Chapter 5.0

Overview of Construction Activities

This chapter describes, to the extent feasible, how construction of the Preferred Alternative might be undertaken and summarizes the measures that have been and would be taken to minimize the impacts of these activities on the community and the environmental resources in the corridor. Additional detail can be found in the *Purple Line Construction Activities Technical Report.* Actual construction methods may change depending on the method used. As the project design advances, The Maryland Transit Administration (MTA) will develop a specific construction plan describing construction sequencing, equipment, and methodologies. The MTA is considering a variety of methods to construct the Preferred Alternative including the possibility of a Public-Private Partnership (P3), in which one entity would be contracted by the MTA to design, build, operate, and maintain the facilities, equipment, and services, as well as provide project financing. Under any method of constructing and operating the Purple Line, the MTA will remain responsible for the Purple Line and will be responsible for honoring all commitments made as part of the NEPA process.

At this conceptual level of study, the project was organized into 11 construction areas based on available access points; this chapter is organized by construction area. It is critical for MTA to have adequate access to an entire construction area to efficiently and safely complete the work. Access points are limited in some areas, specifically along the Georgetown Branch right-of-way, or controlled by a single entity such as the campus of the University of Maryland (UMD).

Section 5.1 discusses the construction schedule. Section 5.2 describes the construction areas. The construction areas are used in this chapter as a way to organize the presentation of information; the construction contracts will not necessarily correspond to these areas, nor do they imply sequence. Sections 5.3 and 5.4 discuss the role and major elements of a Transportation Management Plan and Environmental Compliance Plan, respectively, which will be implemented during construction.

5.1 Construction Schedule

MTA anticipates construction of the Preferred Alternative from July 2015 to late 2020, with revenue service beginning in December 2020. The time to construct each project element would differ based on the type of element, site characteristics, weather, structural design, and other factors, such as the relationship among the construction elements. Table 5-1 identifies typical construction activity tasks and average durations. The duration of a few elements, such as the structures connecting to the Silver Spring Transit Center (SSTC), is expected to be the entire construction period, while other areas would require a substantially shorter time.

Construction activity is likely to begin simultaneously at several locations within the project corridor to accommodate activities requiring lengthy construction times, such as tunnels, underground stations, and aerial segments. The time necessary for each activity would vary depending upon such factors as work hours, traffic

Table 5-1. Typical Construction Activities

Activity	Tasks	Average Time Required[1]
Pre-construction survey	Locate utilities, establish right-of-way and project control points and centerlines, and relocate survey monuments	6 months
Site preparation	Relocate utilities and clear and grub right-of-way (demolition), widen streets, establish detours and haul routes, erect safety devices and mobilize special construction equipment, prepare construction equipment yards and stockpile materials, install monitoring instrumentation for tunneling, implement ground improvements, underpin existing building, and establish maintenance of traffic	18 months
Heavy construction	Excavate and construct the tunnel portals, tunnels, and underground stations; construct the aerial structures, including foundation elements, construct surface trackway, reconstruct adjacent roadways and sidewalks	52 months
Medium construction	Lay track work, construct surface stations, install drainage, minor earthwork, and roadway paving	26 months
Light construction	Finish work, install system elements (electrical, signal, and communications), street lighting, landscaping, signage and striping, close detours, clean-up, and test system	24 months
Pre-revenue service	Test communications, signaling and ventilation systems, training of operators and maintenance personnel	9 months

[1]Activities may overlap

restrictions, and contractors' means and methods. Other factors would include the number and type of utilities requiring relocation and location and condition of nearby surface and subsurface structures.

Typically, surface and above ground construction activities would occur 6 days a week, 15 hours per day. There would be instances when certain construction activities could take place during weekends or other times. Typical construction activities for the underground sections, which include portal areas, stations, ancillary buildings, and tunneling, would be performed 7 days a week, 24 hours a day. Trucking would be permitted only on designated truck routes and may occur up to 24 hours a day, 7 days a week. As design of the project progresses, the construction schedule, and assumptions would be refined.

5.2 Summary of Activities by Construction Area

The activities described in this section are based on the MTA's conceptual construction staging plan and are subject to change as the project design advances. The effects of construction result from several activities:

- The movement of materials and equipment to the construction site and the removal of unwanted material. The effects of these activities are experienced on haul routes and at access points.
- The storage of materials and equipment, the assembly of components, and the management offices and other facilities for workers within staging areas. The effects of these activities result from the establishment of the staging areas and the activities that take place within them.
- The construction work performed on the site, which would range from shallow excavation to install the at-grade portions of the transitway, to the construction of aerial structures, to the construction of the Plymouth Street tunnel.

The potential for these activities to affect the community often is greatest at the access points where the workers, materials, and equipment enter the staging areas or access points on the site and where equipment and unwanted materials leave the site.

Staging areas may be located within the construction site in some cases, but this may not always be reasonably feasible given the various site constraints such as those found in the Georgetown Branch right-of-way or in the UMD campus west of US 1.

Where reasonably feasible, land area needs and impacts would be minimized by locating staging areas on sites designated for permanent non-transitway elements of construction, such as the

yard, the maintenance facility, or the traction power substation sites. In other cases, temporary construction easements on public land, when possible, or on private land would be required. Where reasonably feasible, access points would be located at staging areas to reduce the need for additional movements of material and equipment. By limiting access points to specific locations, MTA will minimize impacts to surrounding properties and resources and limit effects on the transportation network.

Potential haul routes were identified on public roads for each construction area to move equipment and materials to construction access points, as well as to remove unwanted materials. The at-grade portions of the transitway also could be used as a haul route.

Construction sequencing would be determined when detailed construction activities are more fully developed, but MTA anticipates that multiple parts of the project would be under construction simultaneously, and the transitway likely would be built in pieces. Due to the duration of the construction of certain elements, some communities potentially would be affected for longer periods of time than others.

In each of the discussions of the proposed construction areas that follow, the potential haul routes, access points, and staging areas that are currently anticipated to be used are identified, and the general construction activities in each construction area from west to east are described.

Table 5-2 identifies the transitway, roadway, and drainage structures that would be widened or constructed in each construction area; the roadways that potentially would be impacted because the transitway would be constructed within, along, or across the roadway; and any special features for Construction Areas 1 through 9 that comprise the transitway. Construction Areas 10 and 11 are the Yard and the Maintenance Facility, respectively.

The impacts to the affected roadways would typically be temporary lane closures or complete closures of the street for brief periods, the need for flagging operations, and restrictions on parking. To the extent reasonably feasible, street and lane closures would be at off-peak hours. As discussed in Section 5.3, MTA will prepare a Transportation Management Plan, including a public outreach and information component, to minimize the effects of construction on the transportation system and to inform the public of the current changes in the system before they occur. MTA also will prepare an Environmental Compliance Plan as discussed in Section 5.4 to ensure compliance of the construction activities with federal, state, and local requirements and the commitments and mitigation measures identified in this FEIS.

Figure 5-1 through Figure 5-5 illustrate the various types of construction equipment and activities discussed in this chapter.

Table 5-2. Elements of Construction Areas 1 Through 9

Construction Area	Limits and Length	Structures	Affected Roadways	Special Features
1	▪ Bethesda Metro Station to east of Jones Mill Road ▪ 2.0 miles of transitway	▪ New culvert at Coquelin Run ▪ Connecticut Avenue bridges ▪ Jones Mill Road bridges over the transitway ▪ Underpasses at Sleaford Road, Columbia Country Club (2), and Lynn Drive ▪ Pedestrian bridge at Bethesda	▪ Connecticut Avenue ▪ Jones Mill Road ▪ Montgomery Avenue ▪ East West Highway	▪ Bethesda Metro Station ▪ Capital Crescent Trail ▪ Columbia Country Club ▪ Connecticut Avenue bridge
2	▪ East of Jones Mill Road to east of Lyttonsville Place ▪ 0.7 mile of transitway	▪ Rock Creek bridge ▪ Capital Crescent Trail over Rock Creek ▪ Lyttonsville Place Bridge ▪ Capital Crescent Trail underpass west of Grubb Road	▪ Brookville Road ▪ Lyttonsville Place ▪ Jones Mill Road	▪ Capital Crescent Trail ▪ Rock Creek bridges ▪ Lyttonsville Yard

Table 5-2. Elements of Construction Areas 1 Through 9 (continued)

Construction Area	Limits and Length	Structures	Affected Roadways	Special Features
3	▪ East of Lyttonsville Place to west of Georgia Avenue ▪ 1.7 miles of transitway	▪ Talbot Avenue Bridge ▪ 16th Street Bridge ▪ Spring Street Bridge ▪ Transitway crossing of CSXT, WMATA, and Colesville Road ▪ Trail bridge over CSXT ▪ Trail bridge from Apple Avenue to Silver Spring Transit Center	▪ Stewart Avenue ▪ Talbot Avenue ▪ Brookville Road ▪ 16th Street ▪ Spring Street ▪ Colesville Road ▪ Bonifant Street ▪ East-West Highway ▪ 4th Avenue ▪ Michigan Avenue ▪ Kansas Avenue ▪ Lanier Drive ▪ Ripifant Street ▪ Apple Avenue	▪ Capital Crescent Trail ▪ Silver Spring Transit Center
4	▪ West of Georgia Avenue to University Boulevard (MD 193)/Piney Branch Road (MD 320) ▪ 2.1 miles of transitway	▪ Wayne Avenue bridge over Sligo Creek ▪ Culvert extension over Long Branch stream ▪ Plymouth Street tunnel	▪ Bonifant Street ▪ Georgia Avenue ▪ Wayne Avenue ▪ Fenton Street ▪ Flower Avenue ▪ Arliss Street ▪ Plymouth Street ▪ Piney Branch Road	▪ Plymouth Street tunnel
5	▪ University Boulevard to west of West Campus station ▪ 2.7 miles of transitway	▪ Bridge over Northwest Branch	▪ University Blvd, including the intersections of Piney Branch Road and Campus Drive ▪ Intersection of Campus Drive and Adelphi Road ▪ Various side streets	N/A
6	▪ West of Adelphi Road/West Campus Station to Rossborough Lane ▪ 1.2 miles of transitway	N/A	▪ Campus Drive ▪ Intersection of Campus Drive and Adelphi Road ▪ Presidential Drive ▪ Union Drive ▪ Rossborough Lane ▪ Regents Drive	UMD
7	▪ Rossborough Lane to east of Haig Drive ▪ 1.9 miles of transitway	N/A	▪ Paint Branch Parkway ▪ River Road	N/A
8	▪ East of Haig Drive to Veterans Parkway ▪ 1.8 miles of transitway	▪ Northeast Branch Bridge ▪ Bridge over intersection of Kenilworth Avenue and East West Highway ▪ Baltimore-Washington Parkway bridges over Riverdale Road	▪ Intersection of Kenilworth Avenue and East West Highway ▪ Riverdale Road ▪ Baltimore-Washington Parkway ▪ River Road	▪ Kenilworth Avenue/East West Highway bridge ▪ Baltimore-Washington Parkway
9	▪ Veterans Parkway to New Carrollton Station ▪ 2.1 miles of transitway	N/A	▪ Veterans Parkway ▪ Ellin Road	▪ Glenridge Maintenance Facility ▪ New Carrollton Metro Station

Figure 5-1. Example of Pile Driving Equipment

Figure 5-2. Example of Bridge over Roadway with a Crane

Figure 5-3. Examples of Site Grading and Equipment

Figure 5-4. Example of Road Cut for Track Installation

Figure 5-5. MSE Retaining Wall Construction

5.2.1 Construction Area 1: Bethesda Metro Station to East of Jones Mill Road

Construction Area 1 (Figure 5-6) would include 2.0 miles of at-grade and elevated transitway and the construction of the Capital Crescent Trail from the Bethesda Metro Station to Jones Mill Road.

- Haul routes would be along Pearl Street and East West Highway near Sleaford Road, Connecticut Avenue and Jones Mill Road, Connecticut Avenue to Interstate 495, East West Highway to Connecticut Avenue and Wisconsin Avenue, and Jones Mill Road to Connecticut Avenue or East West Highway.
- The access points would be located on Pearl Street, Sleaford Road, Connecticut Avenue, Newdale Road, Jones Mill Road, the traction power substation site on Montgomery Avenue, and Woodmont East.
- The staging areas would be along Newdale Road and at Connecticut Avenue and on the traction power substation site on Montgomery Avenue.

General Construction Activities

To reduce construction time, utilities would be relocated prior to the initiation of transitway construction. Work in Construction Area 1 would require the construction of retaining walls to build the transitway and Capital Crescent Trail to the proposed grade. The construction of these walls requires the use of heavy equipment such as cranes, excavators, bulldozers, loaders, dump trucks, and when necessary rigs to install piles.

Construction plan development is being coordinated with the Columbia Country Club to minimize impact to the Club's golf course. Also, Purple Line construction would be coordinated with the construction of a new south entrance at the existing Bethesda Metrorail station.

5.2.2 Construction Area 2: East of Jones Mill Road to East of Lyttonsville Place

Construction Area 2 (Figure 5-7) would include 0.7 mile of at-grade and elevated transitway and the construction of the Capital Crescent Trail from east of Jones Mill Road to east of Lyttonsville Place.

- Haul routes would be along Jones Mill Road to I-495 and Lyttonsville Place to East West Highway.
- The access points would be located along Jones Mill Road and at the Lyttonsville Yard site.
- The staging area would be the Lyttonsville Yard site.

General Construction Activities

Work would include cut-and-fill and utility relocations and the mass grading of the Lyttonsville Yard site to provide a staging area. Piles probably would be needed for retaining walls and bridges. The shallow bedrock at the yard site would be removed by ripping or splitting. Blasting would be used only as a last resort. Safety measures relative to blasting are discussed in Section 3.6.4.

5.2.3 Construction Area 3: East of Lyttonsville Place to West of Georgia Avenue

Construction Area 3 (Figure 5-8) would include 1.7 miles of at-grade and elevated transitway from east of Lyttonsville Place to west of Georgia Avenue and of the Capital Crescent Trail to its terminus at the SSTC.

- The primary haul routes would be along 16th Street. Secondary routes would be along 16th to East West Highway, US 29, and Stewart Avenue to Brookville Road.
- The access points would be located along the CSXT rail line and on local roadways.
- The staging areas would be between Kansas and Michigan Avenues on CSXT and WMATA property on the site of a proposed traction power substation, along 16th Street and Spring Street, on the Metro Plaza Property at the intersection of East West Highway and Colesville Road, and at 1110 Bonifant Street adjacent to the Silver Spring Transit Center.

General Construction Activities

Construction Area 3 would include retaining walls and other structural elements that require piles and the use of cranes. Augured piling, which employs drilling instead of driving piles to minimize impacts, would be used where reasonably feasible. It is probable that rock would need to be removed to construct the transitway into the SSTC.

Figure 5-6. Construction Area 1

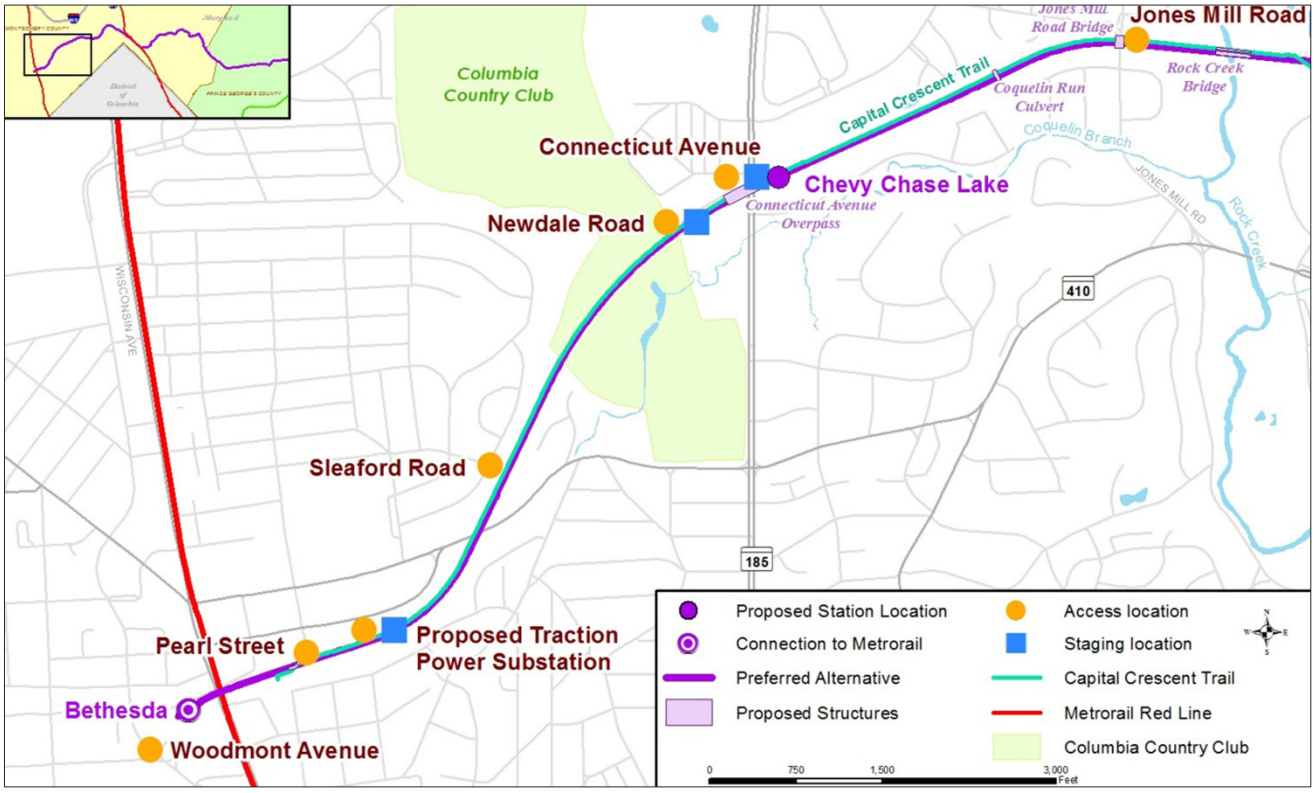


Figure 5-7. Construction Area 2

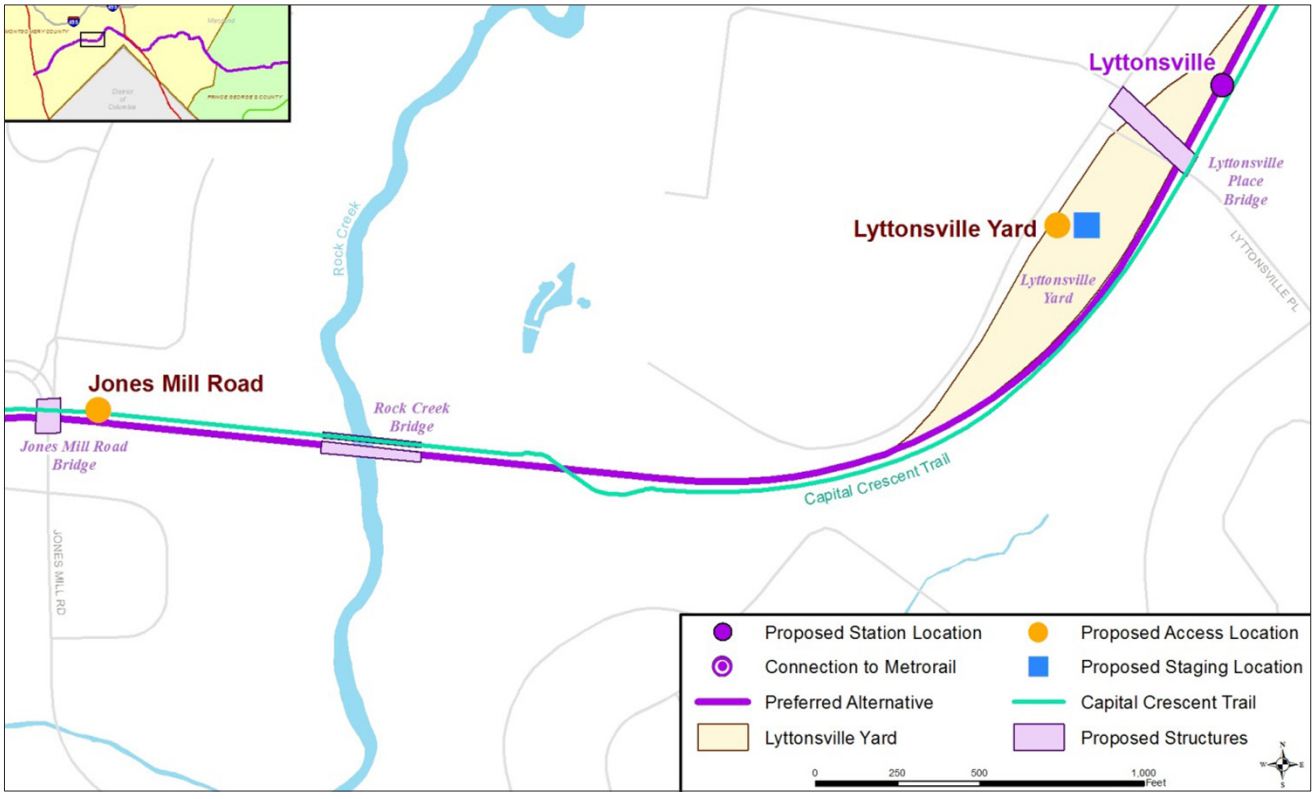
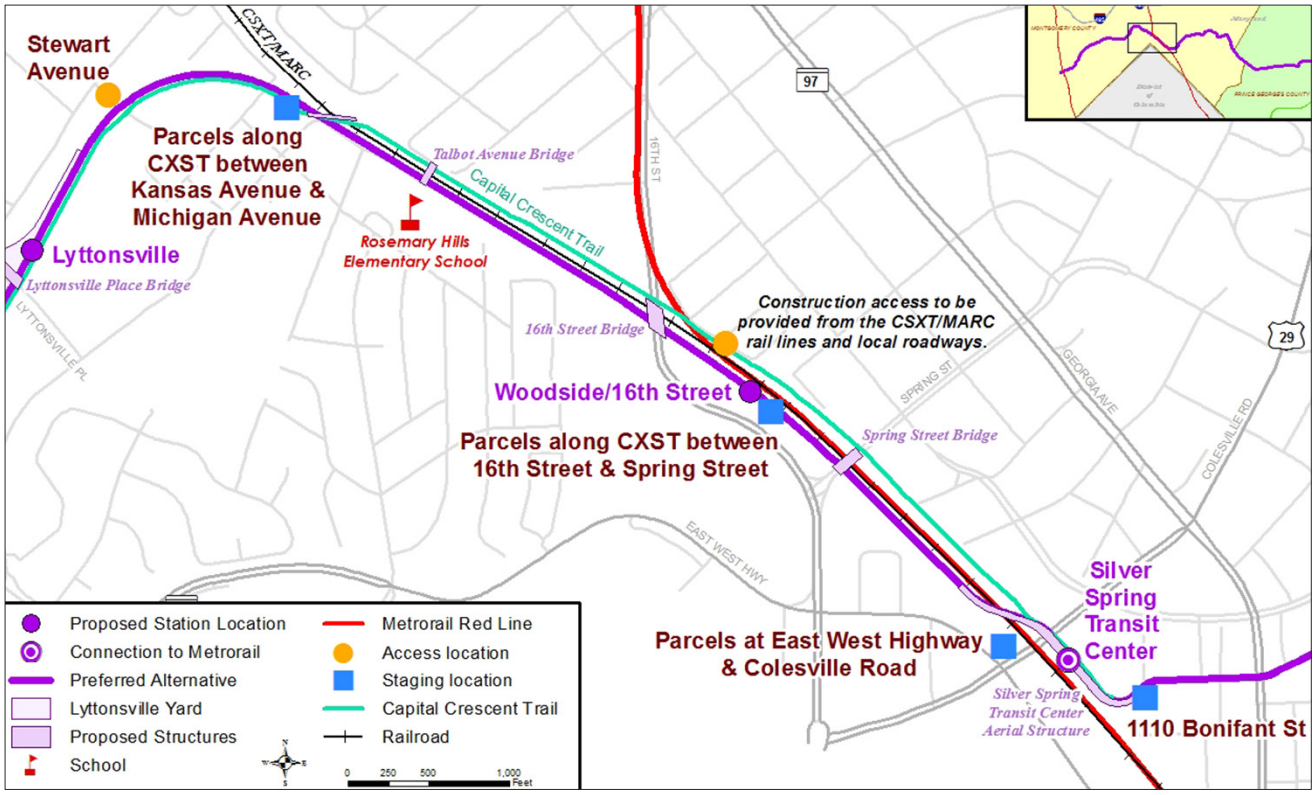


Figure 5-8. Construction Area 3



Before and during construction along and over the CSXT and Washington Metropolitan Area Transit Authority (WMATA) tracks, MTA would coordinate with both entities to ensure that the construction plan meets prevailing railroad safety and operational requirements and does not substantially interfere with railroad operating schedules.

MTA will coordinate with Rosemary Hills Elementary School to minimize disruptions to the extent reasonably feasible.

5.2.4 Construction Area 4: West of Georgia Avenue to University Boulevard — Route 193/Piney Branch Road — Route 320

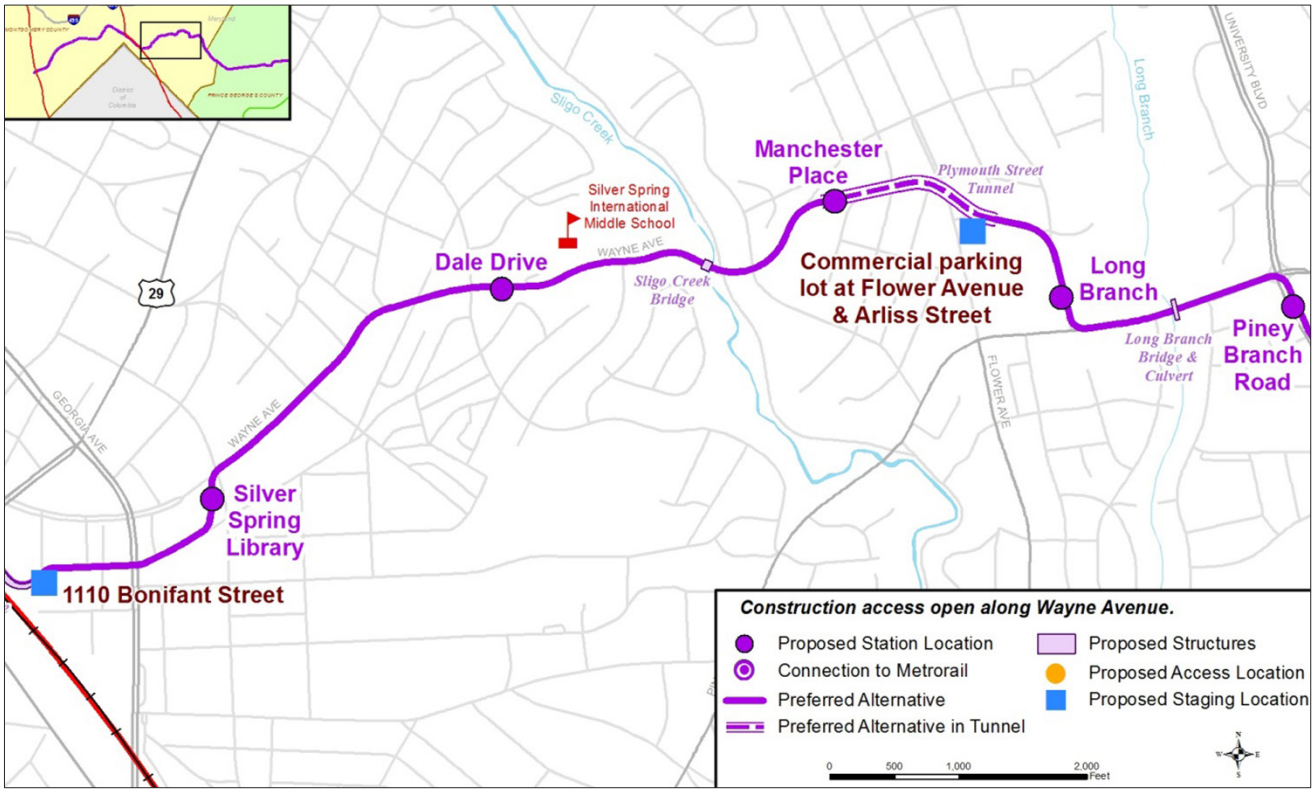
Construction Area 4 (Figure 5-9) would include 2.1 miles of at-grade transitway in both shared and dedicated lanes and in a tunnel from west of Georgia Avenue to the intersection of University Boulevard and Piney Branch Road.

- Haul routes would be along Wayne Avenue to Dale Drive to Colesville Road and along Piney Branch Road to University Boulevard to I-495.
- The staging areas would be located within the construction limits along Wayne Avenue and in a portion of a commercial parking lot at the intersection of Flower and Arliss Streets.

General Construction Activities

Construction Area 4 would include the construction of the Plymouth Street tunnel, a shared bridge on Wayne Avenue over Sligo Creek, a culvert extension at Long Branch, and roadway reconstruction on Wayne Avenue, Arliss Street and Piney Branch Road. Construction over Long Branch Stream Valley Park and Long Branch Local Park would occur primarily from Piney Branch Road. However, temporary occupancy of the parkland would be needed for drainage and bridge construction work. Construction along Wayne Avenue would require that the road be reduced temporarily to one lane in each direction with on-street parking temporarily displaced. Once construction is completed, on-street parking would be available only during off-peak hours. The work would be completed in stages working from one end to the other, so as to preserve much of the on-street

Figure 5-9. Construction Area 4



parking and to limit how far on-street parking must be relocated away from adjacent residences. If temporary lane closures are necessary during off peak periods, a flagging operation would be implemented.

MTA will coordinate with Silver Spring International Middle School to minimize disruptions to the extent reasonably feasible.

The tunnel under Plymouth Street would be a mined tunnel with a small portion of cut and cover sections at each end for the portals. The tunnel would be constructed using the Sequential Excavation Method (SEM), which is also referred to as the New Austrian Tunneling Method (NATM). This is an open face tunneling method, applicable to a wide range of ground conditions, ranging from relatively soft ground to rock. SEM/NATM involves sequential excavation of the tunnel in short sections, while concurrently installing a primary lining to provide immediate support to the ground behind the advancing face. Immediately supporting short sections of tunnel reduces the amount of ground movement and hence reduces surface settlement. Due to the close proximity of residential buildings to the construction activities, alternative methods of removing rock would be tried, and, only if they fail, would blasting during daytime hours be considered as the last resort.

5.2.5 Construction Area 5: University Boulevard to west of West Campus Drive Station

Construction Area 5 (Figure 5-10) would include 2.7 miles of at-grade transitway along University Boulevard to just west of the Adelphi Road/West Campus station.

- The primary haul routes would be along University Boulevard. New Hampshire Avenue would be a secondary haul route.
- The staging areas would be along University Boulevard within the construction right-of-way and on adjacent properties MTA proposes to acquire, specifically 706 University Boulevard.