

## Chapter 9.0

# Evaluation of Alternatives

Chapter 9.0 provides a summary evaluation of the No Build Alternative and the Preferred Alternative. The evaluation contained within this chapter is an assessment of the findings presented in the preceding chapters of this FEIS, along with a discussion of equity and trade-offs of the Preferred Alternative. This evaluation provides a basis for decision-makers and the public to assess the benefits and consequences of implementing the Purple Line.

The following evaluation uses a format similar to that of Chapter 6 in the AA/DEIS but does not include the same discussions of each alternative's attainment of broader goals and objectives and cost-effectiveness, as these considerations were presented primarily to support decision-making for the Alternatives Analysis that was prepared concurrently with the DEIS. In the FEIS, the Preferred Alternative and the No Build Alternative are evaluated based on their ability to meet the purpose and need, the balance between benefits and impacts, and equity.

### 9.1 Effectiveness in Meeting the Purpose and Need

As presented in Chapter 1.0, the proposed project is intended to improve east-west transit service in the Purple Line corridor by addressing the deficiencies and needs that have been identified. The following discussions analyze the effectiveness with which the No Build Alternative and Preferred Alternative address the corridor needs and achieve the intended purpose of the Purple Line project, which is as follows:

- Provide faster, more direct, and more reliable east-west transit service connecting the major activity centers of Bethesda, Silver Spring, Takoma Park/Langley Park, College Park, and New Carrollton, by reducing travel times and improving operations and efficiencies for transit trips.
- Provide better connections to Metrorail and other existing transit services located in the corridor, linking radial Metrorail lines as well as MARC, Amtrak, and other transit with fast, direct, and continuous east-west transit service.
- Provide better connectivity to communities in between the Metrorail lines, by increasing

mobility and accessibility within communities throughout the project corridor.

#### 9.1.1 Provide Faster, More Direct, and More Reliable East-West Transit Service

The first purpose of the Purple Line is to provide faster, more direct, and more reliable east-west transit service connecting the major activity centers in the Purple Line corridor at Bethesda, Silver Spring, Takoma/Langley Park, College Park, and New Carrollton. Current transit service within the study corridor is characterized by various bus routes that are not well-integrated with each other and do not provide a continuous, direct east-west transit route. For example, bus service from Bethesda to New Carrollton requires a transfer at College Park from the WMATA J4 to F6 routes. County bus services, provided by Montgomery County Ride On and Prince George's TheBus, both terminate at the county boundary and require a transfer to continue an east-west trip. Thus, under current conditions, the shortest scheduled travel time for a bus transit trip between Bethesda and New Carrollton is 92 minutes. In addition, many major intersections along the east-west roadways in the corridor already exhibit failing levels of service

(LOS), which increases travel times for both vehicular traffic and existing bus transit services.

**No Build Alternative**

The No Build Alternative would not add a new service throughout the corridor or provide a new exclusive right-of-way. Thus, the No Build Alternative would not address and improve corridor-wide transit travel times. As traffic volumes exceeding the capacity of roadways and intersections along the corridor increase through 2040, transit travel times will increase. Peak hour intersection LOS are projected to worsen under the No Build Alternative, with 18 intersections operating at or exceeding capacity during morning and afternoon peak hours in 2040. Congested roadways and intersections would result in longer delays for both automobile traffic and bus transit.

Degraded roadway LOS would result in an increased likelihood of travel time delays with lower travel speeds and decreased reliability. Automobile travel times for a trip between Bethesda and New Carrollton are expected to increase by approximately 30 percent and 40 percent during the morning and evening peak periods, respectively.<sup>1</sup> The current end-to-end travel time between Bethesda and New Carrollton on Metrorail is 55 minutes, but this route does not provide access to any of the intermediate stops that would be available on the Purple Line. The projected bus transit travel time between Bethesda and New Carrollton is anticipated to increase to 108 minutes under the No Build Alternative.

Longer traffic delays and greater bus service unreliability would be detrimental to travel times

<sup>1</sup> Multiple travel time runs were conducted in both the eastbound and westbound directions during the AM and PM peak periods. Year 2040 travel times were estimated using the average increase in delay across the corridor, based on the projected 2040 traffic conditions.

and the overall quality of life for residents and employees in the project corridor.

**Preferred Alternative**

Table 9-1 provides a summary of some of the key benefits of the Preferred Alternative compared to the No Build Alternative (see Chapter 3.0 for more details). Under the Preferred Alternative, the number of daily transit trips in the region would be about 2 percent higher than under the No Build Alternative. The bulk of the increase in transit trips would be attributable to Purple Line corridor-related trips, which would be 11 percent higher under the Preferred Alternative than under the No Build Alternative. This increase reflects the demand for and attractiveness of faster, more reliable east-west transit service.

Between Bethesda and New Carrollton, the Preferred Alternative would provide a transit travel time of 63 minutes.<sup>2</sup> This time is slightly greater than the current Metrorail travel time, but the

**Table 9-1. Comparative Summary of Transportation Conditions, 2040**

	Alternative		Difference	
	No Build	Preferred Alternative	Number	%
Daily transit trips—region	1,655,075	1,683,701	28,626	2%
Corridor-related transit trips	221,833	247,178	25,345	11%
<b>Transit Travel Time (minutes)</b>				
Bethesda—Silver Spring	17	9	8	-47%
College Park—New Carrollton	20	16	4	-20%
Bethesda—New Carrollton	108	63	45	-42%
Failing intersections	18	15	3	-17%

Purple Line will not require a transfer, and it will serve the many planned stations between Bethesda and New Carrollton. The Preferred Alternative would provide faster travel times than bus service because it is a direct route that would operate primarily in dedicated or exclusive lanes, free from traffic congestion. Transit travel time improvements over the No Build Alternative reflect greater efficiency and reliability of transit service offered by the Preferred Alternative, as it would be able to adhere more strictly to its operations schedule and

<sup>2</sup> While most trips in the corridor would not involve a trip from one end of the corridor to the other, the Bethesda—New Carrollton end-to-end trip time is illustrative.

provide more predictable transit times, contrasted to bus service on congested roadways under the No Build Alternative. Furthermore, the new service would result in fewer vehicles on regional roadways, and traffic conditions would be better than under No Build, with four fewer intersections operating at or exceeding capacity within the project study corridor, as compared to the forecasted No Build Alternative conditions for 2040.

### 9.1.2 Provide Better Connections to Metrorail Services Located in the Corridor

A second purpose of the Purple Line project is to provide better connections to WMATA Metrorail services in the corridor by linking Metrorail stations and lines with fast, direct, continuous east-west transit service. Under current conditions, the project corridor lacks direct and efficient transit connections between the four Metrorail stations. The Metrorail system provides an alternative to traveling on the congested roadways or using bus services for trips between Bethesda, Silver Spring, College Park, and New Carrollton. However, because the Metrorail system is radial, these trips currently require travel into and out of Washington, DC. Such trips are lengthy and, unless traveling between Bethesda and Silver Spring on the Red Line, require a transfer between lines.

#### *No Build Alternative*

While the No Build Alternative includes the construction of a new south entrance to the Bethesda Metrorail Station, the Takoma Langley Transit Center, and the Silver Spring Transit Center (see Chapter 2.0), it does not include any increases to transit services serving these stations or the other Metrorail stations in the study corridor. Thus, transit access and connectivity with the Metrorail system will remain the same, or possibly worsen, due to the impact of increased traffic congestion on transit and auto access times. Assuming no change in current Metrorail travel times, a Metrorail trip from Bethesda to Silver Spring would take approximately 39 minutes on the Red Line through MetroCenter and back.

#### *Preferred Alternative*

The Preferred Alternative would offer a fast, direct one-seat ride between all Metrorail stations within the project corridor. Rather than requiring an indirect trip into and out of Washington DC, on Metrorail, or a more direct bus trip that could be affected by traffic congestion or transfers between routes, the Purple Line would provide an east-west connection between the Metrorail stations along the corridor with greatly improved transit travel times. The Purple Line would travel the approximate 4.3-mile distance between Bethesda and Silver Spring in nine minutes, which would provide a substantial 30-minute travel time savings compared to a Metrorail trip in the No Build alternative. In 2040, 27 percent of Purple Line boardings would be trips that also involve riding Metrorail, demonstrating the value of the Preferred Alternative in providing connectivity to the Metrorail system.

This improvement would benefit travel within the corridor, as well as improving connections to and from other places served by the Metrorail system. The Preferred Alternative also would provide direct transit connections to other transit services including MARC commuter rail, Amtrak, and local bus routes. Connections to the MARC Brunswick Line, Camden Line, and Penn Line would be available at Silver Spring, College Park, and New Carrollton, respectively. Amtrak service is located next to the Preferred Alternative terminus in New Carrollton as well.

The direct connections with MARC, Metrorail, and Amtrak would allow faster, more convenient access to and from Washington, DC, as well as access to job opportunities and places of interest outside the project corridor in Maryland and points beyond.

### 9.1.3 Improve Connectivity to the Communities in the Corridor Between the Metrorail Lines

The third purpose of the project is to improve connectivity to the communities in the corridor between the Metrorail lines, in order to better link people to employment and activities throughout the corridor and beyond to the entire Washington metropolitan region. Over 200,000 people work

within the project study corridor.<sup>3</sup> Many individuals working in the major employment centers in the study corridor also live in the surrounding residential communities, and some are dependent on public transit for mobility and access. Approximately 15 percent of residents in the study corridor have no vehicle available, and 23 percent of workers use public transportation for their daily commutes. The only transit service available in many of the corridor communities is the limited bus service previously described.

### *No Build Alternative*

Between 2005 and 2040, employment is expected to increase by 44.6 percent and 36.4 percent in Montgomery County and Prince George's County, respectively.<sup>4</sup> The No Build Alternative would maintain the current level of access to employment and activity centers through the existing bus network, which would continue to provide discontinuous and often slow east-west service. The No Build Alternative would facilitate safer and more efficient transfers by consolidating bus stops at the Silver Spring Transit Center and Takoma/Langley Transit Center, and it would incorporate bicycle and pedestrian improvements along the Silver Spring Green Trail and in the Bethesda Central Business District, but transit connections to other communities along the corridor are not anticipated to be improved substantially. Increasingly longer travel times for bus riders are expected under the No Build alternative, thus limiting the attractiveness of using bus service to access activity and employment centers.

### *Preferred Alternative*

With 21 stations along its route, the Preferred Alternative would offer fast, direct, and improved access among residential communities, employment centers, educational facilities, entertainment and activity centers, and other destinations of interest within the project corridor. As a result, the number of corridor-related transit trips would be 11 percent greater under the Preferred Alternative compared to the No Build Alternative in 2040.

<sup>3</sup> *Purple Line Travel Forecasts Results Report*, (2013).

<sup>4</sup> County data is for the entire county, not the portion of the county within the study area. See Section 4.5.2 for additional details.

The Preferred Alternative also would include improvements to bicycle and pedestrian circulation, including the Capital Crescent Trail, and related safety and security measures, such as improved sidewalks and crosswalks. These improvements would encourage multi-modal activity and increase safety, which would provide mobility and access benefits especially for individuals with no vehicle available.

In conjunction with the enhanced connectivity to other transit services (MARC, Amtrak, and Metrorail), the Purple Line also would enhance access between the study corridor and communities throughout the region.

The Preferred Alternative is projected to result in over 28,000 more regional transit trips per day than the No Build Alternative. This difference demonstrates the benefit of the Preferred Alternative in improving mobility by better connecting the communities within the corridor.

## 9.2 Balancing Benefits and Effects

The transportation, economic, and community benefits of the Purple Line come with some adverse effects. MTA has strived to avoid or minimize adverse effects by working with stakeholders and the communities. By selecting the Medium Investment LRT Alternative in the AA/DEIS and adding elements of the High Investment LRT Alternative, MTA responded to widespread community support for the Purple Line and the LRT mode. However, MTA recognized at the time that work remained to refine the selected alternative to better fit stakeholder and community expectations and minimize effects to the natural and human environment, while still strongly supporting the project purpose and need. The iterative process of refining the Purple Line design initiated then is still ongoing today, and it will continue beyond the signing of the Record of Decision (ROD), the conclusion of the National Environmental Policy Act (NEPA) process.

Throughout the development of the Preferred Alternative, MTA has refined the design and alignment, where reasonably feasible, to avoid or minimize effects. Yet some adverse effects cannot be

overcome due to the design and safety standards MTA must meet, the developed character of the communities the Purple Line is intended to serve, and the need to avoid adversely affecting future operations of other transportation facilities in the corridor. Consequently, the decision to advance the Preferred Alternative toward construction involves recognizing and understanding that MTA has worked to balance the trade-offs between the benefits and the effects of the Purple Line.

On the benefits side, the Preferred Alternative strongly responds to the purpose and need. It would provide faster, more direct, and more reliable east-west transit service in the corridor; it would connect major activity centers, better connect to Metrorail services, and improve connectivity to the communities between the Metrorail lines. It also strongly supports county land use and economic development plans and goals. As described in the previous sections, and in Chapters 3.0 and 4.0, these benefits would bring positive economic benefits for corridor residents and businesses, enhance safety, and improve intersection performance, in addition to greatly improving mobility, particularly for environmental justice communities in the corridor.

Recognizing that transit projects have the potential to induce community change, and as discussed in the indirect effects portion of Chapter 7.0, MTA is encouraging the counties to put in place land use plans and programs to preserve neighborhood character and affordable housing and to support local businesses.

While the developed character of the corridor makes it an ideal candidate for LRT transit service, it also poses challenges to introducing a new transportation facility. On the one hand, MTA desires to make the system as convenient for the community as possible; on the other hand, it has an obligation to preserve existing and planned freight rail, roadway, parking, transit, bicycle, and pedestrian operations, and to minimize impacts on the surrounding environment and communities. To strike this balance between benefits and effects, MTA has worked with affected parties and the communities to reduce right-of-way needs to the bare minimum. It will continue this iterative process beyond NEPA, focusing in equal measure

on improving the fit of the Preferred Alternative in relation to neighborhoods, historic properties, parks, other community facilities, businesses, and private property owners.

On the natural environment side, the Purple Line's primary use of existing transportation corridors inherently minimizes effects on land and water resources. MTA will continue to coordinate with the regulatory agencies to identify measures to avoid or minimize natural resource effects during the design and permitting phase of the project.

Where adverse effects of the Preferred Alternative remain, MTA has identified mitigation measures intended to offset remaining effects to the natural and human environment. Although some mitigation measures are enforced by federal and state regulations, most of MTA's mitigation measures are project-specific commitments it has made with the affected stakeholders and communities in the Purple Line corridor.

### 9.3 Equity

In addition to measuring the proposed project's effectiveness in meeting the purpose and need and considering the overall effects compared to the benefits, FTA and MTA have assessed the extent to which the Preferred Alternative would provide a fair distribution of benefits, costs, and impacts across various population groups throughout the study corridor. According to FTA, "No person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal Financial assistance."<sup>5</sup>

An equity assessment for a proposed transit improvement project generally includes the following considerations:

- The extent to which the transportation investment improves transit service to various population segments, particularly those that are transit-dependent
- The distribution of the cost of alternatives across population segments through the

<sup>5</sup> FTA C 4702.1B.

funding mechanisms used to cover the local contribution to construct and operate the transportation improvement

- The incidence of any substantial environmental effects, particularly in neighborhoods immediately adjacent to proposed facilities

These three issues are discussed in the sections below.

### 9.3.1 Service Equity

The Preferred Alternative would improve access and mobility within the project study corridor, thereby improving access to jobs, educational facilities, and cultural/entertainment venues. Overall, the Purple Line would improve accessibility for all communities, including low-income, minority, and transit-dependent populations. While some impacts would occur within these communities, these impacts would be minimal compared to the project's benefits to the larger environmental justice populations and would be no different than impacts to the overall population in the corridor, including accessibility to a faster, more reliable mode of transit.

FTA's new Title VI Circular requires conducting "service equity analysis" six months prior to beginning revenue operations. This directive will require MTA to complete a service equity analysis prior to starting to operate the Purple Line.

### 9.3.2 Financial Equity

The Preferred Alternative is anticipated to be primarily funded by a combination of federal and state (Maryland Transportation Trust Fund) sources, with possible local and private investments (e.g., station area improvements). As a result, it is not expected that any one group, particularly low-income or minority populations, would receive a disproportionate share of the financial burden associated with financing the capital and operating and maintenance costs associated with the proposed project. Costs are presented in Chapter 2.0.

Fare payments required for passengers utilizing the Preferred Alternative would be comparable to regular Metrobus rates and policies. Therefore, low-income and minority populations would not be

excluded from the benefits offered by the Preferred Alternative, due to cost, any more than under existing transit conditions.

### 9.3.3 Environmental Equity

An inventory of the likely impacts on neighborhoods, residences, and businesses in this FEIS reveals some localized impacts to low-income and minority communities. As described in Chapter 4.19 Environmental Justice, localized impacts in the study corridor include:

- Parking impacts
- Business property acquisitions, including some business relocations
- Residential property acquisitions
- Displacements and partial acquisitions of some community facilities
- Moderate to high visual effects
- Noise and vibration impacts during construction and operation
- Business disruption during construction
- Increasing rents for business
- Impact on affordable housing

While these adverse effects would occur in environmental justice communities, these communities would also benefit from the project. The key benefits of the Purple Line are improved mobility and travel time to locations along the corridor and better connectivity to other transit services and systems.

These improvements would benefit low-income and minority populations throughout the project corridor, including transit-dependent residents of those areas. Some of the environmental justice neighborhoods that would be directly affected, such as Langley Park and Long Branch, would be among the principal beneficiaries of the Purple Line as these neighborhoods are not served by the Metrorail system, and many of the residents of these areas are transit-dependent.

While some adverse effects would be borne primarily by environmental justice populations, the effects of the Purple Line would be distributed among environmental justice and non-environmental justice communities. For example, the surface alignment of the Preferred Alternative along

Piney Branch Road and University Boulevard would impact an environmental justice community, but the transitway alignment on the Georgetown Branch right-of-way, which is primarily in non-environmental justice neighborhoods, would have high visual impacts to adjacent neighborhoods.

Taking these factors into account, MTA and FTA conclude that the Preferred Alternative as a whole would not have “disproportionately high and adverse effects” on environmental justice

populations. Through its coordination with affected communities and the public, MTA has refined the Preferred Alternative to avoid sensitive areas and minimize impacts to both the human and natural environment. Further, through this coordination, MTA has identified commitments and mitigation measures that are described in this FEIS to address impacts on environmental justice populations from the Purple Line.

