This report recommends that this intersection analysis be updated in conjunction with the transportation study that accompanies the further processing approval of future development sites at the Hospital. As discussed above, the trip generation methodology for potential Hospital improvements utilized in this study is extraordinarily conservative, and the projected delays may not actually occur based on these conservative assumptions as well as changes in traffic patterns and details regarding the Hospital improvements not yet known at this time. Furthermore, as also discussed above, the capacity analysis fails to account for the ability of through traffic to maneuver around turning traffic. During the approval process, the potential need for a left turn lane at this intersection should be considered and further developed if the revised capacity analysis demonstrates such need.

Because the north and southbound approaches of Gate 1 and 38th Street at this intersection are offset, this report also recommends continued evaluation of the overall operation and alignment of this intersection in conjunction with the further processing of future development sites at the Hospital. (The realignment has been included in previous plans and supported by DDOT in those proceedings.) The intersection analysis discussed above should also include further evaluation of the overall intersection operation and refinement of the proposed intersection alignment or other improvements. In addition to an evaluation of the design of the intersection, the analysis should examine the impact of the change on vehicular and pedestrian traffic. To address community concerns, the analysis should also examine design alternatives that will deter cut-through traffic, such as signage, traffic control operations, and/or physical barriers. This report concludes that no other mitigation effort is required at this time.

After review of the above findings, DDOT has asked that the University consider implementing the left turn lane within one year following approval of the Campus Plan. DDOT has also asked the University to undertake annual evaluations of the intersection following the completion of the left turn lane in order to assess whether future improvements to the intersection may be required. The University is evaluating this request.

- *Canal Road/M Street & Whitehurst Freeway/36th Street*

  At this intersection, the eastbound approach during the AM peak hour and the northbound approach in the PM peak hour reach LOS F in the Future with Campus Plan scenario where it did not in the Future without Campus Plan scenario. Overall, the amount of traffic related to the approval of the Campus Plan constitutes a very low percentage of the total traffic passing through this intersection under future conditions (2.4% in the AM peak hour and 2.1% in the PM peak hour) and the delays are not attributable to the impact of the Campus Plan.

  As described above, these delays could be mitigated through optimizations to signal timings and offsets. This would improve the overall intersection and alleviate the unacceptable delays for both movements without an adverse impact on the other major approaches. The delays from the southbound approach would increase to LOS F, but this is because the amount southbound traffic is minimal compared to other approaches, as it consists of traffic exiting the gas station. This report recommends no further mitigation beyond further examination of the signal timings. The final determination regarding any adjustment should be left to DDOT.

ZONING COMMISSION
District of Columbia
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3.1.6 Canal Road Gate Analysis

As stated in Section 2.3 and 2.4.3 above, the Campus Plan calls for the construction of an on-campus bus turnaround near Harbin Hall, which will permit GUTS buses to turn around on campus and exit out of the Canal Road gate at all times of the day except during the morning peak period left-turn restriction at the gate. Even with this left-turn restriction in place, the Harbin Turnaround will significantly reduce the number of GUTS vehicles using neighborhood streets (Q Street and Prospect Street) by 66%.

While the Harbin Turnaround will positively impact the campus and surrounding residential communities alike as proposed, the benefit would be further increased if the Canal Road left-turn restriction is lifted, because it would allow the University to avoid any use of Prospect Street or Q Street for GUTS routes. Table 19 and Table 20 compare the proposed GUTS daily volumes with and without the existing left-turn restriction at the Canal Road gate during the morning peak period. The impact to the site-generated traffic volumes with and without the left-turn restrictions is shown on Figure 25 and Figure 26.

Table 19: Proposed GUTS Daily Volumes (With Left-Turn Restriction)

Roadway	Outbound Volume	Inbound Volume
Reservoir Road to 35th Street	57	57
Reservoir Road to Q Street	0	0
Canal Road	153	228
Prospect Street	75	0
Total	**285**	**285**

Table 20: Proposed GUTS Daily Volumes (Without Left-Turn Restriction)

Roadway	Outbound Volume	Inbound Volume
Reservoir Road to 35th Street	57	57
Reservoir Road to Q Street	0	0
Canal Road	228	228
Prospect Street	0	0
Total	**285**	**285**

In response to concerns regarding the potential impact of lifting this morning peak period left-turn restriction on the commuter traffic volumes along Canal Road and Foxhall Road, Gorove / Slade conducted the following roadway capacity and simulation analyses of the change, based on scope and methods outlined with DDOT. The analyses conclude that the elimination of the left-turn restriction to permit GUTS buses to use this gate during the AM peak period would not have an adverse impact on the surrounding roadway network. **The roadway capacity analysis using HCM methodology shows no negative impact based on traffic volumes, and traffic simulation analysis of resulting queues show no negative impact on the commuter routes entering the study area**.

Capacity Analysis

Additional capacity analyses were performed for the future (2021) conditions with the Campus Plan and the horizon year (2031) conditions without the left-turn restriction. The total future (2021) traffic volumes with the Campus Plan are shown on Figure 27 and Figure 28, including with and without the left-turn restriction. The horizon year (2031) traffic volumes are shown on Figure 29 and Figure 30, including with and without the left-turn restriction.

The results of the roadway capacity analysis with and without the left turn show that there will be no detrimental impact to delay or LOS by allowing GUTS buses to turn left from the Canal Road gate in the AM peak hour. As stated previously,

this analysis was performed at the intersections contained within the study area during the morning and afternoon peak hours. *Synchro, Version 7.0* was used to analyze the study intersections based on the Highway Capacity Manual (HCM) methodology. The results of the capacity analyses are expressed in level of service (LOS) and delay (seconds per vehicle) for each approach.

The capacity analyses were based on: (1) the peak hour volumes outlined above; (2) the lane use and traffic controls outlined in Section 3.5.3; (3) the removal of the left-turn restriction at the intersection of Canal Road and the GU Canal Road gate, which does not require any signal timing changes since the phase is already programmed in to the existing signal timing; and (4) the Highway Capacity Manual (HCM) methodologies (using *Synchro 7* software). The average delay (of each approach) and LOS is shown for the signalized intersections, as well as an overall average delay and intersection LOS grade. The HCM does not give guidelines for calculating the overall 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 21 shows the results of the capacity analyses, including LOS and average delay per vehicle (in seconds).

According to the analysis, the left turn movement would operate at an acceptable level of service during the AM peak hour. Likewise, accommodating the left turn during the AM peak hour would not have a negative impact on the Canal Road levels of service. The eastbound and westbound approaches of the intersection would be level of service C or better, with one exception. In 2031 (the horizon condition), the eastbound approach is projected to operate at a LOS E.

Simulation Analysis

In addition to the capacity analysis results produced by the *Synchro*, the *SimTraffic* program from the software package was used to perform simulations of the morning peak hour conditions in the future (2021) with the Campus Plan with and without the left-turn restrictions. This simulation analysis was performed in order to provide a macroscopic model of the impact of removing the morning peak period left-turn restriction. *SimTraffic* is used to analyze complex situations, including closely spaced intersections with blocking problems, closely spaced intersections with lane change problems, the effects of signals on nearby unsignalized intersections and driveways, and the operation of intersections under heavy congestion. In this scenario, *SimTraffic* was used to model the operation of intersections along Canal Road/M Street and Foxhall Road under heavy congestion.

The simulation model was used to determine the potential impact allowing left turns in the AM would have on commuting patterns on roadways entering the study area. Specifically, the models were used to calculate the average queue length of the commuter dominant movements of Canal Road, Foxhall Road, Reservoir Road, and MacArthur Boulevard as they enter the study area.

Figure 20 shows the results of the traffic simulations, comparing the average queues from an average of 20 model runs for the four approaches described above. The two scenarios modeled were the Future (2021) with Campus Plan conditions, and the same scenario with the AM left turn in place. The results of the queuing analysis show that of the four commuting routes entering the study area in the AM peak hour, three will not have longer queues from allowing GUTS buses to turn left from the Canal Road gate. The average queue along Canal Road gets longer in the traffic models by around 5%, or around 1 car length. **However, the additional queues expected along this road will not result in spillback into adjacent signalized intersections and is not a substantial or negative impact**.

Conclusion

This report recommends permitting left turns during the AM peak period. The results of the capacity analysis and simulations discussed above demonstrate that such activity would not adversely impact traffic operations along the Canal Road corridor. To limit the impact of such change, the University has agreed to limit left turns during this AM peak period (6:15 AM to 10:15 AM) to GUTS vehicles only.

The University will implement operational measures to actively ensure that only GUTS vehicles are able to make left turns during this time period. The design of the Canal Road gate is well-suited to accommodate such measures, as traffic turning right uses one roadway while traffic turning left uses another roadway, which will permit the University to regulate use of the left-turn traffic without impacting right-turn traffic.

DDOT has advised the University that, should it permit such turns, the activity would be permitted on a pilot basis at first, in order to assess the actual impact of the change. The University would be expected to conduct annual monitoring evaluations of the intersection to assess this impact.

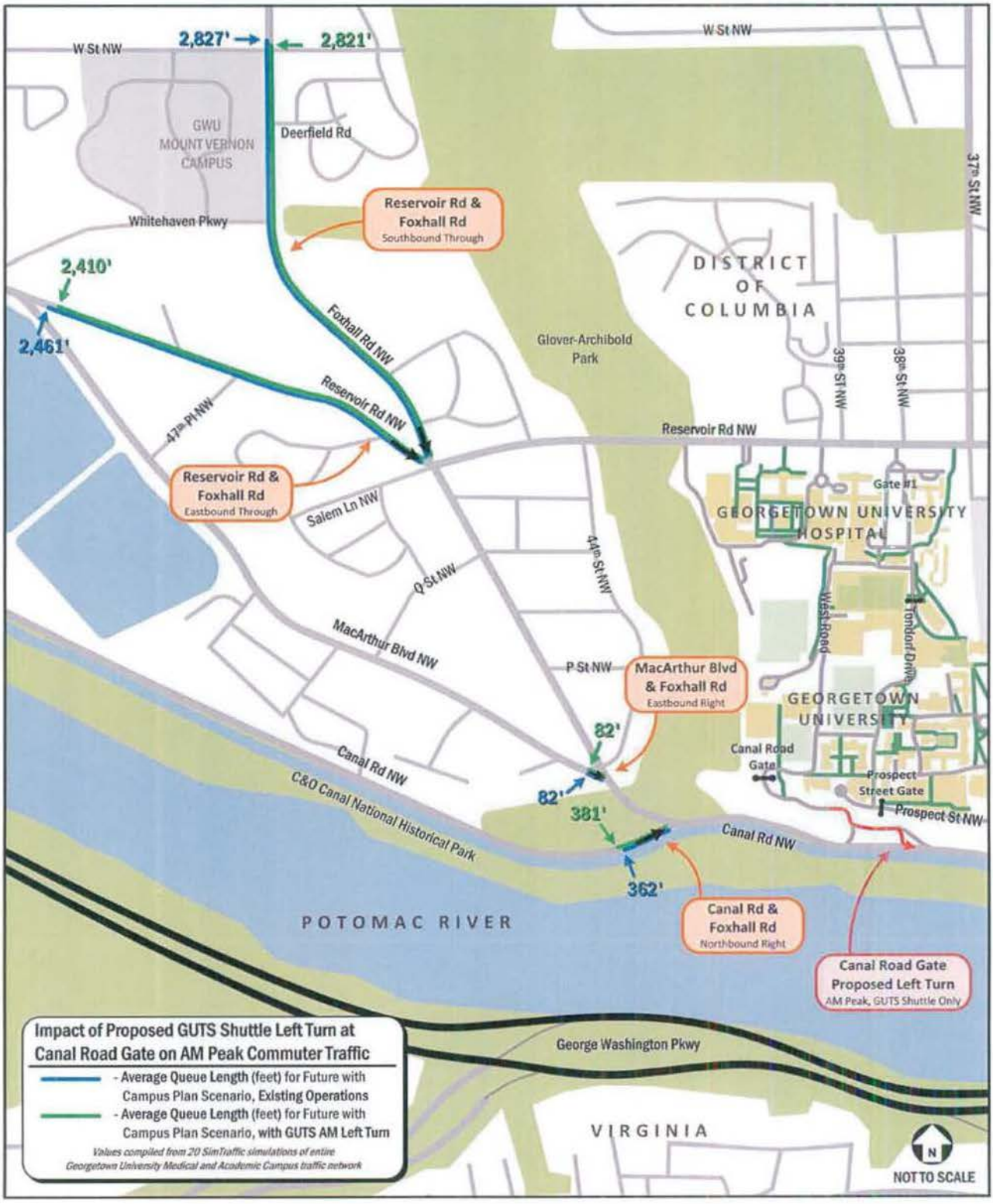


Figure 20: AM Left Turn Queuing Analysis Results

Table 21: Vehicular Levels of Service with and without Canal Road Left-Turn Restrictions

Intersection		Approach	Future (2021) with Campus Plan AM Peak Hour				Horizon Year (2031) AM Peak Hour			
			With Left-turn Restriction		*Without Left-turn Restriction*		*With Left-turn Restriction*		*Without Left-turn Restriction*	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	Reservoir Road & Foxhall Road	**Overall**	**176.7**	**F**	**176.7**	**F**	**224.1**	**F**	**224.1**	**F**
		Eastbound	**153.3**	**F**	**153.3**	**F**	**190.0**	**F**	**190.0**	**F**
		Westbound	79.7	E	79.7	E	**93.2**	**F**	**93.2**	**F**
		Northbound	**184.8**	**F**	**184.8**	**F**	**244.2**	**F**	**244.2**	**F**
		Southbound	**238.1**	**F**	**238.1**	**F**	**297.8**	**F**	**297.8**	**F**
2	Reservoir Road & GUH Gate #4	Westbound Left	1.8	A	1.8	A	2.2	A	2.2	A
		Northbound	**155.3**	**F**	**155.3**	**F**	**364.5**	**F**	**364.5**	**F**
3	Reservoir Road & GUH Gate #3	Westbound Left	8.6	A	8.6	A	10.6	B	10.6	B
		Northbound	**68.0**	**F**	**68.0**	**F**	**118.5**	**F**	**118.5**	**F**
4	Reservoir Road & GUH Gate #2	Westbound Left	7.6	A	7.6	A	9.7	A	9.7	A
		Northbound	**453.1**	**F**	**453.1**	**F**	**3326.4**	**F**	**3326.4**	**F**
5	Reservoir Road & 39th Street	**Overall**	**12.7**	**B**	**12.7**	**B**	**15.2**	**B**	**15.2**	**B**
		Eastbound	12.7	B	12.7	B	14.8	B	14.8	B
		Westbound	8.7	A	8.7	A	12.3	B	12.3	B
		Southbound	31.8	C	31.8	C	32.1	C	32.1	C
6	Reservoir Road & 38th Street/ GUH Gate #1	**Overall**	**302.0**	**F**	**302.0**	**F**	**404.8**	**F**	**404.8**	**F**
		Eastbound	14.1	B	14.1	B	18.7	B	18.7	B
		Westbound	**963.3**	**F**	**963.3**	**F**	**1276.8**	**F**	**1276.8**	**F**
		Northbound	53.8	D	53.8	D	54.5	D	54.5	D
		Southbound	26.1	C	26.1	C	26.3	C	26.3	C
7	Reservoir Road & 37th Street/Winfield Lane	**Overall**	**49.6**	**D**	**49.6**	**D**	**57.2**	**E**	**57.2**	**E**
		Eastbound	3.3	A	3.3	A	5.4	A	5.4	A
		Westbound	2.5	A	2.5	A	2.5	A	2.5	A
		Northbound	44.1	D	44.1	D	45.4	D	45.4	D
		Southbound	**372.9**	**F**	**372.9**	**F**	**430.4**	**F**	**430.4**	**F**

Intersection		Approach	Future (2021) with Campus Plan AM Peak Hour				Horizon Year (2031) AM Peak Hour			
			With Left-turn Restriction		*Without Left-turn Restriction*		*With Left-turn Restriction*		*Without Left-turn Restriction*	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
8	Reservoir Road & 35th Street	**Overall**	**67.5**	**E**	**67.5**	**E**	**86.2**	**F**	**86.2**	**F**
		Eastbound	16.7	B	16.7	B	18.9	B	18.9	B
		Westbound	15.2	B	15.2	B	16.0	B	16.0	B
		Northbound	**112.8**	**F**	**112.8**	**F**	**144.0**	**F**	**144.0**	**F**
		Southbound	**184.7**	**F**	**184.7**	**F**	**243.6**	**F**	**243.6**	**F**
9	Foxhall Road & MacArthur Boulevard/44th Street	**Overall**	**24.5**	**C**	**17.7**	**B**	**30.4**	**C**	**21.4**	**C**
		Westbound	46.2	D	46.2	D	48.6	D	48.6	D
		Northbound	22.7	C	12.6	B	30.9	C	17.5	B
		Southbound	23.8	C	23.8	C	24.5	C	24.5	C
10	Foxhall Road & MacArthur Blvd	**Overall**	**11.4**	**B**	**11.4**	**B**	**14.1**	**B**	**14.1**	**B**
		Eastbound	31.5	C	31.5	C	39.3	D	39.3	D
		Northbound	0.4	A	0.4	A	0.5	A	0.5	A
		Southbound	4.2	A	4.2	A	4.5	A	4.5	A
11	Foxhall Road & Canal Road	**Overall**	**33.2**	**C**	**33.2**	**C**	**56.8**	**E**	**56.8**	**E**
		Eastbound	37.9	D	37.9	D	68.4	E	68.4	E
		Westbound	0.4	A	0.4	A	0.5	A	0.5	A
		Northbound	63.9	E	63.9	E	**105.3**	**F**	**105.3**	**F**
12	Canal Road & GU Canal Road Gate (Unsignalized)	Southbound	12.5	B	10.0	A	12.7	B	10.0	A
13	Canal Road & GU Canal Road Gate (Signalized)	**Overall**	**3.1**	**A**	**14.7**	**B**	**3.0**	**A**	**40.4**	**D**
		Eastbound	0.2	A	16.7	B	0.4	A	58.7	E
		Westbound	7.9	A	9.5	A	7.4	A	8.8	A
		Southbound	*not permitted*		46.0	D	*not permitted*		46.0	D
14	Canal Road/M Street & Whitehurst Freeway/36th Street	**Overall**	**53.4**	**D**	**59.2**	**E**	**100.3**	**F**	**108.6**	**F**
		Eastbound	79.2	E	**89.8**	**F**	**170.6**	**F**	**185.3**	**F**
		Westbound	1.7	A	1.7	A	3.6	A	3.6	A
		Northbound	41.7	D	41.9	D	35.6	D	35.8	D
		Southbound	50.3	D	50.3	D	51.3	D	51.3	D

Intersection	Approach	Future (2021) with Campus Plan AM Peak Hour				Horizon Year (2031) AM Peak Hour			
		With Left-turn Restriction		*Without Left-turn Restriction*		*With Left-turn Restriction*		*Without Left-turn Restriction*	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
15 M Street & Key Bridge	**Overall**	**76.7**	**E**	**74.7**	**E**	**111.0**	**F**	**108.9**	**F**
	Eastbound	14.2	B	14.1	B	14.5	B	14.5	B
	Westbound	**126.9**	**F**	**118.7**	**F**	**177.6**	**F**	**169.0**	**F**
	Northbound	**94.1**	**F**	**94.1**	**F**	**142.2**	**F**	**142.2**	**F**
16 M Street & 34th Street	**Overall**	**13.6**	**B**	**13.5**	**B**	**19.7**	**B**	**19.7**	**B**
	Eastbound	4.3	A	4.4	A	6.6	A	6.7	A
	Westbound	37.1	D	37.1	D	56.3	E	56.3	E
	Northbound	34.7	C	34.7	C	34.7	C	34.7	C
	Southbound	12.3	B	11.3	B	12.5	B	11.7	B
17 M Street & 33rd Street	**Overall**	**31.3**	**C**	**31.3**	**C**	**44.6**	**D**	**44.6**	**D**
	Eastbound	1.2	A	0.9	A	1.2	A	0.9	A
	Westbound	**112.2**	**F**	**112.2**	**F**	**161.7**	**F**	**161.7**	**F**
	Northbound	37.9	D	37.9	D	38.0	D	38.0	D
18 M Street & Wisconsin Avenue	**Overall**	**42.3**	**D**	**41.9**	**D**	**61.1**	**E**	**60.1**	**E**
	Eastbound	28.1	C	27.3	C	56.0	E	53.7	D
	Westbound	42.3	D	42.3	D	46.1	D	46.1	D
	Northbound	41.9	D	41.9	D	43.4	D	43.4	D
	Southbound	68.4	E	68.4	E	**89.8**	**F**	**89.8**	**F**
19 Prospect Street/GU Gate & 37th Street	**Overall**	**7.9**	**A**	**7.8**	**A**	**8.0**	**A**	**7.9**	**A**
	Eastbound	8.1	A	7.9	A	8.3	A	8.0	A
	Westbound	7.8	A	7.8	A	8.0	A	7.9	A
	Northbound	7.4	A	7.3	A	7.5	A	7.5	A
	Southbound	7.7	A	7.6	A	7.8	A	7.7	A

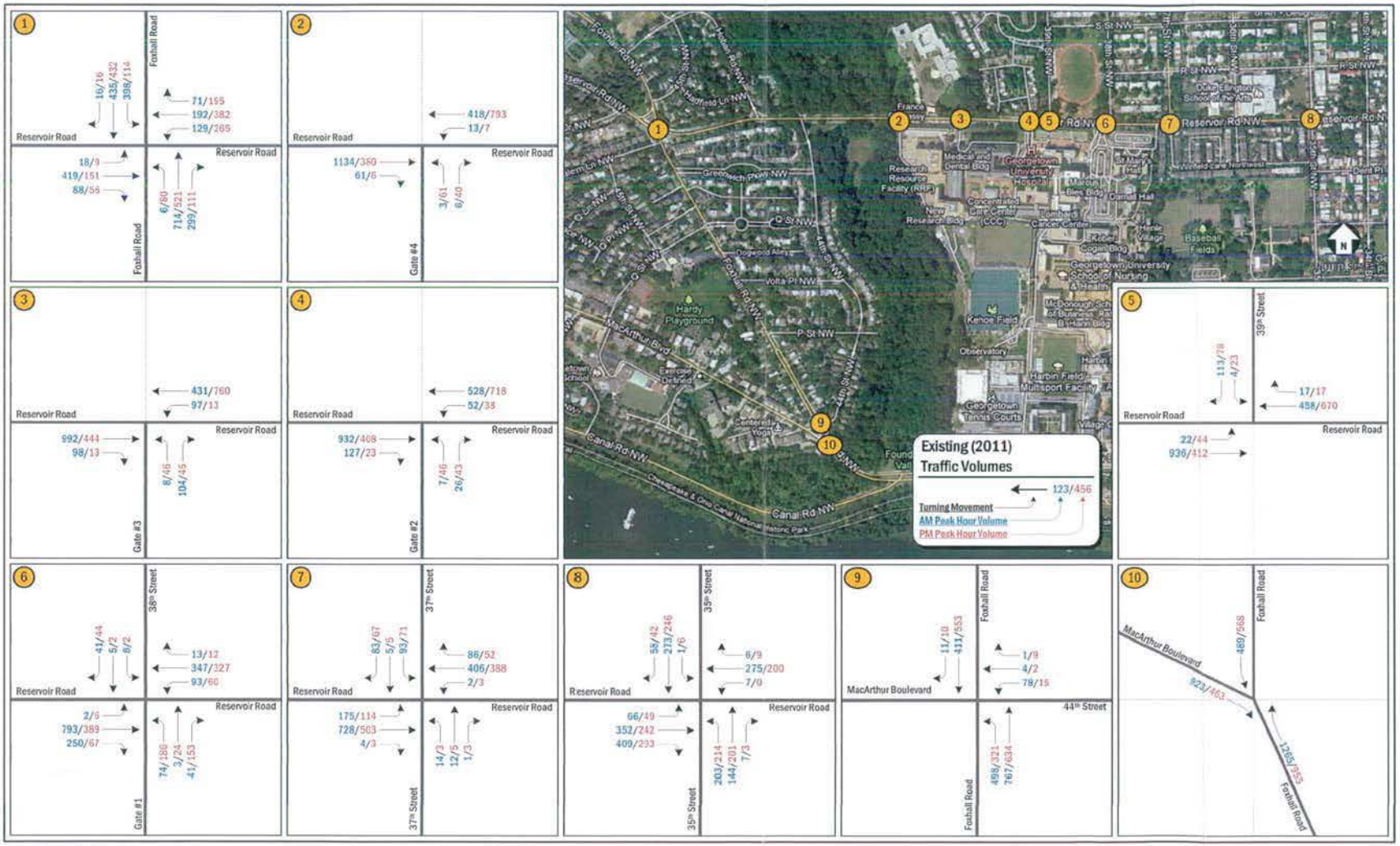


Figure 21: Existing (2011) Peak Hour Traffic Volumes (1 of 2)

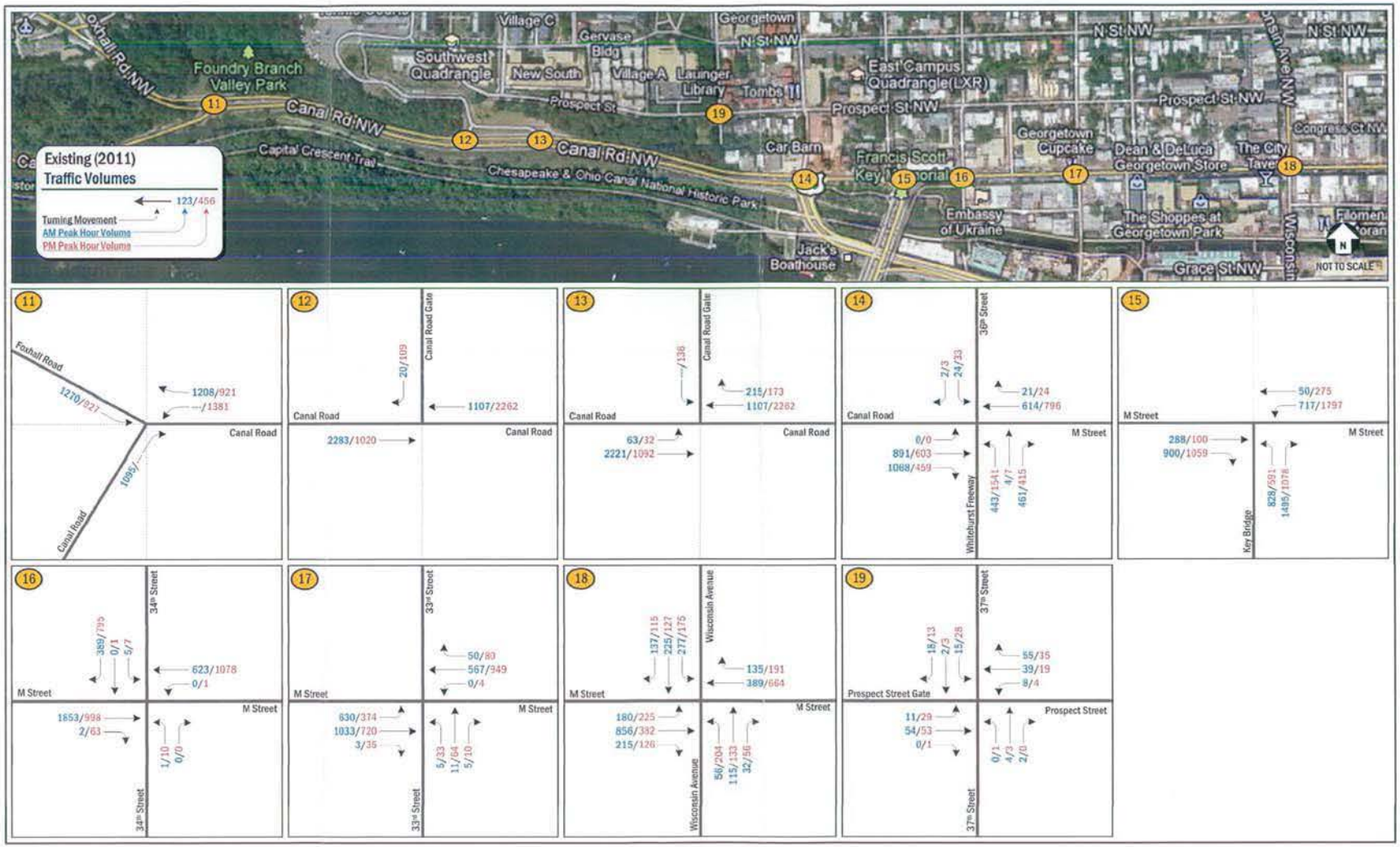


Figure 22: Existing (2011) Peak Hour Traffic Volumes (2 of 2)

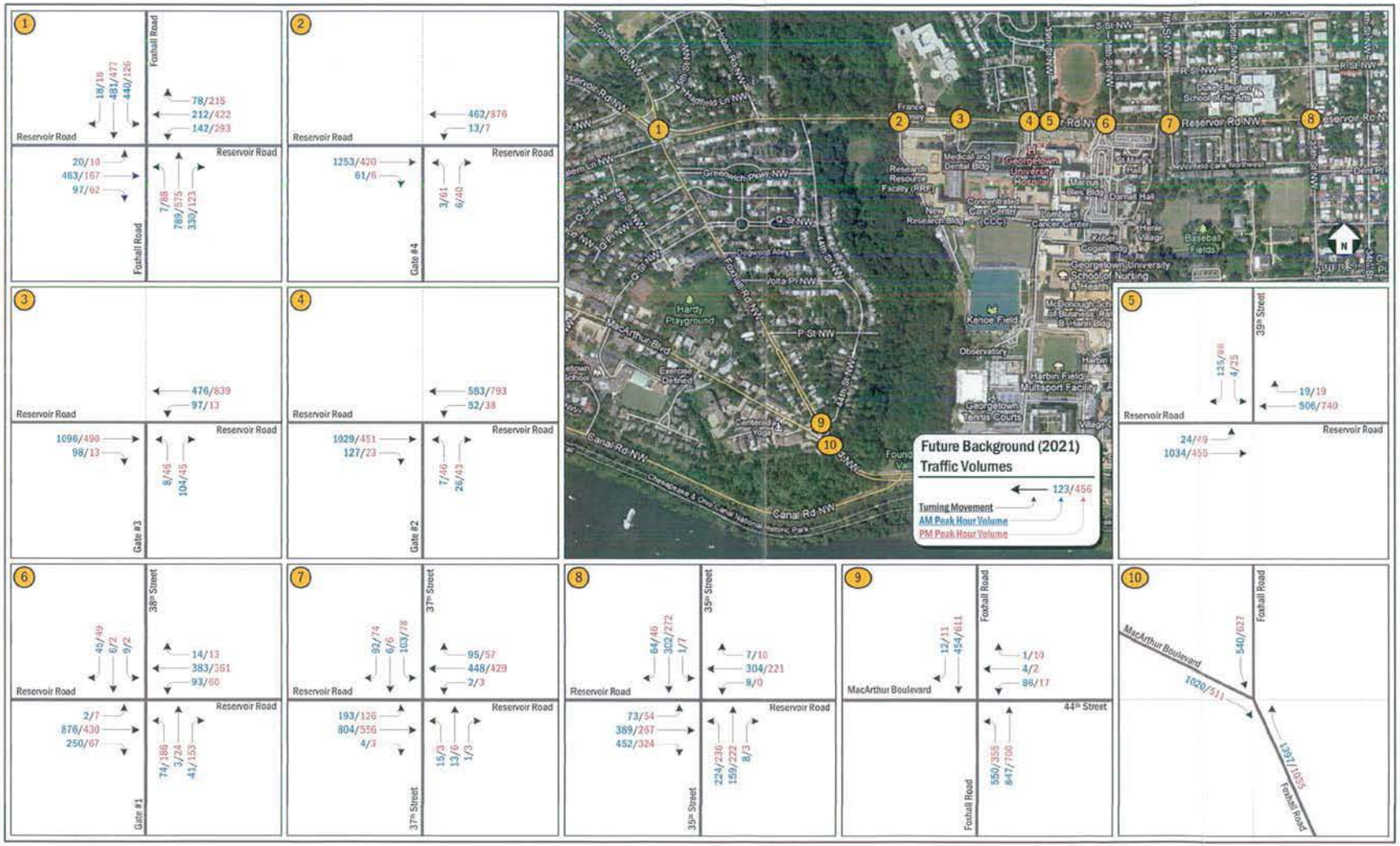


Figure 23: Future (2021) without Campus Plan Peak Hour Traffic Volumes (1 of 2)

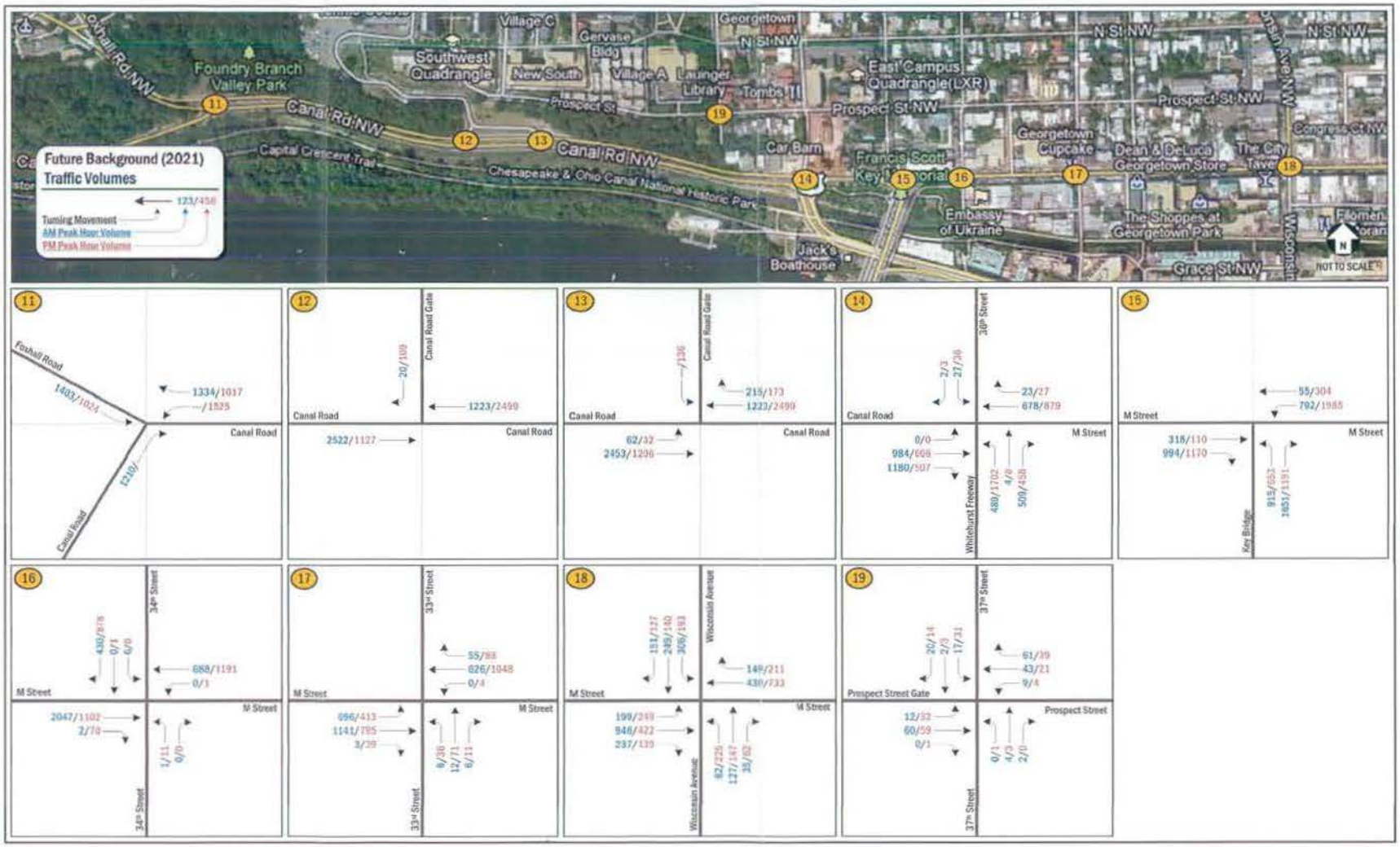


Figure 24: Future (2021) without Campus Plan Peak Hour Traffic Volumes (2 of 2)

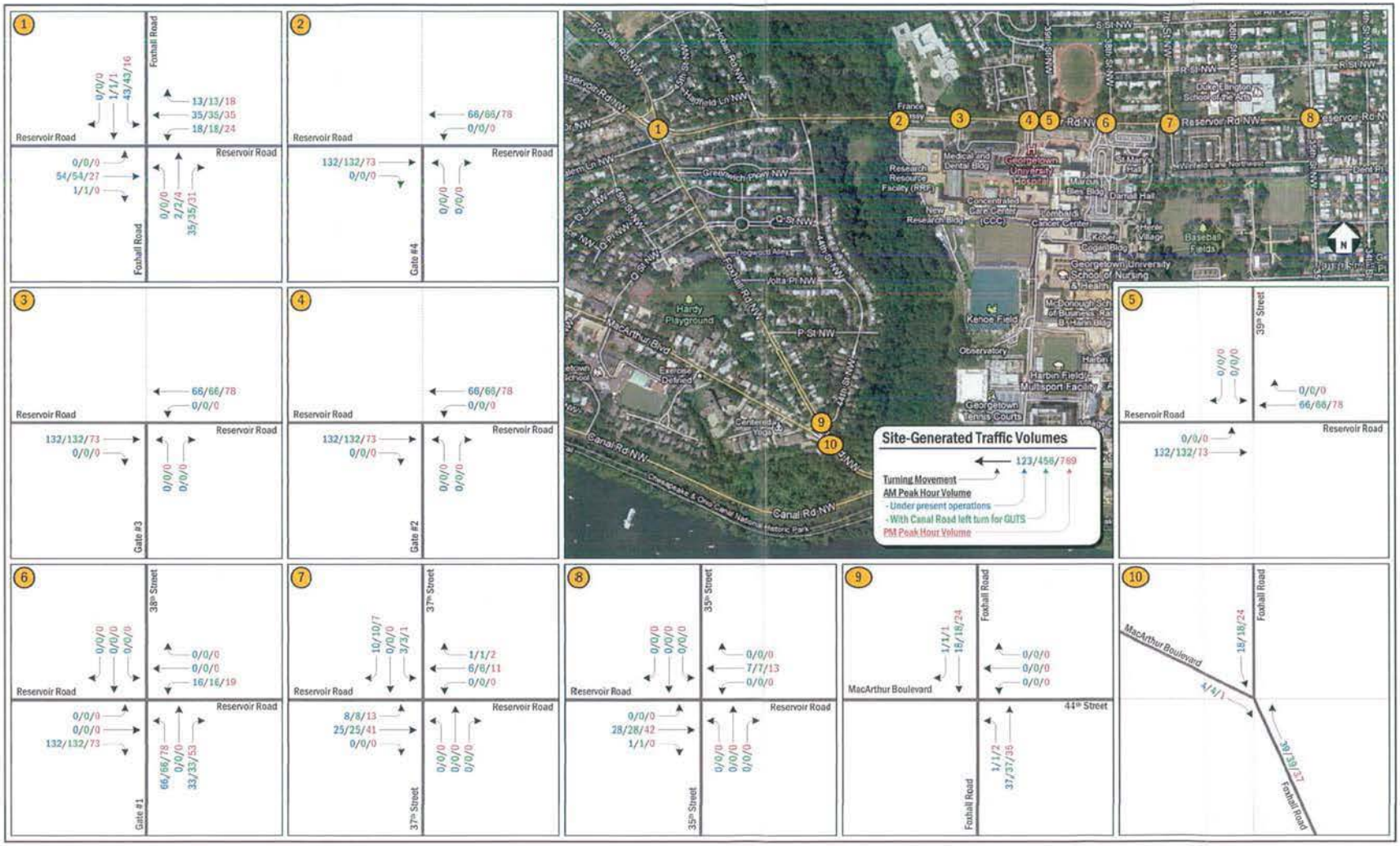


Figure 25: Peak Hour Trips Generated by the Campus Plan (1 of 2)

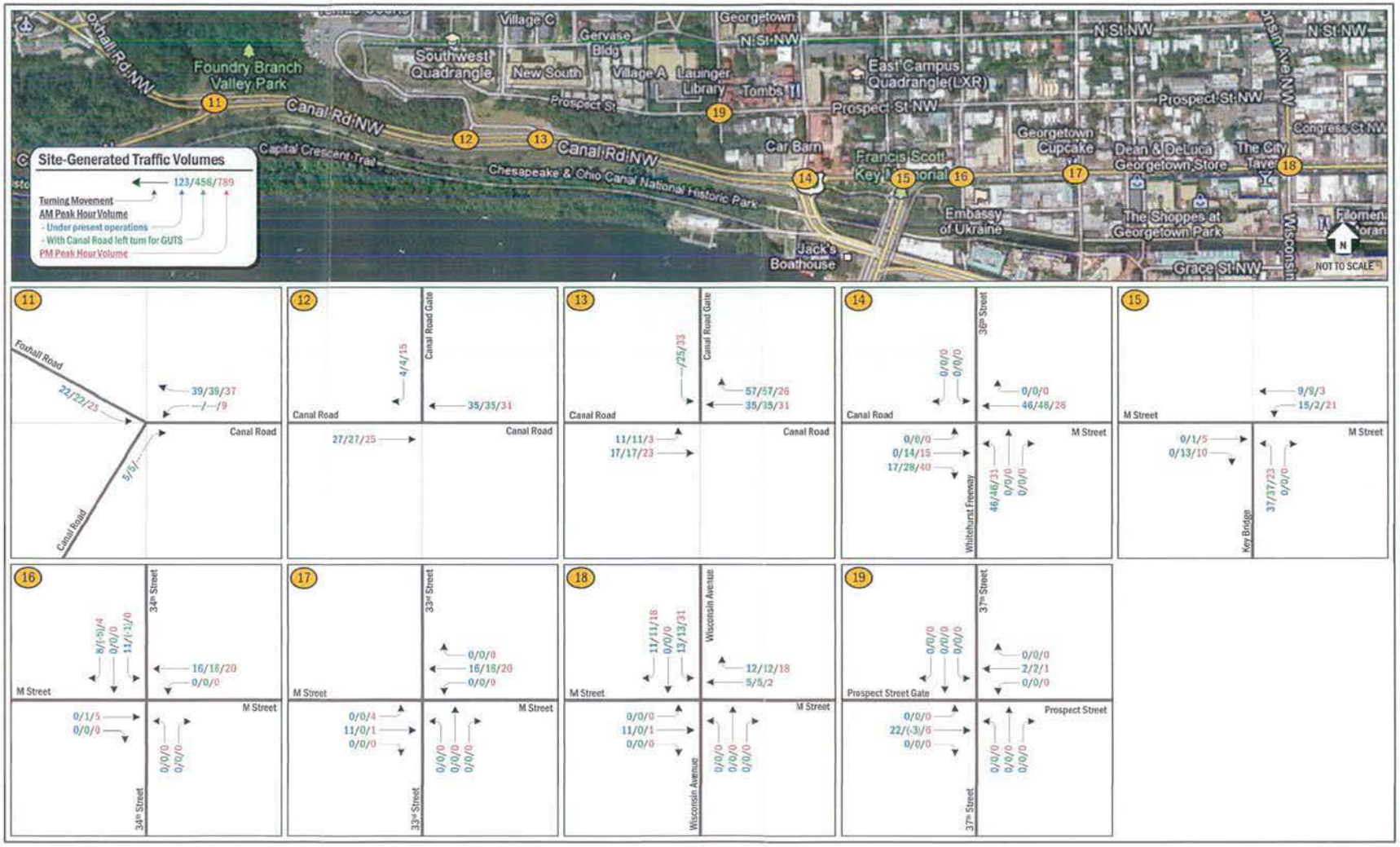


Figure 26: Peak Hour Trips Generated by the Campus Plan (2 of 2)

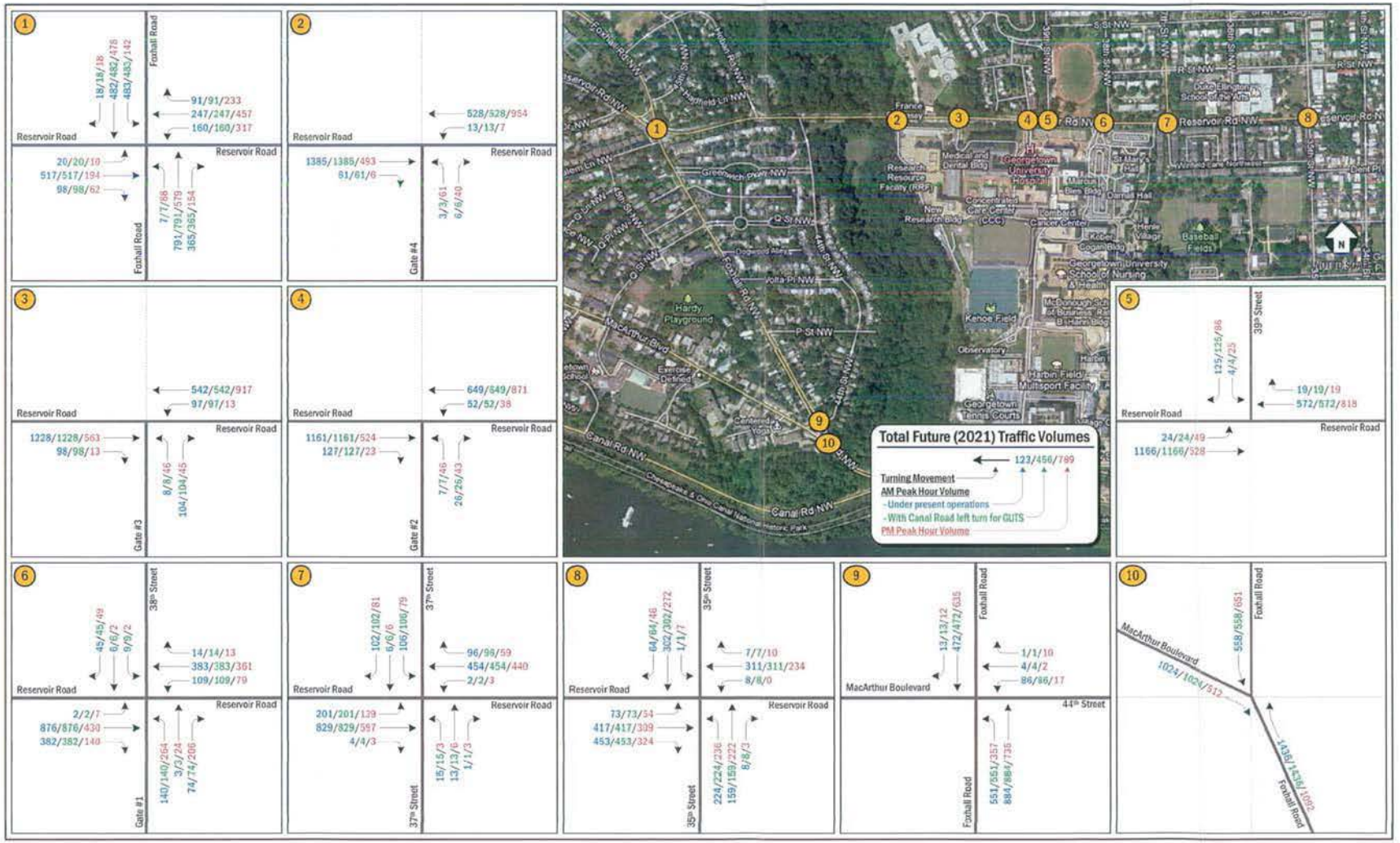


Figure 27: Future (2021) with Campus Plan Peak Hour Traffic Volumes (1 of 2)

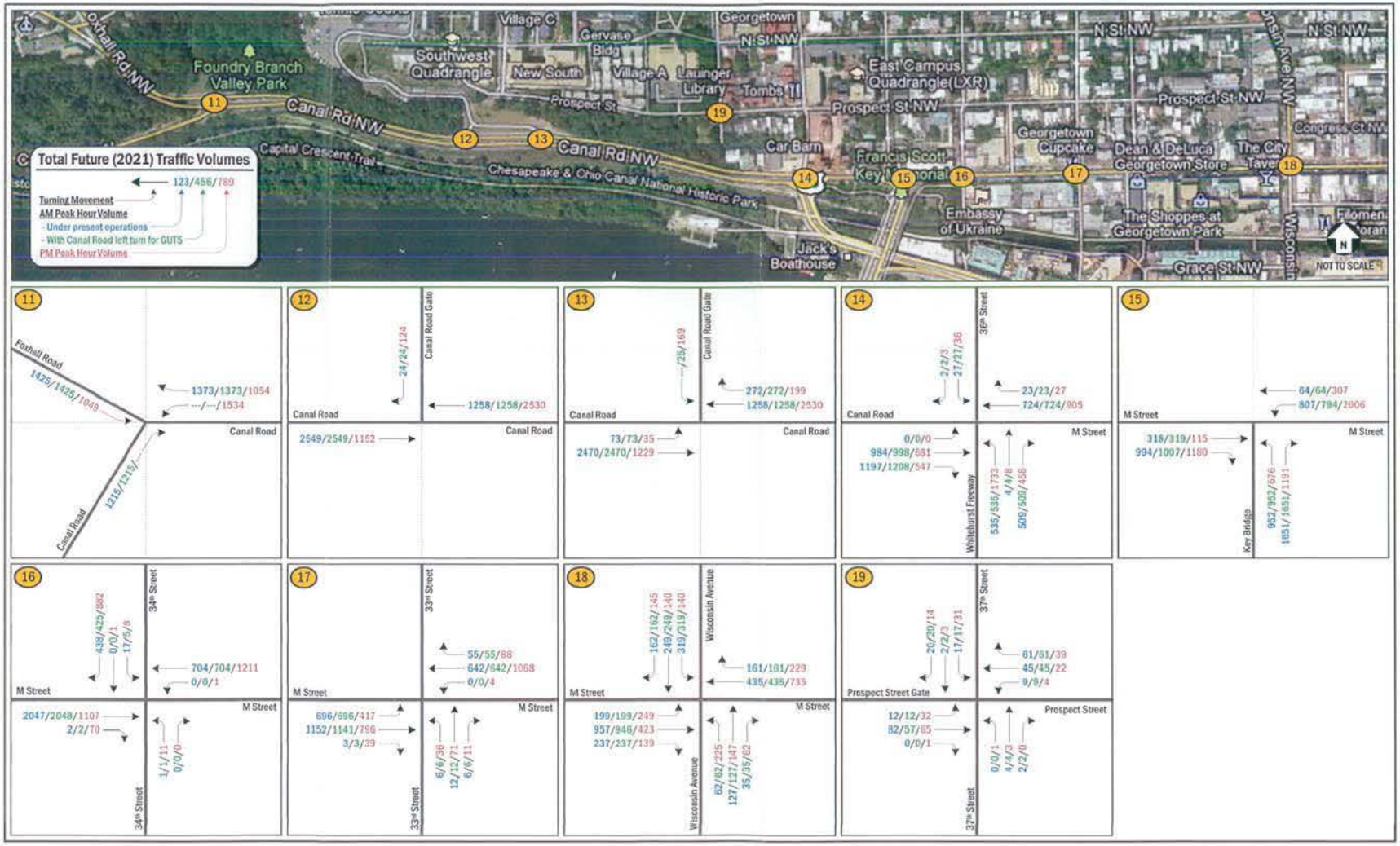


Figure 28: Future (2021) with Campus Plan Peak Hour Traffic Volumes (2 of 2)

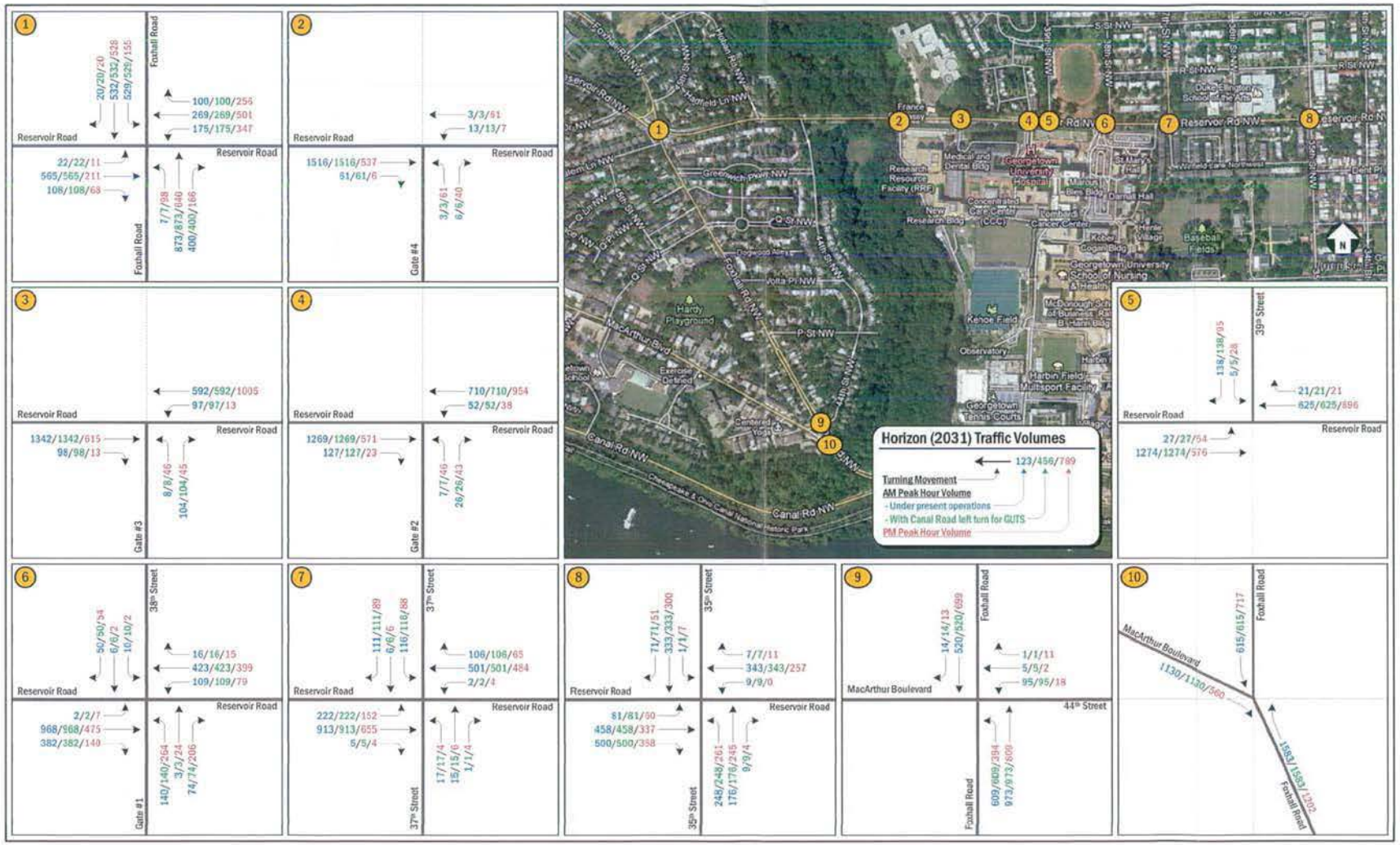


Figure 29: Horizon Year (2031) with Campus Plan Peak Hour Traffic Volumes (1 of 2)

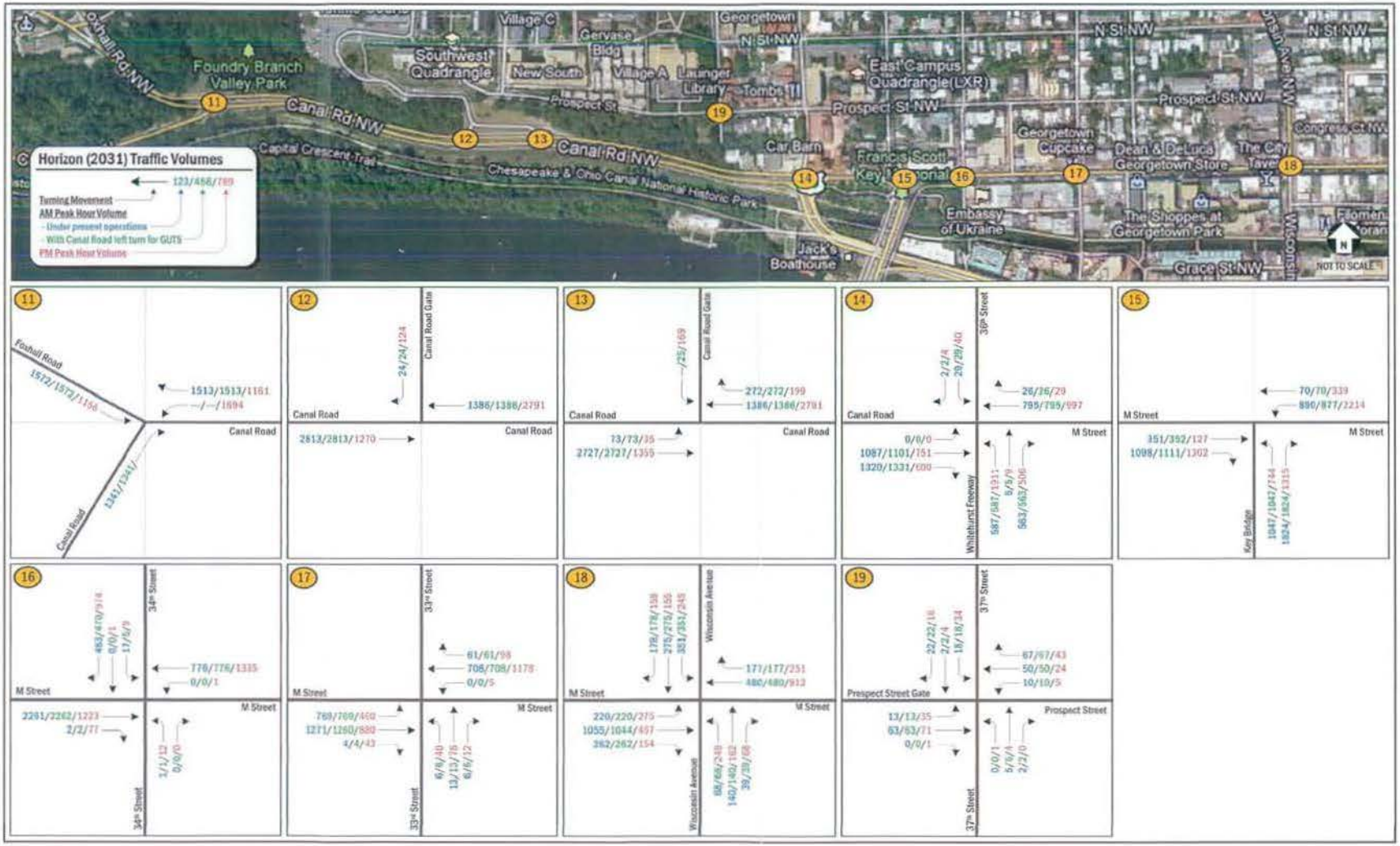


Figure 30: Horizon Year (2031) with Campus Plan Peak Hour Traffic Volumes (2 of 2)

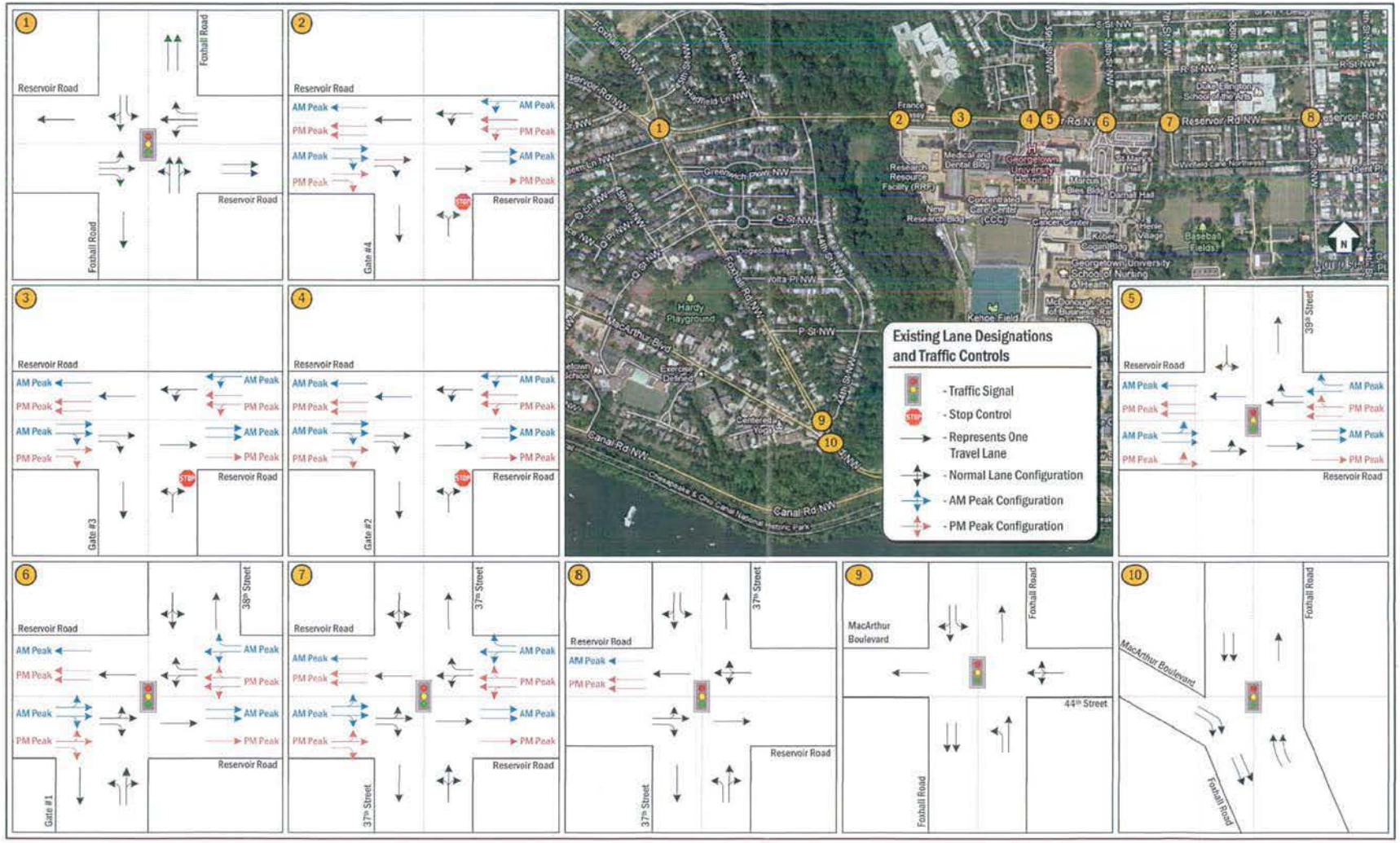


Figure 31: Existing (2011) Lane Configurations and Traffic Controls (1 of 2)

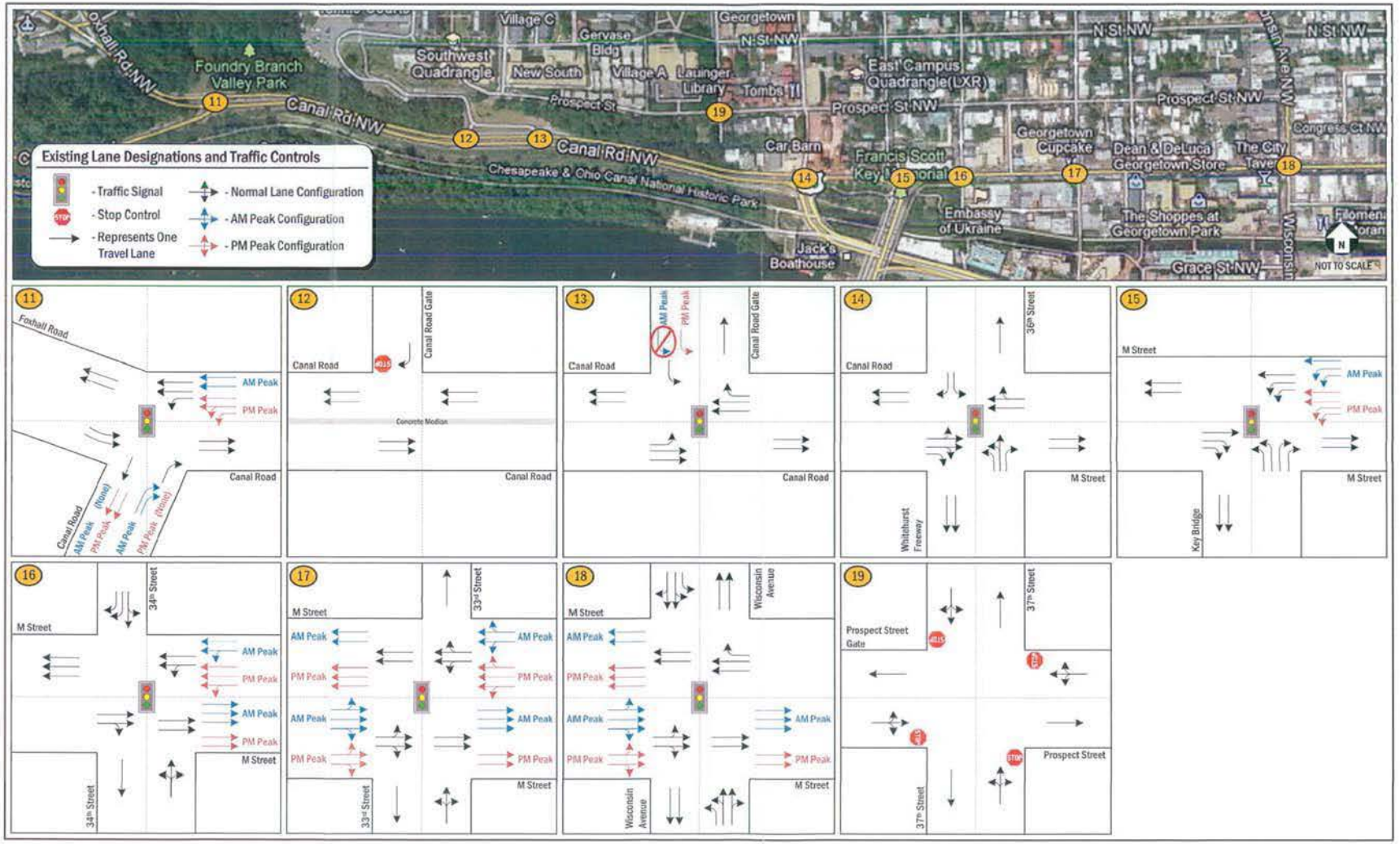


Figure 32: Existing (2011) Lane Configurations and Traffic Controls (2 of 2)

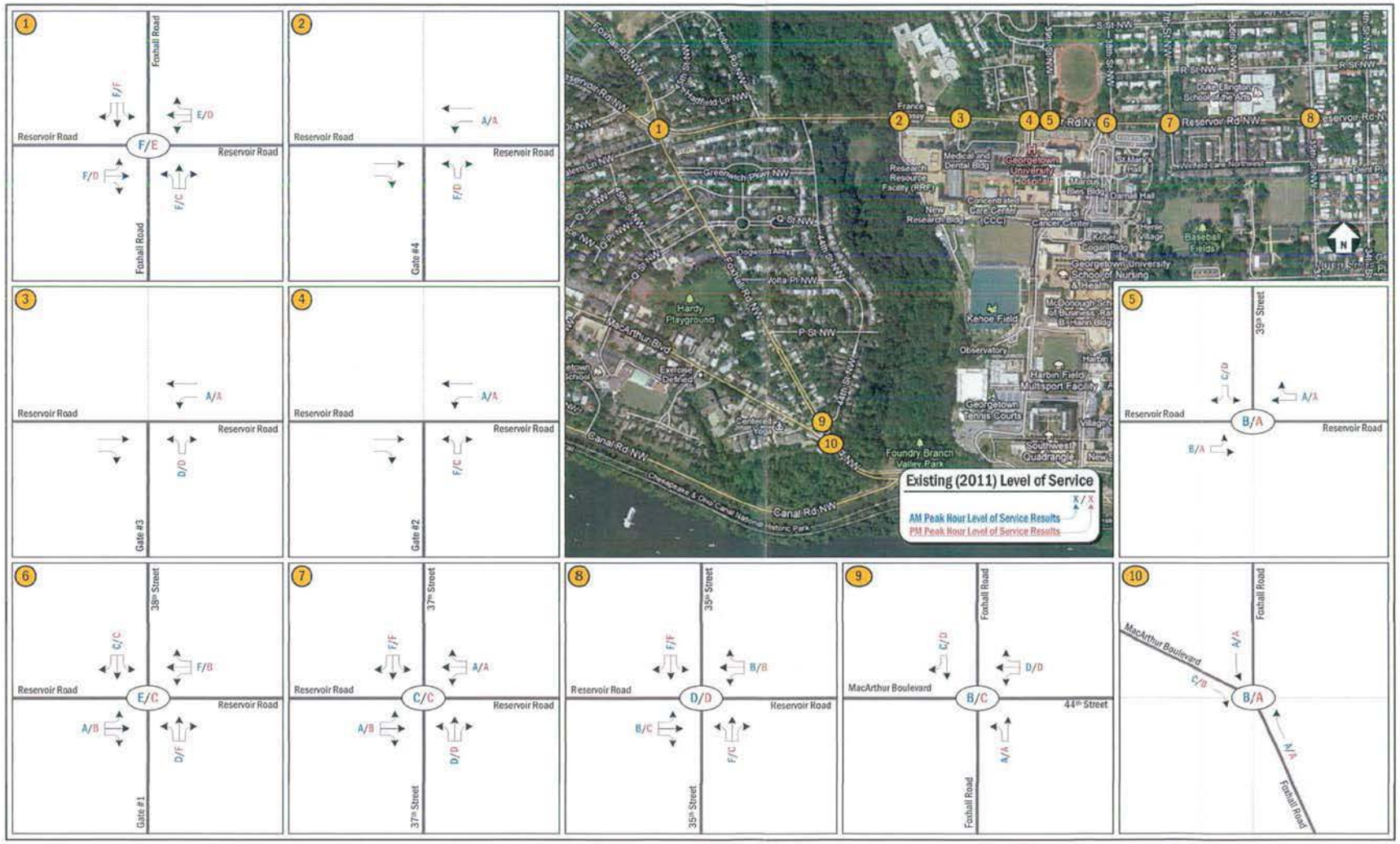


Figure 33: Existing (2011) Peak Hour Levels of Service (1 of 2)

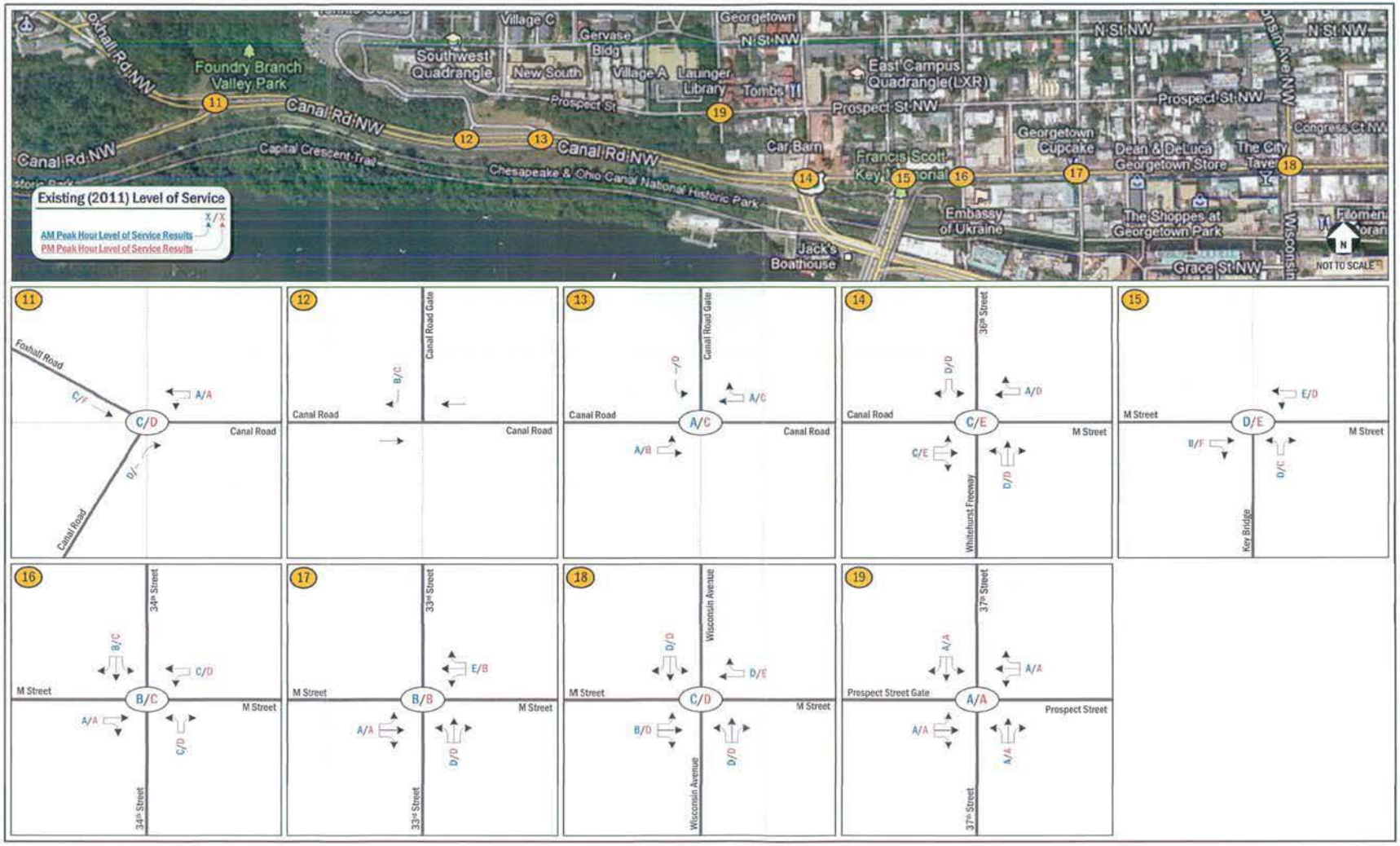


Figure 34: Existing (2011) Peak Hour Levels of Service (2 of 2)

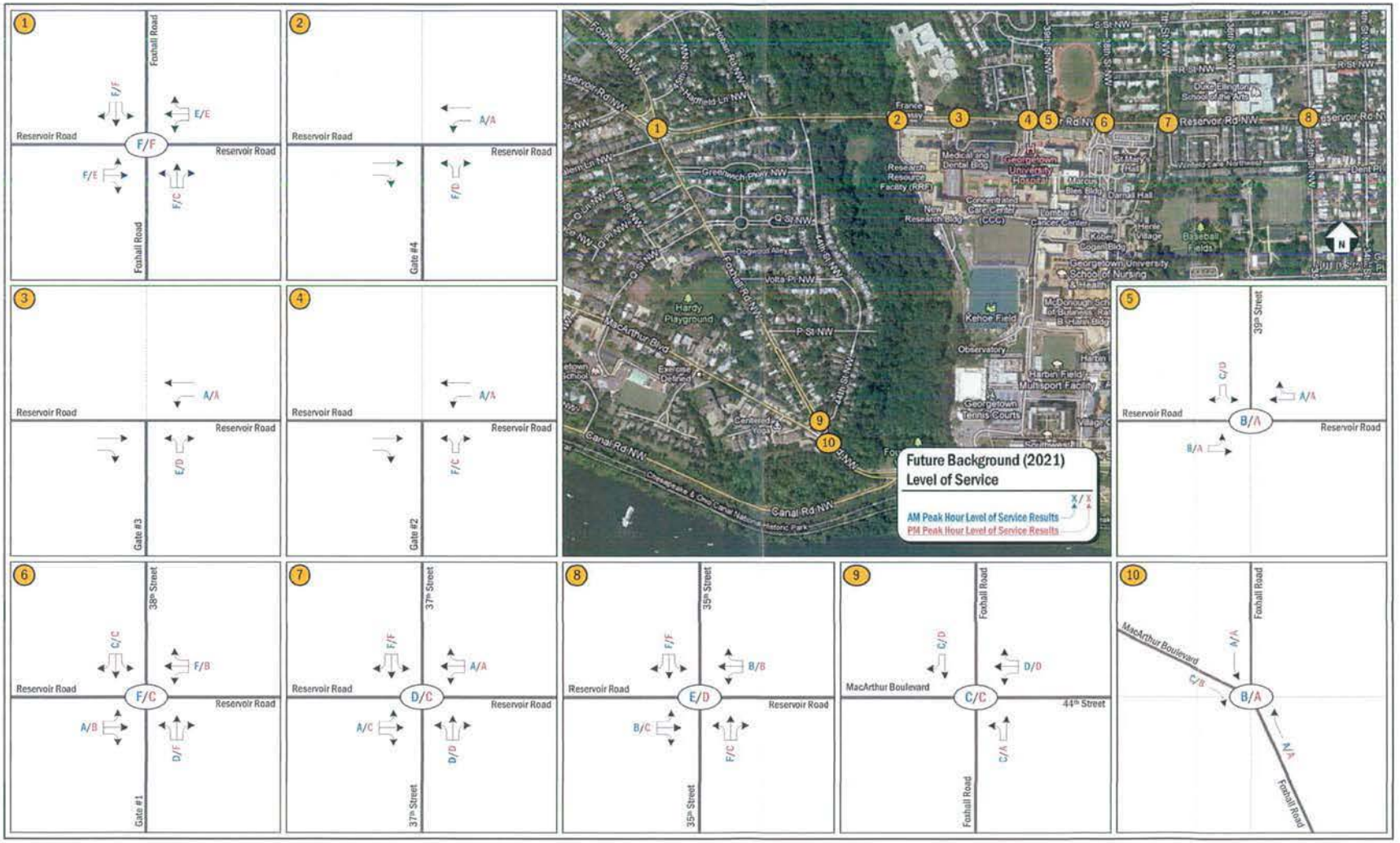


Figure 35: Future (2021) without Campus Plan Capacity Analysis Results (1 of 2)

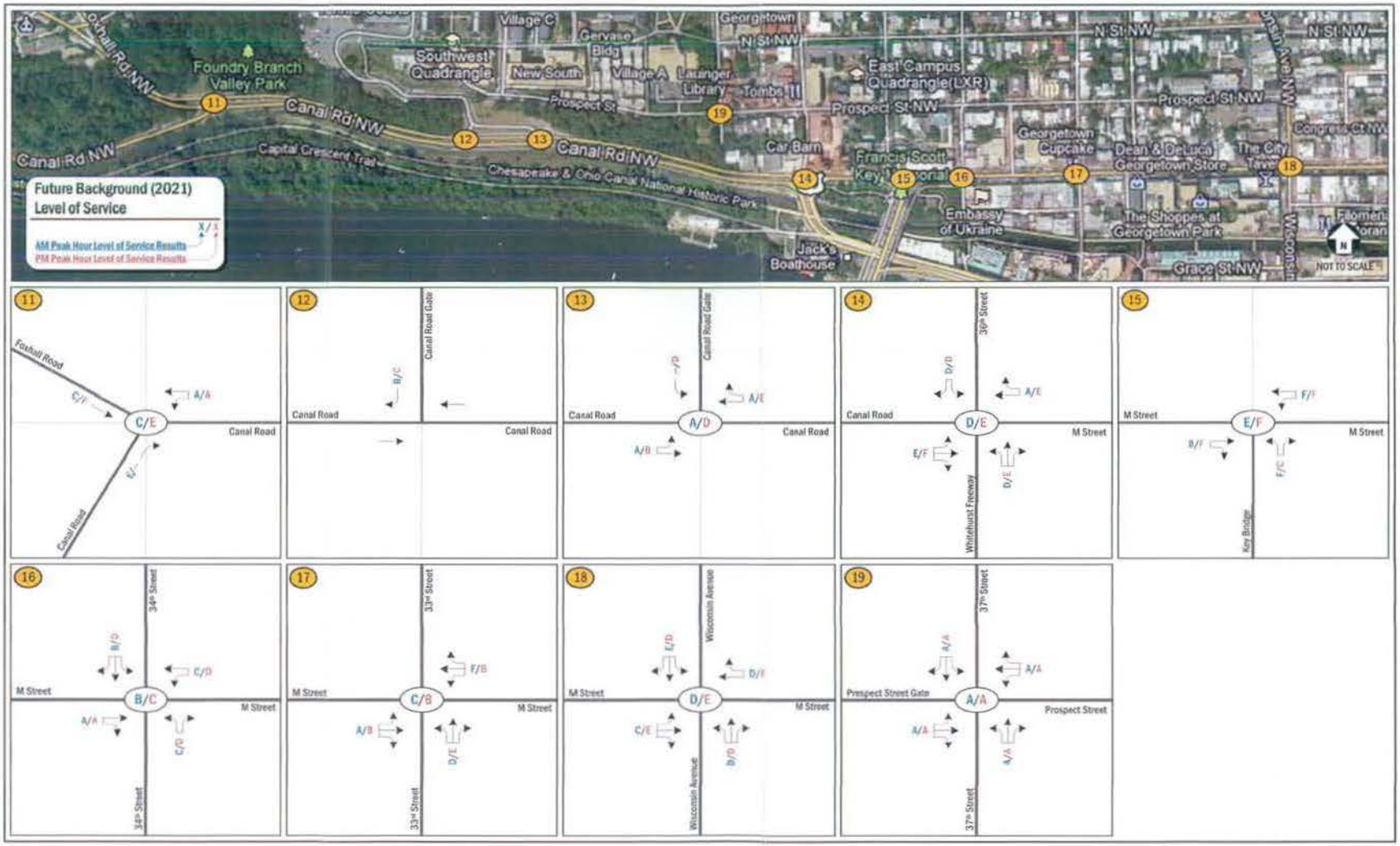


Figure 36: Future (2021) without Campus Plan Capacity Analysis Results (2 of 2)

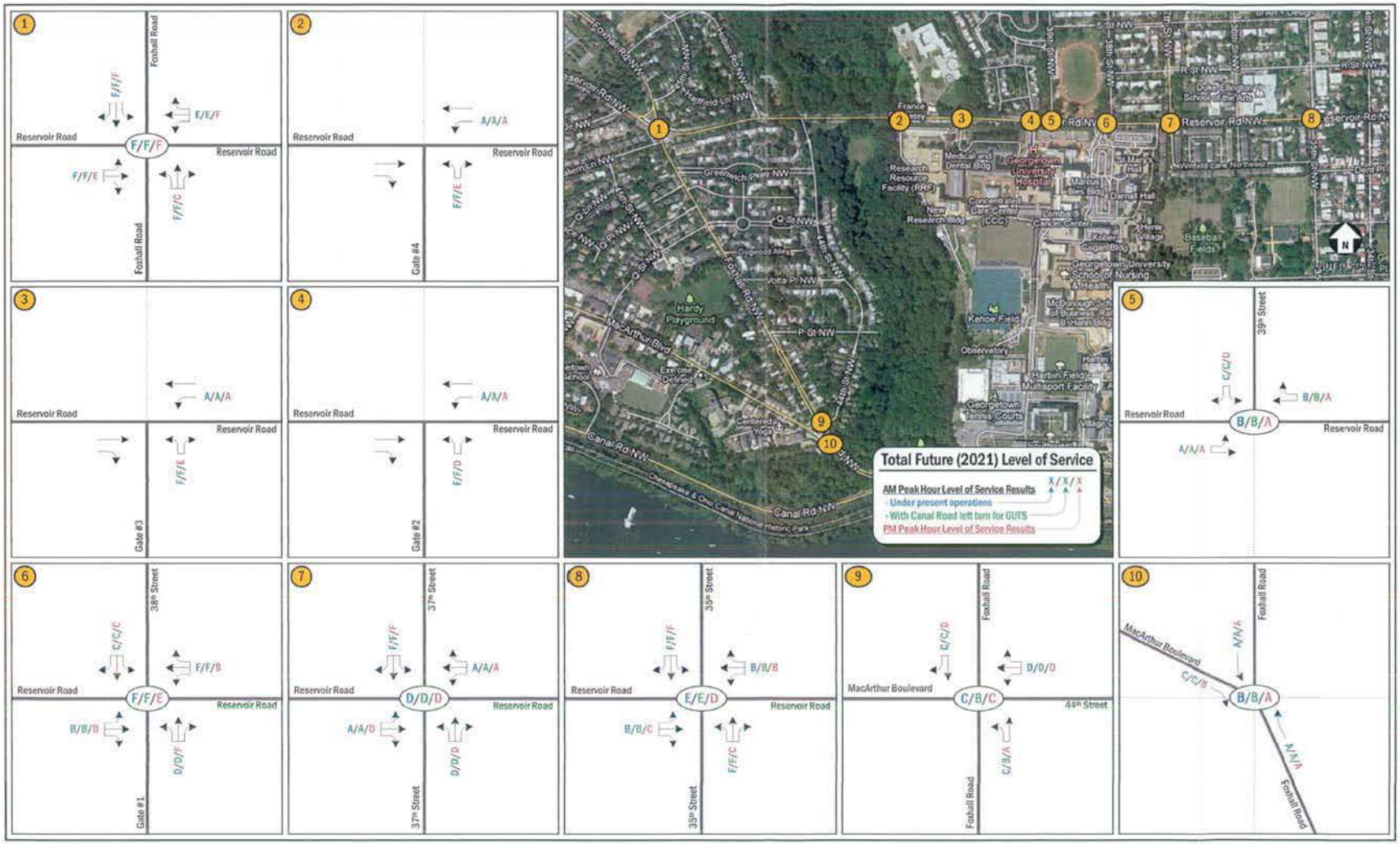


Figure 37: Future (2021) with Campus Plan Capacity Analysis Results (1 of 2)

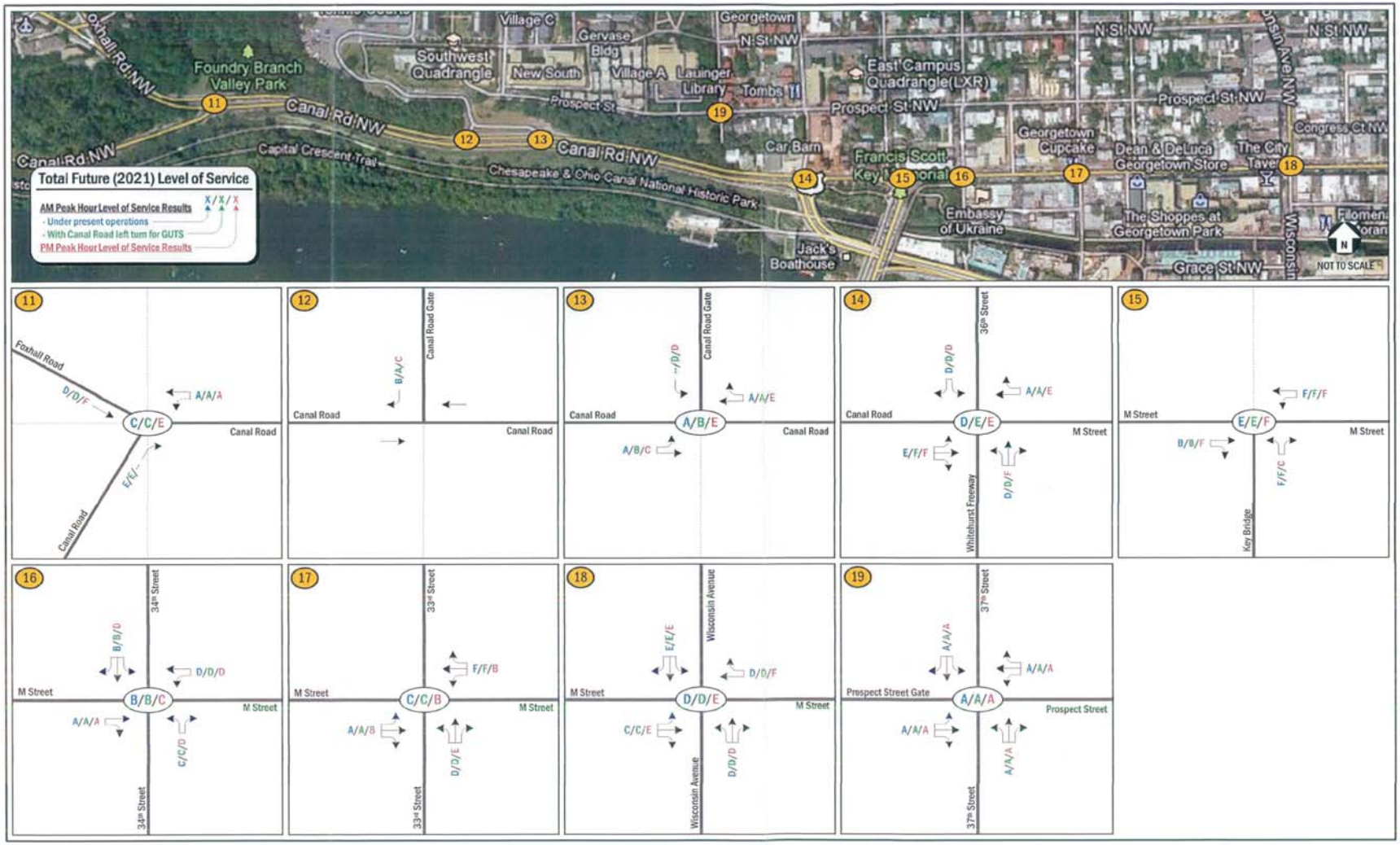


Figure 38: Future (2021) with Campus Plan Capacity Analysis Results (2 of 2)

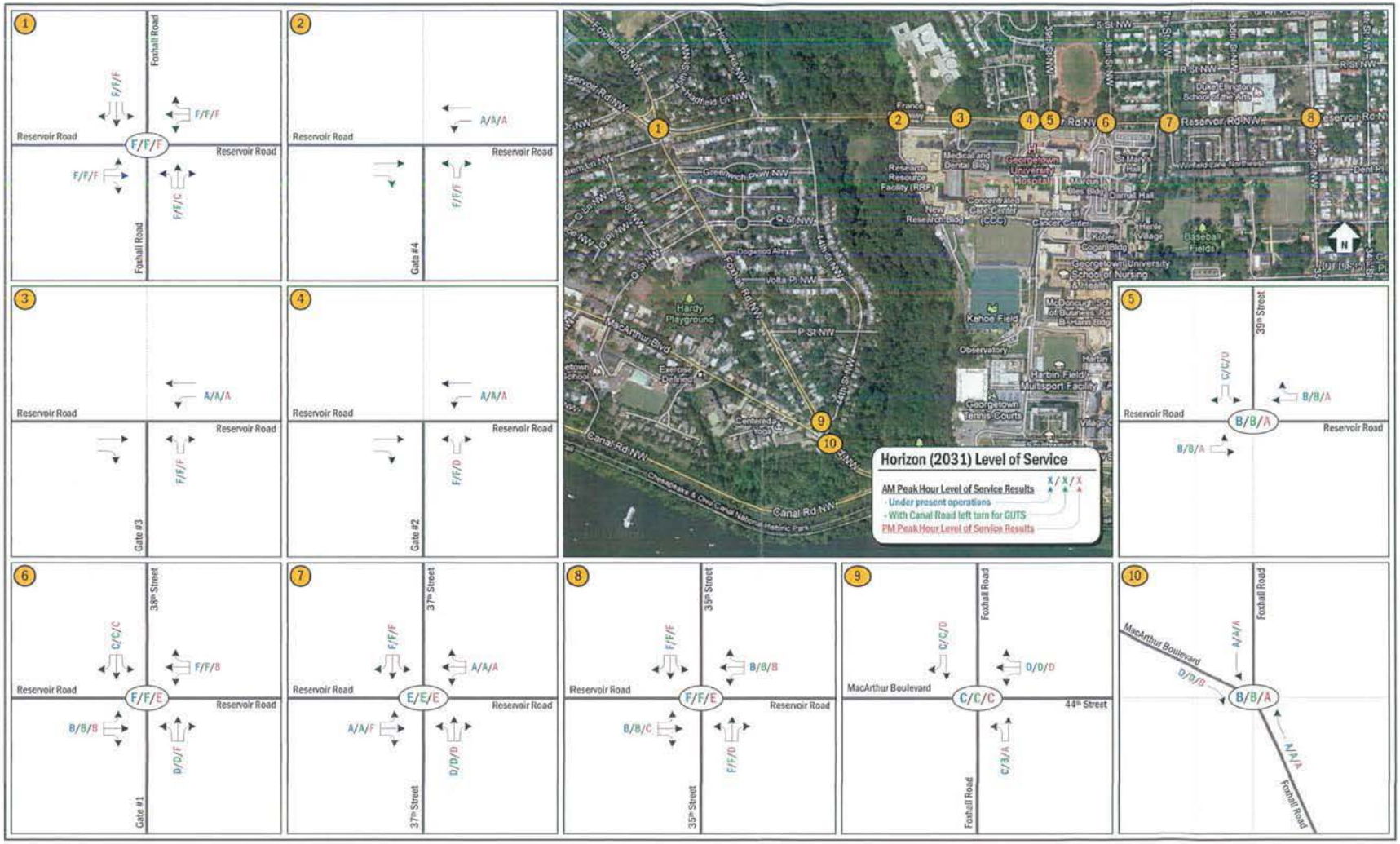


Figure 39: Horizon Year (2031) with Campus Plan Capacity Analysis Results (1 of 2)

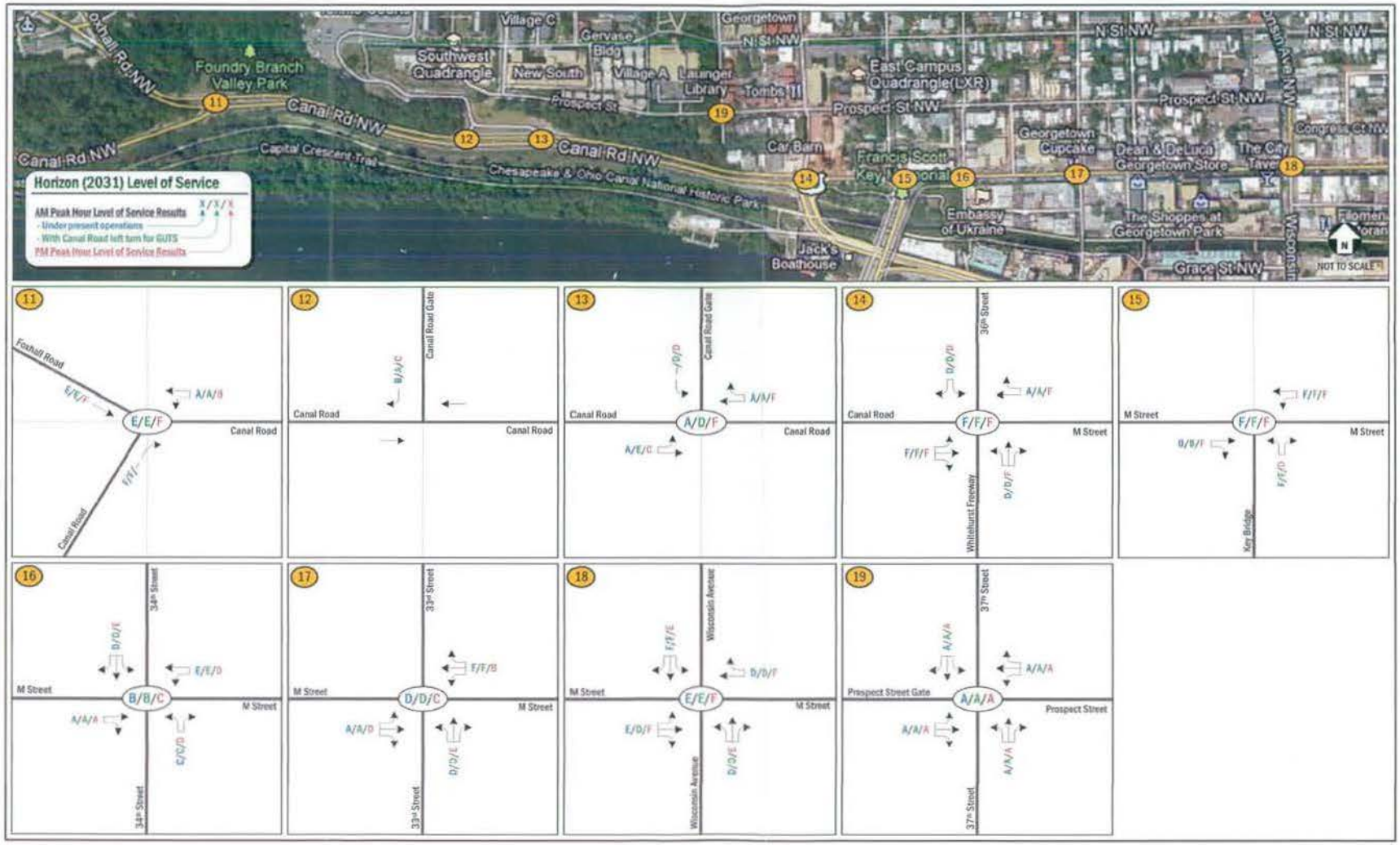


Figure 40: Horizon Year (2031) with Campus Plan Capacity Analysis Results (2 of 2)

3.2 On-Street Parking

3.2.1 Inventory and Occupancy Counts

This section of the report summarizes an on-street parking inventory and occupancy count. The purpose of the count was to establish parking supply and demand on streets within walking distance of the University and identify any trends or patterns associated with neighborhood parking demand. Table 22 lists the inventory and occupancy results and Figure 41, Figure 42, and Figure 43 map the findings.

The following summarizes the methodology and findings of the parking inventory and occupancy count:

- Data collection
  - Conducted parking inventory count on Tuesday, February 8, 2011 which included identifying the number of parking spaces by block face and the type of parking permitted or restricted by space
  - Conducted mid-day parking occupancy count between 2 and 4 PM on Thursday, February 10, 2011 that included identifying the number of occupied spaces by block face and the type of parking permitted or restricted by space
  - Conducted evening parking occupancy count between 8 and 10 PM on Thursday, February 10, 2011 that included identifying the number of occupied spaces by block face and the type of parking permitted or restricted by space
- Count findings
  - The parking inventory identified 1,709 on-street parking spaces in the study area
  - 80% of the on-street parking spaces have residential parking restrictions, which limit the number of hours that a car without a Zone 2 RPP permit can park. Generally, the RPP restrictions limit the number of hours that a car without a RPP sticker can park to 2 or 4 hours
  - 20% of on-street parking spaces do not have RPP restrictions but still limit the duration that a car can park, usually a maximum of 2 or 4 hour Monday through Saturday between the hours of 7 am and 10m PM.
  - The mid-day count found 80% of all spaces occupied and the evening count found 75% of all spaces occupied
  - The mid-day count found 82% of RPP spaces occupied and 68% of the non RPP spaces occupied
  - The evening count found 81% of RPP spaces occupied and 51% of the non RPP spaces occupied
  - The occupancy results found a high rate of utilization but that there is unused parking capacity, indicating that existing demand does not exceed supply in the study area

Gorove/Slade divided the study area into several zones (identified in Figure 41) to identify parking utilization rates in different areas. The following summarizes the findings:

- West Georgetown had higher utilization rates during both count periods (85% Mid-day & 88% Evening) than Burleith (71% Mid-day & 60% Evening)
- West Georgetown RPP parking had higher utilization rates (87% Mid-day & 89% Evening) than parking without RPP restrictions (70% Mid-day & 84% Evening)

- Area 1 had the highest utilization rates of the four areas (88% Mid-day & 91% Evening)

The occupancy results indicate that parking demand is greatest in West Georgetown, but there is no indication from the count results that use, if any, is the primary generator of parking demand. Demand is likely spread between residents with RPP permits, visitors and employees of Georgetown commercial uses, and the University. As noted in Section 1, information provided by DDOT and DPW indicated that during a six-month period (October 2010 – April 2011) that included the dates of this analysis, the District issued a total of 15,976 citations for parking violations within the West Georgetown and Burleith neighborhoods, which includes the blocks contained in the study areas. This indicates that the parking restrictions applicable to these blocks are strictly enforced.

Table 22: Parking Inventory and Occupancy Results

	Study Area						Burleith		West Georgetown	
Area	1	2	3	4	Total	%	Total	%	Total	%
RPP										
Inventory	587	380	23	370	1,360	80%	370		967	
Occupancy										
Mid-Day	527	315	16	263	1,121	82%	263	71%	842	87%
Evening	531	328	21	221	1,101	81%	221	60%	859	89%
Not RPP										
Inventory	92	11	246	0	349	20%	0		103	
Occupancy										
Mid-Day	71	1	166	0	238	68%	0	0%	72	70%
Evening	87	0	92	0	179	51%	0	0%	87	84%
All Types										
Inventory	679	391	269	370	1,709		370		1,070	
Occupancy										
Mid-Day	598	316	182	263	1,359	80%	263	71%	914	85%
Evening	618	328	113	221	1,280	75%	221	60%	946	88%

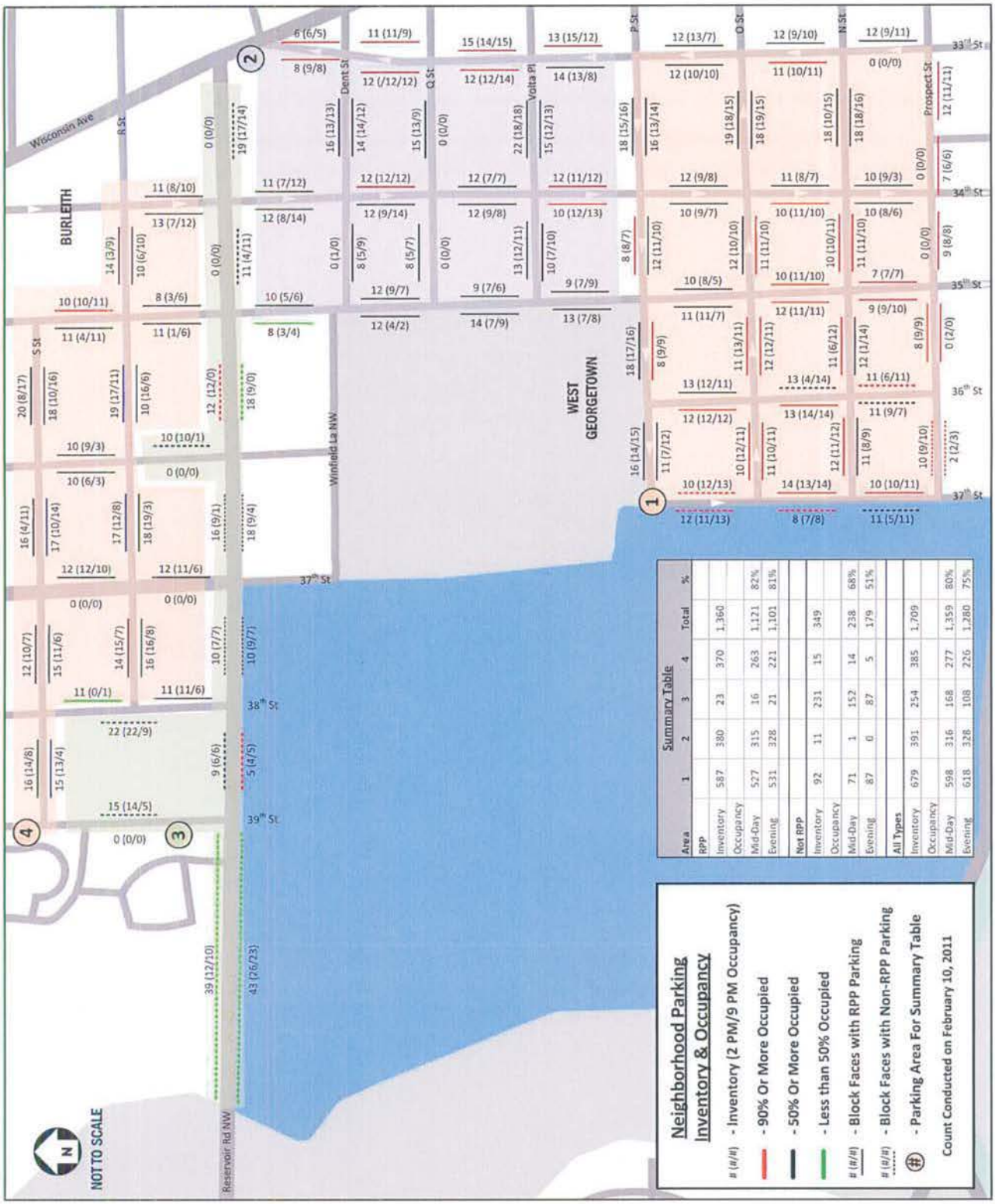
3.2.2 Parking Policies

The occupancy count of on-street parking, general observations and concerns raised by the District and the surrounding neighborhood all indicate that on-street parking is difficult to find in the immediate area surrounding the University. In response to these concerns, the University has proposed a series of conditions to will address parking impacts related to students who live on or near campus:

- Students who reside in University house shall be prohibited from bringing cars to campus or the surrounding neighborhood. Violations of this policy will be grounds for discipline under the code of conduct, and violators shall be sanctioned.
- Students who reside off-campus shall be required to adhere to University policy and District regulations regarding car ownership and registration. Again, violations of this policy will be grounds for discipline under the code of

conduct, and violators shall be sanctioned. Furthermore, the University shall keep license plate and vehicle information for cars of undergraduate students.

- Notices of these restrictions will be provided to students and to the parents of traditional undergraduate students.
- In addition to the above restrictions related to students, the University also agrees to continue to promote public transit, taxi, and GUTS shuttle use by visitors, and discourage visitors from driving to campus.



Area		1	2	3	4	Total	%
RPP							
	Inventory	587	380	23	370	1,360	
	Occupancy						
	Mid-Day	527	315	16	263	1,121	82%
	Evening	531	328	21	221	1,101	81%
Not RPP							
	Inventory	92	11	231	15	349	
	Occupancy						
	Mid-Day	71	1	152	14	238	68%
	Evening	87	0	87	5	179	51%
All Types							
	Inventory	679	391	254	385	1,709	
	Occupancy						
	Mid-Day	598	316	168	277	1,359	80%
	Evening	618	328	108	226	1,280	75%

Figure 41: Study Area Parking Inventory and Occupancy

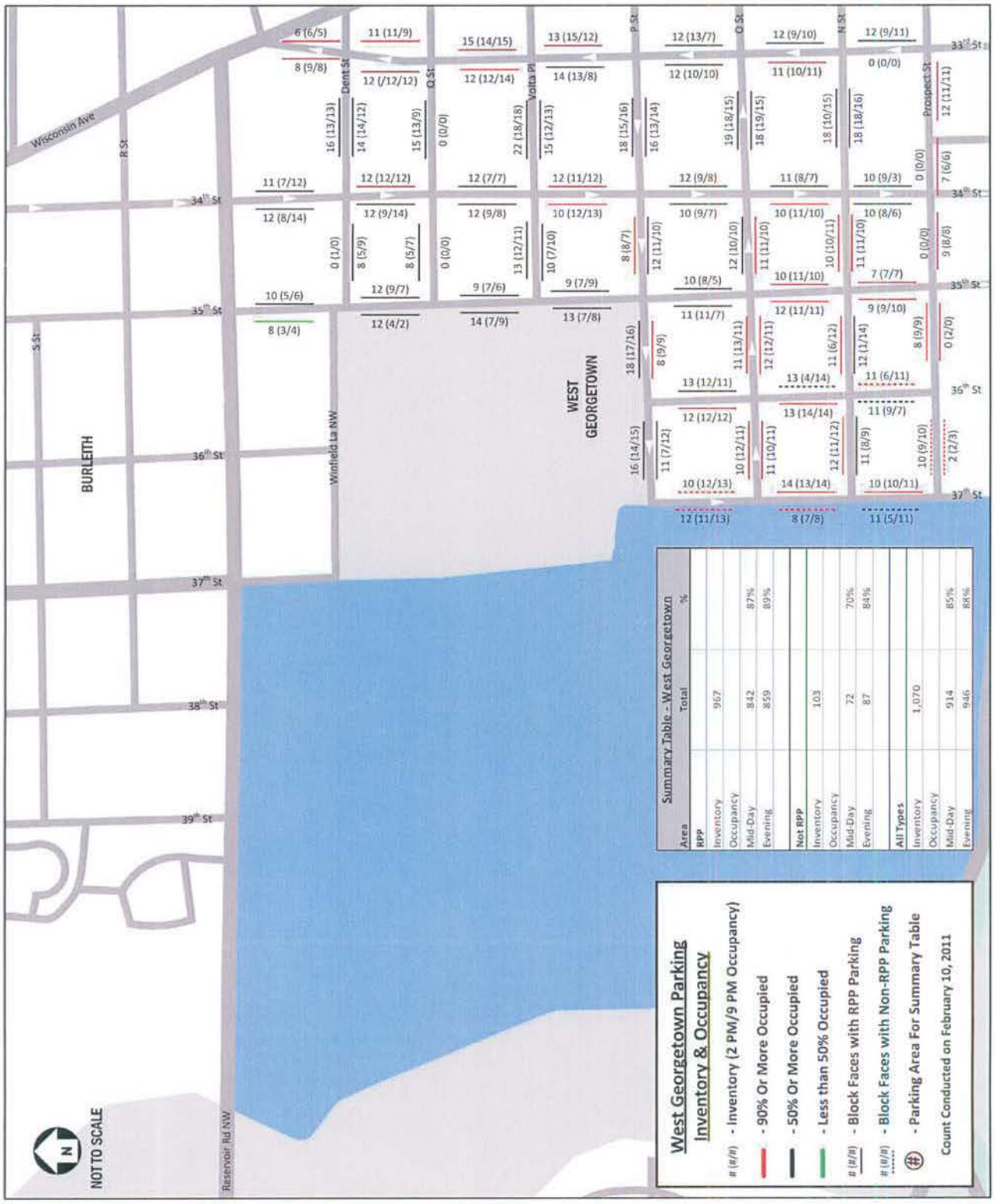


Figure 42: West Georgetown Parking Inventory and Occupancy

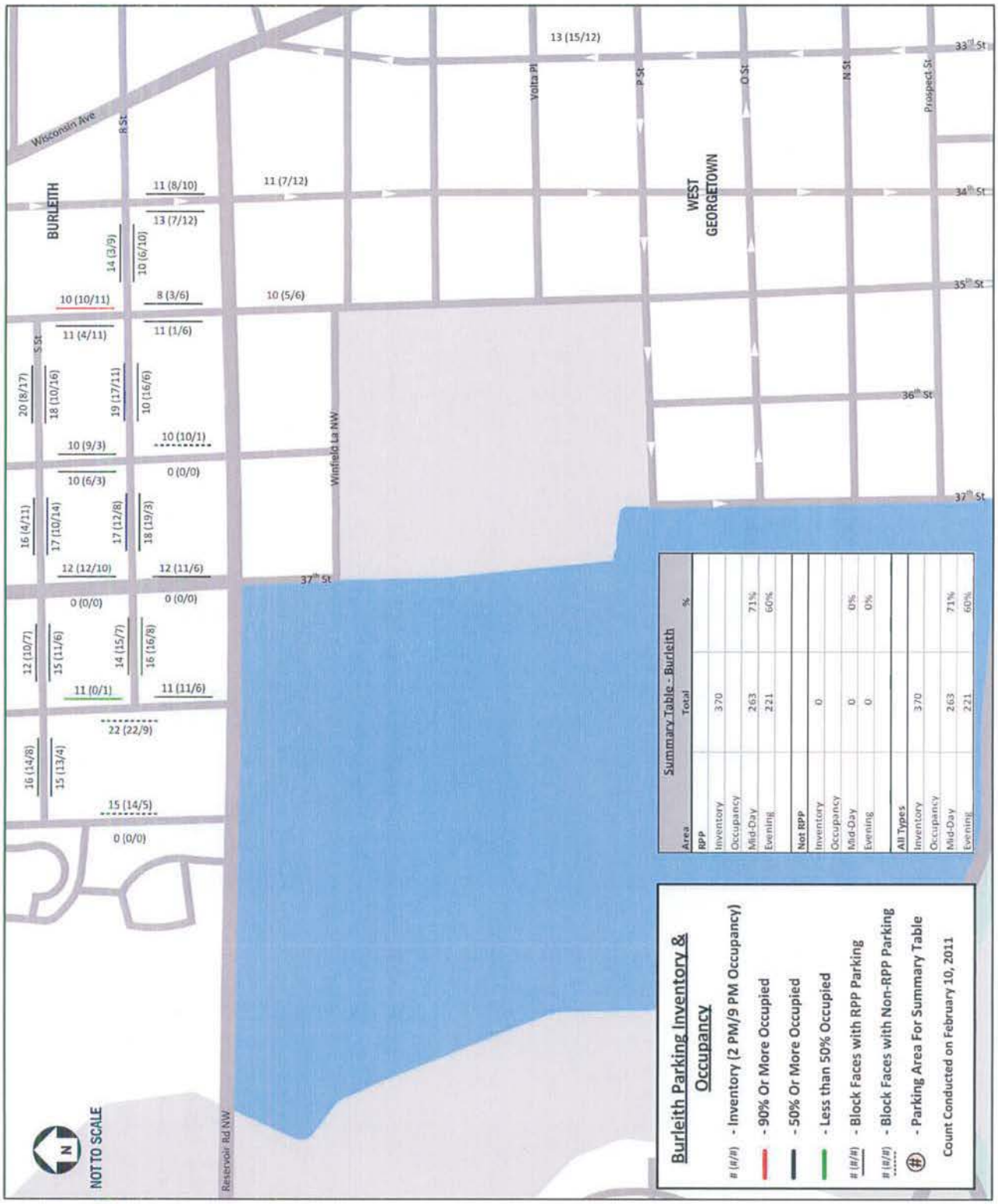


Figure 43: Burleith Parking Inventory and Occupancy

3.3 Non-Auto Modes

This section of the report reviews the trip generation calculations for the non-vehicular modes of travel and their accommodation external to campus. The proposed elements of the campus plan to handle these modes and their respective Transportation Demand Management strategies are covered in the prior section of this report.

3.3.1 Walk & Bike

A significant amount of growth in walking & biking will occur on campus, but most of it will take place internal to campus. Based on the trip generation calculations described in the traffic volumes assumptions (Section 3.1.2), the amount of new net walking and biking trips external to the campus will not be significant. The trip generation calculations showed an increase of 17 walk/bike trips in the AM peak hour and 15 in the PM peak hour. It is possible that the percentage of walkers and cyclists could increase of the course of the Campus Plan, which would make these numbers higher. Even so, the external impact of this increase in walking and cycling to campus will be minimal. The pedestrian and bicycling facilitates adjacent to campus will not need to be upgraded to accommodate this anticipated new demand. The TDM measures described in this report will be able to handle new demand internal to campus.

3.3.2 Transit

The trip generation calculations detailed earlier in this report identified a new transit demand of 225 trips in the AM peak hour and 210 trips in the PM peak hour. The new riders will be split between Metrobus and GUTS routes and facilities. The TDM component of the Campus Plan, described earlier in this report includes new strategies to encourage and increase Metrobus use by the campus population. Based on observations of the Metrobus routes that serve campus, a significant amount of unused capacity exists and can accommodate an increase in ridership. The proposed Campus Plan improvements to GUTS service will encourage a significant amount of the new transit demand to use the GUTS facilities. With GUTS, the ridership will be monitored on a regular basis and adjustments to service levels may be made to meet demand.

3.4 Safety Analysis

This section of the report reviews available crash data within the study area and reviews potential impacts of the Campus Plan on crash rates and makes recommendations for mitigation measures where needed.

3.4.1 Summary of Available Crash Data

The main source of data for this analysis is crash data statistics provided by DDOT. The study area for the crash analysis is the same set of intersection as the roadway capacity analysis. For each of these intersections, DDOT provided three years of crash statistics (2008 through 2010).

Table 23 shows a summary of the crash data, including a crash rate using the turning movement count data collected for the roadway capacity analysis. Not all of the study area intersections from the roadway capacity analysis are represented in the table, as only the intersections where DDOT provided crash data are listed.

Table 23: Summary of Study Area Intersection Crash Data (2008 – 2010)

Intersection	Total Crashes	Ped Crashes	Bike Crashes	Rate per MEV*
Foxhall Road & Reservoir Road	11	0	1	0.39
39th Street & Reservoir Road	16	0	1	1.03
38th Street/GUH Gate #1 & Reservoir Road	19	1	0	1.26
37th Street & Reservoir Road	6	0	0	0.39
35th Street & Reservoir Road	8	0	0	0.44
Canal Road & Foxhall Road	26	0	0	0.73
Foxhall Road & MacArthur Blvd	17	1	1	0.66
36th Street/Whitehurst Freeway & M Street/Canal Road	44	0	0	1.08
Key Bridge & M Street	26	0	0	0.52
33rd Street & M Street	59	2	3	2.36
Wisconsin Ave & M Street	155	3	3	5.64
37th Street & Prospect Street	7	0	0	3.22

** - Million Entering Vehicles*

The crash summary data in Table 23 shows six intersections with a Crash Rate over 1.0 crashes per million entering vehicles, which is considered a threshold for further analysis. A rate over 1.0 does not necessarily mean there is a significant problem at an intersection, but rather it is a threshold used to identify which intersections may have higher crash rates due to operational, geometric, or other issues.

For these six intersections, the crash type information from the DDOT crash data was reviewed, to see if there is a high percentage of certain crash types. Generally, the reasons for why an intersection has a high crash rate cannot be derived from crash data, as the exact details of each crash are not represented. But, some summaries of crash data can be used to develop general trends, or eliminate some possible causes.

Table 24 contains a breakdown of crash types reported for the six intersections with a crash rate over 1.0 per MEV.

Table 24: Summary of Crash Types

Intersection	Crash Type														
	Right Angle	*Left Turn*	*Right Turn*	*Rear End*	*Side Swiped*	*Head On*	*Parked*	*Fixed Object*	*Ran Off Road*	*Ped. Involved*	*Backing*	*Non-Collision*	*Under/Over Ride*	*Unspecified*	*Total*
39th Street & Reservoir Road	2	2	0	3	3	0	4	0	0	1	1	0	0	0	**16**
38th Street/GUH Gate #1 & Reservoir Road	0	0	1	6	5	0	2	0	0	1	2	0	0	2	**19**
36th Street/Whitehurst Freeway & M Street/Canal Road	3	4	2	17	7	0	1	4	0	0	2	0	0	4	**44**
33rd Street & M Street	3	11	3	13	11	1	5	1	0	3	5	0	1	2	**59**
Wisconsin Ave & M Street	5	18	20	27	56	0	8	1	0	4	5	0	0	11	**155**
37th Street & Prospect Street	0	1	0	0	2	0	3	0	0	0	1	0	0	0	**7**

In addition to the crash data, DDOT also performs speed surveys of significant streets within the District, summarized in Analysis *of 2010 Speed Data in the District of Columbia,* by Howard University. Within the report are mean speeds of four streets within the study area, shown in Table 25. Although it is difficult to show whether speed is a contributable factor to the crash rate at intersections, it is known to play a definitive role in the severity of crashes.

Table 25: Summary of DDOT Speed Data

Route	Posted Speed (MPH)	2010 Mean Speed (MPH)
Canal Road, btw Whitehurst Fwy & Foxhall Rd	25/35	32
Foxhall Road, btw 44th St & Reservoir Rd	25	29
Francis Scott Key Bridge	30	29
Reservoir Road, btw Wisconsin Ave & Foxhall Rd	25	25

3.4.2 Potential Campus Plan Impacts

This section reviews the six locations with existing crash rates over 1.0 MEV and reviews potential impacts of the Campus Plan.

- *39th Street & Reservoir Road*

  This intersection is just over the threshold of 1.0 crashes per MEV, with 16 crashes over a three-year period. The types of crashes reported do not show an obvious pattern, although the amount of sideswipe and parked crashes could be the result of cars switching lanes to avoid traffic making turns, as Reservoir Road does not have turn lanes at this intersection. This report does not recommend mitigation measures at this intersection, as the Campus Plan is not projected to make any of these conditions worse, and will notably not increase the amount of vehicle traffic that turns at this intersection.

- *38th Street/Gate 1 & Reservoir Road*

  This intersection experiences a significant amount of rear end and side swipe crashes. Although it is difficult to determine the exact cause of these crashes, this intersection has some non-standard design features. The north and southbound approaches of Gate 1 and 38th Street are offset, which can create driver confusion and limit sight lines. In addition, the traffic signal runs the northbound and southbound phases concurrently, which at an offset intersection exacerbates the driver confusion and limited sight line concerns.

  Because of these non-standard design features, and because the intersection is the main entrance/exit for the Hospital, this report recommends continued evaluation of the realignment of this intersection. (The realignment has been included in previous plans and supported by DDOT in those proceedings.) In concept, the intersection realignment would solve the non-standard design and operational issues at this intersection, and could mitigate the crash rate observed in the DDOT crash statistics.

  As discussed above in the capacity analysis section above, this report recommended that the Gate #1/38th Street intersection analysis be updated in conjunction with the transportation study that accompanies the further processing approval of future development sites at the Hospital. The intersection analysis should include further evaluation of the overall intersection operation and refinement of the proposed intersection alignment or other improvements. In addition to an evaluation of the design of the intersection, the analysis should examine the impact of the change on vehicular and pedestrian traffic. To address community concerns, the analysis should also examine design alternatives that will deter cut-through traffic, such as signage, traffic control operations, and/or physical barriers. Finally, the potential need for a left turn lane at this intersection should be considered and further developed if the revised capacity analysis demonstrates such need. This report concludes that no other mitigation effort is required at this time.

  After review of the above findings, DDOT has asked that the University consider implementing the left turn lane within one year following approval of the Campus Plan. DDOT has also asked the University to undertake annual evaluations of the intersection following the completion of the left turn lane in order to assess whether future improvements to the intersection may be required. The University is evaluating this request.

- *Whitehurst Freeway & M Street/Canal Road*

  This intersection has crash rate just over the 1.0 per MEV threshold. The crash types show a high percentage of rear end collisions, which is typical at intersections controlled by a traffic signal. This report does not recommend mitigation measures at this intersection, as the Campus Plan is not projected to make conditions worse. Based on the roadway capacity analysis volume projections, the Campus Plan is expected to comprise only 2.3% of the future traffic (year 2021) at this intersection during the commuter rush hours.

- *33rd Street & M Street*

  This intersection has a significantly high crash rate, 2.36 per MEV. The crash types show a high amount of left turn, rear end and side swipe crashes. Potential reasons for these crashes are the high amount of vehicular and pedestrian activity at this intersection, and the lack of an eastbound turn lanes on M Street to 33rd Street. Side swipe crashes can often occur when a vehicle going straight through an intersection makes a last second lane change to get around vehicle waiting for a gap to make a left turn from a shared through/left lane. This report does not recommend mitigation measures at this intersection, as the Campus Plan is not projected to make any of

these conditions worse. Based on the roadway capacity analysis volume projections, the Campus Plan is expected to comprise only 0.8% of the future traffic (year 2021) at this intersection during the commuter rush hours.

- *Wisconsin Avenue & M Street*

  This intersection has a significantly high crash rate, 5.64 per MEV, and includes the only fatality within the study area (a single fatality in 2010). The crash types show a high amount of turn crashes, rear ends and a very high percentage of side swipe crashes. Potential reasons for these crashes are the high amount of vehicular and pedestrian activity at this intersection, the high amount of turning traffic from M Street to Wisconsin Avenue (and vice versa), and the lack of eastbound and westbound turn lanes on M Street. Side swipe crashes can often occur when a vehicle going straight through an intersection makes a last second lane change to get around vehicle waiting for a gap to make a left turn from a shared through/left lane. This report does not recommend mitigation measures at this intersection, as the Campus Plan is not projected to make any of these conditions worse. Based on the roadway capacity analysis volume projections, the Campus Plan is expected to comprise only 2.0% of the future traffic (year 2021) at this intersection during the commuter rush hours.

- *37th Street & Prospect Street*

  There were only seven crashes within a three year period at this intersection, but the low volumes at this intersection result in a crash rate of 3.22 MEV. Three of the seven crashes were listed as Parked crash types. This suggests that the narrow geometries at this intersection of two neighborhood streets leads to high crash rates based on the high percentage of turning traffic. This report does not recommend mitigation measures at this intersection. The Campus Plan is not projected to have a significant impact at this intersection, and notes that the recommended changes to GUTS routing and operations will lead to fewer GUTS vehicles passing through this intersection.