

Traffic Impact Study

# **14<sup>th</sup> and U Street, NW Mixed Use Development**

Washington, DC

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**Prepared For:**  
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## EXECUTIVE SUMMARY

This report presents the results of a transportation study prepared in support of the planned redevelopment of properties located south of U Street, along the west side of 14<sup>th</sup> Street, in Northwest, Washington, D.C. The site is located in Ward 2 and is zoned C-R (Mixed Residential, Retail, Office and Light Industrial Uses) and C-3-A (Medium Bulk Major Business and Employment). The site is also within the ARTS (Uptown Arts) Overlay District. The existing uses include several restaurants and other retail establishments and a surface parking lot. Current plans call for the site to be redeveloped with approximately 230 residential apartment units, 19,000 Square Feet (SF) retail space and 156 garage parking spaces. Access to the proposed loading facilities would be provided via the adjacent alleyway system, whereas access to the garage parking would be provided via a single entrance along 14<sup>th</sup> Street.

This traffic impact study was specifically requested by DDOT to address the potential impacts of the garage access on 14<sup>th</sup> Street, relative to alternative access via the adjacent alleyway system. Following a meeting with DDOT and members of the adjacent residential community regarding this issue, a Scoping Document<sup>1</sup> was developed by Gorove Slade and approved by DDOT and the community. This study is in accordance with that document and the general guidelines established by DDOT for the preparing of traffic impact studies. The key findings and conclusions of this transportation study are presented below.

The study area intersections currently operate at capacity during at least one peak hour, except for the 14<sup>th</sup> Street/T Street and T Street/Waverly Place intersections. The proposed development would add a low number of new trips (37- AM, 42- PM) to the study area roadway network. This would be due primarily to anticipated use of the U Street/African American Civil War Memorial/Cardozo Metrorail Station (situated a block away) on the WMATA Green and Yellow Lines, several Metrobus routes along 14<sup>th</sup> and U Streets, and other alternative transportation modes.

Upon its build-out by year 2012, the proposed development would have minimal or negligible impacts on the existing levels of service for the study area intersections. The proposed project would continue to have minimal/negligible impacts, considering hypothetical 20-year (2028) traffic forecasts developed and analyzed in this study for general planning and information purposes. The latter (2028) forecasts are hypothetical based on extrapolated growth in regional/through traffic volumes along U and 14<sup>th</sup> Streets, and the projected trip generation of other planned area developments. These conditions would not occur because: a) trends are towards greater transit mode choice and more people are living and working in the city, and b) those that must drive are adjusting or would adjust their travel periods and routes, and telecommute to avoid traffic congestion.

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<sup>1</sup> *14<sup>th</sup> and U Street Redevelopment Project Scope of Transportation Analysis*, Gorove/Slade Associates, Inc., March 2008.



Loading access to the site would occur via the adjacent alleyway (Waverly Place) which currently operates at capacity at its U Street intersection. The study projects that the proposed development would add approximately five (5) truck trips during the morning and afternoon peak hours, which would minimally impact the operations of the alleyway and the capacity conditions at the U Street intersection.

The proposed garage would be accessed via a widened entrance off 14th Street, which would be virtually in the same location as the entrance to the existing parking lot. Several analyses were undertaken to compare the proposed 14th Street access with alternative access via the adjacent alleyway system (Waverly Place), in terms of operational efficiency and impacts. The study clearly demonstrates that the 14th Street access would be the better option for the following reasons:

- a) Waverly Place is situated diagonally opposite two driveways along the north side of U Street. One driveway provides access to a residential parking lot and is offset approximately 30 feet to the west. The other driveway serves the Reeves Building and has the highest volumes among the three driveways. This driveway is offset approximately 40 feet to the east from Waverly Place. The proximity of the three driveways creates a high potential for conflicts between left-turning vehicles along U Street, and related adverse impacts to vehicular and pedestrian mobility along this roadway. These operational issues would worsen if the garage access were provided via the alleyway. On the other hand, the proposed 14th Street access would be located approximately 90 feet from the nearest intersection (Wallach Place), and is not likely to cause or experience any such left-turning conflicts.
- b) Vehicles turning into and out of the alley do so with difficulty because of the narrow alley cross section. Some drivers experience considerable delay and sometimes have to reverse to allow vehicles already in the alleyway to exit onto U Street. This situation is compounded by the narrow (10-foot) wide sidewalk which is frequently blocked by drivers seeking sight distance advantages before initiating turn movements. The sidewalk along 14th Street is approximately 20 feet wide, permitting vehicles to stop without entirely blocking the sidewalk before turning onto 14th Street. In addition, this study identifies potential streetscaping design improvements that could be implemented to significantly reduce impacts to all users. These improvements, which are consistent with the recommendations of the DDOT 14th Street and U Street transportation studies include the following:
  - Reducing pedestrian crossing distances at the adjacent U Street, Wallach Place and T Street intersections through the use of sidewalk-extending bulb-outs, complemented with high-visibility ladder-striped crosswalks.
  - Extending the sidewalk curb towards the first travel lane to create a bus bump-out at the



- existing T Street near-side Metrobus stop for more efficient bus operations; and
- Designing the 14th Street curb-cut to be at a level grade with the sidewalk as well as using a paving material similar to the adjacent sidewalk to maintain streetscape consistency. This would serve to both promote slower vehicular traffic speeds and to warn motorists that they have arrived in a pedestrian-priority zone.
- c) Capacity analyses show that the alleyway alternative would have significantly greater impacts (in terms of vehicular delay) on U Street, relative to the potential impacts of the access on 14th Street. Alleyway access management measures such as a one-way southbound restriction and peak period turning restrictions at the U Street intersection could potentially improve alleyway operations. However, the Reeves Building Driveway would continue to experience operational problems which would adversely influence the efficiency of ingress from U Street into the alley. In addition, the restrictions would create inefficient circulation within the study area and increase traffic including trucks along residential T Street.

The proposed development would provide 156 parking spaces, which would be more than adequate compared with the City's zoning requirement (108 spaces). The proposed parking would be managed properly to allow shared use by the prospective retail tenants and other businesses within the study area. The retail parking would replace the 2-3 on-street spaces that could be lost due to the proposed widening of the site driveway, and would serve to reduce inefficient circulation and illegal parking observed along 14th and U Streets.

In conclusion, the proposed development could occur as planned without appreciable adverse impacts on the study area roadway network and adjacent communities. The project would have minimal/negligible impacts on existing and future roadway users, and these impacts would be reduced with the location of the proposed garage access along 14th Street (instead of the adjacent alleyway) and the implementation of streetscaping improvements highlighted in this study in keeping with the recommendations of the DDOT 14th Street and U Street transportation studies.





## INTRODUCTION

This report presents the results of a transportation study prepared in support of the planned redevelopment of properties located south of U Street, along the west side of 14<sup>th</sup> Street, in Northwest, Washington, D.C. The site is located in Ward 2 and is zoned C-R (Mixed Residential, Retail, Office and Light Industrial Uses) and C-3-A (Medium Bulk Major Business and Employment). The site is also within the ARTS (Uptown Arts) Overlay District. The existing uses include several restaurants and other retail establishments and a surface parking lot. The proposed development would include approximately 230 residential apartment units, 19,000 Square Feet (SF) retail space and 156 garage parking spaces. Access to the proposed loading facilities would be provided via the adjacent alleyway system, whereas access to the garage parking would be provided via a single entrance along 14<sup>th</sup> Street. The location of the site is shown in Figure 1.

This traffic impact study was specifically requested by DDOT to address the potential impacts of the garage access on 14<sup>th</sup> Street, relative to alternative access via the adjacent alleyway system. Following a meeting with DDOT and members of the adjacent residential community regarding this issue, a Scoping Document<sup>2</sup> was developed by Gorove/Slade and approved by DDOT and the community. This study is in accordance with that document, and the general guidelines established by DDOT for the preparing of traffic impact studies. A copy of the scoping document is included as Appendix A.

Based on the above-noted scoping, Gorove/Slade Associates undertook the following key tasks:

- Conducted field reconnaissance of existing study area roadway and intersection geometrics, traffic controls, speed limits and operations;
- Conducted field observations of the service and operational characteristics of the adjacent alleyway system;
- Held discussions and corresponded with District Department of Transportation (DDOT) staff regarding the study scope and methodology;
- Performed morning and afternoon peak period turning movement counts at the study intersections;
- Determined the existing levels of service at the study intersections;
- Developed background traffic forecasts for year 2028 based on existing counts, traffic generated by other pending/future developments, and traffic pattern changes as a result of roadway improvements (where applicable);
- Determined background levels of service for the study intersections based on background

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<sup>2</sup> *14<sup>th</sup> and U Street Redevelopment Project Scope of Transportation Analysis*, Gorove/Slade Associates, Inc., March 2008.



- traffic forecasts and existing traffic controls;
- Conducted a trip generation survey for the existing land uses on the site;
  - Estimated the AM and PM peak hour trips that would be generated by the proposed development, including mode split assumptions;
  - Projected the total future traffic volumes for year 2028 based on background future traffic forecasts and site traffic assignments;
  - Calculated total future (2028) levels of service at the study intersections based on total future traffic forecasts, existing traffic controls, and existing intersection geometrics; and
  - Conducted parking usage surveys to determine the current on-street parking demand along U and 14<sup>th</sup> Streets, adjacent to the site.

Sources of information for this study include traffic counts conducted by Gorove/Slade, ITE's *Trip Generation Manual*, 7th Edition, the District Department of Transportation (DDOT), and the files/library of Gorove/Slade. This study also incorporates relevant information presented in the following DDOT studies:

- *14th Street, NW, Washington, DC - Multimodal Transportation and Streetscape Design Study, March 2008*
- *U Street/Shaw/Howard University Transportation and Parking Study, March 2006*

### ***Project Scope***

This study is in accordance with the DDOT Scoping Document discussed above and the general guidelines established by DDOT for preparing traffic impact studies. A copy of the scoping document is included as Appendix A. The following intersections (shown in Figure 1) are included in this study:

- 1) 14th Street and U Street , NW
- 2) 14th Street and Wallach Place, NW
- 3) 14th Street and Site Surface Lot Driveway, NW
- 4) 14th Street and T Street, NW
- 5) T Street and Waverly Place, NW
- 6) U Street and Waverly Place/Reeves Building Driveway, NW

For purposes of this study, a horizon year of 2028 was assumed for the future conditions with and without the proposed development. This horizon year was analyzed to provide general “worst case” planning information for consideration by DDOT, as the proposed development would likely be built and occupied within a three to four-year period (i.e., by 2012).

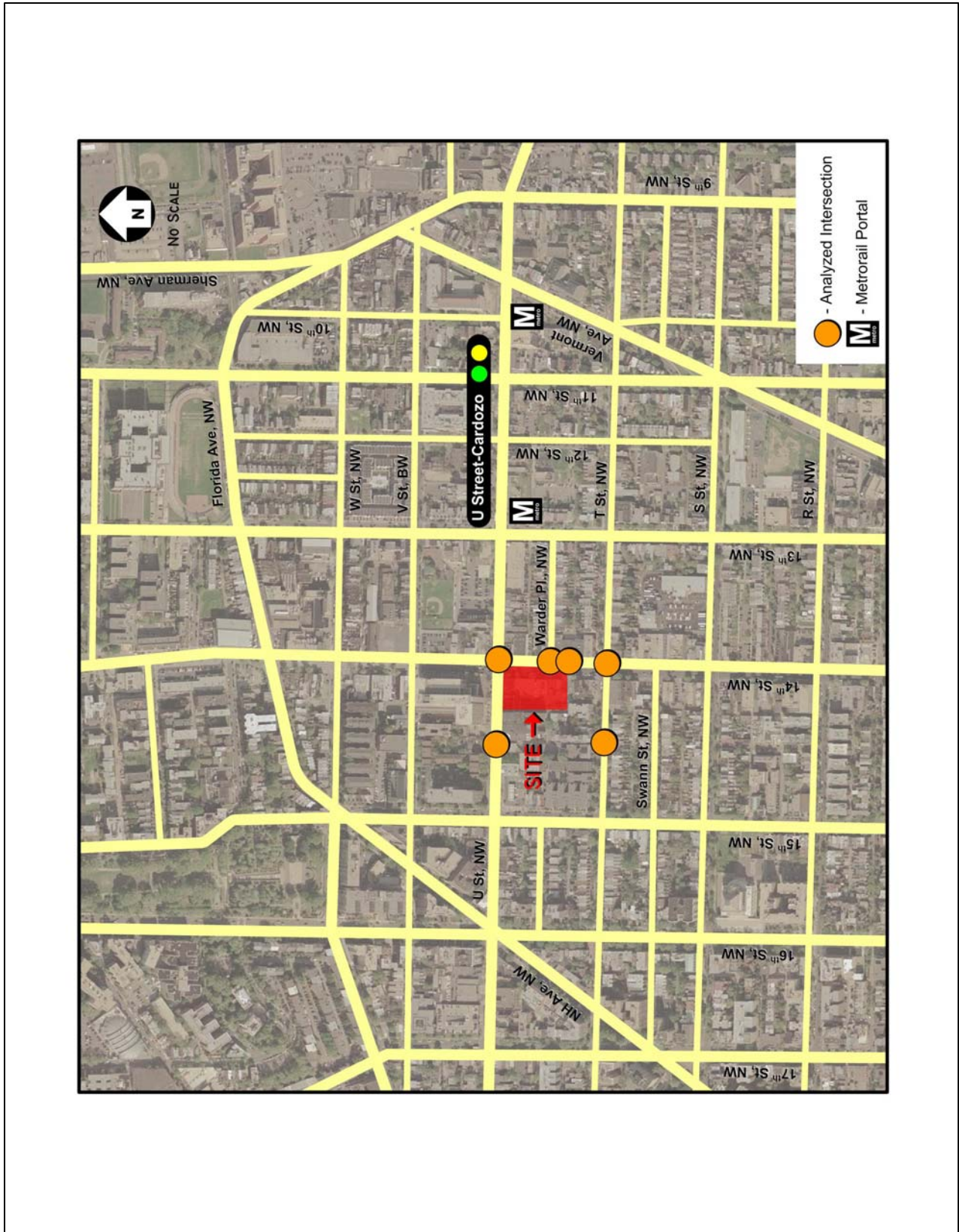


Figure 1 – Site Location and Study Area Map



## EXISTING CONDITIONS

### *Site Access and Existing Road Network*

Regional site access is provided by several principal arterials including U Street/Florida Avenue, 16<sup>th</sup> Street and 13<sup>th</sup> Street/Piney Branch Road. Local site access is provided primarily by 14<sup>th</sup> Street, T Street and U Street, NW. The physical and service characteristics of the key local access roadways are as follows:

- *14<sup>th</sup> Street, NW*

Fourteenth Street is classified as a principal arterial on the City Functional Roadway Classification System. It runs north-south through the study area, and provides two travel lanes, a bicycle lane and a parking lane in each direction. This arterial is also a major bus and commuter route. In the vicinity of the site, this roadway carries an Average Daily Traffic (ADT) volume of approximately 7,900 vehicles, based on the DDOT 2006 Traffic Volume Map. The dominant traffic movements are southbound during the morning peak period and northbound during the afternoon peak period. The posted speed limit is 25 MPH.
- *U Street, NW*

U Street is classified as a principal arterial on the City Functional Roadway Classification System. It runs east-west through the study area, and provides two travel lanes and a parking lane in each direction. This arterial is also a major bus and commuter route. The ADT served is approximately 12,300 vehicles in the vicinity of the site, based on the DDOT 2006 Traffic Volume Map. The dominant traffic movements are westbound during morning peak period and eastbound during the afternoon peak period. The posted speed is 25 MPH.
- *T Street, NW*

T Street is a one-way eastbound collector facility in the vicinity of the site. Residential Permit Parking is provided along both sides. Based on turning movement counts conducted as part of this study, the ADT served is approximately 2,300 vehicles in the vicinity of the site. The posted speed limit is 15 MPH.
- *Wallach Place, NW*

Wallach Place is a one-way westbound local street in the vicinity of the site. Residential Permit Parking is provided along both sides. Based on turning movement counts conducted as part of this study, the ADT served is approximately 400 vehicles in the vicinity of the site. The posted speed limit is 15 MPH.
- *Waverly Place*

Waverly Place is the north-south, 15 feet wide section of an alleyway system situated adjacent



to and west of the site. It intersects with U Street to the north and T Street to the south. Based on turning movement counts conducted as part of this study, the ADT served is approximately 330 vehicles in the vicinity of the site. There is no posted speed limit.

*Other Key Observations*

1. Waverly Place is situated diagonally opposite two driveways along the north side of U Street. One driveway provides access to a residential parking lot, and is offset approximately 30 feet to the west. The other driveway serves the Reeves Building and has the highest volumes among the three driveways. This driveway is offset approximately 40 feet to the east from Waverly Place. The proximity of the three driveways creates a high potential for conflicts between left-turning vehicles along U Street, and related adverse impacts to vehicular and pedestrian mobility along this roadway.
2. Vehicles turning into and out of the alley do so with difficulty because of the narrow alley cross section. Some drivers experience considerable delay and sometimes have to reverse to allow vehicles already in the alleyway to exit onto U Street. This situation is compounded by the narrowness of the sidewalk (10 feet) which is often blocked by vehicles standing in positions providing sight distance advantages.
3. On-street parking along 14<sup>th</sup> and U Streets is inadequate, resulting in various forms of illegal parking and inefficient circulation by parkers looking for available spaces.

Gorove/Slade conducted field reconnaissance to obtain the existing lane usage and traffic controls at the study area intersections. Figure 2 presents the roadway lane configurations and traffic control devices provided at those intersections.

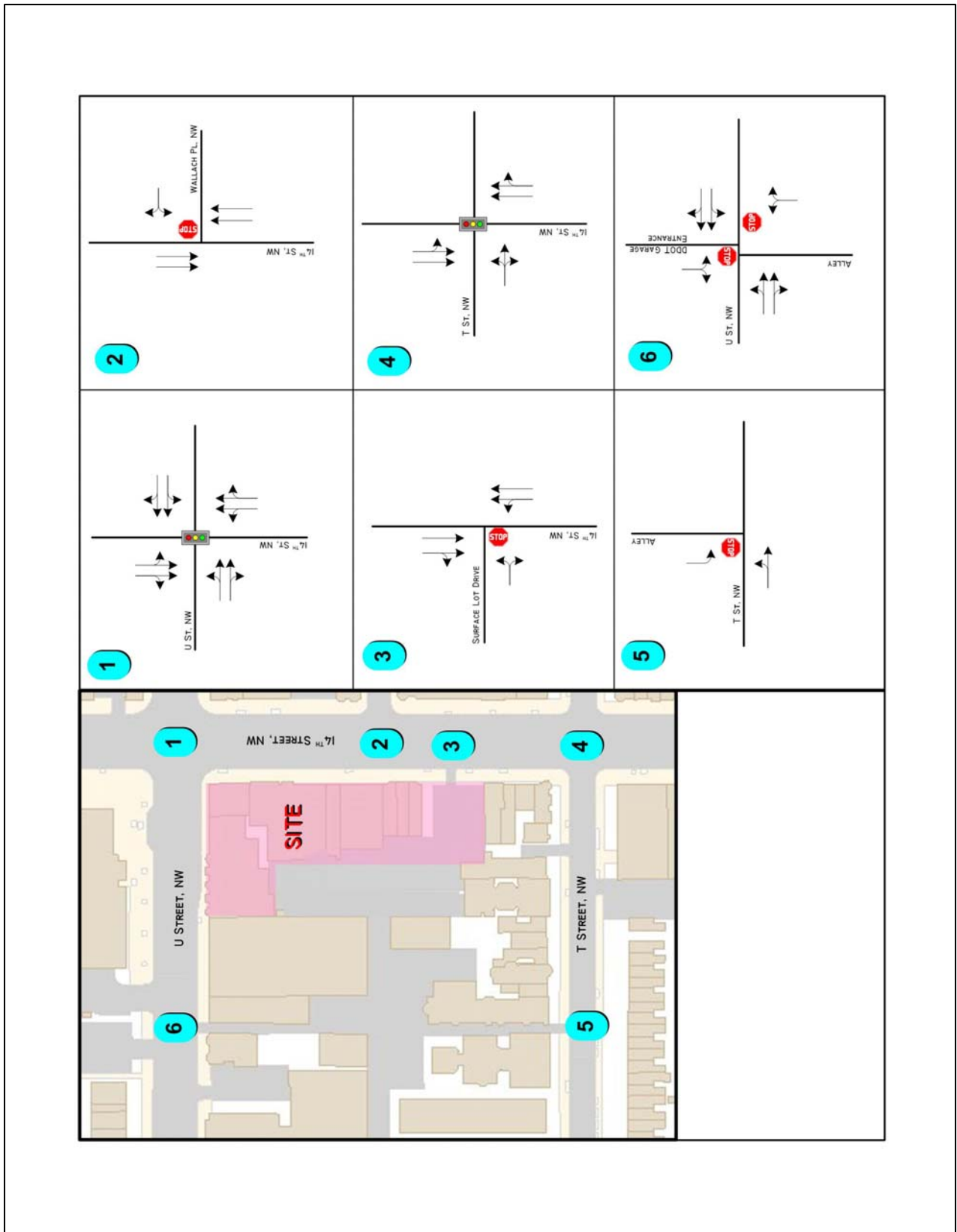


Figure 2 – Existing Lane Configuration and Traffic Control



## ***Parking***

### *On-Street Parking*

Parking is provided along all study area roadways. Metered parking is provided along U and 14<sup>th</sup> Streets. Residential Permit Parking (RPP) for Zones 1 and 2 are provided along T Street and Wallach Place.

Figures 3 and 4 show the on-street parking inventory and occupancy within the study area, based on the 14<sup>th</sup> Street Transportation and Streetscape Study, March 2008.

### *Off-Street Parking*

Off-Street parking is available in the form of surface parking lots and parking garages within the study area. These facilities are only accessible to customers, tenants and guests. Residential and mixed land use developments provide their own parking facilities. Most surface lots are small privately run lots, which typically close after 8:00 pm. Public structured parking is non-existent, with metered spaces available in the Reeves Building on U Street only during non-business hours and weekends. Figure 3 shows the off-street parking inventory within the study area based on the 14<sup>th</sup> Street Transportation and Streetscape Study, March 2008.

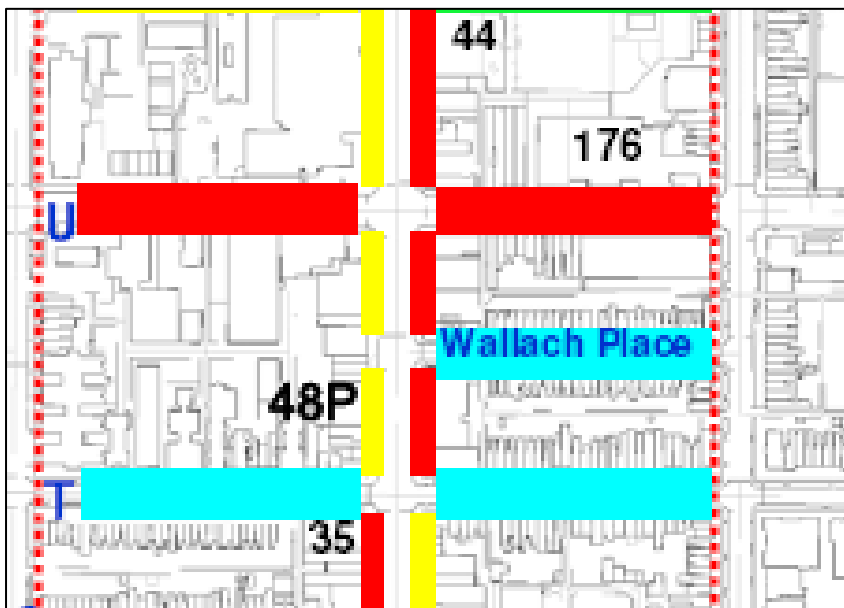
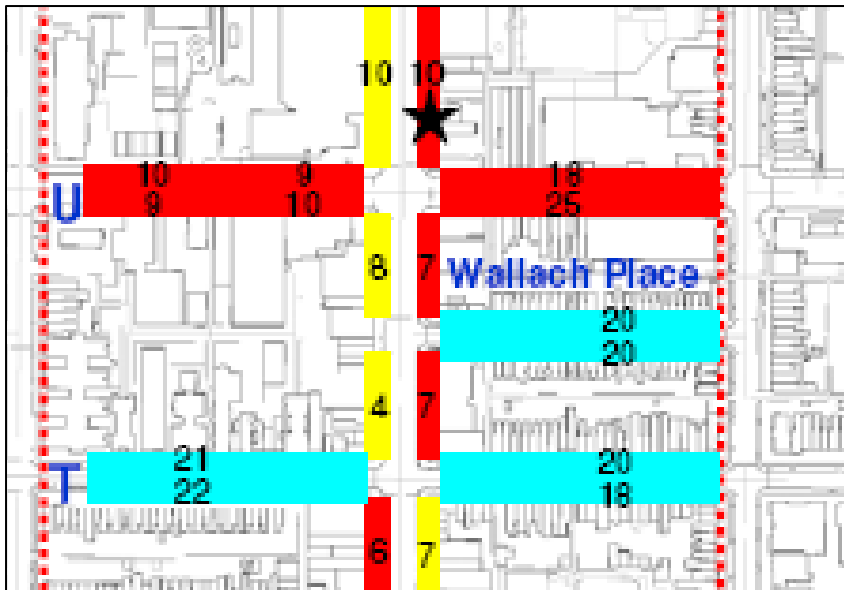


Figure 3 – Existing On-Street (top) & Off-Street (bottom) Parking Inventory

(Source: DDOT 14<sup>th</sup> Street Transportation and Streetscape Study, 2008)



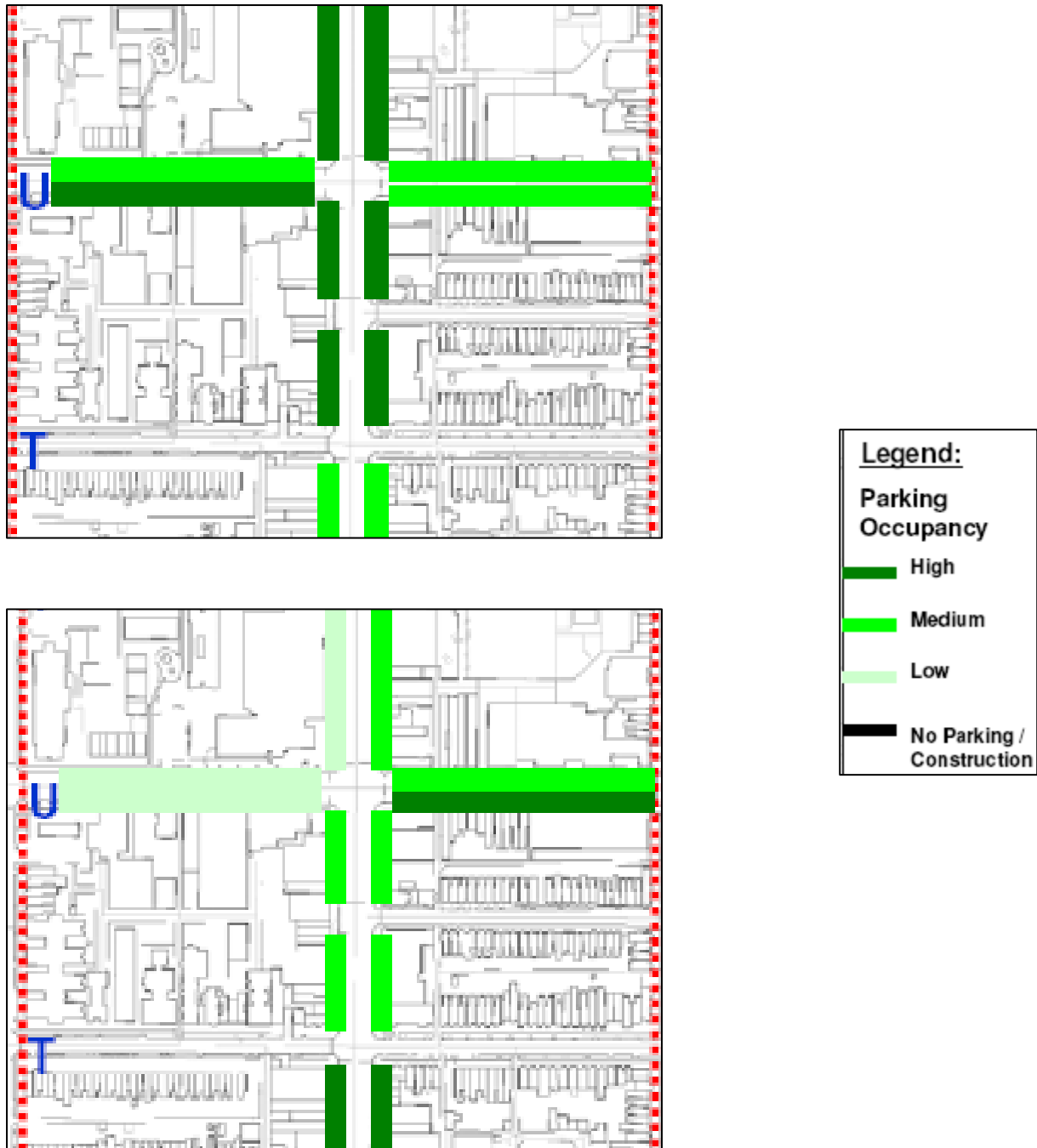


Figure 4 – Existing On-Street Parking Occupancy during Weekday Midday (top) and Evening (bottom)

(Source: DDOT 14<sup>th</sup> Street Transportation and Streetscape Study, 2008)



## ***Existing Public Transportation***

As shown in Figure 5, the site is favorably located with respect to Metrobus and Metrorail transit services and facilities. 14<sup>th</sup> Street is a major Metrobus corridor, directly served by Metrobus Routes 52, 53, and 54. Crossing 14<sup>th</sup> Street are a number of Metrobus Lines along U Street. These routes include the U Street-Garfield Line (90, 92, 93), the East Capital-Cardozo Line (96), the Adams Morgan-U Street Line (98), and the Benning Road Line (X3).

Routes 52, 53, and 54 are major north-south routes through the District, running primarily along 14<sup>th</sup> Street, NW and connecting the corridor to Takoma Park and Columbia Heights Metrorail Station in the north and to Downtown and the L'Enfant Plaza Metrorail Station in the south. Routes 90, 92, and 93 connect the site to Adams Morgan, the Woodley Park/National Zoo/Adams Morgan Metrorail Station, and McLean Gardens in the west; and to Howard University, the H Street NE corridor, Capitol Hill/Eastern Market, and areas east of the Anacostia River. The X3 Metrobus Route travels between the Minnesota Avenue Metrorail Station and McLean Gardens in Northwest Washington, DC. Route 98 primarily serves the U Street corridor, connecting it to Adams Morgan's 18<sup>th</sup> Street corridor and the Woodley Park/National Zoo/Adams Morgan Metrorail Station in the west. Route 96 extends in the southeast/northwest direction, from the Capitol Heights Metrorail Station to McLean Gardens. It connects the site with the Benning Road Metrorail Station, the Stadium-Armory Metrorail Station, DC General Hospital, Capitol Hill, Union Station, Adams Morgan, Woodley Park-Zoo/Adams Morgan station, Washington National Cathedral, and McLean Gardens.

The 14<sup>th</sup> Street Metrobus Line has an excellent frequency of service, with about 5-minute headways during the peak hours and 10-20 minute headways during the off-peak hours. Weekend service includes 15-minute average headways. The U Street-Garfield (90, 92, 93) Metrobus Line also has very good frequency of service, with less than 10-minute headways during the peak hours and 10-minute headways during the off-peak hours. Weekend service includes 15-minute average headways. The East Capital-Cardozo Line (96) provides less frequent services, having 20-minute headways during the peak hours and 30-minute headways during the off-peak hours. During the weekend, the headways average 35 minutes. The Adams Morgan-U Street Line (98) offers frequent services during weekday morning and nights, with headways of about 10 minutes. The service starts at 10 AM on Saturday and ends at 3 AM on Sunday, with 10-minute headways. X3 is a commuter service bus with inbound service during the morning rush hours and outbound service during the evening rush hours. The headways range from 15 to 30 minutes.

Additional high-frequency Metrobus service is available along 11<sup>th</sup> and 16<sup>th</sup> Streets, providing connections to Downtown, DC to the south and to Mount Pleasant, Petworth, Takoma, and Silver Spring to the north (see Figure 5 for route locations and numbers).

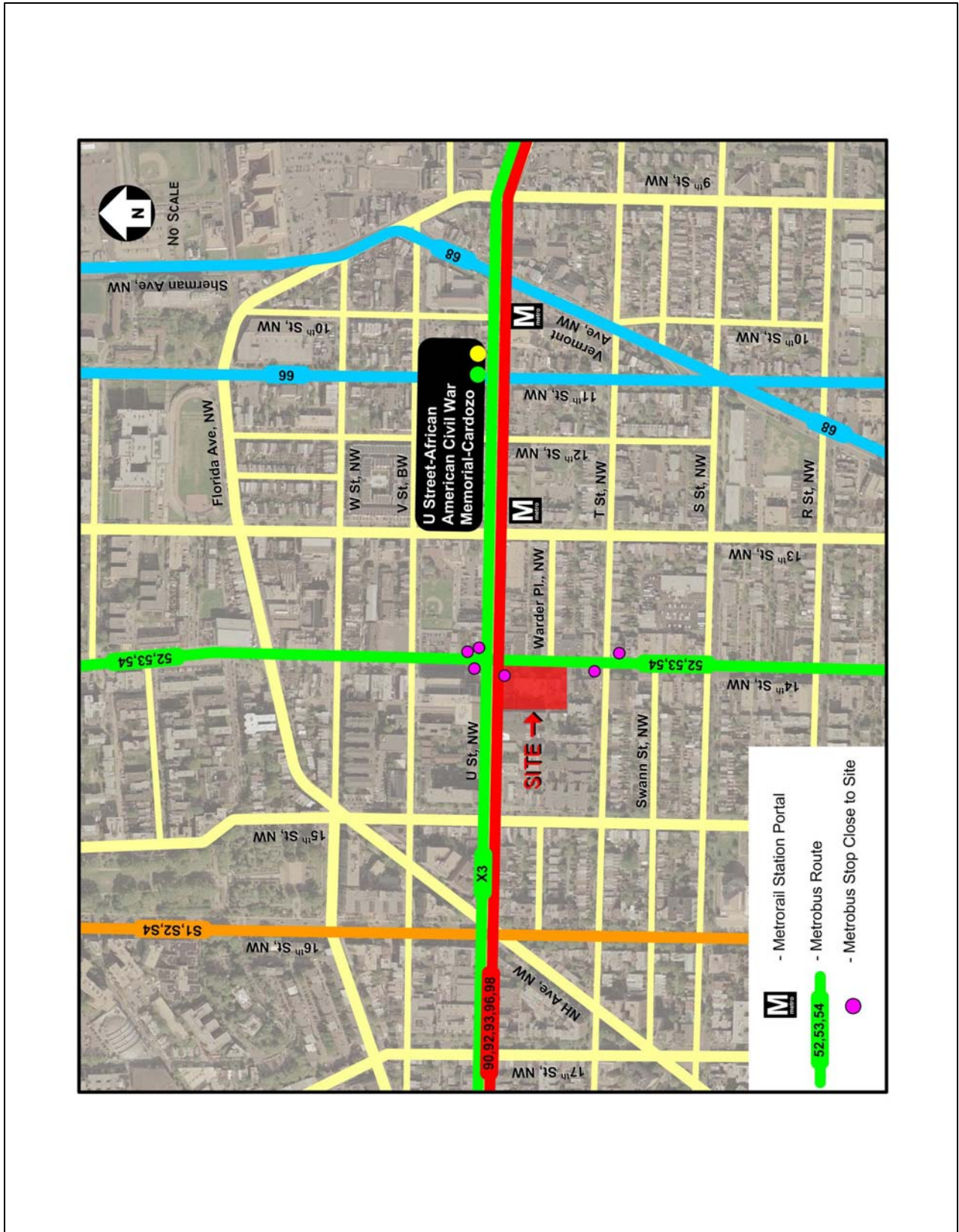


Figure 5 – Public Transportation



The U Street/African American Civil War Memorial/Cardozo Metrorail Station along the Green and Yellow Metrorail lines is located at the corner of 13<sup>th</sup> and U Streets, NW, just one block east of the site or within a three-minute walk. The Green and Yellow Lines provide a fast connection to Downtown, DC, L'Enfant Plaza, Columbia Heights, as well as other key destinations including the Anacostia Waterfront and Pentagon City in Virginia. Peak period weekday headways are generally every 3 minutes with 6 to 10 minute headways during the rest of the week.

#### *Planned Transit*

By 2030, the Metrobus routes along U Street are planned to be upgraded to either streetcar or bus rapid transit (*Source: District of Columbia Transit Alternative Analysis*). This service would feature limited stops at stations with enhanced passenger amenities such as real arrival time information.

With respect to the more immediate term, the DDOT *U Street/Shaw Howard University Transportation and Parking Study* recommends sidewalk bulb-outs at the 14<sup>th</sup> Street at U Street and T Street intersections. These improvements would provide additional passenger waiting space, reduced pedestrian crossing distance and more efficient Metrobus pick-up and drop-off operations.

#### ***Existing Pedestrian and Bicycle Facilities***

The site is surrounded by a generally high-quality pedestrian network. Sidewalks along 14<sup>th</sup> Street are generally around 20 feet in width, while the sidewalk along U Street, adjacent to the site, is significantly narrower (10 feet). All pedestrian crossings adjacent to the site are marked, many with the higher-visibility ladder patterned striping. Finally, most sidewalk pedestrian curb-ramps face the pedestrian crossing as opposed to being angled into the center of the intersection.

The 14<sup>th</sup> Street/U Street and 14<sup>th</sup> Street/T Street intersections have pedestrian crossing count-down signals. The pedestrian crossings at the 14<sup>th</sup> Street and Wallach Place intersection are uncontrolled.

The site is served by bicycle lanes along 14<sup>th</sup> Street and T Street. These lanes are part of an extensive bicycle network serving the District Uptown and Downtown Areas. A SmartBike station is also located at the Reeves Building which is directly across U Street from the site.

#### *Planned Pedestrian and Bicycle Facilities*

Several pedestrian- and bicycle-oriented improvements have been recommended for the study area by the DDOT U Street and 14<sup>th</sup> Street Transportation Studies, as well as the District's Bicycle and Pedestrian Master Plans. These improvements include sidewalks enhanced with intersection bump-outs, more highly-visible crosswalks, new sidewalk surfaces, pedestrian-scale sidewalk lighting, as well as additional on-street bicycle routes, including a grade-separated cycletrack on 15<sup>th</sup> Street.



## ***Existing Volumes***

Traffic and pedestrian turning movement counts were conducted at the six (6) study intersections between the hours of 6:00 to 9:00 AM and 4:00 to 7:00 PM on typical weekdays, during the first week of April, 2008. The traffic count summaries are included in Appendix B. The morning and afternoon peak hours for the system of intersections being studied occur between 8:00 - 9:00 AM and 4:45 - 5:45 PM, respectively. The peak hour volumes are presented in Figure 6.

## ***Existing Capacity Analysis***

Capacity analyses were performed to determine the existing Level of Service (LOS) for the AM and PM peak hours for the study intersections. An LOS grade is a letter grade based on the average delay (in seconds) experienced by motorists traveling through an intersection. LOS results range from “A” being the best to “F” being the worst traffic conditions. LOS D/E is typically used as the acceptable LOS threshold in the District. The *Highway Capacity Manual 2000* (HCM) methodology was used for all analyses. Detailed LOS descriptions for signalized intersections are provided in Appendix C.

The existing LOS capacity analyses were based on: (1) the existing lane use and traffic controls shown on Figure 2; (2) the peak hour turning movement volumes shown on Figure 6; and (3) the *Highway Capacity Manual 2000* (HCM) methodologies (using Synchro 6 software). Copies of the LOS calculation worksheets are included in Appendix D-1. Table 1 shows the results of the capacity analyses, including LOS and average delay per vehicle (in seconds). Figure 7 graphically shows LOS per overall intersection and approach.

The westbound approach of the 14<sup>th</sup> and U Street intersection fails in the AM and PM peak hours while the southbound approach operates at LOS E in the PM peak hour due to heavy through movement and lack of exclusive turn lanes. However the overall intersection operates at LOS D with an average control delay of 52.7 seconds/vehicle during the AM peak hour and at LOS E with an average control delay of 74.7 seconds/vehicle during the PM peak hour.

The northbound and southbound approaches of the U Street/Waverly Place/Reeves Building Driveway intersection both fail in the AM and PM peak hours due to lack of gaps along U Street. The westbound approach of 14<sup>th</sup> Street and Wallach Place intersection operates at LOS E with an average delay of 40.1 seconds/vehicle in the PM peak hour, due to lack of gaps for vehicles turning onto 14<sup>th</sup> Street from Wallach Place. All other approaches and intersections operate at LOS D or better during both peak hours.

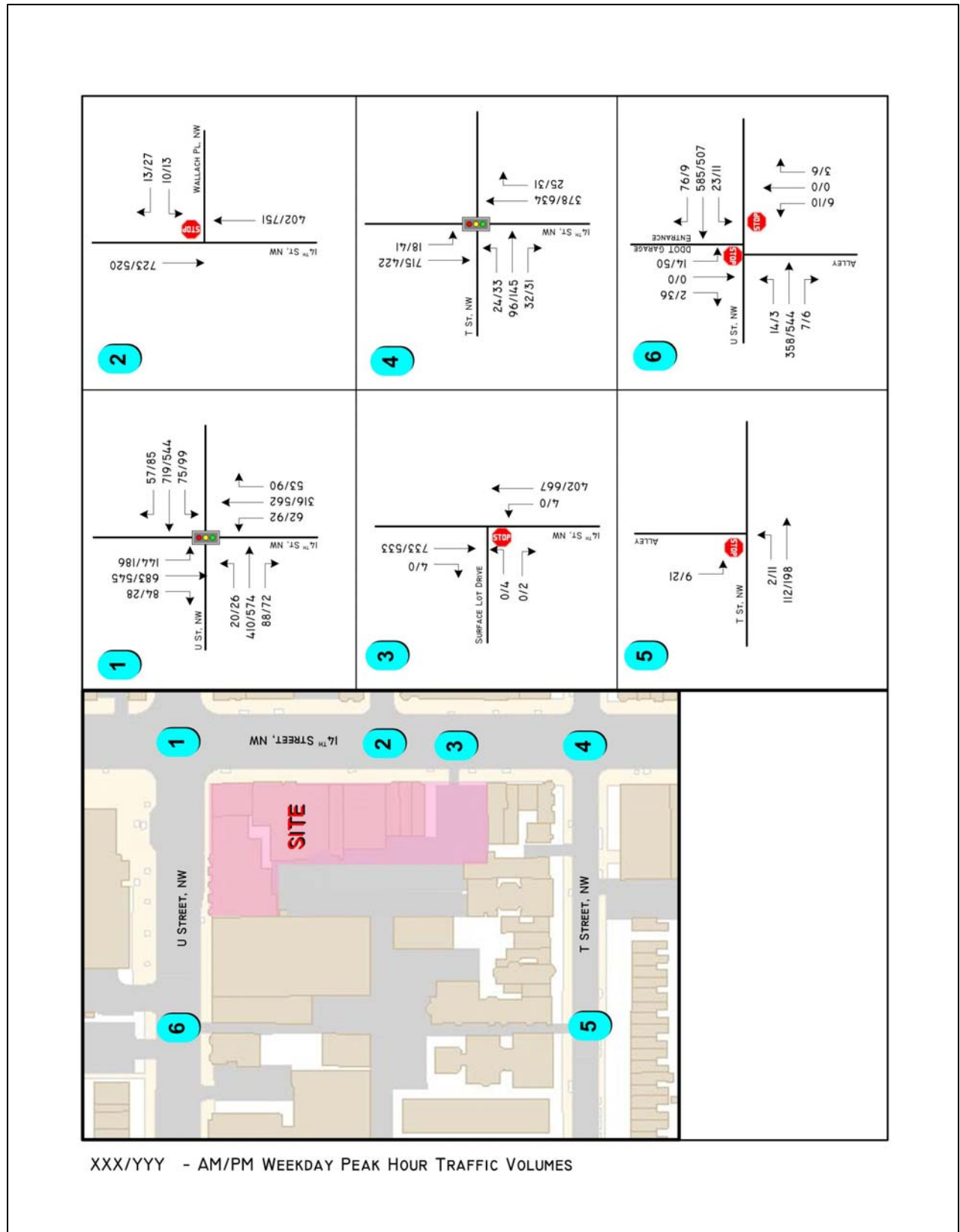


Figure 6 – Existing Peak Hour Traffic Volumes



**Table 1 – Existing Levels of Service**

Intersection	Approach/Movement	AM Peak		PM Peak	
		<i>Delay</i>	<i>LOS</i>	<i>Delay</i>	<i>LOS</i>
1. 14 <sup>th</sup> Street & U Street, NW*	Overall	52.7	D	74.7	E
	EB	24.1	C	26.0	C
	WB	102.7	F	161.3	F
	NB	12.7	B	29.2	C
	SB	39.4	D	69.1	E
2. 14 <sup>th</sup> Street & Wallach Place, NW**	WB Left/Right	18.3	C	40.1	E
3. 14 <sup>th</sup> Street & Site Entrance, NW**	EB Left/Right	0.0	A	42.7	E
4. 14 <sup>th</sup> Street & T Street, NW*	Overall	9.0	A	12.3	B
	EB	43.6	D	44.3	D
	NB	4.1	A	5.8	A
	SB	3.2	A	6.6	A
5. T Street & Waverly Place, NW**	SB Left	11.7	B	12.5	B
6. U Street & Waverly Place, NW**	NB Left/Right	55.9	F	107.6	F
	SB Left/Right	51.2	F	191.7	F

Note:

\* Signalized Intersection. Average Control Delay (in seconds per vehicle) and LOS results provided for all approaches and overall intersection.

\*\* Unsignalized Intersection. Average Control Delay (in seconds per vehicle) and LOS results provided for worst approaches only.

**Source:** Gorove/Slade Associates, Inc.

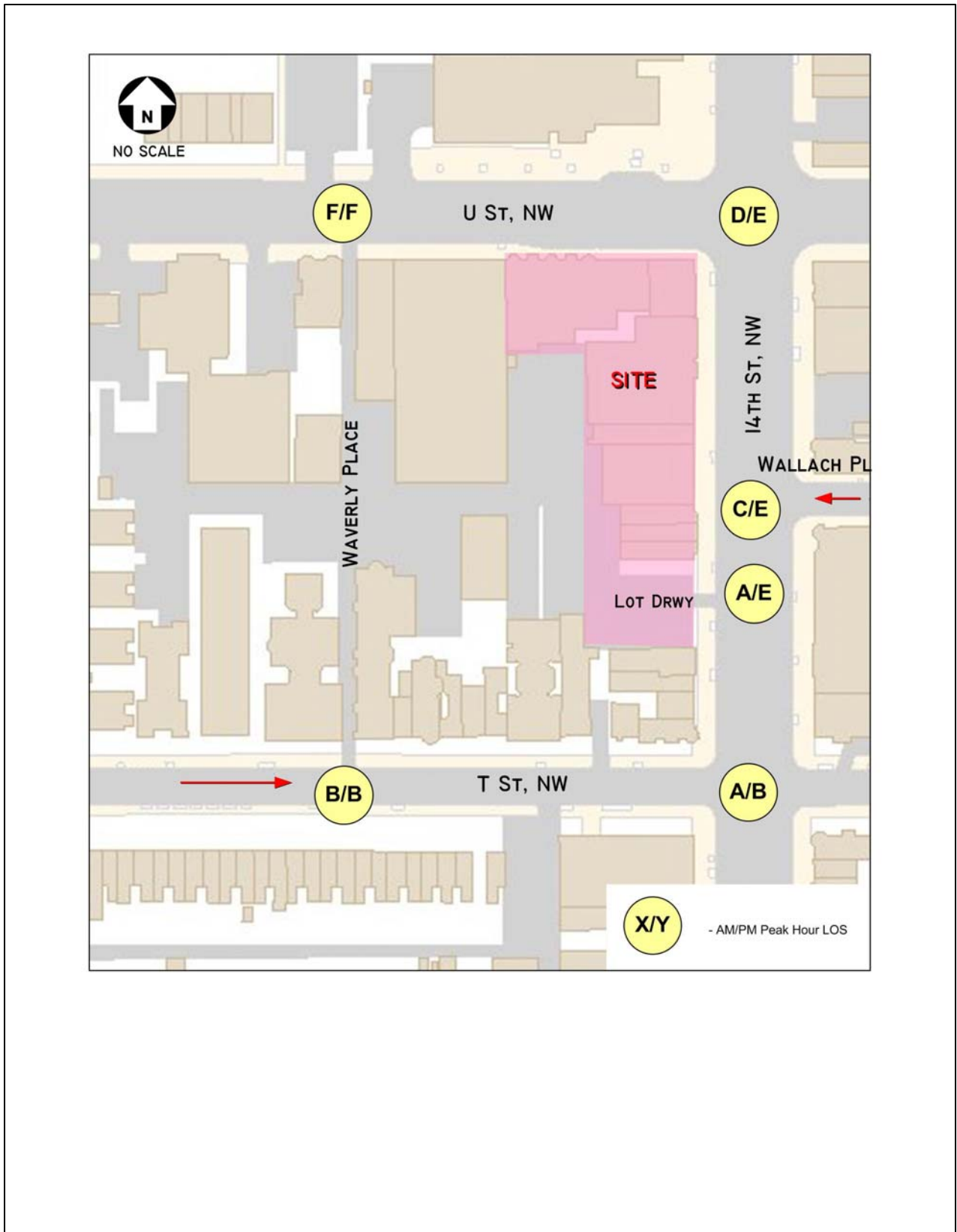


Figure 7 – Existing Levels of Service





## FUTURE (2028) BACKGROUND CONDITIONS

Future background conditions represent the projected future traffic levels without the proposed development. These conditions are a basis for comparison with the total future conditions, which include the proposed development. For the purposes of this study, a horizon period of 20 years (2028) was considered. This horizon year was analyzed to provide “worst case” information for DDOT planning purposes, as the proposed development would likely be built and occupied within a three to four-year period (i.e., by 2012).

The 2028 future background traffic situation was derived by applying a 1% annual growth factor to through traffic movements along U Street and 14<sup>th</sup> Street. This was based on a review of historical traffic data and other planning studies conducted for the study area. Additionally, the study considered the traffic impacts of eleven (11) background developments identified by the DDOT 14<sup>th</sup> Street study and the Washington DC Economic Partnership website. These developments are listed in Table 2 and their locations are shown in Figure 8.

### ***Trip Generation - Background Developments***

Peak hour trip generation estimates were developed for the background developments based on the *ITE Trip Generation Manual*, 7<sup>th</sup> Edition. ITE Land Use Codes 220 and 230 were used for the residential developments, Code 710 was used for Office development and Code 820 was used for the retail components.

The background developments are located primarily along 14<sup>th</sup> Street, NW in the vicinity of the U Street/African American Civil War Memorial/Cardozo Metrorail Station and are served by several Metrobus routes. Therefore, appropriate trip reduction factors (reflecting anticipated use of transit, bike, walk and other alternative modes) were applied to the projected peak hour trip estimates for the developments. The trip reduction factors were based on modal split information presented in the *WMATA 2005 Development Related Ridership Survey* report, with respect to residential and retail land uses situated in the vicinity of the Metrorail Station. The projected trip generation for the background developments is presented in Table 3 on page 20.

**Table 2 – List of Background Developments**

Number	Name	Location	Dwelling Units	Retail Area (square feet)	Distance from Metro (feet)	Number of Parking Spaces	Status	Time of Completion
1	View 14	2303-2315 14th St, NW	180 apartments	35,000	2,373	150	Planned	3/1/2009
2	The Solea	2350 14th St, NW	52 Condos & 7 work-live units	4,800	2,448	52	Proposed	12/1/2008
3	2400 14th Street Residential	2400 14th St, NW	225 Condos	18,000	2,607	175	Planned	3/1/2010
4	Whiteman Walker	1407 S St, NW	N/A	233,000 (Office)	1,934	N/A	Proposed	N/A
5	T Street Flats	1840 14th St., NW	40 Condos	8,000	1,410	40	Planned	6/1/2008
6	14th Street & W (YMCA)	1325 W St., NW	200 housing units	N/A	1,430	N/A	Planned	6/1/2010
7	Central Union Mission Residential	1625 14th St., NW	36 Condos	N/A	2,456	N/A	Proposed	1/1/2011
8	The Stella	1638 14th St., NW	32 Condos	N/A	2,482	31	Planned	12/1/2010
9	1638 14th St., NW	14th and R St.	38 Condos	2,250	2,495	20	Planned	6/1/2008
10	14th St & Corcoran St.	14th St & Corcoran St.	30 Condos	3,000	2,664	30	Planned	N/A
11	Moderno	1939 12th St, NW	15 Condos	5,000	0	12	Planned	N/A

N/A - Not Applicable or Not Available.

**Source:** DDOT 14th Street Study, March 2008 and the Washington, DC Economic Partnership



Figure 8 – Locations of Background Developments



**Table 3 – Trip Generation of Background Developments**

Land Use	Size	Trip Generation						
		AM Peak Hour			PM Peak Hour			
		In	Out	Total	In	Out	Total	
<b>1. View 14 · 2303 · 2315 14th St., NW</b>								
Apartments	180 Dwelling Units	18	74	92	76	41	117	
Non-Auto Mode Trip Reduction	78%	-14	-58	-72	-59	-32	-91	
Retail	35,000 Square Feet	51	32	83	150	163	313	
Non-Auto Mode Trip Reduction	51%	-26	-16	-42	-77	-83	-160	
	Net Trips	29	32	61	90	89	179	
<b>2. The Solea · 2350 14th St., NW</b>								
Condominiums	59 Dwelling Units	6	28	34	26	13	39	
Non-Auto Mode Trip Reduction	78%	-5	-22	-27	-20	-10	-30	
Retail	4,800 Square Feet	15	10	25	40	44	84	
Non-Auto Mode Trip Reduction	50%	-8	-5	-13	-20	-22	-42	
	Net Trips	8	11	19	26	25	51	
<b>3. 2400 14th Street, NW</b>								
Condominiums	225 Dwelling Units	17	82	99	78	39	117	
Non-Auto Mode Trip Reduction	78%	-13	-64	-77	-61	-30	-91	
Retail	18,000 Square Feet	34	22	56	97	105	202	
Non-Auto Mode Trip Reduction	47%	-16	-10	-26	-46	-49	-95	
	Net Trips	22	30	52	68	65	133	
<b>4. White Walker · 1407 S St., NW</b>								
General Office Building	233,000 Square Feet	325	44	369	58	282	340	
Non-Auto Mode Trip Reduction	36%	-117	-16	-133	-21	-102	-123	
	Net Trips	208	28	236	37	180	217	
<b>5. T Street Flats, 1840 14th St., NW</b>								
Condominiums	40 Dwelling Units	4	21	25	19	9	28	
Non-Auto Mode Trip Reduction	78%	-3	-16	-20	-15	-7	-22	
Retail	8,000 Square Feet	21	13	34	57	61	118	
Non-Auto Mode Trip Reduction	64%	-13	-8	-22	-36	-39	-76	
	Net Trips	9	10	17	25	24	48	
<b>6. 14th and W St, YMCA · 1325 W St., NW</b>								
Affordable Housing	200 Dwelling Units	20	82	102	83	45	128	
Non-Auto Mode Trip Reduction	78%	-16	-64	-80	-65	-35	-100	
	Net Trips	4	18	22	18	10	28	
<b>7. Central Union Mission Residential · 1625 14th St., NW</b>								
Condominiums	36 Dwelling Units	4	19	23	17	9	26	



Land Use	Size	Trip Generation					
		AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Non-Auto Mode Trip Reduction	78%	-3	-15	-18	-13	-7	-21
	Net Trips	1	4	5	4	2	5
8. The Stella - 1638 14th St., NW							
Condominiums	32 Dwelling Units	4	17	21	16	8	24
Non-Auto Mode Trip Reduction	78%	-3	-13	-16	-12	-6	-19
	Net Trips	1	4	5	4	2	5
9. 1638 14th St., NW							
Condominiums	38 Dwelling Units	4	20	24	18	9	27
Non-Auto Mode Trip Reduction	78%	-3	-16	-19	-14	-7	-21
Retail	2,250 Square Feet	10	6	16	24	27	51
Non-Auto Mode Trip Reduction	50%	-5	-3	-8	-12	-14	-26
	Net Trips	6	7	13	16	15	31
10. 14th & Concoran Street, NW							
Condominiums	30 Dwelling Units	3	17	20	15	7	22
Non-Auto Mode Trip Reduction	78%	-2	-13	-16	-12	-5	-17
Retail	3,000 Square Feet	12	7	19	30	32	62
Non-Auto Mode Trip Reduction	48%	-6	-3	-9	-14	-15	-30
	Net Trips	7	8	14	19	19	37
11. Moderno - 1939 12th Street, NW							
Condominiums	15 Dwelling Units	2	9	11	9	4	13
Non-Auto Mode Trip Reduction	78%	-2	-7	-9	-7	-3	-10
Retail	5,000 Square Feet	16	10	26	42	45	87
Non-Auto Mode Trip Reduction	82%	-13	-8	-21	-34	-37	-71
	Net Trips	3	4	7	10	9	19
Net New Trips		<b>298</b>	<b>156</b>	<b>451</b>	<b>317</b>	<b>440</b>	<b>753</b>

**Source:** ITE Trip Generation Manual, 7<sup>th</sup> Edition (2007), & Gorove/Slade Associates, Inc.

The background trips were assigned to the study area roadway network based on existing traffic patterns and locations of regional employment centers. The total traffic assignment is shown in Figure 9. Figure 10 shows the future (2028) background traffic volumes.

### **Future (2028) Background Traffic Analyses**

Background peak hour levels of service (without the proposed development) were calculated based on: (1) existing lane use and traffic controls shown on Figure 2; (2) the background traffic volumes shown on Figure 10 and; (3) the *Highway Capacity Manual 2000* (HCM) methodologies (using Synchro 6 software). Copies of LOS calculation worksheets are included in Appendix D-2.

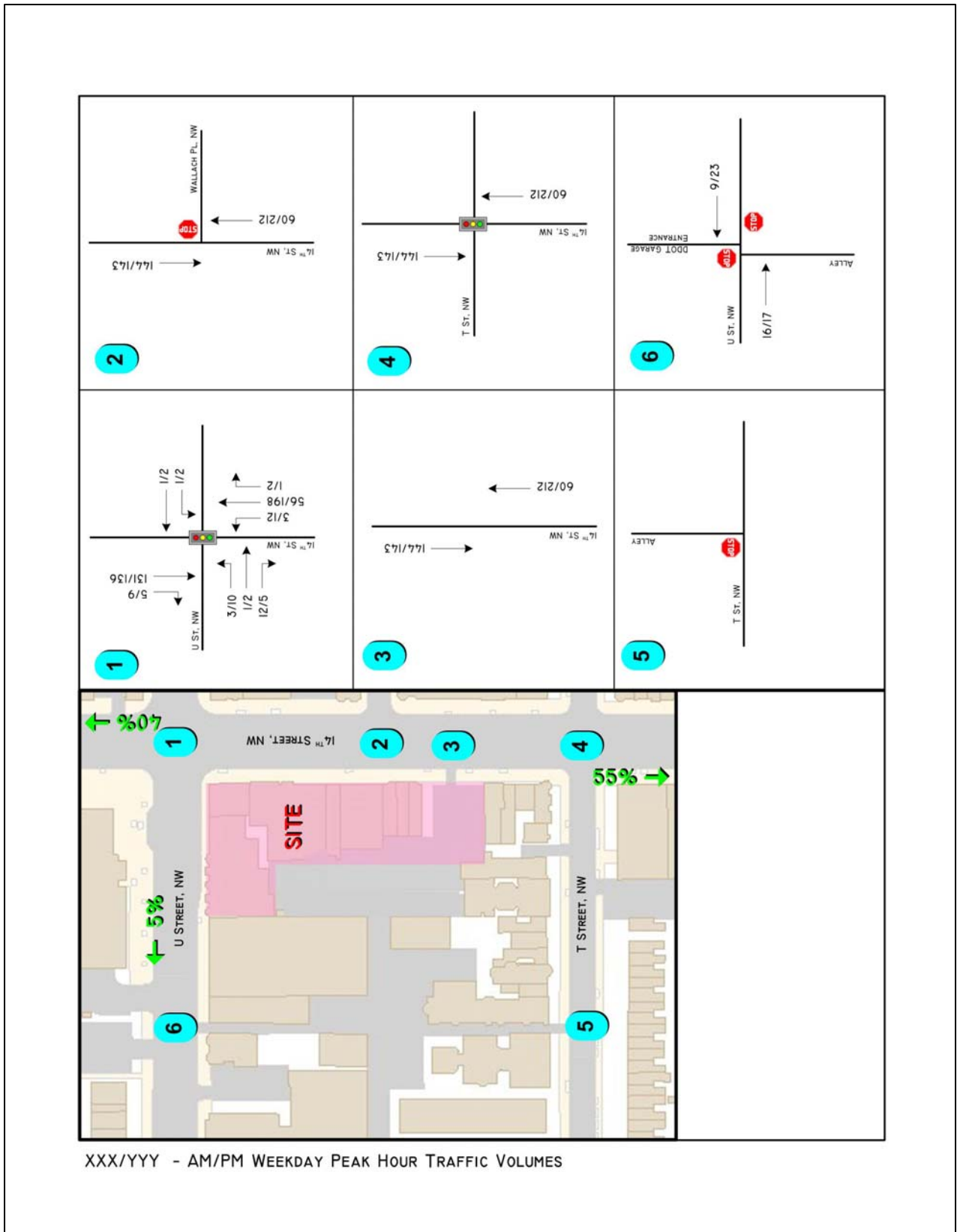


Figure 9 – Background Trip Distribution and Assignment

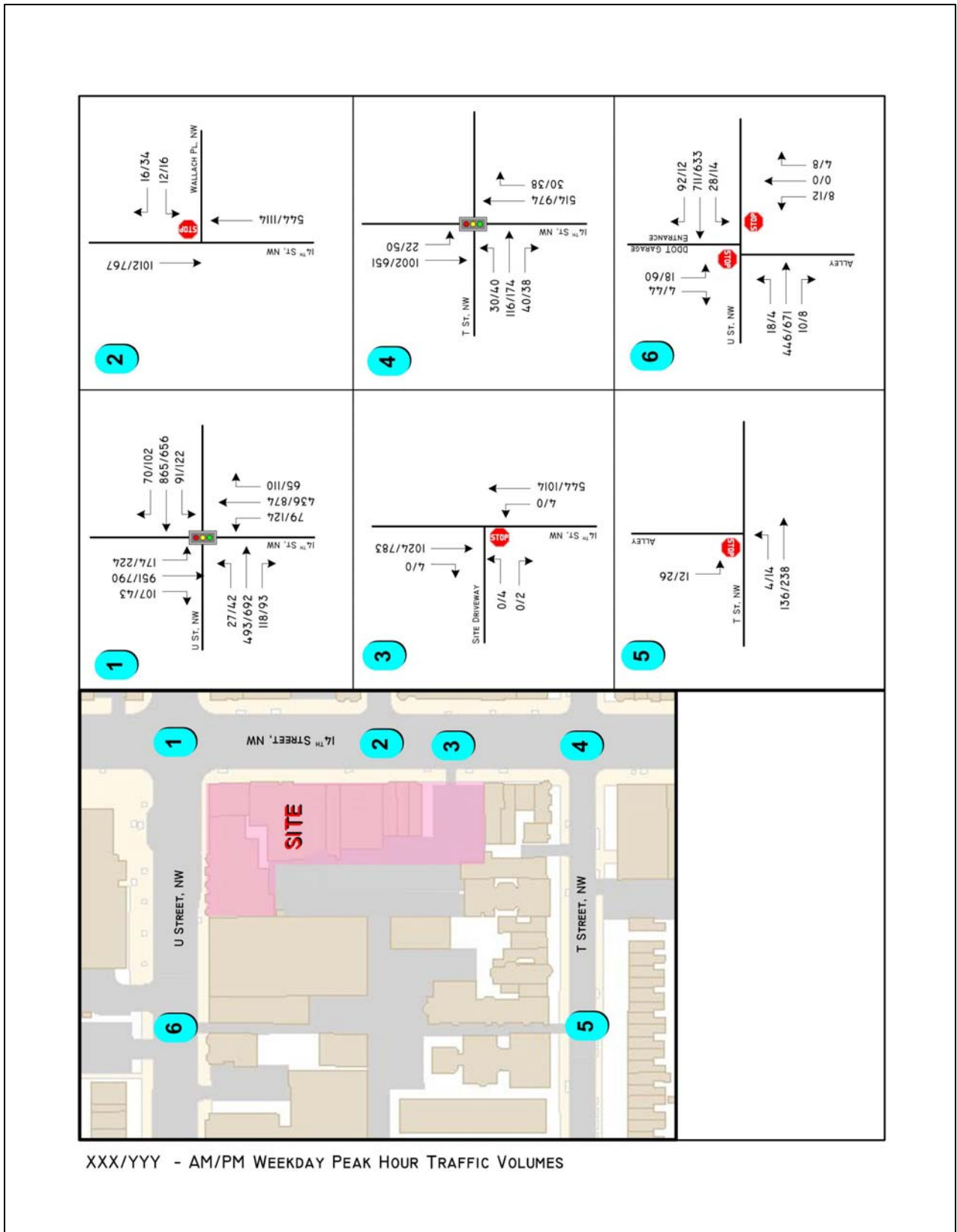


Figure 10 – Background Traffic Forecasts



Table 4 displays the results of the capacity analyses, including LOS and average delay per vehicle (in seconds). Figure 11 graphically shows the overall LOS results.

**Table 4 – Future Background Levels of Service**

Intersection	Approach/Movement	AM Peak		PM Peak	
		Delay	LOS	Delay	LOS
1. 14 <sup>th</sup> Street & U Street, NW*	Overall	288.4	F	330.2	F
	EB	66.6	E	264.3	F
	WB	417.1	F	430.3	F
	NB	35.2	D	147.5	F
	SB	405.6	F	470.2	F
2. 14 <sup>th</sup> Street & Wallach Place, NW**	WB Left/Right	22.0	C	280.3	F
3. 14 <sup>th</sup> Street & Site Entrance, NW**	EB Left/Right	0.0	A	42.7	E
4. 14 <sup>th</sup> Street & T Street, NW*	Overall	8.8	A	14.4	B
	EB	42.8	D	42.7	D
	NB	5.6	A	9.4	A
	SB	3.2	A	11.1	B
5. T Street & Waverly Place, NW**	SB Left	16.3	C	14.0	B
6. U Street & Waverly Place, NW**	NB Left/Right	149.5	F	660.2	F
	SB Left/Right	128.8	F	867.2	F

Note:

\* Signalized Intersection. Average Control Delay (in seconds per vehicle) and LOS results provided for all approaches and overall intersection.

\*\* Unsignalized Intersection. Average Control Delay (in seconds per vehicle) and LOS results provided for worst approaches only.

**Source:** Gorove/Slade Associates, Inc.

The background capacity analyses show that all intersections and approaches would operate at LOS D or better except:

- The U Street/14<sup>th</sup> Street intersection would fail during the AM and PM peak hours due to traffic exceeding capacity on all approaches.
- The NB and SB approaches of the U Street/Waverly Place intersection would fail during both the AM and PM peak hours.
- The WB approach of Wallach Place at 14<sup>th</sup> Street would fail during the PM peak hour.
- The EB approach of the proposed site driveway would operate at LOS E.



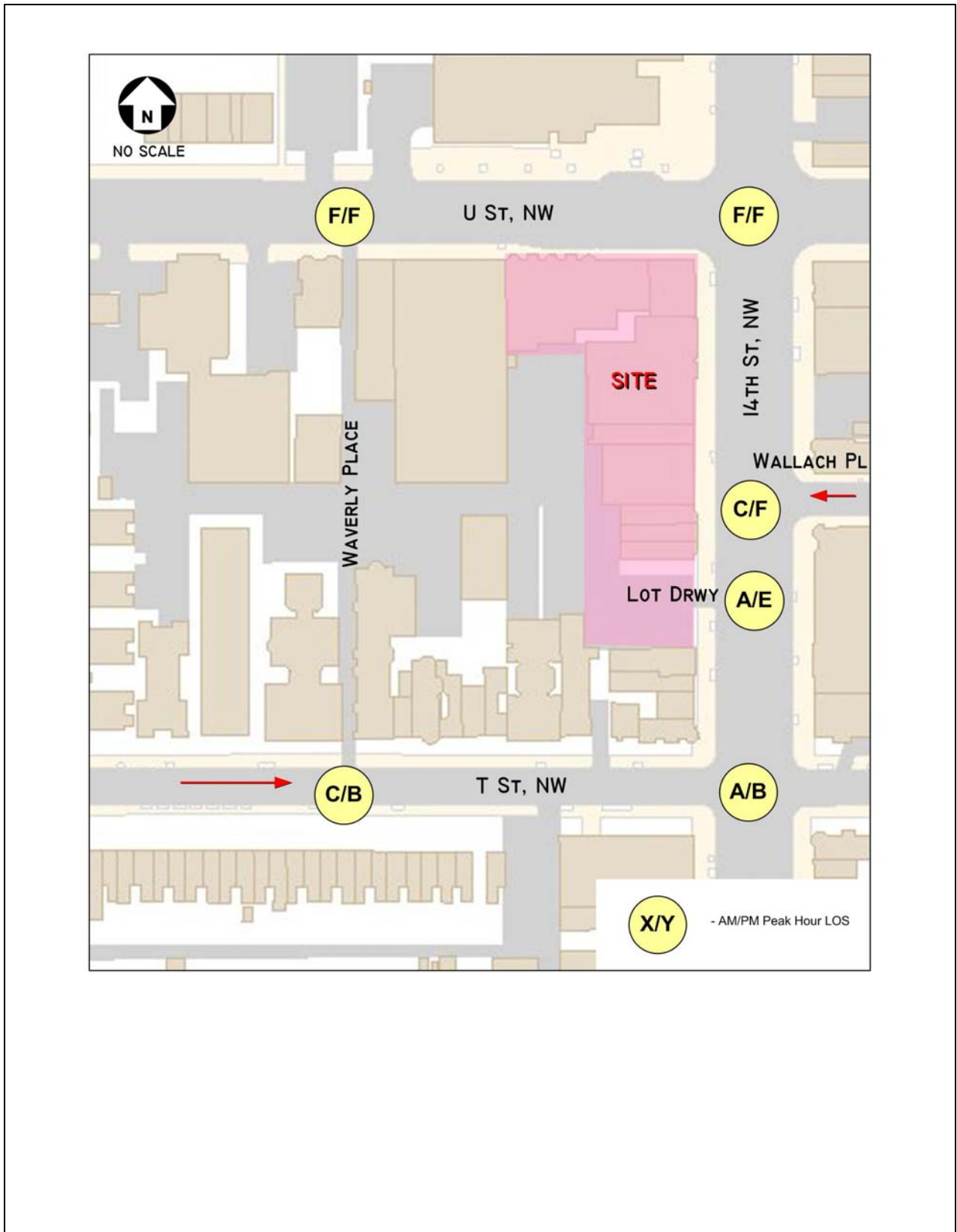


Figure 11 – Background Levels of Service



## TOTAL FUTURE (2028) TRAFFIC CONDITIONS

As noted earlier, the existing site consists primarily of various retail uses served by a 77-space off-street parking lot that is accessed directly from 14<sup>th</sup> Street. The proposed development would consist of 230 residential apartment units, 19,000 Square Feet (SF) retail space and 156 garage parking spaces. Access to the proposed loading facilities would be provided via the adjacent alleyway system, whereas access to the garage parking would be provided via a single entrance along 14<sup>th</sup> Street.

### *Projected Site Trip Generation*

#### *Passenger Vehicles*

The total future traffic conditions would be based on a composite of existing traffic, background growth factors and traffic generated by the proposed development. Table 5 compares the existing and anticipated future site vehicular trip generation.

**Table 5 - Comparative Site Trip Generation – Existing vs. Proposed Land Uses**

Land Use	AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total
A. Existing Uses (10 kSF) <sup>1</sup>	6	0	6	0	4	4
B. Proposed Uses						
Trips/19 kSF Retail <sup>2</sup>	11	1	12	1	8	9
Trips/230 Apartments <sup>3</sup>	5	21	26	21	11	32
Total (B)	16	22	38	22	19	41
<b>Net Trips (B-A)</b>	<b>10</b>	<b>22</b>	<b>32</b>	<b>22</b>	<b>15</b>	<b>37</b>

Notes:

1. Based on counts of vehicles entering and leaving the existing off-street parking lot on the site.
2. Based on an extrapolation of existing trip rates derived from the parking lot counts.
3. Based on the ITE Trip Generation Manual, 7<sup>th</sup> Edition (2007) and a 78% trip reduction factor for transit use in accordance with the WMATA Development Related Ridership Survey (2005).

Source: Gorove/Slade Associates, Inc.

#### *Truck Traffic*

Based on turning movement counts undertaken at the alleyway intersections with U and T Streets, the following was determined:

- Truck ingress/egress activity is moderate, involving an average of 16 trucks during the AM peak hour and 20 trucks during the afternoon peak hour.
- The predominant truck movements are inbound from U Street during the AM peak period and outbound to both U and T Streets during the PM peak period.



It is difficult to estimate the net increase in truck traffic that would result from the proposed redevelopment, because the tenants that would occupy the new development are unknown at this time. However, in absolute magnitude terms, the number of trucks generated by a project of this scale is a relatively low number. During the week, it could be expected that the new project would not generate more than 30 net new peak hour truck trips spread out over five weekdays plus Saturday. This is an average of only five (5) trucks per peak hour per day. Considering both passenger car and truck trips, the proposed site would generate 37 total AM peak hour trips and 42 total PM peak hour trips.

### ***Garage Access***

The current development programming calls for the proposed garage to be accessed via a single driveway along 14<sup>th</sup> Street. This access situation and alternative access via the adjacent alleyway (Waverly Place) are evaluated and compared below to determine the “better” option from the perspective of potential impacts on the study area roadway network and adjacent properties.

#### *Proposed 14th Street Access*

For this analysis, the site trips were distributed using the same distribution pattern assumed for the background developments since the site has the same land use composition (of residential with some ground floor retail) as most of the other background developments, and is also located along 14<sup>th</sup> Street. The site trip distribution and traffic assignment are shown in Figure 12.

The site traffic assignment Figure 12 was combined with the background traffic forecasts shown on Figure 11 to yield the total future (2028) traffic forecasts associated with the build-out of the proposed development. The total future (2028) traffic forecasts are shown in Figure 13. This traffic situation was analyzed and the LOS results are summarized in Table 6 below, and illustrated in Figure 14. Copies of LOS calculation worksheets are included in Appendix D-3.

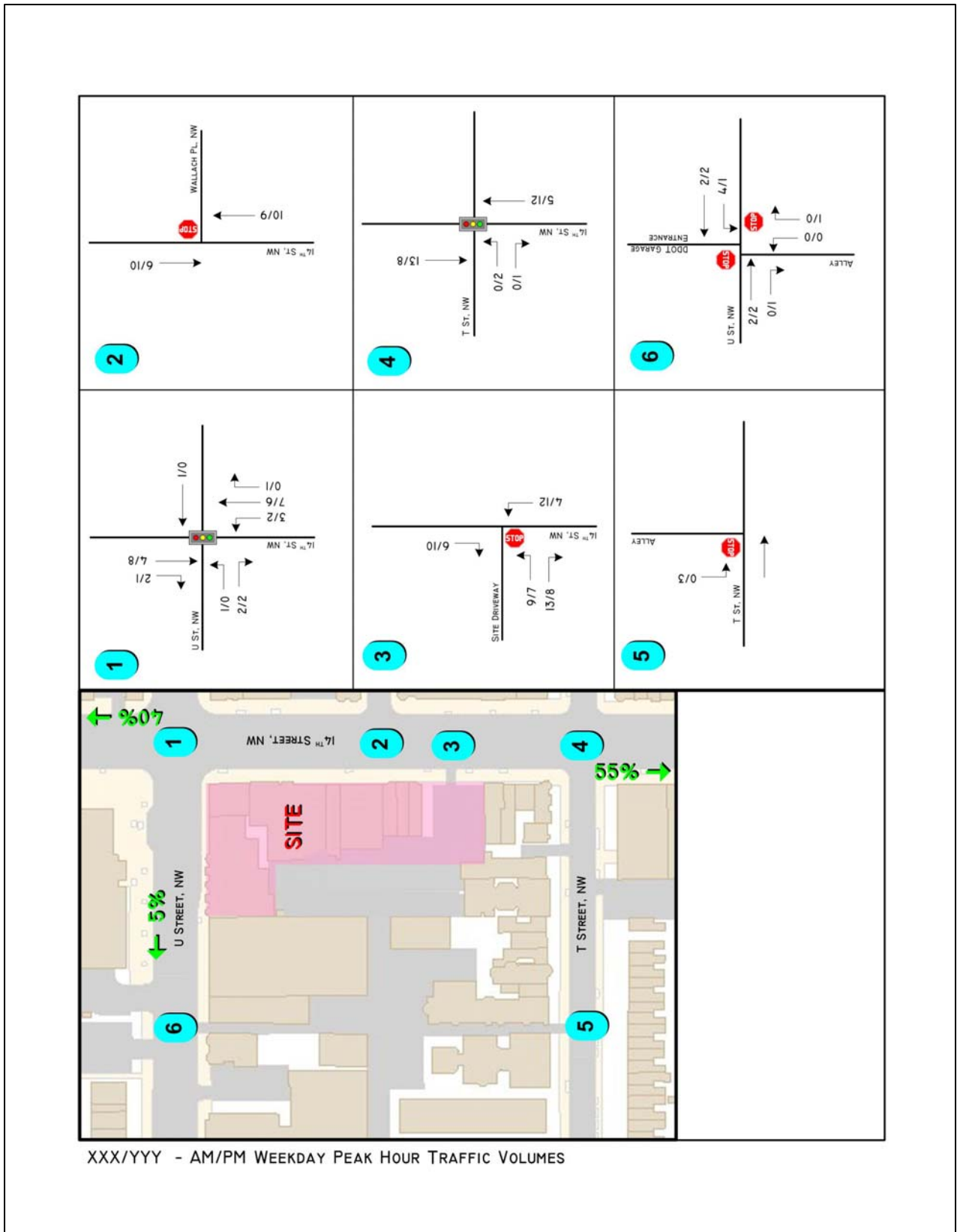


Figure 12 – Site Trip Assignment – with Garage Access from 14<sup>th</sup> Street

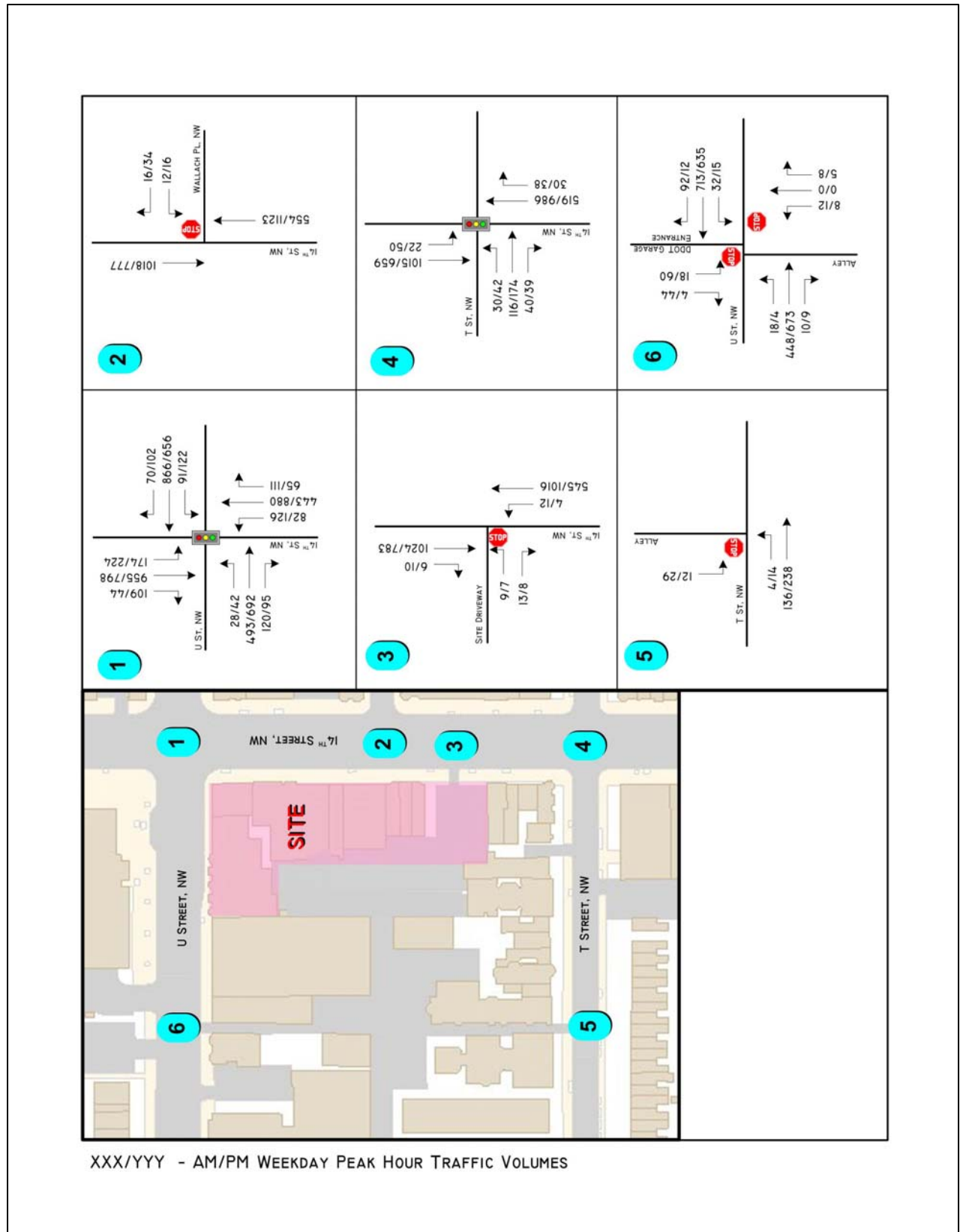


Figure 13 – Total Future Projected Traffic – with Garage Access from 14<sup>th</sup> Street

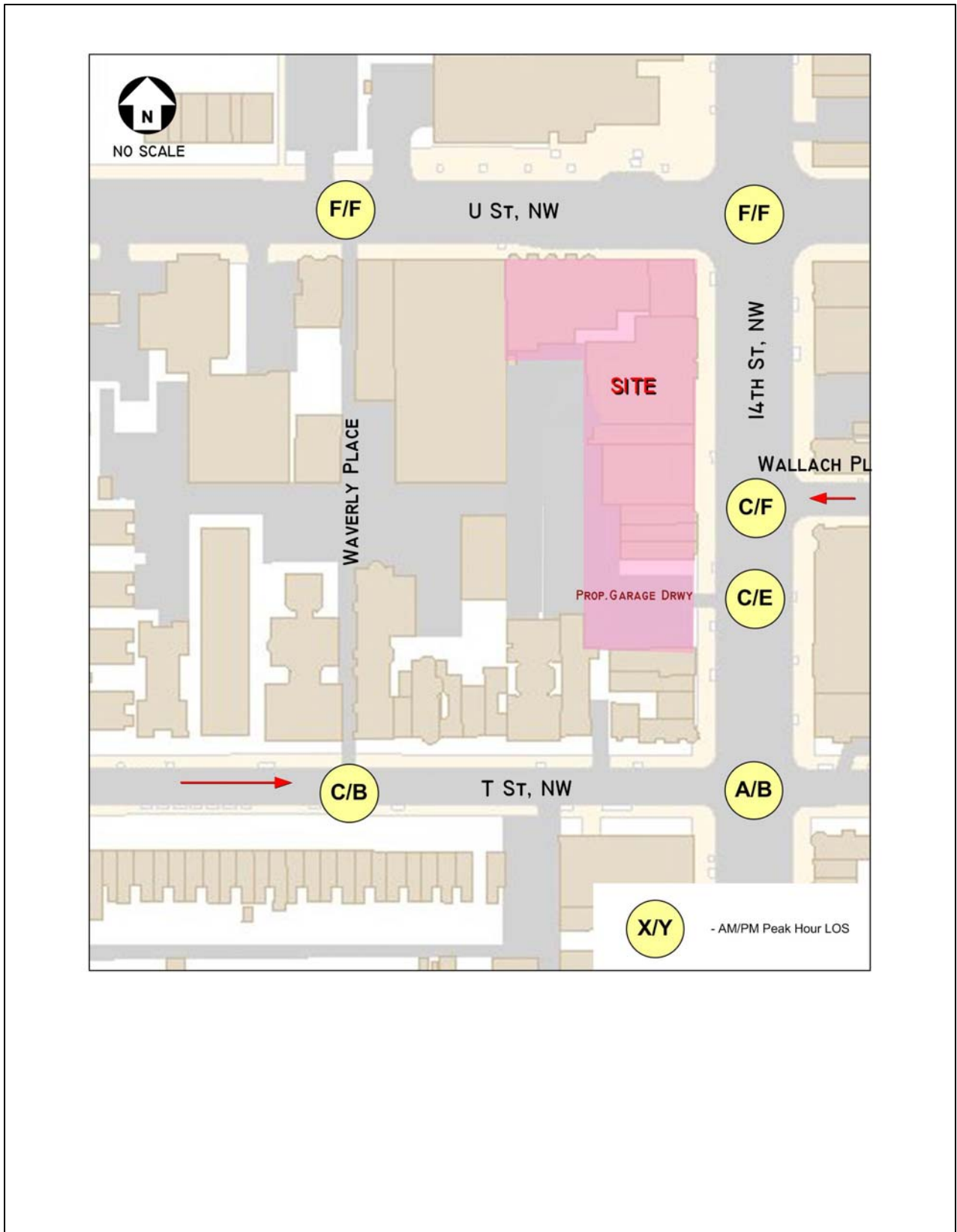


Figure 14 – Total Future LOS Results – with Garage Access from 14<sup>th</sup> Street



**Table 6 – Total Future (2028) Levels of Service – With 14<sup>th</sup> Street Access**

Intersection	Approach/Movement	AM Peak		PM Peak	
		Delay	LOS	Delay	LOS
1. 14 <sup>th</sup> Street & U Street, NW*	Overall	291.7	F	332.8	F
	EB	67.1	E	267.0	F
	WB	418.4	F	432.3	F
	NB	36.4	D	150.2	F
	SB	414.7	F	473.4	F
2. 14 <sup>th</sup> Street & Wallach Place, NW**	WB Left/Right	22.5	C	293.1	F
3. 14 <sup>th</sup> Street & Site Entrance, NW**	EB Left/Right	24.6	C	39.4	E
4. 14 <sup>th</sup> Street & T Street, NW*	Overall	8.8	A	14.4	B
	EB	42.8	D	42.7	D
	NB	5.6	A	9.5	A
	SB	3.2	A	11.1	B
5. T Street & Waverly Place, NW**	SB Left	16.3	C	14.0	B
6. U Street & Waverly Place, NW**	NB Left/Right	151.0	F	667.6	F
	SB Left/Right	130.2	F	874.7	F

Note:

\* Signalized Intersection. Average Control Delay (in seconds per vehicle) and LOS results provided for all approaches and overall intersection.

\*\* Unsignalized Intersection. Average Control Delay (in seconds per vehicle) and LOS results provided for worst approaches only.

**Source:** Gorove/Slade Associates, Inc.

*Vehicular Traffic Impacts*

The capacity results shown in Table 4 (on page 25) and Table 6 were compared to determine the impacts of the proposed development with garage access off 14<sup>th</sup> Street. The results show that the proposed development would result in marginal increases in delay by year 2028. The highest increment would be 12.8 seconds at the 14<sup>th</sup> Street and Wallach Place intersection during the afternoon peak hour. The site access would operate at LOS D (24.6 seconds) and LOS E (39.4 seconds) during the morning and afternoon peak hours respectively. The average driveway results for the alleyway would be LOS F (140.6 seconds) and LOS F (771.2 seconds) for the AM and PM peak hours, respectively.

As noted above, the site access would experience appreciable delay by year 2028. This situation would be less adverse by year 2012, the projected design/build out year. In addition, a gap analysis based on existing conditions indicates that vehicular queues in both directions do not adversely affect the availability of adequate gaps for vehicles entering and leaving the existing site parking lot. This is primarily due to the following:



- The 14<sup>th</sup> Street/T Street signal provides priority to the dominant movements along 14<sup>th</sup> Street during the morning and afternoon peak periods. As such, vehicular queues seldom block ingress and egress from the existing driveway.
- Observations of gaps available for vehicles exiting the existing parking lot indicate that the average time taken to complete the critical left-turns from the site is approximately 18 seconds during both the morning and afternoon peak periods. The trips will be distributed to the north and south along 14<sup>th</sup> Street, and 40%-60% (AM) and 45%-55% (PM) directional split between northbound and southbound was assumed for purposes of this analysis.
- The anticipated site trip distribution and the location of the curb-cut along the southbound roadway segment of 14<sup>th</sup> Street would provide for greater efficiency due to the easy entry (via right-turns) of 60% of the outbound trips into the southbound 14<sup>th</sup> Street traffic streams.

Based on the above considerations, the access via the proposed driveway would not experience significant delays or have adverse traffic impacts.

#### *Impacts on On-Street Parking*

As noted above, the on-street parking is inadequate, resulting in various forms of illegal parking and inefficient circulation. The proposed development will include a 156-space parking garage for the prospective residential units and retail tenants, and for adjacent land uses. This parking would supplement the existing on-street parking and reduce the observed parking violations.

Access to the proposed garage would occur via the existing curb-cut which would be widened from 10 feet to 24 feet. This would result in the loss of two or three on-street spaces. These spaces would be replaced in the proposed garage thus negating the impact of the site on parking spaces available for public use. The objective of providing both residential and public parking would require an effective parking management strategy. This project proposes the implementation of a strategy which includes the following:

- Monthly and annual parking contracts will be available to all residential tenants of the building who want to park in the garage. These will be for guaranteed but non-reserved spaces. The garage will be opened to these contract holders at all times.
- During daytime operating hours, the garage will be attended and open to the public for use by transient parkers on an hourly fee basis *in addition to* use by residents who have a parking contract. After hours, the garage will be closed to the public and the entry will be secured. During those hours, residential tenants with parking contracts will have electronic key card access to the garage.





- The residential monthly or annual contract parkers will always have priority over hourly parkers to ensure the residents can find a parking space. This will be achieved during busy times by posting “Garage Full-Reserved and Contract Parking Only.”
- Alternatively, the building ownership may contract with a parking operations company that will use attendants to stack cars in aisles or Valet Park during peak periods to increase the garage capacity for peak demand periods.

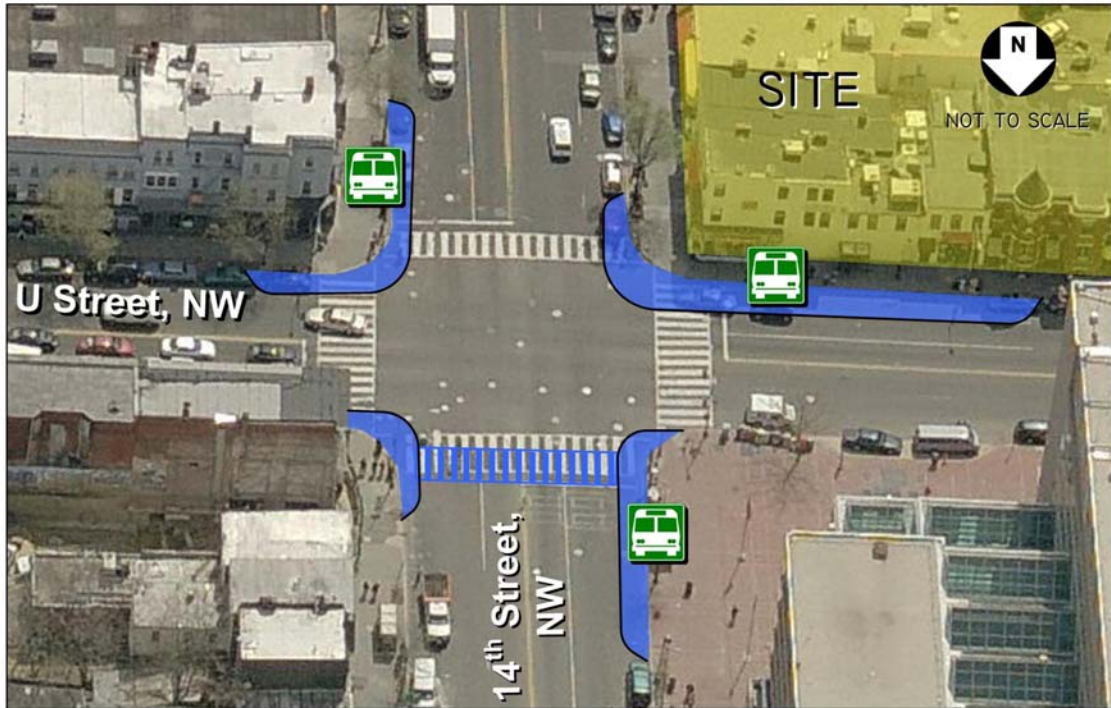
It should be noted that the public parking would need to be easily accessible from 14<sup>th</sup> Street to be effective in addressing the parking demand generated by the proposed and other adjacent uses including the post office.

#### *Impacts on Other Users*

Based on the anticipated trip volume and orientation characteristics for the proposed driveway, it is expected that this site access would not have any appreciable adverse impacts on pedestrian, bicyclist and transit operations along 14<sup>th</sup> Street. Potential streetscaping design improvements were identified to enhance current conditions and mitigate any potential operational impacts of locating the garage access on 14<sup>th</sup> Street. These improvements are consistent with recommendations made by DDOT’s 14<sup>th</sup> Street and U Street transportation studies and include the following:

- Reducing pedestrian crossing distances at the adjacent U Street, Wallach Place and T Street intersections through the use of sidewalk-extending bulb-outs, complemented with high-visibility ladder-striped crosswalks.
- Extending the sidewalk curb towards the first travel lane to create a bus bump-out at the existing T Street near-side Metrobus stop for more efficient bus operations; and
- Designing the 14<sup>th</sup> Street curb-cut to be at a level grade with the sidewalk as well as using a paving material similar to the adjacent sidewalk to maintain streetscape consistency. This would serve to both promote slower vehicular traffic speeds and to warn motorists that they have arrived in a pedestrian-priority zone.

These improvements along with the existing conditions are illustrated in Figures 15 through 19. It is noted that DDOT’s 14<sup>th</sup> Street Transportation Study proposes the elimination of the near side bus stop on the west side of 14<sup>th</sup> Street at T Street. However, the intensity of the new development may increase demand for transit service directly at that corner.



\* Intersection design based on recommendations from DDOT's *14<sup>th</sup> Street Transportation & Streetscape Design Study (2008)* and the *U Street/ Shaw/Howard University Transportation and Parking Study (2006)*

Figure 15 – DDOT Recommended 14th & U Street Pedestrian and Transit Related Improvements



Note: Letter References Illustrated in Figures 17 through 19.

Figure 16 – Recommended 14<sup>th</sup> & U Street Pedestrian and Transit Related Improvements



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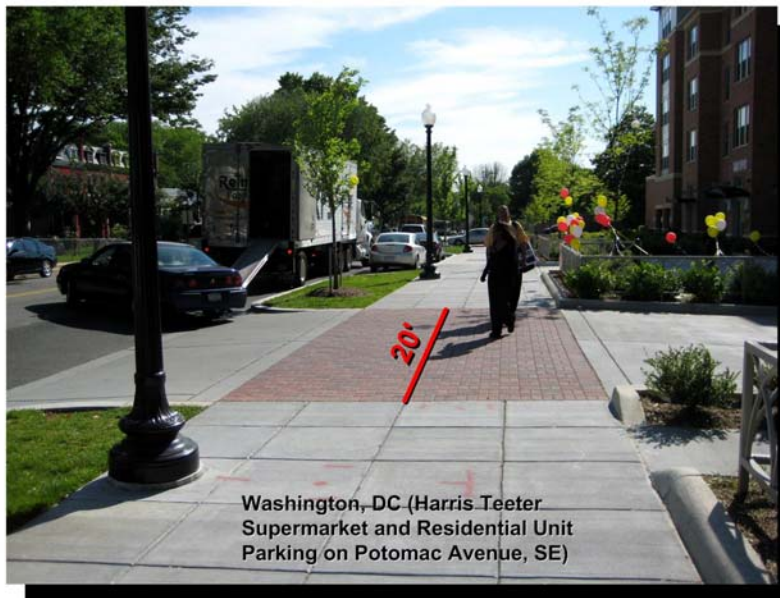
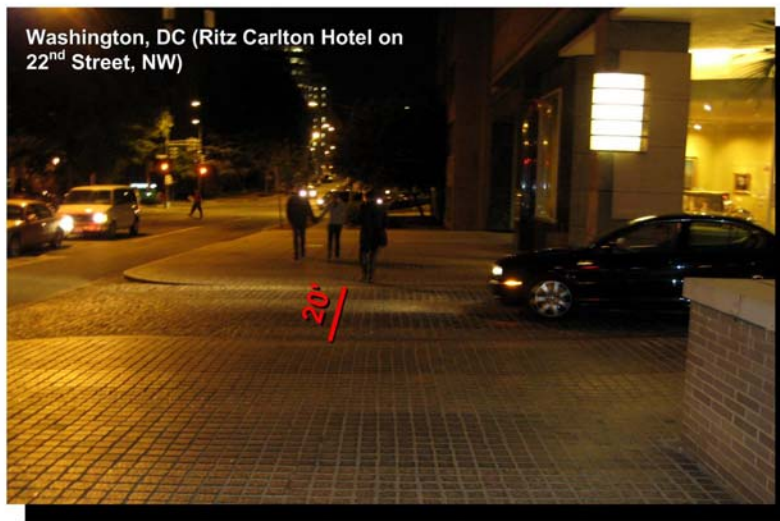


Figure 17 - Example of Pedestrian Friendly Sidewalk at Driveway



Figure 18 - Example of Sidewalk Bulb-Out and High Visibility Crosswalks



Figure 19 – Example of Enhanced Metrobus Stop on Extended Sidewalk Bulb-Out



*Alternative Garage Access via Alleyway*

*Vehicular Traffic Impacts*

The alleyway provides unrestricted traffic flows in all directions. The site traffic assignment based on this access situation is shown in Figure 20. The projected 2028 total traffic forecasts are shown in Figure 21. The capacity analysis results are summarized in Table 7 and illustrated in Figure 22. Copies of LOS calculation worksheets are included in Appendix D-4.

**Table 7 – Total Future Levels of Service – With Existing Alleyway Access**

Intersection	Approach/Movement	AM Peak		PM Peak	
		Delay	LOS	Delay	LOS
1. 14 <sup>th</sup> Street & U Street, NW*	Overall	295.1	F	338.8	F
	EB	90.5	F	288.6	F
	WB	422.1	F	434.3	F
	NB	35.7	D	147.4	F
	SB	409.7	F	480.3	F
2. 14 <sup>th</sup> Street & Wallach Place, NW**	WB Left/Right	21.8	C	296.6	F
3. 14 <sup>th</sup> Street & Site Entrance, NW**	EB Left/Right	0.0	A	0.0	A
4. 14 <sup>th</sup> Street & T Street, NW*	Overall	9.3	A	15.0	B
	EB	42.6	D	42.7	D
	NB	6.1	A	10.0	A
	SB	3.4	A	11.6	B
5. T Street & Waverly Place, NW**	SB Left	17.6	C	14.3	B
6. U Street & Waverly Place, NW**	NB Left/Right	174.5	F	...	F
	SB Left/Right	175.6	F	...	F

Note:

\* Signalized Intersection. Average Control Delay (in seconds per vehicle) and LOS results provided for all approaches and overall intersection.

\*\* Unsignalized Intersection. Average Control Delay (in seconds per vehicle) and LOS results provided for worst approaches only.

**Source:** Gorove/Slade Associates, Inc.

Comparison of the results presented in Tables 6 and 7 indicate the following:

- a. The alleyway access at U Street would be heavily impacted, resulting in excessive delays for the alleyway and movements for the Reeves Building Driveway;
- b. The access is likely to result in delays to other study area intersections along 14<sup>th</sup> Street compared with the 14<sup>th</sup> Street access.

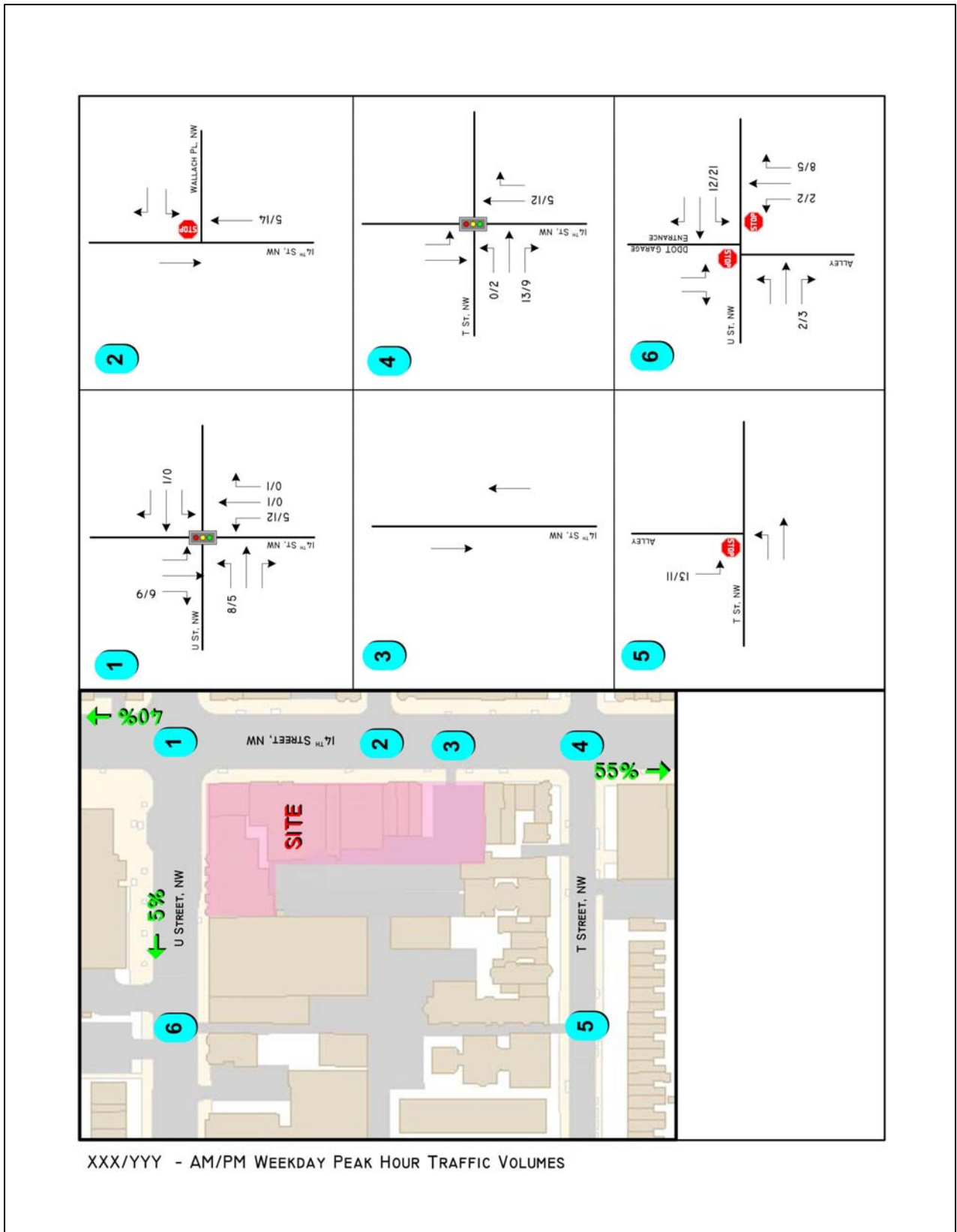


Figure 20 – Site Trip Assignment – with Garage Access from Existing Alleyway



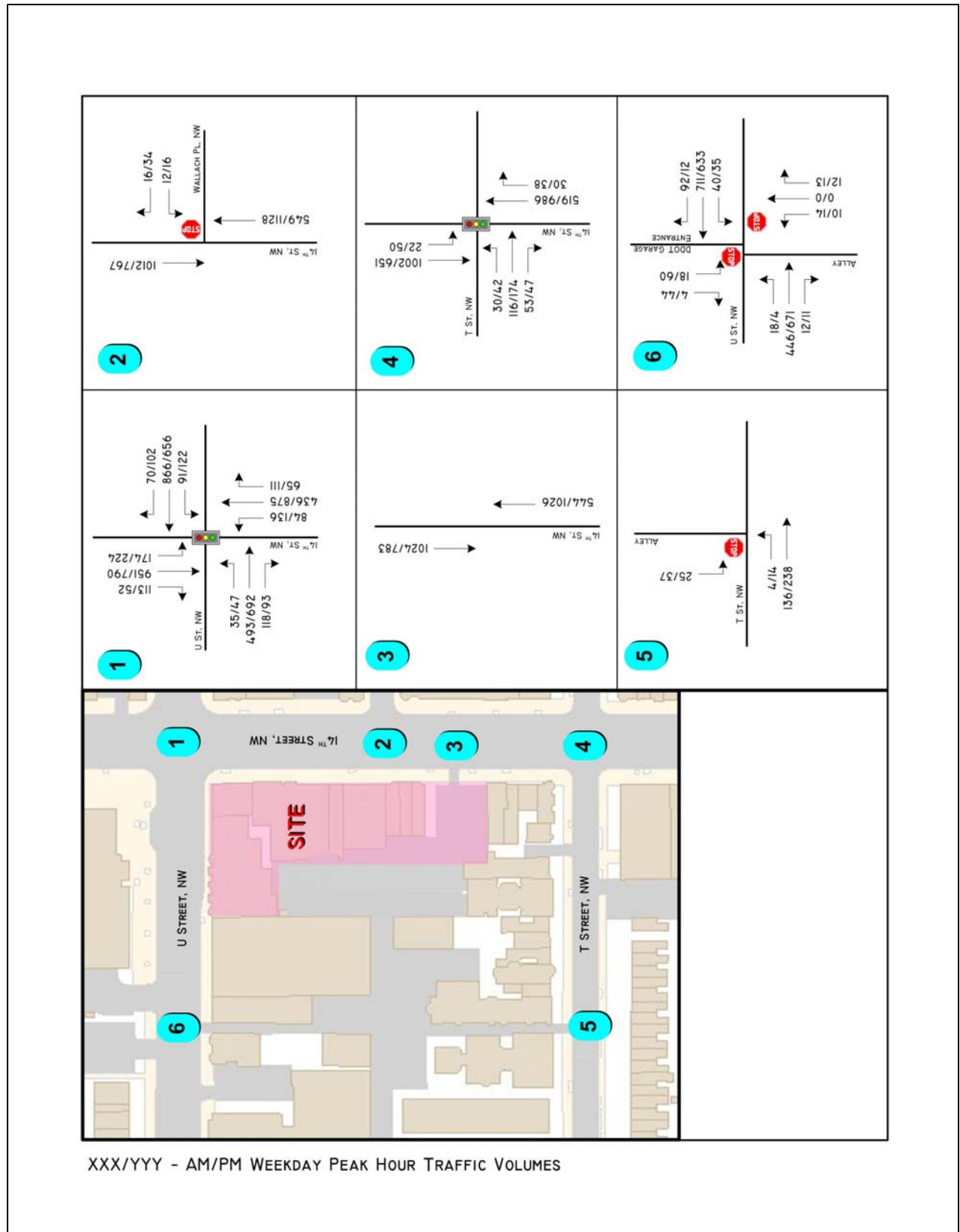


Figure 21 – Total Future Projected Traffic – with Garage Access from Existing Alleyway

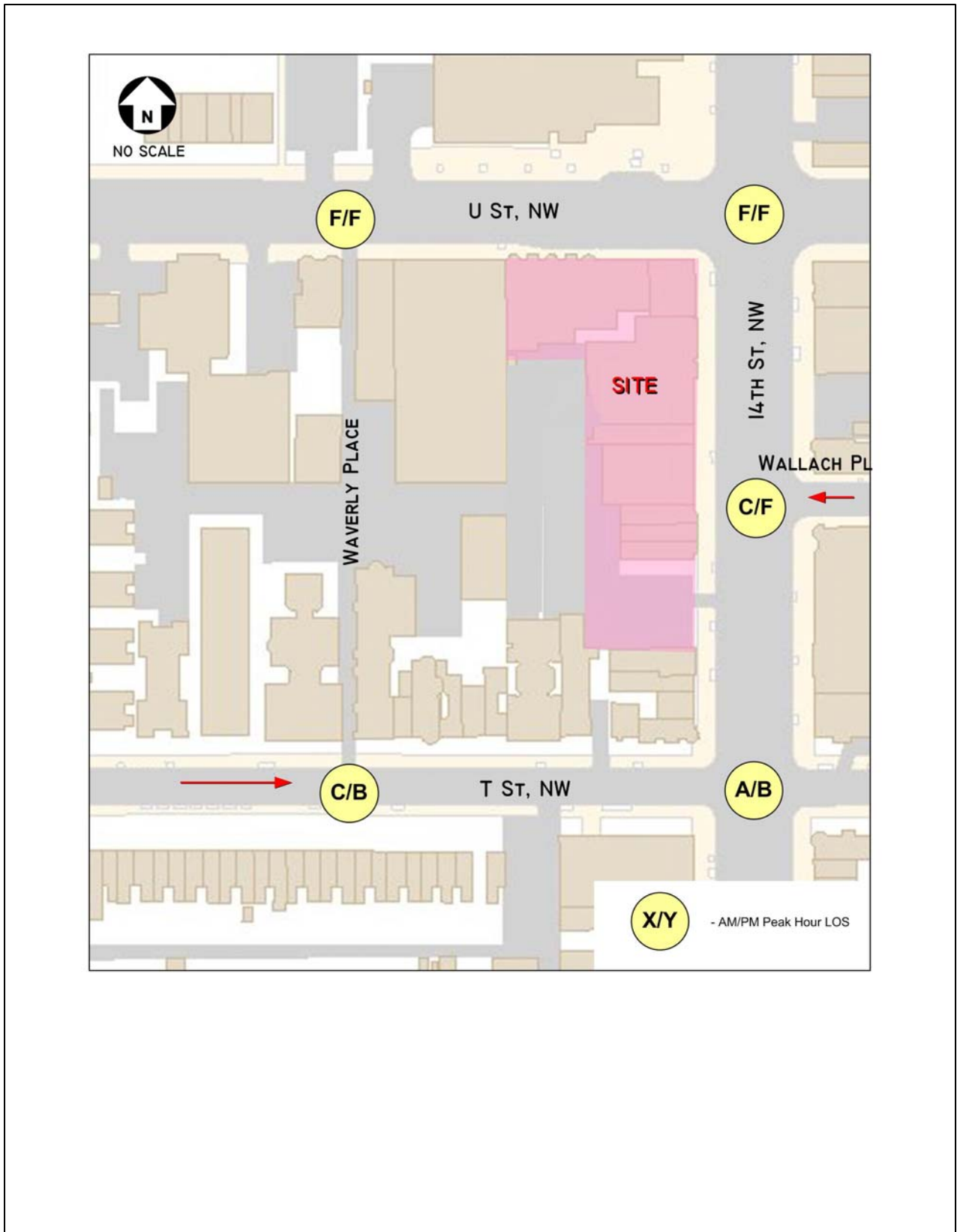


Figure 22 – Total Future LOS Results – with Site Access from Existing Alleyway



*Vehicular Traffic Impacts with One-Way Alleyway Access*

Traffic management techniques were evaluated to determine their potential for accommodating the garage and service/delivery trips via the alleyway system. The technique with perhaps the greatest positive potential is restricting the 15-foot section of the alleyway to one-way southbound. Additional analyses were undertaken to assess the potential impacts of that improvement measure. The site traffic assignment for this access scenario is shown in Figure 23. The projected total future (2028) traffic volumes is shown in Figure 24.

The capacity analysis results for this access scenario are summarized in Table 8 below and shown in Figure 25: Copies of LOS calculation worksheets are included in Appendix D-5.

**Table 8 – Total Future Levels of Service - With One-Way Alleyway Access**

Intersection	Approach/Movement	AM Peak		PM Peak	
		Delay	LOS	Delay	LOS
1. 14 <sup>th</sup> Street & U Street, NW*	Overall	296.7	F	333.5	F
	EB	66.6	E	264.3	F
	WB	417.1	F	430.3	F
	NB	36.7	D	150.4	F
	SB	430.3	F	480.3	F
2. 14 <sup>th</sup> Street & Wallach Place, NW**	WB Left/Right	22.0	C	306.4	F
3. 14 <sup>th</sup> Street & Site Entrance, NW**	EB Left/Right	0.0	A	0.0	A
4. 14 <sup>th</sup> Street & T Street, NW*	Overall	9.8	A	15.5	B
	EB	42.3	D	42.4	D
	NB	6.5	A	10.4	B
	SB	3.7	A	12.0	B
5. T Street & Waverly Place, NW**	SB Left	18.7	C	14.6	B
6. U Street & Waverly Place, NW**	NB Left/Right	0.0	A	0.0	A
	SB Left/Right	128.4	F	--	F

Note:

\* Signalized Intersection. Average Control Delay (in seconds per vehicle) and LOS results provided for all approaches and overall intersection.

\*\* Unsignalized Intersection. Average Control Delay (in seconds per vehicle) and LOS results provided for worst approaches only.

**Source:** Gorove/Slade Associates, Inc.

Capacity analysis results indicate that the alley would operate efficiently with the one-way southbound restrictions. However, the Reeves Building Driveway would continue to operate at capacity and adversely influence the operations of alleyway ingress and egress. The southbound restriction would increase truck traffic along T Street between the alleyway and 14th Street, which is now striped with a bike lane. These impacts would be objectionable to the adjacent community, and the prospective residential and retail users of the proposed development.

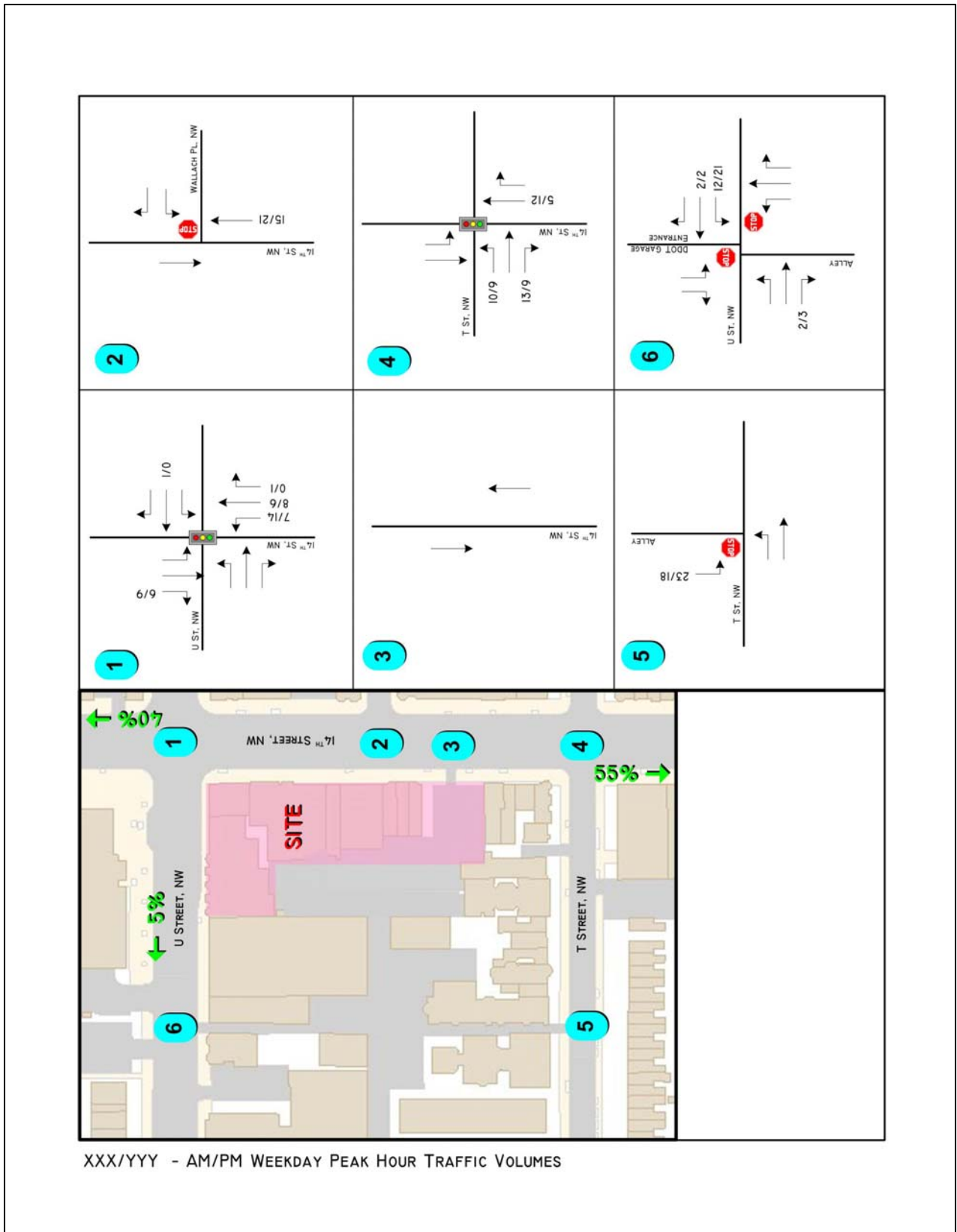


Figure 23 – Site Trip Assignment – with Access from One-Way Alleyway

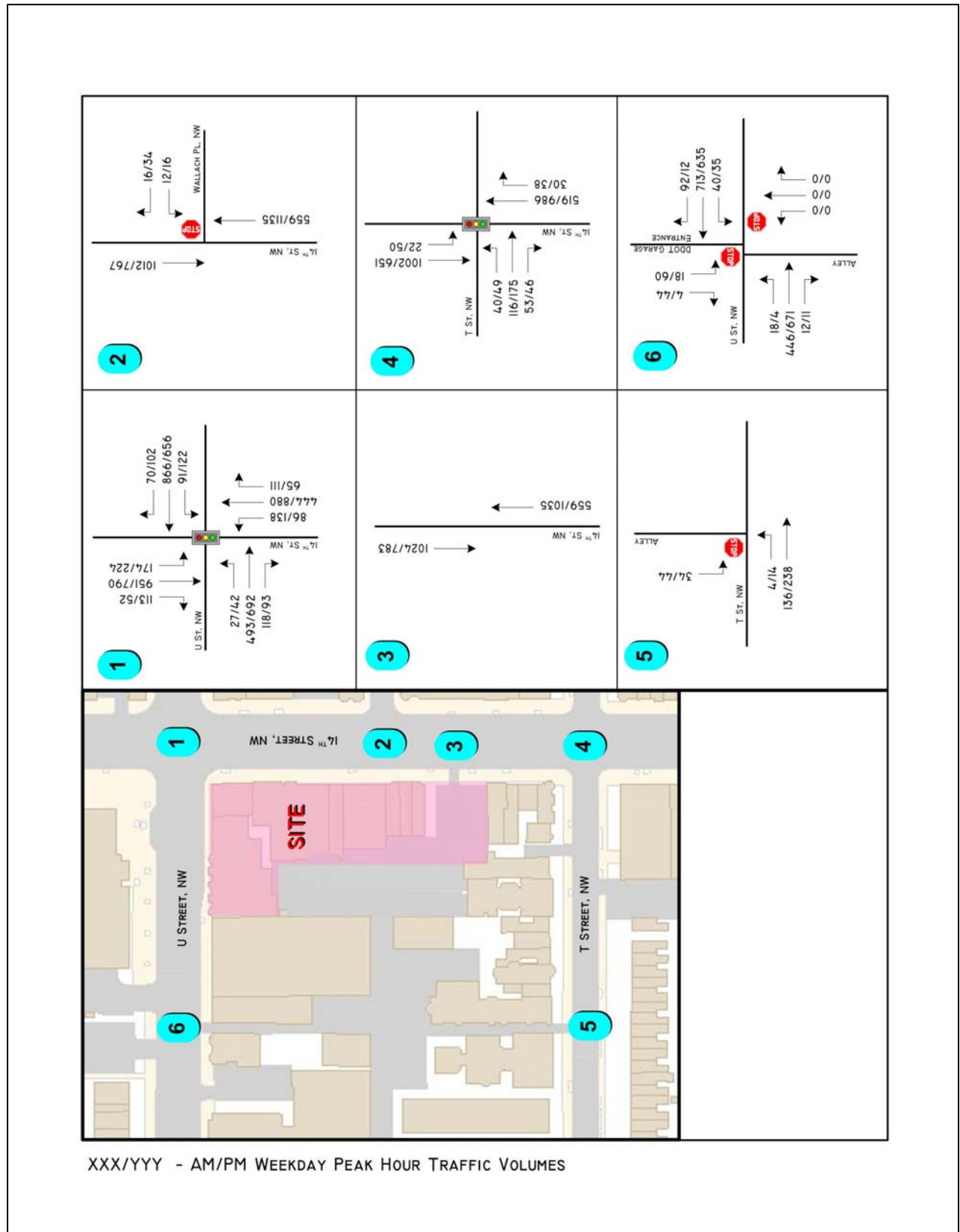


Figure 24 – Total Future Projected Traffic – with Site Access from One-Way Alleyway

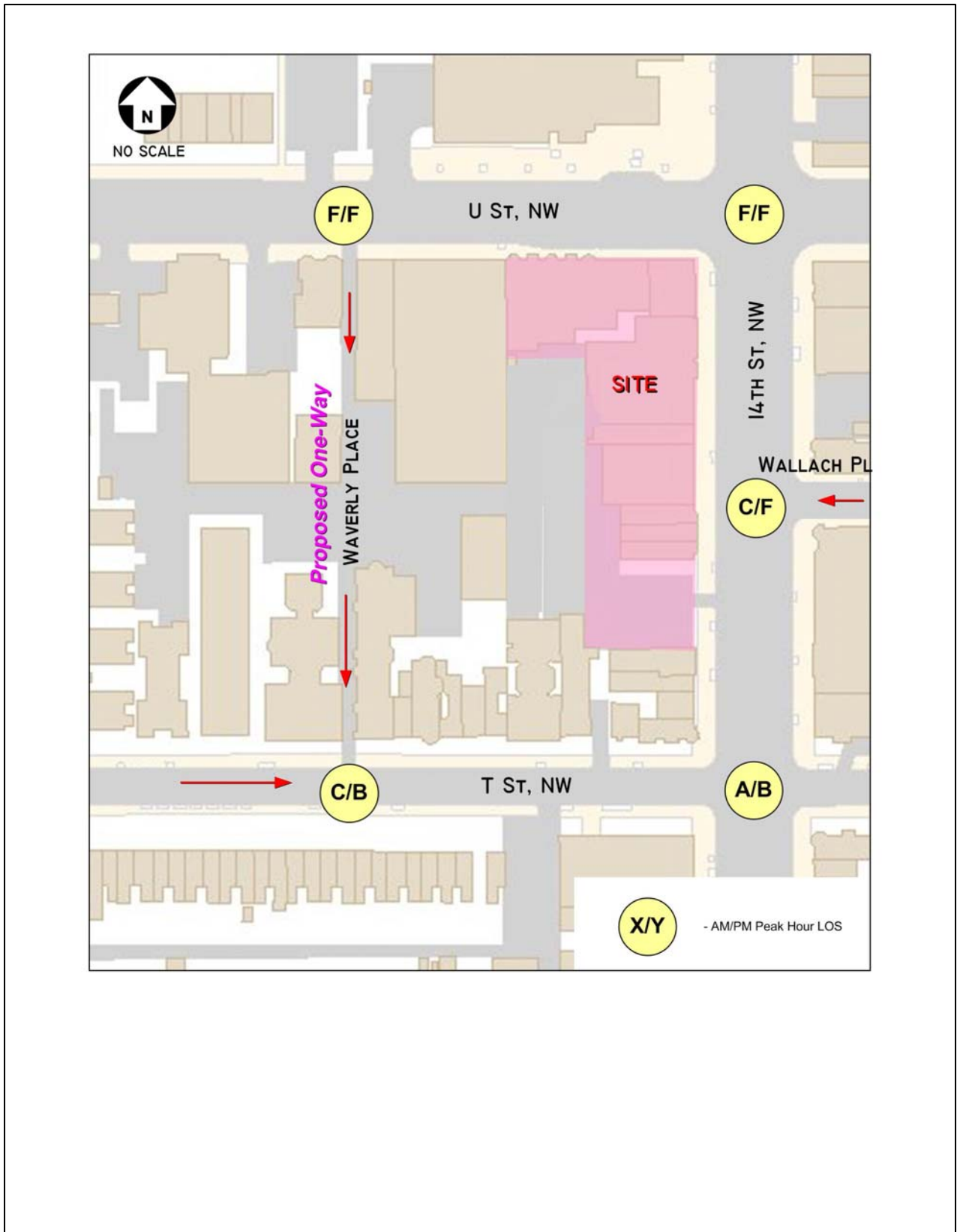


Figure 25 – Total Future LOS Results – with Site Access from One-Way Alleyway



### *Other Management Improvements*

Other potential measures would have greater adverse impacts on alleyway operations and circulation on the adjacent roadways. Peak period turn restrictions at U Street would create inefficient circulation and increase loading activities on the adjacent streets. The Reeves Building Driveway would still be an issue. A northbound restriction would create inefficient circulation due to the one-way restrictions along T and 15<sup>th</sup> Streets, and would produce higher levels of truck traffic along T Street impacting the adjacent residential uses. This measure would significantly exacerbate operational constraints at U Street. In addition, the potential impacts at the U Street intersection would be extremely severe, as illustrated by capacity analysis results presented in Table 7 (on Page 39). A traffic signal would not be warranted at the U Street intersection and its provision could create queuing spillover problems and rear-end crashes particularly along U Street westbound.

### *Vehicular Traffic Impacts – Study Area Intersections*

The capacity analysis results presented for the projected future background traffic situation (excluding the proposed development) indicates that the 14<sup>th</sup> Street/U Street and 14<sup>th</sup> Street/Wallach Place intersections would operate at capacity during at least one peak hour by year 2028. These intersections would continue to operate at capacity with the proposed development. These forecasts are hypothetical based on extrapolated growth in regional/through traffic volumes along U and 14<sup>th</sup> Streets and the projected trip generation of other planned area developments. The projected conditions would not occur because: a) trends are towards greater transit mode choice and more people are living and working in the city, and b) those that must drive are adjusting their travel periods and routes and telecommute to avoid traffic congestion.

The proposed development, in and of itself, would have minimal impacts on the two study intersections. This would be due to the low peak hour volumes projected for the site, considering that approximately 80% of the total trips would travel via transit and other alternative modes based on the 2005 WMATA Development-Related Ridership Survey Report. In addition, the development would be implemented by 2012, which is 16 years before the realization of most of the regional growth and other development impacts projected for year 2028. Based on these considerations, it is concluded that the proposed development would have significantly less/negligible impacts on the intersections upon build-out in 2012.

### ***Parking and Loading***

The proposed development is required to provide a minimum of 108 off-street parking spaces in accordance with the District zoning requirements. The required and proposed parking spaces are compared in the table following:

**Table 9 – Required and Proposed Parking within the Site**

Land Use (Density)	Zoning	Required	Proposed
Retail (5,130 SF)	C-3-A	7	
Retail (13,870 SF)	C-R	15	
<i>Sub-Total Retail (19,000 SF)</i>		22	60*
Residential (55 Units)	C-3-A	28	
Residential (175 Units)	C-R	58	
<i>Sub-Total Residential (230 Units)</i>		86	96**
<b>Total</b>		<b>108</b>	<b>156</b>

\* Applicant proposes to provide additional spaces for patrons of adjacent land uses.

This would supplement existing curb-side parking.

\*\* A low parking ratio of 0.42 spaces/unit is considered since over 75% of the prospective tenants would utilize the adjacent transit and other alternative modes, as indicated in the WMATA 2005 Development-Related Ridership Report. Additionally, a number of bicycle parking spaces would be provided in the garage in accordance with the DDOT 5% requirement.

The above table shows that adequate parking would be provided in compliance with the zoning requirements. It is anticipated that the parking demand will not spill over from the site to the adjacent neighborhood streets and properties.

#### *Loading Considerations*

The loading facility requirements for the proposed development, as stipulated by the District zoning regulations, are as follows:

- 1 loading berth @ 30 ft deep with 1 loading platform @ 100 SF
- 1 loading berth @ 55 ft deep with 1 loading platform @ 200 SF
- 1 service/delivery space @ 20 ft deep

The proposed development will satisfy all of the above requirements, except for the 55-ft loading berth. A 45-ft loading berth would be provided instead for the following reasons:

- a) Alleyway Constraints. As noted in other sections of this report, the north-south section of the alley is physically constrained. This section is only 15 feet wide and adequate turning radii for large semi-trailer trucks are not provided where it intersects with the east-west section. Therefore, access to the alley and to the proposed loading docks would be limited to smaller single-unit type trucks. This has been confirmed by standard Auto-Turn truck tracking analyses.
- b) Retail Use Characteristics. The Applicant envisages that the proposed retail uses would not be served by large semi-trailer type trucks as would be the case for a Safeway or CVS store. The





residential units will typically average 700 SF in size and thereby not have the capacity for large house furniture that would require large moving vehicles.

The occasional visit by a large truck could be accommodated in the outer southbound lane along 14<sup>th</sup> Street, during the off-peak and after-hour periods. This would not create significant adverse effects due to the considerably lower vehicular and pedestrian traffic volumes and the excess roadway capacity available during those periods.



## CONCLUSION

This study has examined the potential transportation impacts of the proposed U Street at 14th Street mixed-use development. It has also evaluated the proposed garage access along 14th Street, in comparison with alternative access via the adjacent alleyway system. The key findings and conclusions of this transportation study are as follows:

- a) The study area intersections currently operate at capacity during at least one peak hour, except for 14th Street at T Street and T Street at Waverly Place.
- b) The proposed development would generate a low volume of new trips (37- AM, 42- PM). This would be due primarily to anticipated use of the U Street/African American Civil War Memorial/Cardozo Metrorail Station (situated a block away) on the WMATA Green and Yellow Lines, several Metrobus routes along 14th and U Streets, and other alternative transportation modes.
- c) Upon its build-out by year 2012, the proposed development would have minimal or negligible impacts on the existing levels of service for the study area intersections.
- d) The proposed project would continue to have minimal/negligible impacts, considering hypothetical 20-year (2028) traffic forecasts developed and analyzed in this study for general planning and information purposes. The latter (2028) forecasts are hypothetical based on extrapolated growth in regional/through traffic volumes along U and 14th Streets, and the projected trip generation of other planned area developments. These conditions would not occur because: i) trends are towards greater transit mode choice and more people are living and working in the city, and ii) those that must drive are adjusting or would adjust their travel periods and routes and telecommute to avoid traffic congestion.
- e) Loading access to the site would occur via the adjacent alleyway (Waverly Place) which currently operates at capacity at its U Street intersection. The study projects that the proposed development would add approximately five (5) truck trips during the morning and afternoon peak hours, which would minimally impact the operations of the alleyway and the capacity conditions at the U Street intersection.
- f) The proposed garage would be accessed via a widened entrance off 14th Street, which would be located virtually in the same location as the entrance to the existing parking lot. Several analyses were undertaken to compare the proposed 14th Street access with alternative access via the adjacent alleyway system (Waverly Place) in terms of operational efficiency and impacts. The study clearly demonstrates that the 14th Street access would be the better option for several reasons including those presented in Items (g) through (i) below.



- g) Waverly Place is situated diagonally opposite two driveways along the north side of U Street. One driveway provides access to a residential parking lot and is offset approximately 30 feet to the west. The other driveway serves the Reeves Building and has the highest volumes among the three driveways. This driveway is offset approximately 40 feet to the east from Waverly Place. The proximity of the three driveways creates a high potential for conflicts between left-turning vehicles along U Street and related adverse impacts to vehicular and pedestrian mobility along this roadway. These operational issues would worsen if the garage access were provided via the alleyway. On the other hand, the proposed 14th Street access would be located approximately 90 feet from the nearest intersection (Wallach Place) and is not likely to cause or experience any such left-turning conflicts.
- h) Vehicles turning into and out of the alley do so with difficulty because of the narrow alley cross section. Some drivers experience considerable delay and sometimes have to reverse to allow vehicles already in the alleyway to exit onto U Street. This situation is compounded by the narrow (10-foot wide) sidewalk which is frequently blocked by drivers seeking sight distance advantages before initiating turn movements. The sidewalk along 14th Street is approximately 20 feet wide, permitting vehicles to stop without entirely blocking the sidewalk before turning onto 14th Street. In addition, this study identifies potential streetscaping design improvements that could be implemented to significantly reduce impacts to all users. These improvements, which are consistent with the recommendations of the DDOT 14th Street and U Street transportation studies , and include the following:
- Reducing pedestrian crossing distances at the adjacent U Street, Wallach Place and T Street intersections through the use of sidewalk-extending bulb-outs, complemented with high-visibility ladder-striped crosswalks.
  - Extending the sidewalk curb towards the first travel lane to create a bus bump-out at the existing T Street near-side Metrobus stop for more efficient bus operations; and
  - Designing the 14th Street curb-cut to be at a level grade with the sidewalk as well as using a paving material similar to the adjacent sidewalk to maintain streetscape consistency. This would serve to both promote slower vehicular traffic speeds and to warn to motorists that they have arrived in a pedestrian-priority zone.
- i) Capacity analyses show that the alleyway alternative would have significantly greater impacts (in terms of vehicular delay) on U Street, relative to the potential impacts of the access on 14th Street. Alleyway access management measures such as a one-way southbound restriction and peak period turning restrictions at the U Street intersection could potentially improve alleyway operations. However, the Reeves Building Driveway would continue to experience operational problems which would adversely influence the efficiency of ingress from U Street into the alley.



In addition, the restrictions would create inefficient circulation within the study area, and increase traffic including trucks along residential T Street.

- j) The proposed development would provide 156 parking spaces, which would be more than adequate compared with the City's zoning requirement (108 spaces). The proposed parking would be managed properly to allow shared use by the prospective retail tenants and other businesses within the study area. The retail parking would replace the 2-3 on-street spaces that could be lost due to the proposed widening of the site driveway, and would serve to reduce inefficient circulation and illegal parking observed along 14<sup>th</sup> and U Streets.

In conclusion, the proposed development could occur as planned without appreciable adverse impacts on the study area roadway network and adjacent communities. The project would have minimal/negligible impacts on existing and future roadway users, and these impacts would be reduced with the location of the proposed garage access along 14<sup>th</sup> Street (instead of the adjacent alleyway) and the implementation of streetscaping improvements highlighted in this study in keeping with the recommendations of the DDOT 14<sup>th</sup> Street and U Street Transportation Studies.