FLASH
NEW HAMPSHIRE AVE

New Hampshire Avenue Bus Rapid Transit Study

REPORT

FEBRUARY 2026

New Hampshire Avenue Bus Rapid Transit Study

Report

Montgomery County Department of Transportation

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1 Executive Summary

1.1 Introduction

Through this "New Hampshire Avenue Bus Rapid Transit Study," the Montgomery County Department of Transportation (MCDOT) has identified a recommended preferred alternative for Flash Bus Rapid Transit (BRT)[1] service along an approximately 8.5-mile portion of New Hampshire Avenue (MD 650) in Montgomery County, Maryland. The proposed New Hampshire Avenue Flash BRT service (the project) would serve Langley Park, Adelphi, Hillandale, White Oak, and Colesville as well as parts of western Prince George's County and the City of Takoma Park.

As proposed, the New Hampshire Avenue BRT route would include 14 stations, providing transfer opportunities to other regional transit services including the Red, Green, and Yellow Metrorail lines at Fort Totten; future Purple Line light rail at Takoma-Langley; US 29 Flash BRT service at White Oak; and proposed Flash BRT services on University Boulevard at Takoma-Langley and Randolph Road in Colesville.

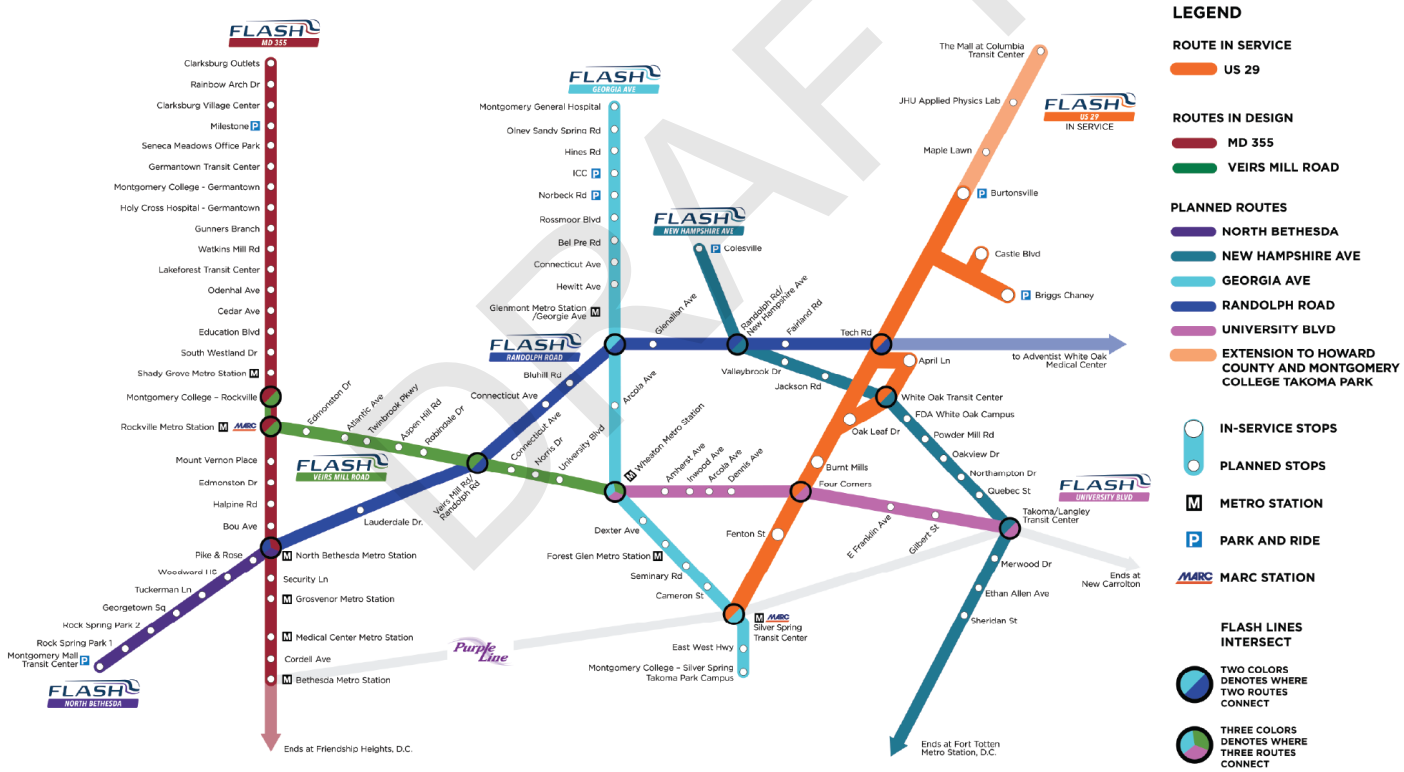


Figure 1: Flash BRT System Map

[1] Flash is MCDOT's planned BRT network spanning 100 miles, with more than 100 stops along eight routes. Designed to form a network that integrates with Metrorail, it will connect Montgomery County residents to destinations faster and more efficiently through high frequency bus service with modern station amenities.

Implementation of the project would be one step toward realizing the broader County vision for a connected network of Flash BRT routes (see **Figure 1** above) as articulated in the 2013 Countywide Transit Corridors Functional Master Plan (BRT Master Plan), which identified this portion of New Hampshire Avenue as a high-ridership transit spine serving many transit-dependent households. However, existing service can often be slow and unreliable. The project would provide high-quality transit service that improves bus speed and reliability along New Hampshire Avenue and would enhance current riders' experience. Improved service could also attract new riders.

1.2 Project Goals & Objectives

The broader goals of MCDOT's Flash BRT program and this project are improving mobility choices, providing sustainable travel solutions, enhancing corridor safety, promoting economic growth, improving quality of service, and advancing equity. In collaboration with agency and community stakeholders, the following objectives were identified to build on the goals' foundation and guide development of project-level alternatives:

- Provide high-quality, cost-effective transit options to serve existing riders.
- Connect people to job centers and new developments with faster transit trips.
- Increase connections and access to regional destinations.
- Improve on-time performance and provide consistent travel times for more predictable transit arrival times.

1.3 Measures of Effectiveness

Measures of Effectiveness (MOEs) facilitated comparison among the 'No-Build' and the build alternatives in later study phases. The MOEs below were the primary metrics that separated the recommended preferred alternative from the others tested:

- Travel time for Flash BRT, local bus, and general traffic;
- Transit accessibility to jobs; and
- Estimated total capital costs for construction, design, and new buses.

1.4 Project Corridor

Overview

The New Hampshire Avenue study corridor, as shown in **Figure 2**, is approximately 8.5 miles long, running in a north-south direction from the Maryland–Washington D.C. line at Eastern Avenue on the southern end to the Colesville Park & Ride near Randolph Road at the northern end.[2] Although most of the study corridor is in Montgomery County, segment between University Boulevard and Northampton Drive is in Prince George's County. It is one of the few regional north-south corridors in eastern Montgomery County connecting its northern suburbs with Washington, D.C.

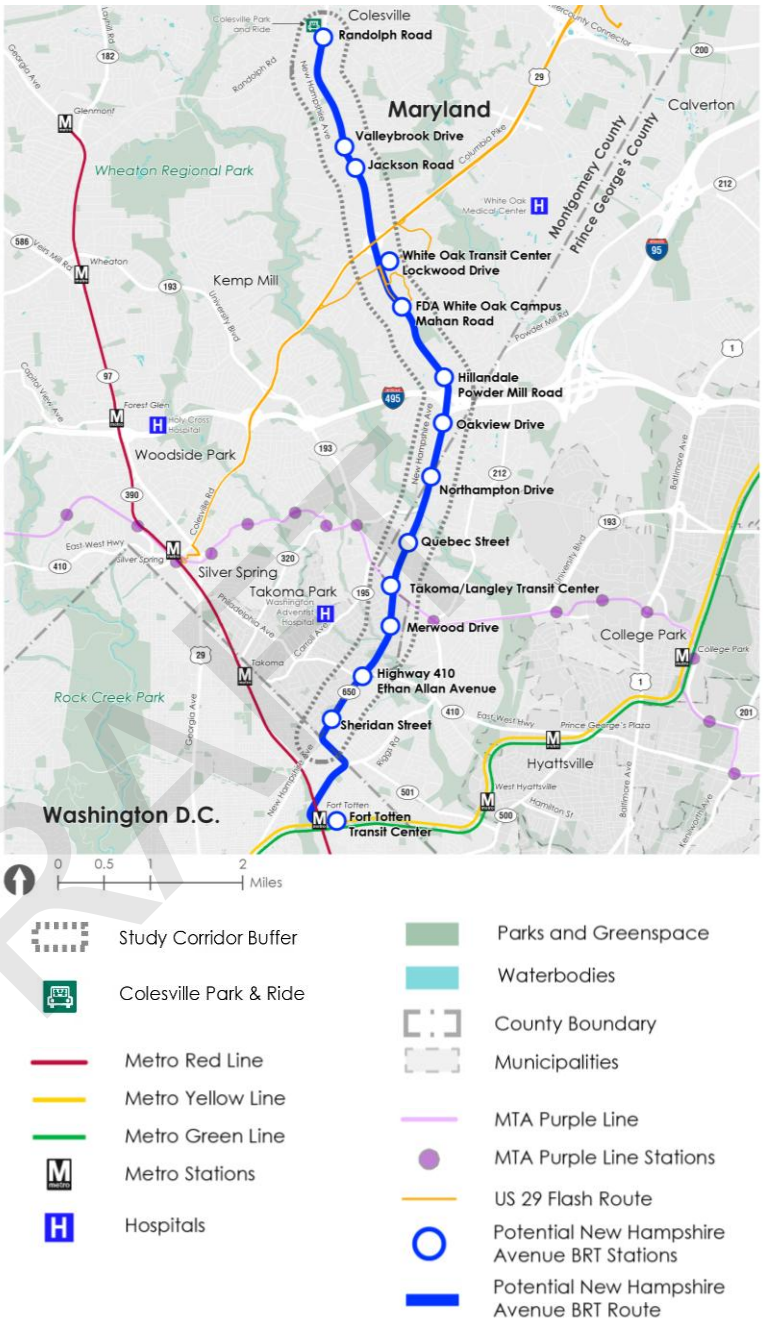


Figure 2: New Hampshire Avenue BRT Study Area

Land Use and Development Patterns

Land use along the corridor is mostly suburban residential, with many post-war single-family homes and some clusters of multi-family development. Retail and commercial centers are located near major intersections. Density and commercial activity is generally higher at the southern end of the corridor and tapers off toward the north. Planned projects, such as Hillandale Gateway, and adopted master

[2] Although MCDOT anticipates that New Hampshire Avenue BRT service will extend to the Fort Totten Metrorail station, this study did not analyze alignment alternatives or options to redesign any streets in Washington, D.C. MCDOT also envisions another BRT route along Randolph Road, which intersects with New Hampshire Avenue at the northern terminus of the study corridor.

plans, propose additional dense, mixed-use development at nodes including Colesville, White Oak, and Hillandale.

Socioeconomic Conditions

About 70 percent of the corridor lies within a half-mile of equity areas containing transportation-disadvantaged communities as defined by Montgomery County and the Metropolitan Washington Council of Governments (MWCOG). **Figure 3** maps equity areas along the study corridor.

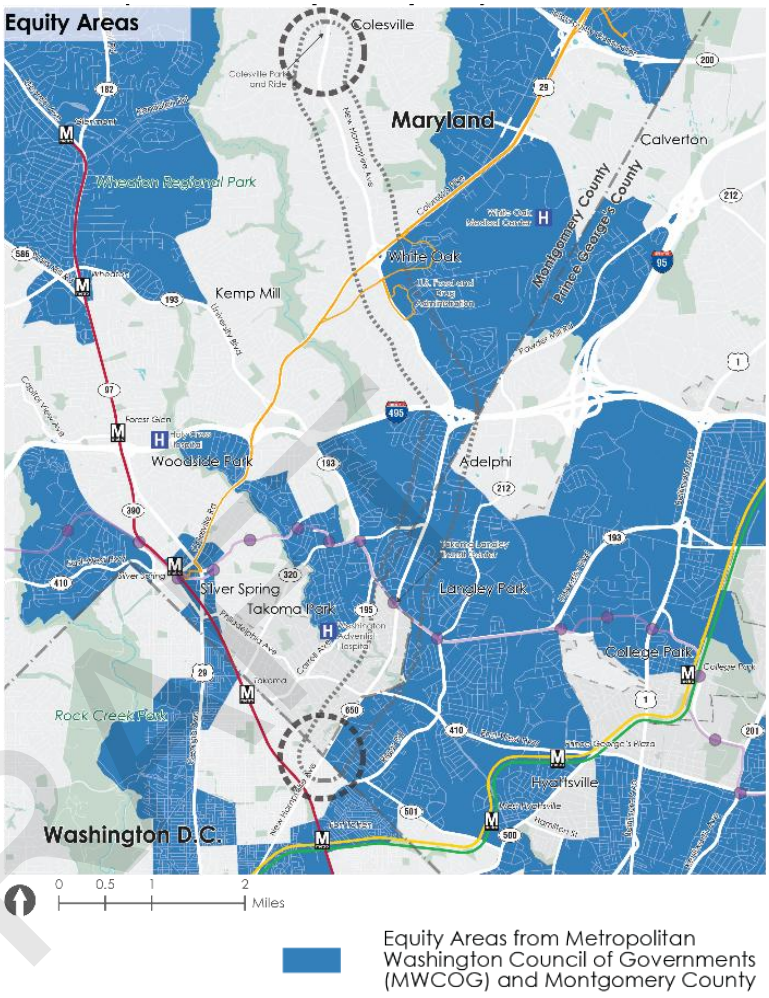


Figure 3: Equity Areas along the Study Corridor

Montgomery County has designated Equity Focus Areas to "apply a holistic equity lens to planning practices to address existing inequities and prevent the creation of new inequities."[3] These areas are characterized by three (3) main factors, including household income, race and ethnicity, and the ability to speak English. The County's 'Equity Focus Area' tool also considers access to resources and opportunities.

The MWCOG similarly designates a series of Equity Emphasis Areas with a similar goal of prioritizing equity in the planning process to inform growth and decision making. These Equity Emphasis Areas track "high concentrations of low-income individuals and/or racial and ethnic minorities."[4]

Transit use is among the highest in the region, especially within these equity areas near the White Oak Transit Center and south of the Takoma-Langley Transit Center.

[3] Montgomery County Equity Focus Areas Analysis

[4] MWCOG Equity Emphasis Areas

Transportation Network

New Hampshire Avenue is situated between two Metrorail corridors (the Red Line and Green/Yellow lines). It is served by several local bus routes operated by the Washington Metropolitan Area Transit Authority (WMATA), and MCDOT Ride On. Prince George's County's 'The Bus' service has one bus route that runs on a very short segment of New Hampshire Avenue to serve the Takoma-Langley Transit Center. The study corridor intersects with the future Purple Line light rail and planned Flash BRT along University Boulevard at the Takoma-Langley Transit Center; US 29 Flash BRT at White Oak Transit Center; and another planned Flash BRT route along Randolph Road, at the northern end of the study corridor.

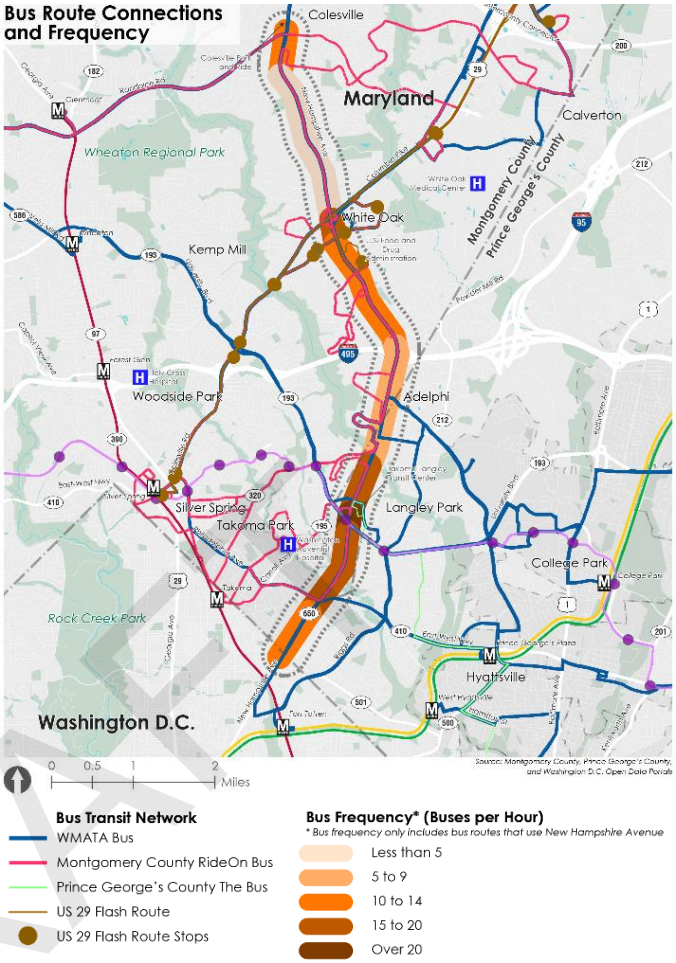


Figure 4: Existing Bus Frequency along the Study Corridor

As shown in **Figure 4**, New Hampshire Avenue is served by several high-frequency bus routes, with up to 20 buses per hour in peak times. However, as shown in **Figure 6** and **Figure 7** bus service is often slow and unreliable, since buses operate in general travel lanes with heavy vehicular traffic, especially south of US 29.

Figure 5: New Hampshire Avenue at Metzerott Road

New Hampshire Avenue is a state road and a major suburban arterial roadway with a posted speed limit of 35 miles per hour south of Piney Branch Road and 40 miles per hour north of it. Most of the study corridor carries between 35,000 and 43,000 vehicles per day on average, except for the segment around the Capital Beltway (I-495), where the average number of vehicles per day increases to 75,000 to 80,000. **Figure 5** shows New Hampshire Avenue at Metzerott Road.

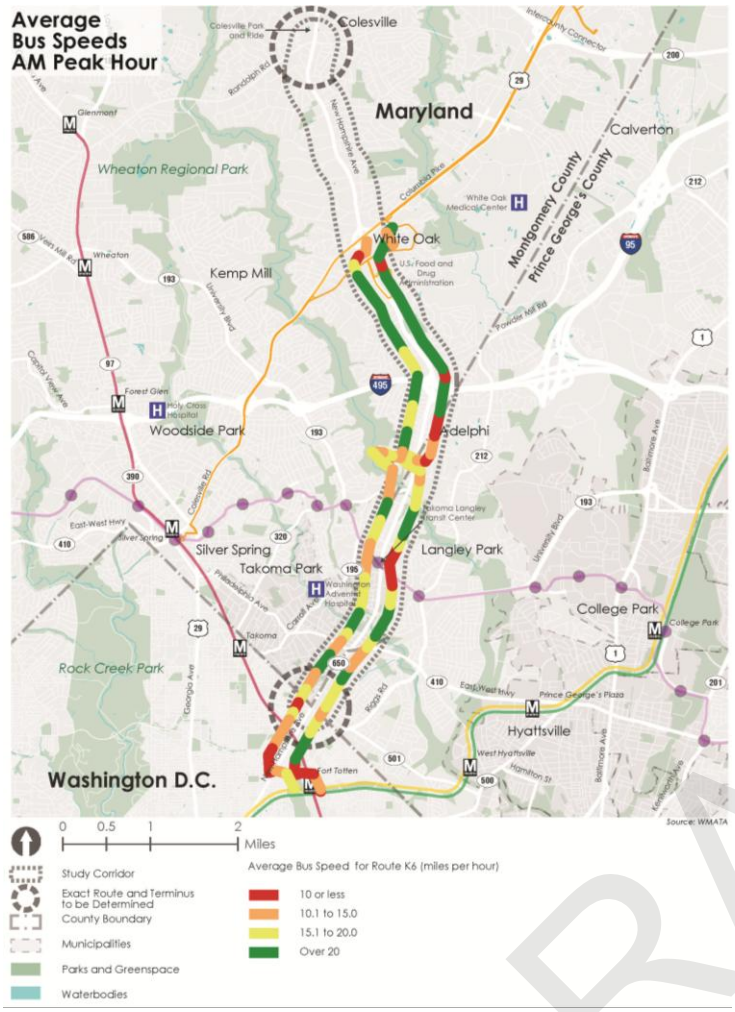


Figure 6: Average Bus Speeds AM Peak Hour

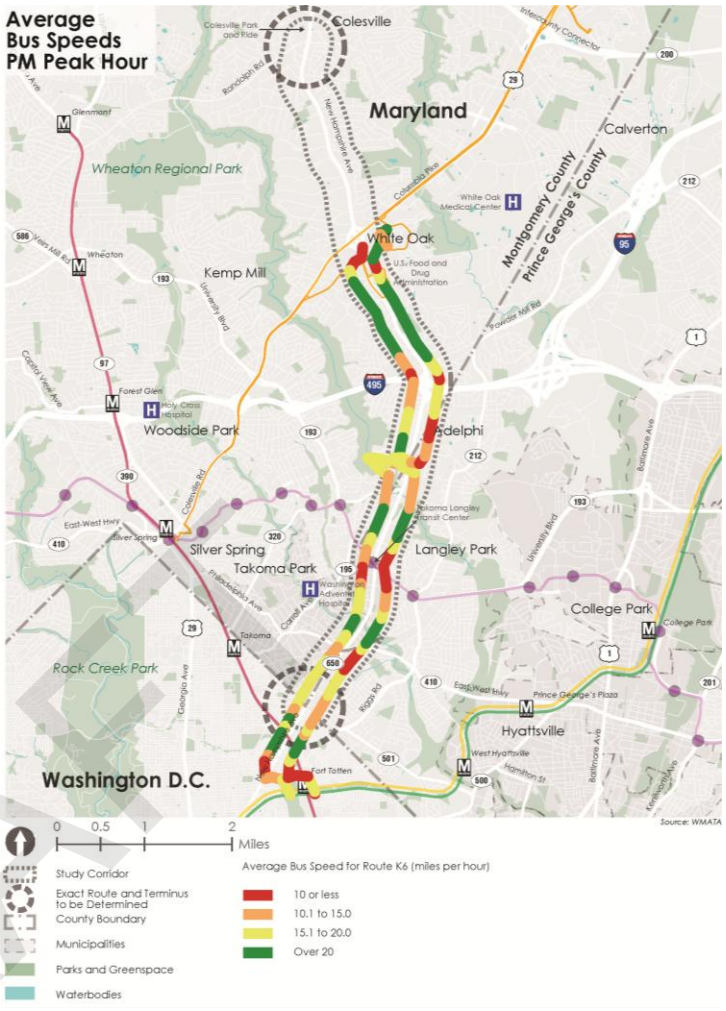


Figure 7: Average Bus Speeds PM Peak Hour

Pedestrians face a challenging environment; sidewalks are available on both sides of the roadway, but they are narrow and are minimally buffered or adjacent to curbs. Large and infrequently spaced signalized intersections with limited crosswalks further limit pedestrian comfort and mobility.

The study corridor does not have any dedicated bicycle facilities, except for one 0.7-mile-long northbound striped bike lane and a shared-use path on the eastern side of the road along the US Food and Drug Administration (FDA) campus. Crashes are both frequent and severe on New Hampshire Avenue. Between 2015 and 2019, there were eight fatal crashes, 759 injury crashes, and 1,477 property damage-only crashes within the study corridor.

1.5 Stakeholder Engagement and Public Outreach

Extensive stakeholder engagement and public outreach informed this planning study. Stakeholders and community members were eager to see Flash BRT implemented along New Hampshire Avenue.

Residents, businesses, agencies, and community groups provided input through numerous meetings, events, surveys, innovative online digital platforms, and traditional methods. The study reflects a high level of meaningful participation from the community, especially people in typically underrepresented demographic groups. Feedback was sought and provided on analysis findings and design alternatives as they were developed.

Outreach included the following activities:

- Establishment of and collaboration with a Technical Advisory Committee (TAC) comprising staff representing several state, local, and regional agencies.
- Establishment of and collaboration with a Corridor Advisory Committee (CAC) comprising community members, including residents, workers, and business owners.
- Six virtual TAC and CAC meetings provided regular project updates and collected input on analysis and recommendations.
- Twenty-two in-person pop-up events engaging more than 2,000 people at bus stops, farmers' markets, and other local events, with materials provided in multiple languages.
- A survey (online and print) on design alternatives received almost 400 responses.
- Four public meetings (three in-person and one virtual) to share project updates and solicit feedback on recommendations.
- Five additional meetings with important local stakeholders such as the FDA.

Frequently expressed concerns included pedestrian safety, especially getting to median island bus stops, as well as the construction timelines for such projects, the project's potential effect on right-of-way (ROW), and traffic congestion, especially around the Beltway. Feedback consistently focused on prioritizing the quick implementation of fast, frequent, safe, well-connected, and cost-effective Flash BRT service along the study corridor without displacing local service or causing significant traffic or property impacts.

1.6 Alternatives Development

The alternatives development process was an iterative and collaborative exercise that relied on input from the TAC and other community stakeholders. The existing conditions analysis and first round of public engagement prompted an initial list of concepts that encompassed all reasonable approaches. The initial concepts were categorized into four broad concepts, each of which included variations and spot treatments to optimize performance.

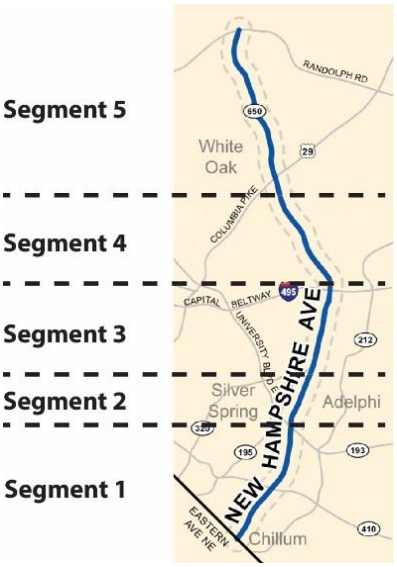


Figure 8: Corridor Segments

The concepts were screened by corridor segment for feasibility, fatal flaws, potential to generate operational gains, and consistency with the BRT Master Plan. As shown in **Figure 8**, the study corridor was divided into five segments based on characteristics including travel demand, land use, and transit frequency:

- **Segment 1:** Eastern Avenue to University Boulevard
- **Segment 2:** University Boulevard to Piney Branch Road
- **Segment 3:** Piney Branch Road to Powder Mill Road
- **Segment 4:** Powder Mill Road to Lockwood Drive
- **Segment 5:** Lockwood Drive to Randolph Road

Working with the TAC, four concept types were short-listed to be combined by corridor segments into end-to-end design alternatives that spanned the full study corridor from Eastern Avenue to Randolph Road.

Before conducting a detailed analysis, these three initial end-to-end alternatives were presented to the TAC. Based on their feedback, a fourth end-to-end alternative was added to test two median lanes in Segment 4. Alternatives analysis was conducted using MOEs and compared the four end-to-end design alternatives as well as the 'No-Build' alternative.

- **No-Build Alternative –** Maintains existing conditions along the study corridor including all existing bus service in mixed traffic conditions. No Flash BRT or any other transportation infrastructure improvements are considered as part of the 'No-Build' alternative.
- **Alternative 1: Mixed Traffic with Queue Jumps (QJ) -** Mixed traffic with Transit Signal Priority (TSP) or QJs throughout the corridor. This is the Transportation Systems Management (TSM) alternative required by the Federal Transit Administration (FTA) to be included in the alternatives analysis. TSM represents a minimum set of improvements that could be made to enhance the performance, safety, and reliability of existing transportation systems without major new construction. The TSM alternative serves as a low-cost baseline to compare with other alternatives that would require major infrastructure changes.
- **Alternative 2: Curbside Lanes –** Repurpose existing general purpose travel lanes to curbside Bus-Only lanes south of Piney Branch Road. Mixed traffic with TSP and without QJs north of Piney Branch Road.
- **Alternative 3: Median Lanes -** Repurpose existing general purpose travel lanes to two median Bus-Only lanes south of Piney Branch Road. Add a single reversible-median Bus-Only lane from Piney Branch Road to Lockwood Drive. Mixed traffic with TSP and without QJs north of Lockwood Drive.

- **Alternative 4: Additional Median Lanes -** Repurpose existing general purpose travel lanes to two median Bus-Only lanes south of Piney Branch Road and between Powder Mill Road and Lockwood Drive. Add a single reversible-median Bus-Only lane from Piney Branch Road to Powder Mill Road. Mixed traffic with TSP and without QJs north of Lockwood Drive.

Figure 9 illustrates the initial four end-to-end build design alternatives.

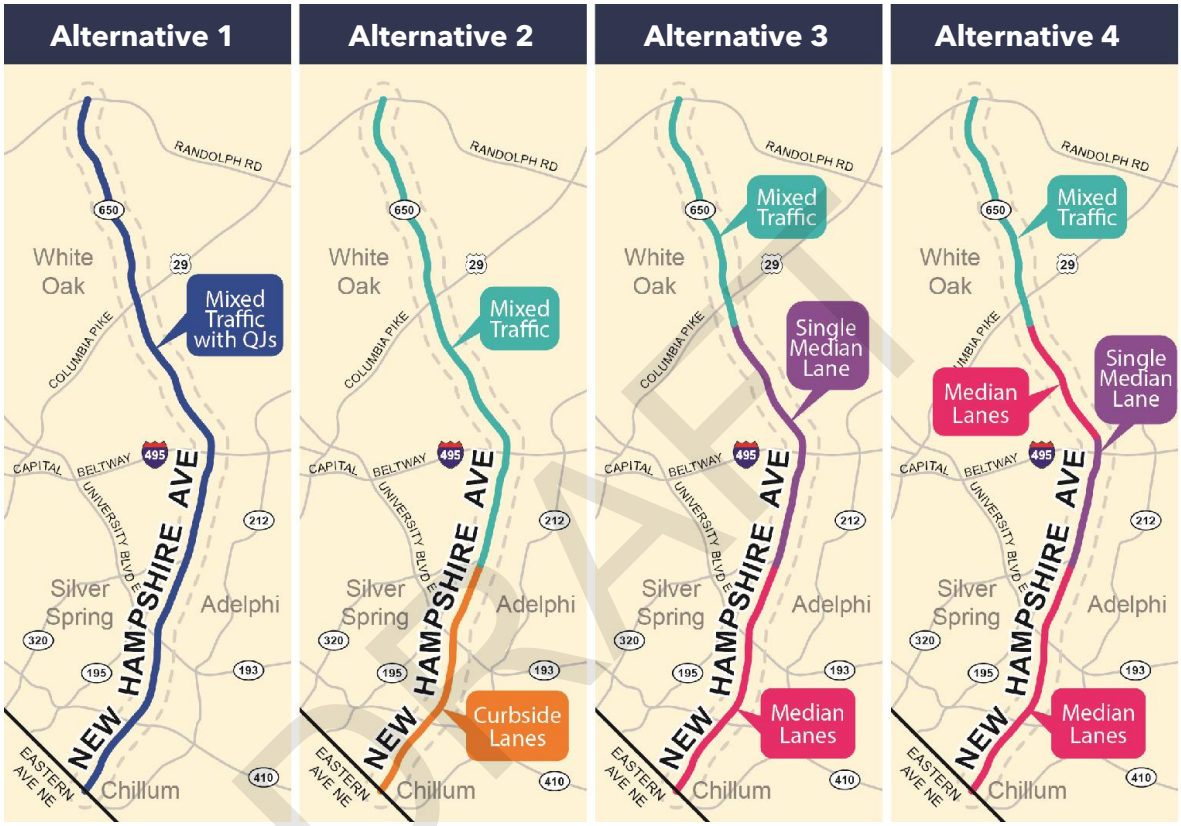


Figure 9: Initial Corridor Alternatives

The four design alternatives and the 'No-Build' alternative were evaluated based on MOEs related to travel time, transit ridership, access to jobs, cost, and ROW requirements.

An initial segment-level evaluation of both qualitative and quantitative criteria concluded that no alternative performed best across all MOEs or across all segments. To optimize performance, a Hybrid Alternative was developed by combining the best-performing (based on cost, travel times, conflicts with local buses, and traffic and property impacts) elements from the original four alternatives. In consultation with the TAC and community stakeholders, a detailed analysis of the Hybrid Alternative was undertaken.

1.7 Hybrid Alternative

A detailed segment-level review confirmed that the Hybrid Alternative, building on Alternative 2 (Curbside Lanes) with specific additional treatments from other alternatives could outperform all previous alternatives. Bus pullouts were added at high-ridership local stops along segments with curbside bus lanes to further enhance BRT performance and avoid delays due to local buses sharing bus lanes. Opportunities to improve pedestrian safety and accessibility along the corridor were also pursued: the conceptual design includes a redesign of certain intersections near BRT stations with new crosswalks with pedestrian refuge islands and tighter intersection geometries to shorten crossing distances. **Figure 10** Illustrates the Hybrid Alternative.

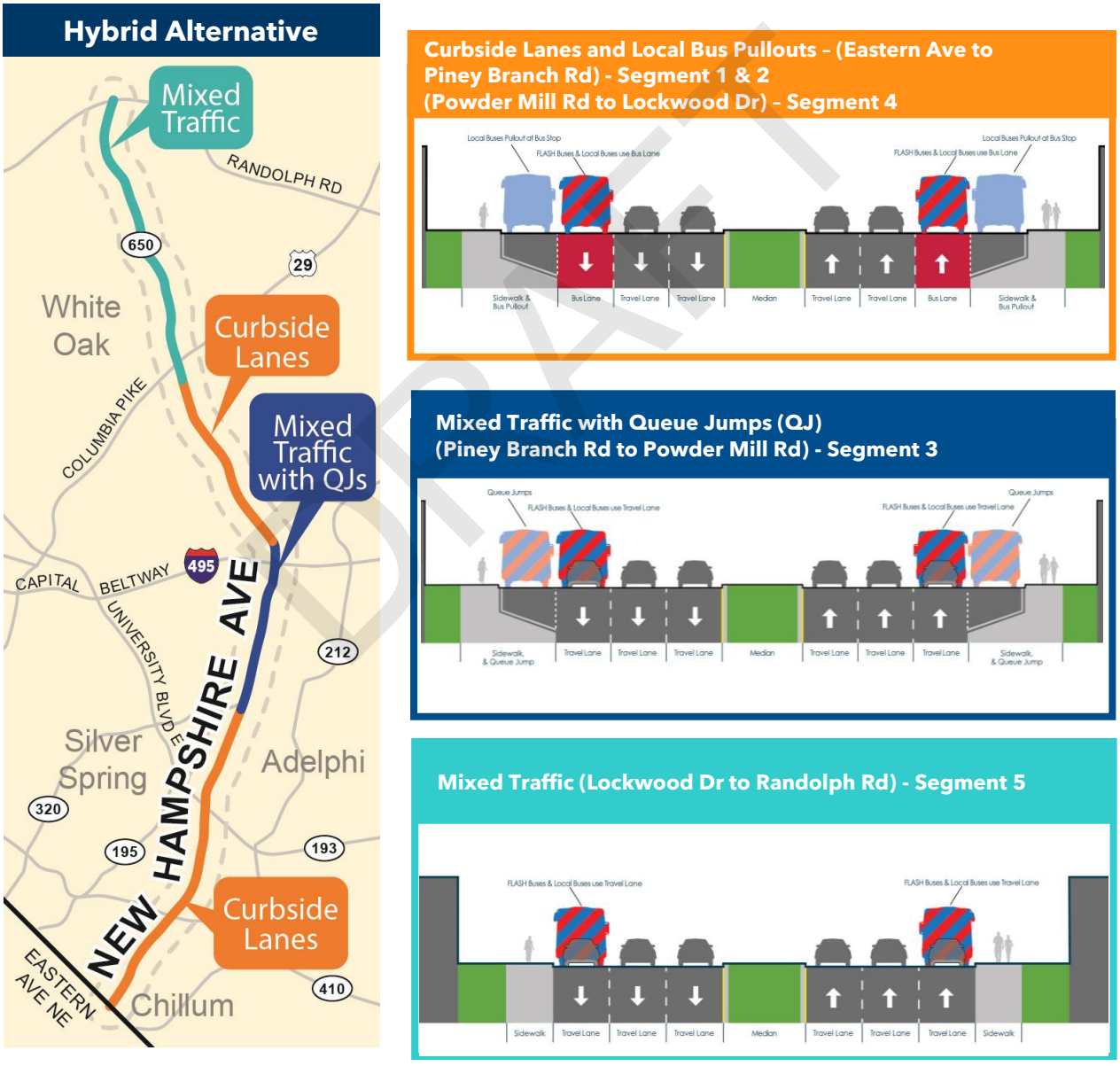


Figure 10: Hybrid Alternative

The Hybrid Alternative includes the following treatments:

- Curbside bus lanes with local bus stop pullouts at certain locations south of Piney Branch Road and from Powder Mill Road to Lockwood Drive
- Mixed traffic with QJs from Piney Branch Road to Powder Mill Road
- Mixed traffic without QJs north of Lockwood Drive

1.8 Alternatives Analysis Results

The Hybrid Alternative was evaluated against all MOEs to test and compare its performance to the initial four design alternatives and the 'No-Build' alternative to objectively determine the alternative that best achieves Flash BRT program/project goals. Evaluation results for the Primary MOEs, including total capital costs, are illustrated in **Table 1**. **Figure 11** displays a summary of total capital costs for each alternative.

Alternatives 3 and 4 are substantially more expensive yet provide only limited Flash BRT travel time savings compared to Alternatives 1 and 2. These alternatives also require significant additional ROW and increase travel times for both general traffic and local buses operating in mixed traffic. The Hybrid Alternative performs best overall, achieving the lowest BRT and local bus travel times while avoiding the high costs of median-running designs. It also improves general traffic travel time, making it the most cost-effective and balanced option. Results of the full evaluation are described in **Section 10** of this report, with further details provided in **Appendix J**.

Table 1: Summary of Alternatives Evaluation for Key MOEs

Measures of Effectiveness (MOEs)	No-Build	Alternative 1 Mixed Traffic	Alternative 2 Curb Lanes	Alternative 3 Median Lanes	Alternative 4 Additional Median Lanes	Hybrid Alternative
Flash BRT Travel Time	N/A	47.3 min.	43.1 min.	36.4 min.	36.3 min.	33.4 min.
Local Bus Travel Time	62.6 min.	47.0 min.	43.2 min.	64.7 min.	67.5 min.	38.2 min.
General Traffic Travel Time	48.0 min.	31.3 min.	45.7 min.	47.5 min.	50.2 min.	39.9 min.
ROW Requirement	N/A	4.2 acres	1.7 acres	26.1 acres	24.0 acres	4.0 acres
Total Capital Cost	N/A	$119.5 Mil.	$109.0 Mil.	$455.7 Mil.	$441.0 Mil.	$142.1 Mil.
Cost/Mile	N/A	$14.3 Mil.	$13.1 Mil.	$54.7 Mil.	$52.9 Mil.	$17.1 Mil.
2045 Weekday New Hampshire Ave BRT Ridership	N/A	7,720	8,168	9,210	9,181	10,973

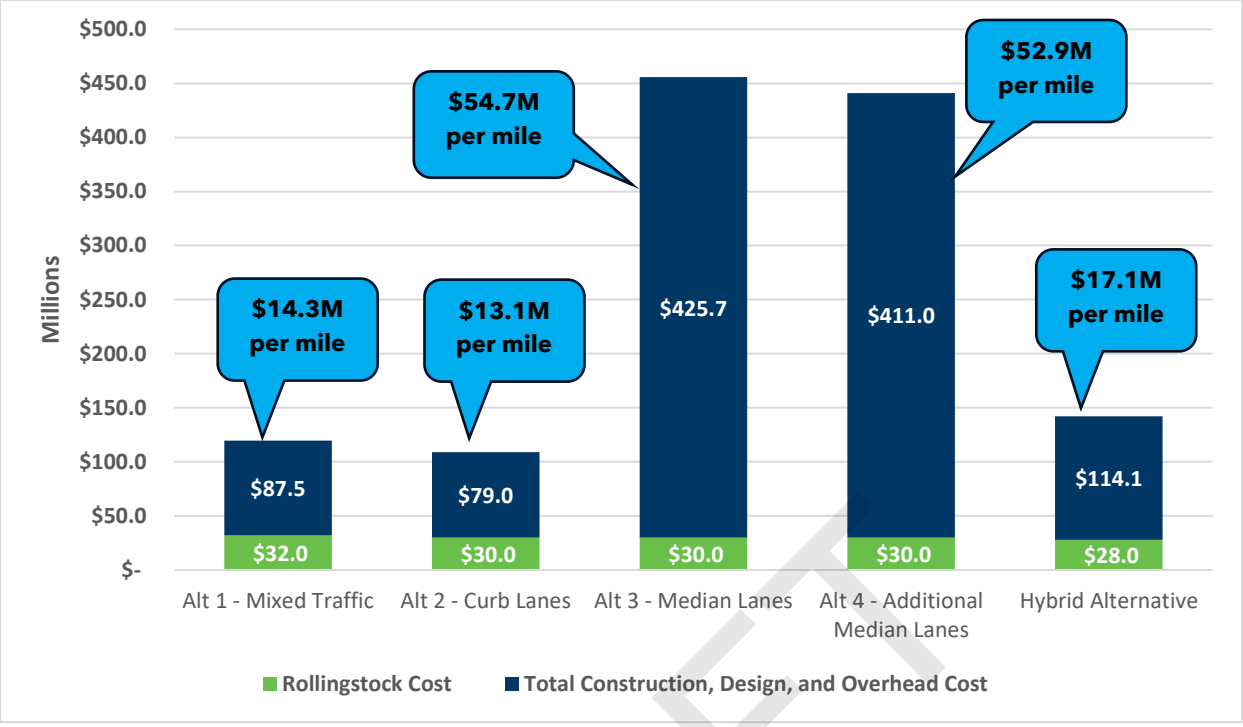


Figure 11: Summary of Total Capital Costs in Millions

Note: Rollingstock cost refers to the expense of purchasing new Flash buses for the study corridor. The number of buses needed differs between Alternative 1 and the Hybrid Alternative compared to Alternatives 2, 3, and 4, due to differences in BRT travel times.

1.9 Recommended Preferred Alternative

The Hybrid Alternative would provide the greatest value and outperform all other alternatives in achieving the project's goals and objectives. MCDOT recommends that it be advanced as the Preferred Alternative for preliminary engineering and environmental review for the following reasons:

- It would provide the fastest BRT travel time of all the alternatives.
- It would minimize traffic disruption and property impacts compared to other dedicated bus lane options.
- It is a cost-effective alternative that best achieves project goals.
- It would generate the highest projected transit ridership.

The Hybrid Alternative reflects input from stakeholders and community members, who supported its development and selection as the preferred option. It would better serve current transit riders while offering higher-quality service to attract users of other travel modes.

2 Introduction

The Montgomery County Department of Transportation (MCDOT) is developing a countywide Bus Rapid Transit (BRT) network (Flash BRT) across eight corridors, including New Hampshire Avenue (MD 650) in eastern Montgomery County (the project). Flash BRT is a high-capacity transit system that delivers fast, reliable, safe, high-quality, and cost-effective service. BRT features include dedicated or exclusive transit lanes, branded stations with near-level boarding platforms and other passenger amenities, and intersection treatments such as Transit Signal Priority (TSP) and Queue Jumps (QJ) that improve transit performance.

New Hampshire Avenue is a principal arterial road owned and maintained by the Maryland State Highway Administration (SHA). It is one of the few regional north-south corridors in the eastern portion of the county, connecting suburban communities with Washington, D.C. **Figure 12** shows New Hampshire Avenue at Metzerott Road.

Many surrounding communities have large transit-dependent populations. While New Hampshire Avenue is served by many high-ridership local bus routes, it is also heavily used by motor vehicle commuters, which affects these buses' frequency, speed, and reliability. Many existing stops lack amenities such as seating and shelters, and safe access is hampered by fragmented and substandard pedestrian infrastructure.

The New Hampshire Avenue BRT Study (Study) evaluates multiple design alternatives developed to improve the speed and reliability of transit service and, based on this analysis and extensive input from stakeholders and the public, recommends a preferred alternative to advance the project.

Figure 12: New Hampshire Avenue at Metzerott Road

2.1 Study Corridor Overview

The study corridor is defined as the public right-of-way (ROW) and fronting properties along an 8.5-mile portion of New Hampshire Avenue from the Maryland–Washington D.C. line at Eastern Avenue on the southern end to the Colesville Park & Ride near Randolph Road at the northern end.[5] As shown on **Figure 13**, the study corridor connects communities such as Langley Park, Adelphi, Hillandale, White Oak, and Colesville, as well as small portions of western Prince George's County south of the Capital Beltway (I-495) and the City of Takoma Park.

New Hampshire Avenue is a major suburban arterial roadway featuring three general-purpose travel lanes in each direction, divided by a landscaped median that accommodates left-turn lanes at intersections. There are additional right- and left-turn lanes at some major intersections. The corridor has a posted speed limit of 35 miles per hour south of Piney Branch Road and 40 miles per hour north of Piney Branch Road. Most of the study corridor carries between 35,000 and 43,000 vehicles per day on average, except for the segment around the Capital Beltway (I-495), where the average increases to 75,000 to 80,000 vehicles per day. Segments of the study corridor also include service roads providing local access to residential properties. These service roads increase pedestrian crossing distance and create complex intersections that can be challenging for all modes to navigate.

The communities along New Hampshire Avenue are currently served by a total of 17 bus routes operated by the Metropolitan Area Transit Authority (WMATA), MCDOT Ride On, and Prince George's County's 'The Bus' service.[6] Ridership data was collected for WMATA and Ride On in September 2024. WMATA's K6 and K9 bus routes, which ran along most of the length of the New Hampshire Avenue study corridor, carried nearly 9,990 passenger trips on an average weekday. The data collection and analysis for this study was conducted before WMATA implemented its Better Bus Network redesign that renamed all bus routes and consolidated or realigned some of the routes. The K6 and K9 routes were replaced and renamed as M60 and M6X respectively. However, all bus route references in this report reflect the older network.

Analysis of existing transit ridership shows that there are about 14,470 weekday bus transit trips in the study corridor. Bus service along the study corridor is frequent, with as many as 20 buses per hour in peak periods, but it is often slow. Bus travel can require up to 50 percent more time than driving a car.

[5] Although MCDOT anticipates that New Hampshire Avenue BRT service will extend to the Fort Totten Metrorail station, this Study did not analyze alignment alternatives or options to redesign any streets in Washington, D.C.

[6] The data collection and analysis for the New Hampshire Avenue BRT Study took place from January 2022 to December 2024, before WMATA implemented its Better Bus Network redesign. That redesign renamed all bus routes and consolidated or realigned some of them. Therefore, all bus route references in this report reflect the older network.

Many portions of the study corridor have been defined as equity communities by the Maryland-National Capital Park and Planning Commission (MNCPPC) - Montgomery County Planning Department and the Metropolitan Washington Council of Governments (MWCOG). These communities have high proportions of residents who are income-constrained, minorities, or members of other disadvantaged groups. Transit is often a lifeline to people in these communities, providing access to economic opportunity.

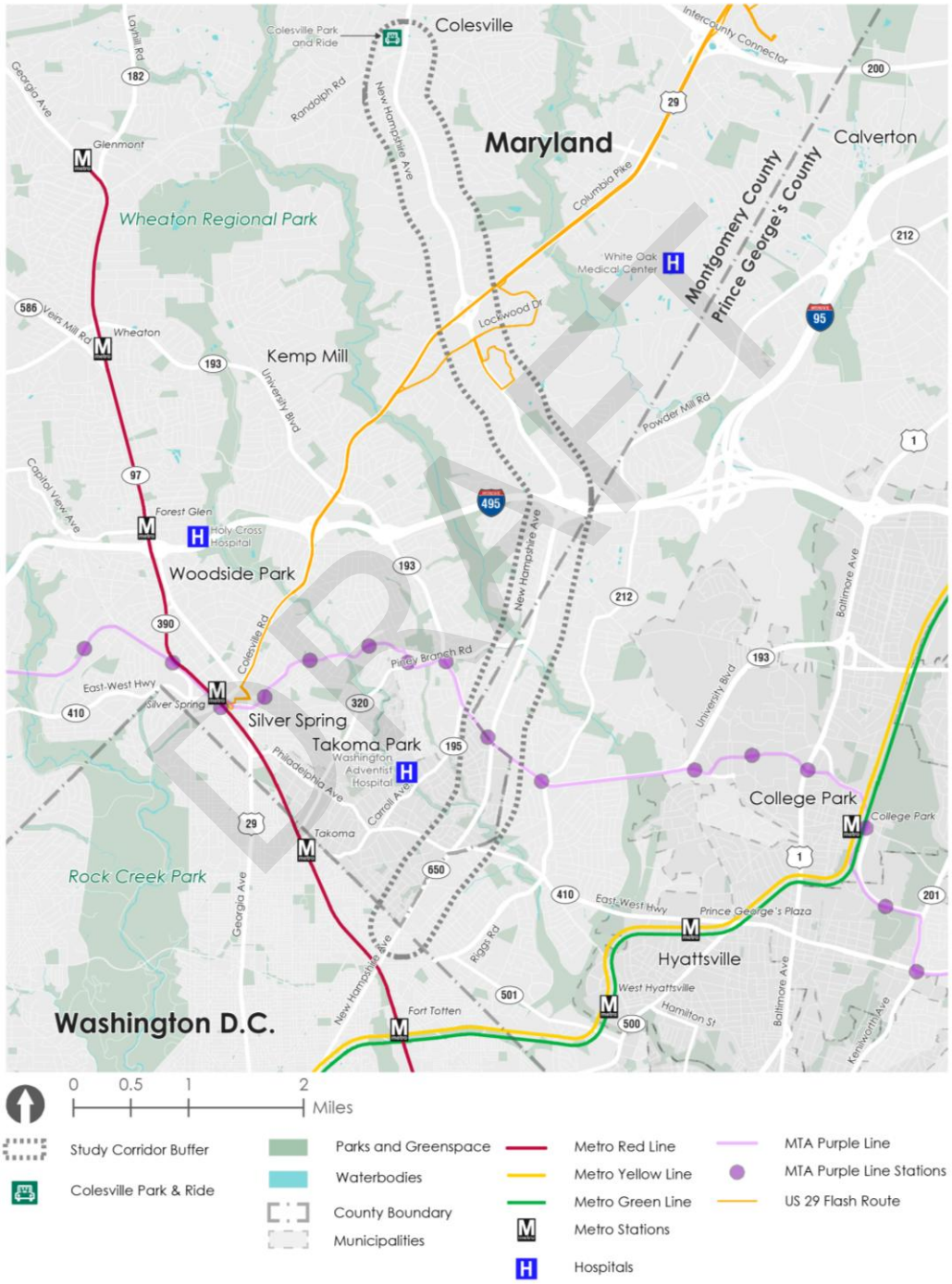


Figure 13: New Hampshire Avenue BRT Study Area

2.2 Project Background

The Montgomery County Council approved the 2013 Countywide Transit Corridors Functional Master Plan (BRT Master Plan) in 2013. The plan recommended a 102-mile network comprising 10 corridors (later consolidated into eight corridors by MCDOT), including New Hampshire Avenue. The BRT Master Plan made broad, high-level recommendations for implementing BRT on New Hampshire Avenue, including route termini, station locations, maximum ROW width, and running way configurations. It offered general guidance to be refined with further analysis through corridor studies such as this one and recommended specific segments for dedicated bus lanes and mixed traffic, respectively. As shown on **Figure 14**, along New Hampshire Avenue the plan recommended dedicated bus lanes south of Lockwood Drive near Columbia Pike (US 29) and buses in mixed traffic north of Lockwood Drive. It also recommended 12 stations along the study corridor.

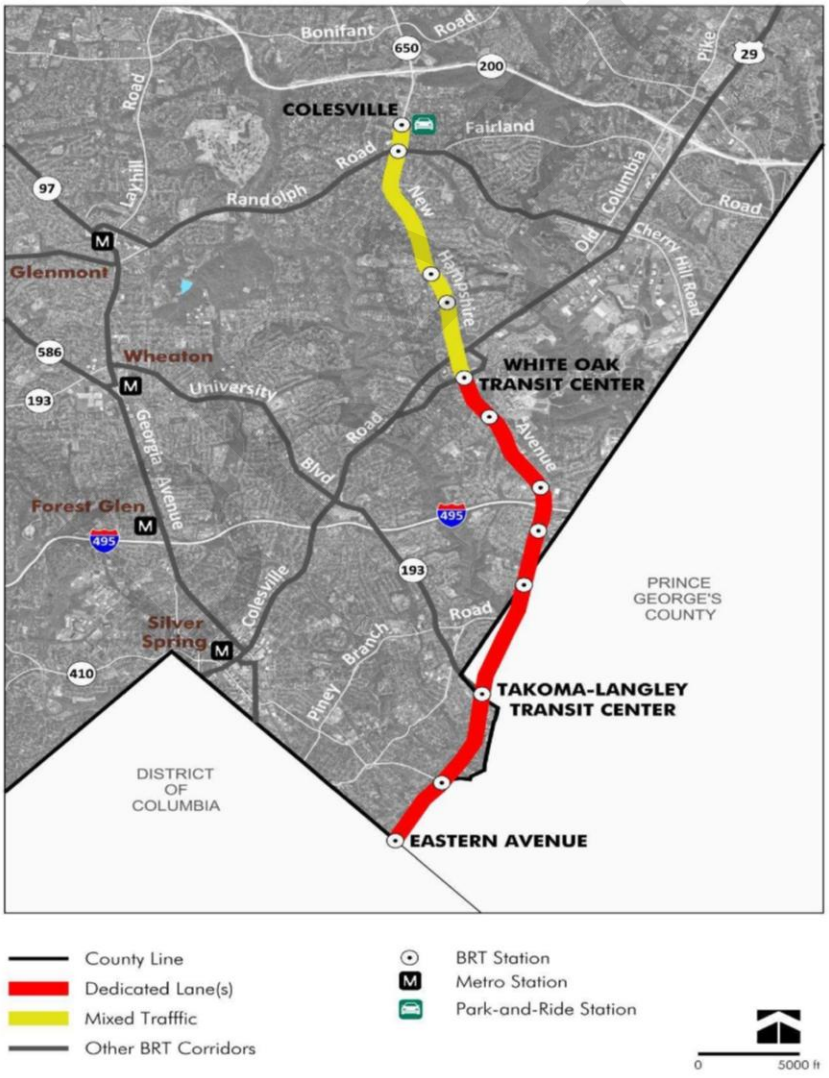


Figure 14: BRT Master Plan New Hampshire Avenue Recommendation (2013)

Flash Bus Rapid Transit

The Flash program was established to implement the vision outlined in the BRT Master Plan. Flash is the County's branded limited-stop, high-amenity BRT service. Flash BRT service is designed to arrive every 15 minutes or less, and move riders more reliably, comfortably, efficiently, cost-effectively, and sustainably than existing local and commuter bus service. It also uses enhanced vehicles, stations, and operations:

- Passengers board through multiple doors, and vehicles have spacious interiors that can accommodate wheelchairs, strollers, and bikes.
- Stations provide shelters, real-time arrival information, and near-level boarding platforms that make it easier to board buses with wheelchairs, strollers, and bikes.
- Fewer stops, higher frequency, and more direct routes promote faster travel, enhanced by operations design features such as bus-only lanes and signal communications.
- Several Flash BRT corridors will include dedicated or exclusive bus lanes and intersection treatments such as Transit Signal Priority (TSP) and Queue Jumps (QJ) to improve transit performance.

As illustrated on **Figure 15**, the Flash network will, as it is implemented, provide BRT service along eight corridors.[7]

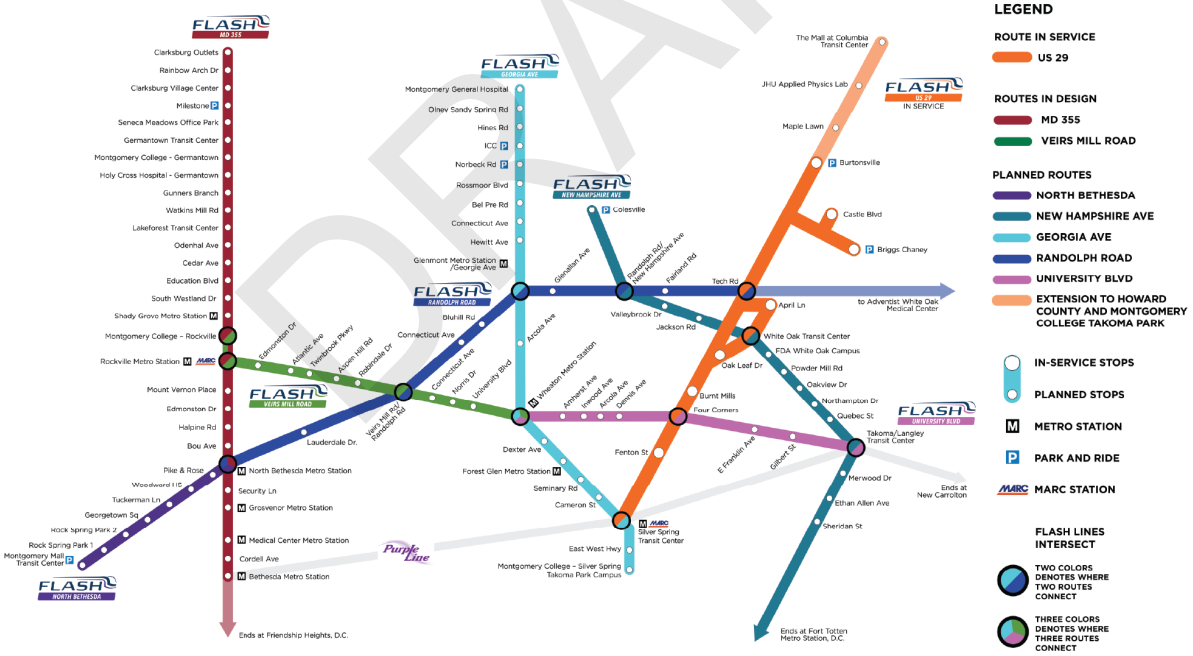


Figure 15: Flash BRT Network

[7] The Flash BRT network combines the ten corridors recommended in the BRT Master Plan into eight corridors. It consolidates the Georgia Avenue North and Georgia Avenue South corridors into a single Georgia Avenue corridor and MD 355 North and MD 355 South into a single MD 355 corridor.

3 Purpose & Need

3.1 Project and Study Purpose

The purpose of the project is to improve the speed, frequency, and reliability of bus service along New Hampshire Avenue. The project also seeks to enhance rider experience by adding station amenities and improving safety for accessing stations. Together, these improvements are intended to better serve existing riders and attract new users.

The study evaluates multiple design alternatives for implementing Flash BRT along the corridor to deliver faster, more frequent, and more reliable service. With input from stakeholders and affected communities, the study identifies a preferred alternative for implementing Flash BRT along New Hampshire Avenue.

3.2 Need for the Project

The BRT project, envisioned along New Hampshire Avenue, will address the following needs:

- Existing multiple bus routes, while providing frequent service, are slow and unreliable - speeds are often below 10 mph - and many high-volume bus stops lack amenities such as seating and shelters.
- New Hampshire Avenue is one of the highest ridership bus transit corridors in the region. WMATA's K6 and K9 bus routes, which ran along most of the length of the New Hampshire Avenue study corridor. Based on the data collected in September 2024, K6 and K9 bus routes carried nearly 9,990 passenger trips on an average weekday. Analysis of existing transit ridership shows that there are about 14,470 weekday bus transit trips in the study corridor.
- About 70 percent of the corridor is within a half-mile of an equity area, as defined by MWCOG and the Montgomery County Planning Department, with a high concentration of low-income, limited-English, and carless households.
- New Hampshire Avenue is a key corridor for all travel modes, including bus transit and vehicular traffic, as there are few alternate or parallel regional north-south corridors connecting eastern Montgomery County to Washington D.C.

4 Goals and Objectives

MCDOT established the following six program-wide goals for implementing and operating the Flash BRT system consistently across the various corridors. These goals provided the framework for development of the following project objectives:

- Goal #1: Mobility Choices
  - Maximize the number of jobs accessible by transit
  - Increase connection between study corridor and regional job opportunities
  - Provide pedestrian and bicycle infrastructure to access stations
- Goal #2: Sustainable Solutions
  - Minimize needed ROW expansions
  - Minimize effects to the built and natural environments
  - Develop cost effective alternatives that are competitive against peer projects
  - Develop alternatives that can be implemented and constructed efficiently
- Goal #3: Corridor Safety
  - Improve the safety of corridor for all road users and make progress toward the County's Vision Zero Plan
- Goal #4: Economic Growth
  - Support planned and potential new development along the corridor
- Goal #5: Quality Service
  - Improve the speed and reliability of transit service in the corridor
  - Provide high frequency transit within the study area
  - Provide connections to high frequency and regional transit services
- Goal #6: Community Equity
  - Effectively serve equity and disadvantaged communities in the corridor

These project objectives were used to develop qualitative and quantitative Measures of Effectiveness (MOEs) to analyze alternatives and to substantiate the Project's purpose and need. MOEs were categorized into two classes: Primary MOEs and Secondary MOEs. The Primary MOEs included quantitative metrics that produced separate results for the 'No-Build' and each of the build alternatives. The following Primary MOEs were used to compare corridor-wide end-to-end BRT alternatives.

- Travel time for Flash BRT, local bus, and general traffic
- Property impacts and ROW needs for roadway and stormwater infrastructure
- Estimated total capital costs for construction, design, and new buses
- Total capital cost per mile
- BRT transit ridership

The Secondary MOEs produced the same results when calculated for the 'No-Build' and each of the build alternatives, as all alternatives followed a common route alignment and had the same station locations. The calculations for the Secondary MOEs were based on the underlying data, such as U.S. Census demographic data, which remained constant for each alternative. The following Secondary MOEs were used to strengthen the overall case for the Project.

- Transit Accessibility to Jobs - Number of jobs within a half-mile of stations
- Pedestrian Level of Comfort (LOC) within a half-mile of station
- Bicycle Level of Traffic Stress (LTS) within a half-mile of station
- Pedestrian LOC for New Hampshire Avenue Study Corridor
- Bicycle LTS for New Hampshire Avenue Study Corridor
- Acreage of transit-supportive future land use within a half-mile of station areas
- Acreage of vacant and underutilized parcels within a half-mile of station areas
- Proximity to sensitive receptors and environmental resources
- Potential construction duration
- Inclusion of safe and appropriate traffic safety treatments
- Bus and vehicle delay
- Frequency of peak-period BRT service
- Frequency of BRT service in midday and other off-peak times
- Number of connections to high-quality transit service
- Equity population within a half-mile of stations
- Number of zero- or one-vehicle households served

Detailed alternatives analysis results for these secondary MOEs are presented in **Appendix J**.

5 Existing Conditions

For the Study, BRT concepts and corridor alternatives were developed using a baseline of data describing existing demographics, land use, travel patterns, transit network, bicycle/pedestrian network, traffic and transit operations, and crashes. The analysis of this data helped guide the development of concepts and alternatives. As the process moved forward, the corridor was divided into segments to reflect its varied characteristics. This allowed for comparison of different BRT treatments and helped identify context-sensitive solutions best suited to improve conditions at specific locations.

5.1 Roadway and ROW Characteristics

The typical condition along New Hampshire Avenue is three vehicular traffic lanes in each direction, divided by a grass or concrete median, with a center turn lane at intersections or private driveway access points. Several segments include a service road providing local access to residential properties. The mainline portion of the roadway is typically about 85 to 95 feet wide. Narrow five-foot-wide sidewalks are present on both sides along most of the study corridor, but they are often very close to fast-moving vehicles. Bicycle facilities are largely non-existent, except for one 0.7-mile-long northbound striped bike lane and a shared-use path on the eastern side of the road along the US Food and Drug Administration (FDA) campus.

In some portions of the corridor there are service roads on the left, right, or both sides of the mainline travel lanes. These service roads are typically about 18 feet wide, carrying one travel lane in the same direction as the adjacent mainline lanes and one vehicular parking lane. The service roads are typically stop-controlled and many restrict left and/or through movements at the intersections. Service roads are typically divided from the mainline via narrow concrete or grass medians. Where service roads are provided, the width of New Hampshire Avenue can increase from 85 to up to 180 feet. **Figure 16** maps service roads along New Hampshire Avenue.

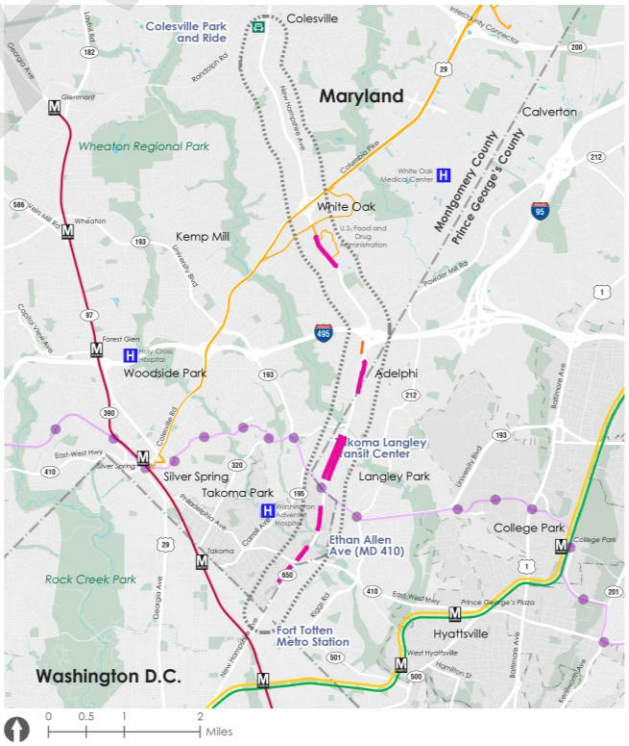


Figure 16: Service Roads on New Hampshire Avenue

The public ROW for New Hampshire Avenue, including service roads, typically varies from 100 to 180 feet, but the roadway is constrained by adjacent land uses. Many of the service roads are lined with single-family

houses and residential driveways. Many shopping centers, small businesses, and parking lots are close to the roadway, especially south of University Boulevard.

Additional details on data sources, analysis methodology, and results are available in **Appendix A**. The following findings were the most salient to the development of concepts and alternatives.

5.2 Bus Ridership Along the Corridor is High

The corridor is situated between two Metrorail routes (the Red Line, which runs through western Montgomery County, and the Green/Yellow Lines, which run through Prince George's County). Owing to the system's hub-and-spoke configuration, Metrorail is only convenient for direct transfers from New Hampshire Avenue at the southern end of the study corridor[8].

Average weekday bus ridership illustrates the relative demand on each bus route operating on the corridor.[9] Based on the data collected in September 2024, average weekday bus ridership for bus routes along New Hampshire Avenue is over 25,800 trips per weekday. Although not all bus passengers are boarding or aboard buses within the study corridor, they would benefit from BRT improvements that increase frequency and reliability and reduce overall transit travel time.

Further analysis of existing transit ridership shows that there are about 14,470 weekday bus transit trips in the study corridor. Of these, about 2,100 passengers are aboard buses when they enter New Hampshire Avenue corridor. In addition, there are over 12,300 daily boardings within the study corridor, including bus boardings at the Fort Totten Metrorail station bus hub. Weekday ridership for each route using is provided in **Table 2**.

The table shows that:

- The WMATA K6 had the highest ridership overall along the corridor.
- The WMATA K9 had less ridership but only operates in peak periods.
- WMATA Route C8 and Ride On Routes 10, 15, 16, and 20 all had strong ridership.

[8] While MCDOT anticipates that New Hampshire Avenue BRT service will extend to the Fort Totten Metrorail station, this study did not analyze alignment alternatives or options to redesign any streets in Washington, D.C.
[9] Not all riders included in the total ridership board or alight in the New Hampshire corridor or will travel on the corridor during their rides.

Table 2: Average Weekday Ridership for Buses Using New Hampshire Avenue Corridor

Bus Service Provider and Route			Daily Weekday Ridership
WMATA	C8	College Park Station – White Flint Station	2,990
	F8	Langley Park – Cheverly Station	1,299
	K6	New Hampshire Ave - Maryland	8,926
	K9	New Hampshire Ave – Maryland Limited	1,064
	R1	Riggs Road	706
	Z2	Colesville – Ashton	374
Ride On	10	Hillandale – Twinbrook	2,551
	15	Takoma Langley Crossroads – Silver Spring	1,978
	16	Takoma – Silver Spring	2,475
	17	Takoma Langley Crossroads – Silver Spring	636
	18	Takoma Langley Crossroads – Silver Spring	391
	20	Silver Spring – Hillandale	1,857
	21	Silver Spring – Briggs Chaney Park & Ride Lot	144
	22	Silver Spring – Hillandale-FRC/FDA	176
	24	Takoma – Hillandale	125
	25	Takoma Langley Crossroads - Takoma	136
TOTAL			**25,828**

Source: WMATA and Ride On September 2024 ridership data.

5.3 Ridership is Highest in the Corridor's Many Equity Communities

Approximately 70 percent of the study corridor by area falls within an equity area as defined by the Montgomery County Planning Department[10] and MWCOG.[11] Many corridor residents are minorities, use a primary language other than English, or live in low-income households. Of the 14,470 weekday bus transit trips, about 65 percent, or 9,400 passengers, board or alight at bus stops within an equity area along the study corridor. While the County's Equity Focus Areas typically overlap with MWCOG's Equity Emphasis Areas, as shown in purple below, there are some differences in how the two agencies are mapping these areas.[12] **Figure 17** maps equity areas along the study corridor.

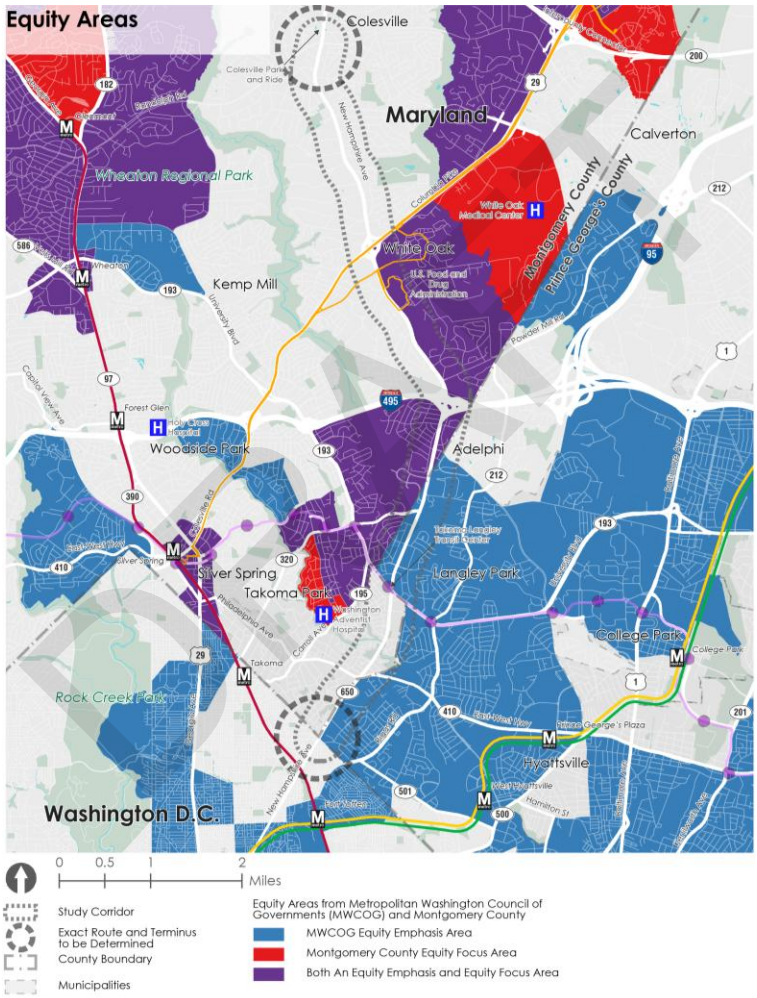


Figure 17: Equity Areas

[10] Equity Focus Areas Analysis (montgomeryplanning.org)

[11] Equity Emphasis Areas (mwcog.org)

[12] The County's tool considers limited English speaking while MWCOG's tool does not. This is especially relevant along the New Hampshire Avenue corridor, where there are a significant number of non-English-speaking residents. The County's tool also does not apply to the small portion of the study area within Prince George's County.

While most households within the study corridor have at least one vehicle, census block groups near Langley Park and White Oak have more zero-vehicle households. North of US 29, more than 95 percent of households have at least one vehicle. However, south of the Beltway, more than 40 percent of households have access to only one, or no, vehicle. Areas with the highest share of zero-vehicle households are near existing transit hubs at University Boulevard and White Oak. In the Takoma Langley area, more than 80 percent of households have access to one or fewer vehicles. Refer to **Appendix A** for maps of zero- and one-vehicle households.

5.4 Existing Bus Service is Often Slow and Unreliable

While the New Hampshire Avenue corridor is served by many local bus routes, travel can be unpredictable and slow owing to heavy passenger car traffic on this urban arterial roadway. For example, many corridor bus riders used Metrobus Routes K6 and K9, which operated along the busiest and most congested portion of the New Hampshire Avenue corridor: from the White Oak area to the Fort Totten Metrorail Station. **Figure 18** maps average bus speed for the K6 bus route in the PM Peak Hour.

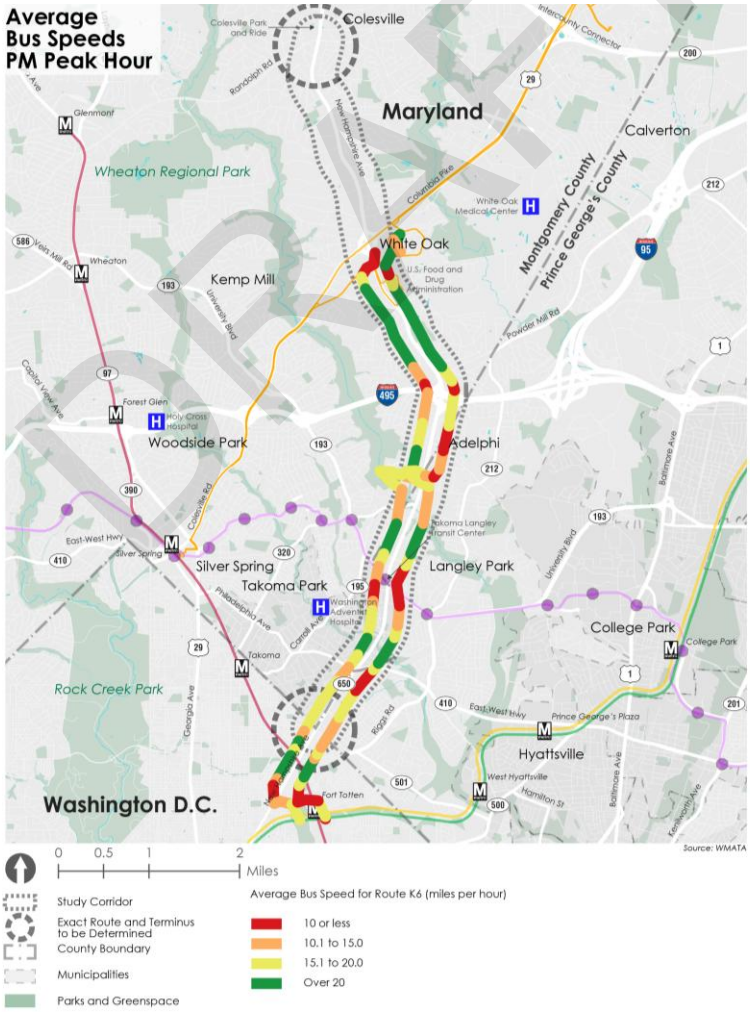


Figure 18: Average Bus Speed for Route K6 (PM Peak Hour)

Consistent with the analysis, many participants at pop-up engagement events expressed frustration about the speed and reliability of existing service and enthusiasm about the project's potential to provide faster, more reliable service.

For additional details on the analysis of existing bus service, see **Appendix A**.

5.5 Residents Could Reach Jobs Quickly with a Faster Two-Seat Transit Ride

New Hampshire Avenue is heavily used for commuting to and from other suburban areas as well as Washington D.C. U.S. Census Longitudinal Employer-Household Dynamics (LEHD) data show that corridor residents tend to travel to White Oak, Silver Spring, the MD 355 corridor, and Washington D.C. for work. People who work in the study corridor tend to commute from the outer suburbs north and east of the study area. New Hampshire Avenue BRT can provide connections to the US 29 Flash route, the future Purple Line at University Boulevard, and to the Red, Green, and Yellow Metrorail lines at Fort Totten Metro station. These regional premium transit connections provide opportunities for residents to reach employment centers with a faster two-seat transit ride across the Washington D.C. region. **Figure 19** maps where people who live in the study corridor work with the regional WMATA Metrorail transit system overlaid on top.

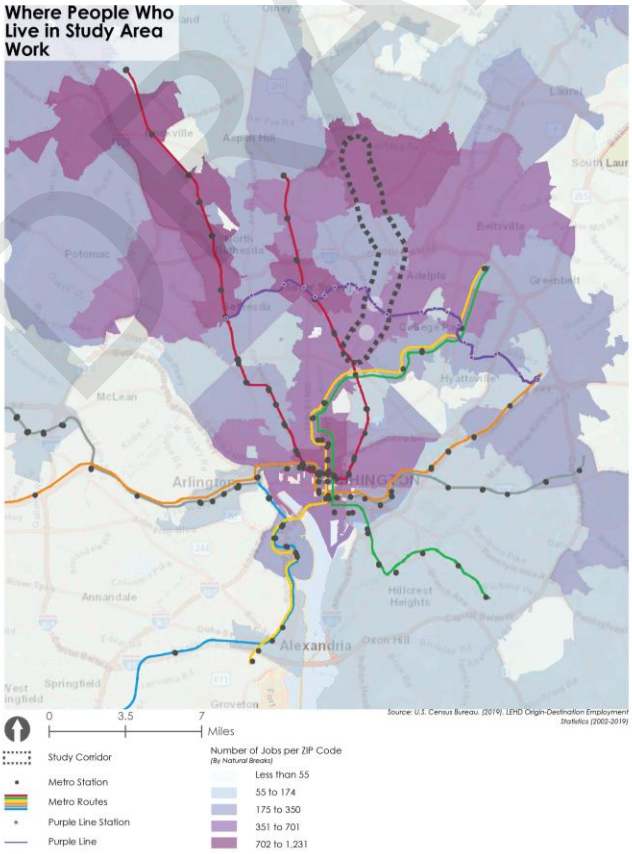


Figure 19: Study Corridor Jobs Distribution

5.6 Land Use and Transportation Characteristics vary along the Corridor

Conditions and context vary in different parts of the study corridor. To develop context-sensitive BRT concepts and alternatives, the study corridor was divided into five segments based on characteristics including travel demand, land use, and transit frequency (as shown on **Figure 20** and listed below).

- Segment 1 – Eastern Avenue to University Boulevard (1.85 miles)
- Segment 2 – University Boulevard to Piney Branch Road (0.93 mile)
- Segment 3 – Piney Branch Road to Powder Mill Road (1.49 miles)
- Segment 4 – Powder Mill Road to Lockwood Drive (1.43 miles)
- Segment 5 – Lockwood Drive to Randolph Road (2.64 miles)

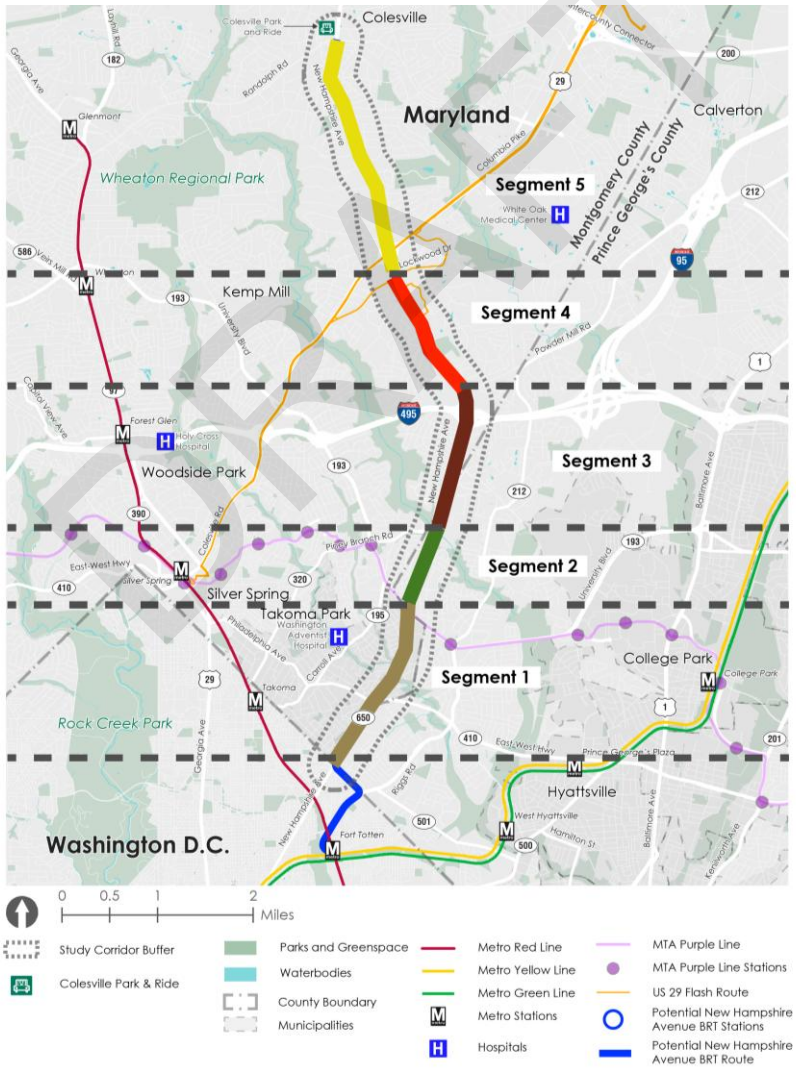


Figure 20: Study Corridor Segments

***Segment 1 – Eastern Avenue to University Boulevard (1.85 miles)*:**
Segment 1 is the southernmost portion of the corridor, spanning the Maryland-Washington D.C. line at Eastern Avenue to University Boulevard. This segment is largely in the City of Takoma Park. Land uses between Eastern Avenue and East-West Highway are mostly suburban commercial and retail, with a few multi-family residential buildings. Land uses between East-West Highway and University Boulevard are mostly suburban single-family residential, with a few multi-family residential buildings and suburban commercial and retail uses closer to University Boulevard. Destinations include the Takoma Park Shopping Center, Sligo Creek Trail, the Takoma Park Recreation Center, La Union Center Mall, Langley Park Plaza, and Takoma Langley Transit Center. According to SHA, the 2019 average traffic volume in this segment was slightly more than 39,500 vehicles per day.

Segment 1 has two typical cross sections. The southern end, from Eastern Avenue to Glenside Drive (**Figure 21**), has an approximately 102-foot-wide ROW. Three travel lanes in each direction are 11 feet wide, and there is a 19-foot-wide landscaped median. Sidewalks on both sides of the roadway are seven feet wide.

Figure 21: Segment 1 Existing Typical Section (southern end)

The northern end of Segment 1, from Glenside Drive to University Boulevard (**Figure 22**), serves major destinations including Langley Park Plaza and the Anacostia Tributary Trail System's Sligo Creek Trail, as well as multi-family and single-family housing. The ROW widens to 133 feet. In this portion of the corridor, three 11-foot-wide travel lanes in each direction are supplemented by a 16-foot-wide one-way service road on the southbound side. There are two medians: a 21-foot-wide landscaped median between the travel lanes and an 11.5-foot-wide concrete median separating the service road from the main roadway. Six-foot-wide sidewalks are present on both sides of the roadway, and there is a buffer between the sidewalk and the service road.

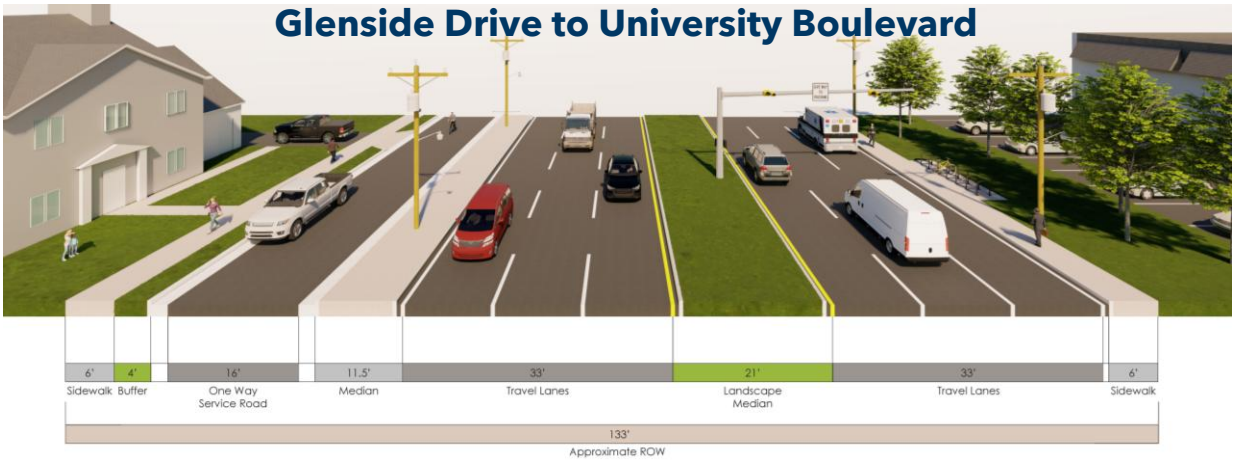


Figure 22: Segment 1 Existing Typical Section (northern end)

***Segment 2 – University Boulevard to Piney Branch Road (0.93 mile)*:**
Segment 2 spans from University Boulevard to Piney Branch Road. This whole segment is in Prince George's County (**Figure 23**). Like the northern part of Segment 1, Segment 2 provides access to the Anacostia Tributary Trail System via the Northwest Branch Trail as well as multi-family and single-family housing.

Land uses between University Boulevard and Piney Branch Road are mostly suburban single-family residential, with a few multi-family residential buildings and suburban commercial and retail uses closer to University Boulevard. According to SHA, the 2019 average traffic volume in this segment was slightly less than 37,000 vehicles per day.

The 144-foot-wide ROW includes three 11-foot-wide travel lanes in each direction and 18-foot-wide one-way service roads. Sidewalks on each side are five feet wide with an additional five-foot-wide buffer from the service roads. The median separating the southbound service road from the main roadway is 22 feet wide, while the center median and northbound service road median are each five feet wide.

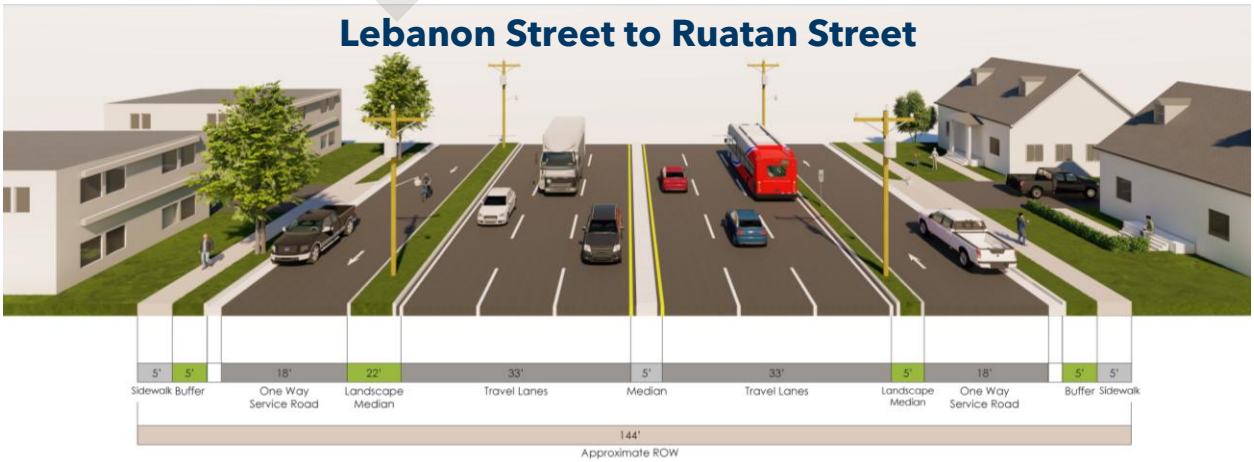


Figure 23: Segment 2 Existing Typical Section

Segment 3 – Piney Branch Road to Powder Mill Road (1.49 miles):
Segment 3 includes the middle of the corridor and straddles the Montgomery County-Prince George's County line. New Hampshire Avenue from Piney Branch Road to Northampton Drive is in Prince George's County. The study corridor north of Northampton Drive is in Montgomery County.

Land uses between Piney Branch and Powder Mill roads are mostly suburban single-family residential, with a few multi-family residential buildings closer to Piney Branch Road and suburban commercial and retail uses closer to University Boulevard and the Capital Beltway (I-495). There is a suburban commercial and retail node in Hillandale at the intersection with Powder Mill Road. Hillandale Gateway, a new multi-family development, is also under construction at this intersection. This segment has the highest traffic volumes in the study corridor due to its proximity to the Capital Beltway (I-495): according to SHA, the 2019 average traffic volume in this segment was close to 80,000 vehicles per day.

A typical section of this segment (**Figure 24**) has a similar configuration to the northern part of Segment 1, but with the service road on the northbound side. The ROW is approximately 127 feet wide, with 33 feet dedicated to travel lanes in each direction. There is a 19-foot-wide landscaped median dividing the main travel lanes and a smaller landscaped median separating the service road from the main travel lanes. There are five-foot-wide sidewalks on each side of the roadway, and the sidewalk adjacent to the service road has a six-foot-wide buffer.

Figure 24: Segment 3 Existing Typical Section

***Segment 4 – Powder Mill Road to Lockwood Drive (1.43 miles)*:**
Segment 4 is north of the Capital Beltway (I-495) between Powder Mill Road and Lockwood Drive. Land uses along this segment are mostly suburban single-family residential, with a few institutional, multi-family residential, and suburban commercial and retail destinations closer to US 29, just north of Lockwood Drive. The FDA Campus is located on this segment. Other destinations include Hillandale Local Park, a fire station, and the Hillandale Shopping Center. According to SHA, the 2019 average traffic volume in this segment was slightly more than 57,000 vehicles per day.

The southern end of Segment 4 has an approximately 104-foot-wide ROW with three 11-foot-wide travel lanes in each direction divided by a 19-foot-wide landscaped center median. Seven-foot-wide sidewalks line each side (**Figure 25**).

Figure 25: Segment 4 Existing Typical Section (southern end)

The northern end of Segment 4 is wider – approximately 177 feet wide (**Figure 26**). There is an additional northbound travel lane as well as a southbound service road. The two medians are landscaped, and the center median is 34 feet wide, while the median separating the southbound service road is 22 feet wide. The western side of the segment has a five-foot-wide sidewalk with a five-foot buffer from the service road. The eastern side of the segment has multimodal facilities, including a five-foot-wide conventional bike lane and a 10-foot-wide shared-use path.

Figure 26: Segment 4 Existing Typical Section (northern end)

***Segment 5 – Lockwood Drive to Randolph Road (2.64 miles)*:**
The northernmost corridor segment is characterized by lower-density suburban single-family residential land uses. There is a suburban retail commercial node at the intersection with Randolph Road. This segment serves Martin Luther King, Jr. Park, a library, churches, small businesses, and schools. The 103-foot-wide ROW includes three 11-foot-wide travel lanes in each direction separated by a 19-foot-wide landscaped median (**Figure 27**). Five-foot-wide sidewalks on either side are buffered from the roadway by four-foot-wide planting strips. According to SHA, the 2019 average traffic volume in this segment was slightly more than 44,000 vehicles per day.

Figure 27: Segment 5 Existing Typical Section

6 Stakeholder and Community Engagement

A detailed plan was designed and continuously updated to promote collaborative, far-reaching, equitable, and effective engagement and outreach. Study recommendations were developed over time, in an iterative fashion. The project team presented draft analysis and draft recommendations at all stages and refined them based on input received throughout the planning process. Staff representing agencies across the Montgomery County Government, including County Regional Service Centers, were engaged in the stakeholder and public engagement efforts.

Stakeholder and public outreach included:

- Establishment of and collaboration with a Technical Advisory Committee (TAC) comprising staff representing several state, local, and regional agencies.
- Establishment of and collaboration with a Corridor Advisory Committee (CAC) comprising community members including residents, workers, and business owners.
- Six virtual TAC meetings, providing regular project updates and collecting input on analysis and recommendations from technical stakeholders.
- Six virtual CAC meetings, providing regular project updates and collecting input on analysis and recommendations from community stakeholders.
- Twenty-two in-person pop-up events engaging more than 2,000 people at bus stops, farmers' markets, and other local events, with materials provided in multiple languages.
- A survey (online and print) on design alternatives, which received almost 400 responses.
- Four public meetings (three in-person and one virtual) to share project updates and solicit feedback on recommendations.
- Five additional meetings with important local stakeholders such as the FDA.

6.1 Stakeholder and Public Engagement Meetings

Technical Advisory Committee

The TAC acted as an inter-agency stakeholder group. The TAC included representatives from the Montgomery County Department of Transportation (MCDOT), the Maryland- National Capital Park and Planning Commission (M-NCPPC) - Montgomery County Planning Department, County Regional Service Centers; the Maryland State Highway Administration (SHA); the Maryland Transit Administration (MTA); the District Department of Transportation (DDOT); the Washington Metropolitan Area Transit Authority (WMATA); the City of Takoma Park; Prince George's County; the US Food and Drug Administration (FDA); and the US General Services Administration (GSA).

Six TAC meetings were held virtually at appropriate points to share Study status, seeking feedback, obtaining information for decision making, and coordinating project progress with other projects and initiatives in the region. The TAC also provided guidance on public outreach approaches and strategies. The TAC and its activities are discussed in more detail in **Appendix K**.

Supplemental Agency Meetings

The project team also held five supplemental meetings with the Maryland Transit Administration (MTA)'s Purple Line project team, the City of Takoma Park, the White Oak Transit Center project team, District Department of Transportation (DDOT), SHA, WMATA, FDA and Prince George's County. Multiple meetings were held with some of these agencies. The purpose of these meetings was to discuss other projects along the corridor (such as the Purple Line project and the SHA's Statewide Pedestrian Safety Action Plan – MD 650 Corridor Safety Improvements Project), review engagement approaches, discuss key aspects and potential impacts of BRT alternatives, and review agency comments. Supplemental agency meetings are discussed in more detail in **Appendix K**.

Corridor Advisory Committee (CAC)

The CAC acted as a community stakeholder group. The CAC comprised community members[13] who live, work, and travel along the New Hampshire Avenue corridor. In total, 26 people comprised the CAC, including 19 residents, bus riders, and business owners. The CAC also included representatives from organizations such as Saul Centers, Takoma Langley Crossroads Development Authority, Friends of White Oak, CHI Centers, Tamarack Triangle Civic Association, Colesville Civic Association, Hillandale Gateway LLC, and Greater Colesville Citizens Association. Six CAC meetings were held to share project status, seek feedback, obtain information for decision making, and coordinate public outreach activities with community networks. The CAC meetings were open to the general public, effectively serving as another public outreach forum. CAC and its activities are discussed in more detail in **Appendix K**.

Supplemental Community Meetings and Events

The project team presented and answered questions at other public meetings, including a meeting with the Hillandale property developer and the High Injury Network Safety Study Public Meeting. They also met with members of the CAC upon request. Montgomery County was provided with project materials to distribute at their National Night Out event in the Fall of 2023.

[13] People interested in serving submitted applications that were reviewed by Montgomery County, with 26 selected, including residents, bus riders, and business owners. The CAC also included representatives for Saul Centers, Takoma Langley Crossroads Development Authority, Friends of White Oak, CHI Centers, Tamarack Triangle Civic Association, Colesville Civic Association, Hillandale Gateway LLC, and Greater Colesville Citizens Association.

MCDOT staff shared a presentation about the study at the Silver Spring Citizens Advisory Board (SSCAB) meeting held on May 19, 2025. This presentation included a study overview and findings from the existing conditions analysis. Staff also discussed the approach to developing corridor alternatives, as well as evaluation results and next steps.

Public Meetings and Open Houses

Due to the COVID 19 pandemic, public outreach in 2022 was focused on online meetings. CAC meetings were open to the public, increasing opportunities for community members to participate in the planning process. In addition to CAC meetings, the project team conducted two rounds of public meetings to keep the community up to date on Study progress. The first, held in June 2022, focused on the existing conditions analysis and consisted of three in-person meetings and one virtual session. The second round, which included an in-person open house to present corridor alternatives, including the Hybrid Alternative, was held in May 2025. A detailed summary of these meetings is provided in **Appendix K**.

Pop-Up Events

The project team hosted 22 pop-up events to reach more people along the study corridor (see **Figure 28** and **Figure 29**). Pop-up events reached people from typically underrepresented demographic groups, including people in equity emphasis areas, bus riders, pedestrians, bicyclists, families with lower median household income, limited English speakers, Spanish speakers, Amharic speakers, Vietnamese speakers, BIPOC communities, and people with limited digital presence and access. Spanish language translators participated in these events, which engaged more than 2,000 people at bus stops, farmers' markets, and other local destinations.

The project team was able to engage in quick conversations to share information about the Study, seek quick feedback, direct people to visit project website, fill out surveys, and encourage them to attend upcoming public meetings. During conversations, people expressed enthusiasm for improved access to employment centers, faster bus travel times, and expansion of the Flash network. Many people were familiar with, and had ridden, the Flash service on US 29. Additional details are provided in **Appendix K**.

Figure 28: Pop-up Event Photos

Figure 29: Pop-up Event Photos

6.2 Online Engagement

Several online engagement tools shared Study updates and sought feedback from community members who may not have attended in-person or virtual meetings.

Website

The project team helped the County establish and maintain a project webpage on MCDOT's website (**Figure 30**). This website served as a landing page for materials including postcards, flyers, boards, reports, and CAC meeting notes. The website also includes project team contact information, a form to sign up for updates, links to project surveys, and information about public events.

The website can be accessed here:
https://www.montgomerycountymd.gov/dot-dte/projects/newhampshireave/

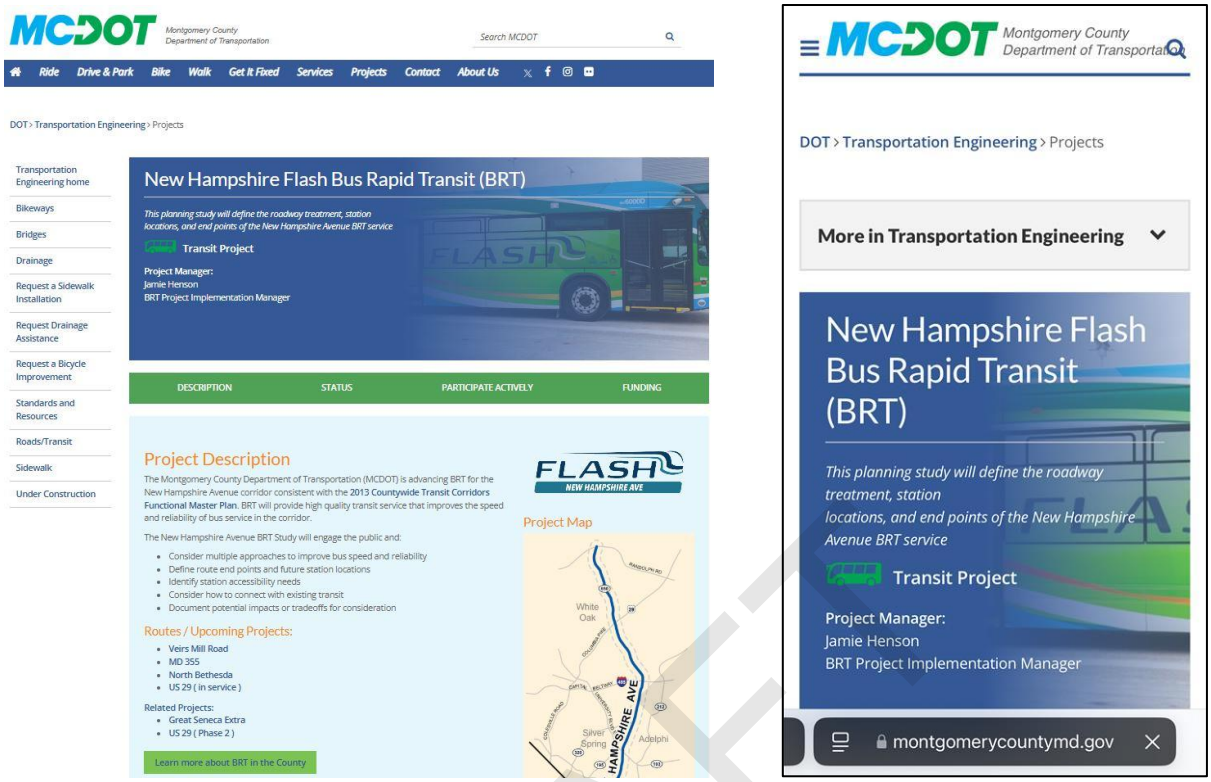


Figure 30: Project Website (Left: Desktop; Right: Mobile)

E-blasts, Social Media, and Newsletters

The project team advertised upcoming events and provided project status information through email blasts sent to a contact list developed through several events and channels. Social media campaigns, both paid and organic, were used to engage a broad audience, informing users about the project and directing them to online surveys and in-person events. These efforts are discussed in more detail in **Appendix K**.

Online Comment Map

The project team developed an online map illustrating conceptual designs for the initial four end-to-end corridor BRT alternatives overlaid on aerial imagery for the New Hampshire Avenue corridor (**Figure 31**). Participants could toggle between the alternatives on the map and submit comments. Twenty-eight comments were received via this online mapping tool. These comments are included in **Appendix K**.

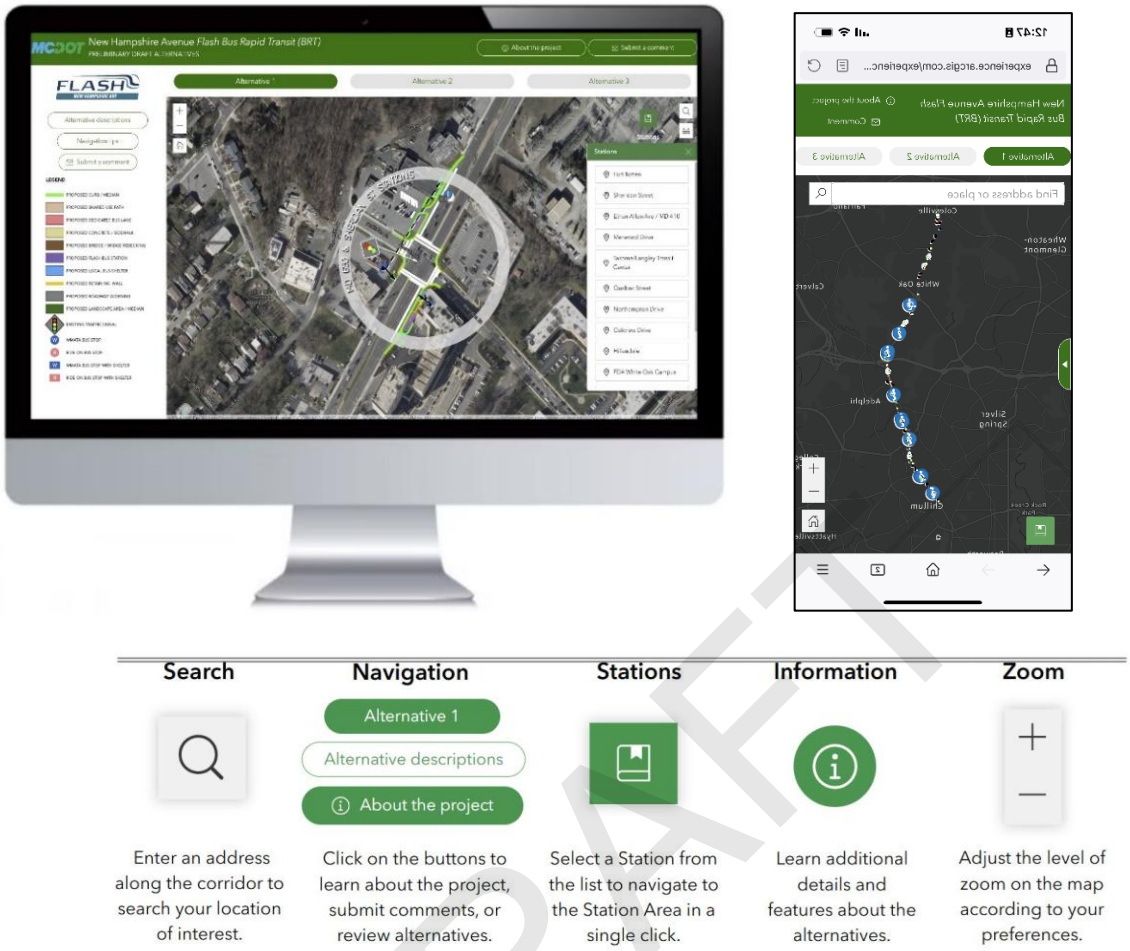


Figure 31: Online Mapping Tool

Emails and Phone Calls

The project team also received project comments by phone and email. These were compiled in the project folder and referred to when developing and refining BRT alternatives.

Online Survey

The project team used the Survey Monkey platform to collect public feedback on all corridor alternatives, including the Hybrid Alternative. It was conducted online from April 29 to June 30, 2025 and distributed through the project website, social media, newsletters, email blasts, and printed flyers with QR codes in English and Spanish at in-person meetings and events.

A total of 389 responses were received. Geographic responses clustered around the New Hampshire Avenue corridor, with significant representation from Langley Park, Adelphi, Chillum, Takoma Park, and nearby communities. Most participants primarily travel along New Hampshire Avenue by driving alone, while a smaller share uses transit. About 70 percent of respondents reported living along the corridor and 47 percent said they shop there.

Survey results are summarized in **Appendix K**.

6.3 Results of Stakeholder and Community Engagement

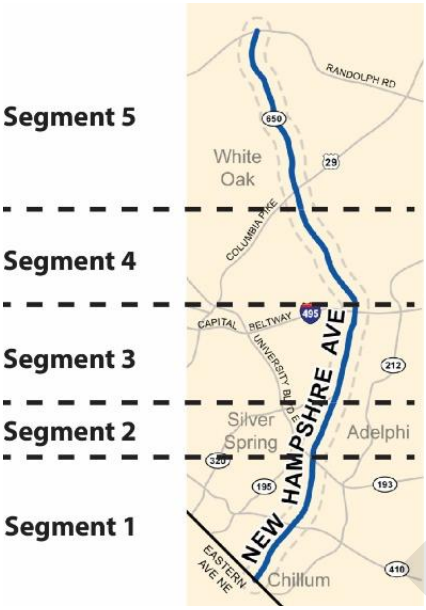
Several themes emerged during the outreach process. At pop-up events, current riders and other community members expressed general excitement about investments in transit to promote better, more frequent service along New Hampshire Avenue. Corridor residents also guided the project team to prioritize fast implementation of Flash BRT in a cost-effective manner with limited environmental and property impacts.

Public opinion on specific BRT concepts was varied. Some people strongly favored median-running BRT, while others were more concerned about pedestrian safety and crossings at BRT stations located in the medians of a four- to six-lane roadway. Others were concerned about the traffic impacts of repurposing existing general travel lanes for BRT. Many residents, property owners, and business owners were also concerned about potential property impacts and construction disruption along New Hampshire Avenue.

7 Alternatives Development Process

7.1 Concept Identification

Considering the project's purpose, goals and objectives; input from the TAC and other community stakeholders; relevant plan and policies; and the existing conditions analysis, the project team first developed a list of concepts incorporating all BRT approaches appropriate to this kind of corridor, ranging in scope from minor treatments such as TSP and QJs to significant roadway design changes such as adding exclusive bus lanes in each direction.



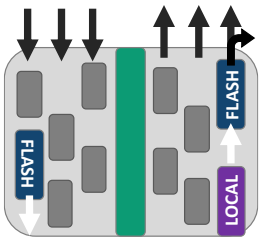
As described above in **Section 5.6**, the study corridor was divided into five segments based on characteristics including travel demand, land use, and transit frequency:

- **Segment 1:** Eastern Avenue to University Boulevard
- **Segment 2:** University Boulevard to Piney Branch Road
- **Segment 3:** Piney Branch Road to Powder Mill Road
- **Segment 4:** Powder Mill Road to Lockwood Drive
- **Segment 5:** Lockwood Drive to Randolph Road

The concepts were screened by corridor segment for feasibility, fatal flaws, potential for operational improvement, and consistency with the BRT Master Plan. Only concepts appropriate to the study corridor's challenges and opportunities were advanced.

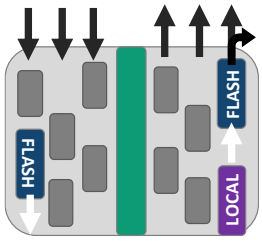
This work generated four broad concepts with variations and spot treatments to optimize performance, as briefly described below:

Concept 1: Mixed Traffic with Transportation System Management



Concept 1A: Transportation System Management with TSP

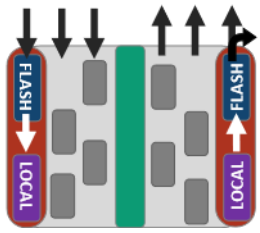
All buses share the travel lanes with all other motor vehicle traffic, priority is given to Flash buses.



Concept 1B: Transportation System Management with QJs, Bus Pullouts, and TSP

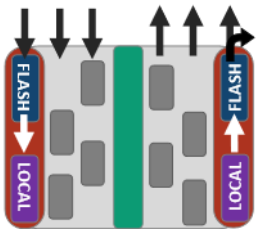
All buses share the travel lanes with all other motor vehicle traffic, but priority is given to Flash buses. QJs allow all buses to jump ahead of vehicular traffic at signals. Bus pullouts are paired with QJs to prioritize Flash buses. Additional ROW or space in the service roads is needed to accommodate bus pullouts.

Concept 2: Repurpose Existing Travel Lanes into Dedicated Bus Lanes



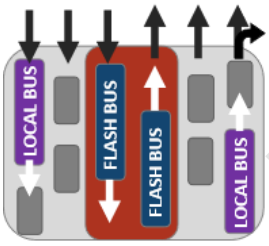
Concept 2A: Repurpose Curbside Running Lanes for Flash and Local Buses

Flash buses, local buses, and right-turning vehicles share the exclusive curbside bus lanes and stops. Local buses stop in exclusive lanes in the path of Flash buses, which may negatively affect Flash service. Only limited roadway widening would be required.



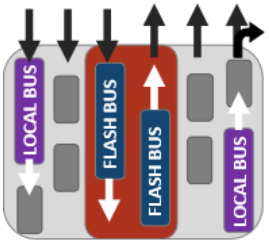
Concept 2B: Repurpose Curbside Running Lanes for Flash and Local Buses with Bus Pullouts

Flash buses and local buses share the bus lanes and stops. Local buses use bus pullouts where Flash does not stop. Right-turning motor vehicles use exclusive lanes. Additional ROW or space in the service roads is needed to accommodate bus pullouts.



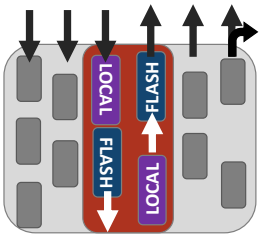
Concept 2C: Repurpose Median Running Lanes for Flash Only

Flash buses use two exclusive median bus lanes while local buses use general travel lanes. Flash and local stops are not shared. Left-turning movements must be controlled. Additional ROW or space in the service roads is needed along much of the corridor to accommodate left-turn pockets and stations.



Concept 2D: Repurpose Median Running Lanes for Flash Only with Curbside Bus Pullouts and QJs

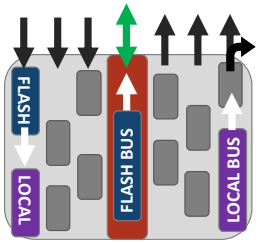
Flash buses use two exclusive median bus lanes while local buses use travel lanes with bus pullouts and QJs. Flash and local stops are not shared. Left-turning movements must be controlled. Additional ROW or space in the service roads is needed along much of the corridor to accommodate left-turn pockets and stations as well as the bus pullouts.



Concept 2E: Repurpose Median Running Lanes for Flash and Local Buses

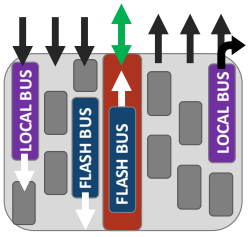
Flash buses and local buses share exclusive median bus lanes. Flash and local stops are shared. Left-turning movements must be controlled. Additional ROW or space in the service roads is needed along much of the corridor to accommodate left-turn pockets and stations.

Concept 3: Widen Roadway to Add One Dedicated Bus Lane



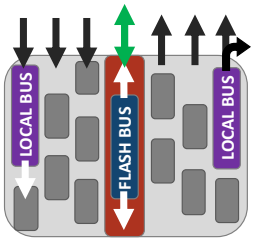
Concept 3A: Add One Flash-Only Lane, Center Peak-Period Lane Flash, Curb Off-Peak

Peak-direction Flash service uses exclusive center bus lane while off-peak Flash service uses general traffic lanes. Center-platform Flash use for peak-direction travel requires off-peak Flash service loading on the curbside. Left-turning movements must be controlled. Additional ROW or space in the service roads is needed along much of the corridor to accommodate left-turn pockets and stations.



Concept 3B: Add One Flash-Only Lane, Center-Loading Flash, Peak-Direction Transit Lane Use

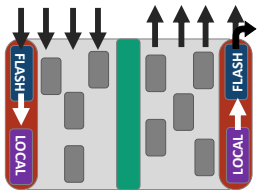
Peak-direction Flash service uses exclusive center bus lane while off-peak Flash service uses general traffic lanes. Both peak and off-peak Flash service load at center platforms. Left-turning movements must be controlled. Additional ROW or space in the service roads is needed along much of the corridor to accommodate left-turn pockets and stations.



Concept 3C: Add One Flash-Only Lane, Center-Loading Flash, Shared Bi-Direction Transit Lane Use

Flash buses traveling in both directions use the center bus lane by alternating between opposite-direction travel and waiting for the other direction to clear as needed. Passing segments could be included. Service is all day long and not oriented to a peak period. Flash service always loads at center platform. Left-turning movements must be controlled. This is similar to EmX service in Eugene, OR. Additional ROW or space in the service roads is needed along much of the corridor to accommodate left-turn pockets and stations as well as passing locations.

Concept 4: Widen Roadway to Add Two Dedicated Bus Lanes



Concept 4A: Widen the Road to Add Two New Lanes
The roadway is widened to accommodate two additional travel lanes. These lanes could be in the median or on the curbside. Flash buses and local buses would share the new exclusive bus lanes if they are on the curbside but would likely not share them if they are in the median. Additional ROW or space in the service roads is needed along the entirety of the corridor to accommodate the wider roadway.

7.2 Initial Screening

The project team subjected each concept to a high-level screening by corridor segment to determine which treatments might be viable and where they could be implemented. Concepts were grouped into four categories based on feasibility:

- Potentially feasible
- Fatally flawed
- Unlikely to generate operational gains
- Inconsistent with the BRT Master Plan

Fatally flawed concepts were defined as those which resulted in one or more of the following conditions:

- Major property impacts on large number of properties, especially in equity areas
- Significantly affected existing local bus service
- Major operational challenges affecting service reliability
- Complicated roadway design elements, challenging for riders to navigate
- Potential for major traffic operation impacts

Several concepts were eliminated because they posed significant operational, safety, or property challenges that outweighed potential benefits. Concepts requiring major widening were removed from consideration due to excessive traffic and ROW impacts or inconsistency with the County's BRT Master Plan in terms of roadway widening and number of additional lanes needed. Others were determined to be infeasible based on likely rider confusion, minimal transit benefit, or technological and operational challenges for bi-directional or peak-only lane configurations.

Further details on the evaluation approach, the analysis results, and how various concepts and sub-concepts were eliminated or advanced for further review are included in **Appendix B**. Based on initial screening results and input from the TAC, CAC, and the public, the following four concept types were short-listed to be combined by corridor segment into end-to-end design alternatives. These concepts were selected because they offered feasible, scalable

ways to improve transit speed and reliability while minimizing property, traffic, and cost effects. Each aligns with the County's BRT Master Plan in terms of number of lanes required, and provides a balance between operational benefit, constructability, and consistency with existing corridor constraints.

Optimize Transit in Mixed Traffic

Flash BRT and local buses share travel lanes with other vehicles, but Flash buses use TSP, QJs, and bus pullouts to reduce delays. QJs enable buses to jump ahead of other vehicles at traffic signals, while bus pullouts mitigate conflicts between Flash and local buses, further reducing delays. This concept can serve as the TSM alternative required by FTA to be analyzed as part of the alternatives analysis. **Figure 32** shows the Mixed Traffic concept.

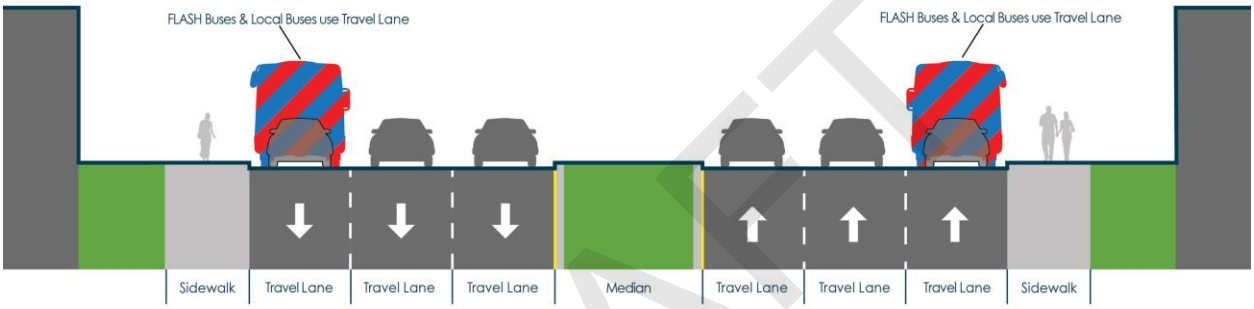


Figure 32: Mixed Traffic

Repurpose Existing General-Purpose Travel Lanes to Curbside Bus-Only Lanes

Existing general-purpose travel lanes are repurposed to curbside Bus-Only lanes that can be used by both Flash and local buses, with buses sharing a dedicated lane at intersections with only right-turning vehicles. This concept can also be paired with bus pullouts at local bus stops to reduce BRT service delays when local buses stop in the path of BRT buses. This concept offers a cost-effective and constructible way to provide dedicated space for transit without roadway widening. It has the potential to improve bus travel times and reliability and aligns with the BRT Master Plan's guidance. **Figure 33** shows the Curbside Bus-Only Lanes concept.

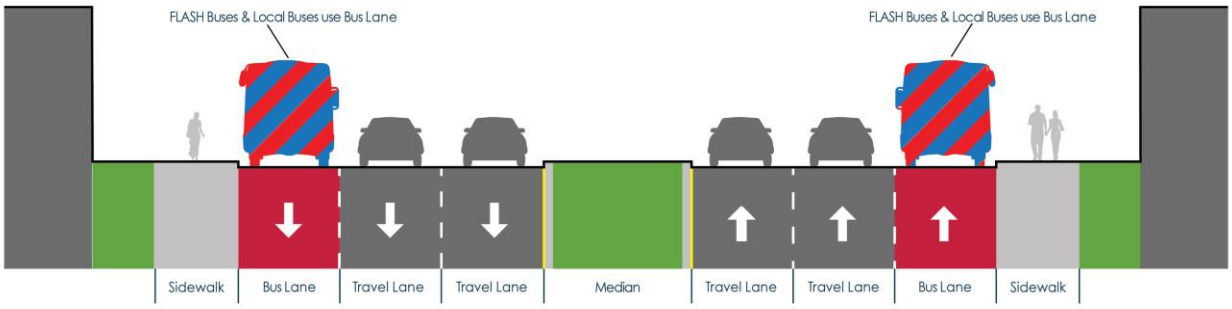


Figure 33: Curbside Bus-Only Lanes

Add One Bus-Only Lane

A single center-running Bus-Only lane with median boarding islands for Flash buses. The median lane is managed for peak-direction travel. Center-median bus-boarding islands, adjacent to the median lane, require control of left-turning vehicle movements.

This concept enhances BRT performance in the most congested segment while maintaining general traffic capacity. It provides dedicated space for peak-direction Flash operations, aligns with the BRT Master Plan's intent for dedicated lanes, and represents a balanced approach between operational improvement and corridor feasibility. **Figure 34** the Single Median Bus-Only Lane concept

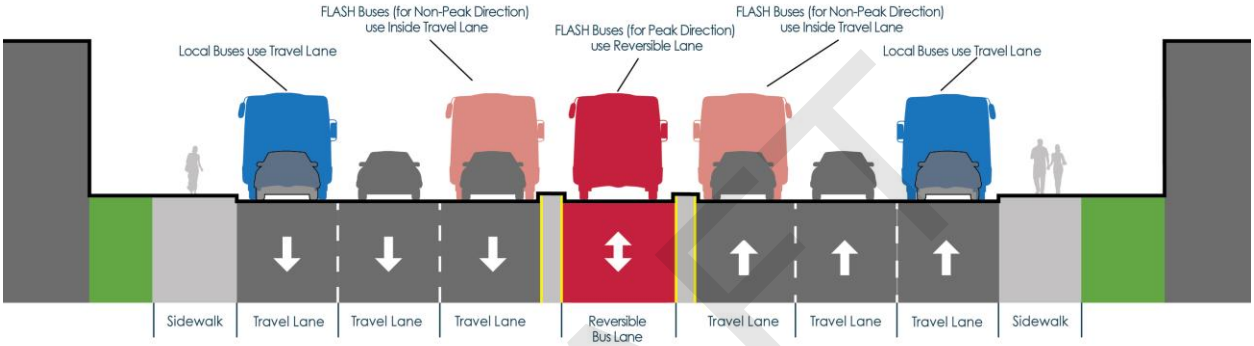


Figure 34: Single Median Bus-Only Lane

Repurpose Existing General-Purpose Travel Lanes to Two Median Bus-Only Lanes

Two fully dedicated center-running lanes exclusively for Flash buses, requiring some roadway reconstruction. Local buses may continue to use general-purpose curbside lanes for travel. Local bus performance may be negatively affected because these buses would operate in mixed traffic and repurposing two travel lanes would reduce vehicle capacity. This concept provides the highest level of transit priority and reliability by fully separating BRT service from general traffic. This configuration aligns with the BRT Master Plan's vision for dedicated median-running lanes, offers faster and more consistent bus operations, and supports long-term corridor capacity and service quality goals. **Figure 35** shows the Two Median Bus-Only Lanes concept.

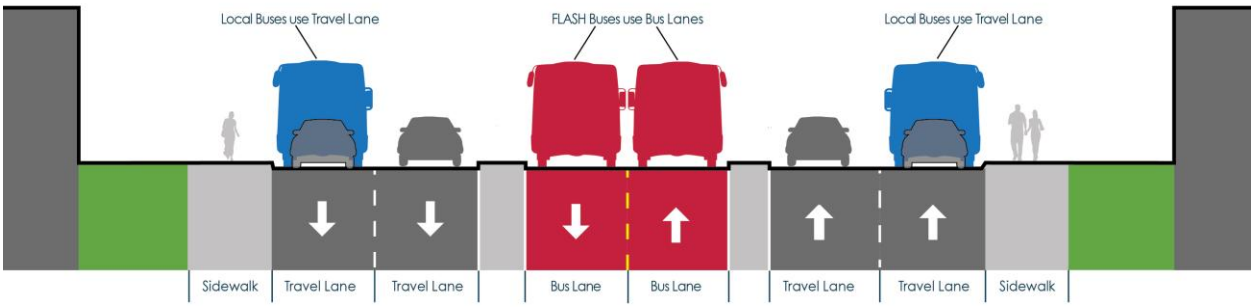


Figure 35: Two Median Bus-Only Lanes

7.3 BRT Station Locations

Prior to developing corridor-wide end-to-end corridor alternatives, the project team identified BRT station locations. The project team started with station locations noted in the BRT Master Plan and refined locations based on the following criteria:

- Opportunity for connecting to existing or planned transit service
- Bus ridership
- Proximity to dense residential land uses with a high concentration of equity communities
- Proximity to commercial services and employment opportunities
- Ability to relatively easily construct a station
- Consistency of spacing between stations

The station locations were finalized through a collaborative process, reflecting broad consensus and input from the TAC, CAC, and the public. **Figure 36** presents the 14 station locations along the study corridor.

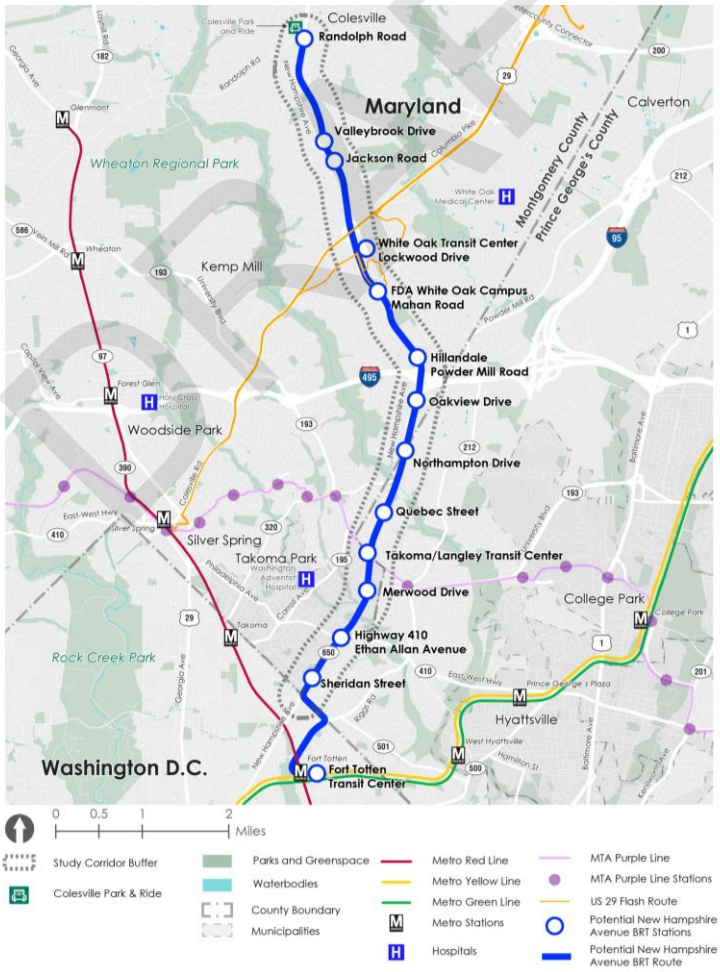


Figure 36: Proposed BRT Station Locations

Most locations were proposed in the BRT Master plan, with the three exceptions noted in **bold**:

1. New Hampshire Avenue and Randolph Road
2. New Hampshire Avenue and Valley Brook Drive
3. New Hampshire Avenue and Jackson Road
4. White Oak Transit Center
5. FDA White Oak Campus
6. New Hampshire Avenue and Powder Mill Road
7. New Hampshire Avenue and Oakview Drive
8. New Hampshire Avenue and Northampton Drive
9. **New Hampshire Avenue and Quebec Street (New)**
    - Station added based on the long distance between Northampton Drive and Takoma/Langley and demonstrated ridership and transit demand. Quebec Street offered the best balance of spacing and access to equity areas.
10. Takoma/Langley Transit Center
11. **New Hampshire Avenue and Merwood Drive (New)**
    - Station added to fill a spacing gap south of Takoma/Langley and to serve the Takoma Park Recreation Center, Hampshire Tower Apartments, Takoma Overlook Condominium, and Sligo Creek Trail – providing better local access where demand and land use justify an extra stop.
12. New Hampshire Avenue and Ethan Allen Avenue (MD 410)
13. New Hampshire Avenue and Sheridan Street
14. **Fort Totten Metrorail Station Transit Center (New)**
    - Station added as the terminus based on public and stakeholder feedback. It provides transfer opportunities to multiple Metrorail lines, enabling regional transit access.

The Colesville Park & Ride location, though near the proposed Randolph Road BRT station, is not proposed as a station at this time, but can be a location for layover and turnaround. Future phases of this project may further evaluate this location as a potential additional BRT station.

Each proposed station location, regardless of alternative, will have separate northbound and southbound platforms, except at the Fort Totten Transit Center and the White Oak Transit Center. Flash BRT buses will leave the New Hampshire Avenue corridor to serve the Fort Totten and White Oak Transit Centers. At the northern end, Flash BRT can lay over and turn around at the Colesville Park and Ride. At the southern end, they will terminate, lay over, and turn around at the Fort Totten Transit Center.

The northbound BRT station at Takoma/Langley Transit Center is relocated to the east side of New Hampshire Avenue to improve efficiency and address safety concerns, as described in **Section 10**. Further details on the project team's approach to evaluating BRT station locations and the analysis results are included in **Appendix C**.

7.4 FDA White Oak Campus Transit Access Evaluation

While developing the corridor-wide end-to-end alternatives, the project team evaluated how the BRT service might interact with and serve the U.S. Food and Drug Administration White Oak Campus (FDA Campus). The FDA Campus is located at 10903 New Hampshire Avenue in Silver Spring, near the New Hampshire Avenue/Lockwood Drive intersection within Segment 4 of the study corridor.

Currently, many local bus routes serve the FDA Campus and some, such as the US 29 Flash BRT, Metrobus K9, and Ride On 22, enter the site. Other bus services, such as the Metrobus K6, stopped on New Hampshire Avenue without entering the site. The assessment considered various approaches to serving the site, including a possible BRT connection through the FDA Campus to the White Oak Transit Center on Lockwood Drive.

The project team evaluated three distinct options, as shown in **Figure 37**, to provide BRT transit connections to the FDA Campus.

Option 1:
Stop on New Hampshire Ave

Option 2:
Loop into and Exit Campus

Option 3:
Connect through to Lockwood Dr

Figure 37: Options to serve the FDA Campus

The evaluation revealed elements of Options 2 and 3 make these alignments less favorable than Option 1 (see **Appendix D** for the FDA White Oak Campus Evaluation Memo, which provides details on Options 1 – 3 and the evaluation results described in this subsection).

Therefore, Option 1, the BRT stop at the intersection of New Hampshire Avenue and Mahan Road, was chosen as the preferred approach for serving the FDA Campus. Ridership generated at the FDA Campus is a small portion (less than one percent) of the total ridership along the

corridor. In addition, a stop on the Campus site would be further away from other area jobs and neighborhoods, lengthening the route for non-FDA riders. The FDA may consider operating additional internal shuttle service routes to connect employees using the BRT station to destinations within the FDA Campus.

Detailed evaluation of several FDA campus access options can be found in **Appendix D**.

8 Initial End-to-End Alternatives

The end-to-end build alternatives were created by combining the shortlisted concepts across different corridor segments. End-to-end design alternatives define specific BRT treatments for each of the five corridor segments, spanning the entire study corridor from Eastern Avenue to Randolph Road. Each alternative tested specific BRT concepts broadly applied through the corridor in the segments where they were most relevant. Developing complete corridor alternatives as test cases enabled consistent comparison of results for travel times, ridership, costs, and ROW impacts.

The alternatives analysis included a review of the 'No-Build' alternative described below apart from the end-to-end build alternatives:

- **No-Build Alternative –** Maintains existing conditions along the study corridor including all existing bus service in mixed traffic conditions. No Flash BRT or any other transportation infrastructure improvements are considered as part of the 'No-Build' alternative.

Initially, the following three end-to-end build alternatives were developed:

- **Alternative 1: Mixed Traffic with Queue Jumps -** Mixed traffic with TSP or QJs throughout the corridor. This is the TSM alternative required by FTA to be included in the alternatives analysis. The TSM alternative serves as a low-cost baseline to compare with other alternatives that would require major infrastructure changes
- **Alternative 2: Curbside Lanes –** Repurpose existing general purpose travel lanes to curbside Bus-Only lanes south of Piney Branch Road. Mixed traffic with TSP and without QJs north of Piney Branch Road.
- **Alternative 3: Median Lanes -** Repurpose existing general purpose travel lanes to two median Bus-Only lanes south of Piney Branch Road. Add a single reversible-median Bus-Only lane from Piney Branch Road to Lockwood Drive. Mixed traffic with TSP and without QJs north of Lockwood Drive.

Before conducting a detailed analysis, the three initial end-to-end corridor alternatives were presented to the TAC and CAC. Based on their feedback, a fourth alternative was introduced.

- **Alternative 4: Additional Median Lanes –** Repurpose existing general purpose travel lanes to two median Bus-Only lanes south of Piney Branch Road and between Powder Mill Road and Lockwood Drive. Add a single reversible-median Bus-Only lane from Piney Branch Road to Powder Mill Road. Mixed traffic with TSP and without QJs north of Lockwood Drive.

Figure 38 shows initial end-to-end build design alternatives Conceptual design layouts for each of the end-to-end alternatives are provided in **Appendix G** (Alternatives 1,2,3, and 4) and in **Appendix H** (Hybrid Alternative).

Figure 38: New Hampshire Avenue BRT Initial Alternatives

The alternatives incorporated BRT infrastructure and improvements including:

- **Bus Lanes:** A traffic lane on a surface street reserved for exclusive bus use. Bus lanes can be located either at the curb or in the median.
- **TSP:** Passive TSP re-times signals to align with average bus speeds. Active TSP detects the presence and status of a vehicle and adjusts the signal cycle in line with corridor priorities, including lengthening or shortening a signal cycle to reduce the frequency and duration of buses stopping at red lights.
- **QJs:** A short stretch of bus lane combined with TSP. Queue jumps allow buses to bypass general traffic in a dedicated lane and cut ahead of the queue with an early green signal.
- **Local Bus Stop Relocation:** In alternatives where BRT service operates in mixed traffic or in curbside lanes, local bus stops near BRT stations will be relocated nearby, if needed, to improve transit travel time, access, wayfinding, and transfers between services.

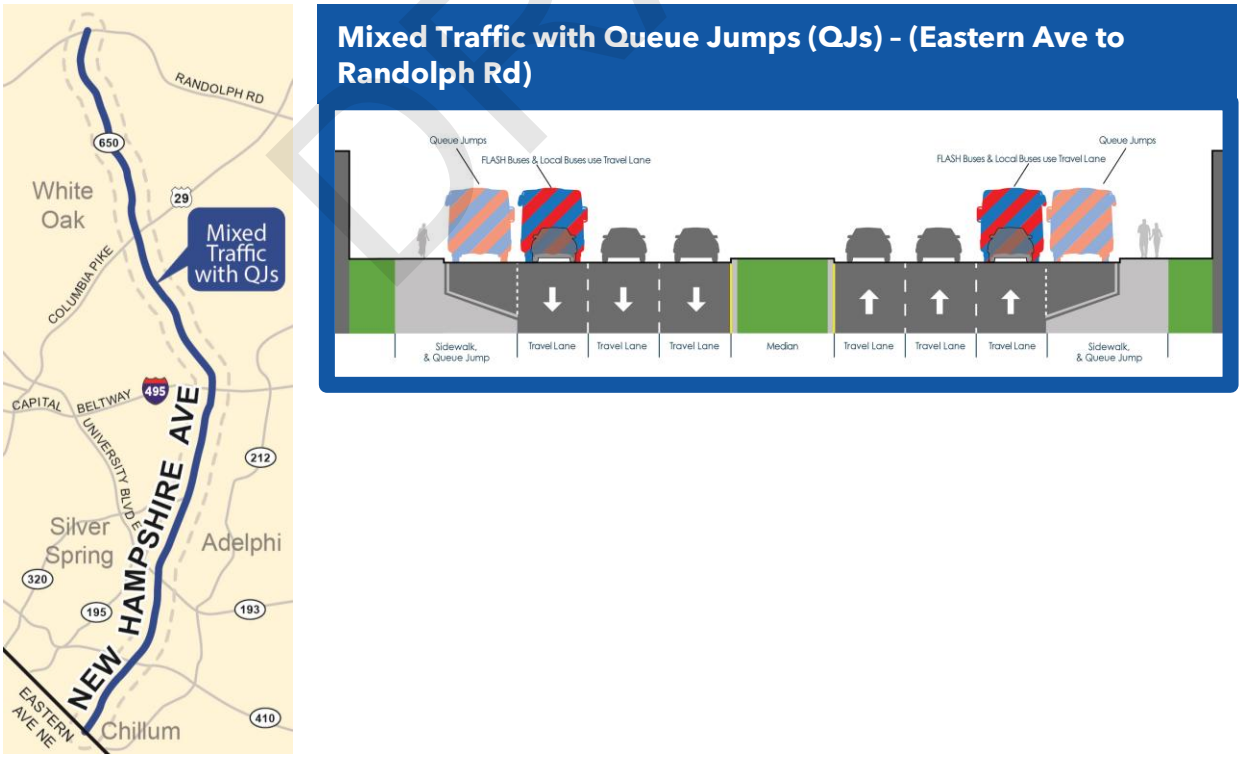
8.1 Alternative 1 – Mixed Traffic with Queue Jumps

In Alternative 1, buses operate in mixed traffic but benefit from QJs and TSP at key intersections. QJs are paired with bus pullouts so local buses can stop with minimal impacts to the Flash operations. These treatments extend along the entire corridor from Eastern Avenue (Maryland–Washington D.C. line) to Randolph Road. QJs are included only in this alternative to evaluate their effectiveness in mixed traffic, compared to segments in other alternatives without QJs.

This is the Transportation Systems Management (TSM) alternative the Federal Transit Administration (FTA) requires in the alternatives analysis. TSM represents a minimum set of improvements that could enhance the performance, safety, and reliability of existing transportation systems without major new construction. The TSM alternative serves as a low-cost baseline to compare with other alternatives that would require major infrastructure changes.

Along New Hampshire Avenue, except at the Fort Totten Transit Center and at the White Oak Transit Center, each proposed station location will have a separate northbound station platform along the east side curb of the road and a southbound station platform along the west side curb of the road. Flash BRT stops and bus bay locations will differ at different transit centers. **Figure 39** shows Alternative 1 – Mixed Traffic with Queue Jumps.

Figure 39: Alternative 1 – Mixed Traffic with Queue Jumps



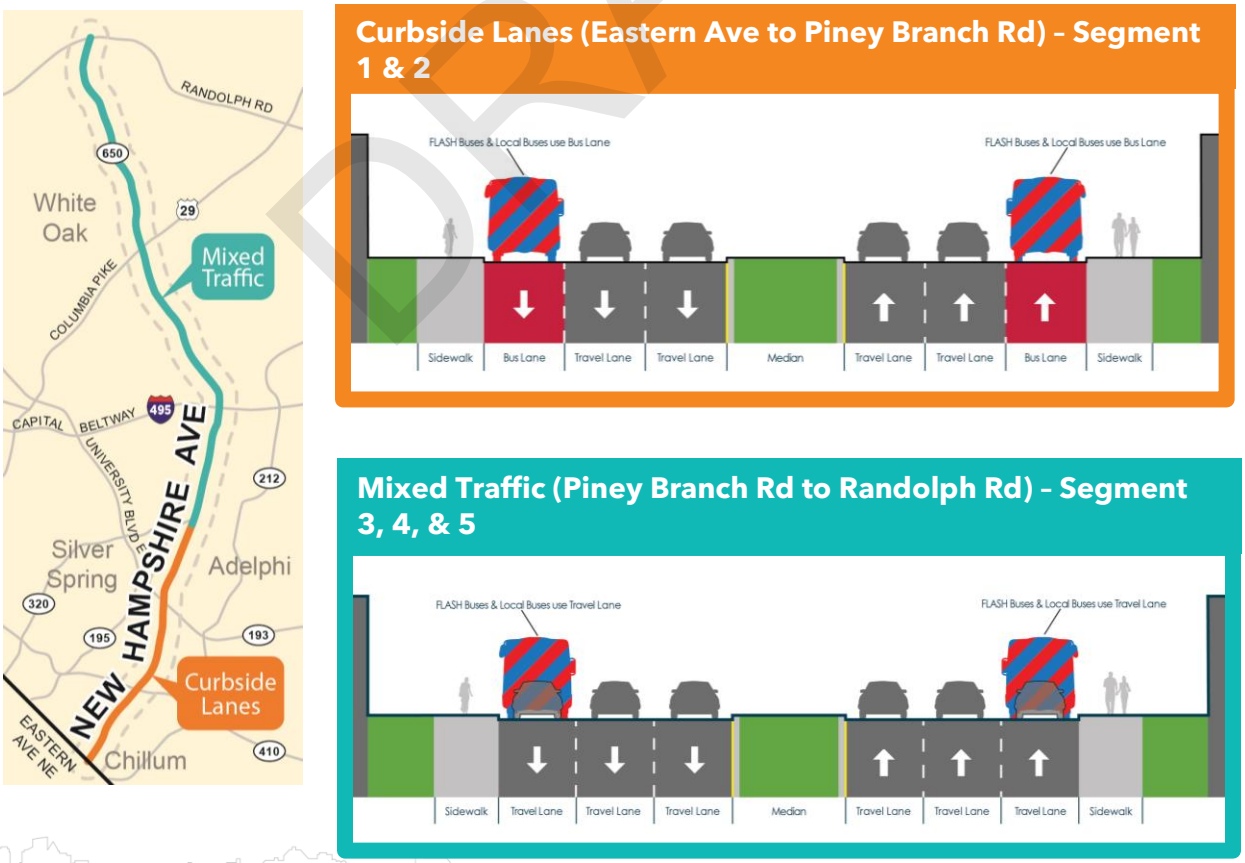
8.2 Alternative 2 – Curbside Lanes

In this alternative, existing curbside general-purpose lanes are converted to curbside bus lanes between Eastern Avenue and Piney Branch Road. Right-turning vehicles are allowed to use these lanes at intersections and driveways. North of Piney Branch Road to Randolph Road, all buses continue to operate in mixed traffic without queue jumps. Some local-only stops near BRT stations are relocated. Because no pullouts are provided for local buses, Flash buses may occasionally be delayed behind local buses.

Curbside bus lanes are focused south of Piney Branch Road to improve Flash BRT speed and reliability in the corridor's slowest segment for buses. North of Piney Branch Road, buses remain in mixed traffic due to high traffic volumes near I-495 that make lane repurposing impractical and lower traffic volumes with higher bus speeds farther north. This configuration also aligns with the BRT Master Plan recommendation.

Along New Hampshire Avenue, except at the Fort Totten Transit Center and at the White Oak Transit Center, each proposed station location will have a separate northbound station platform along the east side curb of the road and a southbound station platform along the west side curb of the road. Flash BRT stops and bus bay locations will differ at different transit centers. **Figure 40** shows Alternative 2 – Curbside Lanes.

Figure 40: Alternative 2 – Curbside Lanes



8.3 Alternative 3 – Median Lanes

Alternative 3 introduces median bus lanes along much of the corridor to prioritize Flash BRT service where transit demand is highest and bus speeds are slower. The length of median lanes in this alternative is consistent with the BRT Master Plan recommendation.

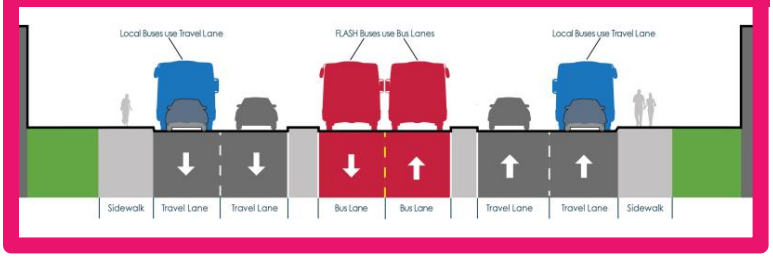
Between Eastern Avenue and Piney Branch Road, two median lanes are repurposed for Flash-only use, while local buses stay in general traffic lanes. Flash and local stops are separate, requiring passengers to walk between them when transferring. Left turns are managed through signal timing and turn restrictions to prevent conflicts. Some additional ROW or repurposed service road space is needed for left-turn pockets and station areas.

Between Piney Branch Road and Lockwood Drive, Flash operates in a single, reversible median bus lane used in the peak direction. This lane is added without removing existing traffic lanes but requires similar left-turn controls and limited additional ROW. Passengers board at different stops for local and Flash services. North of Lockwood Drive, all buses remain in mixed traffic without QJs. This approach reflects lower traffic volumes, faster bus speeds, and consistency with the BRT Master Plan recommendation for the northern corridor segment.

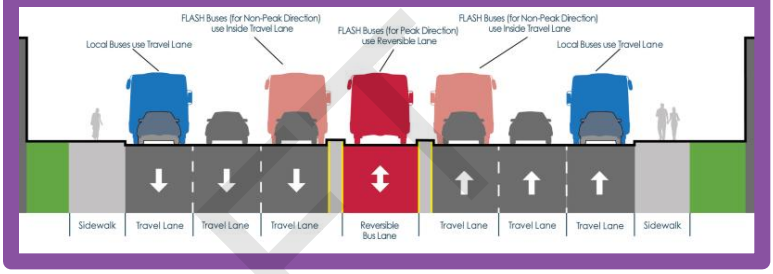
Along New Hampshire Avenue, except at the Fort Totten Transit Center, and at the White Oak Transit Center, each proposed station location will have separate northbound and southbound platforms. For segments with median bus lanes, station platforms will be in the middle of the roadway along the medians. Northbound station platforms will be located on the eastern median, and southbound station platforms will be located on the western median. Segments with a single median lane will include median cuts to allow buses to enter a widened area with two bus lanes at station locations to service the station platforms. Segments with mixed traffic will have separate northbound and southbound station platforms, one along the east curb and one along the west curb. Flash BRT stops and bus bay locations will differ at different transit centers. **Figure 41** shows Alternative 3 – Median Lanes.

Figure 41: Alternative 3 – Median Lanes

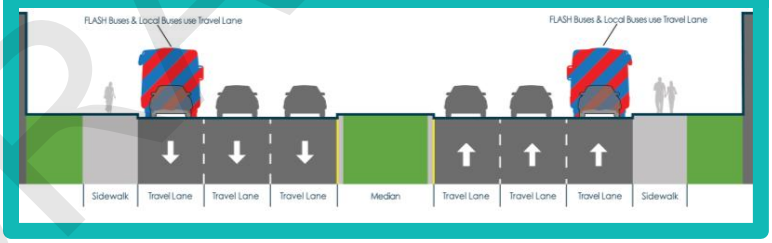
Median Lanes (Eastern Ave to Piney Branch Rd) – Segment 1 & 2



Single Median Lane (Piney Branch Rd to Lockwood Dr) – Segment 3 & 4



Mixed Traffic (Lockwood Dr to Randolph Rd) – Segment 5



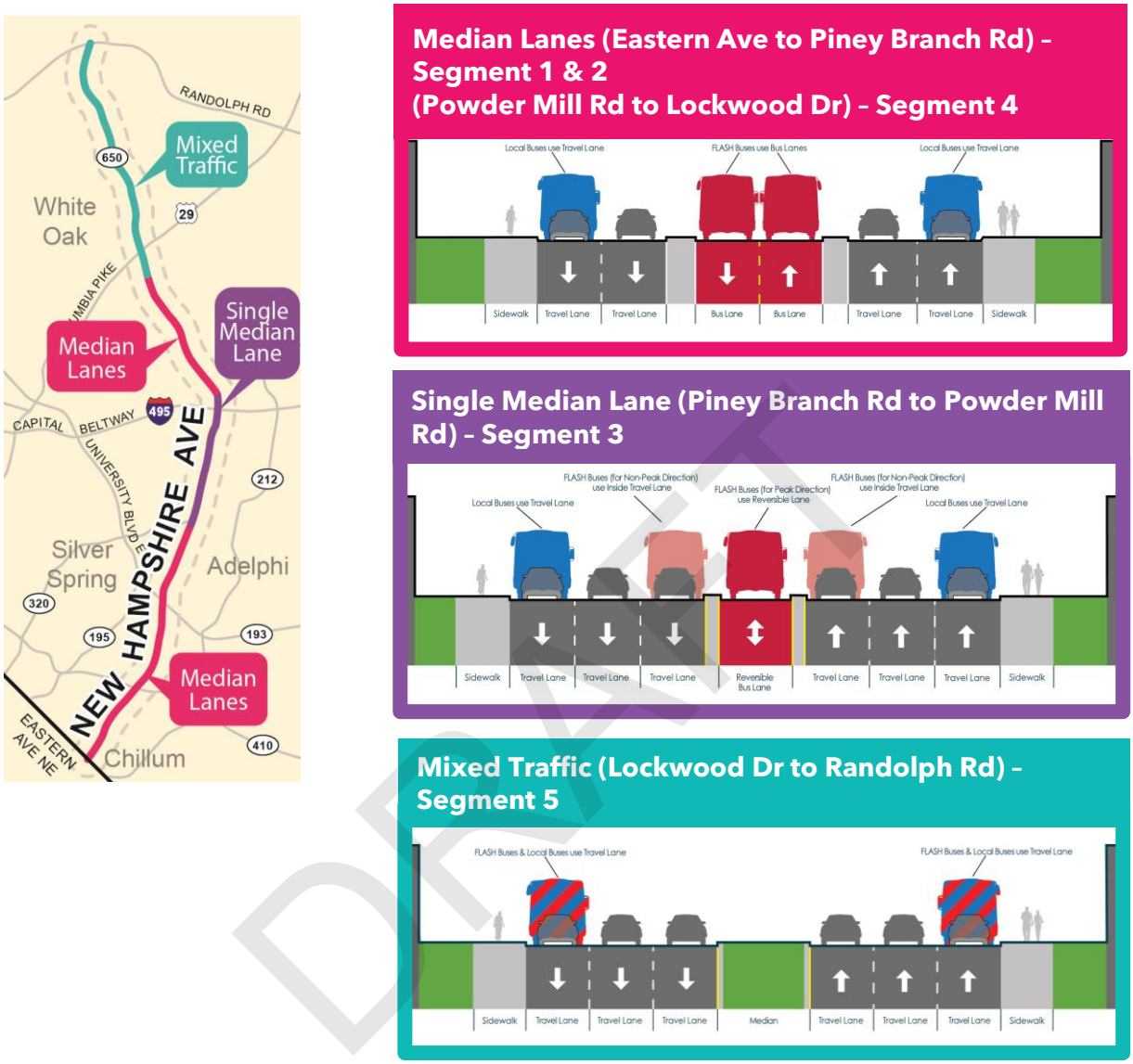
8.4 Alternative 4 – Additional Median Lanes

Alternative 4 builds on Alternative 3 and TAC input to test two median bus lanes between Powder Mill Road and Lockwood Drive. It includes dedicated median bus lanes from Eastern Avenue to Piney Branch Road and again from Powder Mill Road to Lockwood Drive. As in Alternative 3, Flash buses use the median lanes, while local buses stay in general traffic lanes. Flash and local stops are separate, and left turns are managed to avoid conflicts.

Between Piney Branch Road and Powder Mill Road, Flash operates in a single reversible median lane—used in the peak direction—while off-peak buses use general traffic lanes. From Lockwood Drive to Randolph Road, all buses operate in mixed traffic, consistent with the BRT Master Plan. North of Lockwood Drive, traffic volumes are lower and bus speeds are relatively high, making dedicated bus lanes unnecessary.

Along New Hampshire Avenue, except at the Fort Totten Transit Center, and at the White Oak Transit Center, each proposed station location will have separate northbound and southbound platforms. For segments with median bus lanes, station platforms will be in the middle of the roadway along the medians. Northbound station platforms will be located on the eastern median, and southbound station platforms will be located on the western median. Segments with a single median lane will include median cuts to allow buses to enter a widened area with two bus lanes at station locations to service the station platforms. Segments with mixed traffic will have separate northbound and southbound station platforms, one along the east curb and one along the west curb. Flash BRT stops and bus bay locations will differ at different transit centers. **Figure 42** shows Alternative 4 – Additional Median Lanes

Figure 42: Alternative 4 – Additional Median Lanes



8.5 Evaluation of Initial Alternatives

The four alternatives were evaluated based on Measures of Effectiveness (MOEs) related to travel time, transit ridership, access to jobs, costs, and right-of-way (ROW) requirements. A detailed analysis was performed using VISSIM microsimulation analysis for traffic operations and travel time, Simplified Trips-on-Project Software (STOPS) modelling was conducted for transit ridership, additional Geographic Information System (GIS) analysis was performed using travel time data to calculate accessibility to jobs, and conceptual designs were produced in Computer-Aided Design (CAD) to assist in calculating costs and ROW requirements.

A summary of results based on Primary MOEs in included in **Section 10**. Additional detailed alternatives analysis results based on all MOEs is included in **Appendix J**.

9 Hybrid Alternative

The initial segment-level evaluation of both qualitative and quantitative criteria concluded that none of the four alternatives performed best across all MOEs or across all segments. Alternative 2 (Curbside Lanes) performed the best among the four alternatives across most MOEs, but other Alternatives outperformed Alternative 2 on certain segments of the corridor.

To optimize performance throughout the corridor, a Hybrid Alternative was developed by combining the best-performing (based on cost, travel times, conflicts with local buses, and traffic and property impacts) elements from the four rigorously tested alternatives. The Hybrid Alternative was created by combining the most effective BRT treatments in different segments. It builds on Alternative 2 (Curbside Lanes) with additional treatments such as QJs in mixed-traffic segments. In addition to combining the best-performing segments, the Hybrid Alternative also includes other spot improvements to further refine it. Following consultation with the TAC and community stakeholders, the Hybrid Alternative was officially added to the project and comprehensively evaluated, alongside the initial four alternatives, across the Primary MOEs.

9.1 Development Approach

Figure 43 illustrates the Hybrid Alternative development approach. It adopts the most effective treatments by corridor segment to minimize travel time and maximize cost savings.

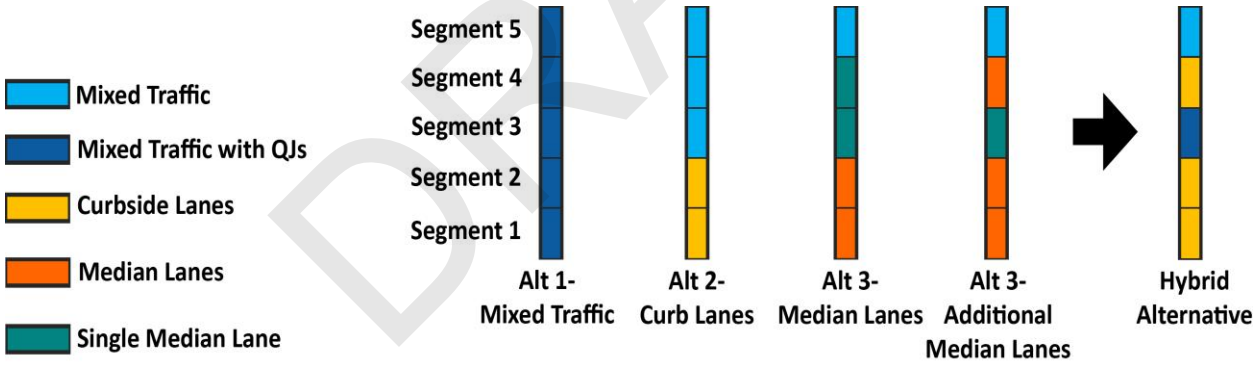


Figure 43: Approach to Develop Hybrid Alternative

9.2 BRT Treatments

As shown in **Figure 44**, the Hybrid Alternative includes the following treatments:

- Curbside bus lanes with local bus stop pullouts at certain locations from Eastern Avenue to Piney Branch Road and from Powder Mill Road to Lockwood Drive
- Mixed traffic with QJs from Piney Branch Road to Powder Mill Road
- Mixed traffic without QJs from Lockwood Drive to Randolph Road

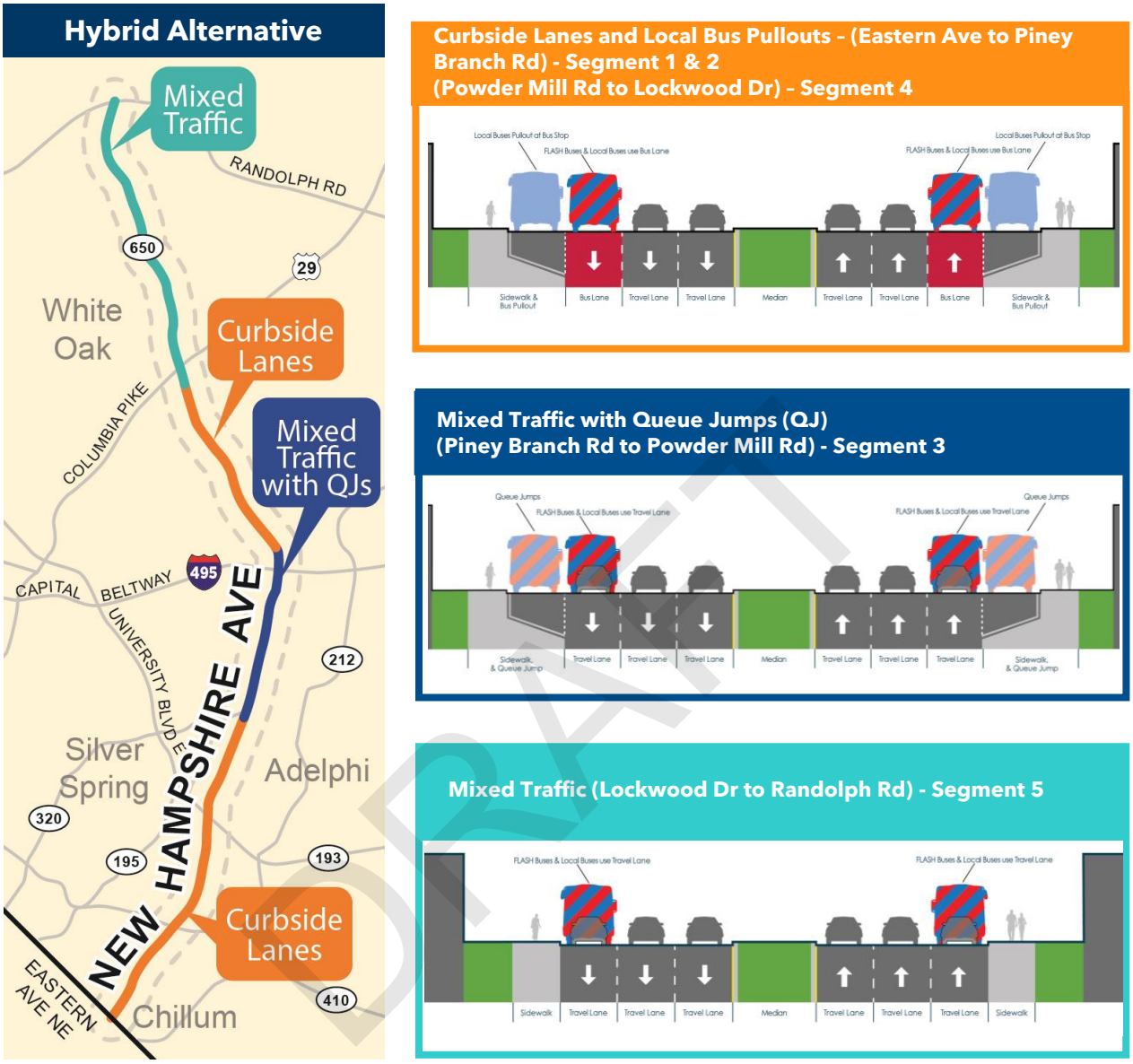


Figure 44: Hybrid Alternative Treatments

9.3 Local Bus Stop Pullouts

To mitigate potential effects to Flash buses following frequently stopping local buses, local bus pullouts at certain high-ridership local stops were added, as shown below in **Figure 45**. The 13 (of 55 total) locations were selected based on:

- High potential BRT travel time savings
- High local bus ridership and dwell time
- Favorable geometric and environmental conditions
- Availability of a curbside bus lane for easy re-entry

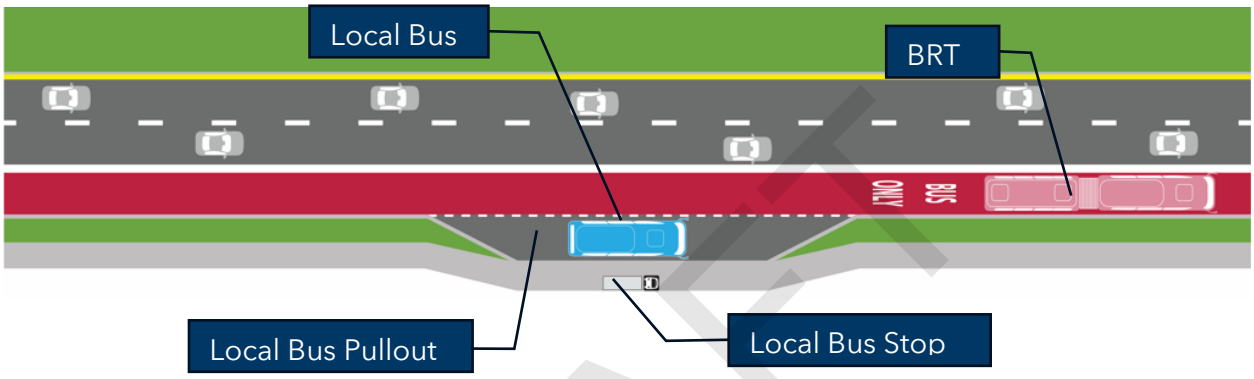


Figure 45: Bus Pullouts Example

9.4 Northbound BRT Station at Takoma Langley Transit Center

The initial analysis of the four end-to-end alternatives compared options for locating the northbound Flash BRT station near the Takoma-Langley Transit Center. Placing the station within the transit center would have made transfers between Flash BRT and local buses more convenient but required a detour via University Boulevard and Lebanon Street before returning to New Hampshire Avenue. This detour would add nearly four minutes of travel time for Flash BRT buses. Ridership forecasts for 2045 project only about 1,000 daily weekday transfers at this location – around seven percent of total corridor ridership – making the detour difficult to justify. **Figure 46** illustrates the Flash BRT station location options at Takoma-Langley Transit Center.

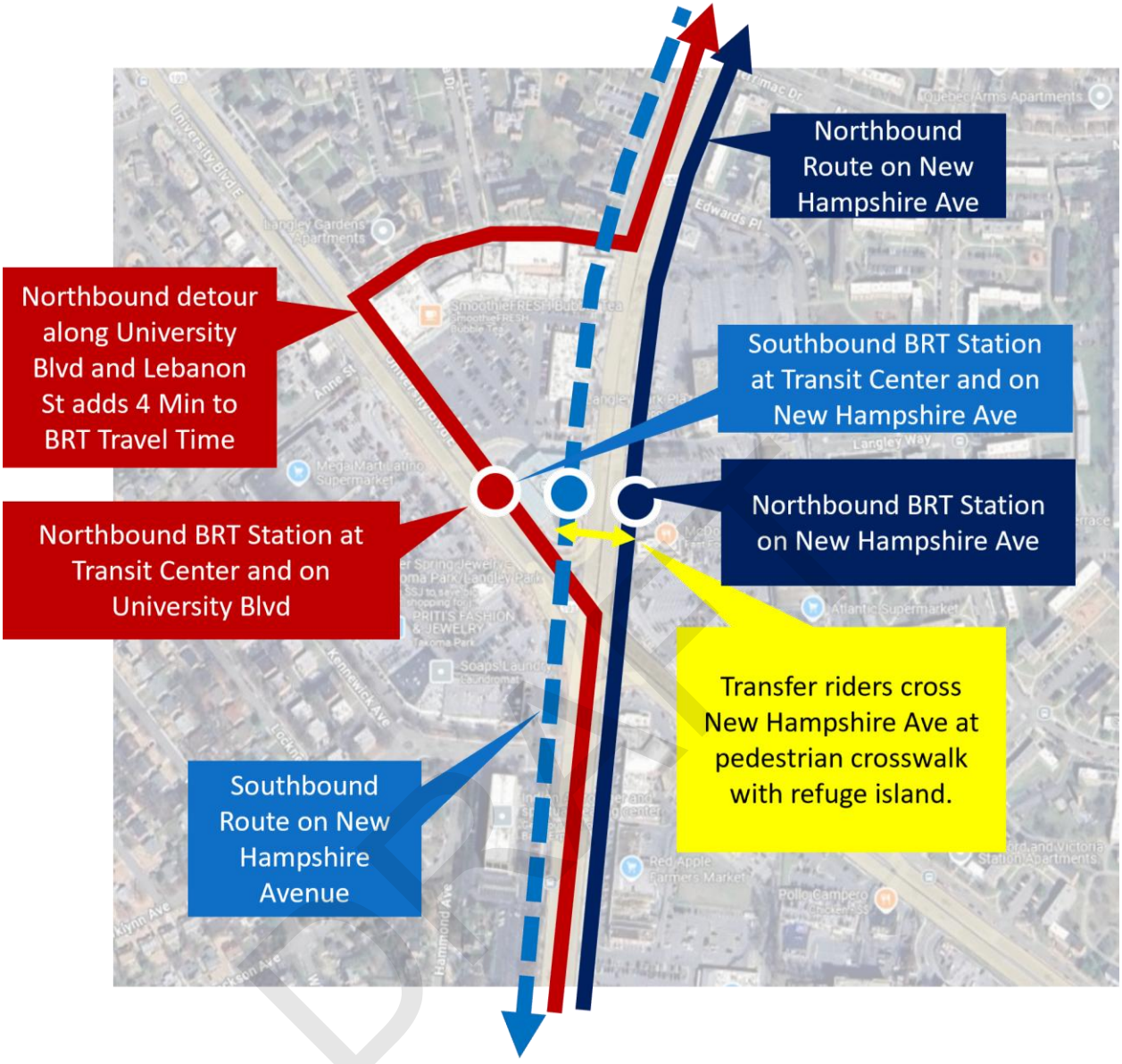


Figure 46: Flash BRT station location options at Takoma-Langley Transit Center

Instead, the Hybrid Alternative locates the northbound BRT station directly on New Hampshire Avenue, across from the transit center near the signalized entrance to the Takoma Langley Crossroads Shopping Center. This avoids the detour, saving four minutes of travel time. The conceptual design includes a pedestrian refuge island, which enhances safety and shortens the crossing between the Flash station and the transit center. Pedestrian safety upgrades are also planned at the New Hampshire Avenue/University Boulevard intersection as part of the Purple Line project.

10 Evaluation of Alternatives

10.1 Measures of Effectiveness

The 'No-Build' alternative and each of the build alternatives were evaluated using the Primary MOEs to compare and select a recommended preferred alternative. The comprehensive list of MOEs used for alternatives analysis was divided into two groups:

- Primary MOEs – evaluation results differ across alternatives, helping to identify a recommended preferred alternative.
- Secondary MOEs - evaluation results serve project purpose and need but results are consistent for all four alternatives.

The following Primary MOEs were identified as the best criteria for selecting the preferred alternative:

- Travel time for Flash BRT, local bus, and general traffic
- Property impacts and ROW needs for roadway and stormwater infrastructure
- Estimated total capital costs for construction, design, and new buses
- Total capital cost per mile
- BRT transit ridership

Evaluation Methodology

The 'No-Build' and build alternatives were rated against each Primary MOE related to travel time, transit access to jobs, costs, ROW requirements, and transit ridership. Detailed analyses were conducted using the following tools and methodologies to calculate results for various MOEs for all alternatives:

- Detailed traffic operations analysis was conducted using an advanced multi-modal microsimulation modelling software called PTV VISSIM. This analysis was used to calculate travel times for BRT, local, bus, and general traffic. Additional details related to traffic analysis are included in **Appendix E** and **Appendix F**.
- FTA's standardized ridership forecasting tool called Simplified Trips-on-Project Software (STOPS) was used to calculate transit ridership. STOPS uses census, employment, and transit service data to calculate transit ridership forecasts. Additional details related to STOPS modeling are included in **Appendix I**.
- Geographic Information System (GIS) analysis was conducted using ESRI's ArcGIS software platform. GIS analysis used transit travel time data to calculate accessibility to jobs.
- MicroStation, a Computer-Aided Design (CAD) software, was used to develop conceptual designs to assist in calculating costs and ROW requirements. Conceptual

plans for initial alternatives and for the Hybrid Alternative are included in **Appendix G** and **Appendix H**, respectively.

Evaluation results for Secondary MOEs not used to compare and select the recommended preferred alternative are provided in **Appendix J**.

10.2 Evaluation Results

Table 3 summarizes alternatives evaluation for all Primary MOEs for the 'No-Build' and all build alternatives, including the Hybrid Alternative.

Table 3: Summary of Alternatives Evaluation for Key MOEs

Measures of Effectiveness (MOEs)	No-Build	Alternative 1 Mixed Traffic	Alternative 2 Curb Lanes	Alternative 3 Median Lanes	Alternative 4 Additional Median Lanes	Hybrid Alternative
Flash BRT Travel Time	N/A	47.3 min.	43.1 min.	36.4 min.	36.3 min.	33.4 min.
Local Bus Travel Time	62.6 min.	47.0 min.	43.2 min.	64.7 min.	67.5 min.	38.2 min.
General Traffic Travel Time	48.0 min.	31.3 min.	45.7 min.	47.5 min.	50.2 min.	39.9 min.
ROW Requirement	N/A	4.2 acres	1.7 acres	26.1 acres	24.0 acres	4.0 acres
Total Capital Cost	N/A	$119.5 Mil.	$109.0 Mil.	$455.7 Mil.	$441.0 Mil.	$142.1 Mil.
Cost/Mile	N/A	$14.3 Mil.	$13.1 Mil.	$54.7 Mil.	$52.9 Mil.	$17.1 Mil.
2045 Weekday New Hampshire Ave BRT Ridership	N/A	7,720	8,168	9,210	9,181	10,973

The Hybrid Alternative outperforms all other alternatives, with the lowest transit travel time, minimal impact to motorists, a comparatively low cost, and the highest ridership. Input from TAC, CAC, and the community members also favored the Hybrid Alternative. Therefore, this Study recommends advancing the Hybrid Alternative to engineering design and implementation as the Preferred Alternative.

Additional details about the results of the evaluation of the initial four alternatives as well as the Hybrid Alternative can be found in **Appendix J**.

11 Advancing the Preferred Alternative

MCDOT, based on the results of this Study, recommends a preferred alternative to implement Flash BRT service along an approximately 8.5-mile-long portion of New Hampshire Avenue. The project would serve communities in eastern Montgomery County and western Prince George's County including Langley Park, Adelphi, Hillandale, White Oak, Colesville, and Takoma Park.

The project is consistent with the County's BRT Master Plan and builds upon its vision of a 102-mile BRT network by advancing BRT on one of the eight recommended corridors. It would provide high-quality transit that improves the speed and reliability of bus service in the corridor. Through the Study, MCDOT identified a BRT route alignment and station locations and analyzed five corridor-wide alternatives consisting of various BRT treatments.

Following extensive public and stakeholder engagement, and in consideration of the project's established purpose and need, goals and objectives, and the existing conditions analysis, the project team developed concepts encompassing all reasonable approaches for implementing Flash BRT service along New Hampshire Avenue and screened them to identify elements appropriate for further analysis and evaluation.

Four initial alternatives were developed using these elements. A segment-level screening concluded that none performed best across all Primary MOEs and corridor segments, so a Hybrid Alternative was developed by mixing and matching the best-performing BRT treatments by corridor segment and evaluated against all MOEs.

This evaluation confirmed that the Hybrid Alternative outperforms all others across most MOEs and best achieves the Flash BRT Program goals (see **Section 10** for results). It delivers the shortest travel times for both Flash BRT and local bus services while requiring minimal additional ROW or property. Although not the least expensive option, the Hybrid Alternative provides the greatest value when costs are evaluated alongside overall performance and benefits.

Based on the alternatives analysis, technical evaluation results, and stakeholder input, the Hybrid Alternative, with a mix of curbside running bus lanes and mixed traffic with QJs, is selected as MCDOT's Recommended Preferred Alternative for New Hampshire Avenue to be advanced into the next phase of project development.

Preliminary conceptual design plans for the Recommended Preferred Alternative (Hybrid Alternative), including the proposed limits of roadway improvements, connections to existing transit, station locations, and pedestrian and bicyclist facilities, are provided in **Appendix H**.

The next step to advance the project is to identify potential funding sources to conduct preliminary engineering design and environmental analysis. The scope of environmental analysis will be finalized in the next phase depending on funding source and respective federal, state, or local requirements.

As part of future project phases, MCDOT will develop more detailed implementation strategies including potential construction phasing and service patterns that can provide additional connections to Flash BRT corridors such as US 29 and Randolph Road, to new developments, and to other major travel demand generators along or near the corridor.

Appendix A – Existing Conditions Analysis and Maps

Appendix B – Alternatives Development

Appendix C – Identification of Station Locations

Appendix D – FDA White Oak Campus Evaluation

Appendix E – Existing Traffic Analysis

Appendix F – Future Traffic Analysis

Appendix G – Initial Alternatives – Concept Plans

Appendix H – Hybrid Alternative – Concept Plans

Appendix I – Transit Ridership Forecasting

Appendix J – Alternatives Evaluation

Appendix K – Public & Stakeholder Outreach Summary