TRAFFIC ANALYSIS TECHNICAL REPORT

AUGUST 2013

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1. Introduction and Project Description

1.1 Introduction

Understanding how people are likely to be affected by a transportation project facilitates good decision-making during project development. By taking into account the transportation needs of all stakeholders within the project area, recognizing existing patterns of travel, and identifying areas of concern, the project can be designed to address these issues. This Traffic Analysis Technical Report (TATR) assesses the potential effects of the proposed Purple Line on the traffic and congestion in the area within or immediately adjacent to the project corridor.

This report consists of five sections. Section 1 includes this brief introduction to the Purple Line project and provides descriptions of the No Build Alternative and the Preferred Alternative. Section 2 describes the various traffic and travel data that was collected for this project and summarizes the data. This data includes traffic volumes along roadway segments and at key intersections identified along the Purple Line Corridor. It also includes traffic safety crash data for each of the intersections and existing transit services that currently operate in the Purple Line corridor.

Section 3 provides a technical discussion of the travel forecasting process used to predict future traffic conditions for the year 2040, the horizon year for the Purple Line Study. These forecasts are developed for both the year 2040 No Build Alternative and the Build Alternative (Preferred Alternative) and serve as the basis for assessing roadway and intersection capacity impacts that would result from either of the two alternatives.

Section 4 summarizes the impacts the project would have on automobile traffic in terms of the analysis of the key intersections and the operating conditions for the year 2012 existing conditions, year 2040 No Build Alternative traffic conditions, and the year 2040 Preferred Alternative traffic conditions. A level of service (LOS) for each intersection was developed as a measure of intersection capacity and performance for each of the prevailing conditions and to summarize the long-term traffic operations effects of the No Build and the Preferred Alternatives. Intersections that are projected to operate at or above capacity (LOS E or F) are discussed.

Figure 4-1 presents a comparison of the key intersection configurations under the year 2012 existing conditions, year 2040 No Build Alternative traffic conditions, and the year 2040 Preferred Alternative. The section concludes with a brief summary of the short-term construction effects and mitigation.

Lastly, Section 5 summarizes the impacts the project would have on parking in the project study area. Parking is discussed in terms of overall parking effects and also by types of parking such as parking garages, on-street parking, non-residential parking lots, and residential parking lots.

1.2 Project Description

The Purple Line is a proposed 16-mile light rail transit line project in the Maryland suburbs of Washington, DC, inside the Capital Beltway (I-495). The Purple Line will extend between Bethesda in Montgomery County and New Carrollton in Prince George's County. It will connect both branches of the Washington Metrorail Red Line, at Bethesda and Silver Spring; the Green Line at College Park; and the Orange Line at New Carrollton; all three Maryland Area Rail Commuter (MARC) lines; local and regional bus systems; and Amtrak's Northeast Corridor.

The purpose of the proposed project is to provide faster, more direct, and more reliable east-west transit service in the Purple Line corridor, connecting the major activity centers at Bethesda, Silver Spring, Takoma/Langley Park, College Park, and New Carrollton.

There are two Alternatives discussed herein: the No Build Alternative and the Preferred Alternative.

1.2.1 No Build Alternative

For National Environmental Policy Act (NEPA) purposes, the No Build Alternative provides the basis against which the Preferred Alternative is compared. In the Purple Line project, the No Build Alternative incorporates transit service levels, highway networks and traffic volumes, and forecasted demographics for the horizon year of 2040 that are assumed in the Metropolitan Washington Council of Government's (the MPO) Constrained Long Range Plan (CLRP). The CLRP consists of the existing highway and transit network, along with planned and financially committed, programmed improvements.

1.2.2 Preferred Alternative

The Purple Line would be entirely at grade except for one short tunnel and three sections elevated on structures. The Preferred Alternative would operate mainly in dedicated or exclusive lanes, providing fast, reliable transit operations. Users would generally access the Purple Line either by foot, since it directly serves local communities, or by other transit services, particularly Metrorail and local bus services.

There are a total of 21 stations proposed for the Purple Line project, including four stations located at existing Metrorail stations. Transit stations proposed as part of the Purple Line Preferred Alternative would be at the following locations:

- Bethesda
- Chevy Chase Lake
- Lyttonsville
- Woodside/16th Street
- Silver Spring Transit Center
- Silver Spring Library
- Dale Drive
- Manchester Place
- Long Branch
- Piney Branch Road
- Takoma/Langley Transit Center
- Riggs Road
- Adelphi Road/West Campus
- Campus Center
- East Campus
- College Park
- M Square
- Riverdale Park
- Beacon Heights
- Annapolis Road/Glenridge
- New Carrollton

Though not yet finalized, designs for Purple Line stations currently include the following elements: shelters, ticket vending machines, seating, and electronic schedule information. Stations would be located either along sidewalks or in the median of the streets, depending on specific site conditions and engineering requirements for each station.

A yard would be located on the west end of the project corridor, at Lyttonsville, and a maintenance facility would be located on the east end of the project corridor, at Glenridge, along Veterans Parkway. Additionally, traction power substations would be provided at approximately one-mile intervals along the alignment to provide a consistent supply of power to the Light Rail Transit (LRT) vehicles.

No new parking facilities are proposed as part of the Purple Line. Existing parking that could be used by transit patrons is available at municipal parking garages near the Bethesda Station and Silver Spring

Metrorail Station, along with transit parking facilities located at the College Park Metrorail Station and the New Carrollton Metrorail Station.

The Purple Line project will accommodate the completion of the Capital Crescent Trail, including replacement of the interim trail along the Georgetown Branch right-of-way. Project engineers are designing the trail in coordination with Montgomery County, since the Capital Crescent Trail project would be funded and operated by the County. The trail is proposed to run 4.5 miles along the Georgetown Branch right-of-way, beginning in Bethesda and connecting to the Metropolitan Branch Trail in Silver Spring. The completion of the trail along the CSXT corridor is contingent on agreement with CSXT on the use of their property on the north side of the CSXT tracks for the trail. If agreement is not reached by the time the Purple Line construction occurs, MTA would construct the trail from Bethesda to Talbot Avenue. From Talbot Avenue to Silver Spring, an interim signed bike route on local streets would be used.

2. Traffic and Travel Data Collection

This section details the data collection that was undertaken to support the traffic and travel time analyses conducted for the Purple Line Preferred Alternative. The collection of recent traffic data is vital to establishing the existing baseline traffic conditions to which the future No Build and Build Alternatives can be compared.

Key intersections were identified in the project area. These intersections are either those directly affected by the Build Alternative or are upstream or downstream from the Build Alternative and would require some level of traffic mitigation improvements in order to operate safely and efficiently. A thorough understanding of the study area's local and regional transportation system characteristics was developed by using a variety of sources. Data collected for this study included the following:

- Average Daily Traffic Volumes
- Intersection Turning Movement Volumes
- Crash Data
- Pedestrian Volumes
- Transit Service Data

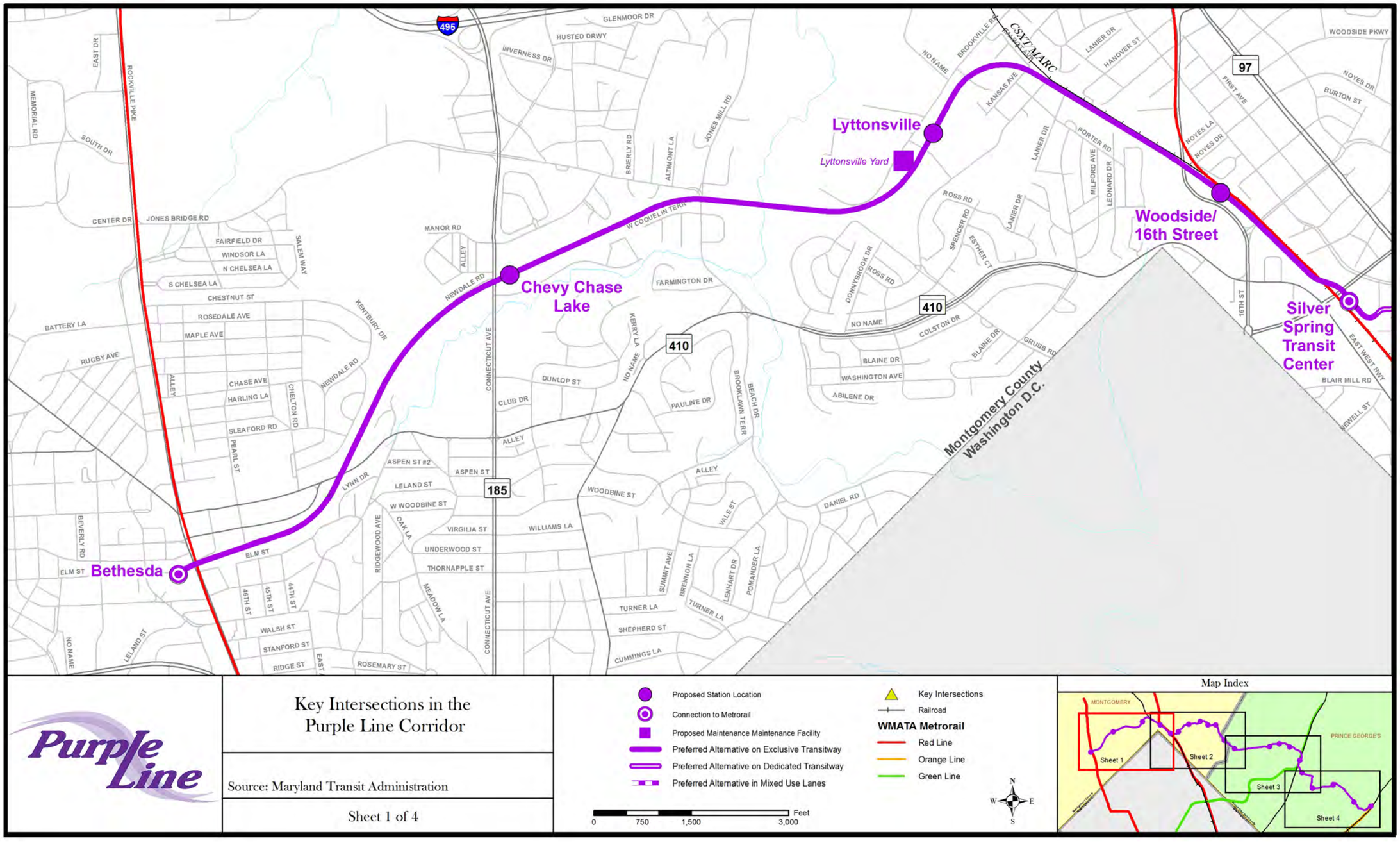
This data collected is summarized for the key intersections in Table 2-1, and the locations of the intersections are shown on Figure 2-1. The data collected is discussed in sections 2.1 through 2.5.

Table 2-1: Summary of Traffic and Safety Data at Key Intersections

Key Intersections		Traffic Data (Data from Either 2011, 2012 or 2013 traffic volumes)			Crash Data (Summary of 3-year period from 2008 to 2010)		
		Average Daily Traffic Volumes (Mainline link only)[1]	Vehicles entering intersection during AM Peak Hour (All legs)	Vehicles entering intersection during PM Peak Hour (All legs)	Total Crashes	Average Severity Index	Crash Rate
1	Bonifant St. at Dixon Avenue	7,300	531	637	0	0	0.00
2	Bonifant St. at Georgia Avenue	43,698	3,537	3,344	8	6	0.20
3	Wayne Avenue at Fenton St.	26,187	1,845	2,345	8	4	0.35
4	Wayne Avenue at Cedar St.	15,598	1,305	1,541	4	1	0.26
5	Wayne Avenue at Dale Dr.	24,463	1,831	2,083	12	9	0.54
6	Wayne Avenue at Mansfield Rd.	14,518	1,394	1,342	0	0	0.00
7	Wayne Avenue at Sligo Creek Pkwy.	25,056	1,825	2,184	7	4	0.32
8	Wayne Avenue at Manchester Rd.	14,006	956	1,194	5	3	0.38
9	Wayne Avenue at Plymouth Tunnel	Future Intersection					
10	Arliss Rd. at Garland Avenue	5,275	544	511	0	0	0.36
11	Piney Branch Rd. at Arliss St.	21,919	1,634	1,873	7	No Data	0.25
12	Piney Branch Rd. at Garland Avenue	23,213	1,877	1,837	5	4	0.47
13	Piney Branch Rd. at Barron St.	24,131	1,856	2,005	10	No Data	0.62
14	Piney Branch Rd. at University Blvd.	57,344	4,704	4,471	31	24	0.18
15	University Blvd. at Seek Lane	33,856	2,810	3,193	6	4	0.35
16	University Blvd. at Carroll Avenue	37,170	3,540	3,710	14	9	0.64
17	University Blvd. at Merrimac Dr.	33,132	2,922	3,062	21	18	0.03
18	University Blvd. at Lebanon St.	31,821	2,835	2,914	1	0	0.09
19	University Blvd. at Takoma/Langley Crossroads/ Hampshire-Langley Shopping Center	39,055	3,098	3,255	3	2	0.36
20	University Blvd. at Takoma/Langley Transit Center	Future Intersection					
21	University Blvd. at New Hampshire Avenue	36,780	5,258	5,638	39	24	0.65
22	University Blvd. at Langley Park Plaza Driveway	37,647	2,485	3,292	1	0	0.03
23	University Blvd. at 14th Avenue	30,062	2,545	2,946	3	2	0.10
24	University Blvd. at 15th Avenue	34,700	2,902	3,649	30	17	0.85
25	University Blvd. at Riggs Rd.	34,700	4,279	5,330	66	32	1.24[2]
26	University Blvd. at Guilford Rd.	32,450	2,564	3,189	12	7	0.38
27	University Blvd. at 23rd Avenue	38,913	2,767	3,374	33	No Data	0.98

Key Intersections		Traffic Data (Data from Either 2011, 2012 or 2013 traffic volumes)			Crash Data (Summary of 3-year period from 2008 to 2010)		
		Average Daily Traffic Volumes (Mainline link only)[1]	Vehicles entering intersection during AM Peak Hour (All legs)	Vehicles entering intersection during PM Peak Hour (All legs)	Total Crashes	Average Severity Index	Crash Rate
28	University Blvd. to 24th Avenue (North)	34,700	2763	3035	1	2	0.03
29	University Blvd. at West Park Dr.	28,060	2,621	2,792	11	No Data	0.37
30	University Blvd. at Campus Dr.	31,157	2,463	2,368	No Data	No Data	No Data
31	Campus Dr. at Adelphi Rd.	30,610	2,800	3,574	9	No Data	0.25
32	Campus Dr. at Presidential Dr.	14,029	1,242	1,393	3	No Data	0.72
33	Presidential Dr. at Valley Dr.	Future Intersection					
34	Campus Dr. at Regents Dr.	14,756	997	1,364	8	No Data	0.62
35	Baltimore Avenue at Rossborough Lane	29,761	2,200	2,638	15	No Data	0.48
36	Paint Branch Pkwy. at Rossborough Lane	Future Intersection					
37	Paint Branch Pkwy. at MFRI Building Entrance	20,194	1,605	1,626	1	2	0.21
38	Paint Branch Pkwy. at Metrorail Parking	24,563	1,926	2,004	3	2	0.52
39	River Rd. at Rivertech Court	13,438	956	1,194	1	2	0.10
40	River Rd. at Haig Dr.	1,038	70	96	2	2	0.24
41	River Rd. at Kenilworth Avenue	36,345	1,934	3,214	32	25	0.82
42	Kenilworth Avenue at Rittenhouse St.	34,341	2,698	3,050	20	12	0.64
43	Kenilworth Avenue at East West Hwy.	77,565	6,020	6,873	55	29	1.04[3]
44	Riverdale Rd. at Mustang Dr. / 62nd Pl.	39,265	2,842	3,269	9	No Data	0.26
45	Riverdale Rd. at 64th Avenue / Eastpine Dr.	41,164	3,070	3,423	54	14	0.78
46	Riverdale Rd. at B/W Pkwy. SB	39,728	3,055	3,745	7	No Data	0.19
47	Riverdale Rd. at B/W Pkwy. NB	41,106	3,024	3,553	3	No Data	0.08
48	Riverdale Rd. at 67th Avenue	35,731	2,721	2,996	13	No Data	0.42
49	Veterans Pkwy. at Glenridge Yard	19,665	1,659	1,832	0	No Data	0.00
50	Veterans Pkwy. at Annapolis Rd.	65,939	5,904	5,703	49	No Data	0.79
51	Veterans Pkwy. at Ellin Rd.	34,890	3,474	3,066	22	No Data	0.62
52	Ellin Rd. at Hanson Oaks Dr.	36,538	884	1,008	5	No Data	0.50
NOTES:	*[1] Average daily traffic volumes included in Table 2-1 were obtained through the SHA Online Traffic Monitoring System or when not available there from the SHA Highway Location Reference Manual.* *[2] Yellow shading indicates intersections with Crash Rate greater than 1 Crash per Million Entering Vehicles.* *[3] Red shading indicates a fatality at the intersection.*						

Figure 2-1: Key Intersections in the Purple Line Corridor



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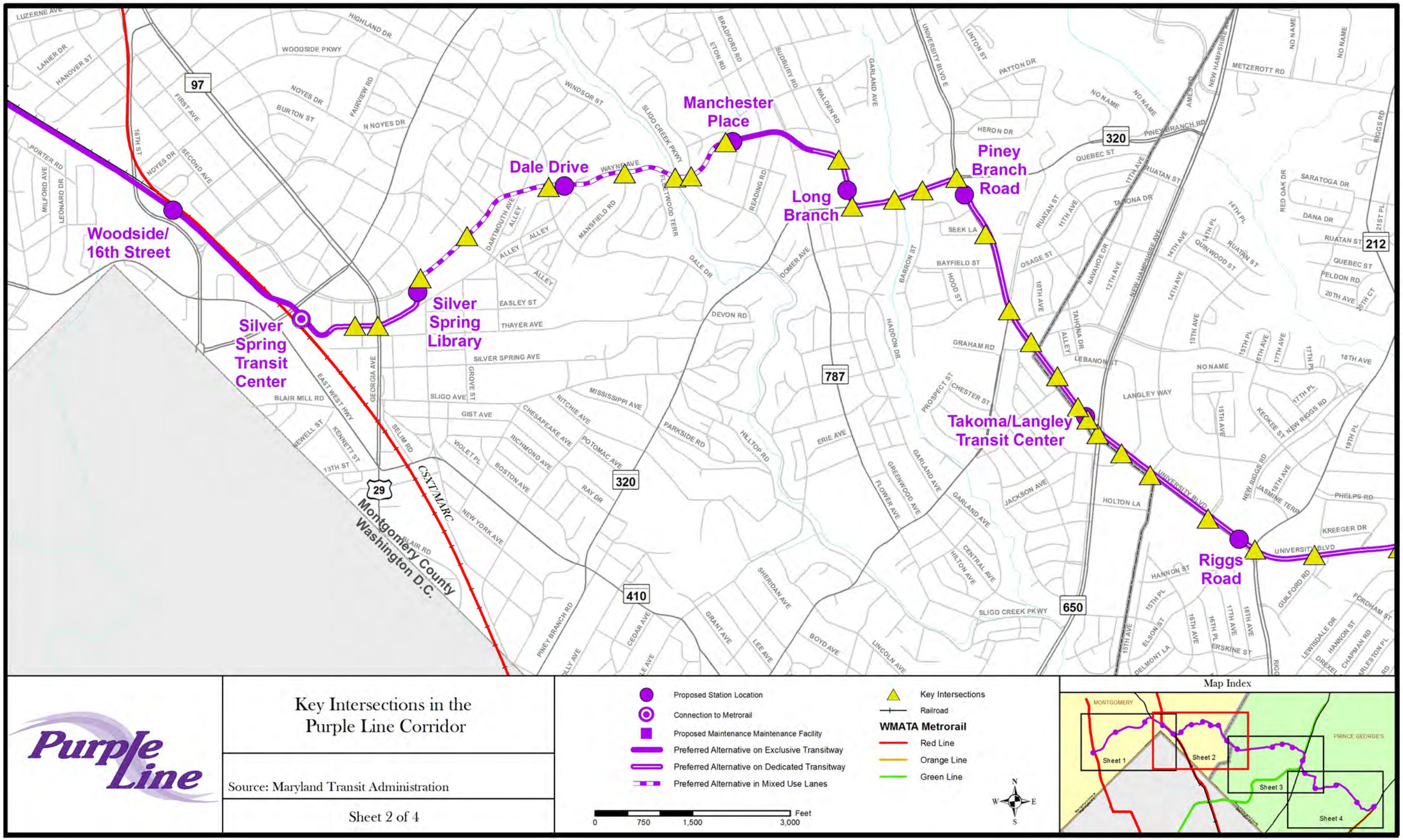

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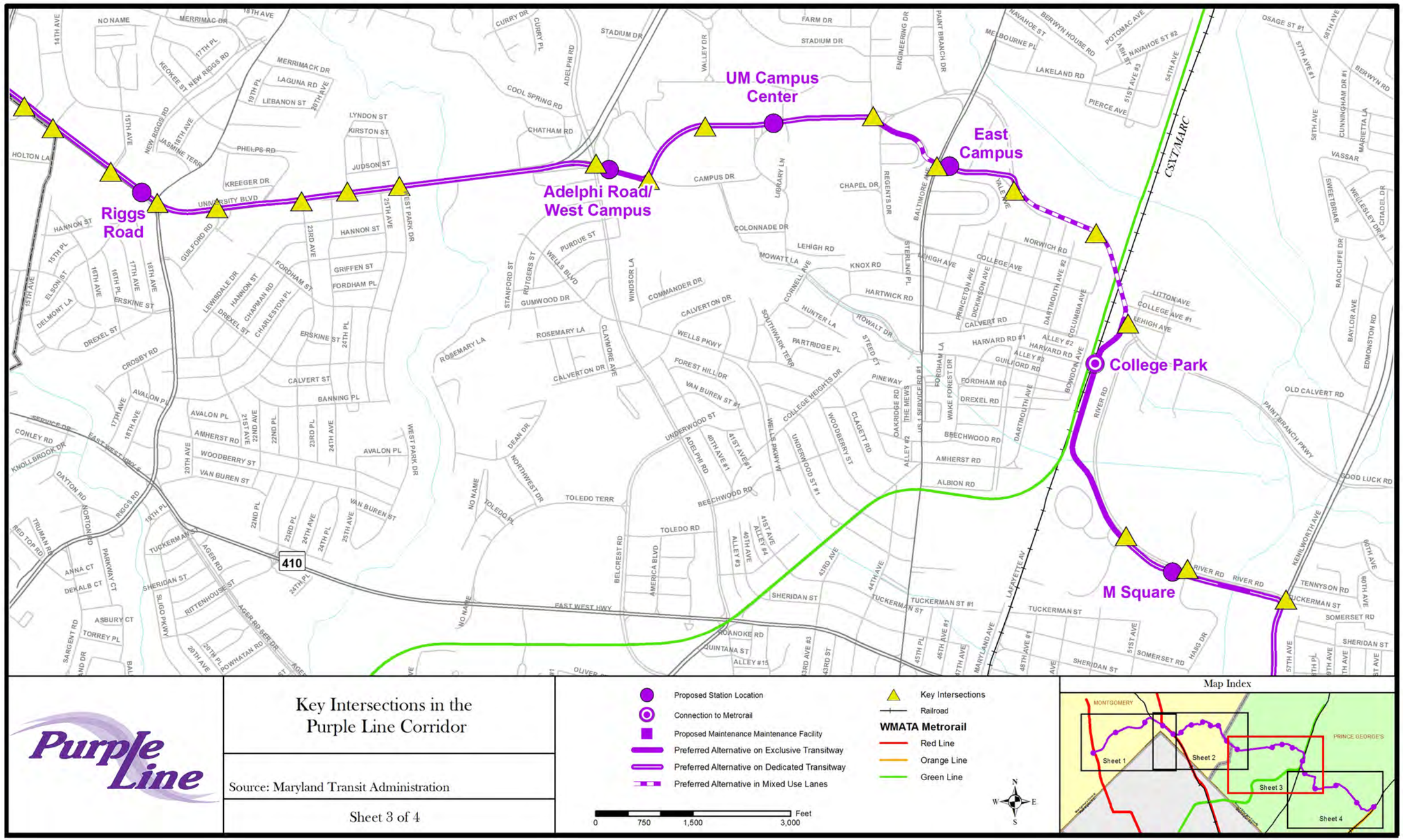

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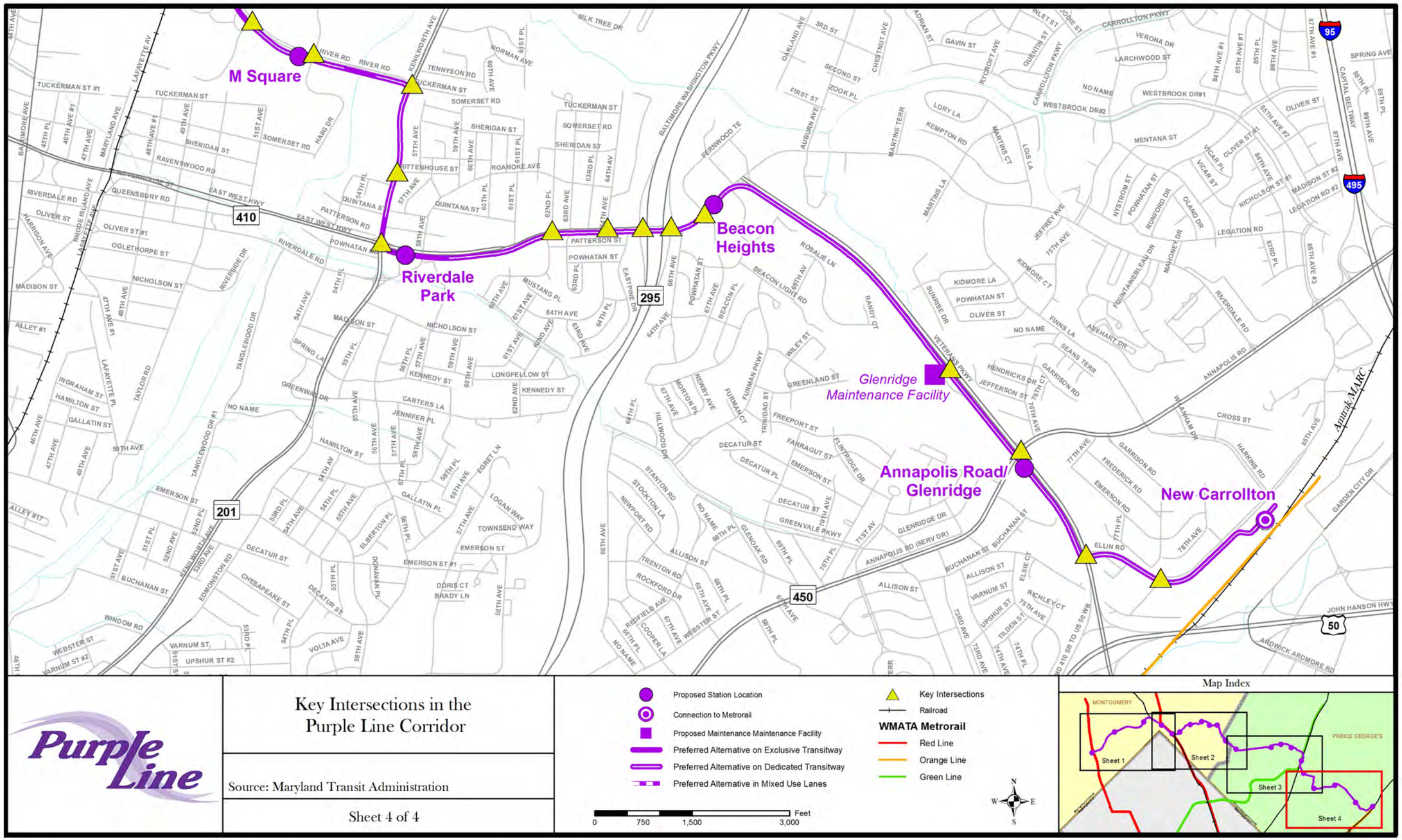


2.1 Average Daily Traffic Volumes

Average daily traffic volumes included in Table 2-1 were obtained through the SHA Online Traffic Monitoring System or, when not available there, from the SHA Highway Location Reference Manual. Twenty-hour traffic data was collected on several key county-owned routes in the corridor. Additional information on traffic volumes for regional routes outside of the Purple Line alignment can be referenced in the *Purple Line Travel Forecasting Technical Report (2013).*

In addition to the peak period and daily traffic volume obtained for this study, existing automobile travel time data was collected along key sections of the Purple Line corridor. This field data was used to verify the estimated travel delay calculated at the various signalized intersections and was used to calibrate simulation models developed for various roadway segments along the corridor.

2.2 Intersection Turning Movement Volumes

Given the focus of the analysis efforts, the primary type of data required for this study was turning movement volumes at each of the signalized intersections located along the corridor. To develop a realistic picture of the existing conditions, the 13-hour traffic volume counts were collected between the hours of 6 AM and 7 PM on a Tuesday, Wednesday, or Thursday, with Montgomery County and Prince George's County public schools in session from Fall 2011 to Spring 2013. Existing signal timings and signal phasing were obtained from Montgomery County, Prince George's County, and SHA for use in analyzing the various signalized intersections in the corridor. Pedestrian traffic volumes were also collected for the same 13-hour period.

2.3 Crash Data

Crash data including all severity levels (Fatal, Injury, Property damage) was available in an electronic database and provided to the study team. The police crash report form includes the following five severity classifications and weights the crash severity numerically as shown in Table 2-2.

Table 2-2: Crash Data Severity Weighting Factors

Crash Severity Classifications	Weighted Value
Fatality	15
Incapacitating Injury	7
Non-Incapacitating Injury	4
Possible Injury	2
Property Damage	1

Crash data was provided from SHA and Maryland State Police records for the key intersections for the three-year period between 2008 and 2010 and summarized in Table 2-1. Crash rates are expressed as "Crashes per Million Entering Vehicles" (MEV) for intersection locations. A high crash rate per MEV at an intersection or a high severity rate indicates intersections that are candidates for safety improvements.

Crash data was analyzed by calculating the crash severity and crash rate for each intersection. The Crash Severity rate index is developed by multiplying the total number of vehicles by a weighted average of all crash's severity. This number is divided by the number of years multiplied (in this case a three-year period) by the annual average daily traffic. The Crash Rate is calculated by multiplying the total crashes by the total number of vehicles. This number is divided by the number of years multiplied (in this case a three-year period) by the annual average daily traffic (see Figure 2-2 for formulas).

These intersections were analyzed for types of crashes, and the design of the Preferred Alternative integrates intersection geometric improvements to improve roadway safety. The design team examined opportunities to separate left and right turn lanes and add exclusive left and right turn signal phasing whenever these movements were expected to cross the tracks. In order to more safely accommodate pedestrians and bicyclists, the design team also is recommending protected/signalized pedestrian crossings for most intersections to address safety.

Figure 2-2: Formulas for Computing Crash Severity and Crash Rate

Crash Severity =

$$\frac{\text{(Number of vehicles) x (Weighted avg. of all crash's severity)}}{\text{(Time frame) x (Annual avg. daily traffic)}}$$

Crash Rate =

$$\frac{\text{(Total crashes) x (Number of vehicles)}}{\text{(Time frame) x (Annual avg. daily traffic)}}$$

3. Travel Demand Forecasting

The effects of the Purple Line on the existing and planned transportation network were analyzed using a travel demand forecasting process that predicts future travel patterns resulting from changes in population and employment. Typically for transportation planning studies, the design year for a new facility is assumed to be at least 20 to 30 years in the future. The design year for the Purple Line study was established to be 2040. Travel patterns for the 2040 conditions were developed using the Metropolitan Washington Council of Governments' (MWCOG) National Capital Region's Transportation Planning Board (TPB) travel forecasting model. TPB is the designated Metropolitan Planning Organization (MPO) for the local government jurisdictions of the three-state Metropolitan Washington area. MPOs are responsible for preparing plans and programs for federally-funded transportation investments in the regions they serve.

MPOs rely on sets of computer-based mathematical travel demand models to forecast the levels of travel that may occur if transportation improvements are implemented. TPB's current model set is designated as the "COG/TPB Travel Forecasting Model, Version 2.1/TP+ Release C." The model incorporates:

- Projected demographic and economic changes in the region, specifically the location of employment and housing
- Projected characteristics of the region's transportation system, including proposed changes in transportation facilities and operating policies
- Assumptions about the factors influencing decisions about when, where, and how people will make trips

The TPB, like most MPOs, uses models based on a four-step travel forecasting process, as follows:

- **Step 1: Trip Generation:** estimate the total number of trip productions and attractions occurring on an average weekday.
- **Step 2: Trip Distribution:** project the geographic distribution of trip ends between production and attraction zones, which are converted to origin–destination figures.
- **Step 3: Mode Choice:** estimate the number of trips that would choose each available mode of travel between each origin and destination zone.

- **Step 4: Network Assignment:** project the specific routes a trip would follow between zones, yielding traffic volumes on links in the regional highway network and on transit vehicles.

A consequence of modeling travelers' choices of destinations, modes, and routes in the strictly sequential manner represented by the four-step process is that these choices depend on the performance of the transportation system, which cannot be estimated until these choices are modeled. The COG/TPB model incorporates feedback between three of the four sequential steps of the travel demand model system to ensure numerical consistency among the inputs and outputs of the various steps.

3.1 Development of Average Annual Traffic Growth Rate

Ridership projections and traffic growth rates were developed using the MWCOG's travel demand model and their Round 8 Cooperative Demographic Forecasts. The MWCOG model was extensively updated to meet FTA guidelines, including the incorporation of a system-wide on-board origin-destination passenger survey, calibration of person trip distribution, background bus speed feedback, and recalibration of mode specific constants.

The year 2040 traffic forecasts were developed using a two-step process. The first step was the development of a conservative estimate of the rate of traffic growth expected through the 2040 horizon year. The second step was applying the selected growth rate to the existing peak hour turning movement volumes at the study intersections.

A traffic growth rate was estimated using link segment analysis. The daily link volumes by direction for each segment were totaled for both the existing base year (2005) model assignment and the future (2040) model assignment. These total existing and 2040 volume assignments were then compared and an average annual traffic growth rate was calculated for each link. Table 3-1 summarizes the modeled average annual traffic growth rate, the selected average annual growth rate (coordinated with SHA), and the mode shift which represents the shift of trips from automobile to transit based on the model data.

Table 3-1: 2040 Forecasted Average Annual Traffic Growth Rates and 2040 Mode Shift

Corridor	Modeled Average Annual Traffic Growth Rate	Selected Annual Traffic Growth Rate	Mode Shift
Wayne Avenue	0.98%	1.00%	-3.00%
Piney Branch Road	-0.44%	0.50%	-0.50%
University Blvd. - W. of Riggs Rd.	0.32%	0.50%	-1.00%
University Blvd. -E. of Riggs Rd.	0.32%	1.00%	-1.00%
Campus Drive	1.38%	1.00%	-5.00%
Paint Branch Parkway	2.54%	3.00%	-1.50%
River Road	1.88%	2.00%	-2.00%
Kenilworth Avenue	0.78%	1.00%	-1.00%
Riverdale Road	-0.30%	0.50%	-1.00%
Veterans Parkway	0.09%	0.50%	-0.50%

The average annual growth rates selected were based on the regional model, the University of Maryland's planned growth, or direction from the Maryland State Highway Administration for specific roadways. A conservative approach was used for the selected annual traffic growth rate and coordinated with SHA, in the development of the design year traffic forecasts. A slightly higher selected growth rate was used for the intersection designs than the model suggested. In some cases growth rates may be considerably

higher, in which case the data was based on SHA's determination based on their analyses of historical data. As a result, the analysis is conservative, meaning the actual design year volumes are likely to be lower and traffic conditions are likely to be better that what the analysis has found.

3.2 Development of Year 2040 Peak Hour Traffic Forecasts

The second step in the forecasting process was applying the selected growth rates to the existing traffic counts collected for the Purple Line No Build and Preferred Alternative scenarios. The applied growth rates by link are summarized in Table 3-1. Based on an average growth rates by segment, the existing peak hour turning movement volumes and daily link volumes were increased by the applied growth rates to determine the design year 2040 traffic volumes. Turning movements at the intersections were projected to grow proportionally.

A mode shift reduction that assumes the proportion of trips that would switch from automobile use to transit under the Preferred Alternative scenario was applied to the forecasted volumes due to the shift of users from vehicle trips to transit trips. The mode shift values were computed by comparing the 2040 No Build with the 2040 Preferred Alternative from the travel forecasting model. The mode shift reduction was then applied to the 2040 No Build forecasted turning movement volumes to generate the final 2040 Preferred Alternative traffic volumes. The mode shift percentage applied along each corridor is summarized above in Table 3-1.

4. Impacts to Automobile Traffic

The impacts to travel by personal automobile of the proposed Purple Line No Build and Build Alternative were evaluated on a number of different levels, including the projected changes in regional travel and congestion, the projected reduction in trips made by automobiles on a district level, and the projected impacts to traffic operations on an intersection-by-intersection basis.

4.1 Capacity Analysis Methodology

Traffic congestion for this project has been quantified using the capacity analysis procedures contained in the 2010 Highway Capacity Manual (HCM), the national standard for evaluating traffic operations. All signalized intersections were analyzed using Synchro Version 7.0. Synchro's default procedures and measures of effectiveness are based on current HCM procedures and are widely used and accepted by public and private agencies as an effective tool in capacity analysis. Key intersections in the Purple Line corridor were analyzed to determine where improvements may be needed to accommodate traffic under both the 2040 No Build and the Preferred Alternative traffic conditions.

4.1.1 Intersection Levels of Service

For this project, intersection traffic analysis results are shown in level of service (LOS), a measure of the efficiency of traffic flow through an intersection or along a roadway segment. LOS is represented by letter grades ranging from A (best) through F (worst). For signalized intersections, LOS A represents uncongested operations with an average delay of less than ten (10) seconds for each vehicle that passes through the intersection. LOS F represents congested conditions with traffic demand that exceeds the intersection capacity with an average delay in excess of 80 seconds per vehicle. Under LOS F, it is common for some vehicles to not pass through the intersection within a single traffic signal cycle.

Along urban roadways, traffic throughput along roadway segments is constrained by the available capacity of the signalized intersections, rather than the number of highway lanes along that segment. The

Preferred Alternative will include additional signal phases to accommodate light rail movements and/or additional turn lanes to mitigate the impact of these changes. Figure 4-1 displays the intersection lane configurations and the changes proposed between the Existing/No Build and the Preferred Alternative. Table 4-1 provides the level of service comparison at the key intersections in the corridor for the year 2012 Existing Condition, the 2040 No Build Alternative, and the 2040 Preferred Alternative.

Table 4-1: Summary of Key Intersection LOS

Note: Orange and red shading denotes intersection levels at or exceeding capacity, i.e., with LOS of E or F. For unsignalized intersections, the LOS shown is for the side street approach.

ID	Intersection	2012 Existing		2040 No Build		2040 Preferred Alternative	
		AM	PM	AM	PM	AM	PM
		LOS	LOS	LOS	LOS	LOS	LOS
1	Bonifant Street @ Dixon Avenue	A	A	A	B	A	B
2	Bonifant Street @ Georgia Avenue	A	A	A	A	A	A
3	Wayne Avenue @ Fenton Street	C	C	C	D	C	F
4	Wayne Avenue @ Cedar Street	B	B	C	B	B	B
5	Wayne Avenue @ Dale Drive	B	C	C	F	E	E
6	Wayne Avenue @ Mansfield Road	A	A	A	A	A	A
7	Wayne Avenue @ Sligo Creek Parkway	D	C	F	F	D	F
8	Wayne Avenue @ Manchester Road	E	E	F	F	C	F
9	Wayne Avenue @ Plymouth Tunnel	N/A	N/A	N/A	N/A	A	A
10	Arliss Street @ Garland Avenue	N/A	N/A	N/A	N/A	N/A	N/A
11	Piney Branch Road @ Arliss Street	B	C	B	C	B	C
12	Piney Branch Road @ Garland Avenue	B	B	B	B	B	A
13	Piney Branch Road @ Barron Street	B	A	B	A	B	A
14	Piney Branch Road @ University Boulevard	D	D	D	D	F	F
15	University Boulevard @ Seek Lane	A	B	A	B	A	A
16	University Boulevard @ Carroll Avenue	D	C	E	C	D	C
17	University Boulevard @ Merrimac Drive	D	F	F	F	A	A
18	University Boulevard @ Lebanon Street	B	C	B	C	A	A
19	University Boulevard @ Takoma-Langley Crossroads	A	B	A	B	A	B
20	University Boulevard @ Takoma-Langley Transit Center	B	A	B	A	A	A
21	University Boulevard @ New Hampshire Avenue	D	E	D	F	D	E
22	University Boulevard @ Langley Park Plaza Driveway	B	B	B	C	A	B
23	University Boulevard @ 14th Avenue	C	C	C	C	B	C
24	University Boulevard @ 15th Avenue	B	D	B	D	B	E
25	University Boulevard @ Riggs Road	D	E	E	F	E	F
26	University Boulevard @ Guilford Road	C	F	B	F	A	B
27	University Boulevard @ 23rd Avenue	A	B	A	B	A	C
28	University Boulevard @ 24th Avenue (North)	A	A	A	A	A	A
29	University Boulevard @ West Park Drive	B	A	B	B	B	B
30	University Boulevard @ Campus Drive	B	C	C	D	C	E
31	Campus Drive @ Adelphi Road	E	E	E	F	E	F
32	Campus Drive @ Presidential Drive	A	A	A	A	B	C
33	Presidential Drive @ Valley Drive	N/A	N/A	N/A	N/A	B	B
34	Campus Drive @ Regents Drive	D	F	F	F	E	E
35	Baltimore Avenue @ Rossborough Lane	A	A	B	B	B	D
36	Paint Branch Parkway @ Rossborough Lane	N/A	N/A	F	F	B	E
37	Paint Branch Parkway @ MFRI Building Entrance	B	B	F	F	C	B
38	Paint Branch Parkway @ Metro Parking	A	B	E	F	F	F
39	River Road @ Rivertech Court	E	F	F	F	D	D
40	River Road @ Haig Drive	C	C	E	D	A	A
41	River Road @ Kenilworth Avenue	B	C	C	C	C	C
42	Kenilworth Avenue @ Rittenhouse Street	A	A	A	A	A	A
43	Kenilworth Avenue @ East-West Highway	F	F	F	F	F	F
44	Riverdale Road @ Mustang Drive / 62nd Place	B	B	B	C	A	C
45	Riverdale Road @ 64th Avenue / Eastpine Dr	A	A	A	A	B	A
46	Riverdale Road @ B/W Pkwy SB	B	B	B	B	C	C
47	Riverdale Road @ B/W Pkwy NB	B	B	B	B	B	C
48	Riverdale Road @ 67th Avenue	B	A	B	A	C	C
49	Veterans Parkway @ Glenridge Yard	E	F	F	F	A	A
50	Veterans Parkway @ Annapolis Road	E	E	E	E	E	F
51	Veterans Parkway @ Ellin Road	B	C	B	C	B	C
52	Ellin Road @ Hanson Oaks Drive	B	B	C	B	A	A

Figure 4-1: Intersection Configurations for Existing, No Build and Preferred Alternative

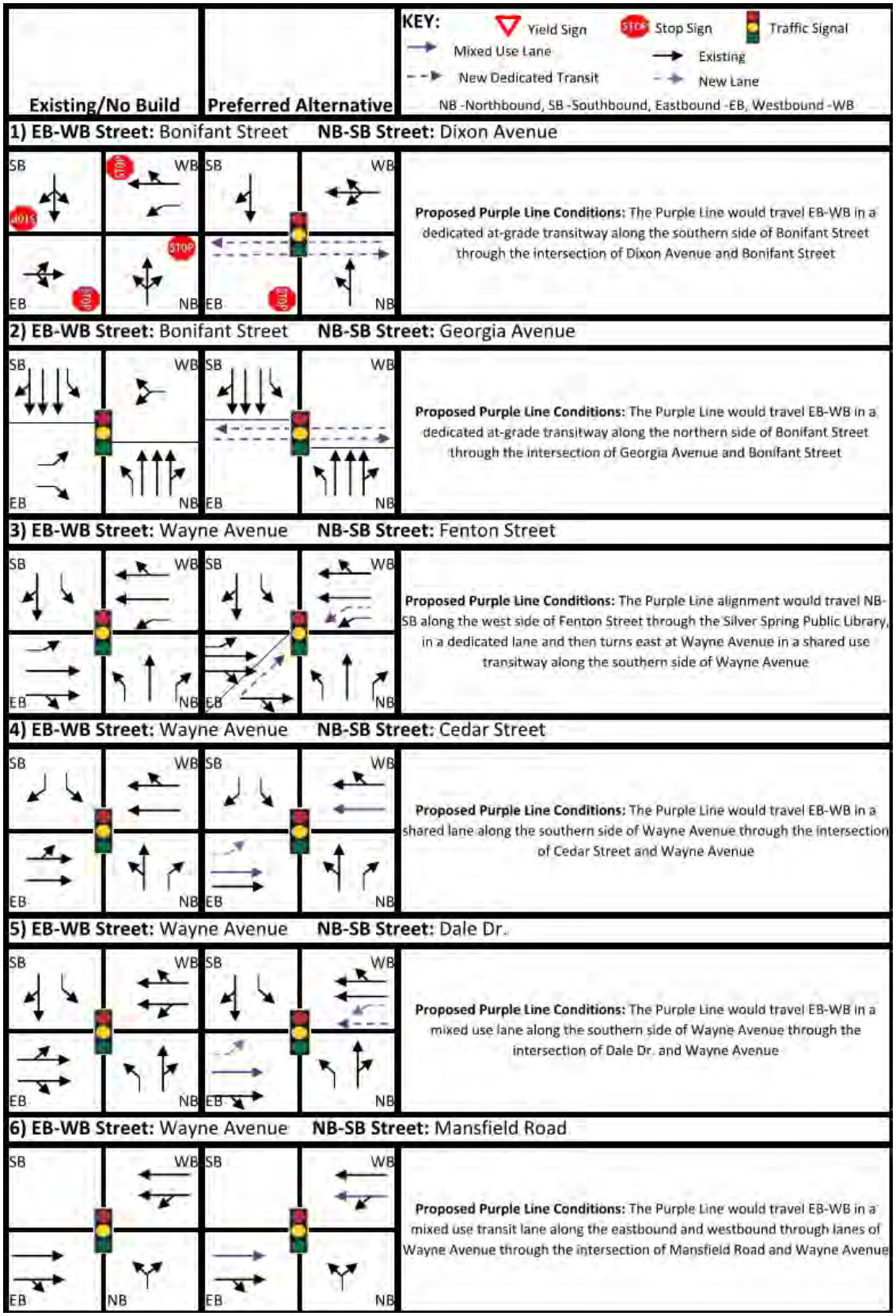
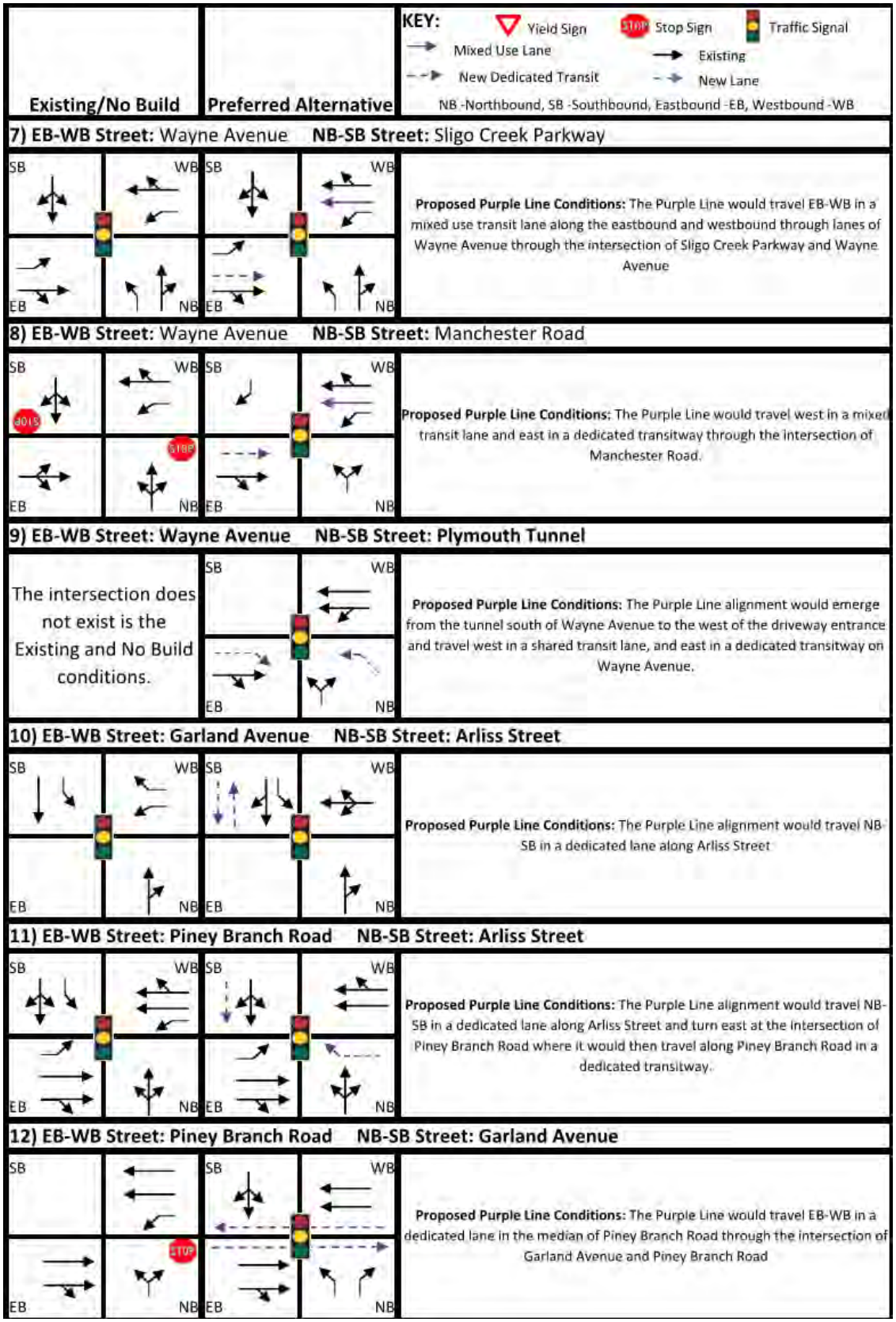


Figure 4-1: Intersection Configurations for Existing, No Build and Preferred Alternative



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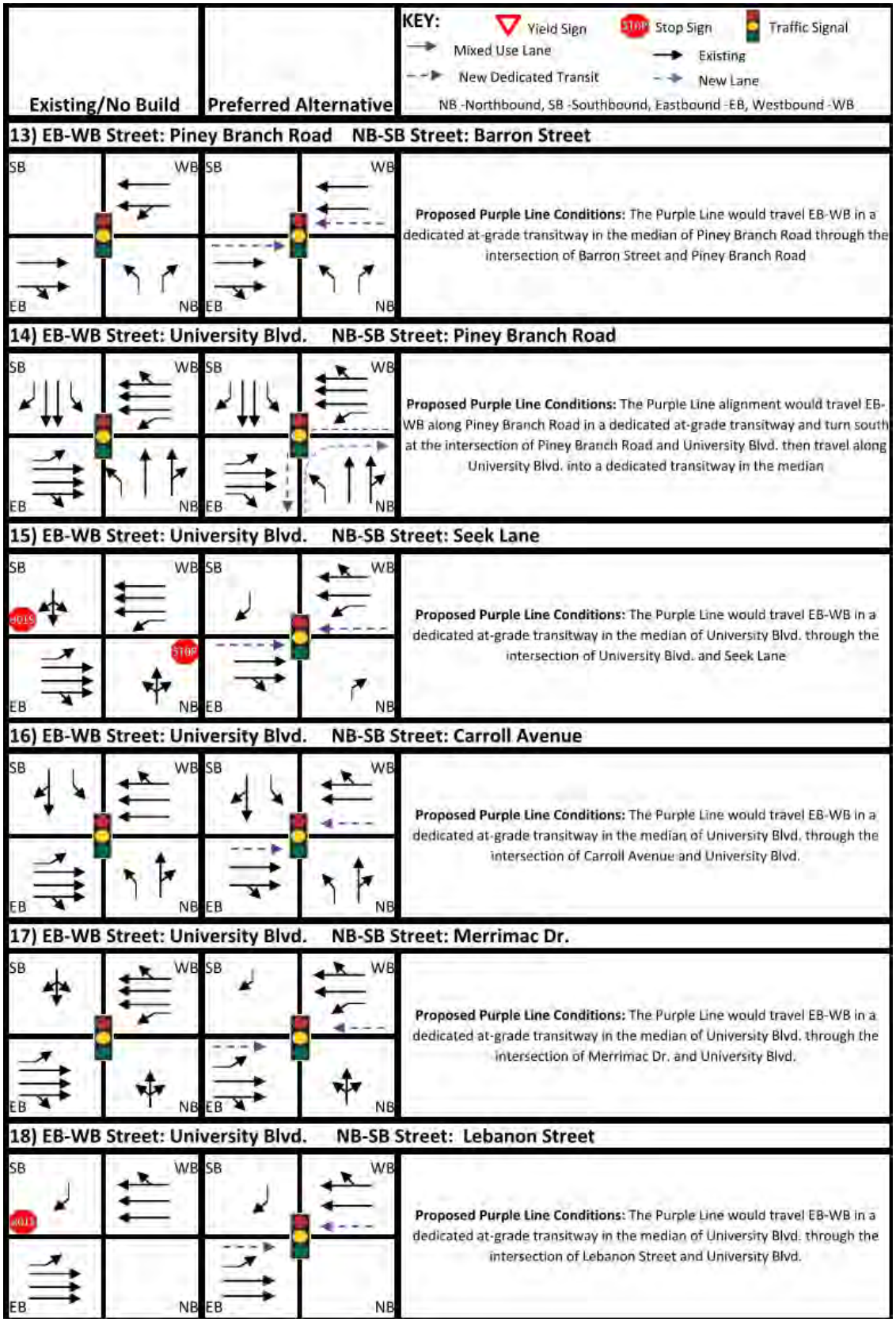

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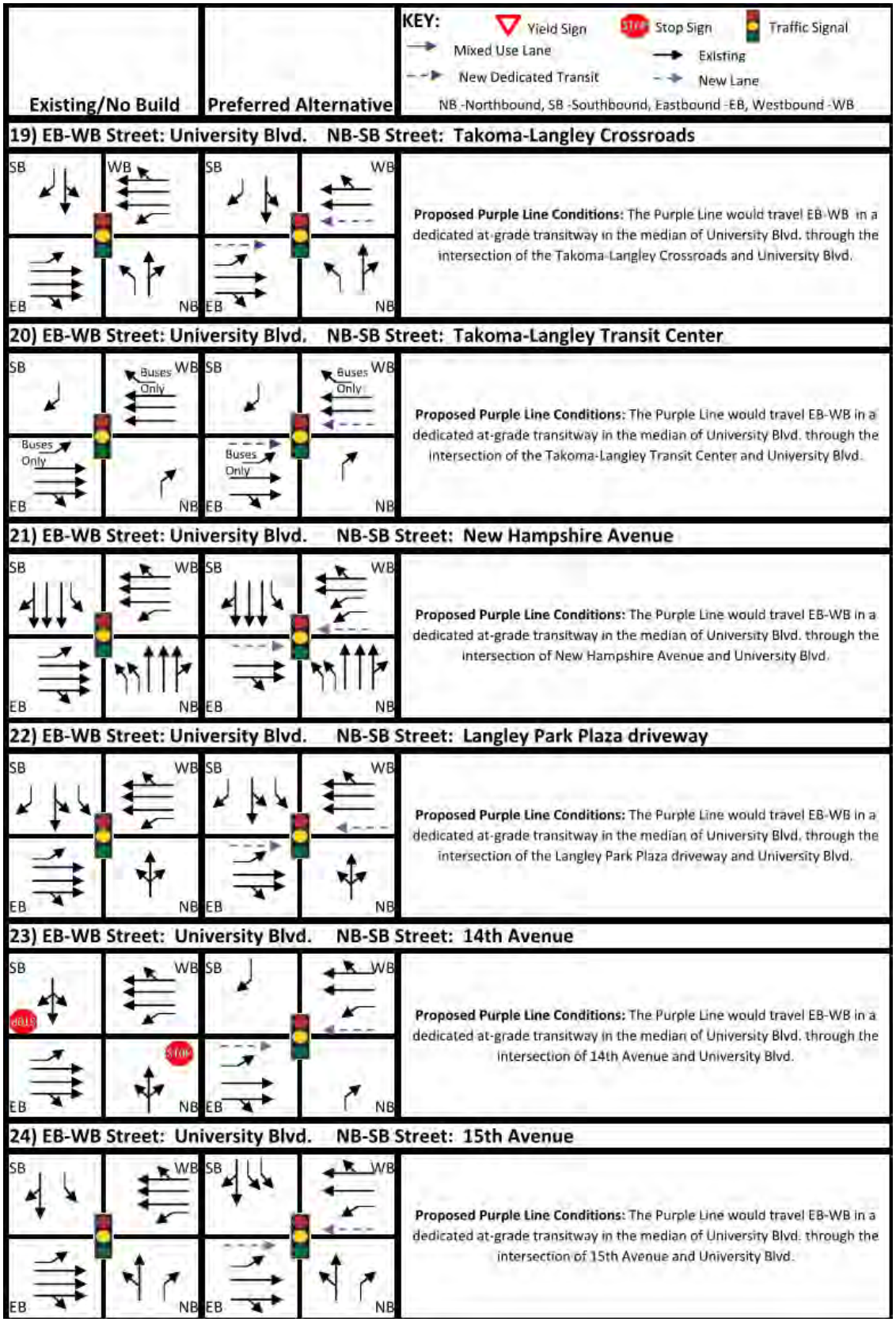

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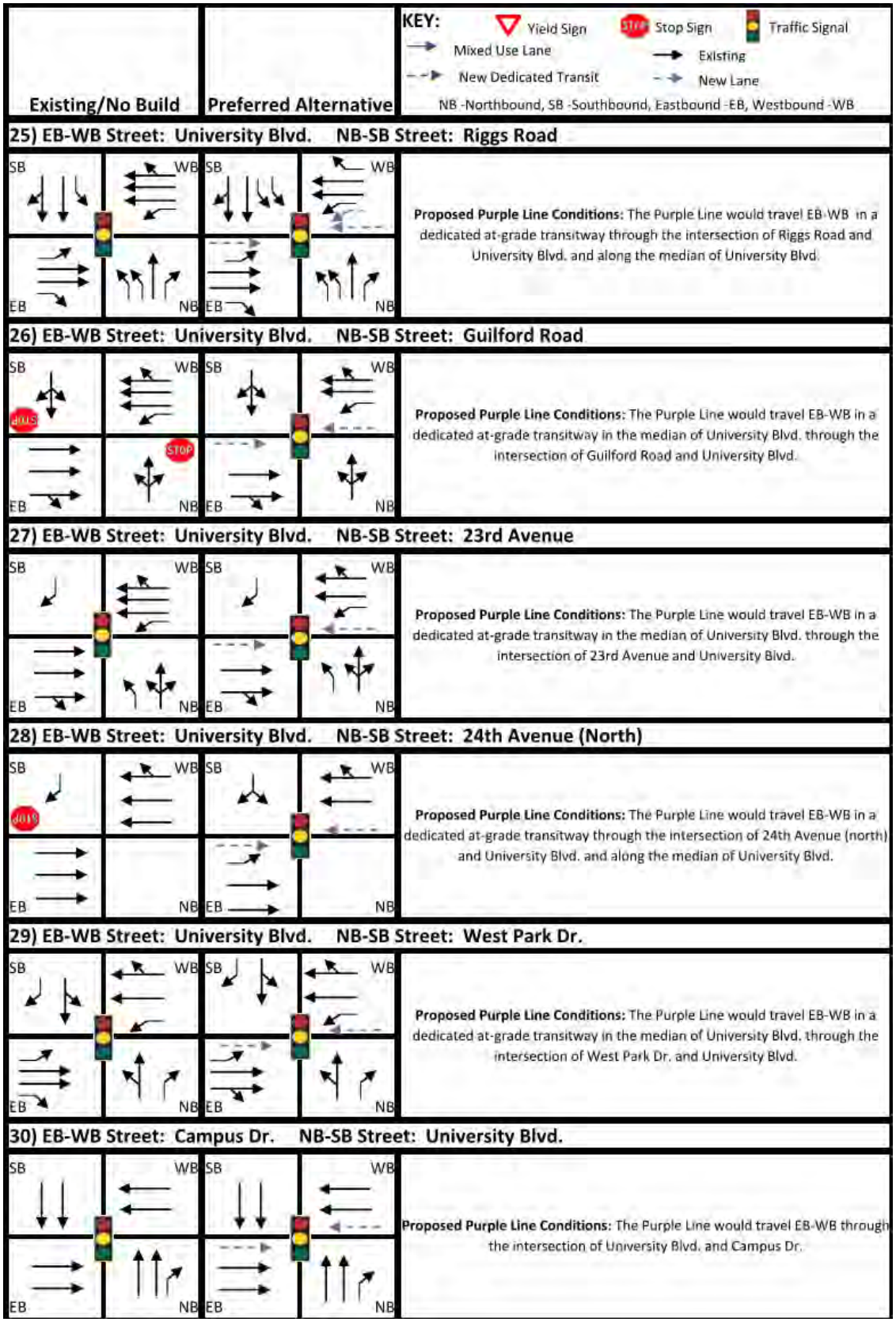

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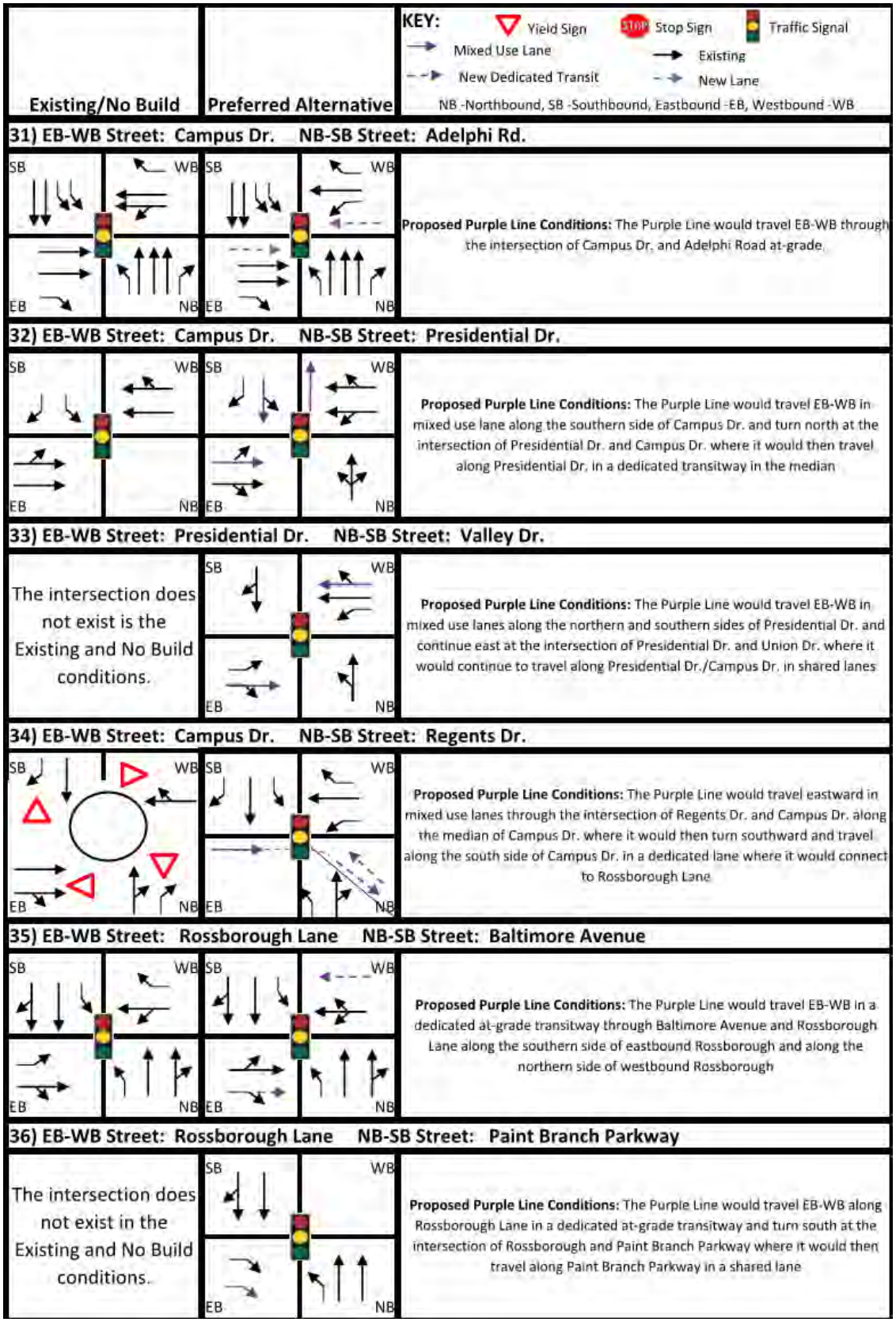

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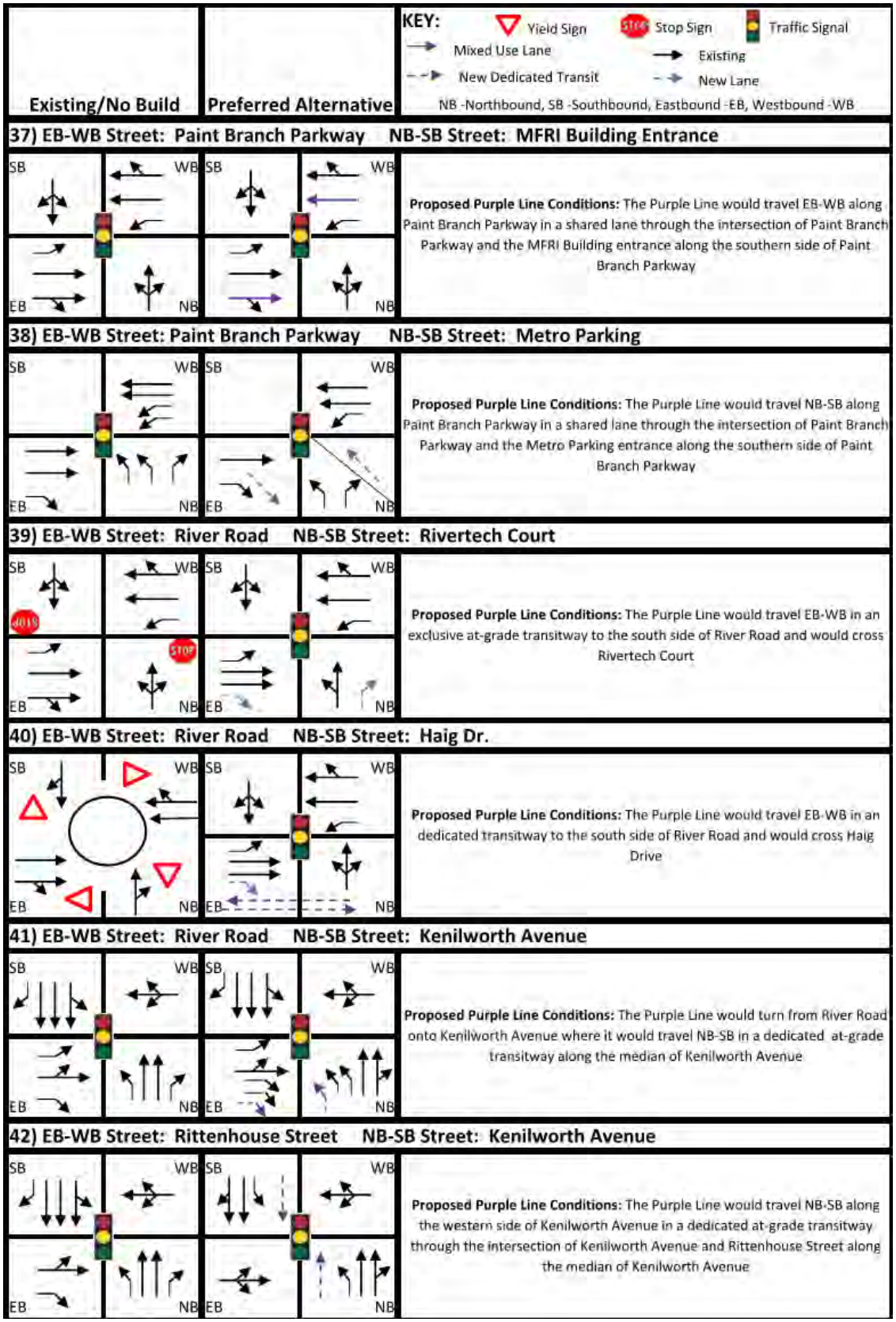


Figure 4-1: Intersection Configurations for Existing, No Build and Preferred Alternative

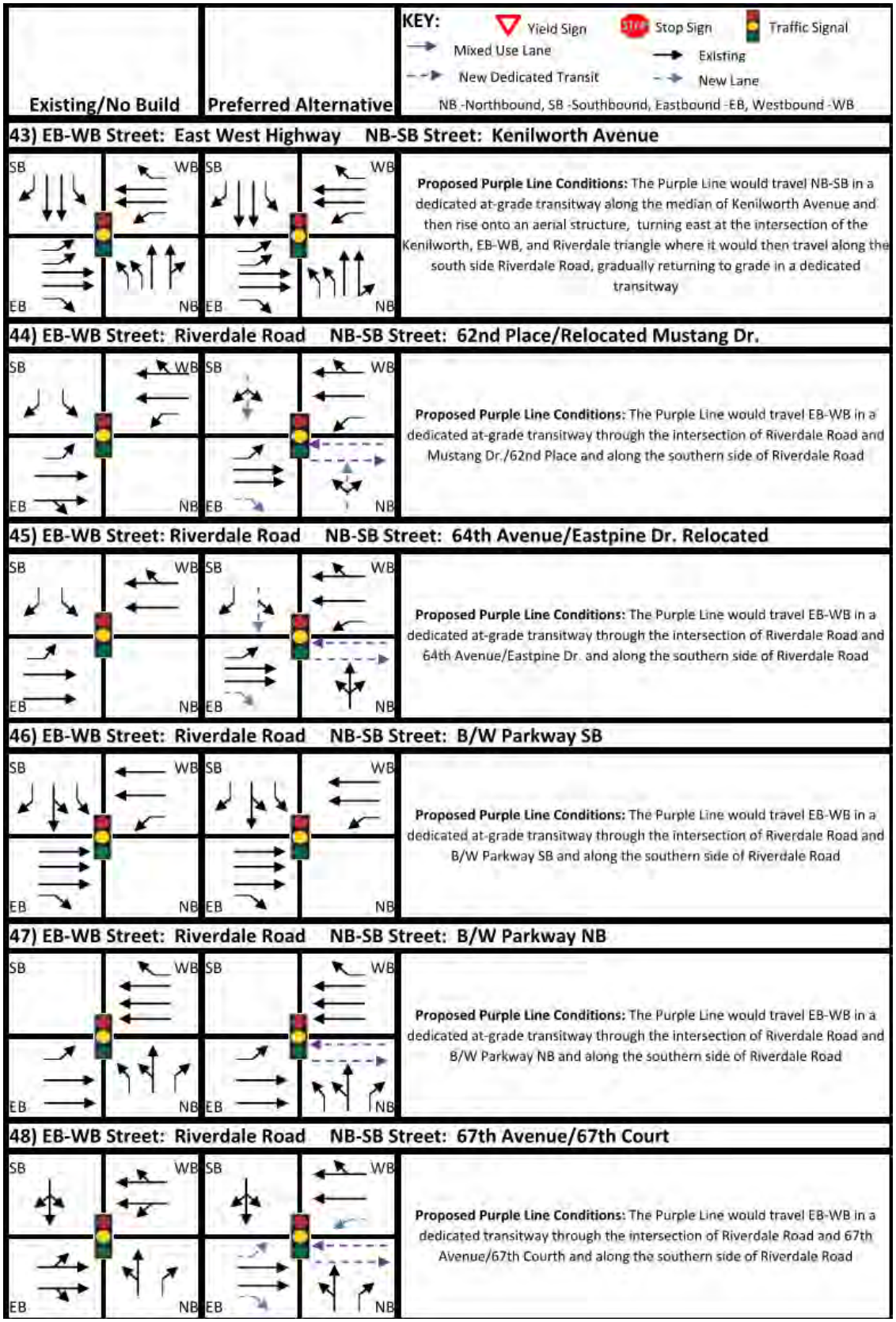
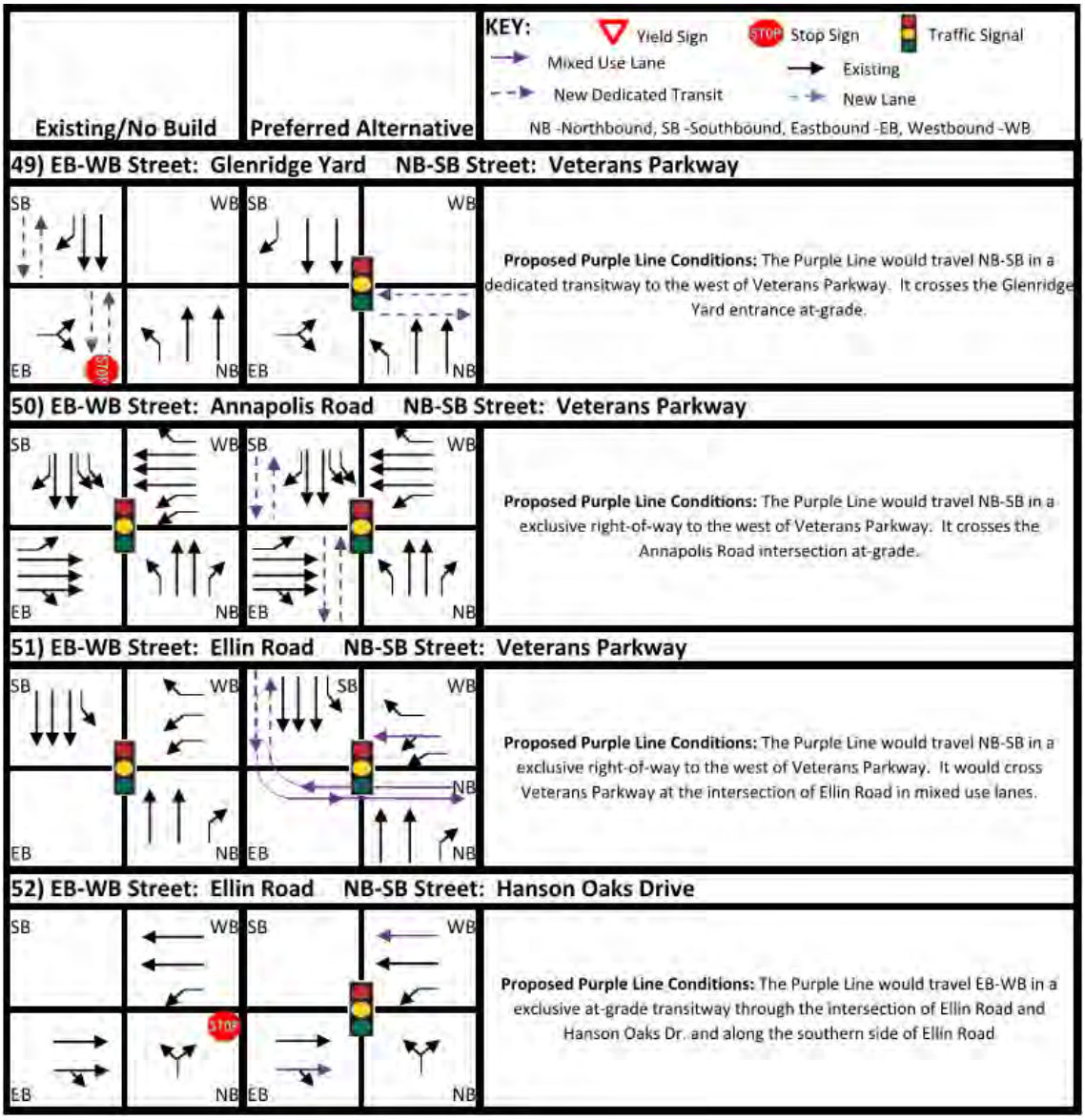


Figure 4-1: Intersection Configurations for Existing, No Build and Preferred Alternative



4.2 Existing Conditions

4.2.1 Roadway Conditions

The existing roadway network along the 16-mile Purple Line corridor consists of the following 17 roadway segments as shown in Table 4-2. The table also shows the functional classification of the highway, the travel direction of the roadway, the number of through lanes and type of median, and the posted speed limit.

Table 4-2: Roadway Segments within the Purple Line Corridor

Roadway Name	Segment	Federal Highway Functional Classification	Travel Direction	Number of Through Lanes/Median Type	Posted Speed (mph)
Brookeville Rd.	End of roadway to Stewart Ave.	Urban Collector	North-South	4-lane / Undivided	30
Bonifant Street	Ramsey Ave. to Fenton Street	Local	East-West	4-lane / Undivided	25
Wayne Ave.	Fenton Street to Manchester Place	Urban Collector	East-West	4-lane / Undivided	25-30
Arliss Street	Flower Ave. to Piney Branch Road	Local	East-West	2-lane / Undivided	30
Piney Branch Ave.	Arliss Street to University Blvd.	Urban Minor Arterial	North-South	4-lane / Continuous Center Left-turn Lane	30
University Blvd.	Piney Branch Rd. to Campus Dr./Adelphi Rd.	Urban Other Principal Arterial	East-West	4 to 6-lane /Curbed median	35-45
Campus Dr.	University Blvd./Adelphi Rd. to Presidential Dr.	Local	East-West	4-lane / Undivided east of Adelphi Rd and Divided west of	25
Presidential Dr.	Campus Dr. to end of Presidential Dr.	Local	North-South	4-lane / Undivided	20
Union Dr.	End of Union Dr. to Campus Dr.	Local	East-West	4-lane / Undivided	20
Campus Dr.	Union Dr. to Regents Dr.	Local	East-West	4-lane / Undivided	20
Rossborough Lane	Campus Dr. west of US 1 to Paint Branch Parkway	Local	East-West	4-lane / Undivided	20
Paint Branch Parkway	Rossborough Lane to east of CSX/WMATA Rail crossing	Urban Collector	East-West	4-lane / Undivided	35
River Rd.	West of Rivertech Court to Kenilworth Ave.	Urban Collector	East-West	4-lane / Curbed median	35
Kenilworth Ave.	River Rd. to East West Highway/Riverdale Rd.	Urban Other Principal Arterial	North-South	4-lane/ Curbed median	35
East West Highway/ Riverdale Rd.	Kenilworth Ave. to Veterans Parkway	Urban Other Principal Arterial	East-West	4-lane / Curbed median and continuous center	35-40
Veterans Parkway	Riverdale Rd. to Ellin Rd.	Urban Other Principal Arterial	North-South	4-lane / Grass median	45

Roadway Name	Segment	Federal Highway Functional Classification	Travel Direction	Number of Through Lanes/Median Type	Posted Speed (mph)
Ellin Rd.	Veterans Parkway to New Carrollton Bus Loop	Local	East-West	4-lane / Curbed median	30

The primary east-west travel routes, the Capital Beltway, East West Highway (MD 410), and University Boulevard (MD 193), experience congestion during peak travel periods and weekends. Many major intersections along the Preferred Alternative alignment currently experience failing levels of service and delay in the morning and evening peak travel periods. As shown in Table 4-3, of the 52 key intersections, 11 intersections (21 percent) operate at or exceed capacity (LOS E or F) during one or both peak hours. The remaining intersections currently operate at LOS D or better during the AM and PM peak hours.

Table 4-3: 2012 Existing Condition LOS for Key Intersection Operating At or Exceeding Capacity during AM or PM Peak

Intersections	Peak Hour Level of Service (LOS) 2012 Existing	
	AM	PM
Wayne Avenue @ Manchester Road	E	E
University Boulevard @ Merrimac Drive	D	F
University Boulevard @ New Hampshire Avenue	D	E
University Boulevard @ Riggs Road	D	E
University Boulevard @ Guilford Road	C	F
Campus Drive @ Adelphi Road	E	E
Campus Drive @ Regents Drive	D	F
River Road @ Rivertech Court	E	F
Kenilworth Avenue @ East-West Highway	F	F
Veterans Parkway @ Glenridge Yard	E	F
Veterans Parkway @ Annapolis Road	E	E
Total LOS F Intersections:	1	6
Intersections at or exceeding capacity:	6	11
Total Intersections at or exceeding capacity:	11	

Note: Orange and red shading denotes intersection levels at or exceeding capacity, i.e., with LOS of E or F.

4.3 No Build Alternative

In the latest update of the MWCOG's Constrained Long Range Plan (July 2012), there are no roadway projects programmed for funding on the Purple Line alignment. The effects of increased traffic would be most pronounced at intersections currently operating at or exceeding capacity, where an increase in queuing of traffic and delay is anticipated by 2040. Level of service analysis of the 2040 No Build Alternative clearly shows further deterioration in levels of service at key intersections.

As shown in Table 4-4, the analysis of the long-term traffic effects on intersections for the projected 2040 No Build condition forecasted that of the 52 intersections, 18 intersections (35 percent) will operate at or exceed capacity (LOS E or F) during one or both peak hours.

Table 4-4: Comparison of 2012 Existing and 2040 No Build LOS at Key Intersections Operating At or Exceeding Capacity (LOS E or F) During AM or PM Peak

Intersection	2012 Existing		2040 No Build Alternative	
	AM	PM	AM	PM
Wayne Avenue @ Dale Drive	B	C	C	F
Wayne Avenue @ Sligo Creek Parkway	D	C	F	F
Wayne Avenue @ Manchester Road	E	E	F	F
University Boulevard @ Carroll Avenue	D	C	E	C
University Boulevard @ Merrimac Drive	D	F	F	F
University Boulevard @ New Hampshire Avenue	D	E	D	F
University Boulevard @ Riggs Road	D	E	E	F
University Boulevard @ Guilford Road	C	F	B	F
Campus Drive @ Adelphi Road	E	E	E	F
Campus Drive @ Regents Drive	D	F	F	F
Paint Branch Parkway @ Rossborough Lane	N/A	N/A	F	F
Paint Branch Parkway @ MFRI Building Entrance	B	B	F	F
Paint Branch Parkway @ Metro Parking	A	B	E	F
River Road @ Rivertech Court	E	F	F	F
River Road @ Haig Drive	C	C	E	D
Kenilworth Avenue @ East-West Highway	F	F	F	F
Veterans Parkway @ Glenridge Yard	E	F	F	F
Veterans Parkway @ Annapolis Road	E	E	E	E
Total LOS F Intersections (by peak period)	**1**	**6**	**9**	**15**
Intersections at or exceeding capacity (by peak period). Level of Service E and F total.	**6**	**11**	**15**	**16**
Total Intersections at or exceeding capacity	**11**		**18**	

Note: Orange and red shading denotes intersection levels at or exceeding capacity, i.e., with LOS of E or F.

4.4 Preferred Alternative

In terms of impacts to traffic, the alignment of the Purple Line Preferred Alternative varies between the following three types of alignments of the transitway.

- Exclusive Lanes;
- Mixed Use Lanes; and
- Dedicated Lanes

The three types of alignments and their impacts to traffic are described in detail below in sections 4.4.1 through 4.4.3.

4.4.1 Exclusive Lanes

Where the Purple Line is in exclusive lanes, i.e., adjacent to the Capital Crescent Trail, in a tunnel or on an elevated structure, it is completely separated from roadway traffic and would have no effect on traffic operations.

4.4.2 Mixed Use Traffic Lanes

In Mixed Use Traffic Lanes, train vehicles would operate similarly to other vehicular traffic in the same traffic lanes, subject to the same queuing and intersection delays as all other traffic. However, since the Purple Line purpose is to provide faster, more reliable transit service in the study area, the MTA is considering geometric changes to lane configurations at some heavily congested intersections to reduce delay and enable priority movements by the LRT vehicles. An example of an enabling change is the provision of a queue jump phase, allowing trains to bypass a queue of roadway vehicles to clear the intersection in advance of an upcoming red signal phase. The MTA proposes queue jump phases at the following intersections:

- Westbound Wayne Avenue at Dale Drive
- Westbound Campus Drive at Valley Drive
- Westbound Rossborough Lane at US 1

Minor modifications to existing signal timing and phasing (including transit signal priority) are other examples of changes to facilitate train movements at congested intersections. Specifically, a short leading green phase would allow the trains in a queue jump lane to move through the intersection before other roadway vehicles are given a green signal. The green phase would only occur when a train is detected in the queue jump lane. Potential impacts to normal intersection operations would be relatively minor, resulting in a slight increase in delay on minor street approaches in cases where the transit vehicle is given priority.

4.4.3 Dedicated Lanes

Dedicated lanes consist of right-of-way longitudinally separated and used solely for train movements protected from parallel traffic and which cross non-parallel roads and pedestrian pathways at-grade. Separation may be achieved by mountable or unmountable curbs, barriers, or safety fences. Protection at some at-grade crossing locations may include flashing lights and gates or traffic signals. Train movements in dedicated lanes are typically controlled by a signaling system if the track is located to the side of a roadway and by traffic signals when the track is longitudinally separated in the middle of a roadway.

Dedicated lanes are transit lanes where the Purple Line light rail transit vehicles operate at-grade within the roadway right-of-way, but in dedicated transit lanes in either the median of existing roadways or adjacent to travel lanes where they are separated from automobile traffic. In some locations, the track is embedded to allow vehicles to cross intersections or medians. The proposed Purple Line would operate in dedicated lanes that are located in the roadway median or along the side of the highway.

When operating in dedicated lanes in an existing street, whether in the median or along the side, Purple Line vehicles would typically have minor effects on existing signal phasing and timing. For example, in median-running alignments, trains would pass to the left of left-turning roadway traffic traveling in the same direction. As a result, left-turn signal phases would be adjusted to eliminate permissive left turn movements. In side running alignments, right turn movements would be delayed when trains are running parallel to the major street. New signals are proposed to be added to 18 intersections that are not currently signalized. The new proposed signalized intersections are as follows:

- Bonifant Street at Dixon Avenue
- Wayne Avenue at Manchester Road
- Wayne Avenue at Plymouth Tunnel
- Arliss Street at South Shopping Center Access
- Piney Branch Road at Garland Avenue
- University Boulevard at Seek Lane
- University Boulevard at Merrimac Drive
- University Boulevard at Lebanon Street
- University Boulevard at 14th Avenue
- University Boulevard at Guilford Road
- University Boulevard at 24th Avenue (North)
- Presidential Drive / Union Drive at Valley Drive
- Campus Drive at Regents Drive
- Paint Branch Parkway at Rossborough Lane
- River Road at Rivertech Court
- River Road at Haig Drive
- Veterans Parkway at Glenridge Yard
- Ellin Road at the New Carrollton Bus Loop

The 2040 Preferred Alternative includes traffic mitigation to allow the intersections to operate in the most efficient conditions; however, due to high traffic volumes in an urban environment, some would still operate at a LOS E or F. Analysis of the long-term traffic effects on intersections for the year 2040 Preferred Alternative forecasted that of the 52 intersections, 15 intersections (29 percent) would operate at or exceeding capacity (LOS E or F) during one or both peak hours (refer to Table 4-5). Level of service analysis of the Preferred Alternative clearly shows an improvement at most intersections when compared to the No Build Alternative, particularly along University Boulevard, Campus Drive, River Road, and Veterans Parkway.

Table 4-5: Comparison of 2012 Existing, 2040 No Build, and 2040 Preferred Alternative LOS at Key Intersections Operating At or Exceeding Capacity (LOS E or F) During AM or PM Peak

Intersection	2012 Existing		2040 No Build Alternative		2040 Preferred Alternative	
	AM	PM	AM	PM	AM	PM
Wayne Avenue @ Fenton Street	C	C	C	D	C	F
Wayne Avenue @ Dale Drive	B	C	C	F	E	E
Wayne Avenue @ Sligo Creek Parkway	D	C	F	F	D	F
Wayne Avenue @ Manchester Road	E	E	F	F	C	F
Piney Branch Road @ University Boulevard	D	D	D	D	F	F
University Boulevard @ Carroll Avenue	D	C	E	C	D	C
University Boulevard @ Merrimac Drive	D	F	F	F	A	A
University Boulevard @ New Hampshire Avenue	D	E	D	F	D	E
University Boulevard @ Riggs Road	D	E	E	F	E	F
University Boulevard @ 15th Avenue	B	D	B	D	B	E
University Boulevard @ Guilford Road	C	F	B	F	A	B
University Boulevard @ Campus Drive	B	C	C	D	C	E
Campus Drive @ Adelphi Road	E	E	E	F	E	F
Campus Drive @ Regents Drive	D	F	F	F	E	E
Paint Branch Parkway @ Rossborough Lane	N/A	N/A	F	F	B	E
Paint Branch Parkway @ MFRI Building Entrance	B	B	F	F	C	B
Paint Branch Parkway @ Metro Parking	A	B	E	F	F	F
River Road @ Rivertech Court	E	F	F	F	D	D
River Road @ Haig Drive	C	C	E	D	A	A
Kenilworth Avenue @ East-West Highway	F	F	F	F	F	F
Veterans Parkway @ Glenridge Yard	E	F	F	F	A	A
Veterans Parkway @ Annapolis Road	E	E	E	E	E	F
Total LOS F Intersections (by peak period)	**1**	**6**	**9**	**15**	**3**	**9**
Intersections at or exceeding capacity (by peak period). Level of Service E and F total.	**6**	**11**	**15**	**16**	**8**	**15**
Total Intersections at or exceeding capacity	**11**		**18**		**15**	

Note: Orange and red shading denotes intersection levels at or exceeding capacity, i.e., with LOS of E or F.

The Preferred Alternative is expected to divert some traffic from existing roads onto adjacent streets. Table 4-6 identifies streets where some traffic could divert from and to, as a result of changes made to traffic patterns due to the Preferred Alternative.

Table 4-6: Traffic Diversion under the Preferred Alternative

Street Changed	Change	Streets to Which Traffic Would be Diverted
Bonifant Street	Converted to one-way street ▪ eastbound east of Georgia Avenue, ▪ westbound west of Georgia Avenue)	Wayne Avenue to the north and Thayer Avenue to the south
Left turn access to the Whole Foods on Wayne Avenue just east of Fenton Street	Right in, right out only	Cedar Street
Piney Branch Road	Elimination of left turns	Gilbert Street, Seek Lane, Greenwood Avenue and Domer Avenue
University Boulevard	Reduced to a 4-Lane typical Section Closure of several median openings	I-495, Adelphi Road and Metzerott Road. Nearest signalized intersections where left turns and U-turns would be permitted
Campus Drive	Converted to 3-lane roadway, with one-way westbound for automobiles and the other 2 lanes would be dedicated for transit vehicles	Eastbound traffic primarily to Fieldhouse Drive and Stadium Drive - eastbound through trips may continue along University Boulevard rather than cut through the campus
Kenilworth Avenue	All intersections converted to right in, right out only except at Rittenhouse Street because of median alignment	Quesada Road and Quintana Street -left turns into and out of these two streets along the west side of Kenilworth Avenue will be accommodated at the Rittenhouse Street traffic signal
Veterans Parkway	Closure of access into and out of the Glenridge Shopping Center	Two existing shopping center access driveways along MD 450

4.4.4 Short-term Construction Effects and Mitigation

Construction of the Purple Line transitway has the potential to affect traffic and roadway operations in a number of ways that are typical of LRT projects in existing roadways: temporary lane closures, temporary detours and traffic diversions, additional travel time due to increased congestion, manual traffic control and the like. As most of the Purple Line is proposed in dedicated and exclusive transit right-of-way and not directly in roadway travel lanes, the effects of project construction on traffic and roadway operations are minimized. Construction effects in areas of mixed-traffic lanes are expected to be somewhat greater as it will be more difficult to implement construction activity while maintaining all travel lanes.

Construction of the Preferred Alternative would occur in stages to provide optimal maintenance of traffic conditions and minimize potential impacts to transportation facilities, residences, businesses, and communities. Potential impacts to local bus services during the construction could include the narrowing of roadway travel lanes, temporary lane closures (limited, when possible, to off-peak or nighttime periods when traffic volumes are low), roadway speed reductions, or short-term detours.

Prior to construction, a transportation management plan (TMP) for the Purple Line will be developed and implemented, in coordination with SHA, Montgomery County, Prince George's County, and existing transit service providers along the corridor, to minimize potential negative impacts to traffic and transit. The draft TMP is being developed as part of the current preliminary engineering phase. A final TMP would be developed in the final design phase. In addition, the TMP will include a public awareness component to keep the traveling public alerted to the schedule of specific construction activities.

To maintain traffic and roadway operations during project construction, a maintenance of traffic (MOT) plan will be prepared and implemented in coordination with the SHA, Prince George's and Montgomery Counties, and affected Emergency Response Teams. The MOT plan will identify specific construction sequencing to maintain traffic, pedestrian and bicycle movements and access, as well as identify planned lane closures, temporary traffic routing and access provisions, bus service changes, speed reductions, and provide temporary signage and traffic control.

5. Pedestrian and Bicycle Impacts

The *Bicycle and Pedestrian Plan for the National Capital Region (October 2010)* reports that 73 projects from the 2006 *Bicycle and Pedestrian Plan* have been completed. At the same time, sixteen major pedestrian intersection improvements, nine streetscape projects, and five pedestrian bridges or tunnels were completed. Currently, approximately 13 miles of shared use paths and nine miles of bicycle lanes are added annually. At this pace of construction, the region will have completed about 390 miles of shared use path and 270 miles of bicycle lanes by 2040, or a little more than half the planned network.

A network of shared use trails, sidewalks, and bicycle paths form a bicycle and pedestrian network that extends throughout the Metropolitan Washington region. The Purple Line study area encompasses portions of eight shared use trails and a number of sidewalks and bicycle lanes within roadway rights-of-way. The Interim Capital Crescent Trail is located along the Georgetown Branch from Bethesda to Lyttonsville and paralleling the proposed transitway to the Silver Spring Transit Center (SSTC). Proposed Pedestrian and Bicycle Conditions Under the Preferred Alternative are shown on Figure 5-1.

Table 5-1 summarizes the existing peak hour pedestrian volumes at selected intersections along the corridor. Bonifant Street at Georgia Avenue, Piney Branch Road at University Boulevard, and Baltimore Avenue at Rossborough Lane have the highest pedestrian volumes during peak periods. Conversely, Riverdale Road at 64th Avenue/East Pine, Piney Branch Road at Garland Avenue, and Wayne Avenue at Sligo Creek Parkway were amongst the lowest pedestrian volumes during peak periods.

Table 5-1: Peak Hour Pedestrian Volumes

Intersection	AM Peak Hour Total Pedestrian Volumes	PM Peak Hour Total Pedestrian Volumes
Bonifant Street at Georgia Avenue	212	260
Wayne Avenue at Sligo Creek Parkway	33	99
Piney Branch Road at Garland Avenue	50	75
Piney Branch Road at University Boulevard	96	183
University Boulevard at New Hampshire Avenue	48	127
University Boulevard at 14th Avenue	67	136

Intersection	AM Peak Hour Total Pedestrian Volumes	PM Peak Hour Total Pedestrian Volumes
University at Riggs Road	40	124
Campus Drive at Adelphi Road	43	95
Baltimore Avenue at Rossborough Lane	130	131
Riverdale Road at 64th Avenue/East Pine Drive	60	45

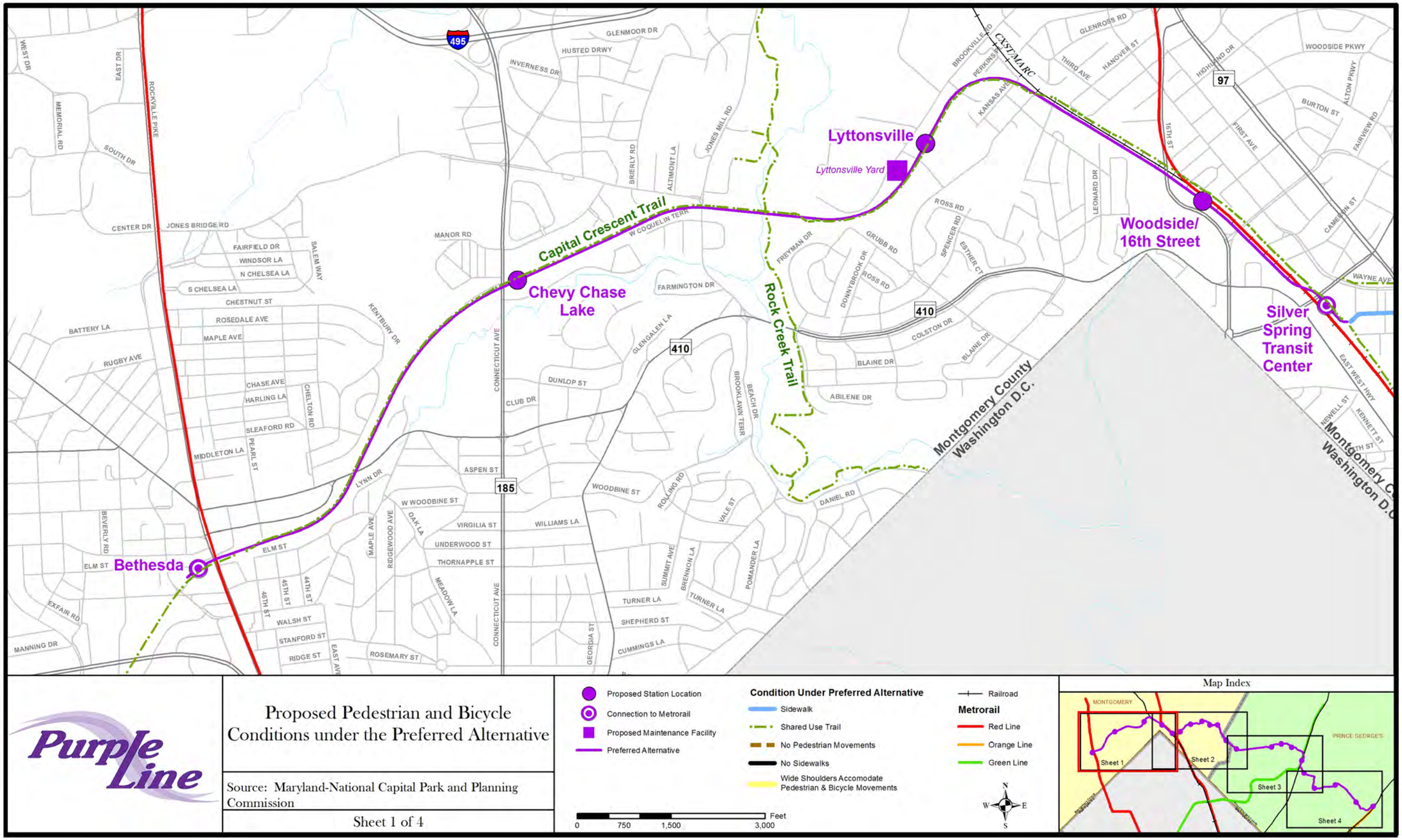
To the extent practicable, MTA will seek to reduce or eliminate pedestrian and motorist conflicts with transit vehicles at MTA stations and facilities. However, conflicts do occur, especially at stations where pedestrians must cross streets at-grade to access platforms, as would be the case for many Purple Line stations. Many safety measures including crosswalks, signals, lighting, and fencing in certain locations, help to reduce the number of conflicts and incidents. In addition, basic design elements are used to enhance safety, including use of platform and parking lot layouts that avoid or reduce pedestrian/vehicle and vehicle/vehicle conflicts, as well as careful use of landscaping to eliminate blind spots and provide openness for security surveillance.

MTA stations and facilities are designed to comply with the ADA to improve safety and ease of movement for disabled individuals. For this corridor, which runs through dense residential, shopping and business districts, operator training and public outreach is important in contributing to pedestrian and motorist safety.

In order to accommodate pedestrian and bicycle needs, the Preferred Alternative includes the following changes to bicycle and pedestrian facilities.

- The eastern 4.3 mile segment of Capital Crescent Trail from Bethesda to Silver Spring
- Sidewalks along new and reconstructed roadways
- A new sidewalk along the east side of Kenilworth Avenue
- Wider outside roadway travel lanes to accommodate bicycles on Piney Branch Road, University Boulevard, and Kenilworth Avenue, and a 5-foot bicycle lane on the eastbound side of Veterans Parkway
- At-grade crossings of sidewalks and bicycle lanes, including the north sidewalk of Bonifant Street west of the Silver Spring Library Station, the south sidewalk of Wayne Avenue east of the Silver Spring Library Station, the south sidewalk of Wayne Avenue west of the Manchester Place Station, the south sidewalk of Paint Branch Parkway approaching the College Park-UM Metrorail station, the west sidewalk of Kenilworth Avenue, and both sidewalks and bicycle paths along the Preferred Alternative on the UMD campus
- Bicycle racks at stations, where possible, and bicycle storage facilities at the Bethesda, Connecticut Avenue, SSTC, College Park Metrorail, and New Carrollton Metrorail stations
- Additional sidewalks or crosswalks, where needed in station areas, to support safe station access

Figure 5-1: Proposed Pedestrian and Bicycle Conditions Under the Preferred Alternative



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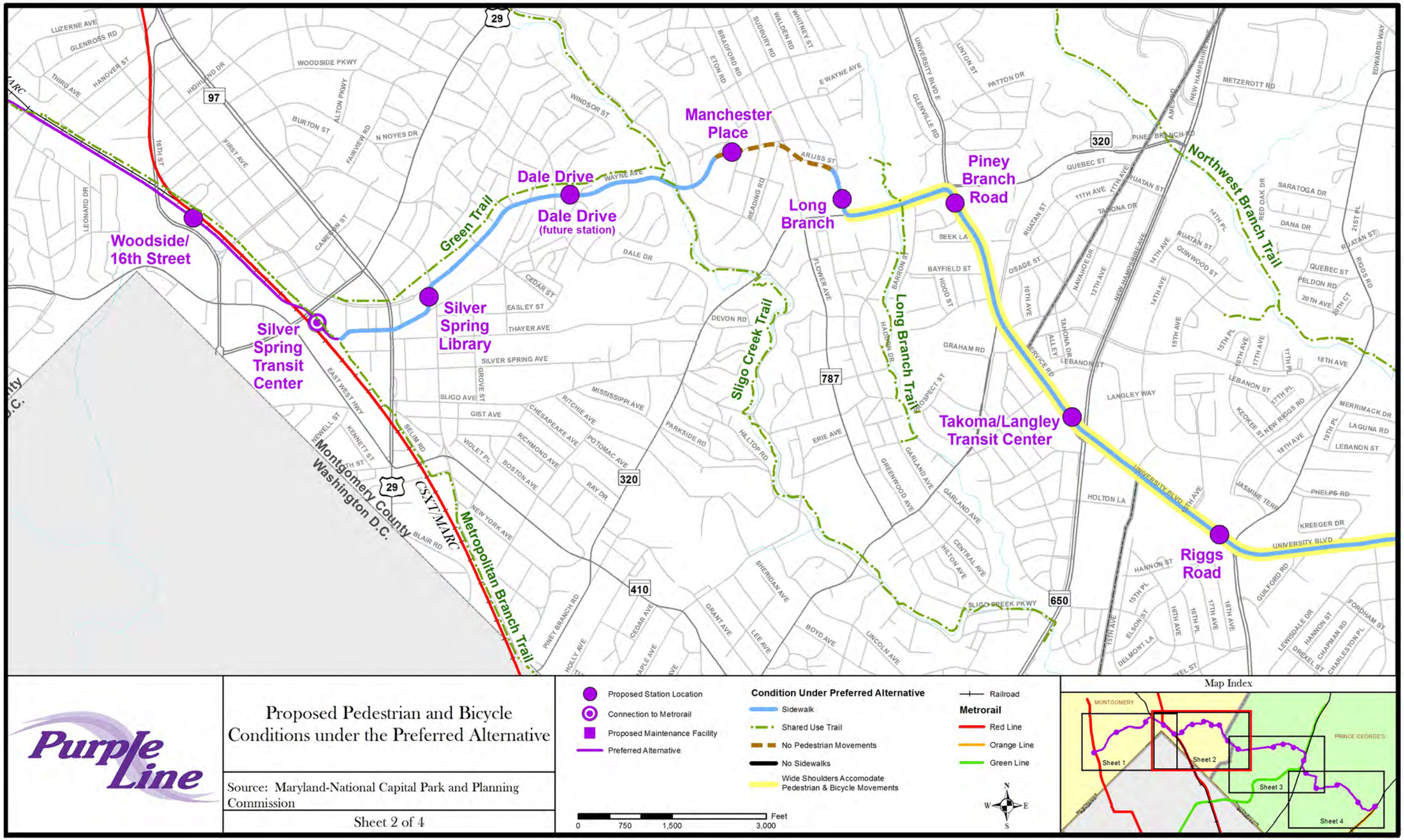

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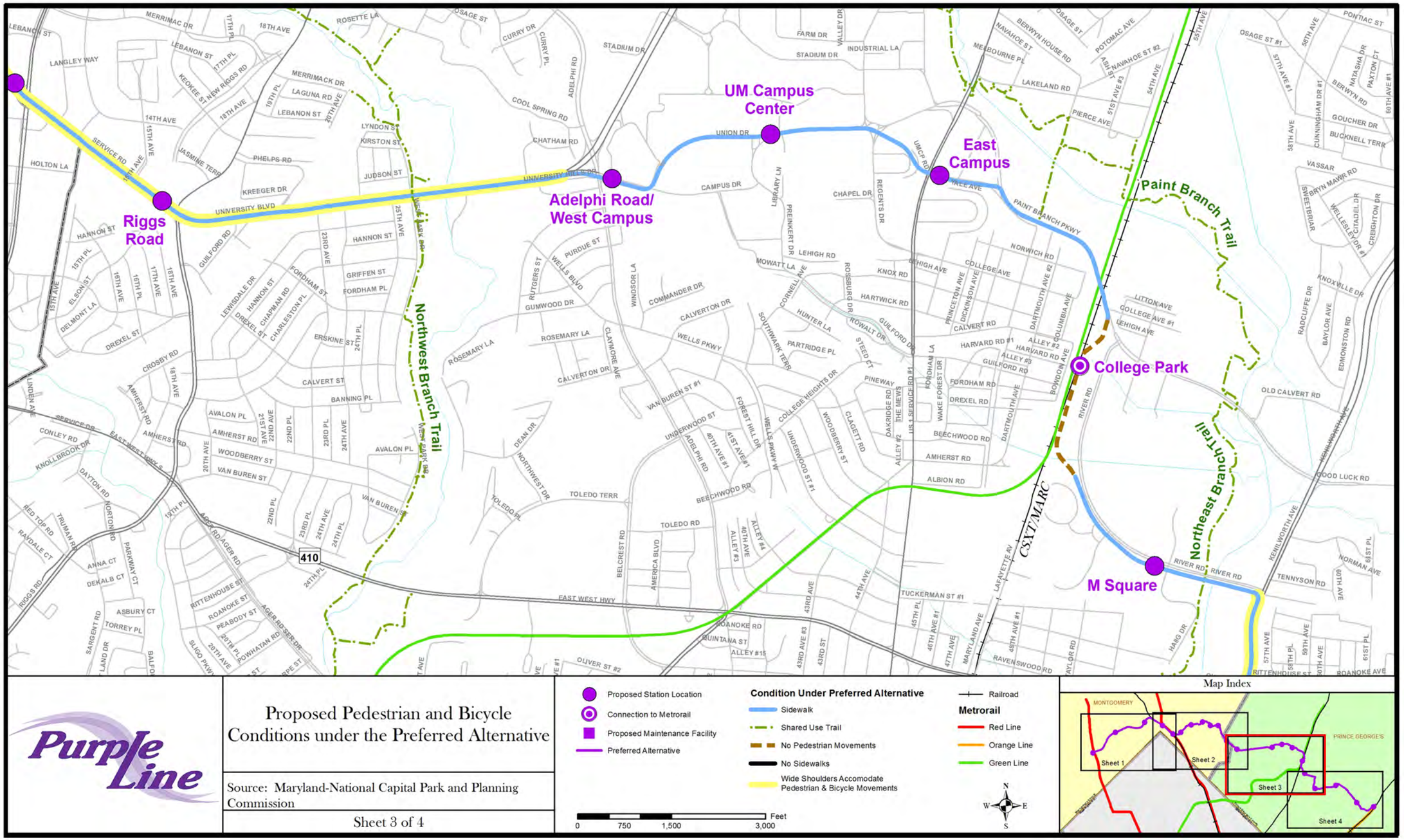

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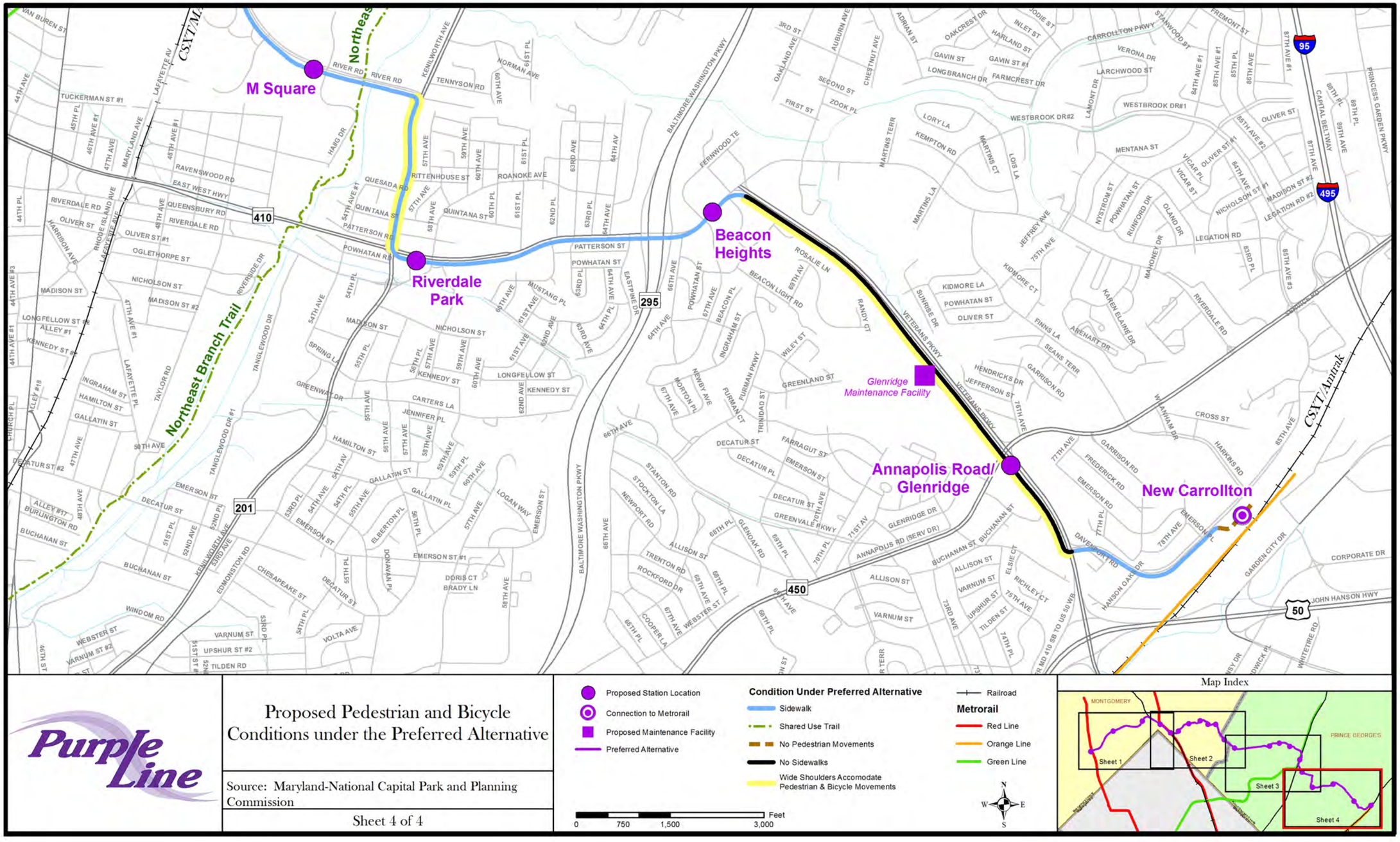


6. Transit Service

Existing transit services in the corridor include three WMATA Metrorail lines: the Red Line, with stations in the Purple Line corridor in Bethesda and Silver Spring; the Green Line, with a station at College Park – UMD; and the Orange Line, with a station at New Carrollton. Metrorail headways are approximately 4 to 6 minutes during peak and 6 to 12 minutes during off peak. The corridor also is served by all three of MTA's commuter rail lines (MARC) including the Brunswick Line into Silver Spring, the Camden Line into College Park, and the Penn Line into New Carrollton; and Amtrak at New Carrollton.

More than 75 bus routes provided by Montgomery County Ride On, Prince George's County TheBus, and WMATA Metrobus operate in the corridor. Of these, only 13 provide east-west service, predominantly disconnected routes that do not serve the corridor from end-to-end. The University of Maryland operates Shuttle-UM in much of the corridor; while this service is not open to the general public, it does serve a large number of University of Maryland (UMD) students, faculty, and employees in the corridor.

Metrorail and MARC primarily serve north-south trips in the corridor. The only east-west transit service is provided by buses, whose speed and reliability is affected by the roadway congestion. In addition, county bus services terminate at the county boundary in the Takoma Park/Langley Park area, so travelers on those services crossing the respective county boundaries must transfer. Table 6-1 shows existing scheduled transit travel times for trips in the corridor. Figure 6-1 shows the existing principal transit services in the Purple Line corridor.

Table 6-1: Existing Transit Service Routes, Schedules and Ridership

Operator	Route #	Route Details	Weekday Headways (minutes)		Operating Hours	Avg. Daily Riders
			AM/PM Peak	Mid-Day/ Evening		
WMATA Metrobus	J1	Silver Spring Metrorail Station to Medical Center Station via Jones Bridge Road	20-30	N/A	5.38AM-6.30PM*	5,881[1]
WMATA Metrobus	J2	Bethesda Metrorail Station to Silver Spring Metrorail Station via Rock Creek Forest	15-20	20	4.45AM-12.53AM*	
WMATA Metrobus	J3	Bethesda Metrorail Station to Silver Spring Metrorail Station via Rock Creek Forest	15-20	N/A	5.53AM-6.16PM*	
WMATA Metrobus	J4	College Park U of MD Metrorail Station to Bethesda Metrorail Station express limited-stop service via Silver Spring Metrorail Station	20-30	N/A	5.33AM-6.37PM*	941
WMATA Metrobus	C2	Greenbelt Metrorail Station to Twin Brook Metrorail Station via University of Maryland (C2)	14-24	30	5.48AM-10.27PM*	10,615[2]
WMATA Metrobus	C4	Greenbelt Metrorail Station to Twin Brook Metrorail Station via Prince George's Plaza Metrorail Station (C4)	14-24	30	4.35AM-12.19PM*	
WMATA Metrobus	K6	New Hampshire Avenue to Maryland Line via University Blvd	11-21	30	4.56AM- 12.25AM*	5,563
WMATA Metrobus	F4	New Carrollton Metrorail Station to Silver Spring Metrorail Station via College Park U of MD Metrorail Station	4-20	40	5.20AM-10.00PM*	7,163[3]
WMATA Metrobus	F6	New Carrollton Metrorail Station to Silver Spring Metrorail Station via Riverdale Road	20-40	40	5.27AM-9.30PM*	
WMATA Metrobus	F8	Prince George's County to Langley Park Line via West Hyattsville station and Prince George's Plaza Metrorail Station	23-37	60	5.35AM-7.52PM*	1,404
WMATA Metrobus	L8	Connecticut Avenue to Maryland Line	11-30	30	5.08AM-11.05PM*	2,710
WMATA Metrobus	R1	Riggs Road Line via Presidential Park	11-33	N/A	5.02AM-6.29PM*	3,509[4]
WMATA Metrobus	R2	Riggs Road Line via Calverton, Federal Research Center at Adelphi and Prince George's Plaza Metrorail Station	20-40	40	4.02AM-10.30PM*	
WMATA Metrobus	R5	Riggs Road Line via via Calverton, and Federal Research Center at Adelphi	16-66	N/A	6.04AM-7.05PM*	
WMATA Metrobus	R3	Greenbelt Metrorail Station to Fort Totten Metrorail Station	28-35	63	6.30AM-9.32PM*	1,219
WMATA Metrobus	T18	Annapolis Road Line Rhode Island Ave Metrorail Station to New Carrollton Metrorail Station	15-40	33	5.15AM-11.20PM*	3,673
WMATA Metrobus	S2	16th Street Line between Silver Spring Metrorail Station and Federal Triangle	6-15	15	4.09AM-3.04AM*	13,346[5]
WMATA Metrobus	S4	16th Street Line between Silver Spring Metrorail Station and Federal Triangle	15-22	15	4.26AM-12.35AM*	
WMATA Metrobus	70	Georgia Avenue to 7th Street Line	12	12	4.00AM-3.05AM*	11,825
Montgomery County Transit-Ride On	1	Friendship Heights Metrorail Station to Silver Spring Metrorail Station	26-30	30	5.07AM-11.25PM*	2,080
Montgomery County Transit-Ride On	2	Silver Spring Metrorail Station to Lyttonsville Ride On Operations Center	30	30	4.32AM-10.41PM*	912
Montgomery County Transit-Ride On	3	Takoma Metrorail Station to Silver Spring Metrorail Station via Dale Drive	33-40	N/A	7.02AM-6.21PM*	36
Montgomery County Transit-Ride On	5	Twin Brook Metrorail Station to Silver Spring Metrorail Station via White Flint Metrorail Station –Garrett Park – Kensington	10-30	15	5.05AM-12.28AM*	2,151
Montgomery County Transit-Ride On	8	Wheaton Metrorail Station to Silver Spring Metrorail Station via Arcola Towers (Certain trips) –Tenbrook Dr – Forest Glen Metrorail Station –Holy Cross Hospital	26-30	30	6.03AM-7.25PM*	708
Montgomery County Transit-Ride On	11	Silver Spring Metrorail Station to Friendship Heights Metrorail Station via Chevy Chase Circle	7-10	N/A	5.54AM-7.38PM*	791

Operator	Route #	Route Details	Weekday Headways (minutes)		Operating Hours	Avg. Daily Riders
			AM/PM Peak	Mid-Day/ Evening		
Montgomery County Transit-Ride On	12	Silver Spring Metrorail Station to Takoma Metrorail Station via Colesville Rd – Cedar St – Flower Ave – Carroll Ave	15-25	20-25	4.34AM-12.39AM*	1,801
Montgomery County Transit-Ride On	13	Takoma Metrorail Station to Silver Spring Metrorail Station via Colesville Rd –Sligo Creek Pkwy – Flower Ave –Carroll Ave	16-48	N/A	6.20AM-6.35PM*	308
Montgomery County Transit-Ride On	14	Silver Spring Metrorail Station to Takoma Metrorail Station via City Place –Colesville Rd – Franklin Ave – University Blvd –Piney Branch Rd	30	30	5.10AM-8.40PM*	810
Montgomery County Transit-Ride On	15	Silver Spring Metrorail Station to Langley Park via Wayne Ave –Manchester Rd – Piney Branch Rd	6-20	12-15	4.20AM-1.05AM*	3,577
Montgomery County Transit-Ride On	16	Silver Spring Metrorail Station to Takoma Metrorail Station via City Place – Sligo Ave –Piney Branch Rd – Quebec Terrace –New Hampshire Ave & University Blvd	12-20	20	4.27AM-12.50AM*	3,635
Montgomery County Transit-Ride On	17	Silver Spring Metrorail Station to Langley Park via City Place – Montgomery College –Philadelphia Ave – Maple Ave – Adventist Hospital	25-30	25	4.41AM-12.10AM*	1,408
Montgomery County Transit-Ride On	18	Silver Spring Metrorail Station to Langley Park via Blair Mill Rd –Montgomery College (Certain trips) – Takoma Metrorail Station – Carroll Ave – University Blvd	30	30	6.45AM-6.25PM*	646
Montgomery County Transit-Ride On	19	Dallas Ave to Silver Spring Metrorail Station via Northwood – Four Corners –Parkside Plaza	30	N/A	6.14AM-7.45PM*	201
Montgomery County Transit-Ride On	20	Hillandale to Silver Spring Metrorail Station via Northwest Park – Piney Branch Rd – Thayer 20 Ave – City Place	7-10	15	4.26AM-12.30AM*	3,279
Montgomery County Transit-Ride On	21	Briggs Chaney Park & Ride Lot to Silver Spring Metrorail Station via Tanglewood –Tamarack – Dumont Oaks – Four Corners	30	N/A	6.06AM-7.00PM*	207
Montgomery County Transit-Ride On	22	Hillandale to Silver Spring Metrorail Station via White Oak – FRC/FDA –Four Corners – Colesville Rd – City Place	30-40	N/A	5.45AM-6.45PM*	395
Montgomery County Transit-Ride On	24	Hillandale to Takoma Metrorail Station via Northwest Park –Piney Branch Rd	20-30	N/A	5.25AM-6.55PM*	276
Montgomery County Transit-Ride On	28	Silver Spring Metrorail Station loop Georgia Ave – National Oceanic and Atmospheric Administration –Cameron St – Fenton St	7-8	7-8	7.00AM-7.00PM*	774
Montgomery County Transit-Ride On	34	Aspen Hill (Designated Trips) to Friendship Heights Metrorail Station via Wheaton Metrorail Station -Kensington - Medical Center Metrorail Station -Bethesda Metrorail Station	15-30	N/A	5.20AM-6.35PM*	2,682
Montgomery County Transit-Ride On	71	Kingsview Park & Ride to Shady Grove Metrorail Station via Steeple Rd – Dawson Farm Rd –Mateny Rd – Clopper Rd – I-270 & I-370 Express	30	N/A	5.14AM-7.20PM*	N/A
Prince George's County The Bus	14	Prince George's Plaza Metrorail Station to College Park Metrorail Station via Prince George's Plaza, Crescent Cities Center, Lafayette Avenue, Riverdale Road, Auburn Avenue and River Road	45	45	5.25AM-7.40PM*	758
Prince George's County The Bus	15 Express	Greenbelt Metrorail Station to New Carrollton Metrorail Station via NASA Goddard Space Flight Center	40	N/A	6.00AM-7.00PM*	286
Prince George's County The Bus	16	Greenbelt Metro Station to New Carrollton Metro Station via Doctors Community Hospital, Beltway Plaza, New Carrollton Mall, Riverdale Road, Lamont Drive, Hanover Parkway, Pontiac Street, 57th Avenue	30	60	5.30AM-7.30PM*	1,114
Prince George's County The Bus	17	IKEA to Mount Rainier Terminal via University of Maryland, College Park Metrorail Station, County Service Building	30	30	5.30AM-7.30PM*	558

Operator	Route #	Route Details	Weekday Headways (minutes)		Operating Hours	Avg. Daily Riders
			AM/PM Peak	Mid-Day/ Evening		
Prince George's County The Bus	18	Langley Park to Addison Road Metro Station via Lewisdale, Prince George's Plaza, Cheverly, Edwards Place, 23rd Avenue, Hamilton Street, Bladensburg Road, Columbia Park Road	35	70	5.30AM-7.30PM*	1,355
University of Maryland Shuttle	104	University of Maryland Campus to College Park Metro Station	10	10-20	6.30AM-1.00AM	N/A
University of Maryland Shuttle	111	University of Maryland Campus to Silver Spring Metro Station	70-80	75-80	6.30AM-9.00PM	N/A
University of Maryland Shuttle	126	University of Maryland Campus to New Carrollton Metro Station	125-135	120-140	6.45AM-8.40PM	N/A
Maryland Area Regional Commuter (MARC) Train Service	Brunswick Line	Washington D.C. to Martinsburg, West Virginia with connections available to the WMATA Red Line at Rockville, Silver Spring, and Union Station	65-95	N/A	5.25AM-7.15PM*	8,003
Maryland Area Regional Commuter (MARC) Train Service	Camden Line	Union Station, Washington, D.C. to Camden Station, Baltimore, Maryland with connections available to the WMATA Green Line at College Park and Greenbelt stations	24-105	N/A	5.10AM-7.35PM*	4,717
Maryland Area Regional Commuter (MARC) Train Service	Penn Line	Washington, D.C. to Perryville, Maryland on Amtrak's Northeast Corridor	10-30	60	4.40AM-10.30PM*	24,728
WMATA Metrorail	Red Line	Rapid transit between Shady Grove Metro Station and Glenmont Metro Station via Bethesda Metro Station and Silver Spring Metro Station	5	12-15	Opens-5AM Weekdays; 7AM Weekends Closes- 12AM Sun-Thur; 3AM Fri-Sat	Bethesda-10,765 Silver Spring-13,471
WMATA Metrorail	Green Line	Rapid transit between Branch Avenue Metro Station and Greenbelt Metro Station via College Park – University of Maryland	6	15-20	Opens-5AM Weekdays; 7AM Weekends Closes- 12AM Sun-Thur; 3AM Fri-Sat	College Park-4,768
WMATA Metrorail	Orange Line	Rapid transit between Vienna Metro Station and New Carrollton Metro Station	6	15-20	Opens-5AM Weekdays; 7AM Weekends Closes- 12AM Sun-Thur; 3AM Fri-Sat	New Carrollton-9,940
Amtrak	Northeast Regional	New York City to Washington DC via New Carrollton Metro Station	19-20 northbound trains and 20-21 southbound trains per weekday operating from 6:30AM-1:30AM			N/A
Amtrak	Vermonter	Washington DC to St. Albans, Vermont via New Carrollton Metro Station	One northbound and one southbound train per weekday			N/A

*Operating hours are Monday through Friday even though services may operate on weekends.
[1]Ridership for WMATA Metrobus routes J1, J2 and J3 is combined because routes operate on the same roadways for a portion of their alignment.
[2]Ridership for WMATA Metrobus routes C2 and C4 is combined because routes operate on the same roadways for a portion of their alignment.
[3]Ridership for WMATA Metrobus routes F4 and F6 is combined because routes operate on the same roadways for a portion of their alignment.
[4]Ridership for WMATA Metrobus routes R1, R2 and R5 is combined because routes operate on the same roadways for a portion of their alignment.
[5]Ridership for WMATA Metrobus routes S2 and S4 is combined because routes operate on the same roadways for a portion of their alignment.

Figure 6-1: Principal Existing Transit Service

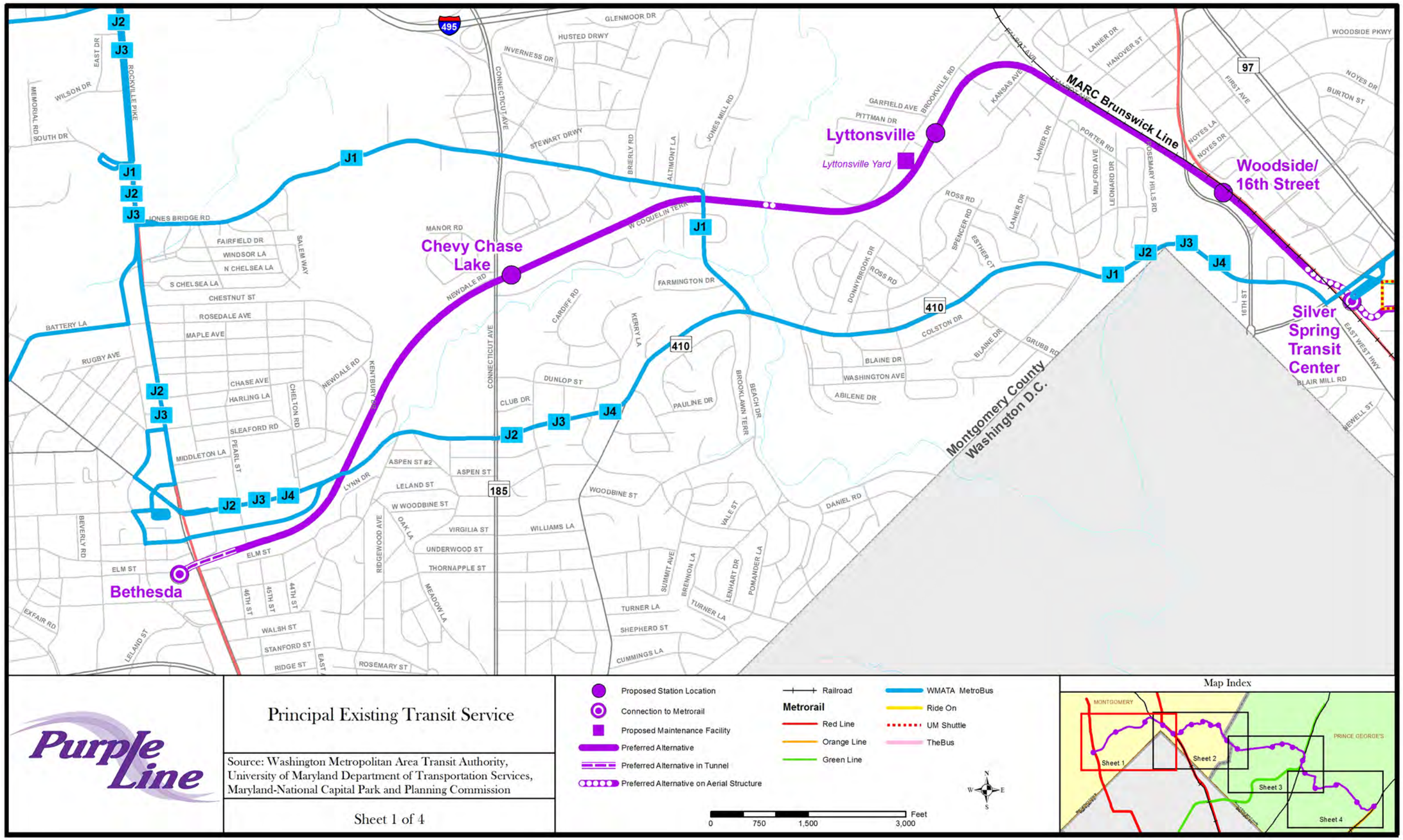


Figure 6-1: Principal Existing Transit Service

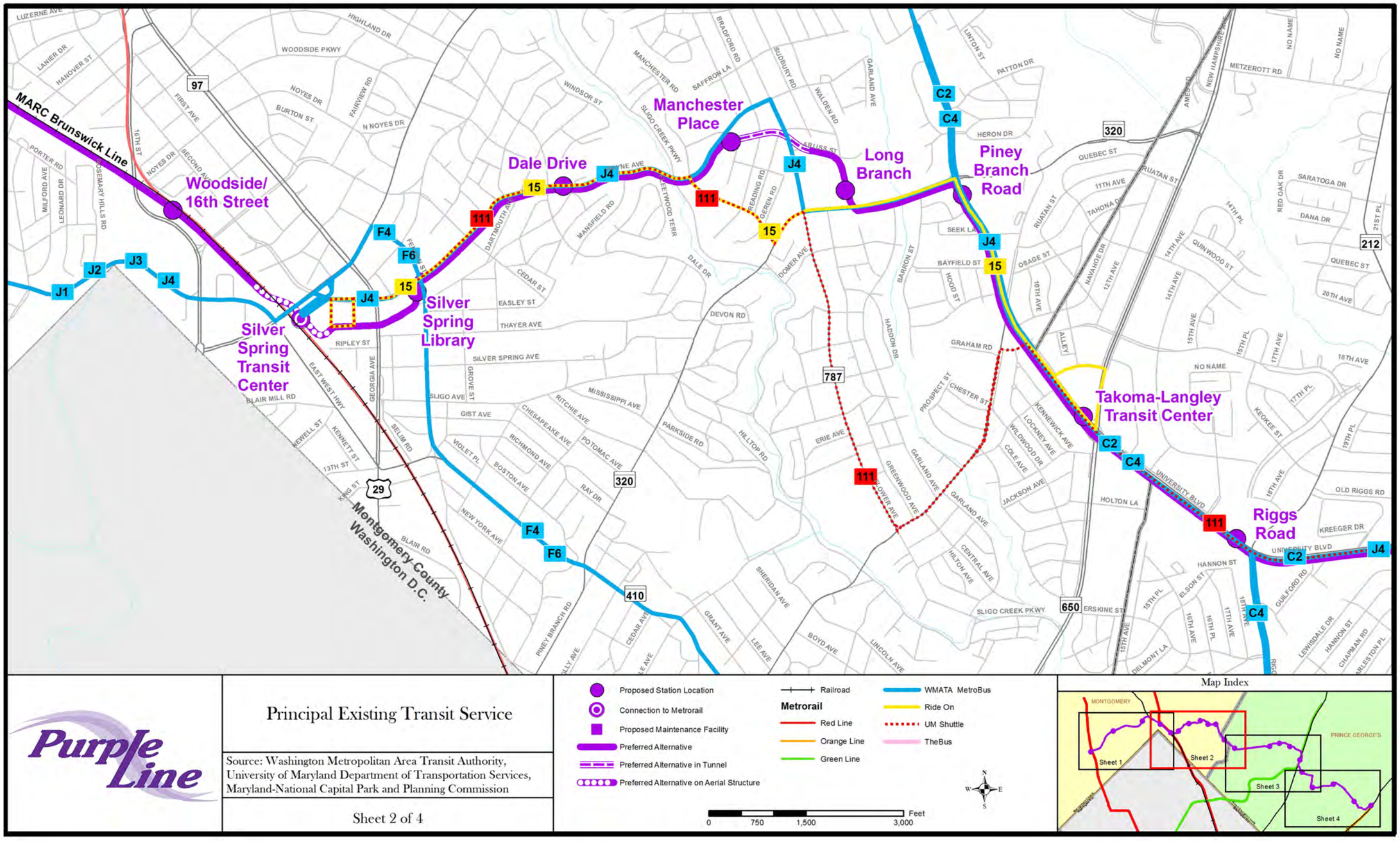


Figure 6-1: Principal Existing Transit Service

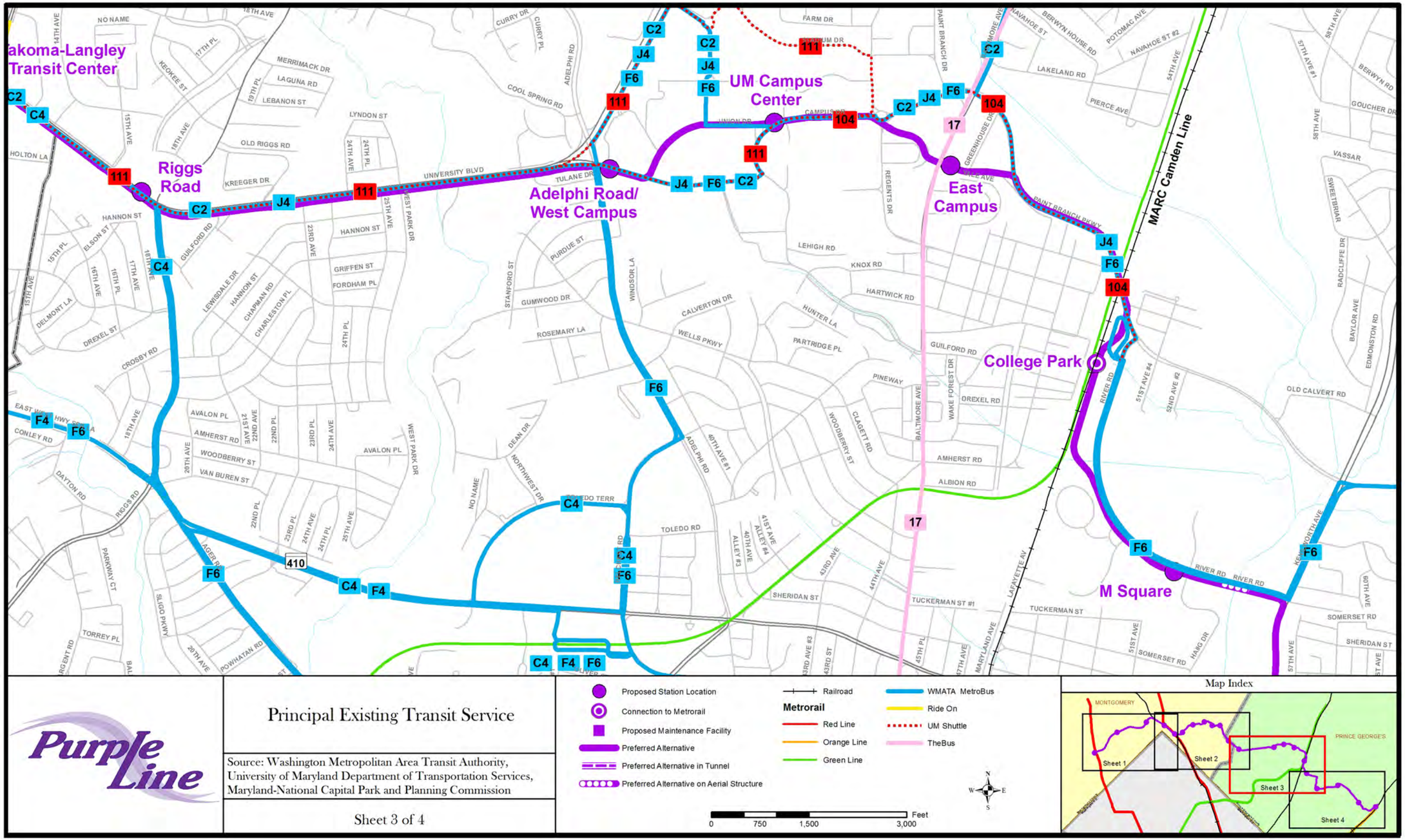
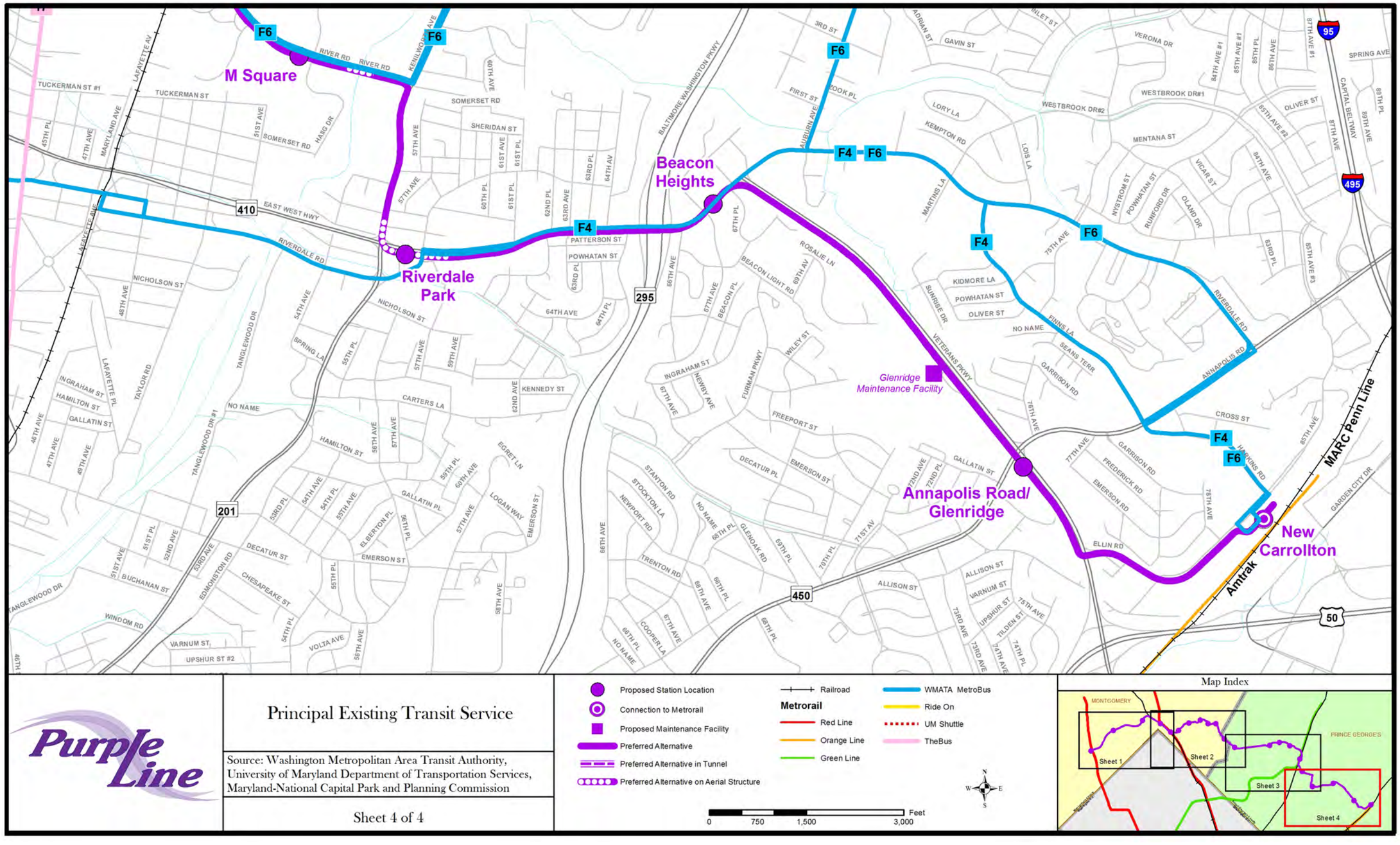


Figure 6-1: Principal Existing Transit Service



The transit improvements being considered for the Purple Line corridor are intended to provide shorter and more reliable east-west transit travel times by enabling faster transit vehicle operating speeds through the provision of more priority, dedicated and exclusive operating conditions. The degree that the alternatives address these goals can be measured by reduced transit travel times, time savings for users, improved operating speeds, and attraction of more riders to transit for each of the key markets identified.

Based on modeled transit trips of the Preferred Alternative during the peak period, users of the Purple Line would save as much as 10 minutes of in-vehicle travel time, on average compared to existing transit. A trip completely within the corridor, from Silver Spring to Bethesda would save 10 minutes. Trips from the corridor to the region (Bethesda to Glenmont) would save approximately 6 minutes. A trip from the corridor to the region (north Washington, DC to Bethesda) would save approximately 8 minutes during the peak period.

Long-term operational effects of the Preferred Alternative on public transportation use and services were considered by examining forecasted ridership demand and potential changes to existing facilities once the Purple Line becomes operational. Detailed information about the Preferred Alternative and future ridership and bus system is discussed in the *Purple Line Travel Forecasting Technical Report (2013).*

7. Parking Facilities

7.1 Existing Conditions

The MTA inventoried the types of parking facilities, locations, and the number of parking spaces located within a Purple Line parking study area. These included parking lots with at least a portion within the limits of disturbance (LOD), on-street parking in the LOD, and public parking garages within one-quarter mile of Purple Line stations. Data sources included field reconnaissance, available mapping, and parking facility owners, including the counties, WMATA, and private entities. Parking facilities in the corridor consist of the following:

- **On Street**—Public parking along the sides of the street
- **Parking Garages**—Parking structures within one-quarter mile of Purple Line Stations that patrons of the Purple Line or other area resources would use for parking.
- **Non-residential Parking Lots**—Paved areas used for parking that are open for public use or to serve businesses and non-residential parking.
- **Residential**—Driveways and parking pads, as well as parking lots that are restricted for residential parking only, such as at apartments or condominiums.

Table 7-1 below shows the existing inventory of parking in the Purple Line study area.

Table 7-1: Existing Parking in Study Area

Parking Facility Type	Existing Spaces
On-Street spaces: public parking along the sides of the street	327
Parking garages: Municipal or privately owned parking garages open for public use	8,395
Non-Residential Parking lots: paved areas used for parking that are open for public use, except those restricted for residential uses	7,897
Residential Parking: driveways, parking pads, and parking lots that are restricted for residential use only	1,343
Total:	**17,962**

7.2 No Build Alternative

Under the No Build Alternative, there would be a loss of 324 spaces from parking lots on the UMD Campus resulting from the planned extension of Presidential Drive and the relocation of Valley Drive. There are no additional parking space losses attributed to the No Build Alternative. It is possible that future development or redevelopment could result in changes or reconfiguration of current parking conditions. The analysis assumed that there would be no impacts to the current on-street parking spaces in year 2040 as per the CLRP (July 2012).

The demand for parking would increase as additional growth in population, employment, and vehicular traffic occur in the corridor. New residential, commercial, and institutional development would be required to provide parking according to local zoning and development requirements. Parking in new private developments would be required, but because such parking facilities are not included in the CLRP, nor are they required until new developments are actually constructed, they are not considered in the No Build Alternative.

7.3 Preferred Alternative

The Preferred Alternative would not provide additional parking at any stations because passengers would access the Purple Line on foot, on a bike, would be dropped off, transfer from other transit lines, or use existing parking facilities. Parking impacts in the study area were classified as either permanent or temporary. Permanent parking effects consist of permanent loss of parking spaces that would not be reconstructed in their existing locations nor replaced in other locations. Temporary parking effects consist of parking spaces that would be temporarily lost due to construction and would be unavailable for some duration of time during the construction process but would be returned after construction is complete or would be relocated.

7.3.1 Long-Term Operational Effects and Mitigation

The Preferred Alternative would remove 1,239 existing parking spaces in the corridor. Table 7-2 shows the number of parking spaces by facility type anticipated to be eliminated. The majority of parking impacts would occur in the portion of the corridor between the SSTC and the UMD campus.

Table 7-2: Permanent Removal of Parking under the Preferred Alternative

Parking Facility Type	Existing Spaces	Permanent Removal of Parking
On-Street Parking	327	220
Parking Garages	8,395	12
Non-residential Parking Lots	7,897	897
Residential Parking	1,343	110
Total:	**17,962**	**1,239**

On-Street Parking

The Preferred Alternative would remove 220 on-street parking spaces. Thirty spaces would be removed from Bonifant Street as a result of converting Bonifant Street to one-way traffic, 60 spaces would be removed along Arliss Street, three spaces would be removed from Piney Branch Road, 66 spaces would be removed along the service roads on University Boulevard to maintain a four-lane roadway with the addition of the Purple Line in the center median, and the remaining 61 spaces would be removed on the University of Maryland Campus. On-street parking loss at the University of Maryland would occur due to adding the Purple Line through the campus. Additional replacement parking is not proposed as part of the Purple Line project.

Parking Garages

The Preferred Alternative would remove twelve spaces in the Bonifant-Dixon Parking Garage due to the removal of an aisle used to connect one side of the garage on the north side of Bonifant Street with the other side

of the garage to the south side of Bonifant Street. The aisle would need to be removed to provide adequate clearance for the overhead wire system which supplies electrical power to the light rail vehicles.

Non-Residential Parking Lots

Fifty-two percent (465 spaces) of the total 897 spaces permanently lost from non-residential parking lots would occur on the UMD campus. Of these 465 spaces, 344 of them would be removed from lots as part of the extension of Presidential Drive and the relocation of Valley Drive, and an additional 121 spaces would be removed from a parking lot off of Administration Circle on the east side of campus next to the visitor center. The extension of Presidential Drive and relocation of Valley Drive is part of the University's Master Plan; therefore, the loss of these parking spaces is planned. The University has plans for several new parking garages on campus that will replace the surface parking. Additionally, a University of Maryland parking garage along Campus Drive to the east of Presidential Drive is proposed in the Campus's master plan to meet long-term parking needs on campus.

The majority of the remaining parking lots affected in the Purple Line corridor are at shopping centers adjacent to the roadways planned for widening due to the Preferred Alternative. Mitigation of permanent parking loss is not proposed in lots where the current parking is underutilized and remaining parking capacity far exceeds parking utilization.

The MTA will conduct appraisals, and in cases where it is determined that parking impacts would appreciably affect businesses and the parking cannot be replaced due to lack of available replacement locations, MTA will compensate business owners for long-term adverse effects that the loss of parking would have on their businesses, above and beyond the compensation for right-of-way displacements.

A list of locations of non-residential parking space losses is shown in Table 7-3.

Table 7-3: Preferred Alternative Permanent Impacts to Non-Residential Parking Lots

Name	Location	Permanent Impacts
7 Eleven	7689 New Hampshire Ave	6
Adelphi Shopping Center	2520 University Blvd	23
Burger King	2208 East University Blvd	8
Carolina Furniture/Cash Depot/La Chiquita Bazar	1600 University Blvd	4
Direct Auto Service	2204 University Blvd	9
El Dorado Restaurant	2200 University Blvd	10
Family Dollar	2020 University Blvd	12
First Korean Presbyterian Church	6410 Kenilworth Ave	14
Forest Shopping Center	2010 University Blvd	18
Giant Grocery Store	8750 Arliss St	46
Glenridge Shopping Center	7520 Annapolis Rd	45
Just Tires	2216 University Blvd	7
La Chiquita Express	2080 University Blvd	5
Langley Park Shopping Center Parking	8011 New Hampshire Ave	28
LRS Group LLC	2217 Kansas Ave	12
McDonalds	2306 University Blvd	4
Miles Glass Company	8714 Piney Branch Rd	2
PANAM Super Market	2340 University Blvd	2
Patel Brothers	2074 University Blvd	4
Pep Boys	1804 University Blvd	14
Pollo Fiesta Restaurant	6408 Kenilworth Ave	1
Refreshing Spring Professional Building	6201 Riverdale Rd	9

Name	Location	Permanent Impacts
Shopping Center	1101 E University Blvd	8
Shopping Center	1167 E University Blvd	6
Silver Spring Used Cars and Trucks	8909 Brookville Road	40
Summit Building	8555 Sixteenth St	7
Tick Tock Plaza	1810 University Blvd	13
University of Maryland	East Side of Presidents Dr North of Campus Dr	28
University of Maryland	North of Presidents Dr	120
University of Maryland	North of Presidents Dr	81
University of Maryland	North of Union Dr	69
University of Maryland	South of Union Dr	10
University of Maryland	South Side of Campus Dr East of Adelphi Rd	36
University of Maryland	UMCP Rd North of Administration Cl	121
University Place Shopping Center	1500 University Blvd	36
University Plaza	1511 University Blvd	16
University Plaza	1535 University Blvd	17
University Plaza West	1425 University Blvd	6
	Totals:	**897**

Residential Parking

The Preferred Alternative would remove a total of 110 residential parking spaces. Seventy-two spaces would be removed from the residential parking lots of six apartment complexes, and the remaining 38 spaces would be removed from private driveways. Property owners would be compensated for the removal of parking spaces. Table 7-4 lists permanent impacts to apartment parking lots.

Table 7-4: Preferred Alternative Permanent Effects to Apartment Parking

Name	Location	Permanent Impacts
East Pines Apartments	6739 Riverdale Rd	3
Falkland Manor Apartments	1545 N Falkland La	43
Flower Branch Apartments	8648 Piney Branch Rd	10
Goodacre Apartments	8619 Piney Branch Rd	1
Graduate Hills Apartment Homes	3424 Tulane Dr	8
University Manor Apartments	820 E University Blvd	7
	Totals:	**72**

7.3.2 Short-Term Construction Effects and Mitigation

Some parking spaces would be temporarily unavailable during construction of the Preferred Alternative. The MTA will strive to phase construction activities to minimize impacts on parking during construction. Table 7-5 summarizes the temporary parking impacts within the corridor.

Table 7-5: Short-term Construction Impacts on Parking Facilities

Parking Type	Existing Spaces	Spaces Temporarily Affected
On-Street Parking	327	69
Parking Garages	8,395	0
Non-Residential Parking Lots	7,923	1,577
Residential Parking	1,317	565
Total	**17,962**	**2,211**

Wayne Avenue is a four-lane roadway with on-street parking. Parking on the north side is restricted during the AM Peak period, Monday through Friday, and the south side is restricted during the PM Peak period, Monday through Friday. Sixty-one parking spaces along Wayne Avenue would be temporarily impacted. The other eight spaces are scattered throughout the corridor and would thus have minimal impact on parking availability.

Several other non-residential and residential parking lots would be temporarily affected throughout the duration of the project. Most of the temporary parking loss is due to the need for construction staging areas. Below are some examples of the larger parking lots where spaces would be removed and relocated.

- **Lyttonsville Yard** - This would include the parking at the County Maintenance Lot during construction of the Lyttonsville Yard. A parking deck will be constructed to replace the parking lot that is removed.
- **Silver Spring International Middle School** - the parking lot would be reconfigured, resulting in temporary loss of parking during construction.
- **Wayne Manchester Towers and Kenwood House Condominiums** - Parking lots would be temporarily removed and then replaced after the construction of the Plymouth Tunnel.