BROAD STREET CORRIDOR AA: STATION AREA ASSESSMENT METHODOLOGY

The purpose of this technical memorandum is to document the process that will be used to select stations and conduct a land use assessment for each station area. The methodology has been developed to take advantage of data that is readily available for the corridor and the previous work by GRTC/ DRPT, the City of Richmond, and Henrico County. The methodology will help to ensure that the stations selected for implementation represent those that would offer the best potential for future transit-oriented development within the 7-mile long study area.

1.0 BACKGROUND

The transit improvements being considered for the Broad Street Corridor are being evaluated under the FTA's Small Starts program. The Small Starts program was created by the FTA to provide a streamlined planning and implementation process for fixed guideway and corridor-based improvements with a total capital cost of less than $250 million. The reporting requirements of the Small Starts program are relatively simple compared to those of the New Starts program and more detailed corridor studies; however, the study team recognizes that the Broad Street corridor is the subject of several ongoing studies and plans, including:

- GRTC's Comprehensive Operational Analysis (COA)
- The City of Richmond's Master Plan
- The City of Richmond's Downtown Master Plan
- The Henrico County 2026 Comprehensive Plan

While the overall objective of this methodology is to meet the reporting requirements of the FTA's Small Starts process, it is equally important that this methodology provide an opportunity to interface with the on-going planning efforts by GRTC/DRPT, the City, and the County. This will help to ensure that the project is consistent with the mobility, land use, and economic development objectives of the region and that these plans are in turn supportive of the transit project.

2.0 STATION AREA ASSESSMENT PROCESS

This station area assessment methodology is designed to work within the context of the Alternatives Analysis process established by FTA for Small Starts projects. Alternatives Analyses are designed to begin with a broad range of general alternatives, then use an iterative process to evaluate each alternative, more fully define those alternatives that best meet the goals and objectives of the study, then apply more detailed criteria to arrive at a Locally Preferred Alternative (LPA) that can be recommended for

advancement into the preliminary and final design (collectively known in the Small Starts process as Project Development.)

Table 2-1 provides an overview of how station areas will be treated during each stage of the Broad Street Corridor AA. As will be the case with all other aspects of the alternatives (alignments, operations, technologies), station areas will only be defined in sufficient detail to allow analysis and screening to proceed to the next stage of the study. Each subsequent stage will allow the team to develop additional details to understand how stations will interface with the transportation network, land uses, and economic development potential of their station areas.

TABLE 2-1: STATION AREA DEFINITION IN THE ALTERNATIVES ANALYSIS PROCESS

	DETAILS DEFINED		
STAGE	**LOCATION**	**TRANSPORTATION**	**LAND USE/ ECONOMIC DEVELOPMENT**
Stage 1: Initial Definition of Alternatives	General location along corridor	Potential connections to other modes (rail, bus) Roadways/intersections affected	Activity centers served Major developments served Population and employment served
Initial Screening of Alternatives/Station Area Identification (Stage I)			
Stage2, Part 1: Detailed Definition of Alternatives	Station footprint Specific location (intersection, location along street)	Inputs to travel demand model and microsimulation • General location and timing of transfers • Interfaces with auto, pedestrian, and bicycle networks	Preliminary ROW requirements Redevelopment potential Consistency with zoning
Detailed Screening of Alternatives/Station Area Assessment			
Stage 2, Part 2: Definition of Locally Preferred Alternative	Location within street (median, curbside, interface with intersections) Interface with adjoining land uses Potential for joint development	Changes to transit network (routing, timing) Pedestrian and bicycle improvements Estimated traffic and parking impacts Estimated user benefits Safety improvements	ROW requirements Opening year land use assumptions Recommended changes to zoning, land use plans for station area

As shown in Table 2-1, the station area assessments will occur in two stages:

- Station Area Identification, occurring in conjunction with the initial screening of alternatives
- Station Area Assessment, to be completed in conjunction with the detailed screening of alternatives

The sections below provide a detailed explanation as to how each stage of the assessment will be conducted.

2.1 Station Area Identification

The station areas for the Broad Street Corridor were initially identified in Tier I of the Richmond Regional Mass Transit Study and have been carried forward into this Alternatives Analysis. All told, 16 station areas have been identified, representing an average station spacing of less than one-half mile. As the Broad Street Corridor Study is oriented towards meeting regional travel needs (rather than providing local circulation services), the spacing between stations is likely closer than appropriate for a longer distance service. Therefore, as part of the initial screening of alternatives, the Station Area Identification process will evaluate each of the 16 station areas and determine if any should be eliminated from further consideration as part of this study or if any should be added.

Table 2-2 defines the criteria that will be evaluated as part of the Station Area Identification. While the majority of these criteria will provide quantitative information, the Station Area Identification will rely on the same, five-point ranking system being used for other criteria in the initial screening of alternatives. This initial ranking will be shared with station area stakeholders (the City of Richmond, Henrico County) to ensure the station rankings reflect the most current information regarding the development environment in the study corridor. Once there is consensus as to which station areas should be carried forward, these will be included in the detailed definition of alternatives.

TABLE 2-2: POTENTIAL SCREENING CRITERIA – INITIAL STATION LOCATION CRITERIA

DESCRIPTION	SOURCE OF DATA
Community facilities – to ensure that major trip generators / attractors (schools, community centers, medical facilities) have stations	GIS data
Redevelopment/in-fill development – number of known redevelopment/in-fill development sites within ½-mile radius of station	City of Richmond and Henrico County Planning Departments
Distance between stations (measured in miles)	GIS calculation, previous proposals
Existing land use densities – population and employment numbers per acre within ½ mile radius of station	GIS data and plan review
Future land use densities - population and employment numbers per acre within ½ mile radius of station	GIS data and plan review
Transit supportive plans and policies – densities permitted within station areas measured in floor-to-area ratios (FAR) and dwelling units per acre	City of Richmond and Henrico County Planning Departments
Connections to other modes (rail, existing and COA bus routes)	GIS data review
Traffic impacts	Synchro files, accident data, road geometry
Boardings/alightings by bus stop in the station area	GRTC data

2.2 Station Assessments

The station areas carried forward from the Station Area Identification and initial screening of alternatives will be assessed in sufficient detail to meet three objectives:

- Meet the Small Starts requirements for reporting transportation impacts, cost effectiveness, and land use characteristics.
- Provide sufficient information to local planning agencies and development stakeholders to allow them to revise and/or refine their plans to account for station improvements and/or add transit supportive measures.
- Allow assessment of environmental impacts under the NEPA process.

Three aspects of each station area will be assessed: physical constraints, land use and economic development potential, and transportation impacts. The criteria for each of these are summarized in Table 2-3 and discussed in greater detail below.

TABLE 2-3: POTENTIAL STATION ASSESSMENT CRITERIA

DESCRIPTION	SOURCE OF DATA
Physical constraints: ROW, major utilities and intersections, bridges, overpasses, topography	GIS mapping, field review
Redevelopment potential / economic development benefit – measured as either FAR permitted compared to existing, or square footage of development existing versus permitted in local comprehensive plans	GIS data and plan review/locality coordination
Consistency with zoning	GIS data / plan review
Parcel analysis – review of parcel configuration (larger parcels can more easily accommodate redevelopment and do not require consolidation)	GIS data review / locality coordination
Boardings and alightings for each station area	GRTC data
Intersection characteristics – signalized versus unsignalized, potential for signal pre-emption	GIS / field observations, coordination with localities
Intersection performance data – traffic volumes, level of service (existing and future), queues, average seconds of delay, accident history	Field observation, HCS calculations, intersection studies, intersection geometry
Parking availability and pricing – measured within station area	Field review / coordination
Sidewalks and pedestrian routes within station area – including analysis of sidewalk widths and conditions	GIS mapping, field review
Bicycle facilities and routes – identification of facilities, routes, and parking within station area	GIS mapping, field review
Potential impact on safety of traffic and transit operations.	Accident data
Consistency with local master plans	Virginia Commonwealth University Master Plan, State Capital Master Plans

Physical Constraints

In order to determine the physical constraints and right-of-way requirements of each station, a generic station footprint will be developed. This footprint will be consistent those of existing BRT stations used on comparable systems (e.g. San Bernardino's E Street/SBx Corridor, Boston's Silver Line.)

The station footprint will be used to refine assumptions as to where the station should sit both in the cross section of the roadway as well as along the Broad Street Corridor. Physical constraints to the location of the station will need to be balanced versus the benefits of locating the station closer to end users and/or other transportation linkages. The station area assessment process will be used to identify any infrastructure requirements that will be needed in each station area – such as noting if additional ROW will be required, transit shelters and signage, landscaping, etc. Identification of infrastructure required to develop station areas will be an important element in the Environmental Assessment and in the development of cost information for the corridor.

Land Use and Economic Development

It will be important to assess the potential for new development that could occur in support of the BRT system due to more intensive vertical and infill development in the corridor. A sensitivity analysis will be prepared wherein future build-out potential within each half-mile radius around the station areas will be assessed. The projections will be based on the difference between existing land use (number of units, land use type, overall square footage, and floor-to-area ratio (FAR) for non-residential) and future land use potential (development mix allowed, setbacks, FAR for non-residential density requirements, and/or building height restrictions). The analysis will also take into account the likelihood of changes from the existing condition given the current condition of property on the parcels within ¼ mile of each proposed station. If appropriate, recommendations for parcel consolidations to maximize future redevelopment potential will be made.

Details for each station area will be developed with input from stakeholders and local planning agencies. As part of these evaluations, station area plans will be presented for each station area. These plans may include urban design guidelines and development recommendations that will enhance the performance of the BRT system.

Transportation Impacts

As the Alternatives Analysis represents an initial assessment of the potential impacts and benefits of the alternatives, the assessment of station area transportation impacts will be performed using existing data readily available from GRTC/DRPT, the City of Richmond, Henrico County, and field surveys. The following transportation issues will be addressed as part of the station area assessment:

Transit facilities and operations. Existing boarding and alighting data will be used to develop an initial assessment of what facilities and station components (shelters, off-board fare collections, variable message boards, etc.) should be included at each location. Existing and planned route patterns will be evaluated to determine how transfers between services may be accommodated within the station area, how transfers between premium and local services may affect roadway operations, and how pedestrian connections between services should be addressed. Boarding information developed from travel demand models for the alternatives will then be fed into this analysis to confirm the scale and location of stations.

Based on land uses, boarding patterns, and proximity to other services, the assessment will provide recommendations as to the need for off-street facilities (transfer centers, kiss and ride). These will need to be evaluated in the context of the land use assessment and physical constraints of the station area.

Roadway impacts. The station area assessment will take into account the following information within ½ mile of station areas when recommending improvements:

- Existing roadway characteristics and committed roadway improvements, including: roadway geometry, turning lanes, and plans for converting one-way roadways to two-way operation or widening.
- Existing and forecast volumes of traffic (auto, transit, pedestrian).
- Historic accident data.

This information will be used to consider the needs for pedestrian, bicycle, and transit improvements in the context of the existing and committed roadway operations, minimizing conflicts between modes and preserving acceptable levels of service for roadway operations. Accident data will be used to understand what types of transit-pedestrian and transit-automobile conflicts need to be minimized as part of station design and operations.

Parking availability and pricing. The potential impacts of transit facilities on parking will be taken account within ¼ mile of each station. Readily available data on existing and committed on- and off-street parking supply and demand will be taken into consideration, both to assess the potential impacts on transit ridership and parking demand in the area.

As the initial line segment under consideration is fairly short and in close proximity to downtown destinations, it is assumed that no Park and Ride facilities will be evaluated at any of the station areas.

Bicycle and pedestrian facilities. Pedestrian and bicycle connectivity will be evaluated within ¼ mile radius around potential station locations. Within the station areas we will prepare an inventory of sidewalks and bicycle lanes or document where they do not exist. Enhancements that can be incorporated into the design or as part of future development activities will also be noted. The study team will assess physical conditions and identify any potential barriers to access that might exist within the corridor. The station area assessment of pedestrian and bicycle connectivity will result in recommendations that promote complete streets and multimodal corridors, including: sidewalks widening, pedestrian-scale lighting and design, and streetscaping.