

BROAD STREET RAPID TRANSIT STUDY: EVALUATION METHODOLOGY

This Evaluation Methodology will outline a process for selecting a locally preferred alternative (LPA) for transit improvement along the Broad Street Corridor in Richmond, VA. This methodology will remain consistent with the requirements of both the Federal Transit Administration's (FTA) Small Starts program. Evaluation will involve two tiers of screening to compare alternatives based on concrete measures of effectiveness developed in direct relation to the goals and objectives described in the Problem Statement.

I.0 STUDY PROCESS

The GRTC Transit System and Virginia Department of Rail and Public Transit (GRTC/DRPT) are seeking to implement a premium transit service along what is already the most heavily used transit corridor in Richmond, VA. Both agencies have identified the FTA Small Starts program as an appropriate course through which to help fund this project. As noted in the FTA's *Small Starts Fact Sheet*, the program requires a project to either:

1. Be a fixed guideway for at least 50% of the project length in the peak period, and/or
2. Be a corridor-based bus project with the following minimum elements:
 - Substantial Transit Stations,
 - Signal Priority/Pre-emption (for Bus/LRT),
 - Low Floor/Level Boarding Vehicles,
 - Special Branding of Service,
 - Frequent Service - 10 min peak/15 min off-peak, and
 - Service offered at least 14 hours per day.

As Small Starts are intended to be less capital-intensive than New Starts projects, FTA guidance allows for a simplified approach to the assessment of alternatives. The assessment of the alternatives for the Broad Street Corridor is designed to systematically screen out alternatives least likely to fulfill a Purpose and Need statement for the project by applying an increasingly specific set of criteria to a decreasing number of alternatives. This is done by:

- Establishing a Purpose and Need to document the reason the study is being conducted.
- Developing goals, objectives and measures of effectiveness to evaluate each alternative's ability to meet the Purpose and Need.
- Developing an initial set of conceptual alternatives that could reasonably address the Purpose and Need of the study.
- Evaluating the conceptual alternatives against a set of initial screening criteria and documenting those alternatives considered unsuitable for further study.

- Refining the remaining alternatives to allow for a more detailed assessment of their ability to meet the Purpose and Need of the study.
- Applying detailed screening criteria to the remaining alternatives and comparing their performance against the goals and objectives of the study.
- Using the results of the screening process (in conjunction with input from stakeholders) to recommend an LPA.

To move forward in the project development process, the LPA must be included in the metropolitan planning organization’s (MPO) long-range plan and demonstrate that it fulfills all NEPA requirements. The project justification criteria are combined with three local financial commitment criteria to establish an overall project rating.

The following sections of the report provide a more detailed description of the goals, objectives and evaluation criteria to be used as part of this study.

2.0 GOALS, OBJECTIVES AND MEASURES OF EFFECTIVENESS

Table 2-1 lists the goals and objectives established in the Problem Statement for the Broad Street Corridor. These have been established to meet the requirements of Small Starts while reflecting the conditions and priorities of the Richmond region. Gauging the relative ability of each alternative to address these goals and objectives is the aim of the alternatives assessment process. That process is only possible when goals and objectives are matched with measureable indicators. These measures, in turn, need to be tailored to the level of detail available at each stage of the screening process. The following sections will explain which measures will be used at each stage.

TABLE 2-1: GOALS AND OBJECTIVES

Goal	Objectives
Improve local and regional mobility	<ul style="list-style-type: none"> • Increase transit ridership • Improve access to the regional transit network • Improve transit service in high ridership areas • Decrease travel times in the study area • Increase transit reliability and on time performance • Minimize negative impact on transit and auto operations in the corridor • Increase transportation system productivity (passengers/hour) within the corridor
Support economic development along the corridor	<ul style="list-style-type: none"> • Improve transit access to existing and future developments • Create connections between transit and centers of employment, education, residence, shopping, culture and entertainment • Provide opportunities for joint development of transit stations and facilities • Provide improved mobility and mode choice to Enterprise Zones planned for redevelopment

Goal	Objectives
Promote livable, transit-oriented development	<ul style="list-style-type: none"> • Provide high-capacity transit facilities at locations where existing and future land uses make them mutually supportive • Promote improved pedestrian connectivity between transit services and adjoining land uses • Encourage transit usage for different trip types and purposes • Support mixed land use and community design that foster reduced auto use
Create a multi-modal transportation system with attractive travel choices	<ul style="list-style-type: none"> • Create a premium transit route with service characteristics that make it competitive with the private automobile • Integrate premium transit service with local bus, bicycle, pedestrian, private automobile and intercity travel modes • Provide safe, convenient and attractive transfer facilities • Create opportunities for future upgrades or additional premium transit services
Optimize return on public investment	<ul style="list-style-type: none"> • Develop cost-effective transit solutions • Capitalize on existing local and regional transit facilities and operations • Support state, regional and local plans • Maximize funding opportunities from state, local, and federal sources
Enhance environmental quality	<ul style="list-style-type: none"> • Minimize and mitigate negative impacts to the human and natural environment • Contribute to improvements in regional air quality

3.0 INITIAL SCREENING METHODOLOGY

The intention of the initial screening is to generate sufficient information about the conceptual alternatives to screen out those alternatives least likely to meet the established Purpose and Need. At this stage in the analysis, the emphasis is on developing qualitative, order-of-magnitude estimates of the costs, benefits and impacts of each alternative, such that major differences between alternatives are readily apparent. The measures of effectiveness for the initial screening have been developed to reflect the qualitative approach to the initial screening, and are listed in Table 3-1.

TABLE 3-1: INITIAL SCREENING CRITERIA

Goal	Objectives	Measures of Effectiveness
Improve local and regional mobility	<ul style="list-style-type: none"> • Increase transit ridership • Decrease travel times in the study area • Minimize negative impact on roadway congestion 	<ul style="list-style-type: none"> • Impact on transit ridership • Impact on general traffic • Impact on on-street parking • Impact on vehicle and pedestrian safety within the corridor
Support economic development along the corridor	<ul style="list-style-type: none"> • Improve transit access to existing and future developments • Create connections between transit and centers of employment, education, residence, shopping, culture and entertainment 	<ul style="list-style-type: none"> • Impact on residential access to transit • Impact on transit access to activity centers • Impact on transit access to redevelopment sites

Goal	Objectives	Measures of Effectiveness
Promote livable, transit-oriented development	<ul style="list-style-type: none"> • Provide high-capacity transit facilities at locations where existing and future land uses make them mutually supportive 	<ul style="list-style-type: none"> • Ability to support higher density land uses
Create a multi-modal transportation system with attractive travel choices	<ul style="list-style-type: none"> • Create a premium transit route with service characteristics that make it competitive with the private automobile • Integrate premium transit service with local bus, bicycle, pedestrian, private automobile and intercity travel modes • Create opportunities for future upgrades or additional premium transit services 	<ul style="list-style-type: none"> • Average operating speed • Number of intermodal connections • Level of investment that can support future upgrades • Frequency, schedule, and travel times of transit services in the corridor
Optimize return on public investment	<ul style="list-style-type: none"> • Develop cost-effective transit solutions 	<ul style="list-style-type: none"> • Order-of-magnitude capital cost • Order-of-magnitude operating cost
Enhance environmental quality	<ul style="list-style-type: none"> • Minimize and mitigate negative impacts to the human and natural environment 	<ul style="list-style-type: none"> • Impact on natural resources (parklands, wetland, water, habitat) • Impact on historic and cultural resources

In addition to these corridor-wide criteria, each of the proposed station areas for each alternative will be evaluated using a separate station area identification methodology. This methodology will determine which of the initial stations under consideration should be carried forward into the detailed definition of alternatives. The methodology used to evaluate station locations is described in greater detail in the Station Area Assessment Methodology.

Each alternative will be evaluated and ranked according to the fifteen measures of effectiveness listed in Table 3-1. The measures of effectiveness applied to the initial screening will use a five-grade ranking system shown in Table 3-2.

TABLE 3-2: RANKING SYSTEM FOR INITIAL SCREENING CRITERIA

Rank	General Assessment
A	The alternative may provide major benefits and/or significantly minimize negative impacts
B	The alternative may provide some benefits and/or minimize some negative impacts
C	The alternative will have negligible benefits or impacts
D	The alternative may have some negative impacts
F	The alternative may have major negative impacts

The ranking under each criterion will be documented using existing data from local, state, and industry sources. The results of the initial screening will be presented to GRTC/DRPT and local stakeholders to ensure their consensus and so they can recommend which alternatives should be carried forward in the study.

4.0 DETAILED SCREENING METHODOLOGY

Those alternatives recommended from the initial screening will be refined to allow more detailed, quantifiable assessments of their costs, benefits and impacts. Modified alternatives will be defined in

sufficient detail to allow the evaluation of variations to the major alternatives retained from the initial screening.

Each alternative and modified alternative will be evaluated using the full set of measures of effectiveness identified in Table 4-1. Many measures have been included to add depth to the evaluation process by differentiating each alternative according to its anticipated impacts and benefits. The measures of effectiveness will be estimated for the proposed opening date in 2015.

TABLE 4-1: GOALS, OBJECTIVES AND MEASURES OF EFFECTIVENESS

Goal	Objectives	Measures of Effectiveness
Improve local and regional mobility	<ul style="list-style-type: none"> • Increase transit ridership • Improve access to the regional transit network • Improve transit service in high ridership areas • Decrease travel times in the study area • Increase transit reliability and on time performance • Minimize negative impact on transit and auto operations in the corridor • Increase transportation system productivity (passengers/hour) within the corridor 	<ul style="list-style-type: none"> • Number of new transit riders* • Number of low-income households, zero-car households and minority populations within ¼-mile of stations • On-time performance of transit vehicles • Traffic impact at key intersections and on key road segments • Number of on-street parking spaces lost • Person-capacity of corridor’s road and transit networks • Impact on vehicle and pedestrian safety within the corridor
Support economic development along the corridor	<ul style="list-style-type: none"> • Improve transit access to existing and future developments • Create connections between transit and centers of employment, education, residence, shopping, culture and entertainment • Provide opportunities for joint development of transit stations and facilities 	<ul style="list-style-type: none"> • Number of housing units within ½ -mile of transit stations • Square feet of potentially developable land within ¼-mile of transit stations • Square feet of office and retail ½ -mile of transit stations • Square feet of redevelopment within ½ -mile of transit stations
Promote livable, transit-oriented development	<ul style="list-style-type: none"> • Provide high-capacity transit facilities at locations where existing and future land uses make them mutually supportive • Promote improved pedestrian connectivity between transit services and adjoining land uses • Encourage transit usage for different trip types and purposes 	<ul style="list-style-type: none"> • Total population and employment within ½ -mile of transit stations, current and proposed • Additions to pedestrian infrastructure • Frequency, schedule, and travel times of transit services in the corridor
Create a multi-modal transportation system with attractive travel choices	<ul style="list-style-type: none"> • Create a premium transit route with service characteristics that make it competitive with the private automobile • Integrate premium transit service with local bus, bicycle, pedestrian, private automobile and intercity travel modes • Provide safe, convenient and attractive transfer facilities • Create opportunities for future upgrades or additional premium transit services 	<ul style="list-style-type: none"> • Average operating speed • Number of intermodal connections • Level of investment that can support future upgrades

Goal	Objectives	Measures of Effectiveness
Optimize return on public investment	<ul style="list-style-type: none"> • Develop cost-effective transit solutions • Capitalize on existing local and regional transit facilities and operations • Support state, regional and local plans • Maximize funding opportunities from state, local, and federal sources 	<ul style="list-style-type: none"> • Capital cost • Annual operating cost • Increases in tax revenue
Enhance environmental quality	<ul style="list-style-type: none"> • Minimize and mitigate negative impacts to the human and natural environment • Contribute to improvements in regional air quality 	<ul style="list-style-type: none"> • Impact on natural resources (parklands, wetland, water, habitat) • Impact on historic and cultural resources • Regional vehicle miles traveled • Transit vehicle emissions and idling

The results of the detailed screening will be presented to GRTC/DRPT, affected stakeholders and the general public to receive their input and feedback; where appropriate, alternatives may be further refined to reflect this input.

As with the initial screening, each of the proposed station areas for each alternative will be evaluated using a separate station assessment methodology. This methodology will focus on the localized impacts of stations on land use, transportation and economic development, allowing for a more meaningful dialogue with local stakeholders as to how station plans will affect their communities. The station-specific measures being considered as part of the detailed analysis are detailed in the Station Area Assessment Methodology.

5.0 PROJECT JUSTIFICATION CRITERIA

At the end of the detailed screening, there will be sufficient information to allow GRTC/DRPT to select and recommend an alternative for the region’s Long-Range Transportation Plan (LRTP). Some adjustments may be necessary to the proposed alternative’s operating assumptions and facility improvements to ensure the alternative meets FTA’s cost-effectiveness thresholds.

The majority of the project justification information necessary to complete a Small Starts application for the Build Alternative will have been developed as part of the detailed screening methodology; however, it will be necessary to document the local financial commitment to the project with the following information:

- A financial plan demonstrating how funding will be secured for the local share of capital costs
- Documentation confirming that the increase in operations and maintenance costs associated with the Build Alternative represents less than 5% of the GRTC’s total operations budget
- Documentation demonstrating that the operating agency is in “reasonably good financial condition”

All information related to project justification criteria will be entered into the Small Starts templates and submitted to FTA as part of the application for entry into Project Development.