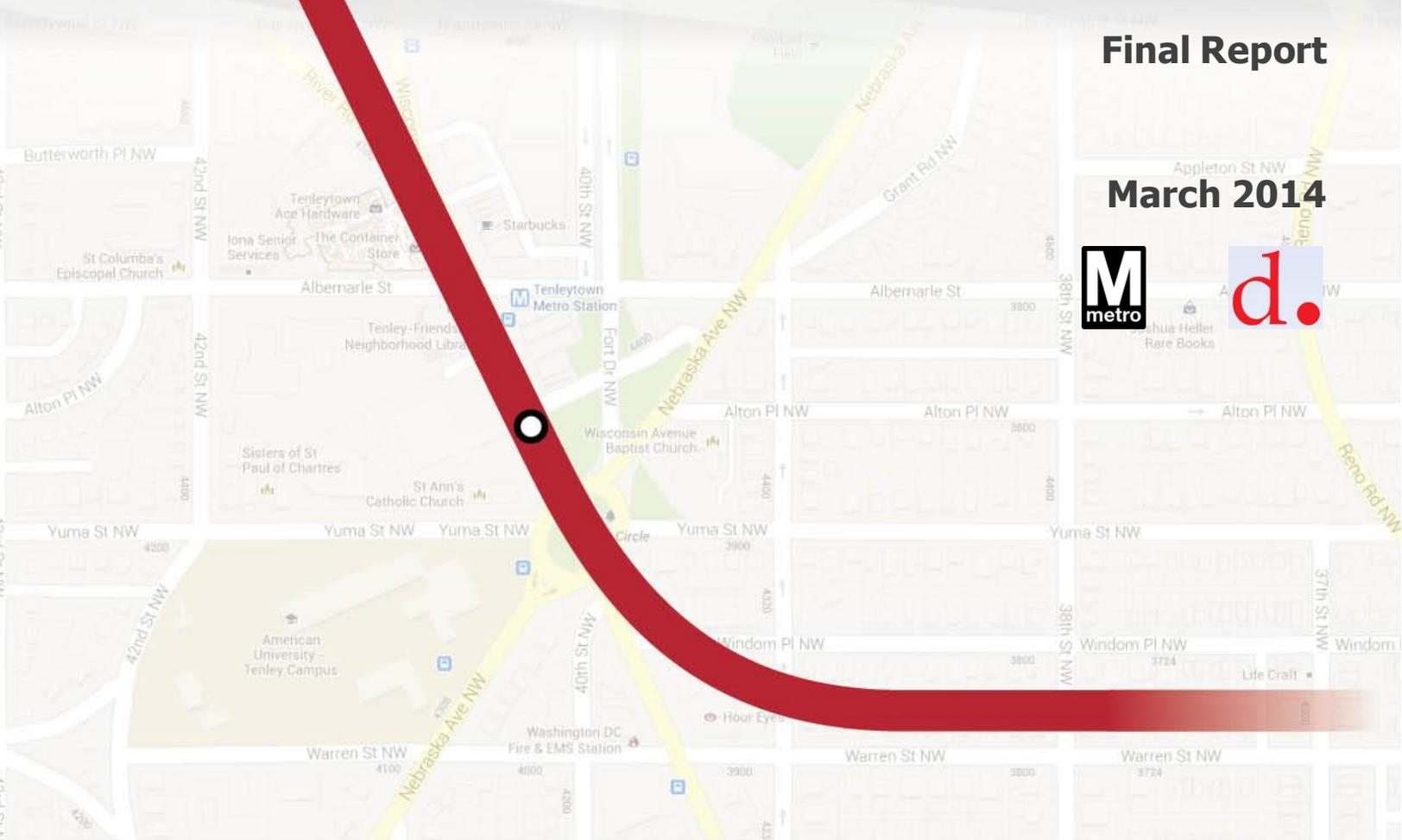




Tenleytown-AU Metrorail Station Access Improvements Study

Final Report

March 2014





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1. INTRODUCTION

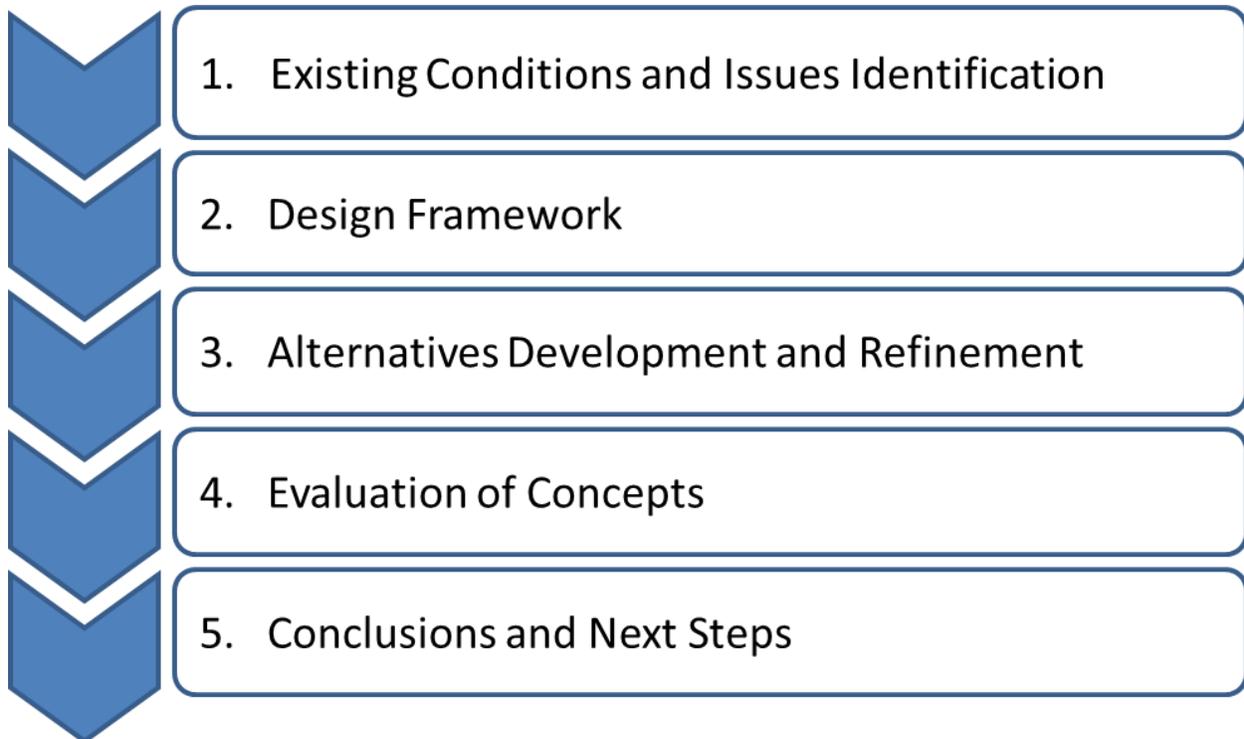
The Washington Metropolitan Area Transit Authority (WMATA), in coordination with the District of Columbia Department of Transportation (DDOT), initiated the Tenleytown-AU Metrorail Station Access Study to identify station access improvements and to redesign WMATA owned property to better accommodate all modes (e.g. walk, bike, transit) of access to the station. The study specifically examined WMATA and DDOT owned property on Fort Drive and 40th Street, the adjacent street grid to the eastern station entrance, in order to provide a higher level of service for all modes of access to the station.

Design alternatives that meet the station's current and future needs in terms of pedestrian, bicycle, transit (both bus and shuttle), and parking/vehicular access modes were jointly developed by WMATA and DDOT. This report describes the design process (see **Figure 1**) and alternatives developed, as well as provides cost estimates for each alternative.

This report structure is as follows:

- Part 1: Introduction and Study Process
- Part 2: Existing Conditions and Issues Identification
- Part 3: Design Framework
- Part 4: Alternatives Development and Refinement
- Part 5: Evaluation of Concepts
- Part 6: Conclusions and Next Steps

Figure 1: Study Process



2. EXISTING CONDITIONS AND ISSUES IDENTIFICATION

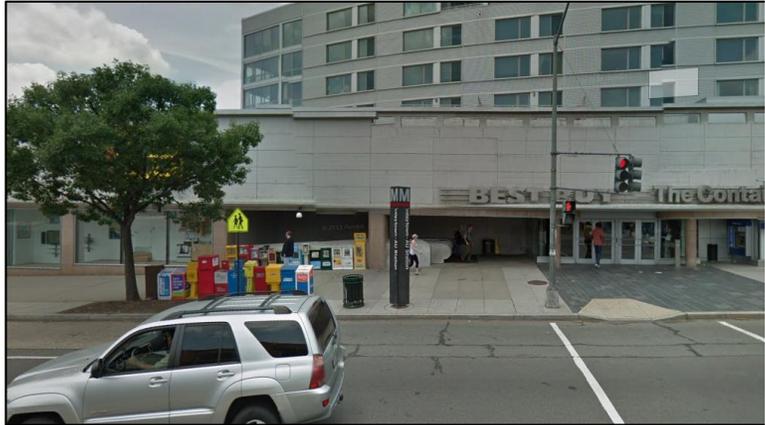
2.1 Existing Conditions

The study team documented the existing conditions at the Tenleytown-AU Metrorail Station to understand the issues that may impede multimodal access to the station. The following is a summary of the existing site conditions for the station. A more detailed summary of the issues is available in the Existing Conditions Technical Memorandum in **Appendix A**.

The Tenleytown-AU Metrorail Station is located on the Metrorail Red Line in Northwest D.C., less than a mile from the Maryland border. The Tenleytown-AU Metrorail Station has two entrances in addition to an elevator entrance. The west entrance is located off of Wisconsin Avenue NW as shown in **Figure 2**, one block north of the intersection with Albemarle Street NW. The east entrance is located on the north side of Albemarle Street NW, just east of the intersection with Wisconsin Avenue NW as shown in **Figure 3**. **Figure 5** shows the quarter-mile area around the station and **Figure 6** shows the immediate area surrounding the station.

Wisconsin Avenue NW is the major north-south arterial and bisects the station area, with approximately 37,300 vehicles per day.¹ Albemarle Street NW is the major access road to the station. The 40th Street-Fort Drive loop to the east of the station provides access to most Metrobus routes and private shuttle services, as well as on-street parking and parking garages.

Figure 2: Tenleytown-AU West Entrance



Source: Google Maps, accessed June 2013

Figure 3: Tenleytown-AU East Entrance



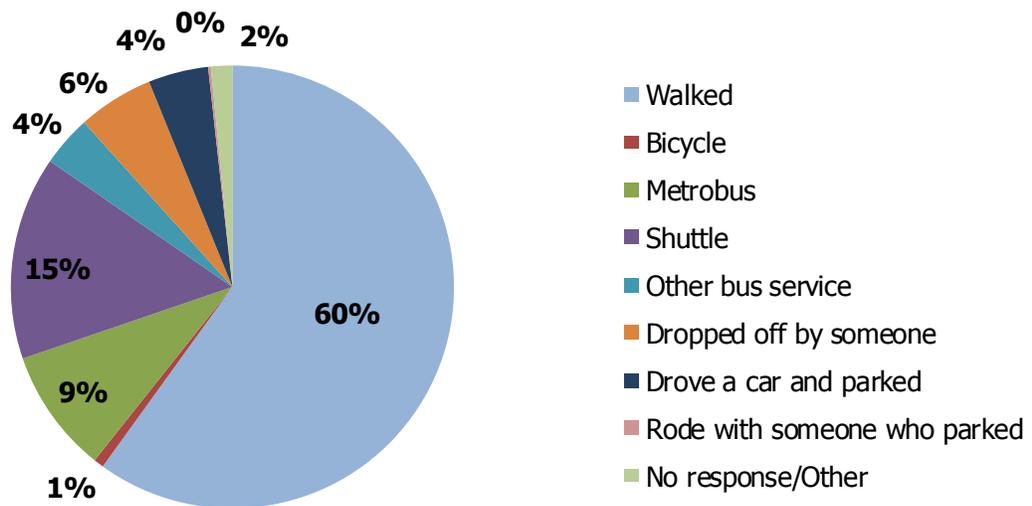
Source: Google Maps, accessed June 2013

¹ District Department of Transportation Traffic Volume Map 2010.
<http://dc.gov/DC/DDOT/About+DDOT/Maps/Traffic+Volume+Map+2010>

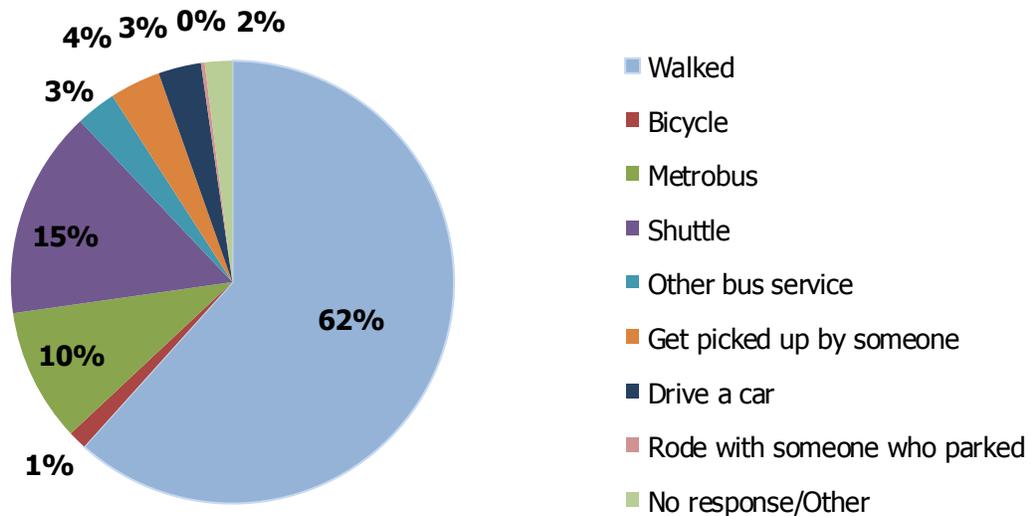
The WMATA station can be accessed by several modes and serves 7,074 passengers on an average weekday (June 2013). According to a 2012 Metrorail Survey, most passengers (60%) walk to the station. The combined percentage of transit (Metrobus, Shuttle and Other Bus) users is 28%. About 10% either drive and park or are dropped off by someone. Only one-percent of the passengers access the station using a bicycle. For passengers leaving the station, 62% walk to their destination. This suggests that most origins and destinations are within walking distance of the station. About 10% of passengers transfer to Metrobus, whereas 15% transfer to a Shuttle. A small percentage of passengers drive or get picked up by someone. A summary of mode share is shown in **Figure 4**.

Figure 4: Access to / Egress from Tenleytown-AU Metrorail Station - Mode Share

Access



Egress



Source: 2012 WMATA Metrorail Passenger Survey

Figure 5: Tenleytown Quarter Mile Station Area

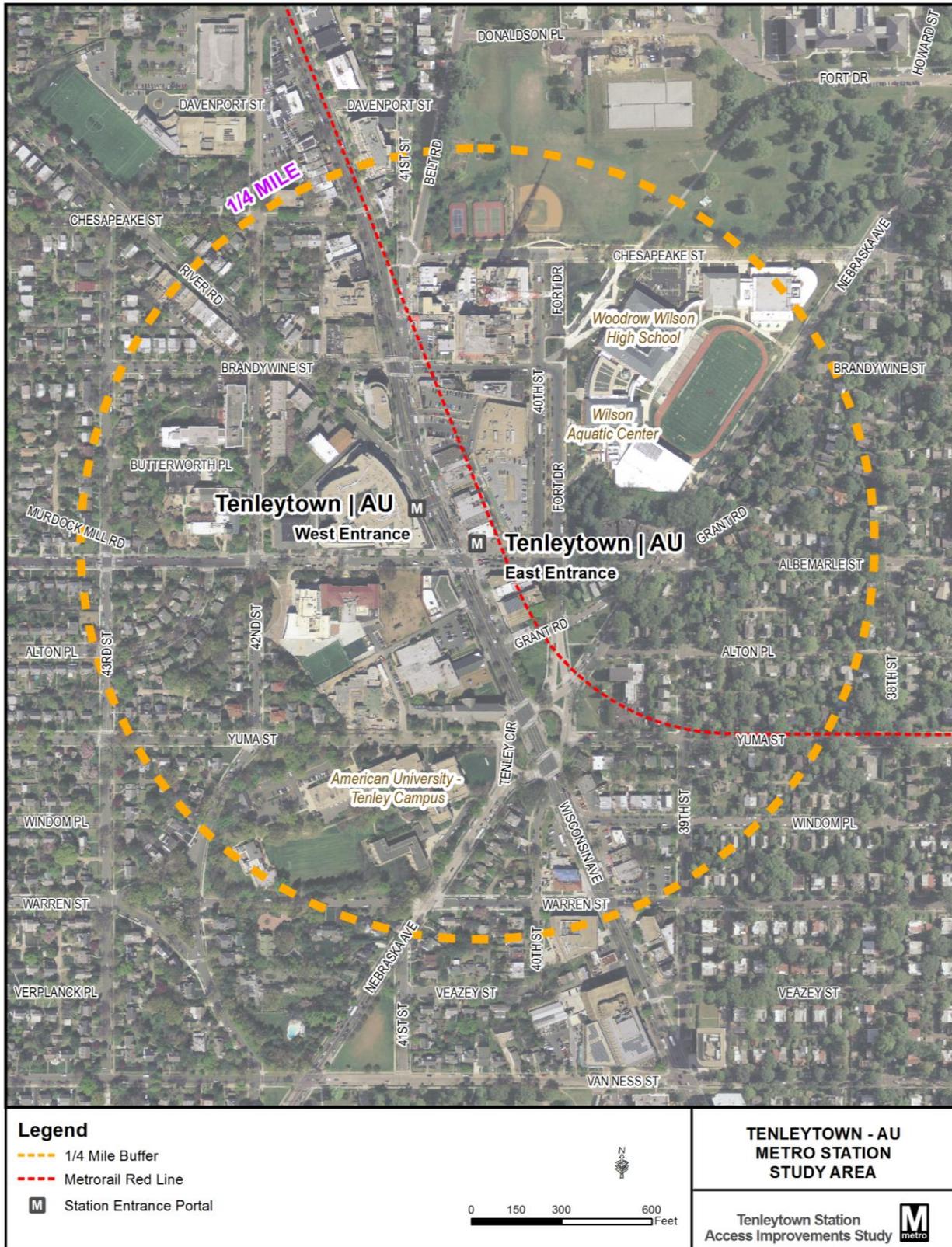
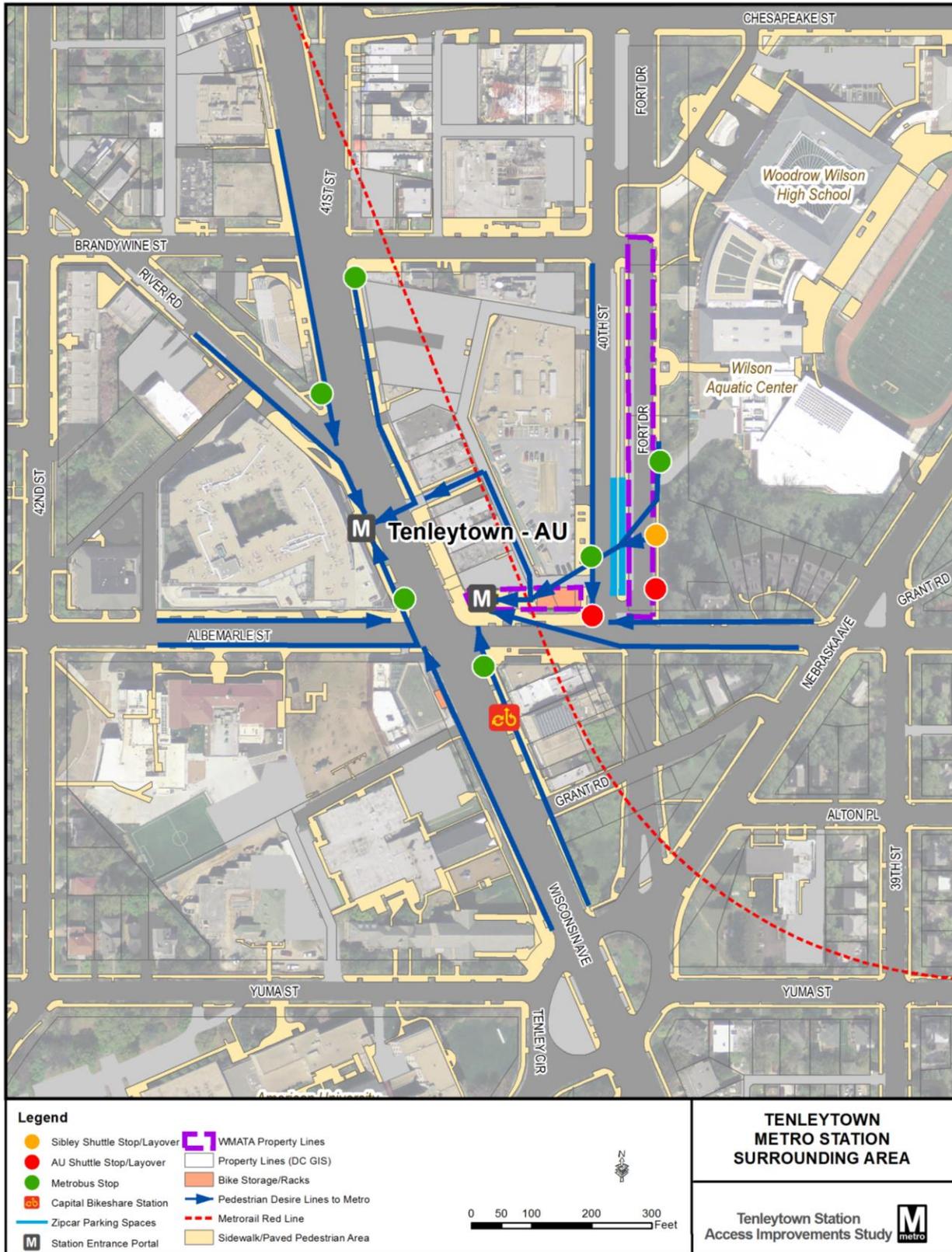


Figure 6: Tenleytown Station Surrounding Area



Neighborhood Context

The station is currently surrounded by moderate-density, mixed-use, retail, and institutional buildings. Retail uses, including restaurants, surround the Tenleytown-AU Metrorail Station, on both Wisconsin Avenue NW and Albemarle Street NW. Some offices are also located in the vicinity of the station. The area surrounding the station is either built out or protected, including several churches, green space, schools and many single family homes. Low-density residential areas are located within walking distance from the station. Additional moderate density, mixed-use development is supported in the District of Columbia's *Comprehensive Future Land Use Plan (2012)* in the block directly adjacent to the eastern station entrance. Most of the revitalization in the area is planned around the Metro station or at American University. Future land use and current redevelopment projects are shown in **Figure 9**.

- **American University College of Law (Figure 7):** American University has planned for redevelopment of an 8-acre site which includes 312,000 square feet of facilities and parking for 400 vehicles for 2,500 students and faculty. The LEED-certified facility will include flexible teaching spaces, a conference center, expanded clinic space, teaching courtrooms, and multiple indoor and outdoor student study and meeting spaces throughout the campus. It is scheduled for completion in 2015.
- **Babe's Billiards Site Redevelopment (Figure 8):** The proposed Planned Unit Development (PUD) at Wisconsin Avenue and Brandywine Street will remove the existing facades, retain and reinforce the former Babe's Billiards structure, and add five new stories of residential above. The LEED-certified building will include ground floor and below-grade retail on the site and no parking.
- **Safeway Redevelopment:** Safeway has plans to redevelop its Tenleytown store into a mixed-use development with a 56,000 square foot grocery store and 190 residences. The planned redevelopment is outside of the immediate study area.

Figure 7: American University College of Law, Tenley Campus, 2015



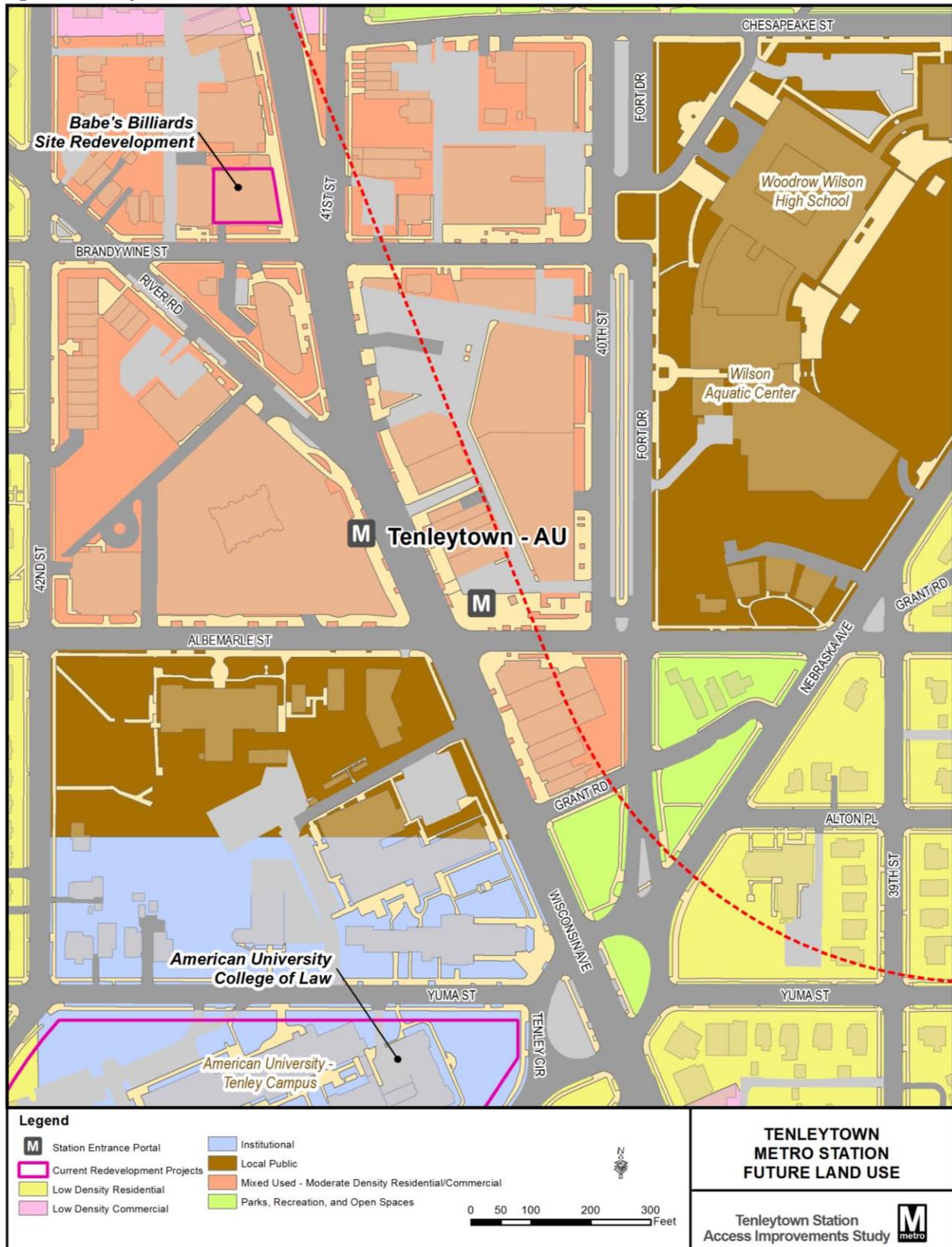
Source: <http://tenley.wcl.american.edu/>, accessed January 2014

Figure 8: Babe's Billiards Redevelopment (Tenley View)



Source: <http://douglasdevelopment.com/properties/tenleyview>, accessed January 2014

Figure 9: Tenleytown Station Area Future Land Use



Previous Plans

Several planning efforts lay the foundation for Tenleytown-AU Metrorail Station area improvements. The following summarizes these planning efforts:

- The 2006 DC Comprehensive Plan recommends urban design improvements to make Tenleytown-AU Metrorail Station a more attractive community hub in the future.
- The 2005 DC Bicycle Master Plan recommends improving bicycle access to transit, including way-finding and bike facilities.
- The 2005 District of Columbia Pedestrian Master Plan recommends restriping existing crosswalks and enhancing the intersection of Wisconsin and Albemarle Avenue.
- *moveDC*, a collaborative effort led by the District Department of Transportation is currently underway to develop a coordinated, multimodal long range transportation plan, addressing all modes of transportation. The multimodal tenets of the *moveDC* effort will be incorporated into this study.

Additionally, neighborhood-specific studies relevant to the Tenleytown-AU Station study area, have made the following recommendations:

Wisconsin Avenue Corridor Transportation Study, 2005

The *Wisconsin Avenue Corridor Transportation Study (2005)* focused on improving pedestrian safety, relieving congestion, and reducing noise pollution. Recommended improvements for the Tenleytown-AU Metrorail Station area included the following:

- Adjust signal timings and phasing to provide sufficient green time for the arterial flow and reduce the green time for the side streets - Brandywine Street, Albemarle Street, and Tenley Circle North.
- Restripe pedestrian crosswalks across Wisconsin Avenue to current DDOT standards: Brandywine Street, River Road, Whole Foods entrance, Albemarle Street, Tenley Circle.
- Upgrade existing non-conforming wheel chair ramps to improve accessibility.
- Replace faded or missing pavement markings to improve visibility and safety.
- Install pedestrian count down signals across the Whole Foods entrance.
- Consider possible four-way stop control at Albemarle Street/Fort Drive and 40th Street.

Rock Creek West II Livability Study, 2011

The *Rock Creek West II Livability Study (2011)* assessed the safety of the street segments and intersections in the vicinity of the Tenleytown-AU Metrorail Station area and gathered input from residents, identified issues, and provided recommendations for improvements. Recommended improvements for the Tenleytown-AU Metrorail Station area included the following:

- Reverse directions of 40th Street between Brandywine Street and Albemarle Street (to be northbound) and Fort Drive (to be southbound), to align approaching traffic movements at the Albemarle Street intersection.
- Remove the U-turn break in the median near the intersection of Albemarle Street. Replace with a median break and new crosswalk at the Whole Foods garage entrance and exit.
- Due to reversed directions of traffic, move Metrobus and shuttle stops to the median side of both 40th Street and Fort Drive.



- Convert metered parallel parking to angled parking along west side of 40th Street and east side of Fort Drive.

American University Transportation Demand Management Study (in progress)

The *American University Transportation Demand Management (TDM)* study was initiated to achieve several objectives linked to the University's growth and sustainability goals. In particular, the TDM Plan focuses on reducing the amount of off-street parking required to support campus growth, while also reducing the traffic impacts of future growth on campus and within surrounding communities. The Plan will also be instrumental in aiding the University in meeting its ambitious Climate Plan goal of carbon neutrality by 2020. By tapping into growing demand for sustainable and active transportation options, the Plan seeks to facilitate modal changes among drivers who are interested in reducing their auto-dependency, while ensuring that parking activity generates funding to increase the appeal and effectiveness of ridesharing, transit, cycling, and walking.

2.2 Issues Identification

The Tenleytown-AU Metrorail Station is located along a crowded street grid where pedestrians, bicyclists, buses, shuttles, taxis, and automobiles compete for space with vehicular traffic and commercial deliveries. There is a high level of activity, however the right-of-way is generally underutilized and the programming for both the sidewalk and street can be improved to meet the needs of residents and transit users.

Through coordination with agency partners and stakeholders, the project team identified general design issues for improvement for pedestrian, bicycle, transit, and vehicular facilities. The study team met with WMATA and DDOT staff for input on bicycle, pedestrian, transit, and park-and-ride issues in the station area. Coordination efforts included a walking tour and design workshops. External stakeholder meetings were also held with the adjacent property owner and Ward3 Vision - a local neighborhood citizen's advocacy group with the mission of improving the vibrancy of the DC's Ward 3 neighborhood - to better understand the neighborhood issues and future plans.

The following narrative provides a general description of the key issues and opportunities by access mode (pedestrian, bicycle, transit, vehicular) identified in this phase of the study. A summary table of the identified issues is seen below (**Table 1**).

Table 1: Issues Identification Summary Table

Mode	Issues and Opportunities
Pedestrian	Public realm enhancements and pedestrian safety improvements are needed at locations surrounding the Tenleytown-AU Metrorail Station.
Transit	Provisions of benches, covered areas, and other transit amenities are needed to accommodate the large numbers of bus transit users.
Bicycle	Provisions of bicycle parking are needed to accommodate existing and planned bicycle mode share to the Tenleytown-AU Station.
Vehicular	Improvements are needed to eliminate awkward vehicular movements and reduce automobile-pedestrian conflicts.

Pedestrian Facilities (Sidewalks, ADA, Crosswalks, and Signalized Crossings)

The location of schools in the station vicinity generates significant pedestrian volumes. Pedestrian access to the station from the escalator entrance off of Wisconsin Avenue NW and from the escalator and elevator entrance located off of Albemarle Street NW. The elevator located on the north side of Albemarle Street NW provides handicapped access per Americans with Disabilities Act (ADA) requirements.

Key Issues and Opportunities: Public realm enhancements and pedestrian safety improvements are needed at various locations surrounding the Tenleytown-AU Metrorail Station.

- **Sidewalks:** There are areas where pavement is in a state of disrepair around the station and utilities cause concern for mobility-impaired individuals. In addition, the median between 40th Street and Fort Drive is in poor condition. Foot paths have worn away grass areas and paving treatment and landscape material are inconsistent.
- **Crosswalks:** The crosswalk connecting the west entrance of the station to the driveway at Whole Foods is not striped. In other places the stripes are faded and need better maintenance.
- **Driveways:** There are several driveways surrounding the Tenleytown-AU Metrorail Station east entrance. In many instances, particularly along Wisconsin Avenue and 40th Street, conflicts between pedestrians and vehicles are common. Pedestrian markings and signage could be improved.
- **Public Realm:** The public realm along Albemarle Street between Wisconsin Avenue and 40th Street is underutilized and there is enough sidewalk space for community amenities. In addition, the Metro Entrance plaza is uninviting.

Figure 10: Pedestrians using the alley to access the station entrance presents pedestrian-auto conflicts.



Figure 11: Passengers waiting for the elevator at the East Entrance.



Transit Facilities (Bus/Shuttle Routes, Stops, and Amenities)

The Tenleytown-AU Metrorail Station is served by 14 Metrobus routes, two American University shuttle routes, and one Sibley Memorial Hospital shuttle. Two Metrobus stops are located at the Wisconsin Avenue NW and Albemarle Street NW intersection, adjacent to the station entrance. The Tenleytown-AU Metrorail Station is an important rail-bus connection with approximately 1,300 daily transfers between the two modes. According to WMATA SmarTrip data, most of the rail-to-bus transfers occur at the Wisconsin Avenue NW bus stops. The bus-to-rail transfers are more evenly distributed from the Wisconsin Avenue and 40th Street/Fort Drive bus stops.

Key Issues and Opportunities: A large percentage of passengers using the Tenleytown-AU Metrorail Station are bus transit users and provision of benches and covered waiting areas is important for the convenience of the users, particularly for the elderly and the disabled.

- **Transit Amenities:** The passengers waiting for the shuttle buses have no protection from inclement weather and no benches are provided. Similarly, only a small canopy is provided for passengers waiting for the elevator to the mezzanine, and no canopy exists for the escalator and elevator at the east entrance.
- **Signage:** There is a lack of signage indicating the shuttle stop locations.
- **Bus Stops and Layover Facilities:** Existing bus stops and layover facilities are currently at capacity. Any additional bus service would need to be accommodated with new facilities.

Figure 12: Passengers waiting for the AU Shuttle without any shelter near the East Entrance



Bicycle Facilities (Bicycle Storage/Lockers, Capital Bikeshare, and Planned Bicycle Network)

Ample bicycle facilities are available at locations surrounding the Tenleytown-AU Metrorail Station, including 20 bike racks and 20 bike lockers located adjacent to the station entrance on Albemarle Street NW. Passengers riding a bicycle access the station from the elevator off of Albemarle Street NW. Additional bike parking is located at the Tenley Friendship Neighborhood Library at the southwest corner of Wisconsin Avenue and Albemarle Street NW. There is a Capital Bikeshare station located along the east side of Wisconsin Avenue NW, just south of the station. Based on site observations during peak hours there is a significant demand for bike parking. The planned bicycle network also sets standards for new bike facilities in the area.

Key Issues and Opportunities: Although bicycle access to the Tenleytown-AU Metrorail Station is only one-percent, this mode of transportation is expected to increase as the District implements bicycle improvements in the station area and surrounding neighborhood.

- **Bicycle Storage and Parking:** Based on site observations (AM peak and PM peak), there is a significant demand for bike parking. Sufficient accommodations should be planned to meet future demand. Additionally, the location of the current bicycle storage area is directly in the pedestrian desire line from the bus stops located on 40th Street and Fort Drive.
- **Connections to Planned Bicycle Network:** The DDOT Bicycle Program has plans for a network of bicycle infrastructure in the Tenleytown area, including shared lane markings and bike boulevards. Plans should connect the planned network to the Tenleytown-AU Station.

Figure 13: Bicycle Parking at the Tenleytown-AU Metrorail Station during AM Peak



Vehicular Facilities

On-street parking is provided in several places including Albemarle Street, Brandywine Street, and along 40th Street NW. Metered parking is operated by both DDOT and WMATA. DDOT parking is restricted to 15-minute intervals during AM and PM peak hours and is currently prohibited in the WMATA metered spaces during the peak periods so as to provide space as a Kiss-and-Ride. Most of the pick-up and drop-off activities take place along the southbound 40th Street NW. There are also two Zipcar spaces along the southbound 40th Street NW. Two structured parking decks are located within a block of the Tenleytown-AU Metrorail Station.

Key Issues and Opportunities: In general, vehicular access is well accommodated around the Tenleytown-AU Metrorail Station with the exception of the intersection at 40th Street and Fort Drive with Albemarle Street NW.

- **Intersection Geometry:** The geometry of the intersection of 40th Street and Fort Drive with Albemarle Street causes conflicts between vehicles and pedestrians. Fort Drive continues south of Albemarle Street, however 40th Street terminates at the intersection. Eastbound vehicles approaching the intersection along Albemarle Street are often confronted with pedestrians jay-walking between the 40th Street median and Fort Drive.
- **U-Turns:** Just north of Albemarle Street, there is a break in the 40th Street and Fort Drive median to permit vehicular U-turns. The median break has a crosswalk for pedestrians accessing parked vehicles, but conflicts between pedestrians and vehicles are common.

Figure 14: 40th Street And Fort Drive Loop Looking North with median break



Figure 15: Fort Drive is Two-Way South of the Intersection with Albemarle Street NW



3. DESIGN FRAMEWORK

3.1 Goals and Criteria

The first step in the alternatives development process was to develop goals and criteria in which the design concepts should address the identified concerns. These goals and criteria were developed in consultation with project stakeholders including WMATA and DDOT staff. A future needs assessment was also done to determine the appropriate level of bicycle and transit facilities for the planning horizon year of 2030. The goals and criteria by mode of access are listed below:

General Space Utilization

- Comprehensive utilization of street and sidewalk right-of-way (ROW).
- Provide space for an enhanced station entrance plaza and improved public realm.

Pedestrian Access Improvements

- Improve the pedestrian experience.
- Address ADA concerns and auto-pedestrian conflicts.
- Accommodate pedestrian desire lines with marked crossings.

Bicycle Access Improvements

- Accommodate bicycle access to the station and connect to planned bicycle networks.
- Accommodate a 5% bicycle mode share by 2030 (total of 100 bicycle parking spaces).
- Connect to planned bicycle boulevard on Chesapeake Street and shared lane markings on Albemarle Street.

Transit Access Improvements

- Accommodate existing and future needs of transit vehicles and customers.
- Accommodate Rail-to-Bus, Bus-to-Rail, and Bus-to-Bus transfers.
- Plan for 2030 transit requirements (5 Bus Stops, 5 Bus Layover Areas).

Vehicular/Parking Access Improvements

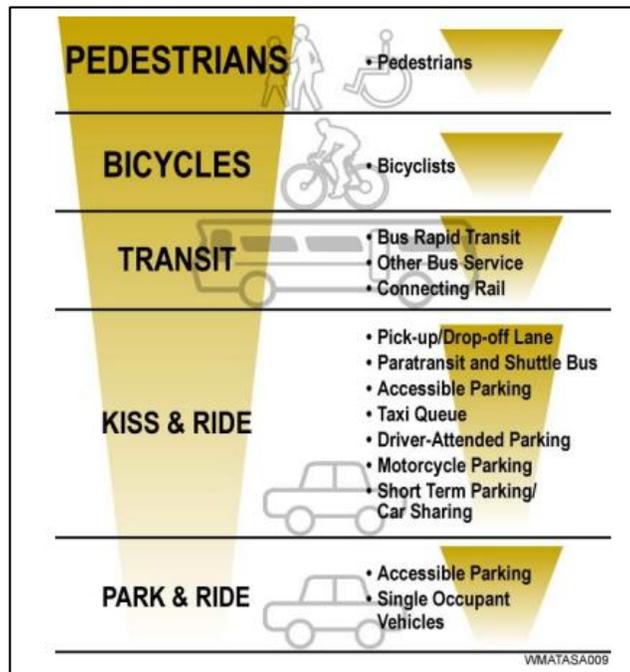
- Improve intersection control and/or geometry at Albemarle Street and 40th Street/Fort Drive.
- Preserve on-street parking to largest extent possible.

3.2 Design Assumptions and Standards

Assumptions:

1. **Tenleytown is considered a mid-line station in an urbanized area.** Mid-line stations are typically located in areas with low to medium density and are usually accessed by Park & Ride, Kiss & Ride, bus, bicycling, and walking modes. As Tenleytown is an urbanized area, currently experiencing renewed investment, it is safe to assume Metrorail customers will continue to access the station using multimodal forms of transportation into the future at equal to greater rates to the present.
2. Priority for station access improvement concepts are based on WMATA’s Station Site and Access Planning Manual (SSAPM) Access Hierarchy. Since all modes of access to a station cannot be given equal priority, WMATA has established the Access Hierarchy to provide a rationale for station site planning and design (see **Figure 16**).
3. Existing ADA Parking on Fort Drive remains unchanged. In order to maintain past commitments for ADA parking for the Wilson Aquatic Center, the four existing ADA parking spaces at the north end of Fort Drive are retained in all design concepts.
4. In discussions with the adjacent property owner, there are no plans to redevelop the “Whole Foods” block. Existing service access points for Whole Foods and other retail are maintained. Additionally, redevelopment or joint development of the “Whole Foods” block was not considered in the design concepts at this time. Note that this may change in the future as market conditions change and demand for property adjacent to Metrorail increases.
5. Assumed a 5% mode share capacity by 2030 to determine future bicycle storage needs.
6. Assumed a 2% annual Metrobus ridership growth rate to determine future bus transit needs.

Figure 16: WMATA's SSAPM Access Hierarchy



Design Standards:

The following design standards were established to provide a uniform set of standards across all three design concepts. These standards are based on the WMATA SSAPM (2008), DDOT's Design and Engineering Manual (2009), existing site conditions, and coordination with WMATA and DDOT staff.

- Curbside bus stop = 12'x80'
- Curbside layover space = 12'x60'
- Auto travel = 12' wide minimum
- Bike lane = 5' wide minimum
- On-street parking lane = 8'x22'
- ADA Parking on-street = 10'x22'

Future Transit Needs:

A future transit needs analysis was conducted to determine bus stops and layover areas required for the future level of bus service expected to be serving the Tenleytown-AU Metrorail Station, particularly the bus areas on Fort Drive and 40th Street.

The current facilities for Metrobus and shuttle boardings and alightings include five bus stops (three on Fort Drive and two on 40th Street). There is one designated "Metrobus Zone" for layovers on Fort Drive. American University and Sibley Hospital Shuttles typically layover in their respective bus stops on Fort Drive and 40th Street.

A 40% growth scenario was assumed to analyze which bus routes would need to add additional buses to respond to increased ridership by 2030. A 40% ridership growth scenario assumes a 2% annual Metrobus ridership growth rate (Source: WMATA Bus Planning – Brookland-CUA Station Access Study). The growth factor was applied to the max load for each trip to determine the projected ridership. The max load for each trip was determined from existing Metrobus ridership data. The projected ridership was then divided by 40 (a full seated load on a standard Metrobus) to determine the future load factor. If the future load factor was over 1.0, an additional bus was assumed to be needed to accommodate the projected ridership. **Table 2**, **Table 3**, and **Table 4** show the Tenleytown Station future transit needs analysis.

The following assumptions were used as part of the analysis:

- Bus routes are assumed to maintain existing route configurations.
- The peak hour of service from the Tenleytown-AU Metrorail Station was determined to be 3:15 – 4:15 PM, the hour in which the greatest numbers of buses in revenue service depart from the station.
- Two new DC Circulator routes would serve the Tenleytown-AU Metrorail Station (Source: DC Circulator Transit Development Plan 2011)
- One of the new DC Circulator routes at 10 minute headways would accommodate need for 5 additional buses on the H Line.
- Bus stop requirements based on a 4 minute dwell; one additional stop for schedule variation.
- Layover requirements based on a 10 minute layover.
- Layovers for DC Circulator buses and AU/Sibley/other shuttles can be accommodated elsewhere.



Table 2: Future WMATA Fleet Needs (2030 - 40% Growth Scenario, 2% Annual Growth)

Time	Route	Max Load	Projected Ridership	Future Load Factor	Additional Buses Needed
3:15	96	36	50	1.3	1
3:15	H3	36	50	1.3	1
3:20	M4	6	8	0.2	0
3:21	H2	33	46	1.2	1
3:25	H3	27	38	0.9	0
3:25	M4	18	25	0.6	0
3:25	W45	14	20	0.5	0
3:25	W47	15	21	0.5	0
3:31	H2	24	34	0.8	0
3:31	X3	48	67	1.7	1
3:36	96	29	40	1.0	1
3:40	H3	38	54	1.3	1
3:40	M4	8	12	0.3	0
3:44	H2	28	39	1.0	1
3:50	H3	24	33	0.8	0
3:51	X3	32	44	1.1	1
3:57	96	30	41	1.0	1
3:57	H4	27	37	0.9	0
4:00	M4	10	14	0.4	0
4:09	H2	26	36	0.9	0
4:11	H3	28	40	1.0	1
Total					10

Table 3: Total Bus Stops Required (2040)

Route	Existing Peak Hour Buses	Assuming 40% Growth	
		Additional Buses Needed	Total 2030 Buses
96	3	3	6
M4	4	0	4
H2, H3, H4	10	0*	10
X3	2	2	4
W45/W47	2	0	2
DC Circulator 1	0	6	6
DC Circulator 2	0	6	6
Sibley Shuttle	1	0	1
AU 1	6	0	6
AU 2	6	0	6
Total Bus Departures	34	17	56
Bus Minutes (assumed 4 min dwell time x # total bus trips)	136	68	224
Estimated Stops needed during Peak (Bus Minutes / 60 Min Peak)	2.3	1.1	3.4
Additional Bay for Schedule Variation	1	-	1
Total Bus Stops Required	3.3		4.4
Total Bus Stops Required (rounded up)			5

*Future ridership projections call for an additional 5 buses for the H Line, however, it was assumed that the new DC Circulator route, which serves the same activity centers at 10 minute headways, would accommodate the need for the additional buses on the H Line.



Table 4: Total Bus Layover Spaces Required (2030)

	Existing Peak Hour Buses	Assuming 40% Growth	
		Additional Buses Needed	Total 2030 Buses
Buses Requiring Layover during Peak Hour (WMATA routes only)	21	5	26
Bus Minutes (10 Minute Layover) x (bus departures)	210	50	260
Estimated Layover Areas needed during Peak (Bus Minutes / 60 Min Peak)	3.5	0.8	4.3
Total Bus Layover Spaces Required (rounded up)			5

4. ALTERNATIVES DEVELOPMENT AND REFINEMENT

Throughout the design process, the project team was in close coordination with relevant WMATA and DDOT staff. WMATA and DDOT staff included individuals representing various program offices including pedestrian, bicycle, parking, bus facilities, and land development within these agencies. As concepts were developed, comments from these internal stakeholders were incorporated into subsequent revisions. **Appendix B** includes all of the previous iterations of the design concepts. The narrative below describes the final design concepts and provides order of magnitude capital cost estimates.

The study team developed three design concepts with differing levels of disturbance to the existing infrastructure: low, medium, and high. These concepts are not meant to be interpreted as sequential improvement options; however, the low-disturbance option could be implemented in the short-term with a longer-term, higher-disturbance option planned for a future date.

4.1 Design Concepts

Concept A – Short-term, Low Disturbance Improvements

Concept A (**Figure 20**) focuses on improvements achievable in the short-term, where few curb modifications are made and no major infrastructure or utilities are disturbed.

Pedestrians

The eastern Metro entrance is improved with a canopy covering the escalator and elevator. The existing curb and landscape area is removed to maximize the pedestrian route between the Metro entrance and bus stops on 40th Street and Fort Drive. New sidewalk is proposed along the alleyway south of Sears to provide a pedestrian refuge.

A mid-block crossing is proposed south of the Whole Foods entrance on 40th Street to allow a safer crossing for pedestrians traveling from the Metro entrance to the bus stops on Fort Drive and other destinations to the east and north. To minimize auto-pedestrian conflicts, a fence extends along the median between the mid-block crossing south to Albemarle Street to encourage pedestrians to use the designated crosswalks. The existing planters in front of Sears and the other businesses on 40th Street are removed to accommodate the increased pedestrian traffic from the midblock crossing to the station entrance. ADA accessibility should be maintained and enhanced through all pedestrian improvements.

Bicycles

Concept A incorporates DDOT’s proposed bike lanes on 40th Street and Fort Drive as part of the Bicycle



Figure 17: Covered bicycle parking area at the Shirlington bus station.

Source: www.bikearlington.com



Figure 18: High capacity bicycle parking at Boston's South Station.

Source : Toole Design Group

Boulevards project between Jenifer Street and 41st Street NW. The proposed bike lanes will connect the Metro entrance to a bicycle boulevard on Chesapeake Street to the north. Also proposed on DDOT’s plans are shared lane markings on Albemarle Street between Wisconsin Ave and 40th Street and on 40th Street north of Brandywine Street.

The existing bicycle parking and lockers at the eastern Metro entrance are replaced with a covered bicycle parking area (example photo seen in **Figure 17**). If single inverted “U” racks are used, approximately 68 bikes can be accommodated; however this area could also provide more secure bike cages or higher capacity storage. An example of higher capacity bicycle storage can be seen in **Figure 18**. Additional spaces for bicycle parking are proposed along the wall between the escalator and elevator, on the back side of the escalators and in front of the planter on Albemarle Street.

Transit

All existing bus and shuttle bus stops are maintained in Concept A. Additional bus layover area is proposed on the east side of Fort Drive on the northern half of the block. Shelters are proposed for the two southern stops on the east side of Fort Drive.

Vehicular

Most on-street metered parking spaces are maintained. One space is lost on 40th Street to the proposed midblock crossing and three spaces are lost on Fort Drive to the midblock crossing and bus layover area.

To minimize auto-pedestrian conflict, the existing U-turn slip between 40th Street and Fort Drive at the intersection of Albemarle Street has been closed.

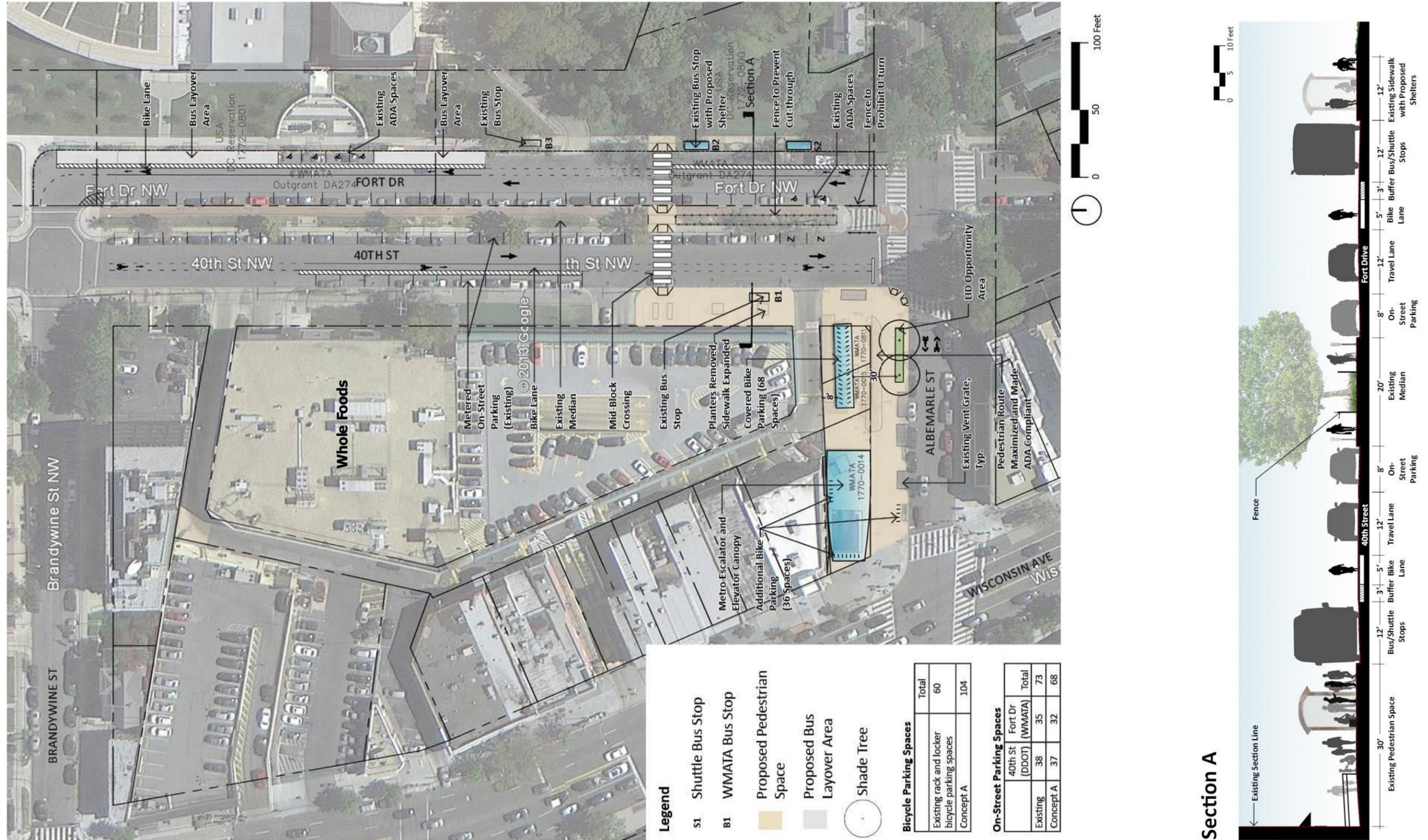
Other

With the southern Metro entrance plaza enhancements, a landscape area is also proposed along Albemarle Street. This area could also potentially serve as a bioretention planter, see **Figure 19**.



Figure 19: Constitution Square Curbside Bioretention.
Source : DC Green Infrastructure

Figure 20: Concept A - Short-term, Low Disturbance Improvements



Concept B - Medium Disturbance Improvements

The southern half of the 40th Street and Fort Drive block is redesigned in Concept B (**Figure 22**) to better align the Albemarle Street and Fort Drive intersection and expand pedestrian space around the Metro station entrance.

Pedestrians

The western curb of 40th Street is shifted approximately 42-feet east to expand the pedestrian space around the Metro entrance and provide more boarding and alighting area for the bus stops on 40th Street. A canopy covering both the escalator and elevator is proposed at the station entrance. The existing curb and landscape area at the station entrance is removed to maximize the pedestrian route between the Metro entrance and bus stops on 40th Street and Fort Drive. To minimize pedestrian-vehicular conflict around the station entrance, access to the alley south of Sears is limited and raised to the sidewalk level with traffic calming measures at either end and differentiated pavement (see **Figure 21**).

A mid-block crossing is proposed around the Whole Foods entrance to provide a safer crossing for pedestrians traveling from the Metro entrance to the bus stops on Fort Drive and other destinations to the east and north. A fence extends along the median between the mid-block crossing south to Albemarle Street to encourage pedestrians to use the designated crossings. The sidewalk behind the bus and shuttle stops on Fort Drive is expanded to provide bus and shuttle passengers more space. The proposed 4-way stop intersection of Albemarle Street and Fort Drive is safer and more convenient for pedestrians. ADA accessibility should be maintained and enhanced through all pedestrian improvements.



Figure 21: Shared Street
Source : MIG, Inc.

Bicycles

Shared lane marking are proposed on both 40th Street and Fort Drive in Concept B to connect the Metro entrance to a bicycle boulevard on Chesapeake Street to the north. Two covered bicycle parking areas are proposed in the expanded plaza space totaling 116 bicycle parking spaces if inverted “U” racks are installed.

Transit

New shelters are proposed for all bus and shuttle stops in Concept B. Larger shelters are proposed for the stops on 40th Street that have been relocated east with the curb line. Bus layover area is proposed on the east and west sides of Fort Drive on the northern half of the block. The proposed 4-way stop at the realigned intersection of Fort Drive and Albemarle Street will cause less delay and improve safety for buses reentering traffic from their stops.



Vehicular

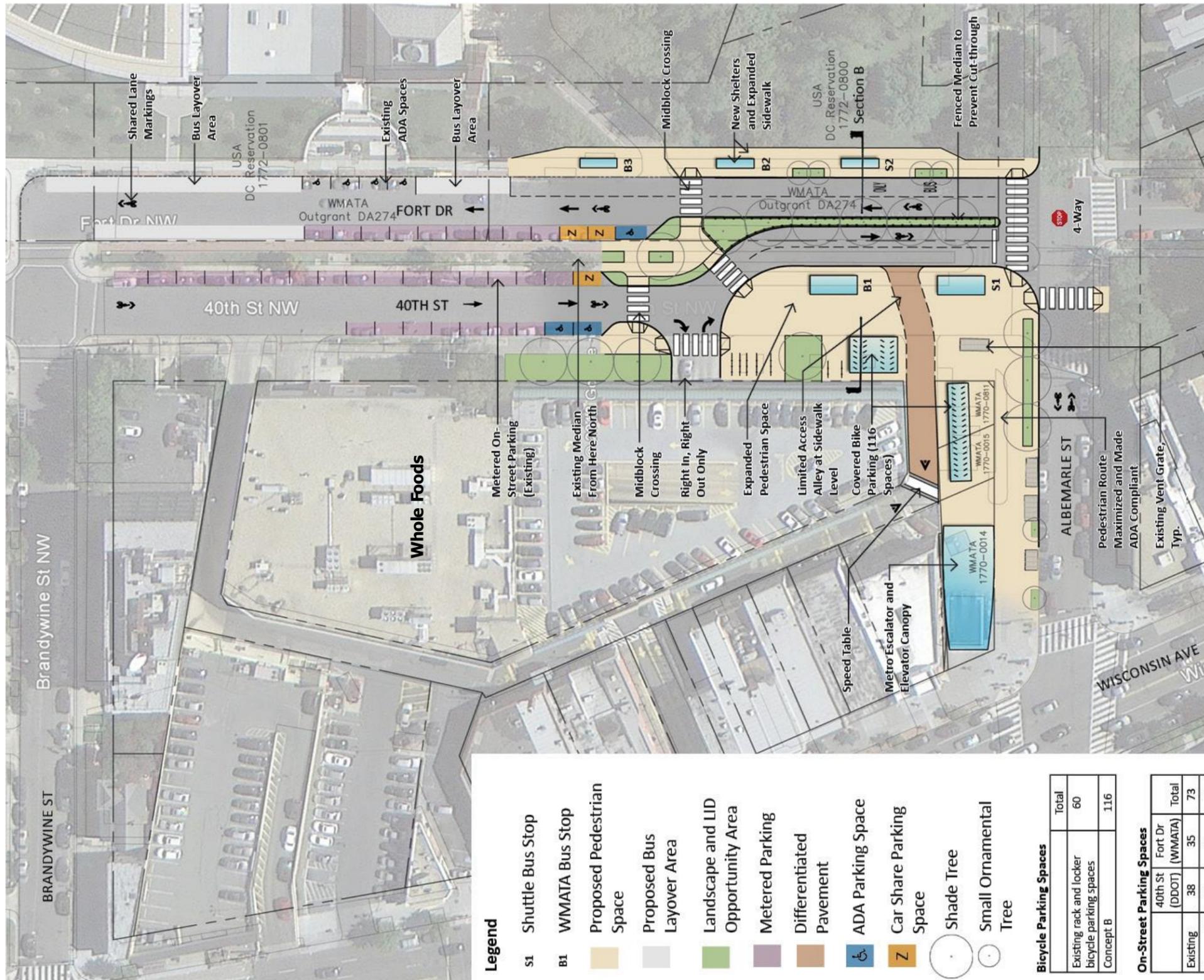
Aligning the intersection of Fort Drive and Albemarle Street eliminates the existing awkward geometry and provides motorists with a better sightlines as well as pedestrians, cyclists and buses. A stop warrant analysis should be conducted to see if a 4-way stop will further enhance the safety of the intersection.

The realignment of the intersection, mid-block crossing, and bus layover areas caused 12 parking spaces to be eliminated on 40th Street and 19 to be eliminated on Fort Drive.

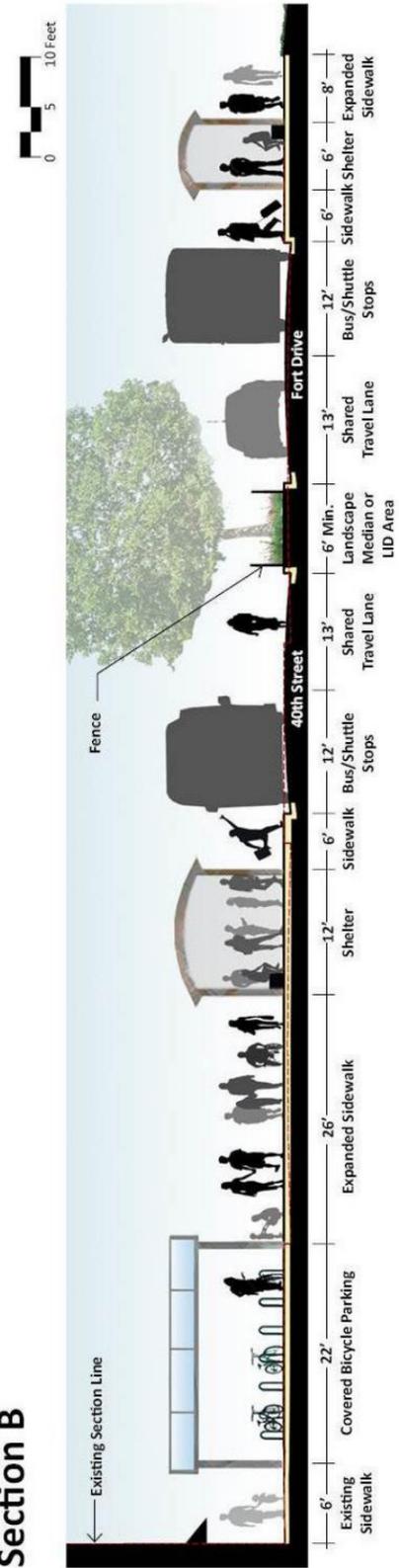
Other

The new median and expanded plaza space provide opportunities for landscape, shade, and bioretention. Adjustments to utilities will need to be made as necessary with the realignment of the southern half of 40th Street and Fort Drive.

Figure 22: Medium Disturbance Improvements



Section B



Concept C – High Disturbance Improvements

Concept C (**Figure 23**) relocates all the bus and shuttle stops on the western side of 40th Street, converts Brandywine Street to a one-way eastbound street and adjusts the alignment of both Fort Drive and 40th Street between Brandywine and Albemarle Streets.

Pedestrians

With the all bus and shuttle stops relocated to the west side of 40th Street, pedestrians connecting to the station via bus or shuttle have a more direct route, free of street crossings. The existing curb line of 40th Street has been shifted approximately 25 feet east, expanding the pedestrian route to the station and along the relocated bus and shuttle stops. A canopy covering both the escalator and elevator is proposed at the station entrance.

To minimize pedestrian-vehicular conflict around the station entrance, access to the alley south of Sears is limited and raised to the sidewalk level with traffic calming measures at either end and differentiated pavement. A mid-block crossing is proposed south of the Whole Foods entrance to provide pedestrians traveling to and from the Wilson Aquatic Center and other destinations north and east a safe crossing. ADA accessibility should be maintained and enhanced through all pedestrian improvements.

Bicycles

A two-way cycle track is proposed in Concept C between Fort Drive and 40th Street to connect the Metro entrance to a bicycle boulevard on Chesapeake Street to the north. A large, covered bicycle parking area is proposed in the expanded plaza space totaling 108 bicycle parking spaces if inverted “U” racks are installed.

Transit

Bus and shuttle buses will need to circulate to the relocated stops on 40th Street via Brandywine Street, traveling clockwise north on Wisconsin Avenue to east on Brandywine Street and south on 40th Street. This necessitates a curb modification to the northern curb line of Brandywine Street after the intersection with Wisconsin Avenue to allow buses to make the turn. Brandywine Street could still function as a two-way street, however almost all on-street parking spaces would be lost. See **Appendix C** for the Auto Turn results showing the Metrobus movements from Wisconsin Avenue to Brandywine Street.

Bus layover space is provided on the south side of Brandywine Street and the east side of 40th Street prior to the stops. New shelters are proposed for all the bus and shuttle stops and larger shelters are proposed for the two stops closest to the Metro entrance. The proposed signal at Albemarle Street and Fort Drive will cause less delay and improve safety for buses reentering traffic after their stops.

Vehicular

Better aligning the intersection of Fort Drive and Albemarle Street eliminates the existing awkward geometry and provides motorists with a better view of each other as well as pedestrians, cyclists and buses. A signal warrant analysis should be conducted to see if a signal will further enhance the safety of the intersection.

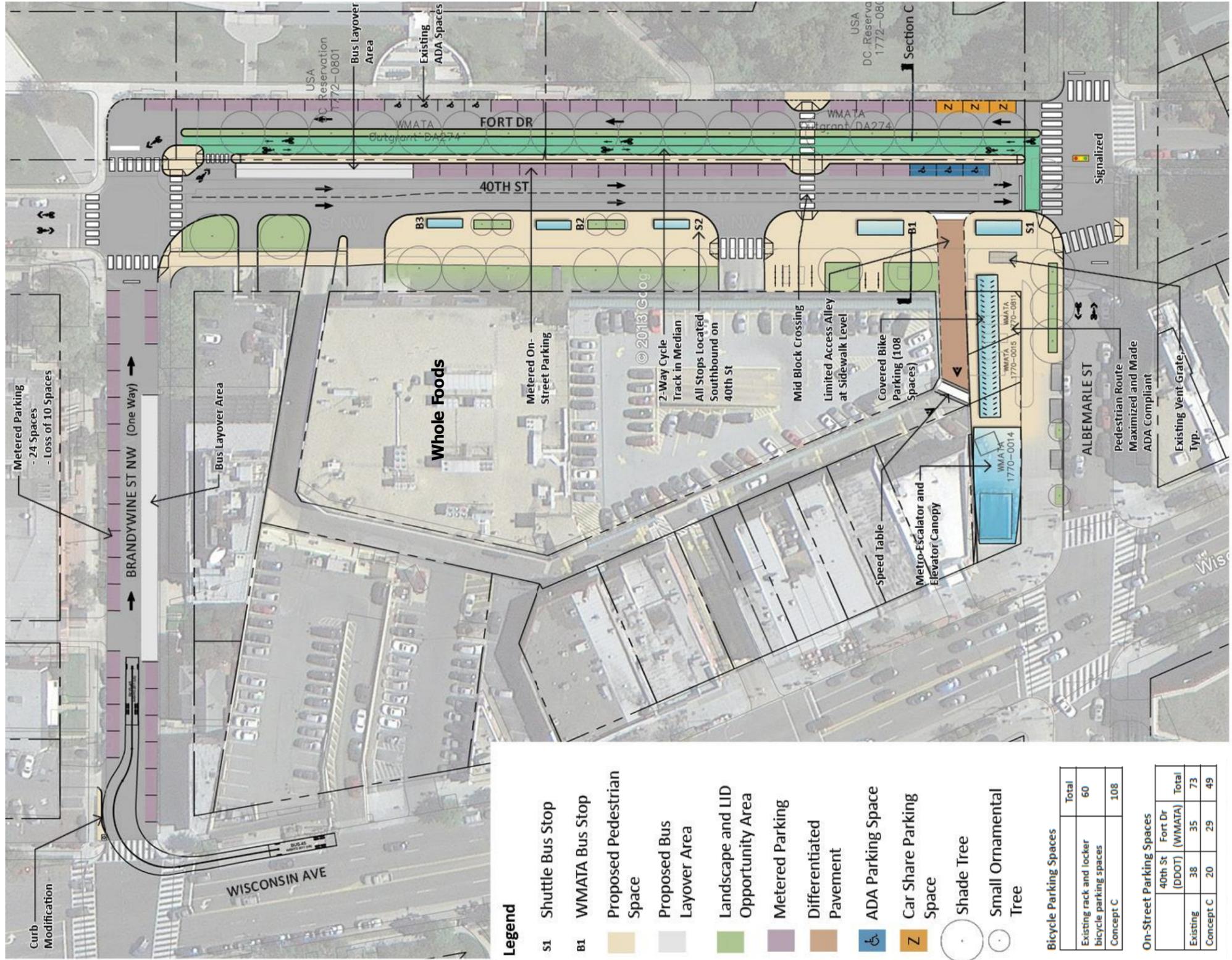
The relocated stops, mid-block crossing and bus layover areas caused 18 parking spaces to be eliminated on 40th Street and 6 to be eliminated on Fort Drive. The modified bus circulation and layover area caused 10 spaces to be eliminated from Brandywine Street.



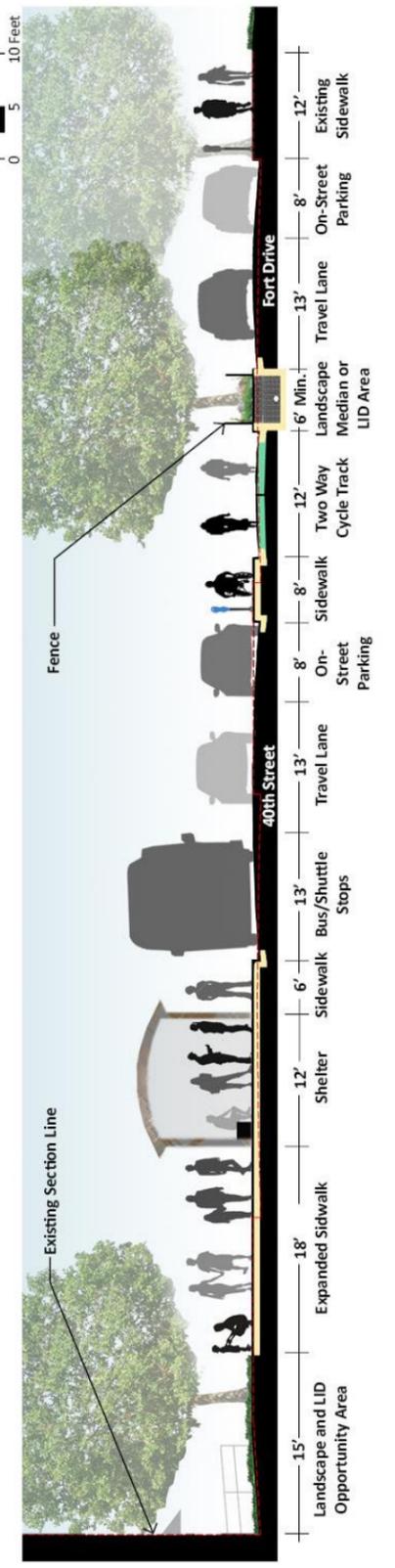
Other

The new median and expanded plaza space provide opportunities for landscape, shade, and bioretention. Adjustments to utilities will need to be made as necessary with the realignment of 40th Street and Fort Drive.

Figure 23: High Disturbance Improvements



Section C



4.2 Capital Cost Estimates

A summary of order of magnitude capital cost estimates is shown in **Table 5**. The cost estimate involves site preparation, modifications to the curb lines, and additional design elements featured in each design concept. To determine the conceptual capital costs for each concept, individual program elements were first itemized and the raw values (unit price X quantity) calculated and summed to provide a total raw value. Final construction costs were estimated by applying percentage costs for drainage, landscaping, 10% preliminary engineering, 25% contingency, and 15% engineering overhead.

The addition of the Tenleytown-AU Metrorail entrance canopy is currently provided for in WMATA’s Capital Improvement Program (CIP) at approximately \$1.5M.² However, the specific design for the station canopy presented in the three design concepts includes an expanded canopy to provide shelter over the existing elevator entrance. The capital cost for the station canopy element takes into account the money already programmed in the CIP. **Appendix D** provides more details on the cost estimates.

Table 5: Capital Cost Estimates

Concept	Cost Estimate (2014 \$)
Concept A – Low Disturbance	\$2,392,000
Concept B – Medium Disturbance	\$4,568,000
Concept C – High Disturbance	\$7,579,000

² WMATA Capital Needs Inventory FY2011 – FY2020.
http://www.wmata.com/about Metro/capital_needs/project_details.cfm?I=088

5. EVALUATION OF CONCEPTS

Figure 24 provides a summary of how the three design concepts accomplish the goals of improving multimodal access to the station. **Table 6** details the strengths and weaknesses of each concept and the trade-offs between the modes of access.

In general, all three concepts improve multimodal access to the Tenleytown-AU station with improvements to the pedestrian, bicycle, and transit users’ environment. These improvements will need to be weighed against vehicular access, most notably with the reduction of on-street parking in close proximity to the station entrance in Concepts B and C.

Table 6: Concepts Strengths and Weaknesses

Concept	Strengths	Weaknesses
Concept A – Short-term, Low Disturbance	<ul style="list-style-type: none"> • Relative low cost • Low disturbance • Can be implemented in the short-term • Pedestrian routes maximized • Improves transit users’ waiting experience • Improves bicycle infrastructure with segregated bike lanes, additional parking, and connections to planned bicycle network • Preserves existing on-street parking 	<ul style="list-style-type: none"> • Bicycle-auto and bicycle-bus conflicts due to on-street parking and bus stop locations • Does not improve Albemarle intersection alignment • Does not expand community space at Metro entrance plaza
Concept B – Medium Disturbance	<ul style="list-style-type: none"> • Expanded pedestrian and community space and improved desire lines • Improves transit users’ waiting experience • Improves bicycle infrastructure with shared lane markings, additional parking, and connections to planned bicycle network • Improved intersection alignment and operation at Albemarle Street 	<ul style="list-style-type: none"> • High cost • Medium disturbance • Long-term implementation • Bicycle infrastructure not segregated • Loss of on-street parking • Limits access to retail alley • Potential ROW impacts to private property
Concept C – High Disturbance	<ul style="list-style-type: none"> • Expanded pedestrian and community space and improved desire lines • Improves transit users’ waiting experience • Improves bicycle infrastructure with segregated bike lanes, additional parking, and connections to planned bicycle network • Improved intersection alignment and operation at Albemarle Street 	<ul style="list-style-type: none"> • High cost • High disturbance • Long-term implementation • Impacts to and loss of on-street parking on Brandywine Street • Loss of on-street parking • Limits access to retail alley • Potential ROW impacts to private property

Figure 24: Summary of Concepts

	Concept A: Short-Term, Low Disturbance Improvements	Concept B: Medium Disturbance Improvements	Concept C: High Disturbance Improvements
Section			
Pedestrian	<ul style="list-style-type: none"> • Extra-large entrance canopy for escalator and elevator • Existing landscaped area reconfigured to maximize pedestrian routes and provide expanded pedestrian space on the west side of 40th St and Albemarle St • Mid-block crossing across 40th St and Fort Dr • Median fence to encourage crossing at crosswalks 	<ul style="list-style-type: none"> • Extra-large entrance canopy for escalator and elevator • Extended curb for expanded pedestrian space on west side of 40th St • Existing landscaped area reconfigured to maximize pedestrian routes and provide expanded pedestrian space on the west side of 40th St and Albemarle St • Mid-block crossing across 40th St and Fort Dr • Raised alley-way and traffic calming measures to reduce auto-pedestrian conflicts • Median fence to encourage crossing at crosswalks 	<ul style="list-style-type: none"> • Extra-large entrance canopy for escalator and elevator • Extended curb for expanded pedestrian space on west side of 40th St • Existing landscaped area reconfigured to maximize pedestrian routes and provide expanded pedestrian space on the west side of 40th St and Albemarle St • Mid-block crossing across 40th St and Fort Dr • Raised alley-way and traffic calming measures to reduce auto-pedestrian conflicts
Bicycle	<ul style="list-style-type: none"> • Bicycle lanes on 40th St/Fort Dr connecting to the planned bicycle boulevard on Chesapeake St and the shared lane markings on Albemarle St • 104 bicycle parking spaces; potential for higher capacity storage 	<ul style="list-style-type: none"> • Shared lane markings on 40th St and Fort Dr connecting to planned bicycle boulevard on Chesapeake St and shared lane markings on Albemarle St • Two covered bicycle parking areas totaling 116 spaces; potential for higher capacity storage 	<ul style="list-style-type: none"> • Two-way cycle track between 40th St and Fort Dr connecting to planned bicycle boulevard on Chesapeake St and shared lane markings on Albemarle St • A large covered bicycle parking area totaling 108 spaces; potential for higher capacity storage
Bus	<ul style="list-style-type: none"> • Existing bus and shuttle stops are maintained • Addition of two shelters for the shuttle stops on Fort Dr • Additional bus layover area on Fort Dr 	<ul style="list-style-type: none"> • New shelters for all bus and shuttle stops; two higher capacity shelters for stops closest to Albemarle intersection • Expanded curb space allows for bus passengers more space for boarding/alighting • Additional bus layover area on Fort Dr 	<ul style="list-style-type: none"> • All bus and shuttle stops are relocated to the west side of 40th St in order to better facilitate transfers and reduce auto-pedestrian conflicts of crossing the street • New shelters for all bus and shuttle stops; two higher capacity shelters for stops closest to Albemarle intersection • Expanded curb space allows for provide bus passengers more space for boarding/alighting • Bus layover area on Brandywine St
Vehicular	<ul style="list-style-type: none"> • Most on-street metered parking spaces are maintained • Minimize potential auto-pedestrian conflict by closing U-turn slip at Albemarle St 	<ul style="list-style-type: none"> • Loss of 31 on-street metered parking spaces • Aligned intersection and 4-way stop of Albemarle St & 40th St/Fort Dr allows for improved traffic operations and pedestrian/bicycle safety 	<ul style="list-style-type: none"> • Loss of 24 on-street metered parking spaces on 40th St/Fort Dr; 10 spaces on Brandywine St • Better aligned intersection and 4-way stop of Albemarle St & 40th St/Fort Dr allows for improved traffic operations and pedestrian/bicycle safety • Changes to Brandywine St traffic operations to facilitate new bus operations

6. CONCLUSIONS AND NEXT STEPS

The purpose of the Tenleytown Station Access Improvements Study was to develop a series of design concepts to enhance multimodal access to the station. The design concepts and features presented in this report all have strengths and weaknesses and varying levels of trade-offs between access modes (e.g. less parking for more pedestrian space, etc.). Without recommending a preferred design concept, the following recommendations can be made to improve the overall station area for multimodal access:

- Consult with the community and relevant stakeholders on the appropriate design concept or design features for the future of the Tenleytown-AU Station area.
- Conduct a detailed traffic analysis to determine the appropriate level of traffic control at the Albemarle Street & 40th Street/Fort Drive intersection.
- Coordinate with American University stakeholders as they implement the recommendations from their on-going Transportation Demand Management study as it relates to the Tenleytown-AU Station area.
- Implement the recommendations for the Tenleytown-AU Station area from the Wisconsin Avenue Corridor Transportation Study (2005) to improve pedestrian safety on the Wisconsin Avenue side of the station area (if not already implemented):
 - Adjust signal timings and phasing to provide sufficient green time for the arterial flow and reduce the green time for the side streets - Brandywine Street, Albemarle Street, and Tenley Circle North.
 - Restripe pedestrian crosswalks across Wisconsin Avenue to current DDOT standards: Brandywine Street, River Road, Whole Foods entrance, Albemarle Street, Tenley Circle.
 - Upgrade existing non-conforming wheel chair ramps to improve accessibility.
 - Replace faded or missing pavement markings to improve visibility and safety.
 - Install pedestrian count down signals across the Whole Foods entrance.
- Improve and repair the existing station area crosswalk markings and sidewalk pavement which are in a state of disrepair.
- Add stop bars and/or markings at the driveway exits surrounding the east station entrance in order to reduce auto-pedestrian conflicts, particularly along Wisconsin Avenue.
- Standardize the rules and restrictions of all on-street parking spaces on 40th Street and Fort Drive (except for ADA and Car-Sharing spaces) to avoid confusion and abuse of short-term metered spots. Consider consolidating authority and ownership of all spaces under one agency (WMATA or DDOT). Due to the loss of on-street parking in the design concepts (in varying levels), the Tenleytown-AU Station area could be considered for future performance parking.

Next Steps:

After coordination with the public and relevant stakeholders and a decision from WMATA, DDOT, and City officials, the recommended concept will be carried into the next phase of work, including required environmental analysis and detailed engineering design. Next steps in the design will take into account comments heard during the public outreach and will coordinate with internal WMATA and DDOT staff, including WMATA's Office of ADA Policy and Planning and DDOT's Transportation Operations Administration. Project funding sources will be more explicitly defined and programmed. Throughout the process, there will be ongoing coordination with key stakeholders, including owners of adjacent property, utility companies, and City officials.