Traffic Impact Analysis

Florida Rock Properties, Inc. Planned Unit Development (PUD)

Washington, D.C.

November 14, 2006 (REVISED)

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EXECUTIVE SUMMARY

This revised report presents the findings of a traffic impact study submitted in conjunction with a Second-Stage Planned Unit Development (PUD) and Zoning Map Amendment application for Florida Rock Properties, Inc. in Washington, D.C. The primary purpose of this study is to evaluate the local traffic impacts of the proposed new development, focusing on the proposed site driveways and the intersections and roadways directly serving the site (Potomac Avenue and 1st Street SE).

Revisions to the original report, dated August 23, 2006, reflect changes made in response to comments made by District Department of Transportation (DDOT) staff in a letter dated September 14, 2006, and comments from the Zoning Commission hearing regarding this property on September 18, 2006.

The Florida Rock site is located on the north side of the Frederick Douglass Bridge in Ward 6 in Washington, D.C., east of South Capitol Street, bounded by the Anacostia River and Potomac Avenue. The proposed development plan consists of slightly over 1,100,000 square feet of mixed-use space, divided among four buildings.

Based on the capacity analysis, prior transportation studies performed near the site, and a review of the site plan, the proposed Florida Rock mixed-use development will have no negative impact on the surrounding local roadway network. The parking provided, circulation within the site, loading operations, and access to Potomac Avenue from site driveways is acceptable for each phase of the project.

The close proximity and quality of access to Metrorail significantly reduces potential traffic impacts. In addition, the connection to the Anacostia Riverwalk Trail provides an additional transportation feature to site residents, visitors and office tenants.

Although the capacity analyses contained in this report show acceptable levels of service at local roadways, all of the regional roadways analyzed operated at or above their capacity. This impacts the proposed development through the encouragement of alternate vehicular routing and alternate mode usage. Although the site is located near South Capitol Street, by using the local roadway system the 11th Street bridges, I-295 and I-395, and downtown DC can easily be reached without the need for South Capitol Street. Thus, even if the regional capacity is not improved through the on-going efforts of DDOT, notably the South Capitol Street EIS project, regional access for the site can still occur through other routes.

INTRODUCTION

This revised report presents the findings of a traffic impact study submitted in conjunction with a Second-Stage Planned Unit Development (PUD) and Zoning Map Amendment application for Florida Rock Properties, Inc. in Washington, D.C.

Revisions to the original report, dated August 23, 2006, reflect changes made in response to comments made by District Department of Transportation (DDOT) staff in a letter dated September 14, 2006, and comments from the Zoning Commission hearing regarding this property on September 18, 2006.

The Florida Rock site is located on the north side of the Frederick Douglass Bridge in Ward 6 in Washington, D.C., east of South Capitol Street, bounded by the Anacostia River and Potomac Avenue. Figure 1 shows the location of the site. The proposed development plan consists of slightly over 1,100,000 square feet of mixed-use space, divided among four buildings:

- Phase 1: Office building with ground floor retail (approximately 306,000 square feet)
- Phase 2: Residential building with ground floor retail (approximately 160 dwelling units)
- Phase 3: Office building with ground floor retail (approximately 345,000 square feet)
- Phase 4: Hotel (approximately 240 rooms and supporting facilities)

Study Overview

The primary purpose of this study is to evaluate the local traffic impacts of the proposed new development, focusing on the proposed site driveways and the intersections and roadways directly serving the site (Potomac Avenue and 1st Street SE). Gorove/Slade Associates undertook the following steps while preparing this study:

- Performed field reconnaissance of existing roadway and intersection geometrics, traffic controls, and speed limits and operations;
- Discussed study scope and methodology with District Department of Transportation (DDOT) staff;
- Conducted peak hour turning movement counts at study intersections;
- Determined existing levels of service at the study intersections;
- Developed background traffic forecasts for project build-out in 2012 and 2017 based on existing counts and traffic generated by other pending/future developments;
- Calculated background levels of service at study intersections based on background traffic forecasts and existing traffic controls;
- Estimated the AM and PM peak hour and daily trips that would be generated by the new development, including mode split assumptions;

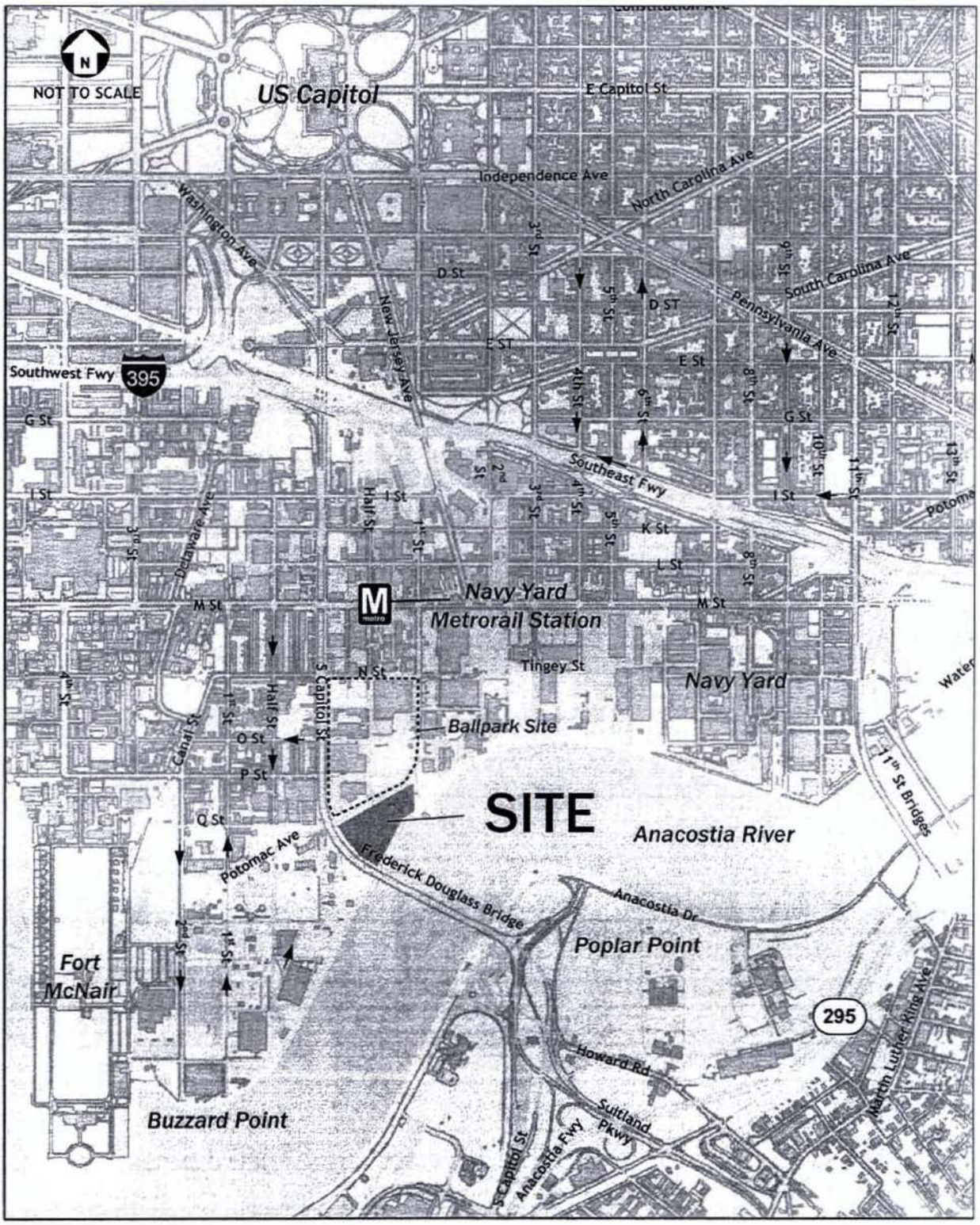


Figure 1 – Site Location

- Forecasted total future traffic volumes for project build-out in both 2012 and 2017 based on background future traffic forecasts and site traffic assignments; and
- Calculated total future levels of service at the study intersections based on total future traffic forecasts, existing and future traffic controls, and existing and future intersection geometrics.

Sources of data for this study include traffic counts conducted by Gorove/Slade, ITE's *Trip Generation*, 7th Edition, site and circulation plans from Davis Buckley Architects and Planners dated November 17, 2006, the District Department of Transportation (DDOT), *Traffic Impact Analysis – 100 Potomac Avenue, Second State Planned Unit Development and Map Amendment Applications* by O.R. George and Associates, Inc., *2005 Development-Related Ridership Survey* prepared by the Washington Metropolitan Area Transit Authority (WMATA), and the files/library of Gorove/Slade.

Study Scope

This traffic impact study was conducted in accordance with discussions held with DDOT staff and a summary scoping document emailed to DDOT on August 23, 2006. A report, dated August 23, 2006 was submitted prior to the Zoning Commission hearing on September 18 2006. Prior to the hearing, DDOT made comments on the report in a letter dated September 14, 2006. This report reflects a revised impact analysis reflecting the comments made in the DDOT letter and at the hearing. Copies of the scoping document and DDOT response letter are included in the Appendix to this report.

Study Intersections

The scope of this study focused on site access and the signalized intersections closest to the proposed site on Potomac Avenue and 1st Street SE. An analysis of traffic beyond the traffic signals included in the scope was not performed for several reasons, (1) the percentage impact of site traffic to M Street SE and South Capitol Street was not significant enough to warrant their inclusion based on DDOT standards, and (2) studies of South Capitol Street and regional traffic are being performed by DDOT (these studies are discussed in more detail later in this report).

These studies have a greater scope than a traditional impact analysis containing a more refined analysis that takes into account more existing and future impacts and influence on traffic. In discussions with DDOT staff, it was agreed that this study should focus on direct site access and nearby traffic signals, and that all data and analysis files be made available for their incorporation into the on-going regional analysis of the area. Thus, the only regional-traffic based study intersections included in this report are the future intersection of Potomac Avenue and South Capitol Street, due to it's proximity to the site, and the intersection of M Street and South Capitol Street, due to its level of importance in the area. In addition, including the intersection of M Street and South Capitol Street provides a good indication of regional traffic conditions in the near SE/SW area since it serves the two main corridors in the area.

The following study intersections are included in this study:

1) Potomac Avenue and South Capitol Street (future intersection)
2) N Street and 1st Street SE
3) M Street and 1st Street SE
4) M Street and northbound South Capitol Street ramps
5) M Street and southbound South Capitol Street ramps
6) All proposed site driveways

Horizon Years

Previous studies of this site have based the horizon year for future conditions on full build-out of all four phases. Since then, more details on the District's planned improvements to the South Capitol Street corridor are available. Based on conversations with DDOT and the phasing indicated by the Florida Rock project team, this study uses two horizon years: 2012 and 2017. The first horizon year, 2012, represents the end of Phase 2, and incorporates the planned interim improvements at the intersection of South Capitol Street and Potomac Avenue. The second horizon year, 2017, represents full-build out of the site and assumes the completion of the proposed traffic oval and new Frederick Douglass Bridge (due to construction phasing, phases 3 and 4 cannot be built until these improvements are made). This was done so the analysis would determine if site driveways will operate acceptably when the intersection of Potomac Avenue and South Capitol Street exists in both its interim and final conditions.

EXISTING CONDITIONS

The site is served by many regional roadways including Interstate 395 (I-395), Interstate 295 (I-295), and several interchanges and bridges. Arterials near the site include South Capitol Street and M Street; 1st Street SE, N Street and Potomac Avenue serve as collector roadways. The following is a description of the major and local roadways included as part of the study area:

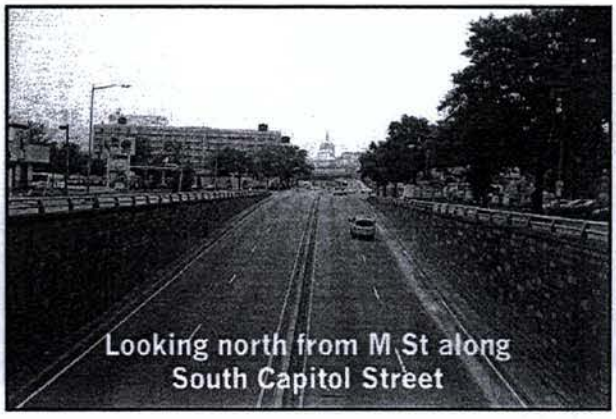
South Capitol Street

South Capitol Street is classified by DDOT as a principal arterial. The ADT volume on the portion of South Capitol Street near the study area is approximately 58,600 vehicle trips. South Capitol Street connects the Frederick Douglass Memorial Bridge to Interstate 395 and the Capitol. North of M Street, South Capitol Street is between 6 and 8 lanes and parking is prohibited. South of M Street, South Capitol Street is a six-lane grade-separated roadway and two lanes serve as access roads for local traffic and entrance/exit ramps. Parking is available south of M Street on the southern leg of southbound South Capitol Street. North of M Street, the right-of-way width for South Capitol Street is 155 feet but narrows to 130 feet from M Street to the Frederick Douglass Memorial Bridge.

M Street

M Street is a six-lane minor arterial divided by a brick median to the west of South Capitol Street and undivided to the east. The roadway extends from Maine Avenue westerly to 11th Street SE. M Street bridges over and has ramp connections to South Capitol Street before terminating at 11th Street SE. The ADT volume on the portion of M Street near the study area is approximately 19,200 vehicle trips. Commuters use M Street during peak periods, offering access between Maryland suburbs (via I-295 and the Whitney Young Memorial Bridge), the Washington Navy Yard, and other destinations in Washington. Generally, parking is not permitted on M Street. The posted speed limit is 30 mph.


Looking east on M Street from South Capitol towards 1st St SE


Looking north from M St along South Capitol Street

N Street

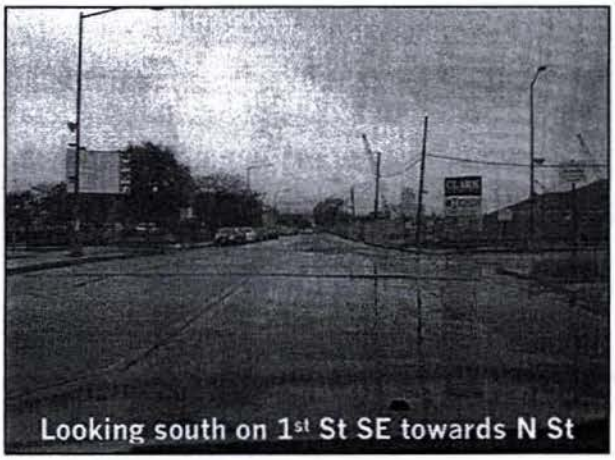
N Street/Tingey Street is a local two-lane roadway with a posted speed limit of 25 mph. East of the intersection with 1st Street, SE, the road name changes from N Street to Tingey Street through the Southeast Federal Center site.

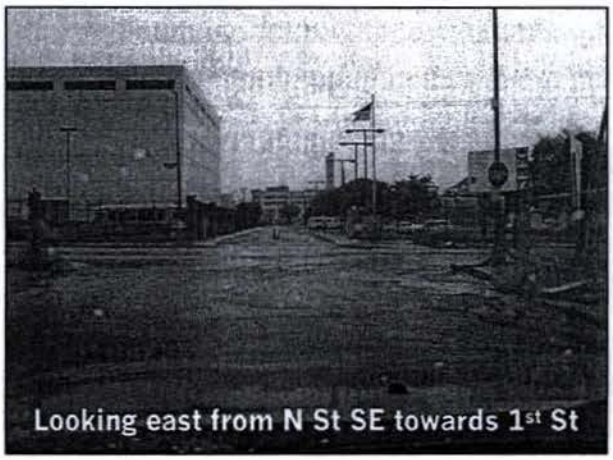
Potomac Avenue

Potomac Avenue is a two-lane local collector street that extends from 1st Street SW and R Street SW just east of Fort McNair to 1st Street SE. The street carries two travel lanes in each direction separated by a median. The ADT volume on the portion of Potomac Avenue near the study area is approximately 2,000 vehicle trips. Potomac Avenue crosses underneath South Capitol Street as a grade-separated intersection. Potomac Avenue has two parking lanes.

1st Street SE

1st Street SE is a two-lane local street that stretches from the Anacostia River waterfront to I Street. The roadway carries commercial and industrial vehicle traffic due to the land uses south of M Street. The intersection of 1st Street SE and M Street is signalized.


Looking south on 1st St SE towards N St


Looking east from N St SE towards 1st St

Gorove/Slade conducted field reconnaissance to obtain the existing lane usage and traffic controls at the intersections within the study area. Figure 2 presents the local roadway network of the study area and existing lane use and configurations.

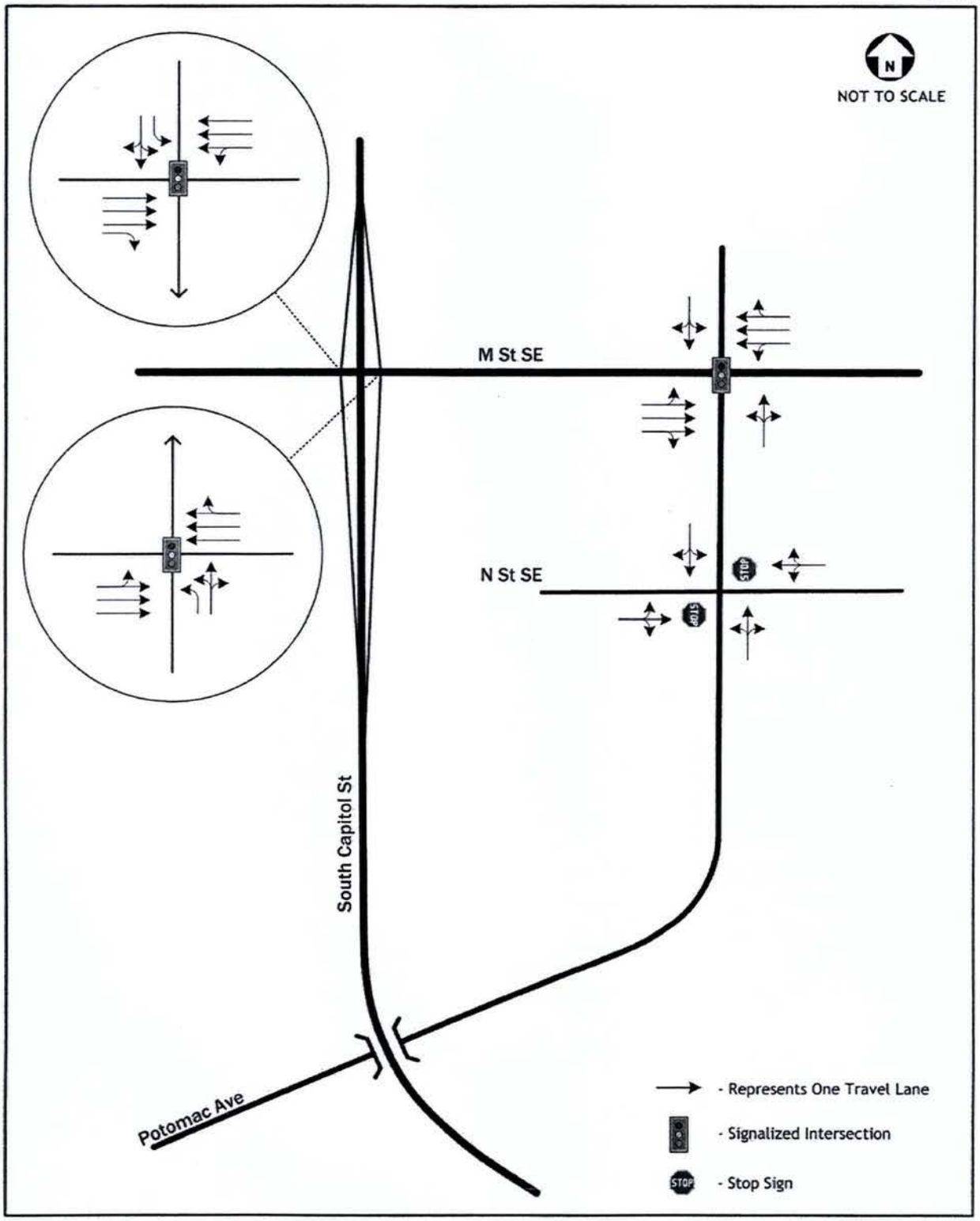


Figure 2 – Existing Lane Use and Configuration

Public Transportation

WMATA Metrorail

The Navy Yard Metrorail Station, served by the Green Line, is located approximately 2,000 feet north of the Florida Rock site. The station has two access portals on M Street SE, one at Half Street and the other at New Jersey Avenue.

WMATA Metrobus

Nine Metrobus routes on four lines operate within the vicinity of the Florida Rock site, mostly on M Street and South Capitol Street. Table 1 summarizes details on theses routes, which include the following:

- *Minnesota Avenue-M Street Line*
  Routes V7, V8, and V9, connect the Smithsonian, L'Enfant plaza, Waterfront-SEU, Navy Yard, Potomac Avenue, Minnesota Avenue, and Deanwood Metrorail Stations via Minnesota Avenue, Pennsylvania Avenue, and M Street. Service hours are from 6:00 a.m. to 2:30 a.m. daily. Weekday headways (time between buses) are approximately 7 minutes during peak periods and 30 minutes during off-peak times. Weekend and holiday headways range from 20 to 40 minutes.

- *Navy Yard Shuttle Line*
  Route N22 connects the Navy Yard Metrorail Station with the Eastern Market Metrorail Station on the Blue and Orange Lines and Union Station on the Red Line, via Pennsylvania Avenue and 8th Street SE. The line operates from 6:00 a.m. to 7:30 p.m. on weekdays, with nine-minute headways during weekday peak periods and 20-minute headways during off-peak periods. No weekend service is provided. The route operates with 20-minute headways on holidays.

- *Anacostia-Eckington Line*
  Routes P1 and P2 connect the Anacostia Metrorail Station with the Navy Yard and Waterfront-SEU Stations (all on the Green Line) and the Federal Center SW and Federal Triangle Metrorail Stations (both on the Blue and Orange Lines) via Martin Luther King, Jr. Avenue, M Street, 4th Street, and Constitution Avenue. Service is offered from 7:00 a.m. to 7:30 p.m. on weekdays, with headways ranging from 20 to 40 minutes. No weekend service is provided.

- *Anacostia-Congress Heights Line*
  Routes A42, A46, and A48, connect the Archives-Navy Memorial Metrorail Station on the Yellow and Green Lines with the Anacostia, Congress Heights, and Southern Avenue Metrorail Stations on the Green Line via 7th Street, M Street, Martin Luther King, Jr. Avenue and South Capitol Street. These routes serve the Southeast Federal Center only when Metrorail is not in

service: midnight to 5:30 a.m. on weekdays and midnight to 8:00 a.m. on weekends. Headways range from seven to 30 minutes.

Table 1 – Metrobus Routes Near Site

Line	Route	Metro Stops	Service
South Capitol Street	A9	L'Enfant, Waterfront-SEU	M to F, limited
Oxon Hill-Ft. Washington	P17, P18, P19	Anacostia	M to F, limited
Navy Yard Shuttle	N22	Navy Yard, Eastern Market, Union Station	M to F, limited
Anacostia-Congress Heights	A42, A46, A48	Archives-Navy Memorial, L'Enfant, Navy Yard, Anacostia	M to Sun, early AM, after midnight
Minnesota Avenue - M Street	V7, V8, V9	Archives-Navy Memorial, L'Enfant, Smithsonian, Waterfront, Navy Yard, Minnesota Ave, Deanwood	M to Sun, service to Archives Metro only on weekends
Anacostia-Eckington Line	P1, P2	Navy Yard, Waterfront, Federal Center, Federal Triangle	M to F, limited

Existing Traffic Volumes

Existing AM and PM peak hour traffic counts were conducted at the existing intersections on July 12 and August 10, 2006. The AM peak hour for the system of intersections being studied occurred between 6:45 a.m. and 7:45 a.m., while the PM peak hour occurred between 5:00 p.m. and 6:00 p.m. A summary of the intersection turning movements is included in the Appendix.

Since these peak hour counts were conducted during the summer, they were increased to reflect the lower traffic volumes observed during the summer months. This was done by comparing peak hour counts at the intersection of M Street and South Capitol Street from 2002 and 2004 with the new summer 2006 counts. Based on the old counts, the expected 2006 intersection traffic was determined and the 2006 summer counts were raised to meet the expected level of traffic. This analysis showed that summer traffic is approximately 10% lower than what would be expected based on historical data. The resulting 2006 traffic volumes are shown on Figure 3.

Existing Capacity Analysis

Existing peak hour levels of service (LOS) were calculated based on: (1) the existing lane use and traffic controls shown on Figure 2; (2) the peak hour traffic volumes of the each key intersections shown on Figure 3; (3) existing signal timings/phasings and (4) the Highway Capacity Manual 2000 (HCM) methodologies (using the Synchro 6 software). Copies of LOS calculation worksheets are included in the Appendix. Table 2 displays the results of the capacity analyses with existing LOS and delay, including LOS and average delay per vehicle (in seconds).

The existing analysis reveals that traffic on 1st Street SE operates above acceptable levels of service,

while the intersection of South Capitol Street and M Street fails during both the AM and PM peak periods. These findings are consistent with previous studies within the near SE/SW neighborhood.

What previous studies have found is that generally, intersections serving local traffic, such as those on 1st Street SE, Potomac Avenue and N Street SE operate at or above acceptable conditions. Regional intersections, such as the intersections of M Street with South Capitol Street or 11th Street SE, and the intersection of South Capitol Street and I Street, operate under failing conditions. These findings lead to the conclusion that the local roads in the study area are under-utilized and limited by several 'choke-points' in the system caused by regional traffic patterns. DDOT has been studying these regional traffic patterns for years and through several studies, notably the Anacostia Access Study and Middle Anacostia River Crossing Study, have identified infrastructure improvements to alleviate and spread out regional traffic.

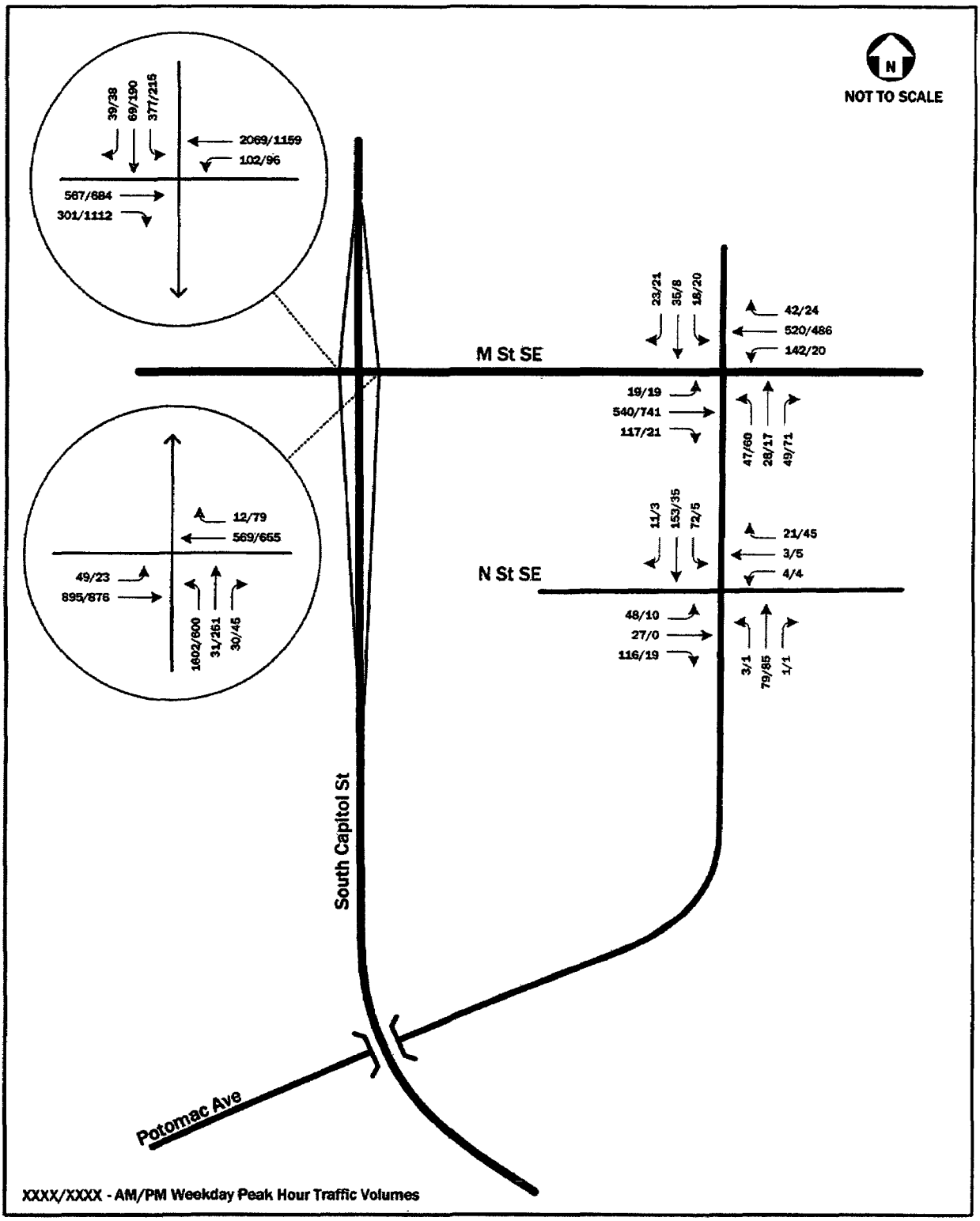


Figure 3 – 2006 Peak Hour Traffic Volumes

Table 2 – Summary of Existing Capacity Analysis

Intersection (Approach)	Existing Conditions			
	AM Peak Hour		*PM Peak Hour*	
	Delay (sec/veh)	Level of Service	Delay (sec/veh)	Level of Service
N St & 1st St SE (2-way stop controlled)				
Overall	**6.3**	**A**	**3.5**	**A**
Eastbound	12.8	B	9.4	A
Westbound	10.3	B	9.2	A
Northbound	0.3	A	0.1	A
Southbound	2.6	A	0.9	A
M St & 1st St SE (traffic signal)				
Overall	**12.9**	**B**	**13.0**	**B**
Eastbound	12.6	B	11.8	B
Westbound	7.3	A	8.1	A
Northbound	34.7	C	31.6	C
Southbound	32.3	C	27.5	C
M St & SB South Capitol Ramps (traffic signal)				
Overall	**16.2**	**B**	**122.8**	**F**
Eastbound	39.3	D	230.3	F
Westbound	1.2	A	1.6	A
Southbound	42.3	D	29.9	C
M St & NB South Capitol Ramps (traffic signal)				
Overall	**110.1**	**F**	**83.2**	**F**
Eastbound	1.9	A	0.8	A
Westbound	36.8	D	24.2	C
Northbound	197.0	F	214.1	F

FUTURE BACKGROUND CONDITIONS

Future background conditions were analyzed for each horizon year. The future background analyses, which represent future conditions at the horizon years if the Florida Rock development were not to occur, provide a basis of comparison for the total future analyses, which include traffic generated by the Florida Rock mixed-use development. In order to develop background traffic forecasts, a composite of existing traffic, ambient growth in traffic and traffic from other future area developments was developed. In addition, planned infrastructure changes to South Capitol Street, Potomac Avenue and 1st Street SE were incorporated.

Future Infrastructure Improvements

This analysis assumed improvements to the study area intersections based on existing traffic studies performed in the area and discussions with DDOT staff. The existing studies performed in the area can be organized into three categories:

- *Regional Access Studies*
  These studies examined regional traffic and major highways and arterials. Those reviewed in preparation of this report included the *4th Street NW Transportation Study*, the *Anacostia Access Study*, the *South Capitol Street EIS*, the *Middle Anacostia River Crossings Study* and the *11th Street Bridges EIS*. Information on these reports can be found on the DDOT website at www.ddot.dc.gov.

  Of particular interest to this analysis are the recommendations arising from the on-going analysis of South Capitol Street, now in the Environmental Impact Study (EIS) phase. The recommendations include interim and permanent improvements to South Capitol Street, notably the intersection of Potomac Avenue and South Capitol Street. Currently, Potomac Avenue travels under South Capitol Street. DDOT plans to alter how the Frederick Douglass Bridges lands on the north side of the Anacostia River so an at-grade intersection of South Capitol Street and Potomac Avenue can be constructed. This interim improvement is expected to be in place by spring 2008. DDOT provided a sketch of the improvement, which is shown in Figure 4. This improvement is assumed to be in place for the 2012 horizon year.

  Although the South Capitol Street EIS has yet to be finalized, one of the alternatives from the report, the 'traffic oval' option was assumed to be in place for the 2017 horizon year. Under this assumption, the intersection of South Capitol Street and Potomac Avenue near the proposed Florida Rock development would be incorporated into the traffic oval. DDOT provided Gorove/Slade analysis files of this condition so it could be incorporated into this report. The volume estimates contained in these files for the South Capitol Street and Potomac Avenue intersection formed the basis for the background volumes assumed at this intersection for this study.

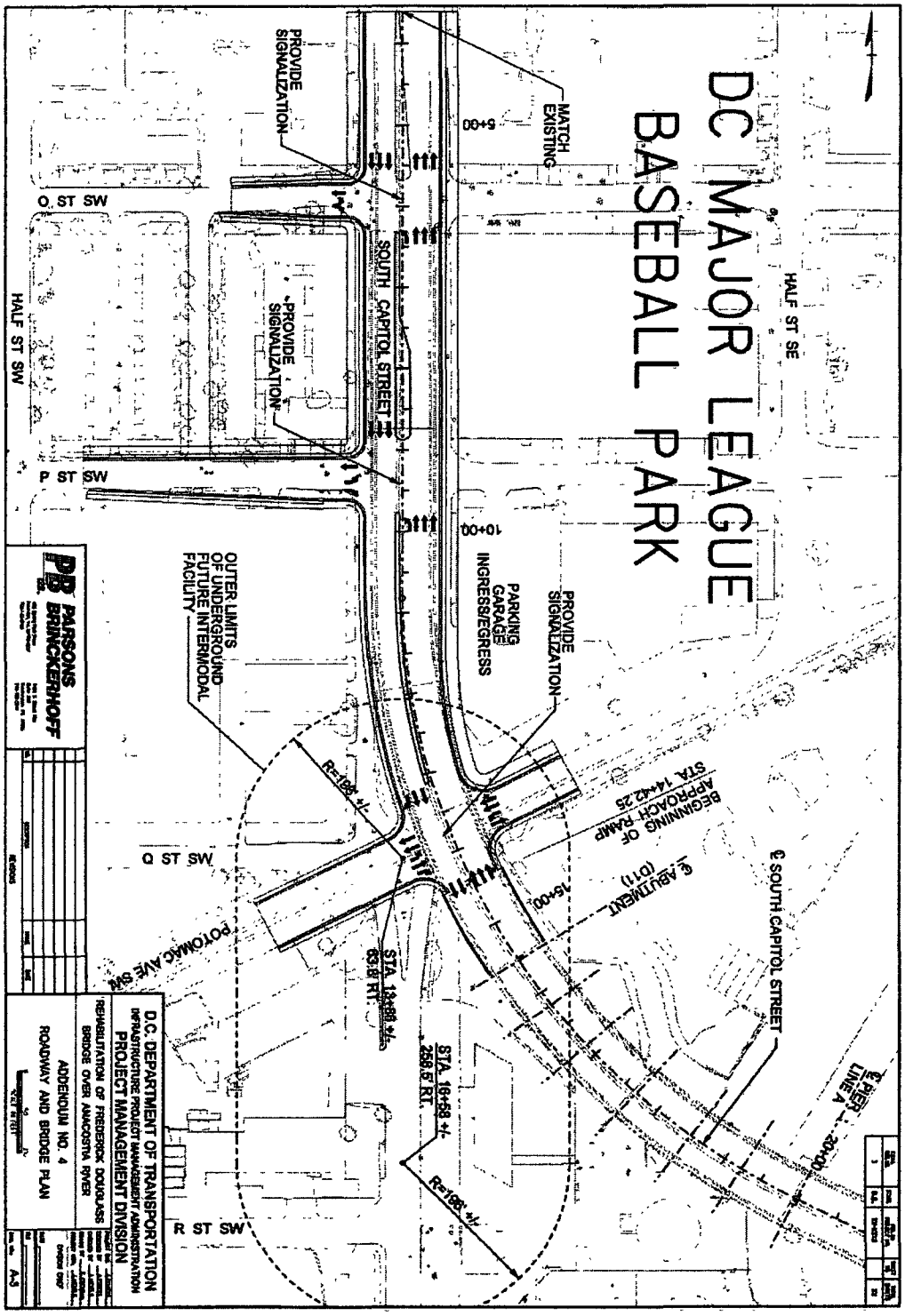


Figure 4 – South Capitol Street Interim Improvements

- *Development Related Studies*
  These studies are related to development near the study area, mostly submitted as part of zoning applications. They include traffic impact analyses for Arthur Capper Carrollsburg, the USDOT Headquarters, the Southeast Federal Center, and the AWI Waterfront. Information from these studies was used to determine growth to traffic for the years 2012 and 2017, including trip generation, distribution and project phasing.

- *Ballpark Related Studies*
  Incorporated into the Ballpark planning process were two transportation studies, the Ballpark Environmental Mitigation Study (EMS), and the Ballpark Transportation Management Plan (TMP). These studies provide insight on what improvements will be in place for the opening of the Ballpark in 2008 and initial concepts for game day operations.

  Included in the Ballpark construction is the rehabilitation of roadways surrounding the site, including Potomac Avenue and 1st Street SE. Based on preliminary plans for these improvements and discussions with DDOT it was assumed that by 2008, Potomac Avenue and 1st Street will be resurfaced to four travel lanes, including on street parking and dedicated bicycle lanes (sufficient right-of-way exists to widen the roadways). In addition, the 'curve' at the intersection of Potomac Avenue and 1st Street SE will be converted to a traditional intersection (allowing for a possible future extension of Potomac Avenue), and traffic signals will be placed at the intersections of N Street and 1st Street SE, and Potomac Avenue and 1st Street SE. The traffic signal at the intersection of Potomac Avenue and 1st Street SE is being installed to help break up traffic and control pedestrian crossings.

In addition, DDOT is currently studying the effects of development in the near SE/SW in detail, incorporating the reports listed above. The purpose of this study is to examine the entire area as a whole and find any projected deficiencies in the system that may not be noticed when looking at individual components of the system or specific time periods. Gorove/Slade is coordinating with DDOT to ensure that the results of this study can be incorporated into this analysis.

Based on these studies and infrastructure assumptions, Figures 5 and 6 show the assumed lane designations and traffic controls for years 2012 and 2017. Note that the northbound lane configuration at the intersection of Potomac Avenue and South Capitol Street shown in Figure 5 does not match that shown in Figure 4. This is a reflection of conversations with DDOT staff regarding the operations of this intersection and desired lane configurations at the time of this report.

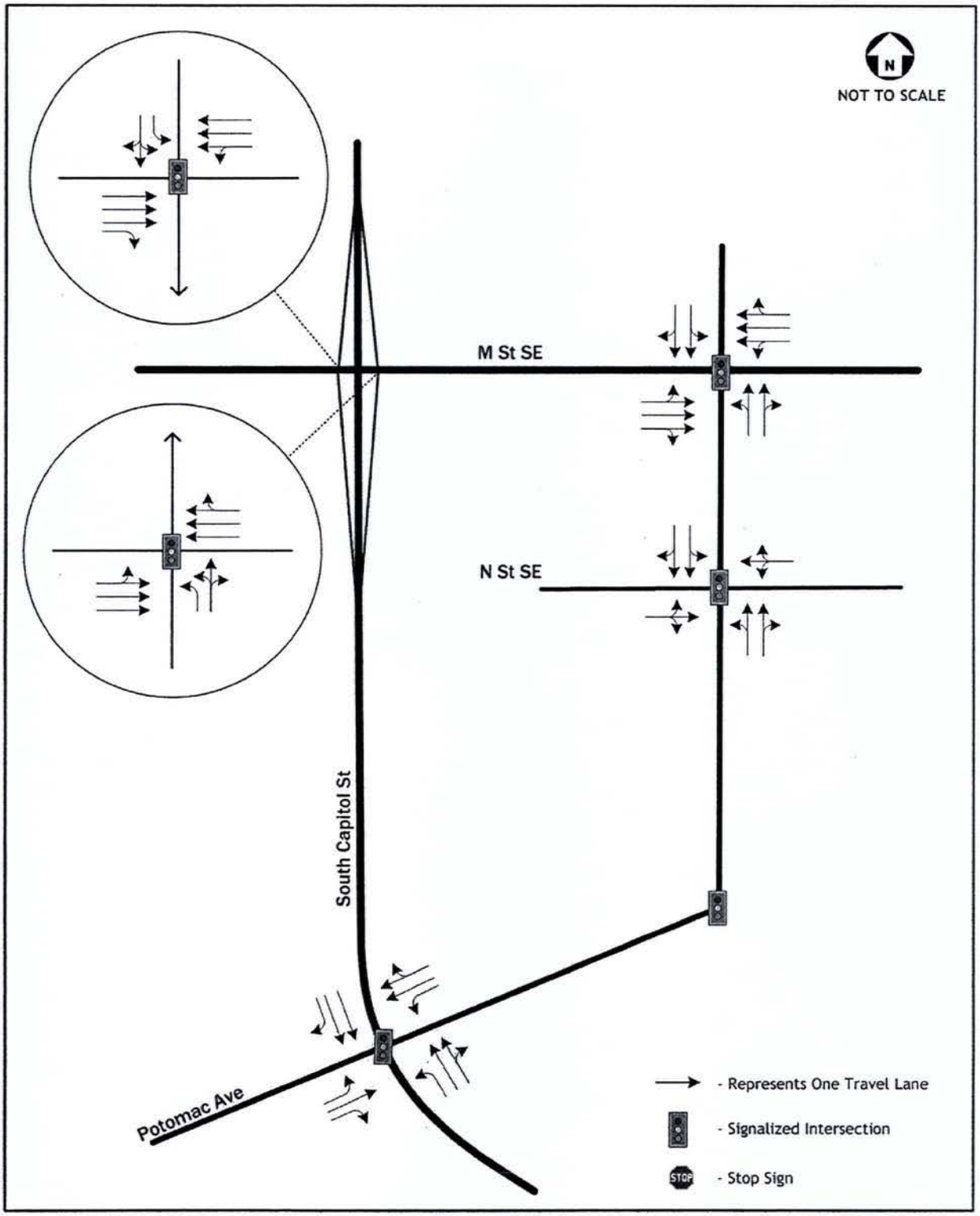


Figure 5 – 2012 Lane Designations and Traffic Controls

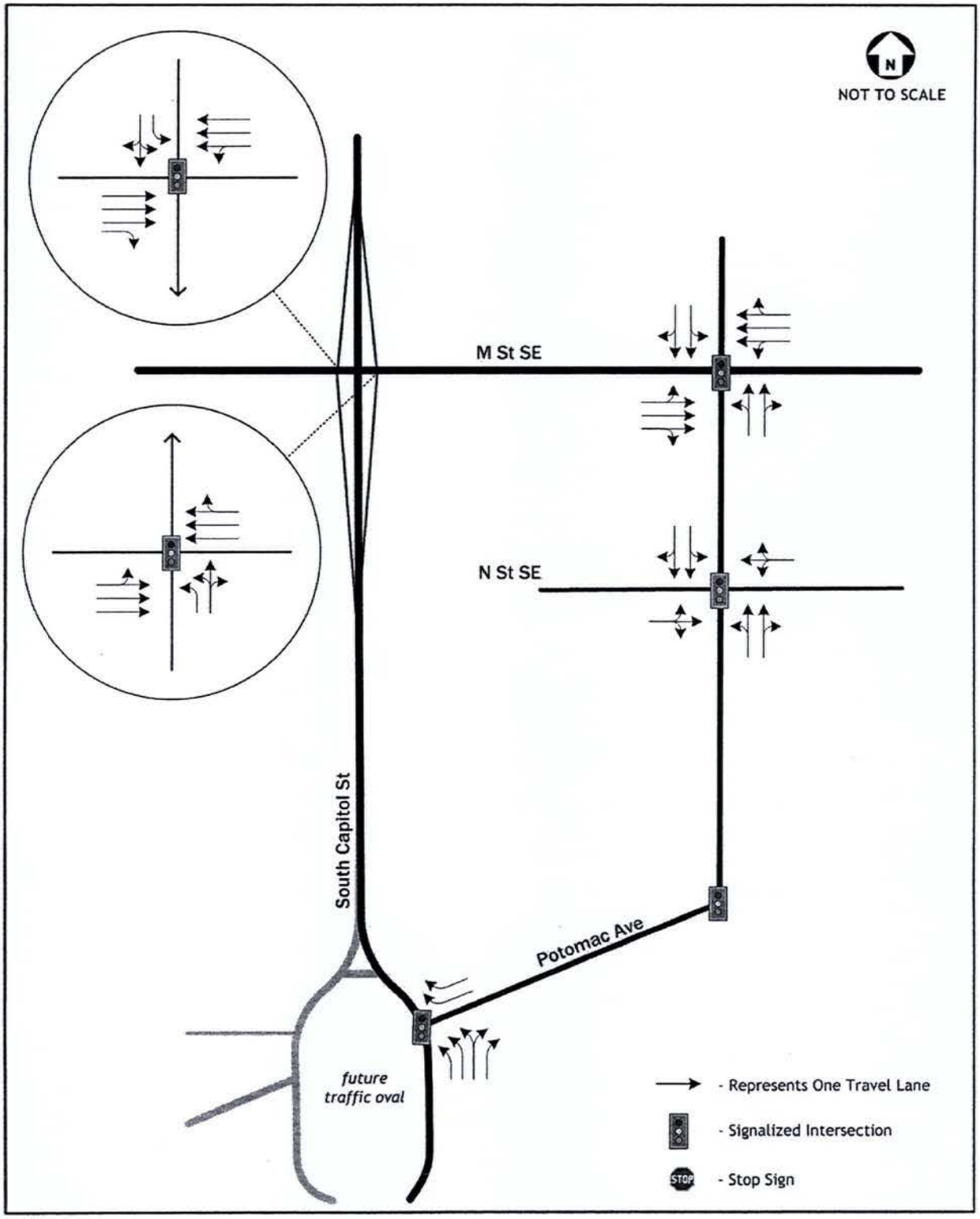


Figure 6 – 2017 Lane Designations and Traffic Controls

Future Background Developments

A traffic impact analysis generally uses two methods to account for growth in traffic on study area roadways for the horizon years; (1) ambient growth of existing traffic and (2) assigning traffic for approved development. The ambient growth is supposed to capture growth in through traffic on streets serving new development located outside of the study area (regional traffic). Generating and assigning traffic for approved developments near the study site accounts for local traffic growth. Ideally, traffic is not double-counted, although it is possible that the ambient growth used may account for both regional and local growth. In some cases, ambient growth rates are skipped entirely, if an extensive list of approved developments exists, to avoid any double-counting of traffic.

Due to the amount of growth on-going and expected in the near SE/SW area of the District, this methodology is difficult to use for this impact analysis. First, the amount of ambient growth is hard to determine, since the majority of growth in local roads has been generated by the new developments in near SE/SW itself. Most areas of the District are not experiencing regional traffic growth, but historical counts of M Street in the last four years show an increase of around 3% per year (based on data contained in Gorove/Slade files). Second, the amount and details of proposed and approved developments is rather long and changes almost daily. A list of approved developments can be generated, but that would not include any changes that may occur over time, any planned developments, or by-right developments that would occur prior to the horizon years.

Due to these considerations, this impact analysis used a combined approach. A relatively large percentage growth rate was used in combination with a key list of approved and planned developments. A growth rate of 3% per year was assumed for roadways in the study area between 2006 and 2012, and a 2% per year growth rate was assumed between 2012 and 2017. This growth rate accounts for regional growth plus smaller development sites scattered throughout the entire near SE/SW area. The approved development specifically assigned as background traffic as limited to the major known development sites; the USDOT headquarters, the Southeast Federal Center, Arthur Capper Carrollsburg, the Waterside Mall, and the AWI Waterfront.

For these developments, trips were generated and assigned based on prior traffic impact analyses, including the *Arthur Capper Carrollsburg Traffic Impact Analysis*, the *4th Street SW Transportation Study*, the *USDOT Traffic Impact Study*, and the *Southeast Federal Center Transportation Management Plan*.

Traffic was not generated and distributed for the new Major League Baseball Ballpark because analyses contained in a traffic impact study focus on 'typical weekday' morning and evening rush hours ('typical' weekday is usually taken as a Tuesday, Wednesday, or Thursday when public schools are in session during a normal five-day work week). Traffic specific to game day activities does not fall under 'typical' weekday conditions, since game days are considered special events and many do not occur during 'typical' weekdays (since many are during the summer or on Fridays/weekends). A discussion on the impact of the Ballpark on site transportation is included in a separate chapter in this report.

Table 3 contains a summary of assumptions used for these studies. Figure 7 shows their location on the study area map.

Table 3 – Summary of Background Developments

Development	Horizon Year	Program	Trip Generation					
			AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Arthur Capper Carrollsburg	2012	40 kSF retail 740 kSF office 800 apartments 260 townhouses 580 condominiums	461	243	706	269	504	773
USDOT Headquarters	2012	5,500 employees	471	41	512	71	448	519
SEFC: Phase 1a	2012	450 kSF 832 residential units 92 kSF retail	299	204	503	233	345	578
SEFC: Phases 1b & 2	2017	1,530 kSF office 2,045 residential units 371 kSF retail	877	467	1,344	597	1,031	1,628
Waterside Mall PUD	2017	2,025 kSF Office 25 kSF retail 400 residential units	731	141	872	207	800	1,009
AWI Waterfront	2017	300 room hotel 750-850 residential units 217kSF retail 160 kSF museum	155	400	555	657	625	1,282

Future Background Traffic Forecast

Using the growth rates and the trip generation and assignments for the background developments contained in the prior studies, the 2012 and 2017 future background traffic volumes were assembled, as shown in Figures 8 and 9.

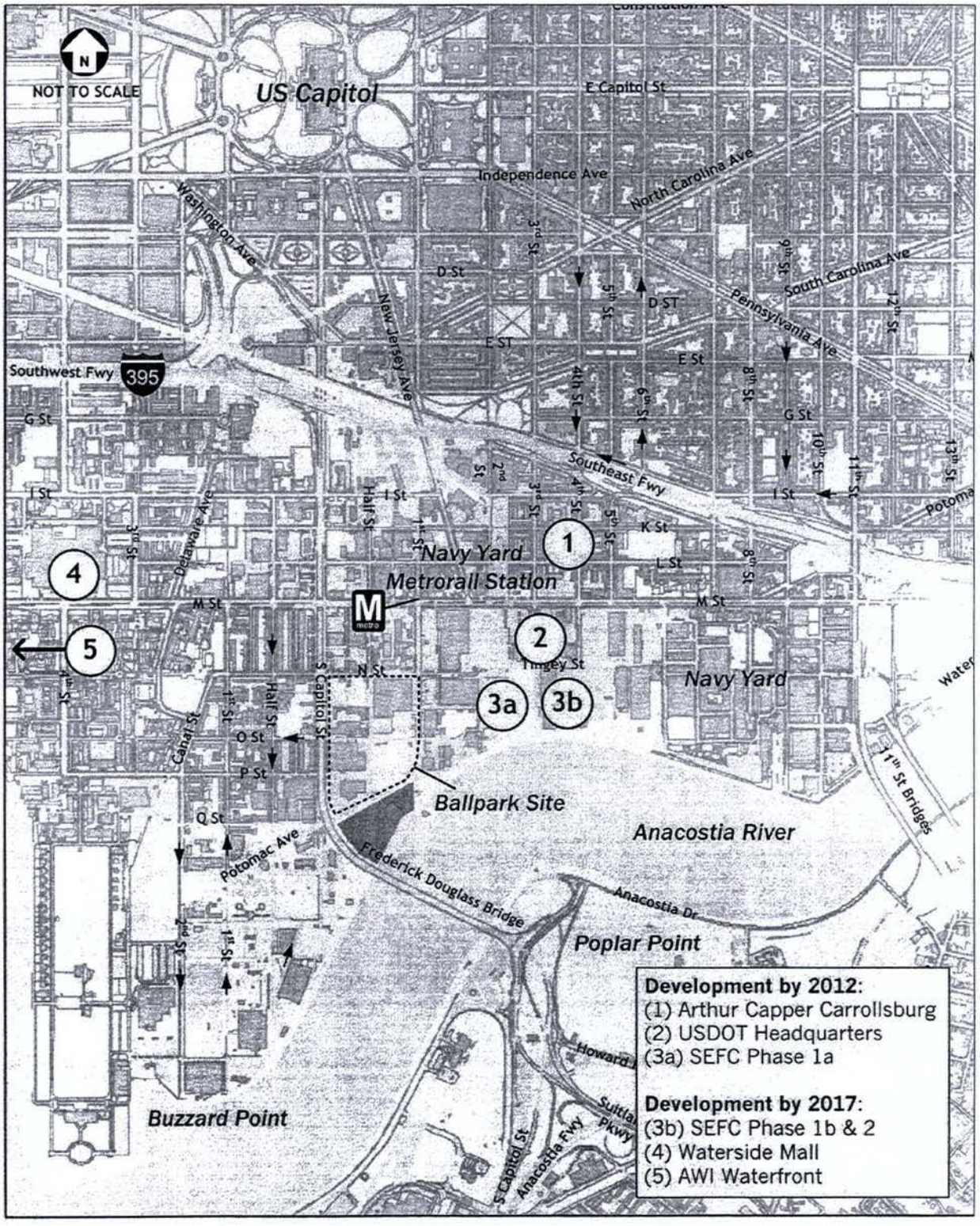


Figure 7 – Location of Approved Background Developments

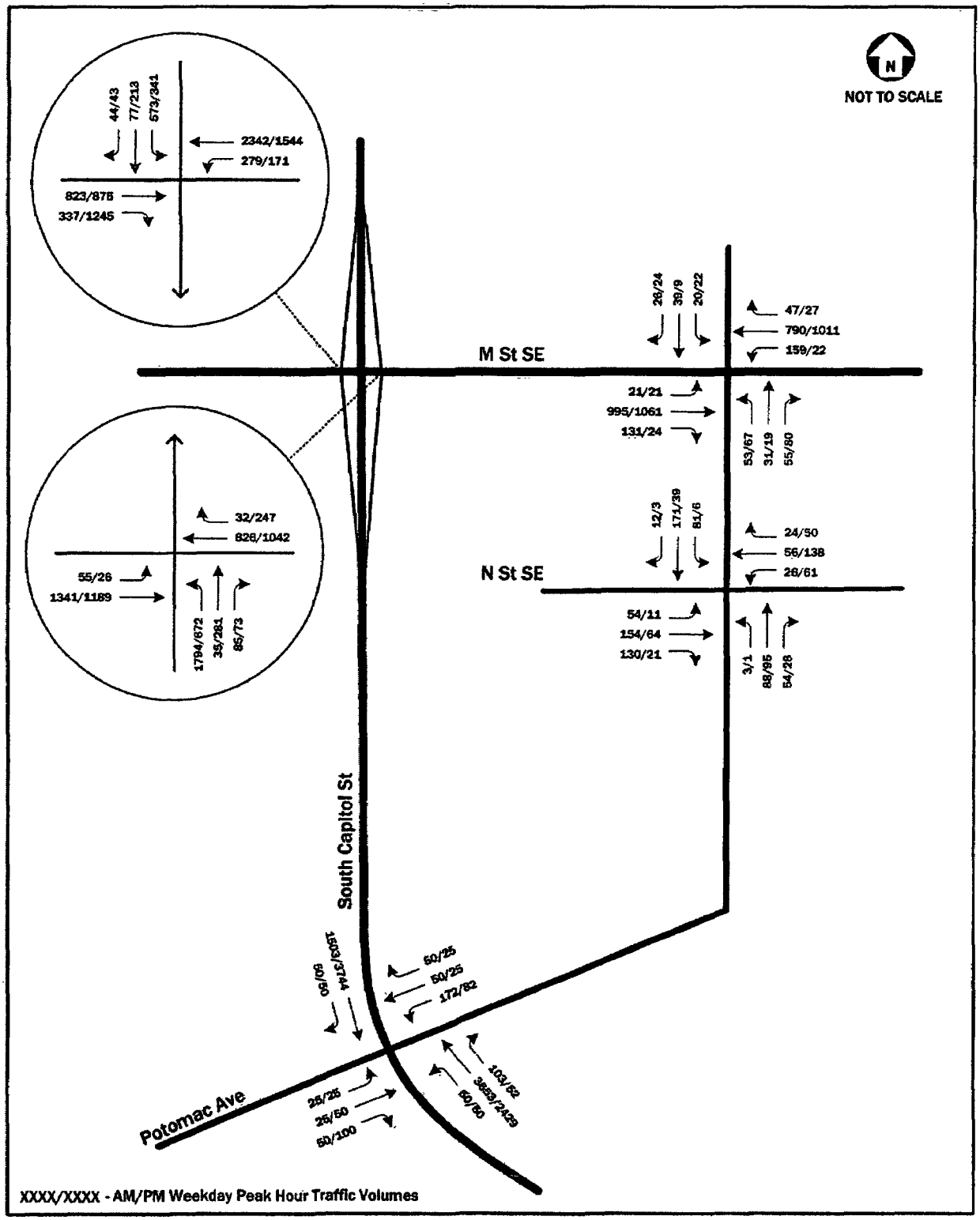


Figure 8 – 2012 Background Peak Hour Traffic Volumes

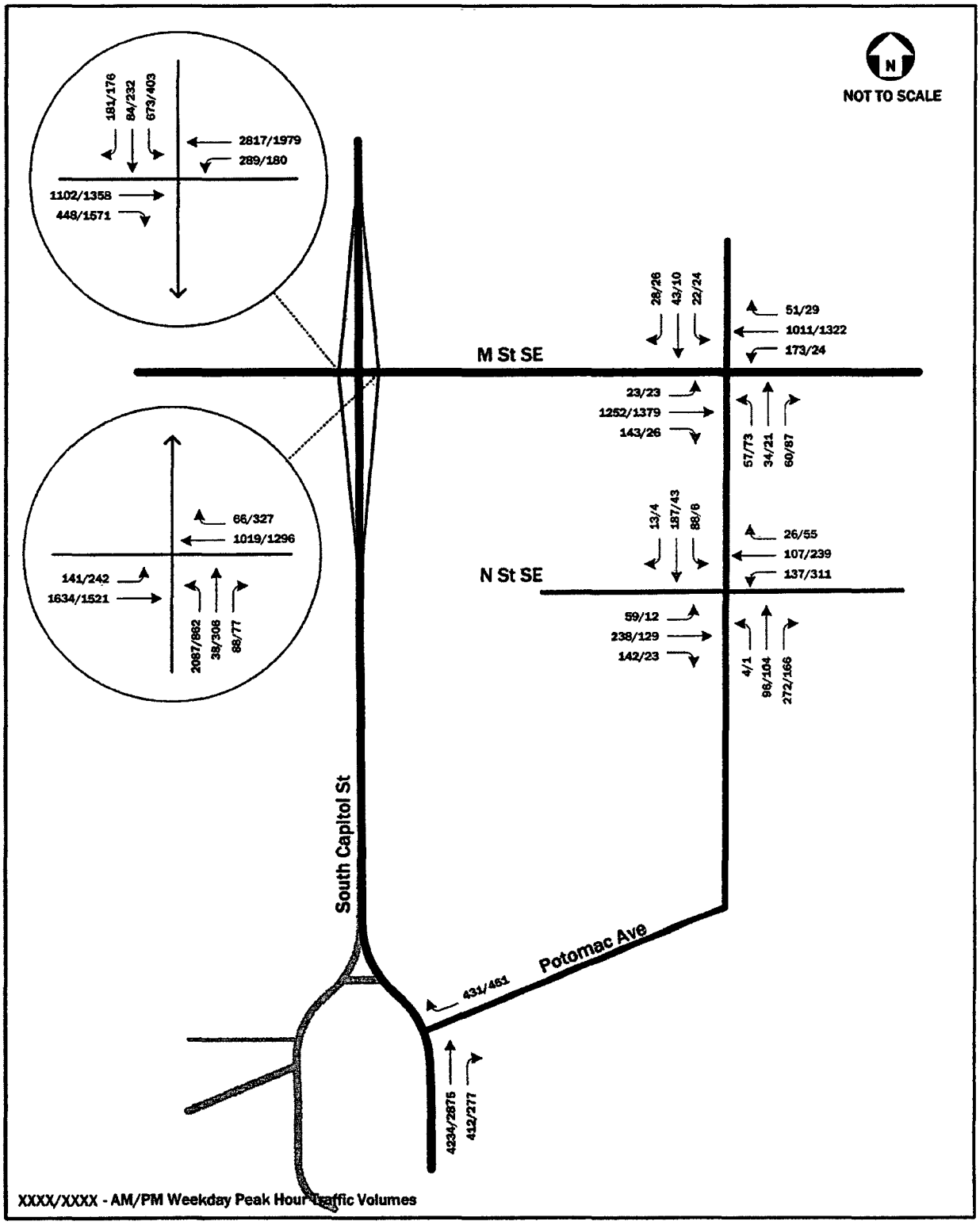


Figure 9 – 2017 Background Peak Hour Traffic Volumes

Future Background Analyses

Background peak hour levels of service (without the Florida Rock mixed-use development) were calculated based on: (1) future lane use and traffic controls shown on Figures 5 and 6; (2) the background traffic volumes shown on Figures 8 and 9; and (3) the *Highway Capacity Manual* 2000 (HCM) methodologies (using Synchro 6 software). The traffic signal timings were optimized using the Synchro software to reflect any changes made by DDOT prior to the horizon years. Copies of LOS calculation worksheets are included in the Appendix. Table 4 displays the results of the capacity analyses, including LOS and average delay per vehicle (in seconds).

The results in table 4 show similar results to the existing conditions capacity analyses. The intersections serving regional traffic patterns on South Capitol Street operate at failing conditions when handling commuter traffic. The intersections on 1st Street SE operate at acceptable conditions.

At the time of writing this report, the South Capitol Street EIS was not issued as a final document. Thus, it is not clear what the final recommendation will be for re-configuring the intersection of South Capitol Street and M Street. The results of this analysis show that improving this connection will be necessary to avoid extremely long commuting delays. It should be noted though, that this analysis does not take into account major shifts in regional commuter traffic patterns, such as the effect that the replacement of the 11th Street Bridges and possibly the John Sousa Bridge will have to South Capitol Street traffic by 2017 (the South Capitol Street EIS does take these factors into account).

Table 4 – 2012 and 2017 Background Capacity Analysis Results

Intersection (Approach)	2012 Background Conditions				2017 Background Conditions			
	AM Peak Hour		*PM Peak Hour*		*AM Peak Hour*		*PM Peak Hour*	
	Delay (sec/veh)	Level of Service	Delay (sec/veh)	Level of Service	Delay (sec/veh)	Level of Service	Delay (sec/veh)	Level of Service
South Capitol St and Potomac Avenue (traffic signal)								
Overall	**214.2**	**F**	**204.8**	**F**	**127.1**	**F**	**25.5**	**C**
Eastbound	34.6	C	38.7	D	...	...	...	...
Westbound	45.8	D	30.4	C	137.4	F	54.1	D
Northbound	315.0	F	67.4	E	126.1	F	21.4	C
Southbound	8.0	A	310.2	F	...	...	...	...
N St & 1st St SE (traffic signal)								
Overall	**15.5**	**B**	**13.3**	**B**	**18.1**	**B**	**17.1**	**B**
Eastbound	13.8	B	12.0	B	14.8	B	4.0	A
Westbound	10.7	B	14.3	B	14.7	B	11.0	B
Northbound	23.9	C	8.6	A	24.1	C	36.8	D
Southbound	14.8	B	22.2	C	18.6	B	26.4	C
M St & 1st St SE (traffic signal)								
Overall	**14.8**	**B**	**13.9**	**B**	**14.0**	**B**	**16.0**	**B**
Eastbound	15.2	B	14.5	B	12.9	B	19.8	B
Westbound	11.3	B	10.5	B	11.7	B	10.3	B
Northbound	28.6	C	27.2	C	33.5	C	25.0	C
Southbound	27.0	C	25.9	C	29.5	C	29.0	C
M St & SB South Capitol Ramps (traffic signal)								
Overall	**48.1**	**D**	**146.7**	**F**	**145.8**	**F**	**275.6**	**F**
Eastbound	51.6	D	266.0	F	113.6	F	478.3	F
Westbound	17.5	B	3.6	A	119.7	F	14.8	B
Southbound	157.8	F	134.2	F	285.6	F	238.1	F
M St & NB South Capitol Ramps (traffic signal)								
Overall	**119.3**	**F**	**42.8**	**D**	**220.1**	**F**	**83.9**	**F**
Eastbound	5.5	A	2.2	A	75.2	E	9.5	A
Westbound	58.1	E	24.9	C	133.4	F	93.0	F
Northbound	229.9	F	113.5	F	379.0	F	177.5	F

FLORIDA ROCK TRANSPORTATION FEATURES

Phasing

The Florida Rock development will be constructed in four phases, detailed in Table 5.

Table 5 – Florida Rock Program and Phasing

Phase	Land Use	Amount	Parking Provided	Estimated Year of Completion
1	Office Retail	270,436 SF 35,657 SF	213	2009
2	Residential Retail	160 Dwelling Units 14,824 SF	275	2011
3	Office Retail	333,010 SF 12,035 SF	356	2014
4	Hotel	240 Guest Rooms	166	2016

Figure 10 shows a phasing plan annotated with notes regarding site access.

Circulation

Site access will be provided through three driveways along Potomac Avenue. The first, the easternmost driveway constructed during phase one, will provide direct access into the site parking garage and is planned as a full-access drive. This driveway will primarily serve the office and retail tenants in the eastern office building (phase 1) and the residential building (phase 2).

The second driveway, a full-access driveway constructed in phase 2, will initially provide access to a pick-up/drop-off area and temporary loading docks for the residential building. Upon full build-out, this driveway will serve as the access point to a central 'piazza', which provides access to several pick-up/drop-off locations (for the residential building, west office building and hotel). In addition, the entrance/exit to the hotel parking garage will be located on the central 'piazza'. Residents will be able to use this garage entry/exit as a secondary access point.

The third driveway, to be constructed in phase 3, will also provide access to the parking garage. This driveway is planned to be limited to right turns in and right turns out only, and will primarily serve the office tenants in the western office building (phase 3).

Two below-grade loading docks are planned, the first accessed near the easternmost site drive on Potomac Avenue. The second loading dock is accessed by the same garage ramp as the westernmost site drive on Potomac Avenue (the right turn in/right turn out driveway).

The vehicular circulation on the site is summarized on Figure 11.

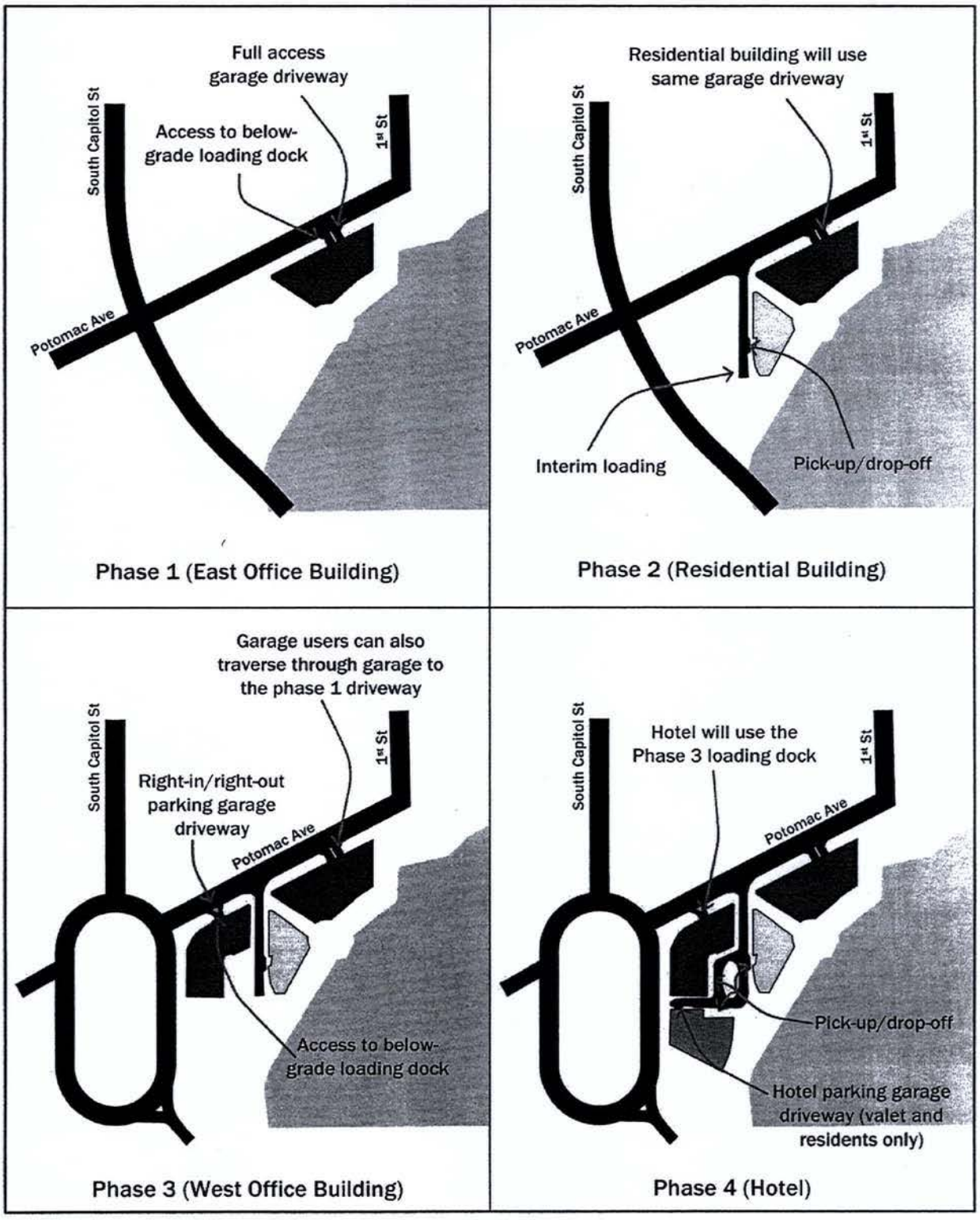


Figure 10 – Florida Rock PUD Phasing and Site Access

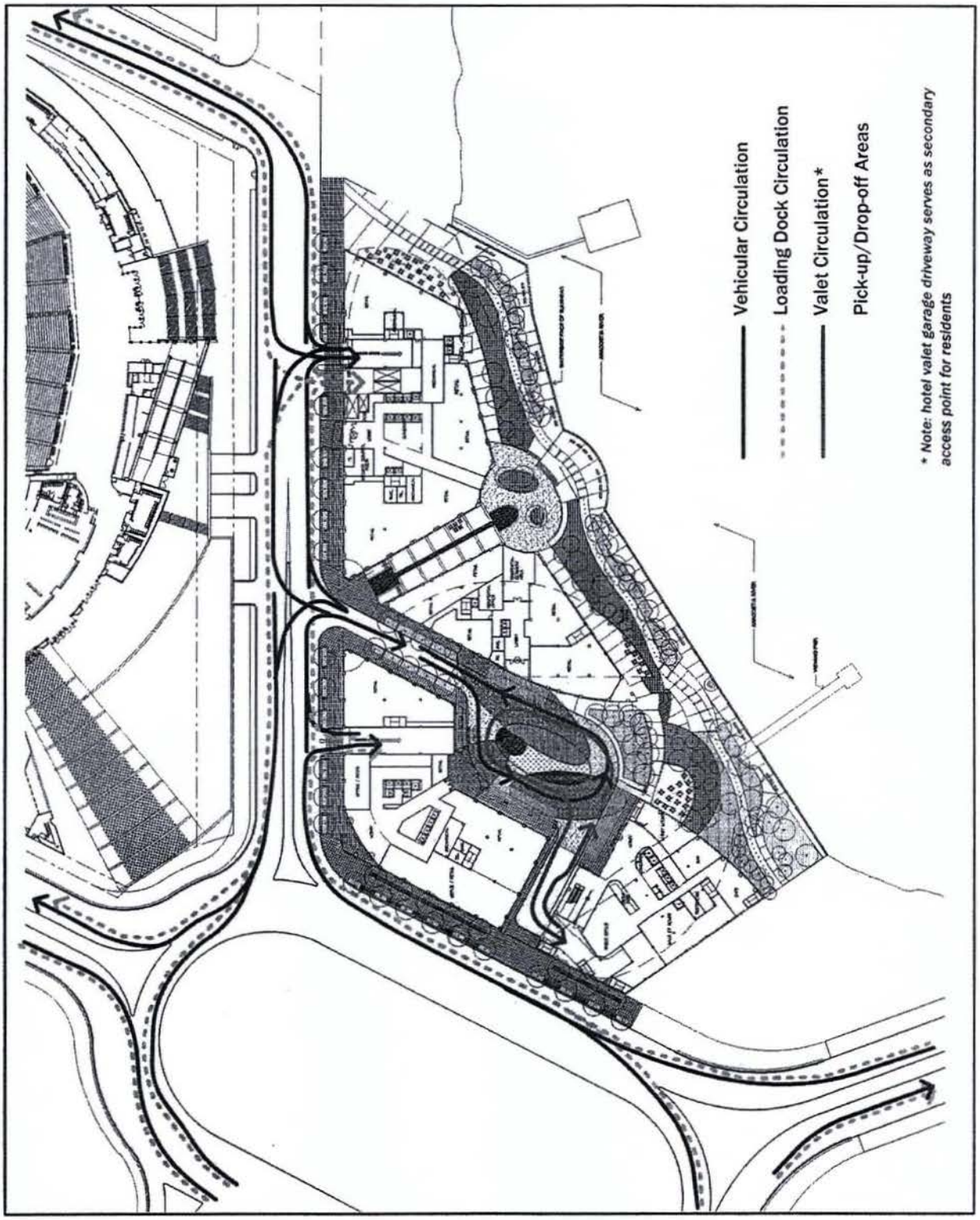


Figure 11 – Florida Rock PUD Vehicular Circulation

The proposed development is located approximately 2,000-2,500 feet south from the nearest Metrorail station, the Navy Yard station, which is served by the Green Line. Also, the Anacostia Riverwalk Trail passes through the site, on the Anacostia River waterfront. The Florida Rock site plan shows wide sidewalks and pedestrian connections to adjacent parcels.

Based on the preliminary plans DDOT has assembled for the roadway improvements to Potomac Avenue and 1st Street SE, sidewalk connections from the Florida Rock site to the Metrorail station and other nearby destinations will be in place prior to completion of the first phase. Adjacent developments, such as the USDOT headquarters and the Southeast Federal Center include sidewalk improvements on the street faces on their property. Although the existing conditions surrounding the site are not pedestrian friendly, due to these improvements Florida Rock residents, office-workers and visitors will have adequate and quality sidewalks connecting them to their neighborhood and transit stations.

Bicycle accommodation through the site will be on the portion of the Anacostia Riverwalk Trail that runs eat-west through the site, near the river. Within the site, bicycle will have a dedicated 10 foot wide pathway, separated from the pedestrian promenade. The design and connectivity of the bicycle pathway was discussed during a meeting the DDOT staff, Office of Planning staff, and the Anacostia Waterfront Commission.

In addition, the District is incorporating bicycle lanes on 1st Street SE, and Potomac Avenue near the site. Bicycle parking will be accommodated in the parking garages (per zoning) for office tenants and residents. Visitors to the site using the Anacostia Riverwalk Trail will be able to park on two bicycle racks stationed near where the trail intersects the pedestrian plazas near the Anacostia River. Figure 12 shows the bicycle circulation plan and parking locations.

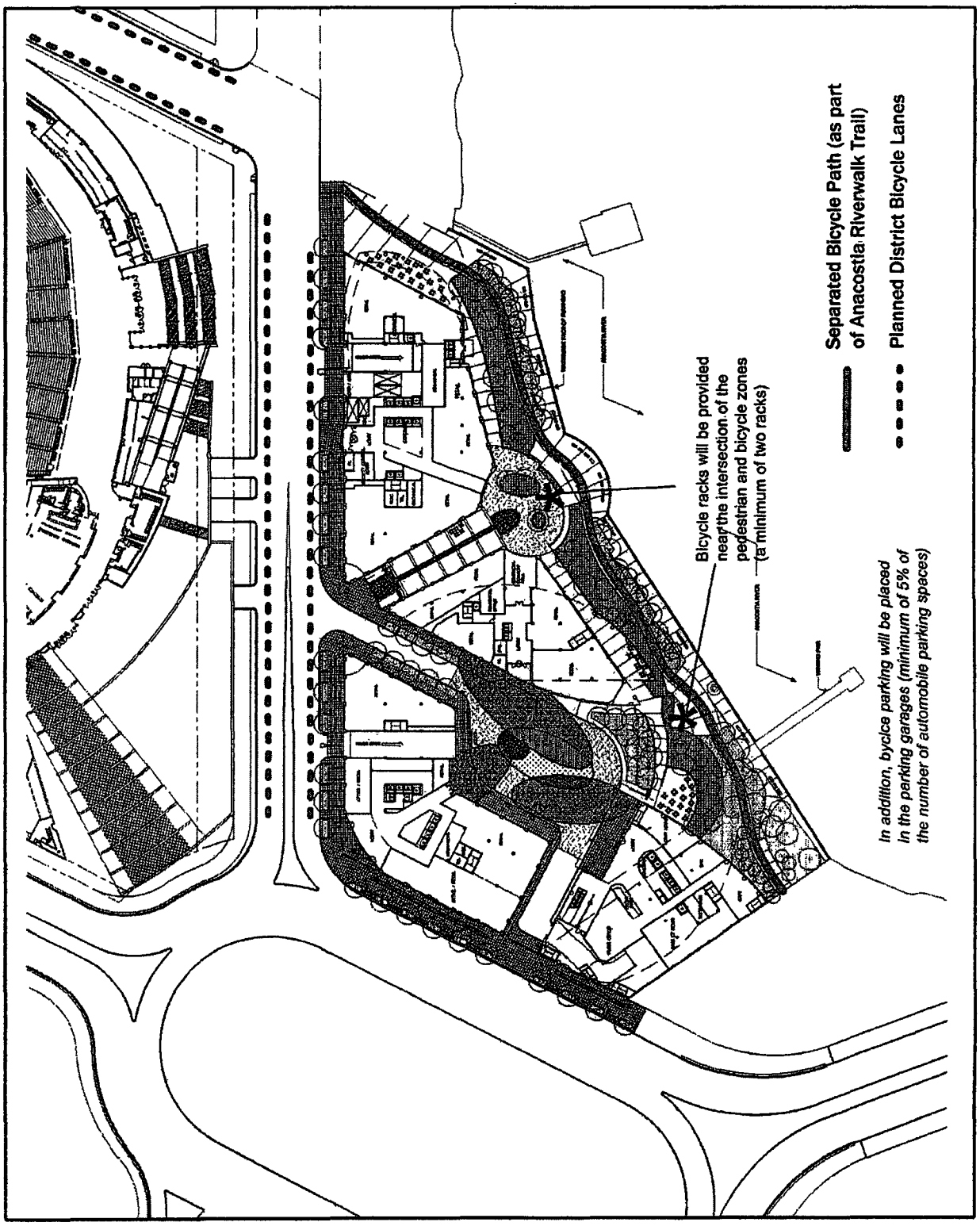


Figure 12 – Florida Rock PUD Bicycle Circulation

Parking

Parking for the project will be provided in a single underground garage to be constructed in four sections, in conjunction with the phases located above. Portions of the garage will be partitioned, such as the hotel and residential spaces, but drivers will be able to circulate throughout the entire garage to any of its access points.

Table 6 summarizes the parking required based on zoning, as well as the number of spaces provided in the plan for each phase. At the end of each phase, the amount of parking provided meets the zoning code required amount. The excess parking is provided in order for the planned development to provide enough supply to meet additional anticipated demand over the zoning requirement.

Table 6 – Summary of Florida Rock Parking

Land Use	Number of Spaces					
	Phase 1	*Phase 2*	*Phase 3*	*Phase 4*	*Total*	*Final Parking Ratio at Build-Out*
Office						
Provided	163	---	343	---	506	0.83 spaces per 1,000 SF
Required	149	---	189	---	338	
Difference	+14	---	+154	---	+168	
Retail						
Provided	50	16	13	---	79	1.26 spaces per 1,000 SF
Required	44	16	13	---	73	
Difference	+6	0	0	---	+6	
Residential						
Provided	---	259	---	---	259	1.62 spaces per dwelling unit
Required	---	54	---	---	54	
Difference	---	+205	---	---	+205	
Hotel						
Provided	---	---	---	166	166	0.69 spaces per guest room
Required	---	---	---	82	82	
Difference	---	---	---	+84	+84	
Total						
Provided	213	275	356	166	1,010	
Required	193	70	202	82	547	
Difference	+20	+205	+154	+84	+463	

Table 6 also shows the resulting parking ratios provided at full build-out. The office and retail ratios are comparable to developments in this area of the District with similar walking distances from a Metrorail station. More residential spaces are provided per unit than comparable sites based on market studies of potential residents. The parking ratio at the hotel is comparable when compared to similar hotels that have meeting rooms and limited conference facilities.

The total number of spaces, 1,010, is less than the Stage 1 PUD approval of 1,358 spaces. This reflects a decrease of over 25% between the Stage 1 and Stage 2 applications.

Transportation Management Plan

The purpose of a Transportation Management Plan (TMP) for the Florida Rock mixed-use development is to provide services and incentives to increase the efficiency of the roadway network without adding additional capacity. A TMP is most successful for large scale employers, and would be aided significantly, if large tenants were brought to the office buildings on site. Given the congested nature of the regional access to the site, it is recommended that the following measures be employed for the development.

A TMP should include broad goals and objectives for reducing vehicular trips, influencing positive mode split changes, and increasing vehicle occupancy ratios, all of which are targeted towards improving congestion and pollution levels. The TMP should also provide a description of existing and potential measures for achieving the stated goals and objectives. This must be followed by an implementation plan and a monitoring and evaluation program. The latter would facilitate an assessment of the effectiveness of the goals and objectives, and the implementation of necessary adjustments. The TMP should also relate to the transportation management and air quality requirements of the local, state, and regional agencies, including working cooperatively with nearby institutions to address those requirements.

TMP Goals and Objectives

Potential goals and objectives of the Florida Rock mixed-use development site TMP are as follows:

Goals

- Influence the travel choices of the prospective users of the proposed development towards reducing their potential adverse impacts on local area traffic congestion and air pollution.
- Establish an opportunity to work cooperatively with federal and local agencies, as well as the adjacent institutions (SEFC, USDOT, Navy Yard, Ballpark), towards reducing local area traffic congestion and air pollution.
- Mitigate identified adverse traffic impacts of the proposed Florida Rock development.

Objectives

- Reduce single occupant vehicular trips, particularly during weekday morning and afternoon peak periods.
- Increase vehicle occupancy ratios.
- Reduce parking supply and demand ratios through effective management strategies.
- Identify strategies that can be implemented with other local area agencies and organizations to achieve the TMP goals and objectives, as well as address local area roadway capacity and safety deficiencies.

Potential TMP Strategies

- *Transportation Coordinator*

  A transportation coordinator is a person designated for administering the TMP. They would disseminate information to the office-workers, residents, and hotel guests and coordinate with District agencies and nearby major institutions on activities and related information. They would also help administer a guaranteed ride home program, the parking management on site, and monitor and evaluate the TMP strategies.

- *Ridesharing (Carpool and Vanpool)*

  Carpooling occurs when two or more people share a ride in a private vehicle. Carpools generally consist of persons who live in the same neighborhood or along the same route, and use a private vehicle to reach a common or nearby destination. Vanpools consist of seven or more people who share a ride in a prearranged van which could be owned or leased by the riders or the employer. The Transportation Coordinator would take an active role in promoting and facilitating these strategies though the maintenance of an accurate database listing all of the participants, arranging ridesharing matches, and helping provide incentives.

- *Transit Amenities*

  The Florida Rock site is situated in proximity to the WMATA Navy Yard Metrorail Station, on the Green Line. Several WMATA Metrobus routes traverse the roadways surrounding the site, however currently WMATA Metrobus routes do not directly serve the site. Transit amenities, such as a shuttle bus service connecting the site to the Navy Yard and other nearby Metrorail stations serving other lines would make use of Metrorail more convenient (see *Shuttle Bus Services*). Office-workers, residents, and hotel guests would further be encouraged to use those transit facilities and services through the issuance of transit subsidies, Metrochecks, etc.

- *Shuttle Bus Services*

  The Florida Rock mixed-use development may be interested in the creation of a jointly operated shuttle bus circulator system connecting the Florida Rock site and adjacent institutions such as the Ballpark, SEFC, USDOT, Navy Yard, and future developments on Buzzard Point to nearby Metrorail stations serving the Orange, Blue, Yellow, and Red Lines along with the Navy Yard Metrorail Station.

- *Shared Vehicles*

  This strategy would be explored to provide a flexible option to the prospective office-workers and residents who would rely primarily on public transportation or alternative travel modes, but would require a vehicle for special trips such as going shopping or trips to areas not accessible via transit. A number of shared vehicles can be located on-site with a corresponding number of reserved spaces within the Florida Rock garage.

- *Flexible Work Hours*

  This program encourages office tenants in the Florida Rock buildings to implement a variable work program, including flextime, allowing office-workers to arrive and depart to and from work during the off-peak periods. In addition, a compressed work week and staggered work hours program would provide office-workers the opportunity to work the same number of hours in fewer days per week, or per pay period. These measures would serve to reduce the morning and afternoon peak period vehicular trip generation of the proposed office uses.

- *Telecommuting*

  Some office-workers, whose jobs allow working remotely, could be given the opportunity to work from home one day or more a week, maintaining contact with their office via fax machine, e-mail, and/or telephone.

- *Guaranteed Ride Home*

  This program, sponsored by the Metropolitan Washington Council of Governments, would be used to provide reliable and free emergency ride home from work for commuters who regularly carpool, vanpool, and bicycle, walk, or take transit to work.

- *Parking Management*

  The TMP will include the assignment of a number of preferentially-located parking spaces to residents and office-workers participating in the ridesharing activities, including carpools and vanpools, managed by the transportation coordinator or even those arriving during the less-congested times of the day. This parking could include assigned spaces near building entrances, level-one spaces in a structured facility, or a priority position on a parking space waiting list. Office-workers and visitors would also be required to pay for parking. In addition, a parking management company may be retained to manage the employee parking, provide valet parking and other related assistance. Other strategies would provision of secure bicycle spaces within the garage.

- *Truck Management Plan*

  The objective of this plan is to ensure that truck-loading requirements of the property have minimal impacts on traffic on the adjacent public streets. Since the loading docks are below-grade, most impacts to adjacent public streets will be minimal, but some additional measures may be necessary. An assigned on-site loading dock manager that is part of the building management staffing will accomplish this (this task could also be performed by an on-site Transportation Coordinator). The following measures will be part of the truck management plan:

  - *Hours of operation*. The loading dock will be open for operation during hours that will not generate noise that could be heard in residential areas. The anticipated hours of operation are from 6 a.m. to 7 p.m. on weekdays, and only for special needs on weekends.

- *Truck routing*. Trucks drivers will by necessity arrive on South Capitol Street and leave by First Street. City truck routes will be posted in the loading dock facilities.
- *Truck marshalling*. The manager will schedule as many truck trips as possible to avoid the need to queue and marshal trucks. In the rare event that there are more trucks on site than the capacity of the loading docks, the manager will accommodate the trucks on-site in the driveways in locations that will not interfere with other traffic movements.
- *Coordination with major events in the area*. The manager will maintain a calendar of events in the waterfront area, including Nationals ball games, concerts, and other public gatherings. Truck activity at Florida Rock will be scheduled to avoid conflicts with these events.
- *Enforcement*. In the event that truck drivers do not adhere to the manager's requirements, the vendor company will be notified, and the manager will follow up with vendor management to ensure that infractions are kept to a minimum.

- *Bicycle Facilities*

  The provision of secured bicycle parking, racks, showers, and the completion of a bikeway through the site connecting to the trail being designed and built along the west bank of the Anacostia River as well as providing connections to the growing network of striped bicycle lanes and signed bicycle routes within Near Southeast would encourage office-workers, residents, and visitors to bike to and from the site.

- *Miscellaneous Strategies*

  Mortgage, rental, relocation and other incentives may be provided to encourage office-workers to live on the site or within the adjacent areas. Day care, retail, recreational and other uses may encourage office-workers and residents to live and work on the site, or use transit or other alternative commuting modes.

- *TMP Coordination*

  The Florida Rock TMP, through the transportation coordinator, should coordinate activities and strategies with other TMPs in the area, including the USDOT and SEFC TMPs. Coordination with the Ballpark and Navy Yard is also recommended. This provides an opportunity for the achievement of administrative efficiency and economies of scale in the effective implementation of TMP measures which ultimately benefit those institutions.

TMP Implementation

The GSA (General Services Administration) *Federal Agency TMP Handbook* serves as a good guide to the process involved in implementing a TMP. This process would include: a) designating the Employee Transportation Coordinator (ETC), b) preparation of a TMP, and determining and allocating the time and resources required for its implementation, c) developing and administering an employee

transportation survey to determine existing and potential travel choices and influencing factors, d) evaluating the marketing effort required for each strategy and seeking ways to improve acceptance or expand the strategy to new groups of office-workers, e) determining internal and external channels of providing commuting information to office-workers on a periodic or continuous basis, and f) developing the program to incorporate commuting information dissemination as part of the new employee orientation program.

Since it is unknown what type of tenants will be occupying the space in the Florida Rock mixed-use development, the implementation process will need to be re-evaluated upon completion of each phase of the development. Starting with the occupation of the east office building, the applicant will either (1) hire an ETC, (2) require tenants to hire an ETC, or (3) contract out to a firm that provides these services. This decision will most likely be based on the type of office tenants occupying the building.

TMP Monitoring and Evaluation

The GSA TMP Handbook also states that in order to maintain a successful TMP, implementation alone is not sufficient. The TMP must be monitored, evaluated, and restructured as necessary in order to be effective. There are different methods for collecting the data for evaluation purposes. Some of the most commonly used methods involve employee surveys, program participation documentation and time sheets/activity logs, vehicular trip generation counts, vehicular occupancy surveys and the monitoring of transit and shuttle bus ridership. The Florida Rock mixed-use development monitoring and evaluation program should be implemented in accordance with the guidelines noted above. This should be done at least every two years and at the completion and occupation of each phase, and required adjustments would be made to enhance the effectiveness of the TMP measures.

TOTAL FUTURE TRAFFIC CONDITIONS

Total future traffic conditions represent future traffic in the study area including existing traffic, background growth, and traffic generated by the proposed Florida Rock development.

Trip Generation

The number of anticipated vehicle trips generated by the PUD was estimated using ITE's *Trip Generation*, 7th Edition, WMATA's *Development-Related Ridership Survey, 2005*, and past studies conducted in the area from the library of Gorove/Slade Associates, Inc.

The trip generation methodology and calculations shown here are revised from the August 23, 2006 report reflecting comments received from DDOT. These calculations reflect an emphasis on known survey data results in favor of engineering judgment, when compared to the trip generation methodology contained in the August 23, 2006 report.

According to the rates and equations provided by ITE, the Florida Rock PUD would generate a total of 1,204 AM peak hour trips (933 in and 271out), 1,320 PM peak hour trips (389 in and 931 out), and 12,742 daily trips when all four phases are completely built and occupied. This is without consideration to any reduction in the trips as a result of it proximity and access to transit or synergy between onsite uses. By definition, ITE's trip generation rates were derived from data collected from single-use developments where virtually all access to the development would be by private automobile (Source – *Trip Generation Handbook*, 2nd Edition, Appendix B). *Trip Generation* does not account for the potential effects of Transit Demand Management (TDM) programs, transit availability, and interaction between various on-site uses (synergy), particularly when these uses are in walking distance of each other. The ITE numbers were therefore used to generate trip estimates for the proposed buildings, however reductions were made for transit use based on WMATA's *Development-Related Ridership Survey, 2005*.

Alternative Mode Reductions

The WMATA *Development-Related Ridership Survey 2005* provides a good look at the travel patterns within the Washington DC Metro region. The survey confirmed previous findings that the walking distance between a site and transit locations, primarily Metro-rail, influences the mode of commute. Gorove/Slade Associates, Inc. included two other independent variables in our analyses of the proposed PUD alternate mode split. These include: 1) The distance of the development from the closest Metro Station; 2) The location of the nearest Metro-rail station to other concentric Metro-rail stations in the system, since this offers the greater ability to access other Metro lines and connect to other areas in DC, Maryland and Virginia; and 3) The parking ratio of the PUD, since the choice to drive depends on the parking supply. There was no single site that was same or identical characteristics of the proposed PUD, so survey results from individual sites, each showing similarity with at least one

of the independent variable were found and averaged to determine the alternate mode split reduction to be applied to the ITE trip generation for the PUD. Additionally, separate analyses were conducted for the residential, office, and hotel portions of the development, because the modal splits were different for each land use. To ensure conservatism in the trip generation estimates, no reductions were applied to the retail portions of the development.

The Florida Rock PUD is approximately 2,000 to 2,500 feet from the Navy Yard Metro Station. Of the sites surveyed by the WMATA study, the Ballston Plaza and Ballston One office buildings were similar in distance from the Ballston Metro Station. The study reflected a transit use of 21% and 15%, respectively for the sites. Using the regression equation provided, the transit use split was approximately 20% for office uses. For the residential uses, there was no site as close in distance to the Navy Yard Metro as the office uses, so the regression equations were used to estimate the transit reductions. The equations showed a 41% reduction to transit.

Given the anticipated growth and development in the southeast portion of the district, the future land use around the Navy Yard Metro Station is expected to exhibit characteristics similar to several stations referred to as "core fringe" or "midpoint" Metro-rail Stations per WMATA's 2005 Development-related Ridership Survey. The average of the four Metro-rail Stations categorized as "core fringe" were therefore used to determine the mode split as it relates to the location of the Navy Yard Station in the Metro system. The results show a 32% reduction for office trips and 60% reduction for residential trips.

The third and final comparison was made using parking ratios. To simplify the analysis, the parking ratio for various components of the development was calculated but only for the final build out. Two office sites, Chevy Chase Plaza and 2 Wisconsin Circle, both of which are closest to the Friendship Heights Metro showed similar parking ratios to the final build out of the Florida Rock PUD. The average transit usage for the buildings was 38%. The North Park Apartments (Friendship Heights Station) and the Avalon – Grosvenor Station (Grosvenor-Strathmore Station) had similar parking ratios on the residential side. Both residential developments had a transit split of 43%.

According to the WMATA Study, only a limited number of data points were collected for hotel usage. These sites showed an average transit use of 35%. In the interest of conservatism, a 25% transit reduction was applied to hotel trips.

The table below summarizes the transit reduction factors used for the trip generation of the Florida Rock PUD.

Table 7 – Summary of Alternate Mode Trip Reduction

Characteristic	Office	Residential	Hotel
1. Distance from Metro	20%	41%	-
2. Proximity to Transfer Stations/City Core	32%	60%	-
3. Parking Ratio	38%	43%	-
Final Alternate Mode Reduction (average)	**30%**	**48%**	**25%**

Synergy

Due to the mixed-use nature of the site, some trips will be captured internally between the different land uses. For example, some residents may work in the office buildings, and some office workers may shop at the retail sites. In order to take this into account, the worksheets and rates contained in ITE's *Trip Generation*, 7th Edition was used. Copies of these worksheets are included in the appendix of this report.

Summary of Trip Generation

Based on the development program, the alternate mode reductions and the synergy reductions, the site trip generation was calculated. The results are shown in Table 8. A detailed table is included in the Appendix to this report.

Table 8 – Summary of Florida Rock Trip Generation

Phase	Trip Generation						
	AM Peak Hour			*PM Peak Hour*			*Daily*
	In	Out	Total	In	Out	Total	Total
Phase 1: Office	268	45	314	90	278	368	3,468
Phase 2: Residential	14	39	54	42	31	73	877
Phase 3: Office	305	45	349	72	286	356	2,815
Phase 4: Hotel	75	55	130	62	65	126	1,740
Total	**661**	**185**	**846**	**265**	**660**	**923**	**8,900**

Trip Distribution and Assignment

The site-generated traffic volumes for the study area roadways are based on existing travel patterns identified during data collection, knowledge of the area, and distributions contained in previous reports. The percent distributions are shown in Table 9. Figures 13 and 14 show the assignment of these trips through the study area intersections for both horizon years.

The trip distribution assumes that the office space would be attractive to workers from the Metropolitan region in general, but would also attract employees from close-un sections of the District. The residential trips generated are expected to be focused more on the major employees closer to this area of the District, including the USDOT Headquarters, the Navy Yard, and Capitol Hill. It was assumed that hotel visitors would act similarly to residents, and retail trips were assigned in a similar fashion as the building they shared space with.

Table 9 – Florida Rock Trip Distribution

Phase	Percent to/from Route			
	East on M St	*West on M St*	*North on S. Capitol St*	*South on S. Capitol St*
Office Phases	20%	10%	30%	40%
Residential & Hotel Phases	10%	30%	35%	25%

Total Future Traffic Forecast

The site-generated traffic assignments depicted on Figures 13 and 14 were combined with the background traffic forecasts shown on Figures 8 and 9 to yield the total future traffic forecasts associated with the build-out of Florida Rock, shown on Figures 15 and 16.

Total Future Traffic Analyses

Total future peak hour levels of service were calculated based on: (1) the future lane use and traffic controls shown on Figures 5 and 6; (2) the total future traffic volumes shown on Figures 15 and 16; and (3) the Highway Capacity Manual 2000 (HCM) methodologies (using Synchro 6 software). Copies of LOS calculation worksheets are included in the Appendix. Table 10 displays the results of the capacity analyses, including LOS and average delay per vehicle (in seconds).

The analysis shows several changes in the levels of service of the study intersections from background conditions to future conditions.

First, the westbound approach at the intersection of South Capitol Street and Potomac Avenue in the evening rush hour changes from D to F with the inclusion of site traffic. This condition is a result of the amount of regional traffic on the traffic oval, and the signal timings at this intersection reflecting a priority for north-south traffic on South Capitol Street instead of Potomac Avenue. A decrease in the amount of westbound delay at this location is possible through changes to signal timings, although none

were assumed in this analysis, since most likely preference will be given to through traffic in the oval. More likely, if this intersection operates at or above capacity, some site traffic will use alternate routes, such as N Street, to access South Capitol Street.

Second, the Levels of Service at the intersection of N Street and 1st Street SE change from B to either C or D with the addition of site traffic. Even with the increase in traffic, this represents an acceptable condition.

The regional intersections that show poor or failing levels of service in the background conditions continue to do so. These levels of service are highly dependant on the final recommendation of the South Capitol Street EIS, and the eventual preferred alternative. It is possible that the detailed analysis and planning efforts performed for the EIS will develop mitigation measures for these levels of service, or show less delay in their calculations since they contain more detail specific to South Capitol Street and the operations of the traffic oval as a whole.

In 2012 both site driveways will operate at acceptable conditions. In 2017 the easternmost driveway approach to Potomac Avenue operates at level of service F. This is due to the difficulty found in turning left onto Potomac Avenue to access South Capitol Street. This delay shown was examined in more detail using traffic simulation, the results of which are contained in the next section of this report.

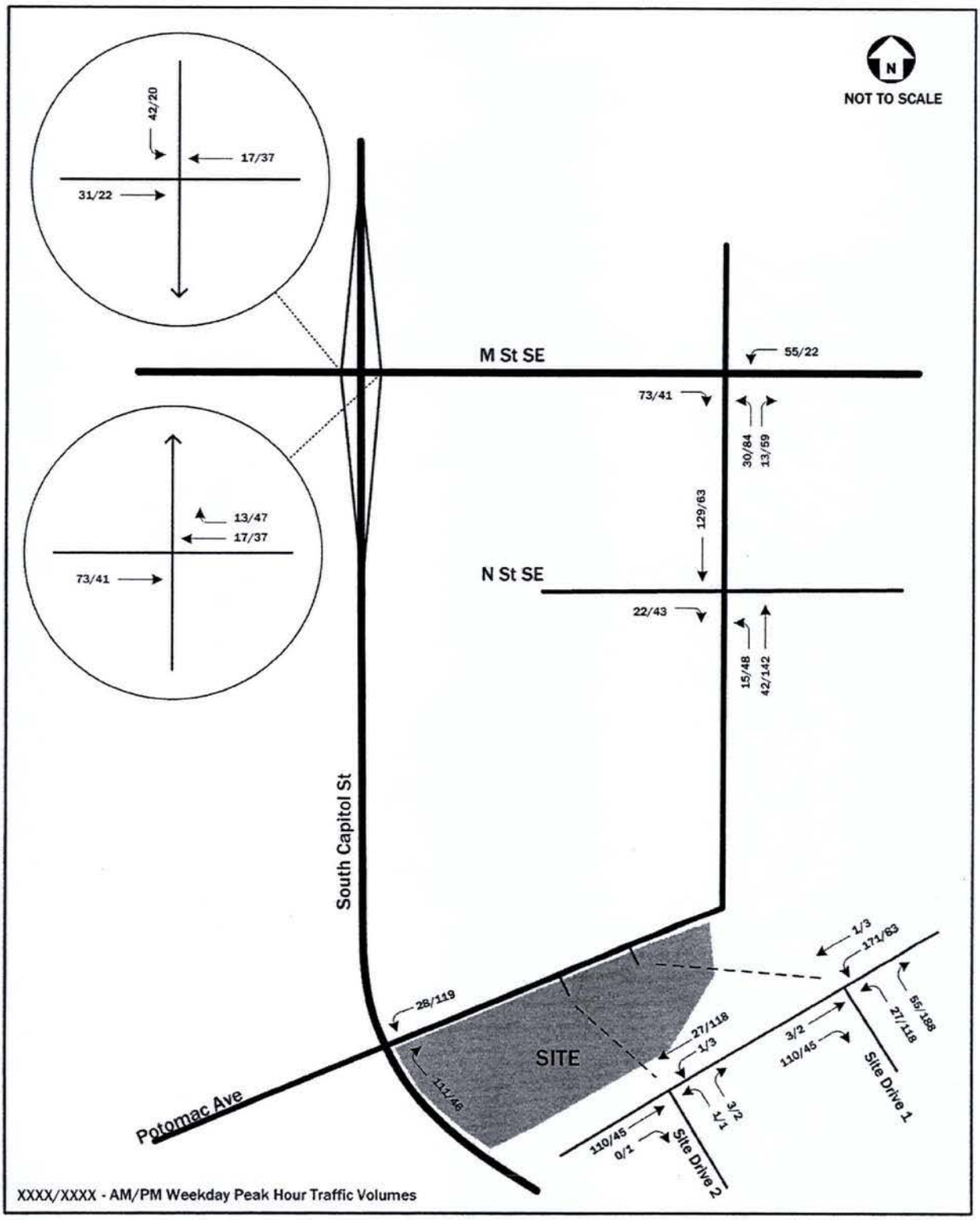


Figure 13 – 2012 Site Generated Peak Hour Traffic Volumes

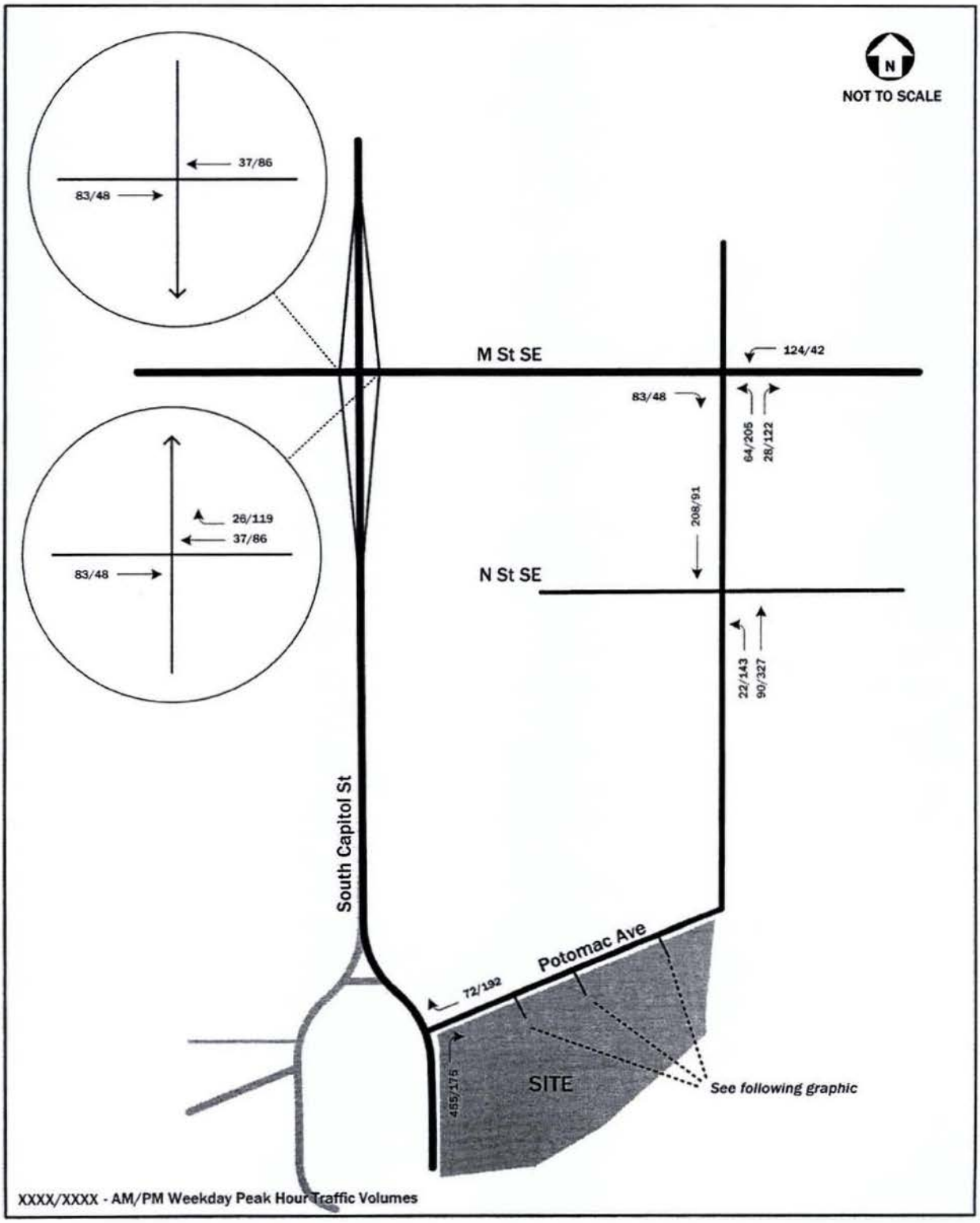


Figure 14a – 2017 Site Generated Peak Hour Traffic Volumes

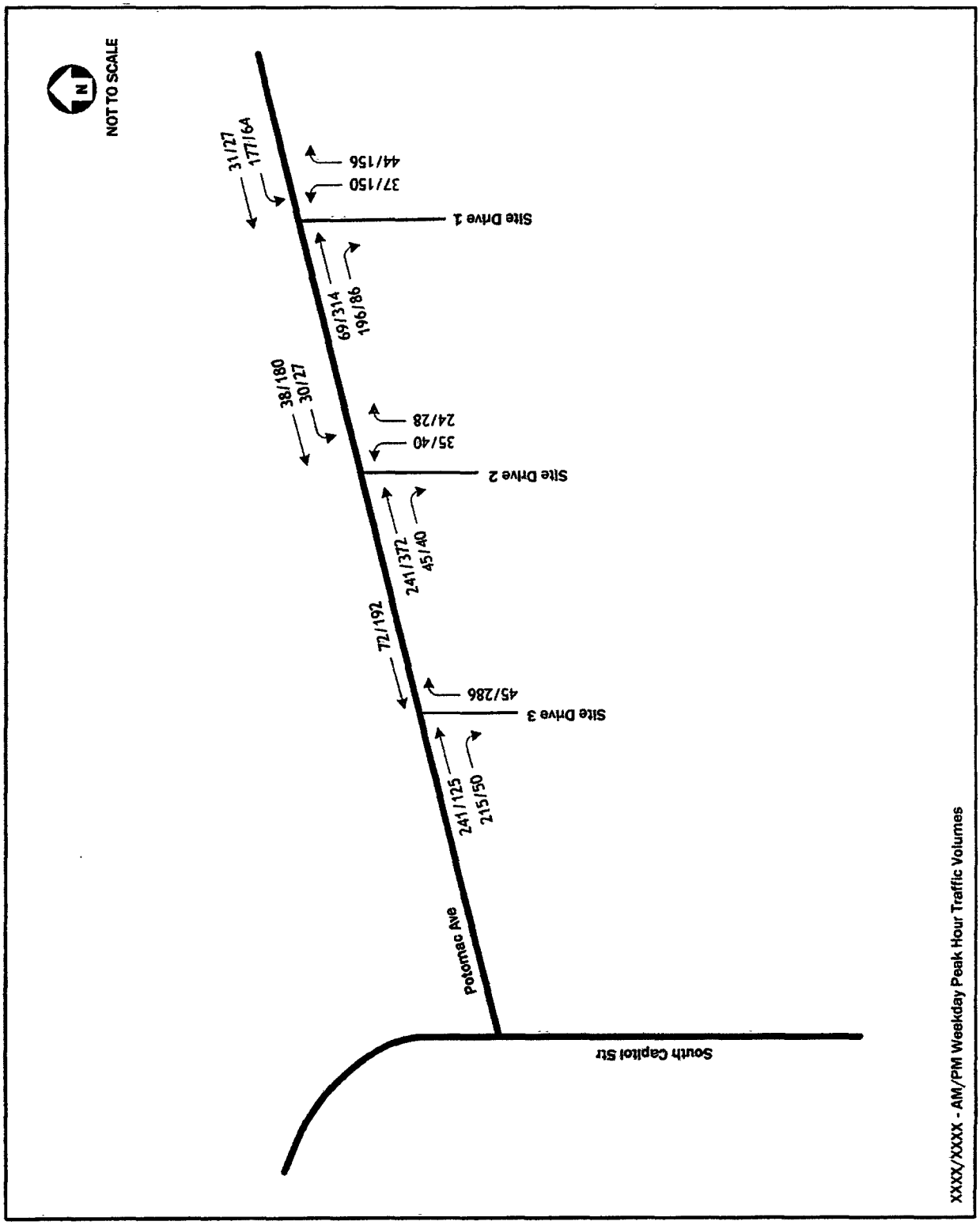


Figure 14b – 2017 Site Generated Peak Hour Traffic Volumes

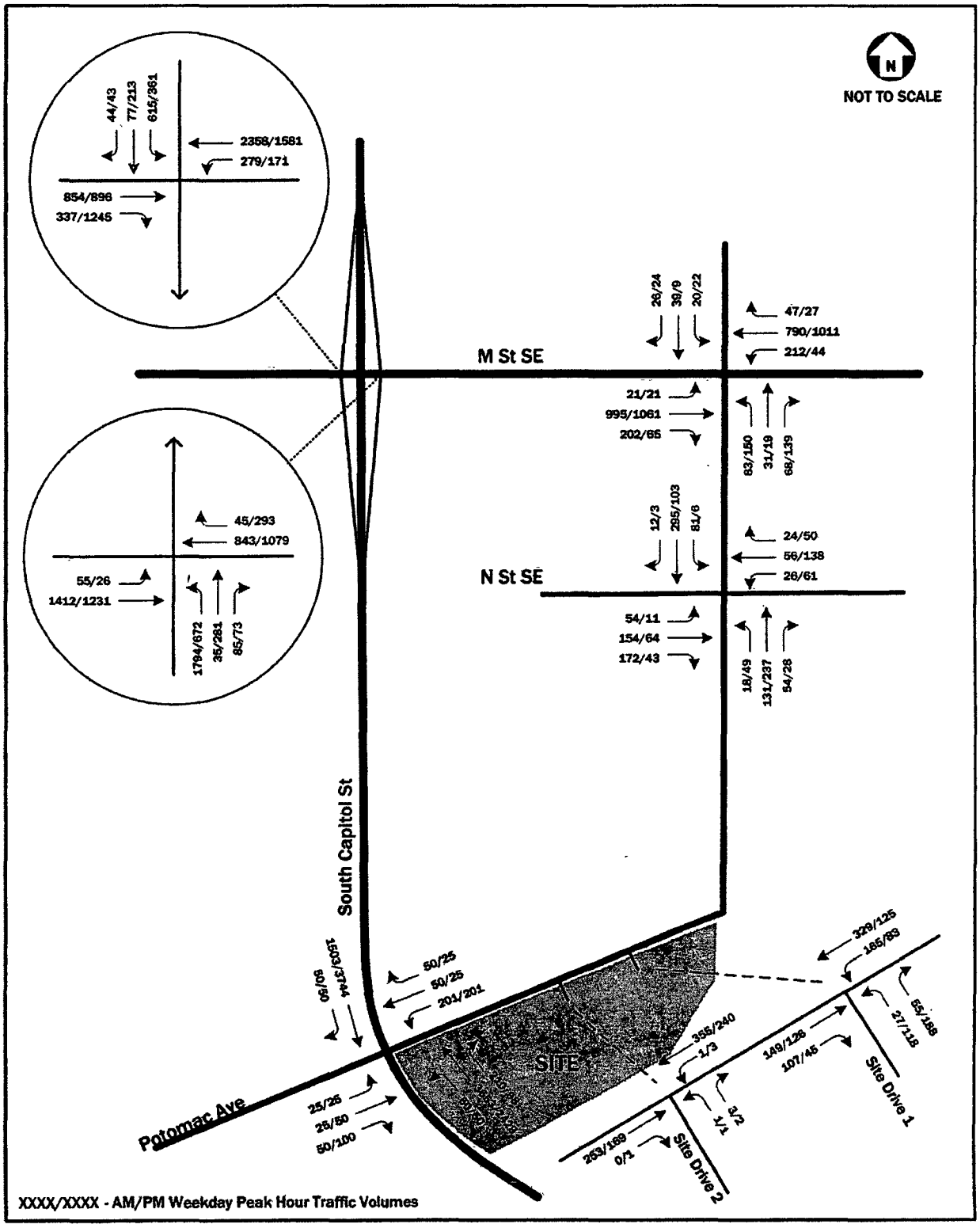


Figure 15 – 2012 Total Future Peak Hour Traffic Volumes

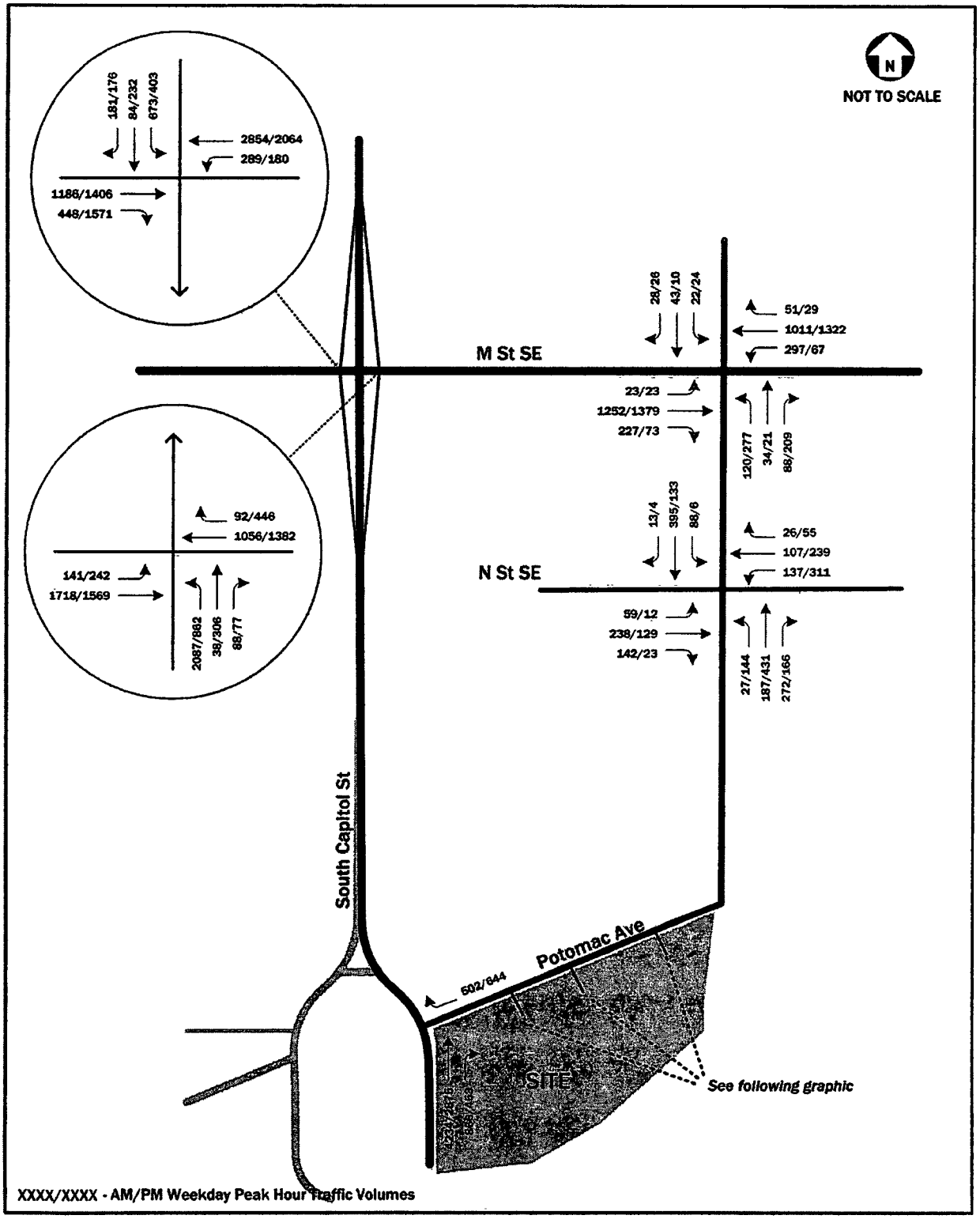


Figure 16a – 2017 Total Future Peak Hour Traffic Volumes

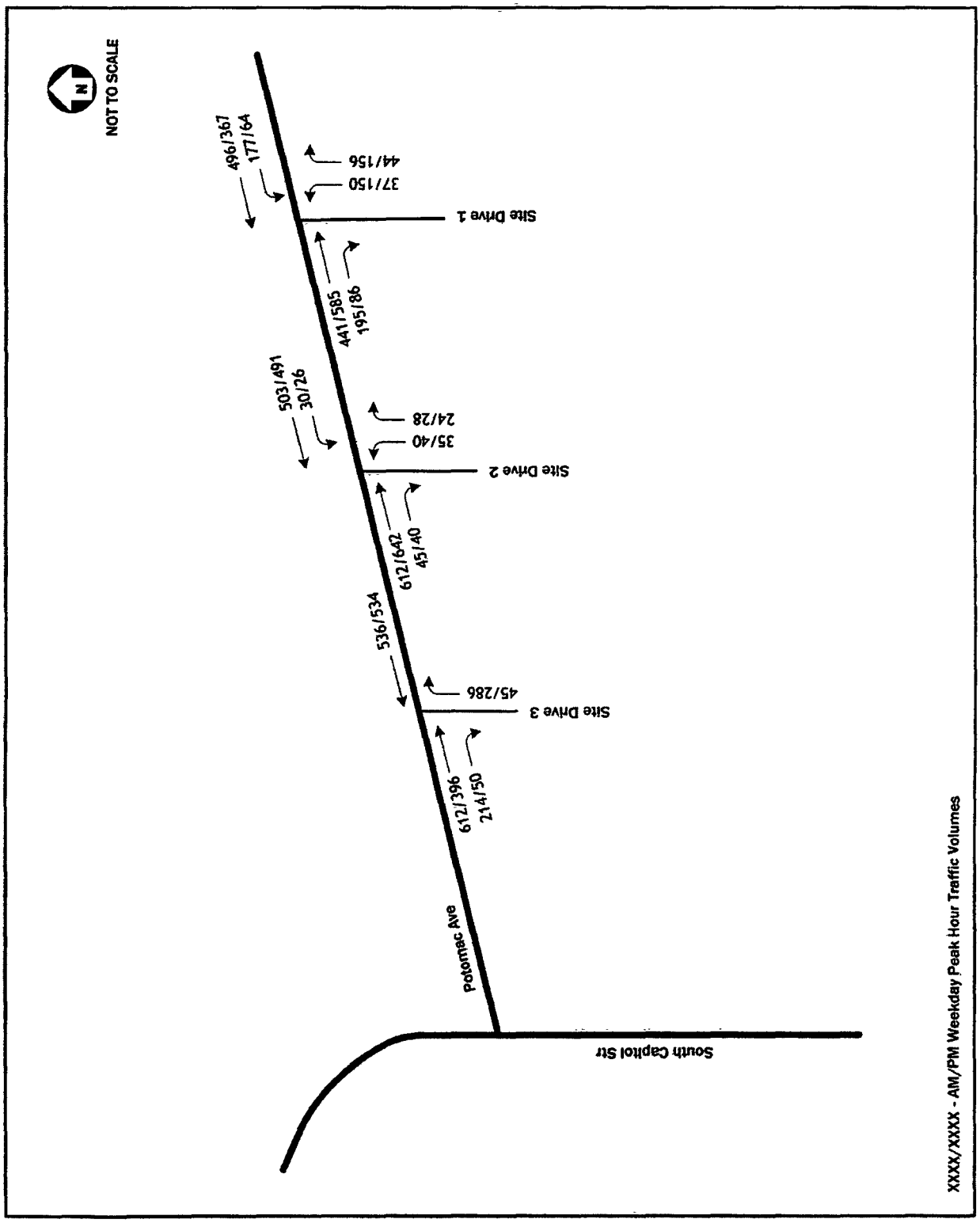


Figure 16b – 2017 Total Future Peak Hour Traffic Volumes

Table 10 – 2012 and 2017 Total Future Traffic Capacity Analysis Results

Intersection (Approach)	2012 Total Future Conditions				2017 Total Future Conditions			
	AM Peak Hour		*PM Peak Hour*		*AM Peak Hour*		*PM Peak Hour*	
	Delay (sec/veh)	Level of Service	Delay (sec/veh)	Level of Service	Delay (sec/veh)	Level of Service	Delay (sec/veh)	Level of Service
South Capitol St and Potomac Avenue (traffic signal)								
Overall	**232.1**	**F**	**206.0**	**F**	**134.2**	**F**	**47.2**	**D**
Eastbound	34.6	C	38.7	D	...	...	...	...
Westbound	60.1	E	73.7	E	136.3	F	86.6	F
Northbound	339.3	F	76.8	E	133.9	F	39.6	D
Southbound	8.0	A	310.2	F	...	...	...	...
N St & 1st St SE (traffic signal)								
Overall	**16.1**	**B**	**15.7**	**B**	**17.7**	**B**	**29.5**	**C**
Eastbound	15.2	B	12.7	B	18.7	B	10.3	B
Westbound	11.2	B	15.0	B	19.1	B	31.3	C
Northbound	24.4	C	19.0	B	14.9	B	35.9	D
Southbound	13.9	B	11.5	B	18.8	B	10.7	B
M St & 1st St SE (traffic signal)								
Overall	**15.3**	**B**	**12.9**	**B**	**13.8**	**B**	**11.0**	**B**
Eastbound	16.0	B	14.7	B	11.6	B	3.4	A
Westbound	11.6	B	11.6	B	12.2	B	19.6	B
Northbound	25.8	C	8.5	A	29.4	C	7.4	A
Southbound	27.0	C	25.2	C	30.4	C	23.2	C
M St & SB South Capitol Ramps (traffic signal)								
Overall	**55.9**	**E**	**149.6**	**F**	**153.9**	**F**	**272.7**	**F**
Eastbound	54.8	D	275.7	F	125.5	F	473.6	F
Westbound	19.9	B	4.3	A	120.3	F	17.8	B
Southbound	187.0	F	125.0	F	315.8	F	240.0	F
M St & NB South Capitol Ramps (traffic signal)								
Overall	**119.4**	**F**	**43.6**	**D**	**229.6**	**F**	**113.8**	**F**
Eastbound	6.9	A	2.4	A	105.2	F	12.4	B
Westbound	67.4	E	29.2	C	143.6	F	170.6	F
Northbound	229.9	F	113.5	F	379.0	F	177.5	F
Potomac Avenue & Site Drive 1 (stop sign controlled)								
Overall	**3.1**	**A**	**7.2**	**A**	**3.3**	**A**	**20.8**	**B**
Westbound Left Turn	3.0	A	3.2	A	3.2	A	1.6	A
Northbound	12.9	B	14.0	B	29.2	D	93.6	F
Potomac Avenue & Site Drive 2 (stop sign controlled)								
Overall	**0.1**	**A**	**0.1**	**A**	**1.2**	**A**	**1.4**	**A**
Westbound Left Turn	0.0	A	0.1	A	...	...	...	...
Northbound	9.8	A	9.4	A	20.1	C	21.1	C
Potomac Avenue & Site Drive 3 (stop sign controlled)								
Northbound Right	---	---	---	---	12.1	B	13.0	B

TRAFFIC SIMULATION OF SITE DRIVEWAYS

A traffic simulation is an analytical tool used to obtain detailed results on traffic systems, and is especially useful when analyzing several intersections as a system. Simulation was used to analyze the site driveways in detail for the Florida Rock development for two reasons:

1) To re-examine the poor level of service shown in Table 10 for the 2017 PM peak hour condition at Site Drive 1.
2) To examine the queues at intersections on Potomac Avenue between South Capitol Street and 1st Street SE. The purpose of this analysis was to determine if queues generated by the site driveways would disrupt operations on Potomac Avenue, especially the traffic oval.

A traffic simulation, compared to the HCM methodology used in the analysis so far, can better interpret the relationships of intersections spaced closely to each other, and the impact of nearby traffic signals to create gaps in the traffic stream. For example, how the traffic signals at South Capitol Street and 1st Street create gaps for cars waiting to exit the site drives at Florida Rock. In addition a simulation will track queues at the intersections creating a statistical profile of queues lengths, incorporating spillback from nearby intersections into the calculations.

The traffic simulation analysis was only performed for the 2017 Total Future Traffic scenario, since it contains the highest volumes of traffic and represents full build-out of the site. The traffic simulation software used for this report was SimTraffic 6. The simulation results, which are contained in the Appendix, are the average of ten separate model runs with outliers and 'bad' runs removed from the average. Table 11 shows the results of the delay and level of service at the site drives. Figure 17 shows the 95th percentile queues at the site drives.

The analysis results in Table 11 show that under a simulation, all three site drives will operate at acceptable conditions. The delay experienced by drivers exiting site drive 1 will be less than shown using HCM methodology because of the presence of traffic signals along Potomac Avenue providing gaps in traffic.

The queuing analysis results show that the queues at the site drives will be acceptable. The simulation showed no queues on eastbound Potomac Avenue extending near the traffic oval, or disrupting the operations of the site drives. The westbound lanes of Potomac Avenue experience some queuing generated by the traffic signal at the intersection of Potomac Avenue and South Capitol Street. Driver waiting to enter the traffic oval queue along Potomac Avenue, sometimes at a length that reaches the Florida Rock site driveways. These queues can interfere with the operations of the driveways, although the delay results show that these disruptions do not increase delay to an unacceptable level. Based on the simulation results, it does not appear that any westbound queuing is generated directly by the site driveways.

Table 11 – Site Driveway Traffic Simulation Results

Intersection (Approach)	2017 Total Future Conditions			
	AM Peak Hour		*PM Peak Hour*	
	Delay (sec/veh)	Level of Service	Delay (sec/veh)	Level of Service
Potomac Avenue & Site Drive 1 (stop sign controlled)				
Overall	**2.9**	**A**	**10.1**	**B**
Westbound Left Turn	8.5	A	6.8	A
Northbound	12.6	B	41.9	E
Potomac Avenue & Site Drive 2 (stop sign controlled)				
Overall	**1.4**	**A**	**1.3**	**A**
Westbound Left Turn	6.9	A	5.3	A
Northbound	11.6	B	10.4	B
Potomac Avenue & Site Drive 3 (stop sign controlled)				
Overall	**4.6**	**A**	**2.5**	**A**
Eastbound Right Turn	0.3	A	0.2	A
Northbound Right Turn	3.7	A	4.7	A

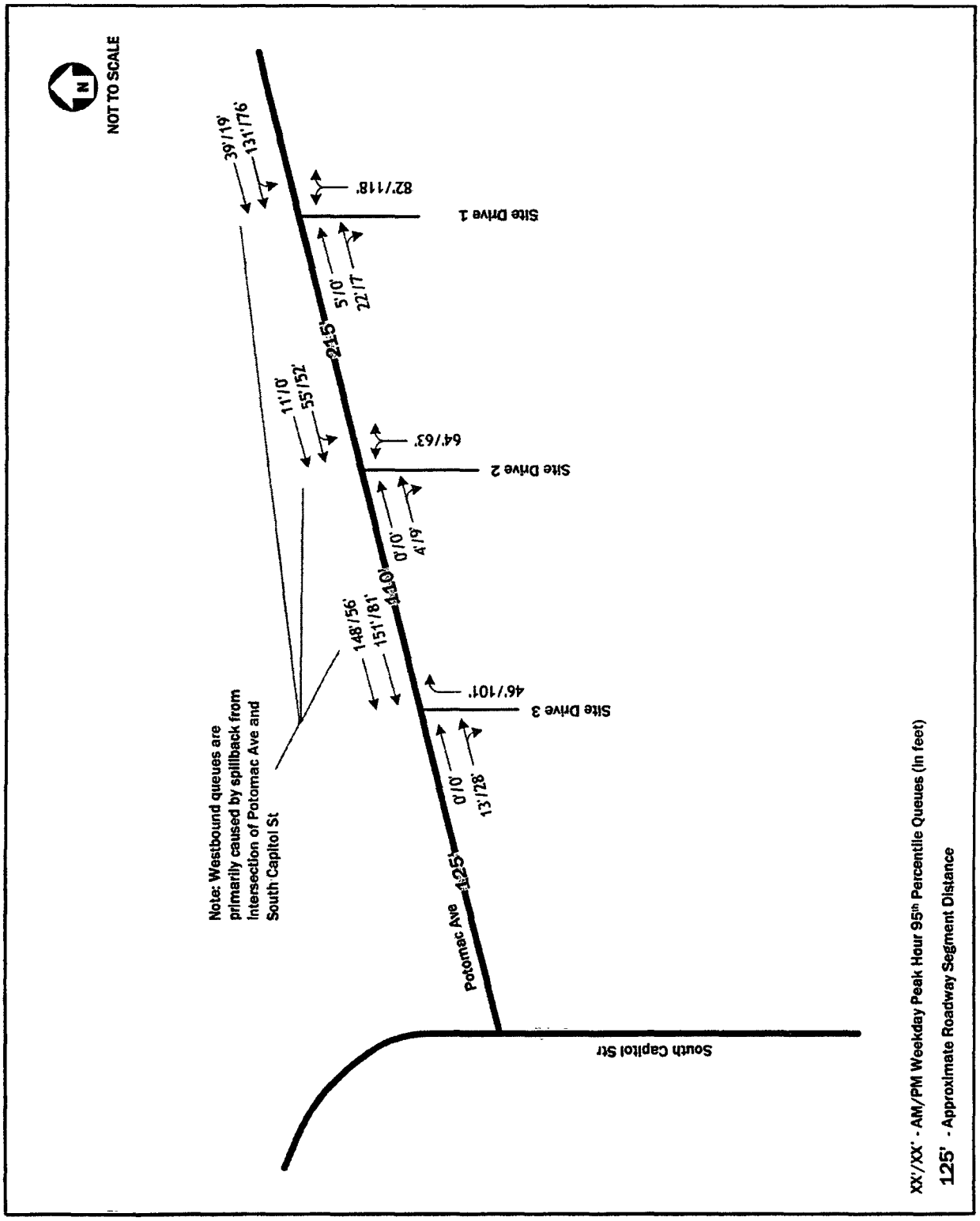


Figure 17 – Results of Site Drive Queuing Analysis

IMPACT OF BALLPARK OPERATIONS

The Florida Rock mixed-use development is located adjacent to the new Ballpark, across Potomac Avenue. Based on the Ballpark EMS and TMP reports, the planned travel demand characteristics of Ballpark patrons and the operations of the Ballpark on game days (81) will not have a significant negative impact on Florida Rock residents or office-workers. This is due to several reasons:

- *Travel demand characteristics*
  The Ballpark TMP shows an average automobile mode split of 36 to 48% depending on the time of game and the relative attendance. Thus, the impacts of the Ballpark on roadways will be reduced significantly by the use of the Navy Yard Metrorail Station and people walking and biking to the Ballpark.
- *Parking facility locations*
  The Ballpark TMP provides an overview of the parking strategy and locations, including the concept of spreading-out parking to disperse the impact at any one location. Thus, many cars will be parking a few blocks away from the Ballpark and not near the Florida Rock site.
- *Operations planning*
  In order to accommodate the additional traffic on area roadways special traffic operations will be in place, including special signal timings, traffic control officers and turning restrictions. These game day measures should alleviate some of the congestion that would otherwise normally occur through the introduction of additional traffic to the roadways system.

It should also be noted that much of the Ballpark regular season schedule occurs during the summer months, when traffic on regional roadways is lighter than normal. Based on the prior two schedules for the Washington Nationals, approximately 30% of game days occur on weekdays (not counting Fridays) during times when DC public schools are in session. Thus, the majority of game days will occur be during times when commuter traffic is lower than 'typical' conditions (weekends, Fridays, and summer months).

It may be that the main source of congestion that Florida Rock residents and office-workers encounter due to Ballpark traffic will not be on the roadways at all, but at the Navy Yard Metrorail Station and sidewalks. It is expected that the Green Line will operate close to capacity coming from the District on weeknight 7:00 p.m. games. As long as residents and office-workers are knowledgeable of game times and walking routes that do not overlap with as many Ballpark patrons, access to sidewalks and transit should be acceptable during games.

Thus, although it would be advisable that Florida Rock residents and tenants would be knowledgeable of game schedules and time to avoid conflicts, travel in and around the Ballpark area will be possible on game days, with an acceptable amount of delay added to the typical delay experience on local roadways and transit systems.

Some parking provided in the Florida Rock development may be available for use for Ballpark patrons. The office parking is well-suited for use on weeknights and weekends by Ballpark patrons, depending on the eventual tenants of the buildings (some tenants, especially government agencies, require secured parking).

Ballpark operational planning is reviewed and updated each off-season, and upon build-out of the Florida Rock site, the operations plan should be updated to include pedestrian and vehicular patterns, and available parking at the site.

CONCLUSION

Based on the capacity analysis results contained in this report, prior transportation studies performed near the site, and a review of the site plan, the proposed Florida Rock mixed-use development will have no negative impact on the surrounding local roadway network. The parking provided, circulation within the site, loading operations, and access to Potomac Avenue from site driveways is acceptable for each phase of the project.

The close proximity and quality of access to Metrorail significantly reduces potential traffic impacts. In addition, the connection to the Anacostia Riverwalk Trail provides an additional transportation feature to site residents, visitors and office tenants.

Although the capacity analyses contained in this report show acceptable levels of service at local roadways, all of the regional roadways analyzed operated at or above their capacity. This impacts the proposed development through the encouragement of alternate vehicular routing and alternate mode usage. Although the site is located near South Capitol Street, by using the local roadway system the 11th Street bridges, I-295 and I-395, and downtown DC can easily be reached without the need for South Capitol Street. Thus, even if the regional capacity is not improved through the on-going efforts of DDOT, notably the South Capitol Street EIS project, regional access for the site can still occur through other routes.