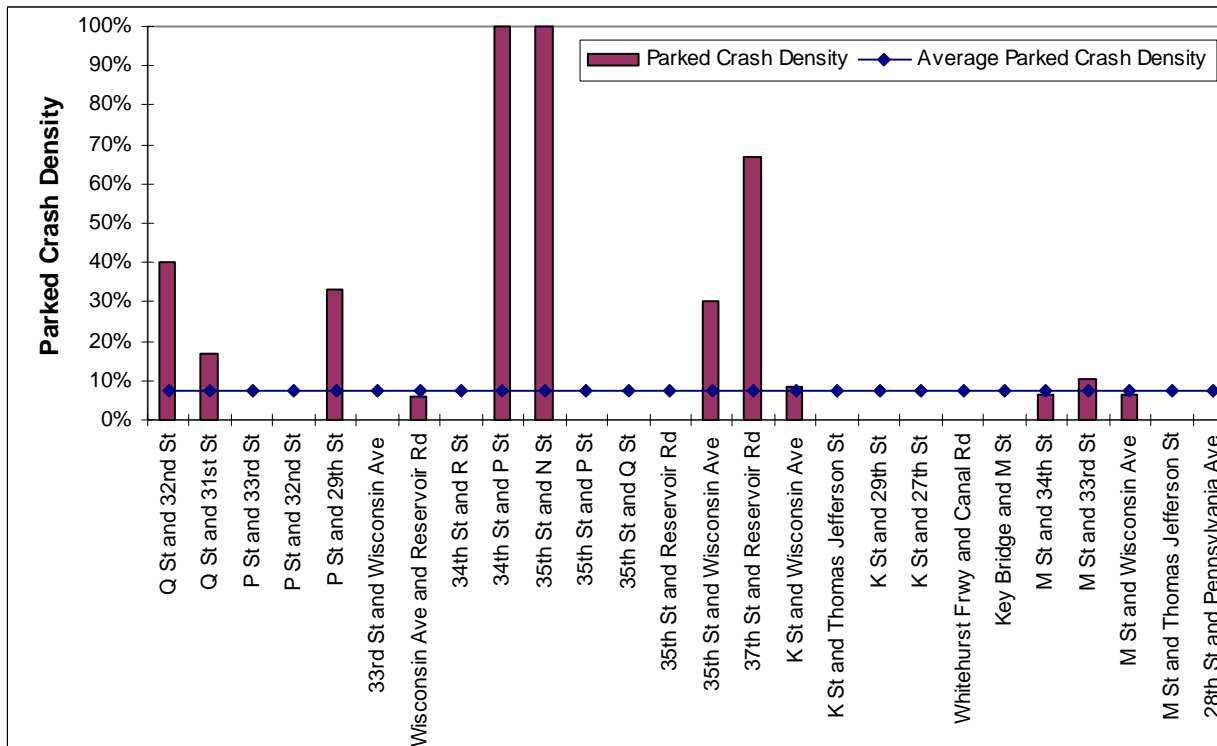
<sup>3</sup> Crash Density refers to the average number of crashes related to a specific type of crash in relation to the overall number of crashes.



**FIGURE 24: COMPARISON OF REAR-END CRASH DENSITIES FOR INTERSECTIONS WITH AVERAGE REAR-END CRASH DENSITY**



**FIGURE 25: COMPARISON OF PARKED VEHICLE CRASH DENSITIES FOR INTERSECTIONS WITH AVERAGE PARKED VEHICLE CRASH DENSITY**



The following is a brief summary of crash statistics for each of the study intersections that experienced average annual crash numbers higher than average:

### ***M St/Wisconsin Ave***

- The data showed that an average of 38 crashes occurred each year at this intersection (more than three per month on average), which is 31% of the total number of crashes per year for all of the study intersections.
- The data showed a total of 84 injuries from crashes at all study intersections; of these 18 (21%) occurred at this intersection.
- Forty-two percent of the crashes occurring between 9:30 AM and 11:30 AM occur at this intersection.

### ***M St/33<sup>rd</sup> St***

- An average of 13 crashes per year occurred at this intersection, with the majority of these (82%) occurring on a weekday.
- The most common type of collision was sideswipe, accounting for 24% of the total incidents at this intersection.

### ***M St/34<sup>th</sup> St***

- The data showed that an average of 10 crashes occurred each year at this intersection.
- Forty-three percent of the crashes at the intersection were sideswipe and 20% were rear-end.
- The majority of the crashes (64%) occurred on a weekday.

### ***M St/Francis Scott Key Bridge***

- A review of the crash data indicates that an average of 8 crashes occur at this intersection yearly.
- The data shows that 38% of those crashes occurring at this intersection are rear-end crashes.

### ***K St/Wisconsin St***

- An average of 8 crashes per year occurred at this intersection.
- The most common type of incident was rear-end, accounting for 25% of the average crashes.

The statistics above provide a better understanding of safety issues at each intersection. The types and number of crashes at each intersection was used to determine the improvements proposed at an intersection to improve safety of all users. Certain recommendations as cited later in the report can improve safety at intersections.

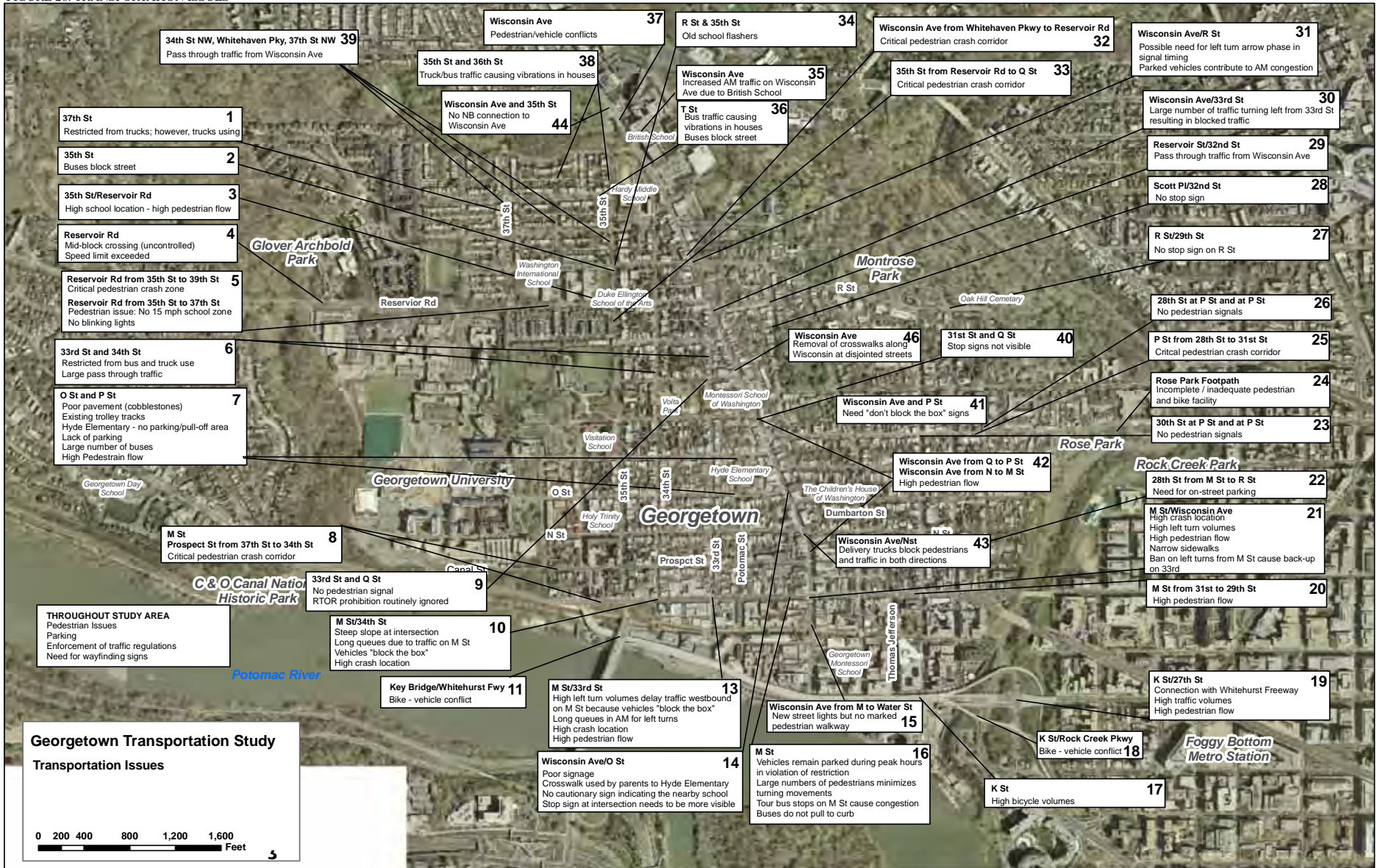
## TRANSPORTATION ISSUES BY MODE

Using information from the sections above as well as comments received during the public process (see [Appendix F](#)), a summary of transportation issues in the study area associated with each mode was developed. The challenges associated with each mode are listed in [Table 4](#) with specific locations for transportation issues shown in [Figure 26](#).

**TABLE 4: TRANSPORTATION ISSUES BY MODE**

Transit	Bicycle	Pedestrian	Traffic
<ul style="list-style-type: none"> <li>Route D2 often strays from the schedule because of congestion in Georgetown at the end of the westbound route.</li> </ul>	<ul style="list-style-type: none"> <li>High bicycle volumes on K Street.</li> </ul>	<ul style="list-style-type: none"> <li>Lack of ADA facilities, and narrow sidewalks in some locations.</li> </ul>	<ul style="list-style-type: none"> <li>Synchronization of signals along Wisconsin Avenue and M Street during peak hours.</li> </ul>
<ul style="list-style-type: none"> <li>Circulator and Georgetown Metro Connection routes/schedule are not readily available.</li> </ul>	<ul style="list-style-type: none"> <li>Disregard of “rules of the road” by bicyclists.</li> </ul>	<ul style="list-style-type: none"> <li>High pedestrian volumes along M Street.</li> </ul>	<ul style="list-style-type: none"> <li>High pedestrian volumes along M Street delay movements.</li> </ul>
<ul style="list-style-type: none"> <li>Connection with Metro stops at Foggy Bottom and Dupont Circle is difficult.</li> </ul>	<ul style="list-style-type: none"> <li>Few bicycle facilities north of M Street.</li> </ul>	<ul style="list-style-type: none"> <li>Missing pedestrian facilities in and around parks and schools.</li> </ul>	<ul style="list-style-type: none"> <li>Pass-through trucks and vehicles on residential streets to bypass congestion on M Street and Wisconsin Avenue.</li> </ul>
<ul style="list-style-type: none"> <li>Cobblestone streets result in an uneven ride and an increased maintenance cost for vehicles.</li> </ul>	<ul style="list-style-type: none"> <li>Lack of bicycle route signage to direct bicycles.</li> </ul>	<ul style="list-style-type: none"> <li>Lack of pedestrian heads at some signalized intersections.</li> </ul>	<ul style="list-style-type: none"> <li>Cobblestone streets result in uneven ride and an increased maintenance costs.</li> </ul>
<ul style="list-style-type: none"> <li>Location of Circulator stop at Union Station is difficult to find.</li> </ul>	<ul style="list-style-type: none"> <li>Lack of traffic restriction enforcement for all modes.</li> </ul>	<ul style="list-style-type: none"> <li>Lack of traffic restriction enforcement for all modes.</li> </ul>	<ul style="list-style-type: none"> <li>Poor pavement conditions in Study Area streets, requires maintenance/ replacement.</li> </ul>
<ul style="list-style-type: none"> <li>Lack of traffic restriction enforcement for all modes.</li> </ul>			<ul style="list-style-type: none"> <li>Parking and traffic associated with finding parking.</li> </ul>
			<ul style="list-style-type: none"> <li>Lack of left/right turn lanes at intersections.</li> </ul>
			<ul style="list-style-type: none"> <li>Lack of traffic restriction enforcement for all modes.</li> </ul>

FIGURE 26: TRANSPORTATION ISSUES







# Future Conditions

## PROJECTED TRAFFIC

The future traffic volumes in the Study Area were developed from two components: The additional traffic based on planned development and the growth of existing traffic volumes.

### FUTURE DEVELOPMENT IN THE STUDY AREA

Building on traffic counts taken in association with this project and presented in Table 2 above, The Washington, DC Economic Partnership (WDCEP) tracks development and renovations within the area. As development occurs, traffic increases due to the attractiveness of the area. **Table 5** shows the developments listed in the WDCEP database as planned or under construction. Traffic generated by these developments was used to forecast 2015 traffic volumes in the study area.

**TABLE 5: PROJECTED DEVELOPMENT IN THE STUDY AREA**

Project	Location	Total Sq. Ft.	Major Use	Hotels Rooms	Office Sq. Ft.	Residential Units	Retail Sq. Ft.	Status	Trip Use Code	# of New Peak Hour Trips
Shops at Georgetown Park, The	3222 M Street, NW	0	Mixed-use	0	0	137 (45 new)	293,000 (40,000 new)	Proposed	*	77
Georgetown University Medical Center	Reservoir Road, NW	0	Education	0	0	0	0	Planned	720	779
Georgetown University Medical Center Parking	Reservoir Road, NW	0	Education	0	0	0	0	Planned	720	see above
Georgetown University Medical Center	Reservoir Road, NW	314,000	Education	0	0	0	0	Planned	720	see above
Georgetown McDonough	School of Business	171,000	Education					Under Construction	710	*
Georgetown Inn (renovation)	1310 Wisconsin Ave, NW	0	Hospitality	0	0	0	0	Planned	*	*
Georgetown Waterfront Park Phase I	Potomac River, Georgetown	n/a	park	n/a	n/a	n/a	n/a	Under Construction	411	*
Georgetown Waterfront Park Phase II	Potomac River, Georgetown	n/a	park	n/a	n/a	n/a	n/a	Planned	411	*
Latham Hotel Georgetown	3000 M Street, NW	0	Hospitality	100	0	0	0	Planned	310	52
Four Seasons Hotel (renovations)	2800 Pennsylvania Ave NW	120,000	Hotel	212	0	0		Under Construction	*	*
Harbourside - North Building	K and 31st Street NW	166,000	Office	0	132,810	30		Under Construction	3	273
Wormley School Residences	2325 Prospect St.		Residential	0	0	29 units	0	Under Construction	220	15
Addison School	P St and Wisconsin Ave NW	16,000	Education	0	0	0	0	Renovation-Differentiated Learning Lab	720	*

Source; Washington, DC Economic Partnership, 2008.

Trip Use Code and Number of Peak Hour Trips are taken from *Trip Generation* volume 7 (Institute of Transportation Engineers)

Trip Use Code is the land use type utilized.

\* - Development will be trip neutral producing zero additional peak hour trips.

## BACKGROUND TRAFFIC

Using the traffic counts taken in association with this study at each of the 25 selected intersections (as shown in **Figure 18**), a growth factor of 0.2% in the AM and Saturday peaks and a growth factor of 0.08% in the PM peak hour was applied to determine the anticipated background traffic. To that background traffic projection, anticipated traffic from known developments in the study area (**Table 5**) was added. **Figure 27** shows the volumes for each of the 29 study area intersections taking into account the background traffic as well as development traffic for the 2015 year. **Table 6** shows the LOS analysis at each of the 29 study area intersections for 2015 projected traffic.





FIGURE 27: 2015 PROJECTED VOLUMES AND LEVEL OF SERVICE AT SELECT INTERSECTIONS

