Transportation Impact Study

Florida Avenue Redevelopment

Washington, DC

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EXECUTIVE SUMMARY

The following report provides the findings of a Transportation Impact Study (TIS) for the Florida Avenue Redevelopment as part of its application to the District of Columbia Board of Zoning Adjustment. A review of the proposed development site found the following:

- Traffic within the study area is primarily concentrated along Florida Avenue and 7th Street/Georgia Avenue connecting local residents to the downtown business core of the District of Columbia. Consequently, significant peaking occurs along this roadway, with southbound and westbound traffic towards downtown dominating conditions during the AM peak hour and northbound and eastbound traffic prevailing during PM peak. While 9th serves as minor arterial connecting the downtown core to Sherman Avenue, 8th and T Streets primarily serve as local roadways for residential traffic only.
- Given the revitalization of the U Street corridor and the high utilization of pedestrian traffic along Florida Avenue and 7th Street/Georgia Avenue, the area sees high levels of pedestrian activity. Recent streetscape improvements have created a very favorable pedestrian experience along Florida Avenue, including high-visibility crosswalks, pedestrian countdown timers at signals, and other pedestrian amenities. Pedestrian facilities elsewhere within the study area are generally adequate considering the lower vehicular traffic volumes that exist along these roadways.
- Bicycling conditions in the study area are generally good due to the availability of local roadways featuring low levels of vehicular traffic. Conditions along Florida Avenue are fair because of the fact that riding bicycles on sidewalks is permitted within the District of Columbia (DC) outside of the central business district. South of the 7th Street/Georgia Avenue intersection and along T Street there are dedicated bicycle lanes. Additional bike lanes are expected to be installed within the study area in the near future which will help to improve bicycle conditions and enhance connections to major bicycle trails and regional destinations.
- The site is well served by several bus lines along Florida Avenue and 7th Street/Georgia Avenue as well as two existing bus shelters located at the intersection of Florida Avenue/7th Street/Georgia Avenue. In addition to the extensive bus system, two Metrorail stations are located within an easy walking distance from the site.
- Transit conditions are also expected to improve in the near future with the inauguration of streetcar service throughout the District. While the first segment will not run near the site, it is anticipated that upon completion of the streetcar system, three separate streetcar lines could pass directly in front of the site along Florida Avenue with direct connections to a vast majority of the streetcar network.

The proposed development plan consists of a mixed-use development featuring a total of 257 apartments and approximately 32,000 square feet of retail space. The project will be completed in a single phase of construction with two separate buildings divided by 8th Street with an anticipated completion of 2015. Below the two buildings, separate parking facilities are expected to serve the residential and retail uses.

Pedestrians will access the site via separate residential and retail entrances off of 9th Street, 8th Street and Florida Avenue and vehicles will access the West and East Buildings through either public alleys or private driveways from 9th and 8th Streets, respectively. Service and loading access will be provided to the development through these same access points.

INTRODUCTION

This report presents the findings of a Transportation Impact Study (TIS) performed for the Florida Avenue Redevelopment. The development is located in Ward 1 in Northwest Washington, DC. The development is located south of Florida Avenue and north of T Street between 9th Street and 7th Street. The property is bounded by existing development on the south and the east sides of the property. The redevelopment consists of two sites. The West Building is located between 9th and 8th Streets and contains approximately 163 residential units and 22,000 square feet of street-level retail use. The East Building is located between 8th and 7th Streets and contains approximately 94 residential units and 10,000 square feet of street-level retail use.

The purpose of this report is to:

1. Review the transportation elements of the redevelopment site plan, supplementing the material provided in the site plans that accompany the development application and demonstrate that the site conforms to DDOT's general polices of promoting non-automobile modes of travel and sustainability. The Design Review section of the report covers this topic.
2. Provide information to the District Department of Transportation (DDOT) and other agencies on how the development of the site will influence the local transportation network. This report accomplishes this by identifying the potential trips generated by the site on all major modes of travel and where these trips will be distributed on the network. The Impacts Review section of the report contains this analysis.
3. Determine if redevelopment of the site will lead to adverse impacts on the local transportation network. This report accomplishes this by projecting future conditions with and without development of the site and performing analyses of vehicular delays. These delays are compared to the acceptable levels of delay set by DDOT standards to determine if the site will negatively impact the study area. The report describes what improvements to the transportation network are needed to mitigate adverse impacts. The Impacts Review section of the report contains this analysis.

This report contains three sections as follows:

- *Introduction & Site Review*
  This section provides a summary of major transportation features near and adjacent to the Florida Avenue Redevelopment site. This includes reviewing roadways, transit facilities, bicycle facilities, and future developments and District initiatives. This section contains information on the site to help establish a reference for the following sections.

- *Design Review*
  This section provides a summary of the internal transportation features of the Florida Avenue Redevelopment site. This section is meant to supplement the details provided in the site plan package contained in the development application and reviews such items as the general parking strategy of the site, bicycle accommodations, and transportation demand management (TDM).

- *Impacts Review*
  This section provides a review of the impacts development of the Florida Avenue Redevelopment site could have to each mode within the transportation network. For each mode, and where necessary, a list of recommendations and mitigation measures are compiled.

1.1 Site Location and Major Transportation Features

The Florida Avenue Redevelopment is located in the Northwest portion of Washington, DC, in Ward 1. The proposed redevelopment is located in an area of the District that is primarily residential, with areas of concentrated street-level retail located nearby. Additionally, Howard University's Central Campus is located less than a quarter-mile from the redevelopment site.

The project site, as shown in Figure 1, is bounded by Florida Avenue to the north, 9th Street to the west, and adjacent developments to the south and east. Two sites are contained within the redevelopment: the West Building is located between 9th and 8th Street and the East Building is located between 8th Street and adjacent development to the east. The Florida Avenue Redevelopment is served by several arterials, including Georgia Avenue. Minor arterials include Florida Avenue and 9th street. The site is also served by several public transportation sources, including Metrorail and Metrobus.

The project site features a pedestrian network consisting of sidewalks and crosswalks along the local streets surrounding the project site. In addition to pedestrian accommodations, the site is also served by the on- and off-street bicycle network, which consists of bike lanes and signed bicycle routes along local roadways.

1.2 Roadways

As stated previously, the site is accessible via arterials, collector, and local streets. Figure 2 shows the roadway network hierarchy for the roadways in the vicinity of the proposed development. The immediate study area of the proposed development has several key local access roads. These include the following:

- *Georgia Avenue/7th Street*
  Georgia Avenue is a four-lane arterial which runs north-south to the east of the redevelopment site. The roadway is classified by DDOT as a principal arterial with an average annual weekday traffic volume of 13,800 vehicles south of Florida Avenue.

- *Florida Avenue*
  Florida Avenue is a four-lane arterial which runs east-west along the northern site boundary. The roadway is classified by DDOT as a principal arterial with an average annual weekday traffic volume of 28,500 vehicles west of Georgia Avenue.

- *9th Street*
  9th Street is a four-lane arterial which runs north-south along the western site boundary. The roadway is classified by DDOT as a minor arterial. Traffic volume data is not available for 9th Street within the study area.

- *8th Street*
  8th Street is a two-lane roadway which runs north-south in between the East and West Buildings. The roadway is classified by DDOT as a local street. Traffic volume data is not available for 8th Street within the study area.

- *T Street*
  T Street is a two-lane roadway which runs east-west to the south of the redevelopment site. The roadway is classified by DDOT as a local street. Traffic volume data is not available for T Street within the study area.

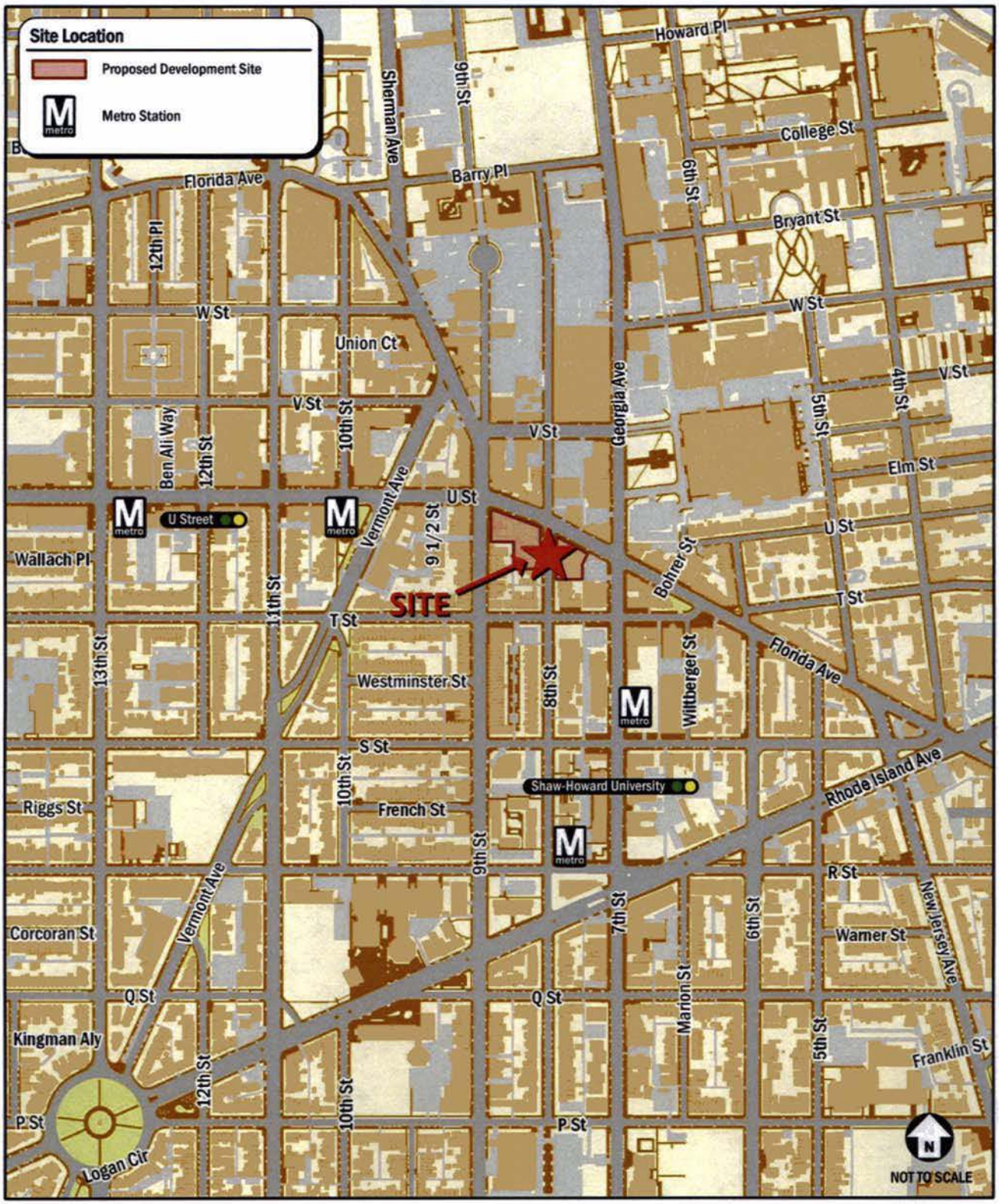

Figure 1: Site Location

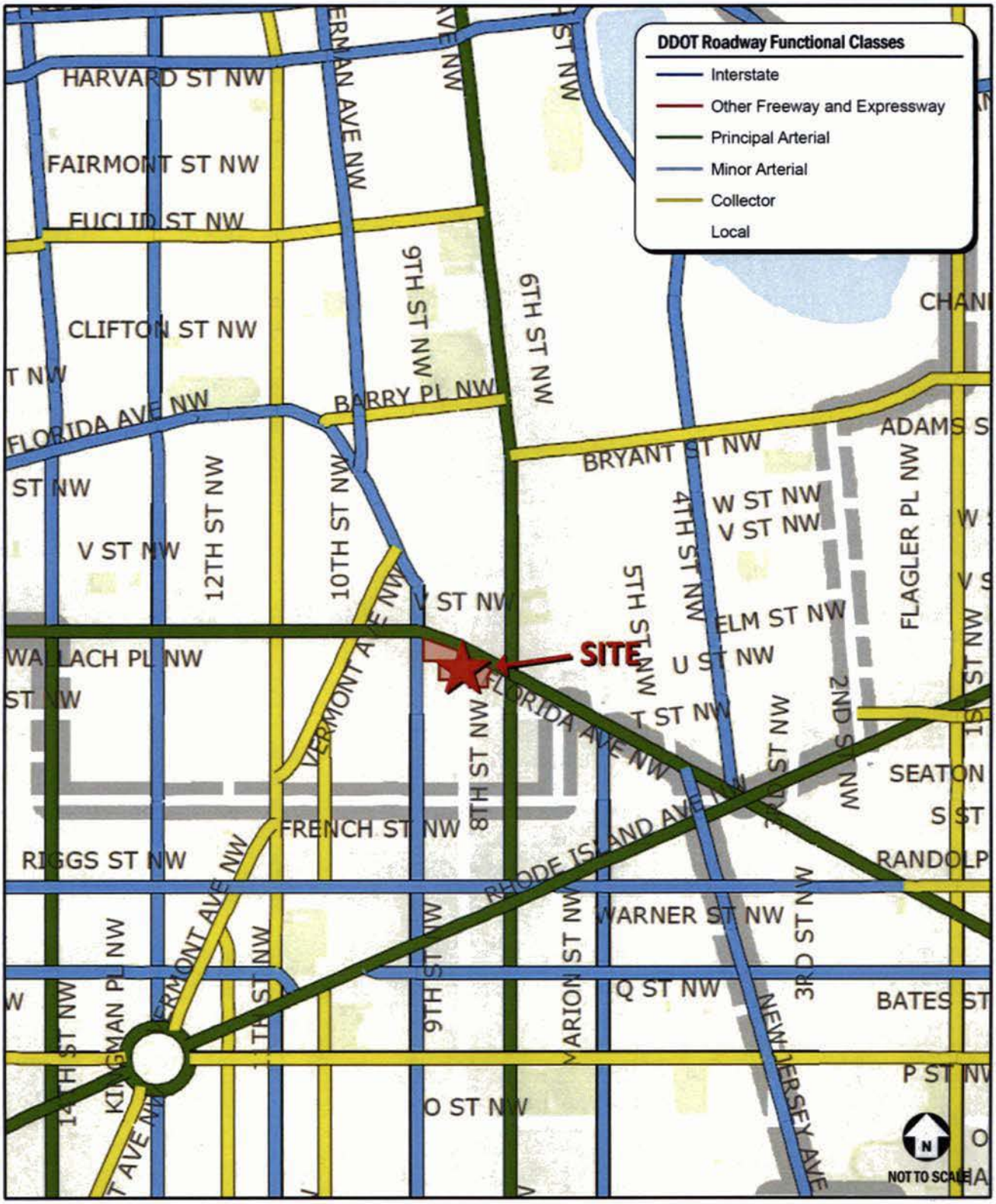

Figure 2: Roadway Functional Classification

1.3 Car-Sharing

Car-sharing is provided in DC and the vicinity of the study area by Zipcar. Zipcar is a private company that allows registered users to reserve cars for a minimum of 30 minutes or for longer periods (up to several days) and provides individual access to a variety of automobiles for trips made easier by car. Table 1 lists the car-sharing locations within 3 blocks of the site and the number of vehicles available.

Table 1: Carshare Location and Vehicles

Carshare Location	Number of Vehicles
Howard University at 8th Street and Florida Avenue NW	10 vehicles
Shaw/Howard Univ. Metro (7th Street & R Street)	1 vehicle
Howard University/8th Street	2 vehicles
Howard University at Howard Center	1 vehicle
Total Number of Carshare Vehicles in Study Area	**14 vehicles**

Car-sharing is also provided by Car2Go in DC. Car2Go is new to the District and provides point-to-point car sharing. Unlike Zipcar, which requires a two-way trip, Car2Go can be used for one-way rentals. Car2Go currently has a small fleet of vehicles located throughout the District. Car2Go vehicles may park in any non- restricted Metered curbside parking space or Residential Parking Permit location in any zone throughout the defined "Home Area". Members do not have to pay the meters or pay stations. Vehicle availability is tracked through their website. While no Car2Go car-sharing vehicles are permanently located within the study area, they provide an additional option for car-sharing patrons.

1.4 Transit

The study area is served by heavy rail and local bus service. Combined, these transit services provide local, city wide, and regional transit connections and link the site with major cultural, residential, employment, and commercial destinations throughout the region. Figure 3 identifies the major transit routes, stations, and stops in the study area.

The nearest Metrorail station is U Street, with a portal located at the intersection of U Street and 10th Street, approximately 600 feet from the intersection of U Street/Florida Avenue and 9th Street. Additionally, the Shaw/Howard University Metrorail station provides access to the site, with portals located approximately 1,000 feet from the intersection of Florida Avenue and 8th Street at the intersection of 7th Street and S Street. The green and yellow lines serves the U Street and Shaw/Howard University stations, running approximately every 6 minutes during the morning and afternoon peak periods and every 15 to 20 minutes during the weekday off-peak periods and on weekends.

Metrobus service is accessible to the site, with stops adjacent to the site on U Street/Florida Avenue at 7th and 9th Street and near the site on other surrounding roadways. The majority of the Metrobus lines that serve the site converge at the nearby Metrorail stations. These routes connect the site with several destinations throughout downtown DC and the surrounding areas. Table 2 shows a summary of the bus route information for the lines that serve the bus stops located within one quarter-mile of the site, including service hours and the headways. Figure 3 shows the existing rail and bus service.

Table 2: Bus Route Information

Route Number	Route Name	Service Hours	Headway
90, 92, 93	U Street-Garfield Line	24 Hours	15-20 min <10 min during peak periods
96, 97	East Capitol Street-Cardozo Line	24 Hours, serves study area during Saturday/Sunday service only	30 min
X1, X3	Benning Road Line	Weekdays 6:00 AM – 10:00 AM Westbound Weekdays 3:30 PM – 7:00 PM Eastbound	20 min
70	Georgia Avenue-7th Street Line	24 Hours	10-15 min
79	Georgia Avenue Metro Limited	Weekdays 6:00 AM – 7:00 PM	10-12 minutes
62, 63	Takoma-Petworth Line	Weekdays 4:30 AM – 2:00 AM Saturdays 5:30 AM – 2:30 AM, only serves study area 7:00 AM – 9:00 AM and 4:00 PM – 6:00 PM Saturdays 5:00 AM – 1:00 AM, does not serve study area during this time	20 min
60, 64	Fort Totten-Petworth Line	5:00 AM – 2:00 AM	20 min

Due to growth of population, jobs, and retail in several neighborhoods in the District and the potential for growth in other neighborhoods, the District's infrastructure is challenged with the need for transportation investments to support the recent growth and to further strengthen neighborhoods. In order to meet these challenges and capitalize on future opportunities, DDOT has developed a plan to identify transit challenges and opportunities and to recommend investments. This is outlined in the *DC's Transit Future System Plan* report published by DDOT in April 2010. This plan includes the reestablishment of streetcar service in the District and in the vicinity of the proposed development.

The proposed streetcar system element of the plan, as shown on Figure 4, includes three routes that travel near the redevelopment site. The streetcar system will consist of modern low-floor vehicles that operate on surface tracks embedded in the roadways, which will mostly operate in travel lanes that are shared with automobiles. Stops will generally be located every ¼- to ½-mile along the routes. The future planned routes serving the study area will connect the site to several areas in the District including Rhode Island Avenue, Washington Circle, Buzzard Point, Woodley Park/Adams Morgan, Congress Heights, Brookland, and Takoma.

The Metro Express limited-stop bus service element of the plan, as shown on Figure 5, includes several routes that travel near the site. The new limited-stop bus service will consist of high-frequency buses using specially marked vehicles, operated by WMATA, which will supplement the four existing Metro Express routes that operate along Georgia Avenue, 16th Street, Wisconsin Avenue, and Pennsylvania Avenue. Stops will generally be located every ¼- to ½-mile along the routes. The Metro Express bus services will also include traffic signal priority and real-time Next Bus arrival displays. The future planned corridors near the development include 16th Street, 14th Street, Georgia Avenue, North Capitol Street, Columbia Road/Michigan Avenue, U Street/Florida Avenue, and Rhode Island Avenue.

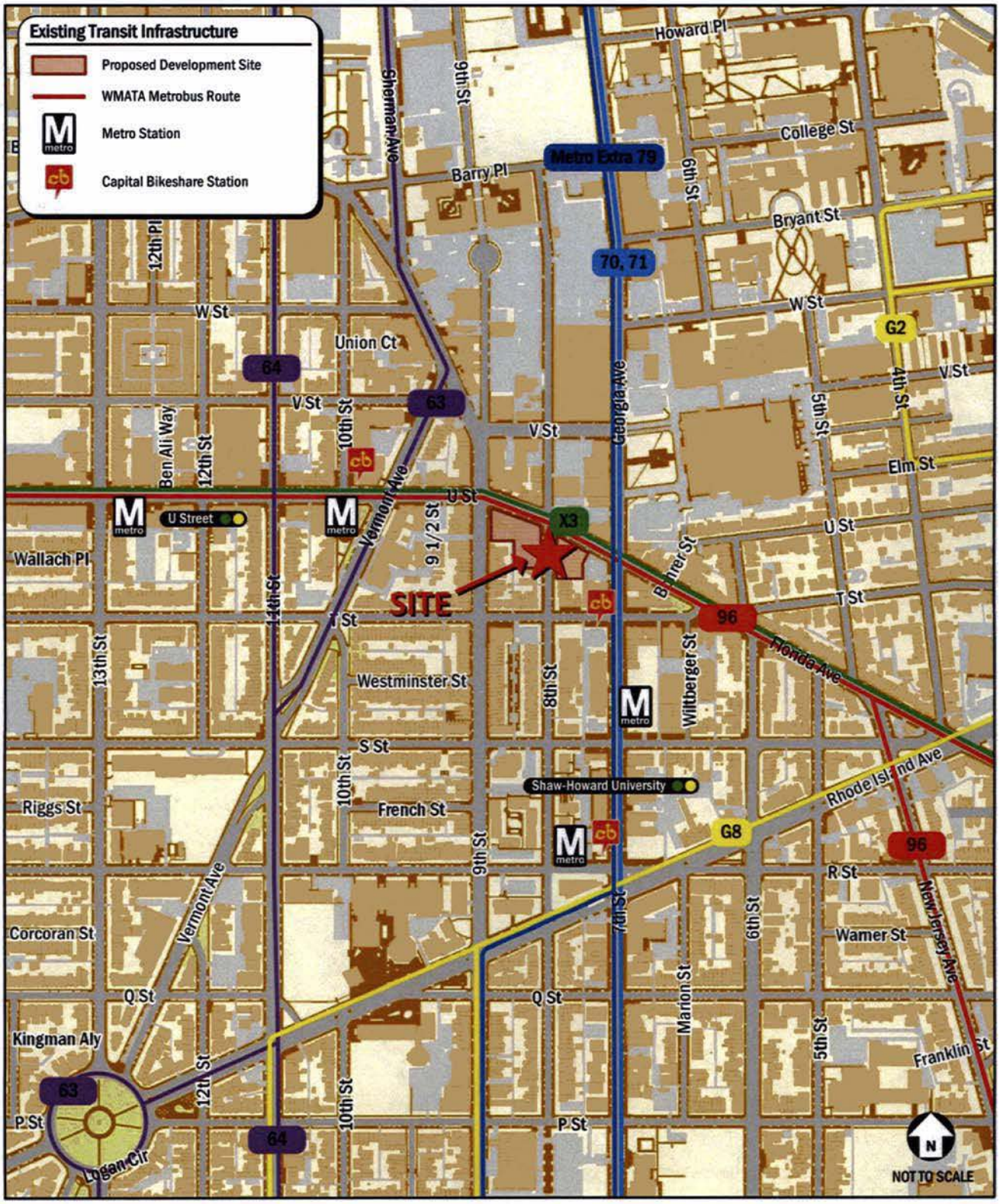

Figure 3: Existing Transit Routes, Stations, and Stops

Figure 4: Future Transit Plan – Streetcar Element

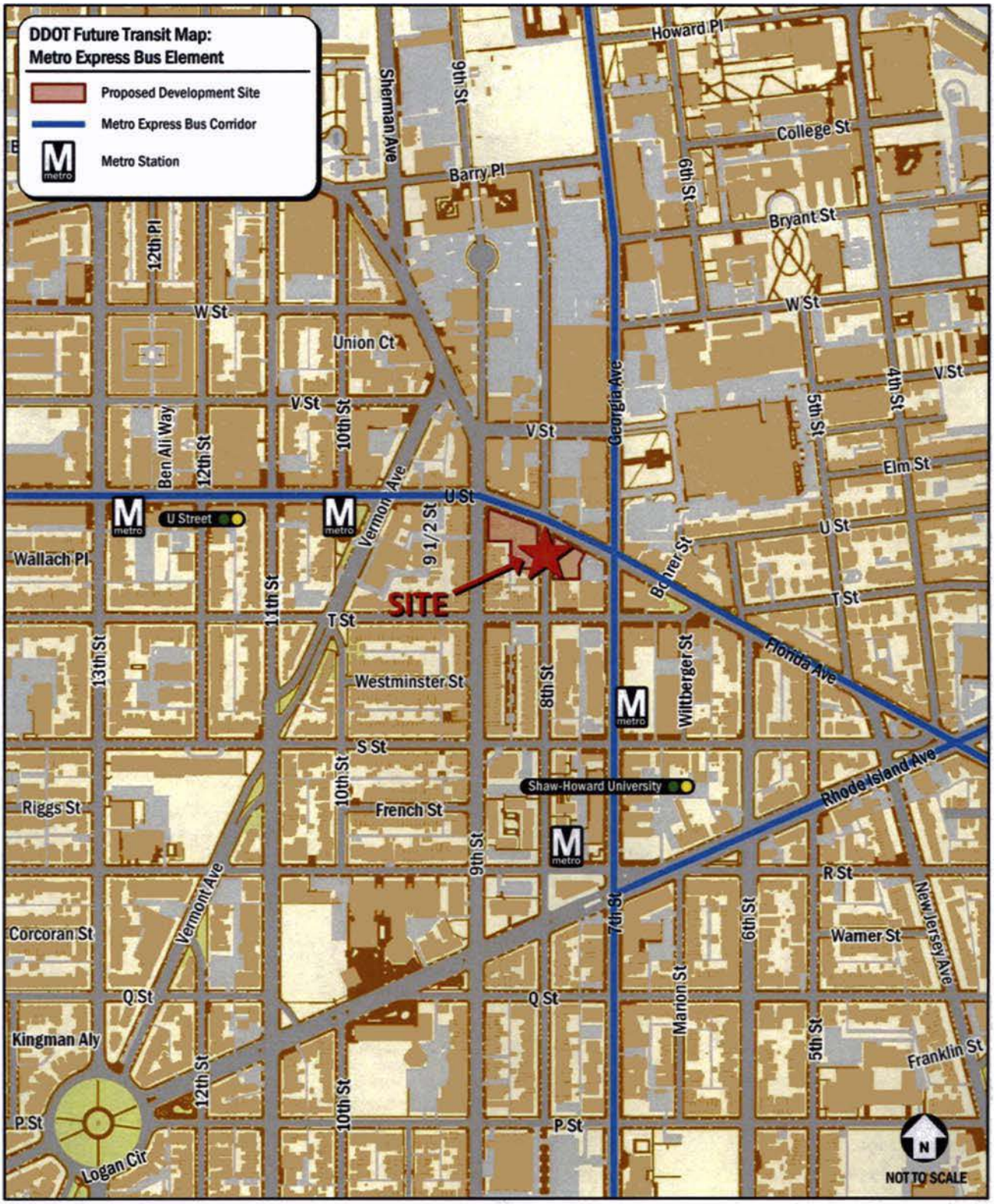

Figure 5: Future Transit Plan – Metro Express Bus Element

1.5 Bicycle Facilities

Within the study area, bicyclists have access to on-street bike lanes, signed bike routes, and local and residential streets that facilitate cycling. The site is directly served by signed bicycle routes and local streets that accommodate cycling. Bicycle use for commuting, short trips, and recreation is increasing in the District and the study area. Increased bicycle traffic can be observed throughout the study area and the limited amount of bicycle parking is frequently occupied during peak periods. On-street bike lanes and signed bike routes have increased in the study area as well. These facilities provide good conditions for cycling in the area around the site, but connections to the surrounding area are limited. Reduced cycling conditions are primarily due to changes in topography and roadway conditions. Figure 6 shows the existing bicycle facilities in the study area.

Several streets in the study area act as barriers between the site and the surrounding area. In particular, Georgia Avenue and Florida Avenue have narrow lane widths and high traffic volumes that discourage cycling. The District Department of Transportation (DDOT) indicates that Georgia Avenue has poor traffic conditions for bicycling between Florida Avenue and Euclid Street, the portion of Georgia Avenue that borders the Howard University Central Campus. This is also true of 9th Street/Sherman Avenue north of Florida Avenue.

As shown in the *DC Bicycle Master Plan* from April 2005, DDOT's proposed bicycle infrastructure for the roadways in the vicinity of the proposed development includes several multi-use trails, on-street bike lanes, and signed bicycle routes. The facilities will significantly improve bicycling conditions in the study area and may lead to higher rates of cycling. They also link the site with major residential and commercial destination in Northwest, DC and beyond. Bike lanes are planned along Q and R Street to the south, V and W Street to the north, Vermont Avenue and 9th Street to west, and extensions along 7th Street to the east.

The newly formed Capital Bikeshare was launched in late September 2010 to replace the DC SmartBike program. This program has placed over 160 bicycle-share stations across Washington, DC and Arlington, VA with approximately 1,525 bicycles provided. In the vicinity of the proposed development, Capital Bikeshare stations have been placed in several locations [1], as shown in Table 3. In conjunction with the improvements proposed in the *Bicycle Master Plan*, the Capital Bikeshare program will increase accessibility of bicycles to the proposed redevelopment. Bikeshare makes bicycling an attractive and convenient option. Capital Bikeshare has plans to expand the system and potential new station locations and expanded locations have been identified. There is not an official timeline for when potential stations will be installed. The DDOT map of "Capital Bikeshare Proposed and Expanded Locations" does not show any additional locations within the study area.

Table 3: Bikeshare Location and Docking Stations

Bikeshare Location	Number of Docking Stations
10th Street & U Street	15 docking stations
7th Street & T Street	15 docking stations
7th Street & R Street/Shaw Library	15 docking stations
Total Number of Bikeshare Docking Stations Study Area	**44 docking stations**

[1] Capital Bikeshare: www.capitalbikeshare.com

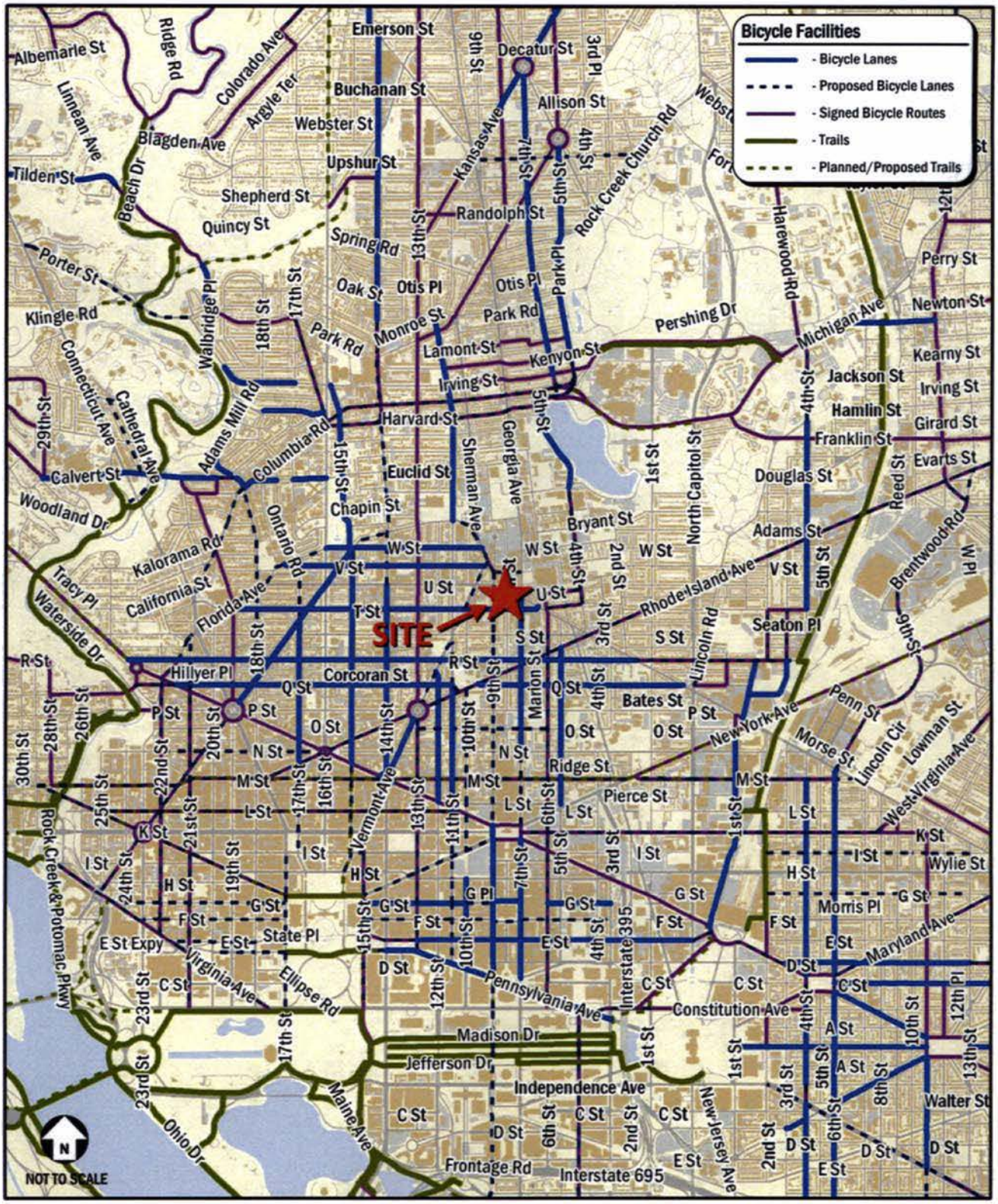

Figure 6: Existing Bicycle Facilities

1.6 Pedestrian Facilities

Overall, the pedestrian facilities within the study area provide a good walking environment. A map of the pedestrian infrastructure is shown as Figure 7. Generally, pedestrian facilities are adequate within the study area. Sidewalks are provided on the study area roadways, and crosswalks are constructed at the study intersection. Along Florida Avenue, north of the site, signalized crossings are provided at Georgia Avenue/7th Street and 9th Street to the east and west, respectively. An additional, unsignalized crossing is located at 8th Street on the east side of the intersection. Along T Street, south of the site, signalized crossings are available at 9th Street and 7th Street, with an additional unsignalized (all-way-stop) crossing located at 8th Street.

Generally, the pedestrian network surrounding the proposed redevelopment provides adequate infrastructure. However, within the study area, a few areas with narrow sidewalks are noted on Figure 7. This includes Westminster Street and French Street to the south and 9th Street/Sherman Avenue to the north. Additional barriers in the study area include the Howard University campus, which limits east-west connectivity, and the lack of controlled crosswalks and high vehicular travel speeds on 9th Street/Sherman Avenue, which limit east-west pedestrian flow.

1.6.1 Florida Avenue Crossing

At the intersection of Florida Avenue and 8th Street, an existing striped unsignalized crossing on Florida Avenue exists which permits pedestrians to cross a heavy commuter route without protection. This crossing has been identified by DDOT as a potential safety concern. Under current conditions, it was observed that very few pedestrians cross at this location. During the morning peak hour, a total of 6 pedestrians were observed crossing at this location while during the evening peak hour a total of 10 pedestrians were observed crossing. Both of these represent a limited number of crossings during the peak hour. To support pedestrians crossing Florida Avenue in the area, signalized crossings exist at 9th and 7th Streets which are only 200 and 300 feet away and permit safe crossings of Florida Avenue.

1.7 On-Street Parking

Within the vicinity of the Florida Avenue Redevelopment, on-street parking consists of a combination of residential permit parking (RPP) and standard on-street metered parking. While parking is generally permitted along most block faces in the area, it is not permitted along the southern portion of Florida Avenue throughout the entire study area.

Parking occupancy was observed in the vicinity of the site during the morning and evening peak hours as well as in the evening when most residents of the area would be home for the evening. Generally, it was observed that during the peak hours there was adequate parking available for persons traveling to the area with a supply of approximately 25-30% available along the various block faces. Later in the evening, it appears that parking demand increases slightly with a lower number of parking spaces available as compared to the peak hours. Overall the increase in demand still allowed for some parking in the area, but at a lower level than during the peak periods. This increase in demand is likely two-fold based on the community residents being home for the evening and patrons visiting the area restaurants and entertainment establishments.

Figure 7: Existing Pedestrian Infrastructure

1.8 Future Projects & Developments

1.8.1 District Initiatives

Several background studies have been undertaken in the study area to help improve the quality of life in the neighborhoods surrounding the Florida Avenue Redevelopment. These studies include the *7th Street/Georgia Avenue Great Streets Framework Plan*; the *Lower Georgia Avenue Transportation and Streetscape Study*; the *DUKE Draft Development Framework for a Cultural Destination District within Washington, DC's Greater Shaw/U Street*; and the Mid-City Element of the *DC Comprehensive Plan*.

The Great Streets initiative is the largest District background improvement in the study area. Recommendations for the Georgia Avenue corridor were obtained from the *Lower Georgia Avenue Transportation and Streetscape Improvements Final Report* from December 2007. This study focuses on transportation improvements for pedestrians/bicycles, transit, and vehicles in order to improve multimodal mobility along the Georgia Avenue and Sherman Avenue corridors between Florida Avenue and New Hampshire Avenue. Right-of-way options are defined in the Plan to improve bus service along the corridor and prepare for the Streetcar. Additionally, pedestrian facilities, including bulb-outs, high visibility crosswalks, and sidewalk extensions, are included in the Plan, as well as bicycle facilities, including signed bicycle routes and bike lanes. In order to improve vehicular travel, signal coordination and transit signal prioritization are suggested, as well as left-turn pockets at intersections where pedestrian bulb-outs are not planned.

1.8.2 Background Developments

There is one other project under construction in the vicinity of the proposed development: Progression Place. Progression Place is located at the intersection of 7th Street and T Street, above the Shaw/Howard University Metrorail portal. The mixed-use development consists of a mix of office, residential, and retail uses. The development contains approximately 100,000 square feet of office uses, 205 residential dwelling units, and 20,000 square feet of street-level retail.

1.8.3 Howard University

As stated previously, the Howard University Central Campus is located approximately one quarter-mile from the proposed redevelopment. The Howard University Campus Master Plan (HUCMP) was submitted in 2011 and includes the development projections for year 2011 through 2021. The population changes expected over the course of the HUCMP are modest. The amount of students is projected to increase, and notably the amount of students living within the campus boundaries is expected to increase significantly. The number of faculty and staff employed by the University (in non-Hospital roles) is expected to remain constant.

Although the planned student population change is modest, the HUCMP includes a significant number of development sites for new buildings or major renovations. The development sites will be the location primarily of University facilities, including academic, research, library, student services, and administrative spaces intended to elevate Howard University's position in the academic marketplace fostering the recruitment and retention of top students, faculty and staff. Four of the development sites are residence hall buildings. The other two buildings are a proposed recreation center and a workforce housing building. Another development to be located on adjacent property owned by Howard University is the Howard University Town Center, a mixed-use residential and retail development. A number of existing buildings and surface parking lots will be removed to make room for these future developments.

Due to the HUCMP's development year of 2021, the Plan is not expected to have any influence on the proposed Florida Avenue Redevelopment, which is projected to be completed in 2015. However, the Further Processing Application for two

of the residence halls proposed in the HUCMP was approved. The first residence hall is located at the southeast corner of 4th Street and College, while the second is located east of 4th Street, between Bryant Street and W Street The two residence halls, containing approximately 484 beds and 878 beds, are projected to be completed before 2015. Since the residence halls are not constructing any dedicated vehicular parking and are removing an existing surface parking lot, the *Transportation Impact Study*[1] performed for the Residence Halls concluded that no vehicular trips would be generated. Due to the nature of the residence halls serving students living on campus and primarily attending classes on the adjacent Central Campus, the only trips generated would be pedestrian trips. These pedestrian trips to and from the Central Campus will not have an influence on the study area of the Florida Avenue Redevelopment.

[1] *Transportation Impact Study*, Howard University – Residence Halls, performed by Gorove/Slade Associates, Inc. on October 28, 2011

2: DESIGN REVIEW

This report section provides an overview of the on-site transportation features of the proposed Florida Avenue Redevelopment. It supplements the information provided in the site plans package that accompanied the zoning applications, which includes several illustrations of site circulation and layout.

2.1 Site Plan & Development Program

The development program for the Florida Avenue Redevelopment consists of a mix of ground floor neighborhood serving retail along with apartment units located above the retail. The overall site is comprised of two separate buildings. The West Building is generally bounded by Florida Avenue to the north, 9th Street to the west, 8th Street to the east and townhouses to the south. Located across 8th Street from the West Building, the East Building consists of a slightly smaller footprint bounded by Florida Avenue to the north, 8th Street to the west, and existing uses to the east and south. The buildings will rise up to 6 stories (dropping down to 4-5 stories in some locations) above the street level. Details regarding the individual buildings are described in further detail below with a ground-floor site plan shown on Figure 8. The approximate breakdown of the development program for the site is shown below in Table 4.

Table 4: Program Summary

Building	Program Summary	
	Retail Space (Square Feet)	Residential – Apartments (Dwelling Units)
West Building	22,000	163
East Building	10,000	94
Total	32,000	257

2.1.2 West Building

The West Building of the Florida Avenue Redevelopment site as shown above is proposed to consist of approximately 163 dwelling units served by approximately 22,000 square feet of ground floor retail space. The retail space is intended to serve the residential component of the site as well as the immediate neighborhood.

2.1.3 East Building

The East Building is intended to be slightly smaller than the West Building. This is primarily due to the smaller footprint available within the property area. The East Building is expected to consist of approximately 10,000 square feet of neighborhood serving retail space and approximately 94 residential units.

2.2 Site Access and Internal Circulation

2.2.1 Vehicular Access

Vehicular access for the West Building is proposed via the alley system which currently connects Florida Avenue and T Street. As shown on Figure 8, the existing alley connection on Florida Avenue would be removed due to the future West Building with a future connection onto 9th Street. This connection to 9th Street would provide continuous access through the alley system and be designed as public right of way as part of an alley easement. Access to a below grade parking garage and loading/service area for this building is provided off of the alley system.

Vehicular access to the East Building will be provided from a future curb cut on the east side of 8th Street to a private driveway serving the building. All private vehicles and loading/trash trucks will access the site from this driveway with a below grade parking facility serving retail patrons and residents.

2.2.2 Loading

As with the vehicular access point, loading access for the West Building is also provided from the alley system connecting 9th and T Streets. For purposes of circulation, any loading vehicles accessing the site would be required to enter the alley from 9th Street. Dependent on the width of the vehicle, exiting the site could be accomplished onto either 9th or T Street. Loading for this building has been proposed to be served by one 20-foot loading berth and one 30-foot loading berth. Due to the average unit size of the residences and retailers, this supply is expected to support the demand of the site.

Similarly to the West Building, loading and delivery access for the East Building is shared with the vehicular access point. All loading, service, and trash access are provided by the private driveway serving the building. Serving these operations are one 20-foot loading space and one 30-foot loading space. Again, one berth will be dedicated to each use.

Loading operations for the Florida Avenue Redevelopment is intended to be separated by both access and loading area. As shown on Figure 8, the loading area serving the West Building will access the site via a relocated curb-cut from 9th Street into an alley system which connects to T Street to the south. Similarly, the East Building loading area will be accessed from 8th Street via a future curb-cut to a private driveway serving the site.

Based on the existing zoning of the site in the C-2-B district, the development would be required to provide the following number of loading berths, platforms and service/delivery spaces as shown in Table 5.

Table 5: Loading and Delivery Zoning Requirements

Land Use	Size	Units	Loading Berths	Loading Platforms	Service/Delivery Space
West Building					
Apartment	163	Dwelling Units	1 @ 55' Deep	1 @ 100 ft^2	1 @ 20' Deep
Shopping Center	22,000	Square Feet	2 @ 30' Deep	2 @ 100 ft^2	1 @ 20' Deep
East Building					
Apartment	94	Dwelling Units	1 @ 55' Deep	1 @ 100 ft^2	1 @ 20' Deep
Shopping Center	10,000	Square Feet	1 @ 30' Deep	1 @ 100 ft^2	

Given the location of the site and the physical constraints of 9th and 8th Streets, the Applicant is proposing to support loading and delivery operations with the loading areas shown in Table 6.

Table 6: On-Site Loading and Delivery Areas

Land Use	Loading Berths	Loading Platforms	Service/Delivery Space
West Building	1 @ 30' Deep	1 @ 100 ft^2 1 @ 200 ft^2	1 @ 20' Deep
East Building	1 @ 30' Deep	1 @ 200 ft^2	1 @ 20' Deep

Based on the anticipated dwelling unit size and average size of the retail establishments and in consultation with management of loading operations by the property owner, these loading bays are anticipated to sufficiently support the demands of the development.

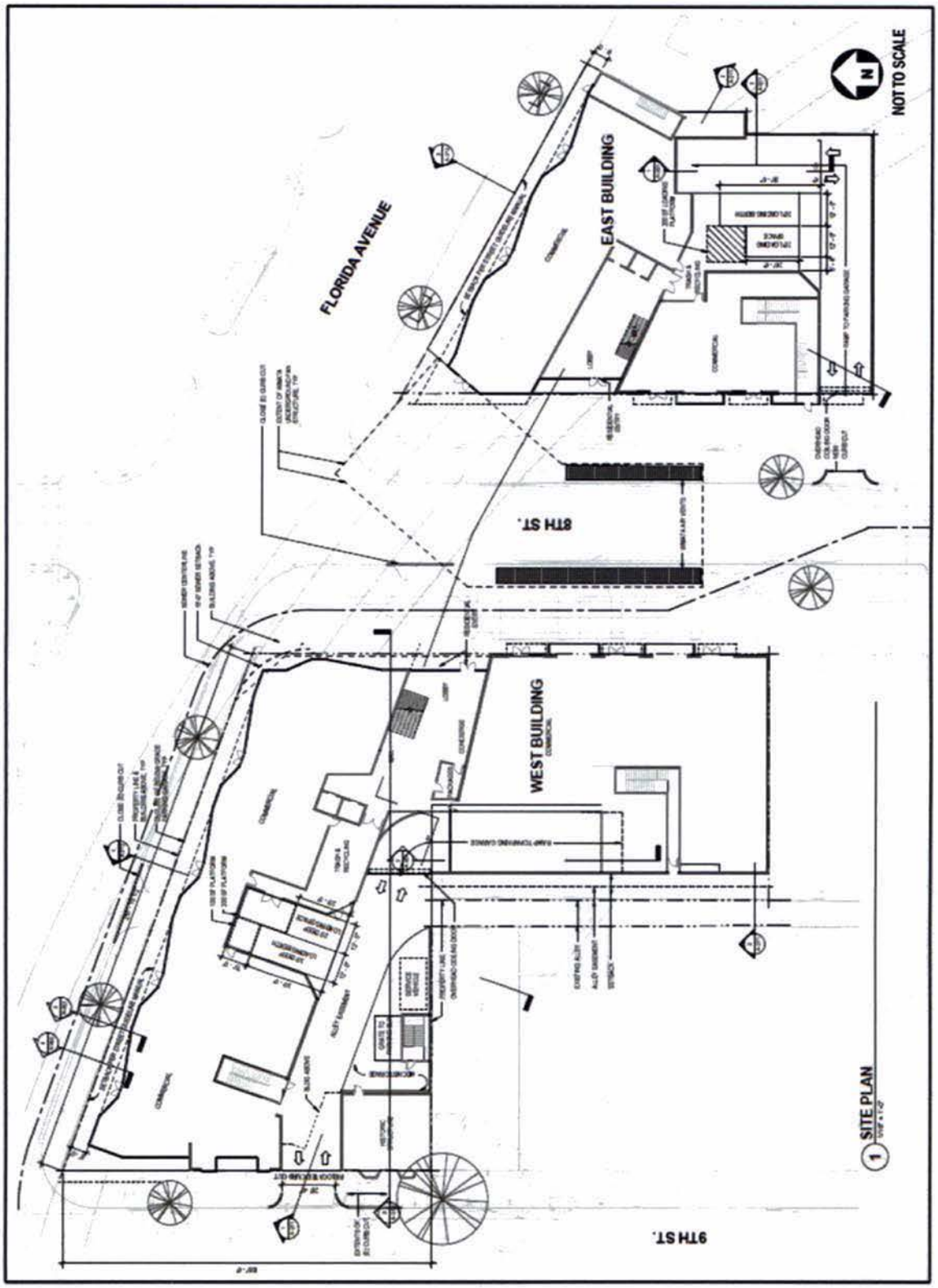

Figure 8: Site Plan

2.2.3 Parking

In an effort to support both the retail and residential uses of the Florida Avenue Redevelopment, the Applicant proposes below grade parking structures serving each building. Based on the current zoning of the site as C-2-B, the development would be required to provide a minimum of 81 parking spaces in the West Building and an additional 42 spaces in the East Building for a total of 123 spaces. These values are shown in Table 7. In order to support the demands of the site, the development has been proposed with 69 spaces on the West Building and 29 spaces on the East Building, for a total of 98 spaces. While the supply would require relief from the parking requirements, parking demand for the development is expected to be supported by the various modes of transportation in the vicinity of the site. With a significant bus system along Florida Avenue and 7th Street/Georgia Avenue and the existence of two Metrorail stations within walking distance of the site, parking demand will be greatly reduced.

Table 7: Off-Street Parking Comparison

Land Use	Size	Units	Required by Zoning	Provided
West Building				
Apartment	163	Dwelling Units	55	
Shopping Center	22,000	Square Feet	26	
Sub-Total			*81*	*69*
East Building				
Apartment	94	Dwelling Units	32	
Shopping Center	10,000	Square Feet	10	
Sub-Total			*42*	*29*
Total			**123**	**98**

As part of the ongoing negotiations with the District of Columbia Office of Planning and Department of Transportation, the Applicant has been provided preliminary approval of the proposed parking supply. This is based on the position of both offices to minimize off-street parking availability for redevelopments such as the Florida Avenue site.

2.2.4 Bicycle Facilities

In compliance with the most recent District of Columbia zoning requirements, the Florida Avenue Redevelopment is committing to providing at least the minimum required parking spaces for bicycles. In order to accommodate these bicycles within the property, secure space within the below grade parking garage will be provided. Access to this area for both buildings will be provided by ramps serving the vehicular parking areas. Secure bicycle parking areas will be provided once inside the parking garage for both the retail and residential components.

As mentioned previously, the Florida Avenue Redevelopment is intending on supporting the bicycle parking demands required as part of its zoning application. Based on the parking regulations for the site of providing 1 parking space for each 3 residential units and providing retail bicycle parking equivalent to 5 percent of the vehicular parking, the West Building would require 57 spaces while the East Building would require 33 spaces.

As a means to assist in promoting bicycle utilization for the site, the Applicant has proposed 60 and 36 bicycle spaces in the West and East Building, respectively which fully supports the zoning requirements of the development. In addition to these secure parking spaces located on the lower level parking garage for each building, the Applicant is also in negotiations with Capital Bikeshare to potentially install a bicycle sharing station within public area adjacent to the site.

2.2.5 Pedestrian Access

Residential pedestrian access for the West Building will be through a lobby area located along 8th Street just south of Florida Avenue. As part of the architectural element of the site, the residential access points for the West and East Buildings are intended to be nearly identical in design and location along 8th Street. Additional emergency egress points will be located adjacent to all building stairwells, but it is unknown if residents will be permitted to enter the building via these doors. Pedestrian patrons of the ground-floor retail establishments will be able to access these stores directly from street level.

Continuing the architectural elements of the development, access for the residents and retail patrons of the East Building are proposed from Florida Avenue and 8th Street. Residential access is proposed opposite the residential access of the West Building with additional emergency access provided as mentioned above. Retail access is dispersed along both roadways with several ingress/egress points for the various retail spaces.

2.2 Transportation Demand Management

Transportation Demand Management (TDM) is the application of policies and strategies used to reduce travel demand or to redistribute demand to other times or spaces. TDM typically focuses on reducing the demand of single-occupancy private vehicles during peak period travel times or on shifting single-occupancy vehicular demand to off-peak periods.

TDM's importance within the District is highlighted within section T-3.1 of the DC Comprehensive Plan, where it has its own dedicated section including TDM policies and actions. As stated in the Plan, the Washington DC, metropolitan region is a leader in developing and implementing TDM strategies. Typical TDM programs include:

- Carpooling/vanpooling, employee shuttles, and improvements that encourage bicycling and walking
- Financial incentives, such as preferential parking for ride-sharers and transit subsidies
- Congestion avoidance strategies, such as compressed work weeks, flexible work schedules and telecommuting

2.2.1 DDOT TDM Expectations for District Development Proposals

The District of Columbia is quickly growing and attracting new residential, commercial, and retail development and redevelopment, which are generating significant additional vehicular traffic to, from, and within the District. In order to meet the District's goals of reducing automobile trips and accommodation travel through the complete transportation network, DDOT is developing a systematic approach and process for integrating TDM in to the development and redevelopment permit process.

Currently, TDM is handled on a project-to-project basis, with a one-size-fits-all framework to development. This approach does not allow for maximization of TDM opportunities or provide a process for consistent application of TDM goals. To address these issues, DDOT initiated an analysis of TDM in the development review process conducted by Michael Baker Jr., Inc. with the assistance of Nelson/Nygaard Consulting Associates; Strategic Transportation Initiatives, Inc.; and Patton Harris Rust & Associates, which is documented in *Incorporation of Transportation Demand Management (TDM) into the Development Review Process, Final Report and Recommendations* from July 2010.

This Final Report includes a *TDM Recommendations Matrix,* which outlines the expected TDM measures that proposed developments are expected to include. The matrix breaks down development proposals by their type (for example by-right vs. PUD), and by the amount of peak hour trip generation.

This report recommends that detailed TDM plans be submitted at the time of their application submissions. It is highly likely that DDOT TDM expectations and requirements, as well as changes in transportation options (for example, the growth of Capitol Bikeshare and the DC Circulator in recent years); will change the landscape of TDM planning.

The trip generation places the site within the "Proposed requires a variance (or is a PUD) and project generates between 100 and 400 peak hour auto trips" category of the TDM Recommendations Matrix (Table 2) from the DDOT TDM report.

According to the TDM Recommendations Matrix, the following five TDM measures are required based on the type of development.

- During construction, maintain or coordinate relocation of any existing bus stops at the developer's expense.
- Comply with Zoning requirements to provide bicycle parking/storage facilities.
- Require all parking costs be unbundled from the cost of lease or purchase. Parking costs must be set at no less than the charges of the lowest fee garage located within ¼ mile.
- Post all TDM commitments on-line, publicize availability, and allow the public to see what commitments have been promised.
- Identify a project's TDM Leader (for planning, construction, and operations). Provide DDOT/Zoning Enforcement with annual TDM Leader contact updates.

In addition to the five measures above, fifteen TDM measures are designated as expected with the option to substitute potential other TDM measures.

- Provide website links to CommuterConnections.com and goDCgo.com on developer and property management websites.
- Provide an on-site business center to residents with access to copier, fax, and internet services.
- Provide a one-time membership fee subsidy in a car sharing program for each residential unit.
- Install a Transportation Information Center Display (kiosk) containing printed materials related to local transportation alternatives, and maintain a stock of materials at all times.
- At no cost, dedicate two spaces in the garage for car sharing services to use with right of first refusal. Locate spaces that are convenient to the garage entrance, available to members of the car sharing service twenty-four hours a day, seven days a week, without restrictions (the garage may be gated – members of the service would have access to the spaces via a key pad combinations to a pass code system or other similar device). Count the car sharing space towards the project's parking requirements.
- Provide reserved spaces for carpools and vanpools that are conveniently located with respect to the elevators serving the buildings. Oversee a program to provide carpools and vanpools with a parking subsidy.
- Provide secured bicycle parking/storage facilities (lockers, bicycle valet parking, etc.).
- Contribute funding to available, non-exclusive Shuttle Service to Metro or DC Circulator (based on total number of trips generated). Only applies to development not considered Transit Oriented Developments by DDOT.*
- Provide location for Bikeshare Program Station/Kiosk.
- Provide Ongoing Funding for on-site Bikeshare Program.

- Provide each new resident with a 1-year subscription to DC Bikesharing program.
- Provide residents with $75 mail-in refund on bicycle purchases.
- Locate and furnish an on-site Transit Store free of charge.
- 30-year commitment to operate an on-site Transit Store.
- Install and maintain new bus stop infrastructure.

The TDM measures that can be substituted for the expected measures listed above are:

- Provide SmarTrip cards plus $100.00 Metro fare media per person, for free, one time, per employee, to each of the tenants' employees and each on-site employee of the property management company and/or building operator. (30-year commitment required.)
- Provide SmarTrip cards plus $100.00 Metro fare media per person, for free, one time, per resident. (30-year commitment required.)
- Operate a Shuttle service to metro (or other appropriate destinations) specific to the site/development.*
- Construct new Metro Rail stations connection (entrance, escalator, fare array).*

**Shuttles and Direct Access to Metro are site specific. DDOT expectations for these measures will be dependent on the practicality of adopting them at a specific location. Since the project is located adjacent to a MetroRail station, these TDM measure are not suitable for including in the Florida Avenue TDM Plan.*

2.2.2 Proposed TDM Plan

The Transportation Demand Management (TDM) plan for the Florida Avenue Redevelopment is based on the DDOT expectations for TDM programs, modified to allow for performance monitoring. The Applicant proposes that upon construction, the project incorporate several TDM measures, including some listed above but also including some not suggested in the DDOT report. At a certain point after opening, the success of the TDM measures will be measured, and the TDM plan adjusted if the plan is judged to not meet expectations.

The Applicant proposes the following TDM measures:

- The Applicant will comply with zoning requirements to provide bicycle parking/storage facilities.
- The Applicant commits that all parking costs be unbundled from the cost of lease or purchase. Parking costs must be set at no less than the charges of the lowest fee garage located within ¼ mile.
- The Applicant will identify a project's TDM Leader (for planning, construction, and operations), and provide DDOT/Zoning Enforcement with annual TDM Leader contact updates.
- The Applicant will post all TDM commitments on-line, publicize availability, and allow the public to see what commitments have been promised.
- The Applicant will provide website links to CommuterConnections.com and goDCgo.com on developer and property management websites.
- The Applicant will provide an on-site business center to residents with access to copier, fax, and internet services.

- The Applicant will install a Transportation Information Center Display (kiosk) within the residential lobbies containing printed materials related to local transportation alternatives, and maintain a stock of materials at all times.
- The Applicant will provide secured bicycle parking/storage facilities.
- The Applicant agrees to host a transportation mobility fair six months after both the residential buildings have opened. The transportation fair will be advertised to all residents and retail workers. The onsite TDM coordinator will work with DDOT's goDCgo team to organize representatives that are experts in the non-auto transportation options that serve the site. Each person that attends the event will be educated on the various options and representatives will work with attendees to help them tailor the use of non-auto options to their specific transportation needs. Based on the turnout of the transportation fair and feedback gleaned by the onsite TDM coordinator, a determination will be made if the event will be repeated the following year.

Two years after the project is occupied, the Applicant will perform a monitoring study of site trip generation. The site trips will be compared to the projected trip generation contained in this report. If the measured trip generation exceeds the projections, the Applicant will supplement the above TDM measures with additional ones, such as those from in *Incorporation of Transportation Demand Management (TDM) into the Development Review Process* suggested for a project of this size not listed above.

2.3 Compliance with Comprehensive Plan

The following table lists the transportation policies and actions from DC's Comprehensive Plan that are relevant to the development review process. As noted in the table, the Florida Avenue Redevelopment complies with all of the relevant policies and actions from the Comprehensive Plan.

Table 8: Relevant Comprehensive Plan Policies & Actions

DC Comprehensive Plan Policy/Action related to transportation and development projects	Comments
Policy T-1.1.2: Land Use Impact Assessment Assess the transportation impacts of development projects using multimodal standards rather than traditional vehicle standards to more accurately measure and more effectively mitigate development impacts on the transportation network.	This transportation study includes discussion and analysis of transit, pedestrian, and bicycle traffic that exceeds a traditional transportation study, especially those performed in suburban environments.
Action T-1.1.A: Transportation Measures of Effectiveness Develop new measures of effectiveness such as a multi-modal level of service standard to quantify transportation service and assess land use impacts on the transportation system.	DDOT has yet to develop a standard level of service standard to access land use impacts. The transportation engineering industry has no readily available metrics that can be easily used in the development review process beyond traditional vehicular capacity metrics. As stated above, this study includes discussion and analysis of transit, pedestrian, and bicycle traffic that exceeds a traditional transportation study.

DC Comprehensive Plan Policy/Action related to transportation and development projects	Comments
Action T-1.1.B: Transportation Improvements Require transportation demand management measures and transportation support facilities such as crosswalks, bus shelters, and bicycle facilities in large development projects and major trip generators, including projects that go through the Planned Unit Development (PUD) Process.	This application includes many improvements to the site, including bicycle parking. In addition, the application meets and exceeds DDOT's stated expectations for TDM measures.
Policy T-1.2.3: Discouraging Auto-Oriented Uses Discourage certain uses, like "drive-through" businesses or stores with large surface parking lots, along key boulevards and pedestrian streets, and minimize the number of curb cuts in new developments. Curb cuts and multiple vehicle access points break-up the sidewalk, reduce pedestrian safety, and detract from pedestrian-oriented retail and residential areas.	The redevelopment contains no surface parking lots. The site will utilize one existing curb cut located off of 9th Streets (while removing 2 existing curb cuts on 8th Street and Florida Avenue).
Action T-2.3.A: Bicycle Facilities Wherever feasible, require large new commercial and residential buildings to be designed with features such as secure bicycle parking and lockers, bike racks, shower facilities, and other amenities that accommodate bicycle users.	As described above, the redevelopment contains a significant amount of bicycle features. This includes short and long term parking.
Action T-3.1.A: TDM Strategies Develop strategies and requirements that reduce rush hour traffic by promoting flextime, carpooling, transit use; encouraging the formation of Transportation Management Associations; and undertaking other measures that reduce vehicular trips, particularly during peak travel periods. Identify TDM measures and plans as appropriate conditions for large development approval. Transportation Management Plans should identify quantifiable reductions in vehicle trips and commit to measures to achieve those reductions. Encourage the federal and District governments to explore the creation of a staggered workday for particular departments and agencies in an effort to reduce congestion.	The application has proposed to include TDM measures meeting DDOT's expectations contained within *Incorporation of Transportation Demand Management (TDM) into the Development Review Process.*
Action T-3.2.D: Unbundle Parking Cost Find ways to "unbundle" the cost of parking from residential units, allowing those purchasing or renting property to opt out of buying or renting parking spaces. "Unbundling" should be required for District-owned or subsidized development, and the amount of parking in such development should not exceed that required by Zoning. Further measures to reduce housing costs associated with off-street parking requirements, including waived or reduced parking requirements in the vicinity of Metrorail stations and along major transit corridors, should be pursued during the revision of the Zoning Regulations. These efforts should be coupled with programs to better manage residential street parking in neighborhoods of high parking demand, including adjustments to the costs of residential parking permits.	The developer will unbundle parking costs from residential units.

3: IMPACTS REVIEW

This section of the report focuses on the influence and impact site generated traffic will have on the local transportation network, with the following purpose:

- To provide information to the District Department of Transportation (DDOT) and other agencies on how the development of the site will influence the local transportation network. This report accomplishes this by identifying the potential trips generated by the site on all major modes of travel and where these trips are expected to travel to and from.
- To determine if development of the site will lead to adverse impacts on the local transportation network. This report accomplishes this by projecting future conditions with and without development of the site and performing analysis of intersection delays. These delays are compared to the acceptable levels of delay set by DDOT standards to determine if the site will negatively impact the study area. The report describes what improvements to the transportation network are needed to mitigate adverse impacts.

3.1 Site Transportation Demand

3.1.1 Base Trip Generation

Traditionally, trip generation for a proposed development is calculated based on the methodology outlined in the Institute of Transportation Engineers' (ITE) *Trip Generation*, 8th Edition. For this report, the methodology was supplemented to account for the urban nature of the site (*Trip Generation* provides data for non-urban, low transit use sites) and to generate trips for multiple modes. The following summarizes the methodology that was used in this study.

First, ITE *Trip Generation* was used to develop base vehicular-trip rates, not accounting for reductions due to mode split. The Shopping Center trip rate was applied in lieu of individual trip rates, such as bank, pharmacy, and supermarket, for the retail uses because applying individual rates would not account for interaction between the retail uses (shoppers visiting more than one store). The Shopping Center trip rate accounts for these uses and interactions.

Second, the vehicle-trips were converted to person-trips by assuming an average vehicle occupancy of 1.1 persons per vehicle, based on the Census Data Transportation Planning Package (CTPP) 2000. Table 9 shows the base number of trips generated by the proposed development.

Table 9: Base Vehicle- and Person-Trip Generation

Land Use	Size*		Trip Generation						Weekday Total
			AM Peak Hour			PM Peak Hour			
			In	*Out*	*Total*	*In*	*Out*	*Total*	
West building									
Residential	163	Dwelling Units	38	25	63	113	118	231	2,538
Retail	20,000	Square Feet	17	67	84	70	37	107	1,111
New Site Vehicular Trips – ITE Rates			55	92	147	183	155	338	3,649
New Site Person Trips –1.1 Persons/Vehicle			61	101	162	201	171	372	4,014
East Building									
Residential	94	Dwelling Units	10	40	50	45	24	69	693
Retail	10,000	Square Feet	24	16	40	67	69	136	1,520
New Site Vehicular Trips – ITE Rates			34	56	90	112	93	205	2,213
New Site Person Trips –1.1 Persons/Vehicle			37	62	99	123	102	226	2,434
Net Vehicle Trips before Non-Auto Reduction			**89**	**148**	**237**	**295**	**248**	**543**	**5,862**
Net Person Trips			**98**	**163**	**261**	**325**	**273**	**597**	**6,448**

3.1.2 Mode Split

Following the base trip generation shown in Section 3.1.1, the trips were split into each mode: transit (consisting of both Metrorail and Metrobus/DC Circulator), walking, biking, and vehicle. Each land use was analyzed by mode separately in order to account for varying mode splits. The mode split percentages were developed using the findings of the 2005 WMATA *Development-Related Ridership Survey* and the results of the 2009 *American Community Survey*. The mode split assumptions were based on the patterns and general findings from that document, observations of existing traffic, and the type and density of surrounding land uses.

The key finding to be taken from these studies is that residential users will be the most likely to use public transit, since these patrons will be regular users of the transit network. Therefore, they will be able to familiarize themselves with and take advantage of the various routes and schedules available along the Florida Avenue and 7th Street/Georgia Avenue corridors to reach destinations in downtown areas of the District and in surrounding areas. Table 10 summarizes the resulting mode split assumptions.

Table 10: Mode Split Assumptions

Land Use	Mode Split			
	Transit	*Walk*	*Bike*	*Auto*
Retail	35%	20%	10%	35%
Residential	40%	20%	5%	35%

It is also important to note that the non-auto mode split values have been increased slightly in order to account for synergy between the residential and the retail uses of the site. Since those building residents who do shop at the retail stores within the Florida Avenue Redevelopment will not need to use the surrounding vehicular or pedestrian street network.

3.1.3 Multi-Modal Trip Generation

Based on the trip generation calculations outlined in Section 3.1.1 and the mode split assumptions shown in Section 3.1.2 (and summarized in Table 10), Table 11 shows the resulting calculations by mode. Again, the assumption of 1.1 persons per vehicle was applied to compute the final amount of vehicular trips. As shown in Table 11, the proposed development will generate approximately 82 vehicular trips, 99 transit trips, 52 walking trips, and 20 bicycle trips during the morning peak hour; 190 vehicular trips, 228 transit trips, 120 walking trips, and 40 bicycle trips during the afternoon peak hour; and 2,052 vehicular trips, 2,481 transit trips, 1,288 walking trips, and 442 bicycle trips during a typical weekday.

3.1.4 Trip Routing

The trips generated by the proposed Florida Avenue Redevelopment are distributed and assigned to the network based on an analysis of the existing travel patterns within the study area. Counted traffic volumes, historical ADT volume data, site observations, and knowledge of the existing commuter and commercial travel patterns throughout the study area were used to develop the general direction of approach percentages. Morning and afternoon peak hour traffic volumes were examined in order to determine the trip distribution for the proposed development. These trip distributions are shown on Figure 9 and Figure 10 for the morning and afternoon peak hours, respectively.

Table 11: Trip Generation for Proposed Development by Mode

Land-Use/Mode	Trip Generation by Mode						
	AM Peak Hour			PM Peak Hour			Daily
	In	*Out*	*Total*	*In*	*Out*	*Total*	Total
West Building							
Residential Uses							
Transit Person-Trips	6	28	33	27	14	41	428
Walking Person-Trips	4	14	18	15	9	24	244
Bicycling Person-Trips	2	7	9	8	4	12	122
Vehicular Person-Trips	7	25	32	27	14	41	428
New Vehicle Trips	*6*	*23*	*29*	*25*	*12*	*37*	*389*
Retail Uses							
Transit Person-Trips	17	12	28	49	52	101	1,117
Walking Person-Trips	8	6	14	25	26	51	558
Bicycling Person-Trips	2	1	3	6	7	13	140
Vehicular Person-Trips	15	9	24	44	45	89	977
New Vehicle Trips	*14*	*8*	*22*	*40*	*41*	*81*	*888*
Total West Building Trips							
Total Transit Person-Trips	23	39	62	76	66	142	1,545
Total Walking Person-Trips	12	20	32	40	35	75	802
Total Bicycling Person-Trips	4	8	12	14	11	25	262
Total Vehicular Person-Trips	22	34	56	71	59	130	1,405
Total New Vehicle Trips	*20*	*31*	*51*	*65*	*53*	*118*	*1,277*
East Building							
Residential Uses							
Transit Person-Trips	4	15	19	18	8	26	267
Walking Person-Trips	2	9	11	10	5	15	152
Bicycling Person-Trips	1	5	6	5	3	8	76
Vehicular Person-Trips	4	15	19	17	10	27	267
Total New Vehicle Trips	*4*	*13*	*17*	*15*	*10*	*25*	*243*
Retail Uses							
Transit Person-Trips	11	7	18	29	32	61	669
Walking Person-Trips	5	4	9	15	15	30	334
Bicycling Person-Trips	1	1	2	4	3	7	84
Vehicular Person-Trips	9	6	15	26	26	52	585
Total New Vehicle Trips	*8*	*6*	*14*	*24*	*23*	*47*	*532*
Total East Building Trips							
Total Transit Person-Trips	15	22	37	46	40	87	936
Total Walking Person-Trips	7	13	20	25	20	45	486
Total Bicycling Person-Trips	2	6	8	9	6	15	160
Total Vehicular Person-Trips	13	21	34	43	36	79	852
Total New Vehicle Trips	*12*	*19*	*31*	*39*	*33*	*72*	*775*
Overall Trip Generation							
Total Transit Person-Trips	**39**	**61**	**99**	**123**	**106**	**228**	**2,481**
Total Walking Person-Trips	**19**	**33**	**52**	**65**	**55**	**120**	**1,288**
Total Bicycling Person-Trips	**6**	**14**	**20**	**23**	**17**	**40**	**422**
Total Vehicular Person-Trips	**35**	**55**	**90**	**114**	**95**	**209**	**2,257**
Total New Person Trips	***98***	***163***	***261***	***325***	***273***	***597***	***6,448***
Total New Vehicle Trips	***32***	***50***	***82***	***104***	***86***	***190***	***2,052***

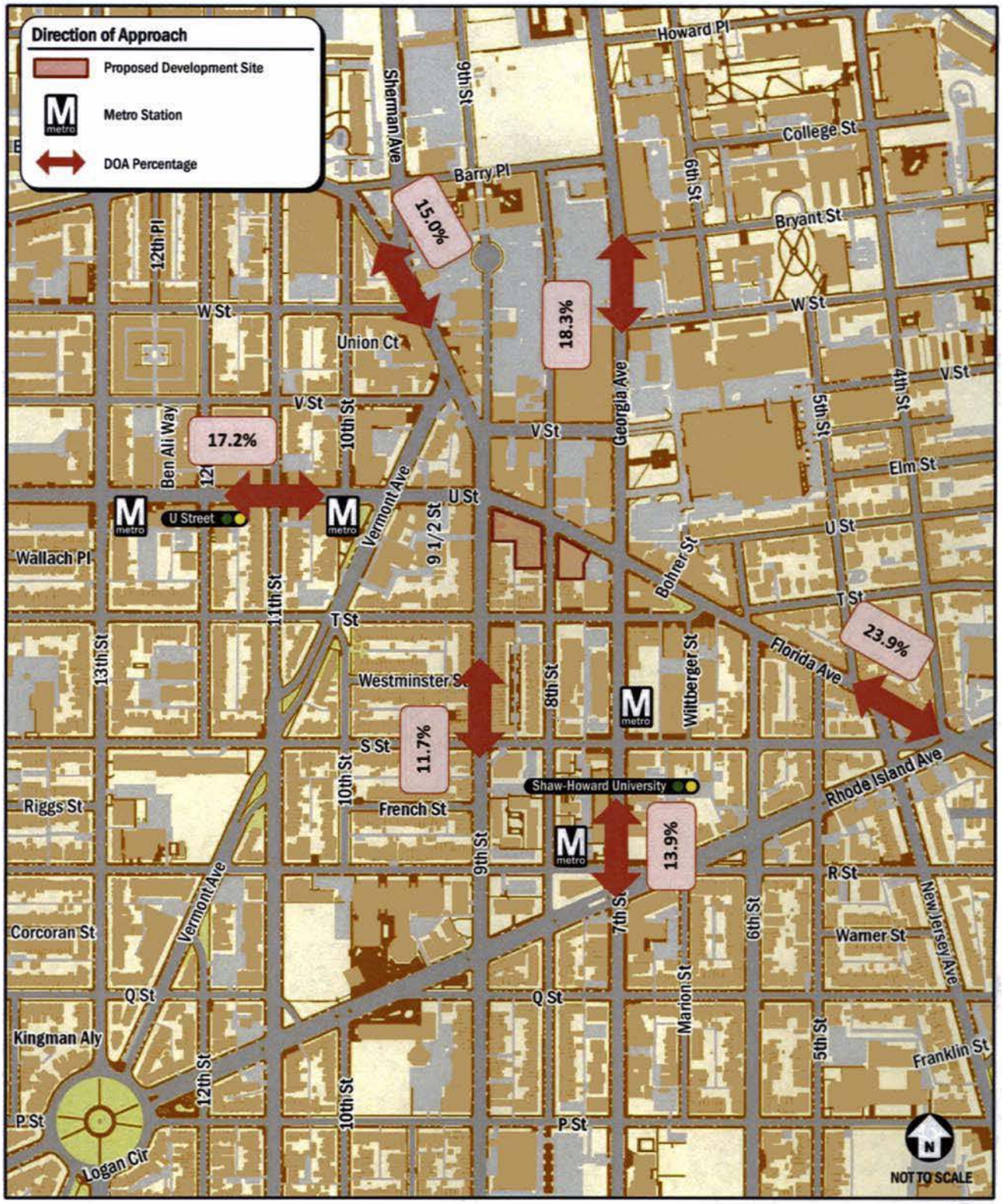

Figure 9: Trip Distribution for Site-Generated Trips – Morning Peak Hour

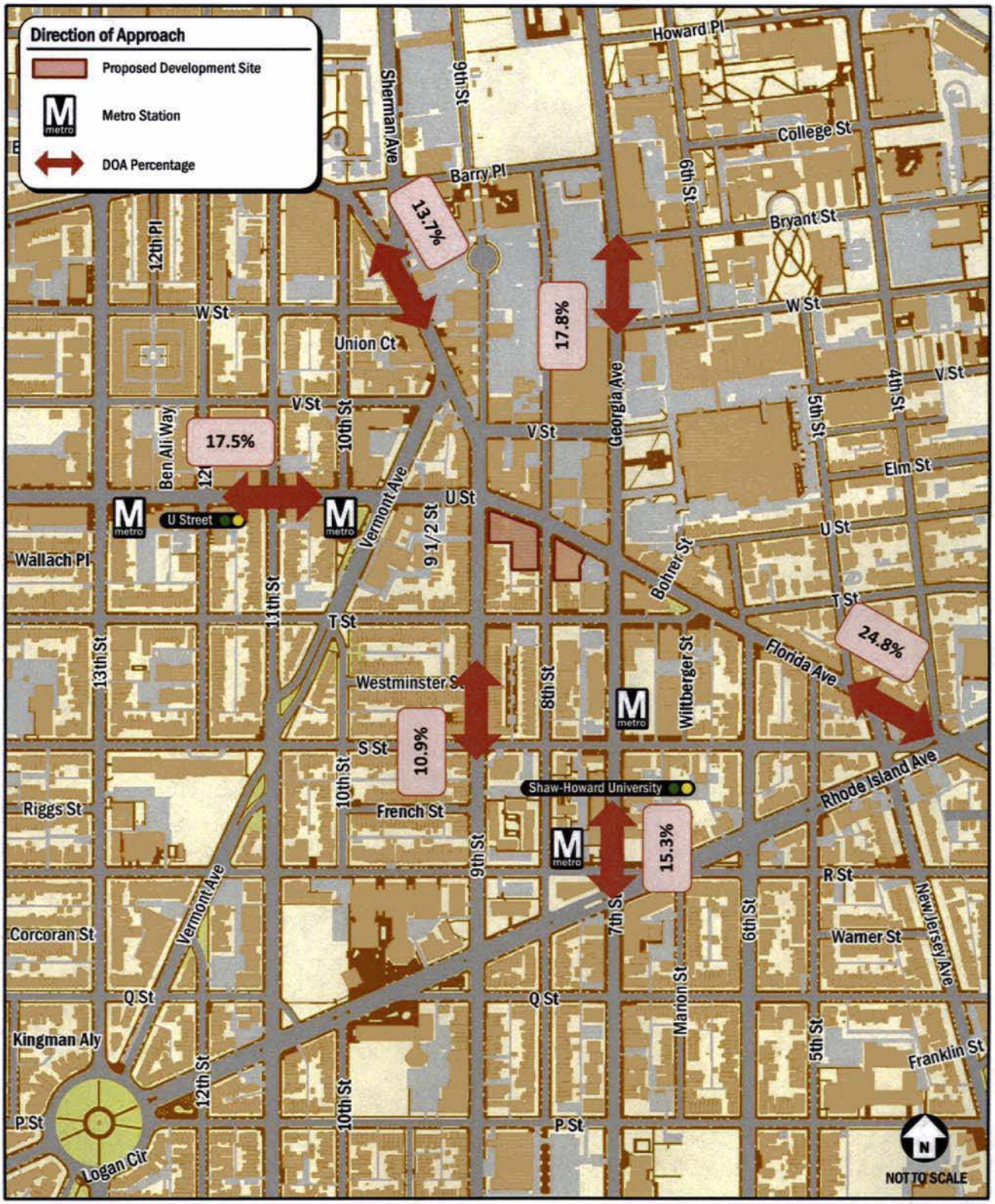

Figure 10: Trip Distribution for Site-Generated Trips – Afternoon Peak Hour

3.2 Roadway Capacity and Operations

This section details the vehicular trips generated in the study area along the vehicular access routes, defines the analysis assumptions, analyses the vehicular impacts of the proposed development, and makes recommendations for improvements where needed.

3.2.1 Scope of Analysis

The purpose of the vehicular capacity analysis is to determine the existing conditions of the intersections located in the immediate vicinity of the proposed redevelopment. The following intersections were selected, as shown in Figure 11:

1. Florida Avenue and Georgia Avenue/7th Street
2. T Street and 7th Street
3. Florida Avenue and 8th Street
4. T Street and 8th Street
5. U Street/Florida Avenue & 9th Street/Sherman Avenue
6. T Street & 9th Street
7. Florida Avenue & T Street

Intersection capacity analyses were performed for the existing conditions at each intersection within the study area during the morning and afternoon peak hours, as well as for future conditions with and without the proposed development. The study scenarios are as follows:

- 2012 Existing Conditions
- 2015 Future Conditions without Development (2015 Background)
- 2015 Future Conditions with Development (2015 Future)

The *Synchro, Version 7.0* software package was used to analyze the study intersections based on the Highway Capacity Manual (HCM) methodology. The *Synchro* model was compiled using signal timings provided by DDOT and with lane configurations and traffic volumes collected by Gorove/Slade. The following sections review the assumptions made for the technical analyses, as summarized in Table 14.

3.2.2 Traffic Volume Assumptions

The following section reviews the traffic volume assumptions made and methodologies used in the roadway capacity analyses, summarized in Table 14.

2011/2012 Existing Conditions

The overall purpose of this study is to show what effect the proposed redevelopment will have on the transportation system in the study area. The existing conditions in and around the site are characterized in order to provide a foundation for assessing the transportation implications of the proposed development. This is determined by examining the peak traffic hours, which are directly associated with the peaking characteristics of the site and the adjacent transportation system. These peaking characteristics are found through analysis of existing count data.

Figure 11: Study Intersections

DDOT and National standards require that traffic counts be conducted on a weekday, not including Monday or Friday, when traffic conditions can be described as "typical". This includes the consideration for adjacent uses, such as retail, special events, and recreation facilities and for major traffic generators, such as the area public school system or any large public or private institutions. Weekend and other off-peak periods are also often reviewed if the study area includes other uses that may be relatively inactive during the "typical" weekday.

The traffic counts conducted on "typical" day are used to determine the morning and afternoon "peak hour" of traffic within the study area. According to the Highway Capacity Manual (HCM) methodologies, a one-hour analysis period is preferred. Analysis periods that exceed one hour are not usually used because traffic conditions are typically not steady for long time periods and because the adverse impact of short peaks in traffic demand may not be detected in a long time period. The "peak hour" represents the worst-case scenario, when the system traffic volumes are the highest. The use of a "typical" weekday morning and afternoon peak hours are used to ensure that conclusions regarding adverse impacts and their respective mitigation measures would apply to the vast majority of time roadways are used in the study area. Although there may be times when volume flows exceed these conditions, such as during special events, holiday weekends, or other times depending on the study area and site location, it is the industry standard to design transportation infrastructure for the peak times during "typical" weekdays.

In order to ensure that the data collected contains the peak hour, traffic counts are taken for a period of several hours during the morning and afternoon peak periods. From these peak periods, a peak hour is derived for both the morning and the afternoon time periods. According to the Transportation Impact Analyses for Site Development Manual published by the Institute of Transportation Engineers (ITE), data is generally collected during the weekday morning (7:00 to 9:00 AM) and afternoon (4:00 to 6:00 PM) peak hours. Although this is the standard, Gorove/Slade usually collects data for a three-hour (or longer) period to ensure that the peak hour is contained within the data collection timeframe.

The peak period counts are analyzed to determine the one hour during the morning and afternoon periods that contains the highest cumulative directional traffic demands. From each peak period count, the morning and afternoon "peak hours" are determined by summing up the four fifteen-minute consecutive time periods in the study area that experience the highest cumulative traffic volumes. These morning and afternoon "peak hours" are analyzed for the system of intersections investigated, choosing the "peak hour" of the entire system instead of each individual intersection.

Following the above guidelines, traffic counts, including vehicular and pedestrian volumes, were conducted by Gorove/Slade at the key study intersections between the hours of 6:00 and 9:00 AM and between 4:00 and 7:00 PM on Thursday, April 26, 2012. These count dates represent "typical" weekdays when the DC public school systems were in session, as well as the surrounding counties in Maryland and Virginia. These "typical" weekdays also represent time periods that include normal operation for other major traffic generators in the study area. The results of the traffic counts are included in the Technical Attachments. The morning and afternoon peak hours for the system of intersections being studied occurred between 8:00 – 9:00 AM and 5:30 – 6:30 PM, respectively. Peak hour traffic volumes are shown on Figure 12 and Figure 13 for the morning and afternoon peak hours, respectively.

2015 Future Conditions without Development (2015 Background)

The Florida Avenue Redevelopment is anticipated to be complete in 2015. The traffic projections for the future conditions without the development consist of the traffic generated by background developments with planned completion by 2015, listed in the section 1.7.2 of this report, and inherent growth on the roadways. Growth from these two sources is added to the existing traffic volumes in order to determine the traffic projections for the future without development.

The only background development included is the Progression Place development located above the Shaw/Howard University Metrorail station at the intersection of 7th Street and T Street. Trips generated by the background development were estimated using the methodology outlined in the Institute of Transportation Engineers' (ITE) *Trip Generation*, 8th Edition. Vehicular trips were determined by examining the WMATA *2005 Development-Related Ridership Survey Final Report*. Automobile mode splits were estimated based on the distance of the proposed developments from the Howard University/Shaw Metrorail Station. Table 12 shows the estimated automobile mode splits for the Progression Place background development.

Table 12: Background Development Mode Split Assumptions

Background Development Mode Split Assumptions			
Source	**Land Use**	**Distance from Metro (Feet)**	**Automobile Mode Split**
Progression Place	Office	170	23%
	Residential	170	19%
	Retail	170	21%

Based on the mode splits outlined in Table 12, Table 13 shows the trips generated by the background developments.

Table 13: Vehicular Trips Added by Background Developments

Land Use	Size*		Trip Generation					
			AM Peak Hour			PM Peak Hour		
			In	*Out*	*Total*	*In*	*Out*	*Total*
Office	100,000	Square Feet	36	5	41	32	159	191
Residential	205	Dwelling Units	16	46	62	51	27	78
Retail	20,000	Square Feet	37	23	60	30	39	69
Subtotal			*89*	*74*	*163*	*113*	*225*	*338*
New Vehicular Trips			**19**	**15**	**34**	**23**	**50**	**73**

In addition to the background developments, other traffic increased due to inherent growth on the study area roadways were accounted for with a 1.6% per year growth rate compounded annually over the study period (2012-2015). This rate was estimated based on a comparison between existing and past average annual weekday traffic volumes obtained from DDOT. This growth rate was applied to all through movements along Georgia Avenue/7th Street, Florida Avenue/U Street, and 9th Street/Sherman Avenue.

Based on the trip distributions discussed previously and shown on Figure 9 and Figure 10, the traffic volumes generated by the Progression Place background development were distributed through the study area. These traffic volumes generated by the background development and the inherent growth were added to the existing (2012) traffic volumes in order to establish the future (2015) traffic volumes without the proposed redevelopment. The traffic volumes for the future conditions without development are shown on Figure 12 and Figure 13 for the morning and afternoon peak hours, respectively.

2015 Future Conditions with Development (2015 Future)

Based on the trip distributions discussed previously and shown on Figure 9 and Figure 10, the traffic volumes generated by the site-generated trips shown in Section 3.1 were distributed through the study area intersections, as shown on Figure 12 and Figure 13 for the morning and afternoon peak hours, respectively.

The traffic volumes for the 2015 future conditions were calculated by adding the development-generated traffic volumes to the 2015 background traffic volumes. Thus the future condition with the proposed development scenario includes traffic generated by: existing volumes, background development through the year 2015, and the proposed Florida Avenue Redevelopment. The 2015 future traffic volumes are shown on Figure 12 and Figure 13 for the morning and afternoon peak hours, respectively.

3.2.3 Geometry and Operations Assumptions

The following section reviews the roadway geometry and operations assumptions made and the methodologies used in the roadway capacity analyses, summarized in Table 14.

2011/2012 Existing Conditions

Gorove/Slade conducted field reconnaissance to confirm the existing lane configurations and traffic controls at the intersections within the study area, shown on Figure 14. Existing signal timings and offsets were obtained from DDOT and confirmed during field reconnaissance.

2015 Future Conditions without Development (2015 Background)

The lane configurations for the 2015 future conditions without the proposed development are based on the existing lane configurations. No roadway infrastructure changes were assumed for the future conditions without development for 2015. The lane configurations and traffic controls for the 2015 background conditions are shown on Figure 14.

2015 Future Conditions with Development (2015 Future)

The lane configurations for the 2015 future conditions with the proposed development are based on the lane configurations for the 2015 conditions without the proposed development. No roadway infrastructure changes were assumed for the future conditions with development for 2015. However, the site driveways, as described previously in Section 2.1.1 and as shown on Figure 8, were added to the roadway network. The lane configurations and traffic controls for the 2015 future conditions are shown on Figure 15.

3.2.4 Vehicular Capacity Analysis Results

Intersection capacity analyses were performed for the three scenarios outlined in Section 3.2.1 at the intersections contained within the study area during the morning and afternoon peak hours. *Synchro, Version 7.0* was used to analyze the study intersections based on the Highway Capacity Manual (HCM) methodology. The results of the capacity analyses are expressed in level of service (LOS) and delay (seconds per vehicle) for each approach. A LOS grade is a letter grade based on the average delay (in seconds) experienced by motorists traveling through an intersection. LOS results range from "A" being the best to "F" being the worst. LOS E is typically used as the acceptable LOS threshold in the District; although LOS F is sometimes accepted in urbanized areas.

The LOS capacity analyses were based on: (1) the peak hour traffic volumes outlined in Section 3.2.2; (2) the lane use and traffic controls outlined in Section 3.2.3; and (3) the Highway Capacity Manual (HCM) methodologies (using *Synchro 7* software). The average delay of each approach and LOS is shown for the signalized intersections in addition to the overall average delay and intersection LOS grade. The HCM does not give guidelines for calculating the average delay for a two-way stop-controlled intersection, as the approaches without stop signs would technically have no delay. Detailed LOS descriptions and the analysis worksheets are contained in the Appendix.

Table 14: Summary of Vehicular Capacity Analysis Assumptions

2011 Existing Conditions

• Dates of data collection:
  o Thursday, April 26, 2012
  o Counts taken from 6:00 – 9:00 AM and 4:00 – 7:00 PM
  o Count sheets in Technical Appendix
• System Peak: 8:00 – 9:00 AM and 5:30 – 6:30 PM
• Geometries and lane configurations based on existing conditions
• Signal timings/phasings/offsets provided by DDOT

2015 Future Conditions without Development (2015 Background)

• Background developments:
  o Only background development is Progression Place
  o Trip generation based on ITE rates
  o Trip distribution based on existing traffic volumes and travel patters
  o Total AM peak hour trips assigned: 34 ; Total PM peak hour trips assigned: 73
• Background growth percentage:
  o 1.6% per year growth rate assumed, compounded annually
  o Determined based on historical traffic volumes in study area from DDOT
  o Applied to through movements along Georgia Avenue/7th Street, Florida Avenue/U Street, and 9th Street/Sherman Avenue.
• No roadway infrastructure or signal timing improvements assumed.

2015 Future Conditions with Development (2015 Future)
• Site trip generation and mode split assumptions are detailed in Section 3.1 of report • Trip distribution for vehicles based on existing traffic volumes and travel patterns in the study area, as shown on Figure 9 and Figure 10. • No external roadway infrastructure or signal timing changes assumed. • Included addition of new site driveways, as shown on FIGURE

Table 15 shows the results of the capacity analyses, including LOS and average delay per vehicle (in seconds) for the 2012 Existing and 2015 Background and Future scenarios. The capacity analysis results for the morning peak hour are shown on Figure 16 and for the afternoon peak hour are shown on Figure 17. Additionally, Table 16 shows the queuing results for the study area intersections during the 2011 Existing and the 2015 Background and Future scenarios.

The majority of study intersections operate at acceptable conditions during the morning and afternoon peak hours for the 2011 Existing, 2015 Background, and 2015 Future scenarios. However, the following intersections/approaches operate under unacceptable conditions during one or more peak hour:

- Florida Avenue and Georgia Avenue/7th Street
- Florida Avenue and 8th Street

Generally speaking, the proposed development is considered to have an impact at an intersection within the study area if the capacity analyses show an LOS F at an intersection or along an approach in the future conditions with the proposed development where one does not exist in the future conditions without the proposed development. As shown in Table 15, no new LOS F are shown in the 2015 conditions with the proposed development that are not also included in the background and existing conditions.

In the existing conditions, the westbound approach at the intersection of Florida Avenue and Georgia Avenue/7th Street operates under unacceptable conditions. The addition of the background growth and development further degrades the operation of the westbound approach during the afternoon peak period. The addition of the site-generated trips further exacerbates the existing failing operation, causing the average overall intersection LOS to increase to F as well. However, retiming the intersection may help alleviate this delay. This report recommends that DDOT consider this change.

Additionally, in the existing conditions, the northbound approach of 8th Street at T Street operates under unacceptable conditions during the afternoon peak period. The addition of the background growth and development changes the operation of the intersection allows the northbound approach to operate under acceptable conditions. This is likely due to the way that the HCM calculates vehicular delay at an unsignalized intersection. In this scenario, the addition of the background traffic at the two adjacent, signalized intersections changes the operation of the entire roadway due to the existing configuration and coordination along Florida Avenue/U Street. The addition of the background growth and development on the adjacent signalized intersections at 9th Street and 7th Street/Georgia Avenue changes the coordination of the roadway, leading to larger or more frequent gaps between vehicles. This increase in gaps (both in length and frequency) allows for vehicles turning on to Florida Avenue from 8th Street northbound to experience an overall average decrease in delay. With the addition of the site-generated trips, the intersection continues to operate under acceptable conditions. This report recommends that DDOT continue to monitor the operation of the intersection during future studies.

3.2.5 Vehicular Queue Analysis

In addition to calculating the capacity results of the study area intersections, a review of the queuing distance for each approach at each intersection was requested by DDOT. For purposes of this analysis, the 95th percentile queue distances were computed utilizing the methodology discussed above as part of the capacity analysis utilizing the Highway Capacity Manual (HCM) and *Synchro, Version 7.0* and are shown on Table 16.

Figure 12: Morning Peak Hour Traffic Volumes

Figure 13: Afternoon Peak Hour Traffic Volumes

Figure 14: 2012 Existing and 2015 Background Lane Configurations

Figure 15: 2015 Future Lane Configurations

Figure 16: Morning Peak Hour Level of Service Results

Figure 17: Afternoon Peak Hour Level of Service Results

Table 15: Vehicular Level of Service Results

Intersection	Approach	Existing Conditions (2012)				Future Background Conditions (2015)				Total Future Conditions (2015)			
		AM Peak Hour		*PM Peak Hour*		*AM Peak Hour*		*PM Peak Hour*		*AM Peak Hour*		*PM Peak Hour*	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Florida Avenue & Georgia Avenue/7th Street	**Overall**	**30.7**	**C**	**52.3**	**D**	**36.4**	**D**	**72.4**	**E**	**37.0**	**D**	**83.7**	**F**
	Eastbound	20.2	C	19.7	B	21.9	C	21.5	C	21.9	C	22.7	C
	Westbound	41.2	D	94.9	F	56.3	E	142.5	F	57.7	E	167.8	F
	Northbound	21.9	C	24.4	C	20.8	C	23.9	C	22.0	C	25.6	C
	Southbound	28.0	C	21.7	C	28.2	C	21.4	C	28.3	C	21.9	C
T Street & 7th Street	**Overall**	**11.0**	**B**	**21.9**	**C**	**12.7**	**B**	**24.8**	**C**	**12.9**	**B**	**24.8**	**C**
	Eastbound	26.7	C	18.9	B	26.8	C	18.9	B	27.4	C	19.7	B
	Northbound	9.8	A	19.9	B	10.0	A	20.7	C	10.0	A	20.7	C
	Southbound	9.5	A	23.7	C	11.8	B	28.3	C	11.8	B	28.4	C
Florida Avenue & 8th Street	Eastbound Left	0.5	A	2.0	A	0.5	A	1.5	A	0.5	A	1.5	A
	Westbound Left	1.2	A	1.1	A	1.2	A	1.1	A	1.5	A	2.3	A
	Northbound	19.4	C	60.0	F	19.2	C	22.0	C	19.3	C	25.1	D
	Southbound	21.7	C	41.0	E	22.5	C	18.3	C	23.8	C	21.2	C
T Street & 8th Street	**Overall**	**7.8**	**A**	**8.0**	**A**	**7.8**	**A**	**8.0**	**A**	**8.0**	**A**	**8.5**	**A**
	Eastbound	7.8	A	8.1	A	7.8	A	8.1	A	8.0	A	8.7	A
	Northbound	7.4	A	7.4	A	7.4	A	7.4	A	7.5	A	7.6	A
	Southbound	8.0	A	8.0	A	8.0	A	8.0	A	8.2	A	8.5	A
U Street/Florida Avenue & 9th Street/Sherman Avenue	**Overall**	**22.7**	**C**	**32.8**	**C**	**23.4**	**C**	**33.6**	**C**	**23.6**	**C**	**33.6**	**C**
	Eastbound	21.4	C	22.8	C	21.6	C	23.2	C	21.6	C	23.4	C
	Westbound	28.3	C	58.0	E	29.9	C	59.5	E	30.0	C	59.6	E
	Northbound	23.1	C	24.2	C	23.2	C	24.3	C	24.0	C	25.5	C
	Southbound	17.5	B	16.4	B	17.7	B	16.6	B	17.8	B	16.7	B
T Street & 9th Street	**Overall**	**8.0**	**A**	**11.6**	**B**	**7.7**	**A**	**11.3**	**B**	**7.7**	**A**	**10.9**	**B**
	Eastbound	40.8	D	47.3	D	40.8	D	47.3	D	40.8	D	47.3	D
	Northbound	4.0	A	4.2	A	4.0	A	4.2	A	4.0	A	4.3	A
	Southbound	2.5	A	3.1	A	2.5	A	3.0	A	2.6	A	3.3	A
Florida Avenue & T Street	Northbound	13.0	B	10.9	B	15.9	C	15.5	C	15.8	C	15.4	C
9th Street & West Driveway	Westbound	--	--	--	--	--	--	--	--	10.3	B	12.7	B
	Southbound Left	--	--	--	--	--	--	--	--	0.4	A	1.5	A
9th Street & East Driveway	Westbound	--	--	--	--	--	--	--	--	9.3	A	9.6	A
	Southbound Left	--	--	--	--	--	--	--	--	0.5	A	1.5	A

Table 16: Queuing Results

Intersection	Approach	Existing Conditions (2012)		Future Background Conditions (2015)		Total Future Conditions (2015)	
		95% Queue		*95% Queue*		*95% Queue*	
		Delay	LOS	Delay	LOS	Delay	LOS
Florida Avenue & Georgia Avenue/7th Street	Eastbound	134	187	143	199	146	203
	Westbound	382	#522	~456	#556	~461	#562
	Northbound Thru	143	193	150	206	159	216
	Northbound Right	2	8	2	8	2	8
	Southbound Left	124	154	119	154	119	154
	Southbound Thru	386	438	406	478	406	478
	Southbound Right	20	37	20	38	21	40
T Street & 7th Street	Eastbound	37	79	39	81	50	97
	Westbound	66	106	72	113	72	113
	Southbound	48	#113	62	#760	62	#760
Florida Avenue & 8th Street	Eastbound	--	1	--	1	--	1
	Westbound	--	3	--	3	--	4
	Northbound	--	6	--	5	--	7
	Southbound	--	27	--	28	--	30
T Street & 8th Street	Eastbound	--	--	--	--	--	--
	Northbound	--	--	--	--	--	--
	Southbound	--	--	--	--	--	--
U Street & 9th Street	Eastbound	93	132	98	139	100	141
	Westbound LT	158	m195	175	m192	176	m192
	Westbound Right	15	m30	19	m27	19	m27
	Northbound	53	88	55	91	60	98
	Southbound Left	90	142	90	142	90	144
	Southbound TR	146	193	154	204	157	207
T Street & 9th Street	Eastbound	56	116	56	116	56	116
	Northbound	16	26	17	27	18	29
	Southbound	33	41	34	42	36	45
Florida Avenue & T Street	Eastbound	--	0	--	0	--	0
	Westbound	--	0	--	0	--	0
	Northbound	--	10	--	15	--	16
9th Street & West Building	Westbound	--	--	--	--	--	4
	Northbound	--	--	--	--	--	0
	Southbound	--	--	--	--	--	1
8th Street & East Building	Westbound	--	--	--	--	--	2
	Northbound	--	--	--	--	--	0
	Southbound	--	--	--	--	--	0

3.3 Non-Auto Impacts

3.3.1 Transit

The trip generation estimates for the Florida Avenue Redevelopment show that a significant amount of new transit riders will be generated. The proposed development is projected to generate over 2,400 transit trips on a weekday.

As stated in Section 1, there is a significant amount of transit service nearby, including two Metrorail green line stations and several bus routes. The U Street Metrorail station is approximately a 600-foot walk from the intersection of U Street/Florida Avenue and 9th Street. A 1,000 foot walk separates the redevelopment from the Shaw/Howard University Metrorail station, which has portals located at the intersection of 8th Street and R Street and the intersection of 7th Street and S Street. Major bus service is provided along Georgia Avenue/7th Street and along Florida Avenue/U Street. Several routes have frequent service every day of the week, with multiple stops located within a quarter-mile of the site.

The Florida Avenue Redevelopment will likely generate an equal number of rail and bus trips. Residents at the redevelopment will likely split almost evenly between using Metrorail and the nearby bus service, as will customers of the on-street retail uses.

WMATA's studied capacity of Metrorail stations in its *Station Access & Capacity Study*[1]. The study analyzed capacity of Metrorail stations for their vertical transportation, for example the capacity of the station at elevators, stairs and escalators to shuttle patrons between the street, mezzanine, and platforms. The study also analyzed stations capacity to process riders at farecard gates. For both analyses, vertical transportation and farecard gates, volume to capacity ratios were calculated for existing data (from 2005) and projections for the year 2030.

Based on findings presented in the *Station Access & Capacity Study,* the U Street station can accommodate the additional riders generated by the Florida Avenue Redevelopment. The study did not find any high volume to capacity ratios at the station.

WMATA also studies capacity for its bus routes. *DC's Transit Future System Plan*[2] lists the bus routes with the highest load factor (a ratio of passenger volume to bus capacity). Table 17 shows the bus load factors identified in the Plan.

Table 17: Bus Load Factors

Route Number	Route Name	Load Factor*
90, 92	U Street-Garfield Line	1.06 (all day)
X1, X3	Benning Road Line	1.34 (peak)
70	Georgia Avenue-7th Street Line	1.07 (Saturday) 1.39 (Sunday)

**Load factor over 1.2 in peak periods or over 1.0 in off-peak periods/weekends exceeds acceptable load standards*

While three of the lines that serve the study area are identified in the Plan, several future transit improvements are planned. As stated previously in Section 1.4 and shown in Figure 4, three streetcar lines will serve the site in the future. Additionally, three Metro Express lines will serve the site in the future.

Due to the planned future service in the study area, as well as the existing Metrorail station capacity, the existing transit service should be able to accommodate the future riders generated by the Florida Avenue Redevelopment.

[1] *Station Access & Capacity Study Final Report*, April 2008, Washington Metropolitan Area Transit Authority
[2] *DC's Transit Future System Plan Final Report*, April 2010, District of Columbia Department of Transportation

3.3.2 Bicycle

Of all of the modes analyzed in this report, the trip generations estimates for cycling are the lowest. The projected trips are around 400 per weekday for the entire Florida Avenue site. Although bicycling will be an important mode for getting to and from the site, with significant bicycle facilities located on site and quality routes to and from the site, the impacts from bicycling will be relatively less than impacts to other modes.

The cyclists traveling to and from the site area are expected to take advantage of the existing and planned routes that exist. Based on the trip generation estimates for bicycling, and the quality of the routes near the project's location, the Florida Avenue site will not have a negative impact to bicycle facilities in the study area.

3.3.3 Pedestrian

The Florida Avenue Redevelopment is located in a walkable area, with connections to major existing and future retail locations, employment sites, residential neighborhoods, and transit connections. The trip generation estimates project around 1,300 trips per weekday for the entire development.

The origins and destinations of these trips are likely to be employment opportunities where residents can walk to work, such as the Reeves Center and Howard University, and retail locations located along the Georgia Avenue and U Street/Florida Avenue corridors.

Based on these origins/destinations, most pedestrians generated by the redevelopment will walk along Florida Avenue/U Street. There will also be use of 9th Street and 7th Street/Georgia Avenue. In addition to these trips, the transit trips generated by the site will also generate pedestrian demand between the site and nearby transit stops. The vast majority of these transit riders will travel along Florida Avenue and 7th Street/Georgia Avenue.

Most of the sidewalks surrounding the site are of high quality. A summary of the existing pedestrian infrastructure was included previously as Figure 7.

The capacity of sidewalks to handle the projected number of pedestrians will not be negatively impacted by this project. DDOT requires that all sidewalks are a minimum of 6 feet wide, with sidewalks on arterial streets 8 to 10 feet wide depending on the location. The proposed widths of the sidewalks adjacent to the site property meet the District standard. The *Highway Capacity Manual* (HCM) outlines methodologies for calculating capacity of sidewalks based on the sidewalk widths. According to methodologies contained in the HCM, the LOS grade on a 6 foot wide sidewalk does not reach LOS D until the sidewalk volumes reach 2,000 pedestrians per hour. Similarly, LOS E is not reached until volumes reach 3,000 pedestrians per hour. The existing pedestrian counts adjacent to the site combined with the projected pedestrian trips associated with the site will not approach these thresholds. Thus, the sidewalk capacity will not be exceeded, and there will be no detrimental impacts.

Based on the trip generation estimates for walking, the quality of the routes near the project's location taking into account the streetscapes that will be redeveloped and improved, the Florida Avenue Redevelopment will not have a negative impact to pedestrian facilities in the study area.

With regards to the existing safety concerns at the Florida Avenue/8th Street intersection, the addition of the Florida Avenue Redevelopment is not anticipated to cause a significant increase in pedestrian traffic crossing Florida Avenue at this location. While the main pedestrian access points to both the West and East Buildings are located along 8th Street, additional daily pedestrian traffic in the northbound direction is not expected to be significant. Further, the existence of the 9th and 7th Street signalized crossings will help permit safe pedestrian crossings along Florida Avenue. Given that there are

few existing pedestrian trips at this location, it would be beneficial for DDOT to consider removing the existing striping along Florida Avenue to assist in safety concerns with the redevelopment of the site and other future developments.

3.4 Crash Analysis

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

3.4.1 Summary of Available Crash Data

A safety analysis was performed to determine if there was an abnormally high accident rate at any study area intersections. The District Department of Transportation (DDOT) provided the last three years of intersection accident data; from 2008 to 2010. This data set included all signalized intersections adjacent to the site. This data was reviewed and analyzed to determine the accident rate at each location. For intersections, the accident rate is measured in accidents per million-entering vehicles (MEV). The accident rates per intersection are shown in Table 18.

According to the Institute of Transportation Engineer's *Transportation Impact Analysis for Site Development*, an accident rate of 1.0 or higher is an indication that further study is required. Six intersections in the study area meet this criterion (as shown in red in Table 18 and detailed in Table 19). The proposed site needs to be developed in a manner to help alleviate, or at minimum not add to, the conflicts at these intersections.

Table 18: Intersection Crash Rates

Intersection	Total Crashes	Ped Crashes	Bike Crashes	Rate per MEV*
Florida Avenue and Georgia Avenue/7th Street	109	4	0	**3.66**
T Street & 7th Street	22	1	1	**1.72**
Florida Avenue & 8th Street	20	2	1	**1.37**
T Street & 8th Street	8	1	0	**2.82**
U Street/Florida Avenue & 9th Street/Sherman Avenue	60	6	2	**2.37**
T Street & 9th Street	23	3	0	**1.44**
Florida Avenue & T Street	8	0	0	0.40

** - Million Entering Vehicles; volumes estimated based on turning movement count data*

The crash summary data in Table 18 shows six intersections with a crash rate over 1.0 crashes per million entering vehicles– the rate which is considered a threshold for further analysis. A rate over 1.0 does not necessarily mean there is a significant problem at an intersection, but rather it is a threshold used to identify which intersections may have higher crash rates due to operational, geometric, or other issues.

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

Table 19 contains a breakdown of crash types reported for the six intersections with a crash rate over 1.0 per MEV.

Table 19: High Crash Rate Intersections by Crash Type

Intersection	Rate per MEV	Right Angle	Left Turn	Right Turn	Rear End	Side Swiped	Head On	Parked	Fixed Object	Ran Off Road	Ped. Involved	Backing	Unspecified	Total
Florida Avenue and Georgia Avenue/7th Street	3.66	10 *9%*	9 *8%*	4 *4%*	32 *29%*	29 *27%*	0 *0%*	7 *6%*	3 *3%*	0 *0%*	7 *6%*	4 *4%*	0 *0%*	**109**
T Street & 7th Street	1.72	1 *5%*	0 *0%*	0 *0%*	7 *32%*	6 *27%*	1 *5%*	2 *9%*	0 *0%*	0 *0%*	1 *5%*	2 *9%*	0 *0%*	**22**
Florida Avenue & 8th Street	1.37	4 *20%*	1 *5%*	0 *0%*	1 *5%*	6 *30%*	1 *5%*	3 *15%*	0 *0%*	0 *0%*	2 *10%*	2 *10%*	0 *0%*	**20**
T Street & 8th Street	2.82	0 *0%*	0 *0%*	0 *0%*	1 *13%*	4 *50%*	0 *0%*	1 *13%*	0 *0%*	0 *0%*	1 *13%*	1 *13%*	0 *0%*	**8**
U Street/Florida Avenue & 9th Street/Sherman Avenue	2.37	3 *5%*	6 *10%*	3 *5%*	14 *23%*	17 *28%*	1 *2%*	4 *7%*	0 *0%*	0 *0%*	4 *7%*	3 *5%*	0 *0%*	**60**
T Street & 9th Street	1.44	3 *13%*	1 *4%*	0 *0%*	1 *4%*	9 *39%*	0 *0%*	3 *13%*	0 *0%*	1 *4%*	2 *9%*	0 *0%*	0 *0%*	**23**

3.4.2 Potential Impacts

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

- *Florida Avenue and Georgia Avenue/7th Street*

  This intersection was found to have a significantly high crash rate, with 3.66 crashes per MEV over the course of the 3-year study period. The majority of the crashes at this intersection were rear-end crashes and side swiped vehicles. Sideswipe crashes can often occur when a vehicle going straight through an intersection makes a last-second lane change to get around a vehicle waiting for a gap to make a left turn from a shared through/left lane, as is the case in this location since this section of Florida Avenue does not have separate turning lanes at this intersection in both directions. Left turns are prohibited at this intersection, so side-swiped crashes may be due to vehicles swerving around vehicles making illegal left-turns. Additionally, elevated rear-end collision rates are typical at intersections controlled by a traffic signal. However, this report does not recommend mitigation measures at this intersection due to future changes proposed due to the streetcar. Additionally, the proposed development is not projected to make significant changes to the commuting patterns, operations, or geometry of this intersection.

- *T Street and 7th Street*

  This intersection is slightly over the threshold of 1.0 crashes per MEV, with a rate of approximately 1.72 crashes per MEV. The majority of crashes at this intersection were side rear-end crashes and side swiped vehicles. As with the Florida Avenue and Georgia Avenue/7th Street intersection, this report does not recommend mitigation measures at this intersection due to future changes proposed due to the streetcar. Additionally, the proposed development is not projected to make significant changes to the commuting patterns, operations, or geometry of this intersection.

- *Florida Avenue and 8th Street*

  This intersection is just over the threshold of 1.0 crashes per MEV, with a rate of approximately 1.37 crashes per MEV. The majority of crashes at this intersection were side swiped vehicles and right-angle crashes. Sideswipe crashes can often occur when a vehicle going straight through an intersection makes a last-second lane change to get around a vehicle waiting for a gap to make a left turn from a shared through/left lane, as is the case in this location since this section of Florida Avenue does not have separate turning lanes at this intersection. Right-angle crashes are generally associated with vehicles entering an intersection and being impacted by traffic traveling through the intersection at a 90 degree angle. While this intersection is anticipated to serve a portion of the traffic to the East Building, there are a low number of additional vehicles entering the site from the north and east that would utilize this intersection. This is due to the general directionality of commuting traffic during the peak period. Further, as residents become accustomed to the road network, those individuals who could utilize this intersection may find alternative routes in order to avoid utilizing this unsignalized intersection. With these considerations and since the crash rate is only slightly above the rate of 1.0, this report does not recommend mitigation measures at this intersection.

- *T Street and 8th Street*

  This intersection is over the threshold of 1.0 crashes per MEV, with a rate of approximately 2.82 crashes per MEV. The majority of crashes at this intersection were side swiped vehicles. Sideswipe crashes can often occur when a vehicle going straight through an intersection makes a last-second lane change to get around a vehicle waiting for a gap to make a left turn due to pedestrians. With the redevelopment increased vehicular traffic is anticipated at this intersection. Given the capacity results and queuing results at this intersection, this report does not recommend mitigation measures at this intersection.

- *U Street and Florida Avenue/9th Street*

  This intersection was found to have a significantly high crash rate, with 2.37 crashes per MEV over the course of the 3-year study period. The majority of the crashes at this intersection were rear-end crashes and side swiped vehicles. Sideswipe crashes can often occur when a vehicle going straight through an intersection makes a last-second lane change to get around a vehicle waiting for a gap to make a left turn from a shared through/left lane, as is the case in this location since this section of Florida Avenue does not have separate turning lanes at this intersection in both directions. Left turns are prohibited at this intersection, so side-swiped crashes may be due to vehicles swerving around vehicles making illegal left-turns. Additionally, elevated rear-end collision rates are typical at intersections controlled by a traffic signal. However, this report does not recommend mitigation measures at this intersection due to future changes proposed due to the streetcar. Additionally, the proposed development is not projected to make significant changes to the commuting patterns, operations, or geometry of this intersection.

- *T Street and 9th Street*

  This intersection is just over the threshold of 1.0 crashes per MEV, with a rate of approximately 1.44 crashes per MEV. The majority of crashes at this intersection were side swiped vehicles and right-angle crashes. Sideswipe crashes can often occur when a vehicle going straight through an intersection makes a last-second lane change to get around a vehicle waiting for a gap to make a left turn from a shared through/left lane, as is the case in this location since this section of 9th Street does not have separate turning lanes at this intersection. As with the intersection of Florida Avenue and 8th Street, right-angle crashes at this intersection indicate vehicles being

impacted by opposing traffic traveling through the intersection. As this intersection is currently signalized and the crash rate is slightly over the recommended rate of 1.0, no mitigation measures are recommended at this intersection.

3.4.3 Leading Pedestrian Intervals

The proposed Florida Avenue Redevelopment will not have a significant effect on many of these intersections, as it will not directly influence commuter traffic patterns or change operations and geometry at most intersections. However, the changes introduced by the proposed development will have a significant impact on pedestrian crossings of Florida Avenue. As the crash data shows pedestrian crashes at a few of the study intersections, this report recommends that DDOT consider adding Leading Pedestrian Intervals (LPI) to the signalized intersections within the study area.

LPIs are a signal-timing-based pedestrian safety measure. Intersections with pedestrian and car traffic often experience conflict between these two groups, with potentially dangerous consequences for the pedestrians. The term LPI refers to when the 'Walk' signal appears approximately three or four seconds before the green traffic signal for vehicles. The 'Walk' signal then remains active for the duration of the green signal. This brief timing adjustment allows pedestrians more time to cross the street and increases their visibility to drivers, especially those making turns[1].

[1] http://www.walkinginfo.org/engineering/crossings-signals.cfm