



**GetOnBoardBRT**  **MD 355**  
BUS RAPID TRANSIT IN MONTGOMERY COUNTY

**Strategic Plan for Phase 2  
of the  
MD 355 BRT Corridor Planning Study**

**September 12, 2017**

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## 1 Introduction

The Montgomery County Department of Transportation (MCDOT) has assumed the lead role in the advancement of the MD 355 Bus Rapid Transit (BRT) Corridor Planning Study (Phase 2). Phase 1 of the study, conducted by the Maryland Transit Administration (MTA), concluded with a Conceptual Alternatives Report dated April 2017. The Conceptual Alternatives Report included a Draft Preliminary Purpose and Need Statement, concept level engineering, and environmental and traffic analysis, which resulted in a qualitative approach to assessing several conceptual alternatives. This analysis, which also included a public involvement program, provided the justification for selecting four alternatives to be carried forward into the next stage of the study: the No-Build Alternative; Alternative 2 or Transportation System Management (TSM); Alternative 3C, which would generally include BRT operations in the median; and Alternative 4C, which would generally include BRT operations along the curb. Each of the Build Alternatives would include varying degrees of potential roadway widenings either in the median or along the outside of the roadway.

The limits of the project are divided into seven defined geographic segments within the 22-mile BRT corridor, labelled sequentially from South to North. Each segment has been selected based on a logical rationale; either by types of service proposed, multimodal transit boundaries, or locational boundaries within a local jurisdiction (Rockville and Gaithersburg).

The goal of this document is to provide a roadmap to further study and evaluate the No-Build and Build Alternatives during Phase 2 to determine a Recommended Alternative for this corridor. The questions this document will answer are: ***What are we trying to achieve and how do we get there by November 2018?***

## 2 Phase 1 Summary

To define what we are trying to achieve in Phase 2, and how we will get there by November 2018, the Project Team has revisited the work previously performed through the drafting of the Phase 1 Conceptual Alternatives Report. Phase 1 of the study consisted of collecting data for existing transit operations, traffic volumes and crash statistics, and environmental information; developing a travel model; and developing aerial base mapping to identify existing conditions to determine constraints and to utilize this data for the initial alternative development. The key elements are described below.

### 2.1 Draft Preliminary Purpose and Need Statement

The Draft Preliminary Purpose and Need Statement of the study was developed during Phase 1:

*The Purpose of the project is to provide a new, higher speed, high frequency, premium transit service along MD 355 between Bethesda and Clarksburg that will:*

- *Enhance transit connectivity and multimodal integration along the corridor as part of a coordinated regional transit system;*
- *Improve the ability for buses to move along the corridor (bus mobility) with improved operational efficiency, on-time performance / reliability, and travel times;*
- *Address current and future bus ridership demands;*
- *Attract new riders and provide improved service options for existing riders as an alternative to congested automobile travel through the corridor;*
- *Support approved Master Planned residential and commercial growth along the corridor;*
- *Improve transit access to major employment and activity centers;*
- *Achieve Master Planned non-auto driver modal share;*
- *Provide a sustainable and cost effective transit service; and*
- *Improve the safety of travel for all modes along the corridor*

## 2.2 Public Involvement

A robust and inclusive public involvement program was implemented in Phase 1, including establishment of two Corridor Advisory Committees (CACs), presentations at open houses and to elected officials, outreach to the Cities of Rockville and Gaithersburg, and other public outreach efforts as documented in the Phase 1 Report.

This public involvement effort will be continued in Phase 2 of the study and is described in more detail in **Section 3.6**.

## 2.3 Alternatives Development

During Phase 1 of the study, a set of alternatives was developed for evaluation. These alternatives were assessed to answer questions about the project termini, alignment, running way operations, station locations, and transit service levels and routes. A set of screening criteria was identified to qualitatively compare the different alternatives and address questions related to transit ridership, travel times, person throughput, accessibility, impacts, and costs. Based upon the qualitative analysis, the Conceptual Alternatives Report recommended four alternatives to advance to the next phase of the study.

For Phase 2 of the study, the Project Team will begin with the alternatives identified in the Conceptual Alternatives Report, and will refine and assess these alternatives in greater detail. Additionally, the Team will investigate if other options identified by the MD 355 MCDOT Steering Committee can improve the BRT service. Each alternative will be compared using selection criteria and ultimately, an alternative will be recommended to advance to a more detailed design and subsequent implementation. More information on the Alternatives in Phase 2 can be found in **Section 3.3**.

### 3 Phase 2 Strategic Action Items

To properly identify and achieve the goals of this project, a series of planning, engineering, cost estimating, traffic and operations, public involvement, and environmental processes will be developed and evaluated against a set of defined and agreed-to Measures of Effectiveness (MOEs) to assess and compare the results of each alternative. The Project Team values transparency and will provide an open process with internal and external project stakeholders. It is necessary to remain focused on the planning and engineering objectives of the project, and equally important to maintain the project schedule.

#### 3.1 Strategic Action Item 1: Steering Committee, Advisory Team, and Project Management Team

MCDOT has developed a three-tier project management team and approach to provide guidance, oversight and decision-making for the MD 355 BRT study. The three teams are the Steering Committee; the Advisory Team; and the Project Management Team.

The Steering Committee is comprised of:

- Mr. Chris Conklin, Deputy Director for Transportation Policy
- Mr. Emil Wolanin, Deputy Director for Operations
- Mr. Bruce Johnston, Chief of Transportation Engineering Division (DTE)
- Mr. Dan Hibbert, Chief of Transit Services Division (Ride On)
- Mr. Venu Nemani, Chief of Traffic Engineering and Operations Division (DTEO)

The Advisory Team is comprised of:

- Ms. Joana Conklin, RTS Development Manager, Director’s Office
- Ms. Sogand Seirafi, Deputy Division Chief, DTE
- Mr. Dan Sheridan, Deputy Division Chief, DTE
- Mr. Phil McLaughlin, Chief of Planning and Implementation, Ride On
- Ms. Darcy Buckley, Planner, Director’s Office
- Mr. Corey Pitts, Bus Rapid Transit Project Manager, DTE

The Project Management Team is comprised of:

- Ms. Darcy Buckley
- Mr. Corey Pitts

The MCDOT Steering Committee will meet every one to two months with members of the Advisory Team, Project Management Team, and consultant team staff to: refine the strategy for the study; concur/comment with major project elements such as the Measures of Effectiveness, system criteria, and typical sections; check on the progress of the study and compare that with the schedule and critical path items; review the public outreach efforts; and most importantly, to define and address issues that have the potential to either affect the direction of the study or impact the schedule. Darcy Buckley and Corey

Pitts will work on a daily basis with the Consultant team, reviewing and providing comments and guidance on methodologies, reports, and other documents as they are produced.

### 3.2 Strategic Action Item 2: Team Development of Measures of Effectiveness

The Measures of Effectiveness are vital for assessing and comparing each segment within an alternative and comparing each overall alternative to the other alternatives being evaluated. The Project Team is: evaluating and refining these goals and their associated objectives, which were originally developed by the County with stakeholder and public input; developing a set of MOEs; and determining how each can be quantitatively defined and applied consistently to each alternative. The overarching primary goals of the project include:

- Provide an appealing, functional, and high-quality transit service;
- Improve mobility opportunities, accessibility, and transportation choices for all;
- Support master planned development; and
- Support sustainable and cost-effective transportation solutions.

The draft MOEs will be vetted and accepted by the MCDOT Steering Committee prior to the evaluation of the alternatives.

### 3.3 Strategic Action Item 3: Team Development of System Design Criteria for Alternative Development

The development of a consistent set of system design criteria that meets Federal, State, and Local codes and standards is necessary to consistently apply an acceptable design for all alternatives. The Draft System Criteria, which are still under development, will include the design criteria and other guidance needed to complete the engineering and design work for the project.

The criteria in these guidelines are just that – a guideline; they are not a substitute for good engineering judgment and sound engineering practice. Specific exceptions may apply in cases where a deviation from the criteria is found to be acceptable. Designers are responsible for identifying variances from the guidelines, whether necessary or desired. In many cases, the design team and Advisory Team will determine if an exception to criteria is acceptable; however, in cases where utilizing the minimum criteria necessitates a severe impact to the natural or built environment, the design team will obtain approval from the Steering Committee and appropriate agencies for an exception to criteria.

The design criteria encompass a myriad of components that needs to be addressed, including: environmental permitting, BRT lanes, civil design and utilities, and station design and accessibility.

### 3.4 Strategic Action Item 4: Development of Alternatives

The Build Alternatives retained for detailed study will utilize the System Criteria described above in **Section 3.3** to guide the development along the corridor. The Project Team will develop the Build Alternatives to a design level of engineering detail of approximately 15 percent. This will include the development of horizontal alignments with typical cross sections in accordance with the design criteria and analysis of the direct impacts in relation to the design elements. Additional design elements will

include the development of conceptual stormwater management, and preliminary station design as pertinent to the alternative with consideration to amenities such as pedestrian and bicycle facilities associated with each alternative.

Each Build Alternative will be assessed for impacts related to environmental, cultural, utility, and right-of-way features associated with the potential roadway widening and stations. In general, this study will not attempt to widen or improve existing major bridges such as I-495, Montrose Parkway, I-370, and Father Cuddy Bridge; however, smaller bridge widenings will be considered in areas where they act as constraints for the median or shoulder widening scenarios. They will also be assessed for the indirect impacts associated with traffic operations and capacity to support the proposed bus operations plan, including BRT service, local bus service, and connections to other BRT corridors planned in the county. In addition, cost estimates will be developed for each Build Alternative. The Build Alternatives are briefly described below.

It should be noted that although certain alternatives have the BRT service running in mixed traffic for the system and engineering evaluation, the possibility exists that separate BRT lanes could be implemented in the future as land use changes are enacted and/or redevelopment occurs in these areas.

#### 3.4.1 Transportation Systems Management (TSM) Alternative

The study team will further define the elements of the TSM Alternative, originally called Alternative 2 in Phase 1 of the study. The TSM Alternative would consist of enhanced bus service operating in mixed traffic in existing lanes from the Bethesda Metrorail Station to Clarksburg along MD 355 and along Clarksburg Road to the Clarksburg Outlets. The service along the length of the corridor would consist of multiple trip routes tied to commuting patterns. It is not anticipated that a single service would run the full length of the corridor between Clarksburg and Bethesda.

The TSM Alternative would include Transit Signal Priority (TSP) at key locations along the corridor. This Alternative would extend the Ride On Extra service being launched in October 2017 north from Lakeforest Mall to Clarksburg and south from the Medical Center Metro Station to Bethesda. The project team will prepare a TSM Alternative Definition Memo.

#### 3.4.2 Alternative A

Alternative A was developed for Phase 2 based on input from the MCDOT Steering Committee. This alternative incorporates elements of the TSM Alternative plus additional elements to create a BRT service with limited infrastructure improvements. Alternative A would consist of BRT service, operating in mixed traffic in existing lanes from the Bethesda Metrorail Station to Clarksburg along MD 355, Middlebrook Road, Observation Drive, Goldenrod Lane, Germantown Road, Observation Drive, Ridge Road, Snowden Farm Parkway, and Stringtown Road to the Clarksburg Outlets. Additionally, the County Master Plan in this area indicates that the BRT would travel along Seneca Meadows Parkway, so this route will also be assessed. Alternative A would include TSP along with queue jumps at key locations along the corridor. It would also include off-board fare collection, level boarding, articulated buses with doors on both sides, and Flash branding.

### 3.4.3 Alternative B

Alternative B (formerly called Alternative 3C in the Phase 1 report) would generally include BRT operations in the median of MD 355 and a mixed traffic alignment along Observation Drive. The seven segments carried forward from Phase 1 will be reevaluated both from an engineering and operational standpoint as more detailed analysis is completed. In general, each segment is defined as follows:

As defined in the Phase 1 Report, in Segments 1 and 7, the BRT would run in mixed traffic with no proposed roadway improvements. In Segment 7, it is assumed that Observation Drive would be completed prior to the implementation of BRT service and therefore the costs associated with the construction of Observation Drive, apart from BRT station infrastructure, would not be borne by the MD 355 BRT project.

Segments 2, 4, and 6 would include two dedicated median BRT lanes where feasible. Segment 4 would narrow to one bidirectional BRT lane in certain locations to minimize or avoid impacts to adjacent features. These locations include north of the Deer Park Road intersection to minimize residential displacements and under the I-370 overpass (between Shady Grove Road and South Westland Drive) to avoid impacts to the structure. Segment 6 would narrow to one bidirectional dedicated median lane to minimize property impacts approaching the Middlebrook Road intersection.

Segments 3 and 5 would include a single dedicated median lane. In Segment 3, two potential transit operational configurations will be analyzed – either fixed southbound all day utilizing the median lane or a reversible operation wherein the dedicated lane would be utilized by the peak direction service: southbound in the AM and northbound in the PM. In Segment 5, the dedicated median lane could support bi-directional or reversible service. Both will be considered and discussed with the Town of Gaithersburg prior to choosing an alternative. In a reversible lane scenario, the southbound service would utilize the dedicated lane in the AM and the northbound service would run in mixed traffic. In the PM, the service would switch with the northbound service utilizing the dedicated lane and the southbound service running in mixed traffic. The reversible lane would be created by repurposing the center left turn lane, which currently accommodates left turns from both directions. All left turns would be made at signalized intersections.

### 3.4.4 Alternative C

Alternative C (formerly called Alternative 4C in the Phase 1 report) would generally include BRT operations along the outside curb lane of MD 355. As stated for Alternative B, the seven segments carried forward from Phase 1 will be reevaluated both from an engineering and operational standpoint as the study moves forward and more detailed analysis is completed.

Segment 1 would include lane repurposing to dedicate a BRT-only curb lane in the southbound direction in the morning peak period and the northbound direction in the evening peak period. The lane repurposing would occur between the Bethesda Metrorail Station and Pooks Hill Road and the raised median would be removed in this scenario; the BRT would run in mixed traffic between Pooks Hill Road and Tuckerman Lane over the bridges of the Capital Beltway. Given the right-of-way constraints in



Segment 1, there would be no widening of the roadway for the bus service but there may be select right-of-way needs for stations or station access.

Segment 2 would include a dedicated curb lane in each direction, which would be shared with local transit service and right-turning vehicles. The BRT would run in mixed traffic near the Montrose Parkway interchange to avoid impacts to the structure.

Segment 3 would include a southbound dedicated curb lane which would accommodate southbound BRT service all day. The dedicated BRT lane would be created by widening the roadway to the outside. The dedicated curb lane would be shared with local transit service and right-turning vehicles. The northbound BRT would operate in mixed traffic with TSM elements applied where feasible.

Segment 4 would include a dedicated curb lane in each direction and would be shared with local transit service and right-turning vehicles. All existing travel lanes would be maintained. The BRT would run in mixed traffic near the I-370 overpass to avoid impacts to the structure.

Segments 5 would include BRT operations in mixed traffic with TSM treatments. There would be no proposed widening for the bus service but there may be select right-of-way needs for stations or station access.

Segment 6 would include a dedicated curb lane in each direction where feasible, which would be shared with local transit service and right-turning vehicles. All existing travel lanes would be maintained.

Segment 7 would include BRT operations in mixed traffic with TSM treatments along MD 355 from Middlebrook Road to Clarksburg. This scenario was discussed at the June 26, 2017 Working Group Meeting and the team and Steering Committee agreed to continue to assess it to properly compare traffic operations along MD 355. This Alternative assumes that MD 355 north of Middlebrook Road would be widened as a separate project prior to the implementation of BRT and therefore the costs would not be borne by the MD 355 BRT project but will be identified and documented as part of this study.

### 3.5 Strategic Action Item 5: Station Locations

Vetting the stations for transit ridership potential and ultimately selecting the location of the stations to optimize bus and pedestrian accessibility and safety are important elements of this Phase of the Study. Station locations will be coordinated with the traffic modeling and ridership forecasting for each Build Alternative. These analyses will help determine if the station locations identified in Phase 1 should be kept, expanded, or contracted. Currently, each Build Alternative is proposing approximately 30 station locations. These locations were initially developed based on recommendations of the Countywide Transit Corridors Functional Master Plan and adjustments were made with the input from local jurisdictions, the CACs, and the public.

The Project Team will study the locations for the stations as the Build Alternatives, traffic analysis, and transit service planning are developed. Connections to existing transit centers will be taken into consideration. Additionally, to reach consensus on the addition or removal of stations, it is imperative that stations are designed per the system criteria including the Countywide BRT Station Design Prototype

Project. The initial station locations did not take into consideration geometric constraints, which present challenges to providing accessible boarding and alighting for all riders. For example, many stations from Phase 1 are located on horizontal curves, which conflict with the system criteria. Solutions will be studied which may include horizontal geometry changes, shifting the location of station platforms, and eliminating stations if not practical.

### 3.6 Strategic Action Item 6: Travel Modeling, Ridership Forecasting, Service and Operations Planning

The travel analysis is critical to the assessment of each of the Build Alternatives and individual segments within each Build Alternative. This will be an iterative process that works hand in hand with the engineering analysis. The Project Team will rely on this modeling to provide inputs into the ridership forecasting model and for the service planning analysis. The outcomes of this process will be utilized as a basis for part of the quantitative analysis of the MOEs.

#### 3.6.1 Travel Modeling

The Project Team will utilize a travel model that was constructed during the Phase 1 of the project to define traffic elements of each of the Build Alternatives. This work will use Phase 1 findings as a starting point. Signal phasing, refining TSP locations, queue jumps locations, and geometric modifications at select intersections will be a focus of the early analysis. The engineering team will coordinate with the modeling and service planning teams on the overall definition of Build Alternatives including the service operations implications of the alternatives such as alignments, intersection treatments and geometry, changes to left turn lanes, right turn lanes, and queue jump locations.

#### 3.6.2 Ridership Forecasting and Service Planning and Operations

Ridership Forecasting and Service Planning and Operations recommendations will be developed in coordination with the development of the Build Alternatives. The BRT operating plan developed in Phase 1 will be refined for coding into the ridership forecasting model. Included in this refinement will be a review of potential updates to the local bus network. To determine the updates, the planning team will conduct an assessment of the existing Ride On and Metro services that will review existing ridership patterns, on-time performance measures, and a load analysis for each of the existing services that operate either on or through the MD 355 corridor or parallel to it. Other service performance metrics will also be assessed, such as passengers per hour, passengers per mile, fare box recovery, and subsidy per passenger. An analysis will also be done to help understand the transit market along the entire MD 355 corridor, and a gap analysis will be performed by comparing travel data, the market analysis, and the alignments of the existing services. The updated feeder services will be designed to provide connections to the BRT service. Travel modeling will generate the anticipated BRT travel speeds, which will be incorporated into the forecasting model along with the final BRT and local bus operating plans for each alternative.

The Phase 1 service plan included three proposed BRT route patterns with frequencies of service associated with each. These route patterns may be revised during Phase 2. In addition to the assessment of travel speeds, operating plan, and ridership information, the Project Team will evaluate local transit

services to determine the ideal feeder service to the BRT and how it will interact with the BRT service. These results will be documented in an Operations Planning technical memo.

### 3.6.3 Operation and Maintenance Costs

The Project Team will develop estimated Operation and Maintenance costs for each Build Alternative. As noted in **Section 3.2**, these will also be included in the MOEs.

### 3.6.4 Fare Collection and Communications Systems Plan

A Fare Collection System and Communications Systems Plan will be developed in the future with input from the MCDOT Steering Committee. The Fare Collection System on MD 355 will mirror the County's system-wide BRT Fare Collection Systems. The communications systems plan will be coordinated with the other two active County BRT projects, US 29 and MD 586 Veirs Mill Road, for consistency.

## 3.7 Strategic Action Item 7: Travel Modeling Analysis Years

As discussed in Section 3.6.1, the Travel Modeling for the Build Alternatives will be developed for the forecast year 2040. In addition, a mid-year analysis will be completed for segments of the BRT that could potentially be implemented earlier. A year 2025 travel analysis will be modeled to evaluate the potential effects of early implementation.

## 3.8 Strategic Action Item 8: Public Involvement

### 3.8.1 Public Involvement Overview

As part of the public involvement strategy for this project, the Project Team's goal is to build and improve upon the public involvement conducted in Phase 1 of the study. The Project Team has prepared a Public Involvement Plan (PIP), which provides an overview of the Project Team's comprehensive outreach plan.

The PIP will define the public and stakeholder engagement process. This document will ensure that project information is shared with the public and is effective in informing the public and increasing public understanding of the MD 355 BRT Project. It will also ensure that the public has ample opportunities to provide input to the project team regarding the project. At its core, the PIP aligns with the master project schedule for tasks and deliverables and will be tied in to the analysis and decision-making process. The PIP defines each outreach activity (including a survey, community update events open to the public, focus groups, pop-up events, and open houses), scheduling of internal and external meetings, active and passive outreach periods, and the collection of feedback and analysis process. The Project Team will implement a robust, inclusive plan that both meets Federal guidelines and develops outreach strategies that yield innovative ideas and solutions for the project participants, stakeholders, and Title VI populations (minority and low-income communities), as well as persons with limited English proficiency.

The PIP aims are to provide the necessary engagement through written, visual and virtual communications to effectively message the goals and objectives of the project. Development of public-facing materials will build on the "Get On Board BRT" outreach efforts, and educate the public about the MD 355 BRT program in accessible and clear language. Examples of material that will be prepared include: fact sheets, electronic

newsletters sent on a regular basis, and other printed informational material. The Project Team will manage the project website and social media accounts for the “Get On Board BRT” program. This program will continue to educate all stakeholders so that as much consensus as possible can be achieved as an Alternative is recommended.

### 3.8.2 Partner Agency Engagement

The project team will facilitate or support quarterly meetings with Maryland DOT (the Maryland Transit Administration and the State Highway Administration), the Washington Metropolitan Area Transit Authority, the Maryland-National Capital Park and Planning Commission, and the Cities of Gaithersburg and Rockville. Partner agency meetings will be held at least every two to three months throughout the project period. This will promote clear lines of communication and cooperation between MCDOT and these partners, who will each have important roles in the implementation of the MD 355 BRT.

### 3.8.3 Stakeholder and Community Leader Engagement

The project team will facilitate or support meetings with community leaders to update them regarding the project status and progress and to prepare them to answer questions they are likely to receive. Recognizing that community leaders often serve as a first line of response to the public, it is important that they are aware of what is happening with the project so that they are well positioned to update their communities, respond to questions, and, when necessary, clear up any confusion that arises.

### 3.8.4 Corridor Advisory Committees

The Corridor Advisory Committees (CACs) play an important role in the public involvement process for the BRT corridor studies and implementation in Montgomery County. CAC engagement for this phase of the MD 355 BRT project will be guided by two key documents: (1) The *Montgomery County Rapid Transit System (RTS) Corridor Advisory Committees: Planning Outline for Structure and Selection Procedures*,<sup>1</sup> which identifies the purpose of the CACs, the selection of CAC members, and the operations and procedures of the CAC program; and (2) the CAC Program Plan (CAC PP), which builds on the PIP to guide engagement with the CACs throughout this phase of identifying a recommended alternative. The CAC PP outlines the role of the CACs, refers to expectations for CAC members’ participation, the anticipated meeting schedule (subject to potential adjustments as necessary) and anticipated meeting topics.

## 3.9 Strategic Action Item 9: Environmental Documentation

The environmental data collection and evaluation for this project is extremely important and will build upon the information collected in the Phase 1 evaluation. Each of the Alternatives will be assessed for impacts to social, economic, natural environmental, and cultural resources. A Corridor Study Report will be prepared which will contain content appropriate for inclusion in subsequent environmental review. The goal is to achieve a level of data collection and analysis of the environmental elements to not only

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<sup>1</sup> Available at: [https://www.montgomerycountymd.gov/BRT/Resources/Files/RTS%20AdvisoryCommittees-PlangDoc\\_Vers14\\_2civic.pdf](https://www.montgomerycountymd.gov/BRT/Resources/Files/RTS%20AdvisoryCommittees-PlangDoc_Vers14_2civic.pdf)

measure the impacts of each alternative, but to advance this work seamlessly into Federal and State requirements for considering environmental impacts.

The Project Team will review and update the Draft Preliminary Purpose and Need Statement from the Phase 1 report as described briefly in **Section 2.1**. The environmental analysis will begin with GIS-based mapping and will be supplemented by field reviews.

A Community Effects Assessment (CEA) of the corridor will update and refine profiles of the communities in the study area and assess overall potential beneficial and adverse effects of the project alternatives. Significant elements to be studied and analyzed for each alternative will be: Community Profiles/Neighborhoods; Land Use; Environmental Justice; Aesthetics and Visual Quality; Emergency Provider and School Officials; and economics. Indirect and Cumulative Effects (ICE) analysis will be developed to assess the appropriate time and geographic boundaries and scope of resources of interest based on potential impacts and agency coordination. The Project Team will identify potential indirect effects related to station development and identify other reasonably foreseeable future actions to inform cumulative resource effects analysis.

Natural environmental analyses will supplement the existing natural resource inventory with additional detailed resource characterization and impact assessment. Additionally, the Project Team will identify appropriate strategies for avoidance, minimization and mitigation. Significant natural environmental elements to be studied and analyzed for each alternative will be: Topography, Geology and Soils; Water Quality and Groundwater; Waters of the U.S., including Wetlands; Floodplains; Terrestrial Resources; Rare, Threatened and Endangered Species; and, Unique and Sensitive Areas.

Other environmental analysis required for this phase of the study will include a qualitative assessment of potential air quality effects; identification of noise sensitive areas along the corridor and development of a preliminary noise analysis of the proposed BRT system; and preparation of a hazardous materials assessment of the study area. Each of these areas of environmental concern will be documented in technical reports that will be included in the Corridor Study Report.

### 3.10 Strategic Action Item 10: Implementation Strategy

Although the 22-mile corridor is being studied comprehensively, the potential implementation of BRT service for the entire length *at one time* is unlikely due in large part to budgetary restrictions and constructability. As the study progresses and as the alternatives, costs and impacts are developed and assessed, there will be a focus on identifying which segments of the projects can be constructed initially that provide independent utility and offer the highest benefits in relation to cost. The MOEs to identify the recommended alternative will also be used to determine which segments of the corridor are most viable independently. A timeline will then be developed for an implementation strategy of short-, medium-, and long-term projects. It will be vetted and approved by the Steering Committee prior to presentation to the Director.