



FINAL | SEPTEMBER 2017

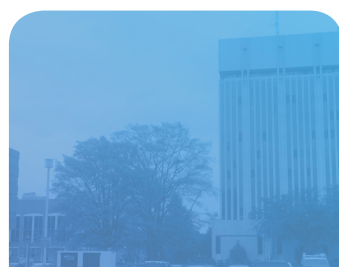
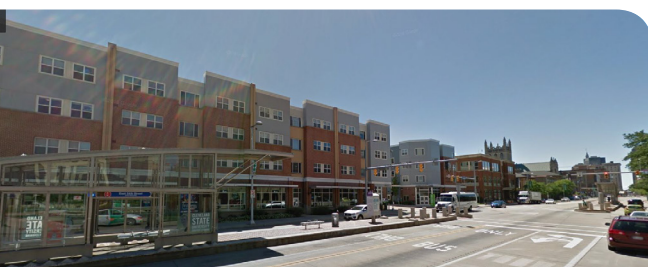




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Executive Summary

What is the Peninsula Corridor Study?

BRT IS A GOOD FIT

The Peninsula Corridor Study found that BRT is the right solution to make it easier and faster to travel around the Peninsula. The study identified three possible BRT corridors that serve key destinations and accomplish the following community goals:

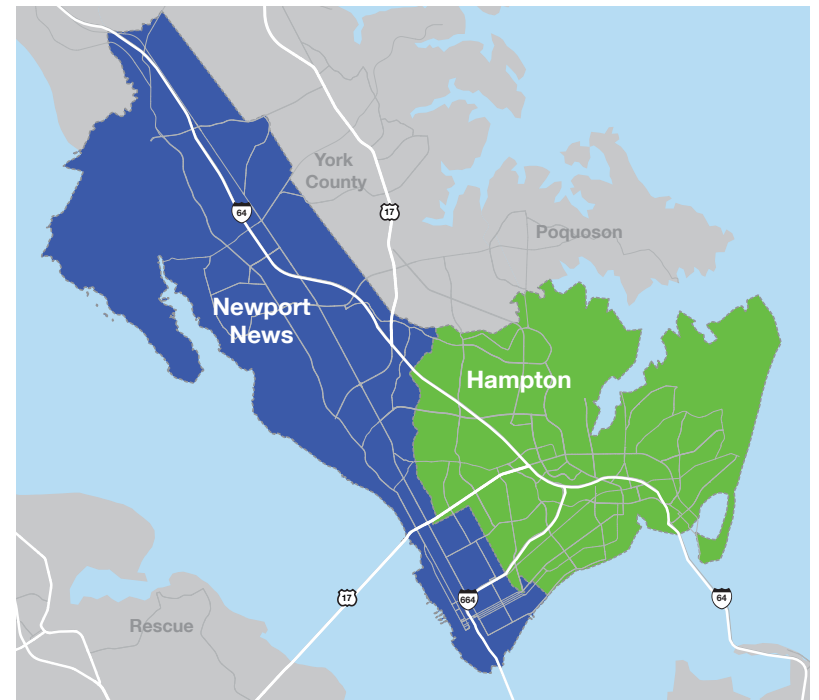
- ☑ Provides travel choices
- ☑ Promotes new and compact growth
- ☑ Creates great places to live, work, and play
- ☑ Improves service for existing riders and attracts new riders
- ☑ Supports economic development

In March 2016, Hampton Roads Transit (HRT), in partnership with the cities of Hampton and Newport News, began the Peninsula Corridor Study to define potential high-capacity transit connections between existing and future activity centers in Hampton and Newport News.

The 18-month study included extensive public outreach, research, analysis, and four distinct phases of work. Based on public and stakeholder input, the study team developed the study's Purpose and Need and then identified 18 possible high-capacity transit corridors (Tier 1 alternatives). Using evaluation criteria based on the Purpose and Need, the study team then narrowed the alternatives to six Tier 2 corridors for further study.

The study initially considered three transit technology options: bus rapid transit (BRT), modern streetcar and light rail transit (LRT). LRT and streetcar were removed from consideration due primarily to high capital cost.

The detailed and in-depth evaluation of the Tier 2 corridors ultimately recommended three cost-effective BRT alternatives for further study, to include environmental documentation and engineering and design.



Peninsula Corridor Study

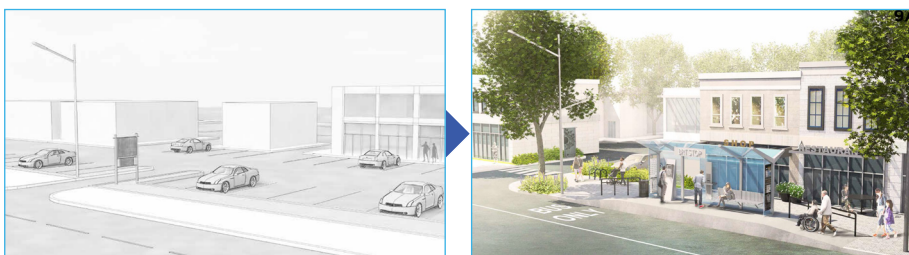
What is Bus Rapid Transit?

BRT is a high-capacity public transportation technology that is fast, reliable, and convenient. It can offer the benefits of light-rail transit at much lower costs. BRT typically offers:

- Bus-only lanes throughout the majority of the corridor
- Enhanced vehicles with level, multidoor boarding
- Substantial passenger waiting stations with seating, lighting, and real-time arrival information of bus arrivals
- Improved technology such as preboard fare collection and signal enhancements at intersections

BRT Creates Opportunity

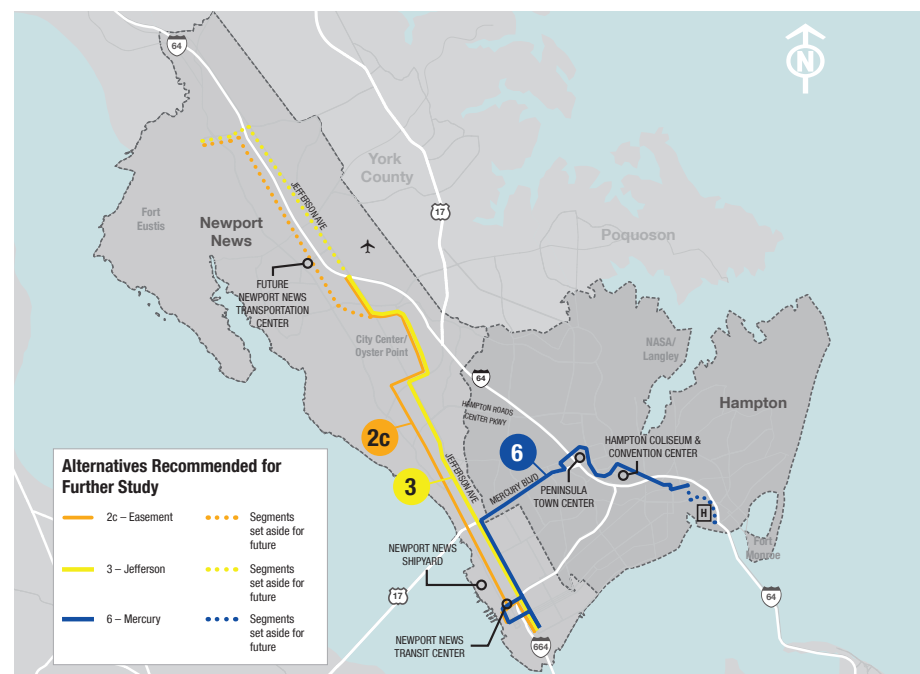
The mobility, infrastructure, and placemaking benefits of a BRT investment makes the corridor more vibrant to residents, visitors, and businesses. BRT can stimulate the environment to attract a talented workforce, customers, and investors.



BRT helps promote growth and creates a more desirable place to live, work, and discover.

Recommended Alternatives

BRT Alternatives **2c – Easement**, **3 – Jefferson**, and **6 – Mercury** are identified as the most feasible, cost-effective alternatives and represent the Peninsula's best opportunity to meet the high-capacity needs of the community and effectively compete for needed Federal Transit Administration (FTA) funding. Alternatives **3 – Jefferson** and **6 – Mercury** are preferred over Alternative **2c – Easement** due primarily to the a disproportionately larger need for right-of-way acquisitions than the other two alignments. In addition, the railroad corridor adjacent to Alternative **2c – Easement** is generally not available for redevelopment and is unlikely to change to a transit supportive land use in the foreseeable future.





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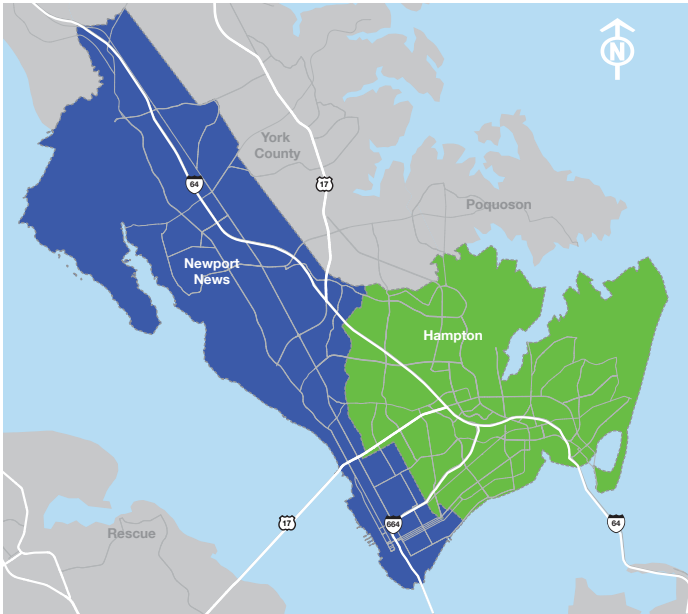
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Introduction

The Peninsula Corridor Study’s intent was to identify one or more high-capacity transit corridors that connect existing and future activity centers within Hampton and Newport News. The study team coordinated closely with residents, elected officials, city staff, area businesses, and community leaders in Newport News and Hampton during the study process. This helped to ensure that all stakeholders had the opportunity to provide input and that the vision for growth on the Peninsula was complemented and enhanced by their perspectives.



The Peninsula Corridor Study followed a two-tiered data driven process to identify the best transit solutions for the Peninsula. Each step in the process is described in more detail throughout the report.



Peninsula Corridor Study

Purpose and Need

The Peninsula Corridor Study's purpose is to identify high-capacity transit improvements that:

- Provide reliable, frequent, and efficient travel choices on the Peninsula, connecting existing and planned activity centers
- Support regional growth and promote concentrated transit-oriented development in accordance with the City of Hampton and City of Newport News land use plans
- Help to mitigate increases in traffic congestion associated with growth by providing a wider range of mobility options
- Contribute to making the Peninsula a desirable place to live and work, both supporting existing and attracting new Peninsula residents including students, young professionals, and those who desire to age-in-place
- Develop qualitative and quantitative data so that the future project(s) can effectively compete for federal transit funding

The transportation needs, summarized by category in the table below, were then used to define the study purpose.

Category	Need
Public and Stakeholder Priorities	<ul style="list-style-type: none">■ Transit that is easier to use■ Transit serving more major destinations on the Peninsula■ Support regional desire to attract new and retain existing residents and employees
Socioeconomic Characteristics	<ul style="list-style-type: none">■ Plan for the forecasted regional growth■ Support and connect the growing activity centers and planned strategic opportunity areas■ Connect major employment sites with high-capacity transit■ Provide appropriate transit service levels for highly-concentrated areas of transit disadvantaged populations
Transportation Infrastructure Characteristics	<ul style="list-style-type: none">■ Improve frequency and travel time of transit service■ Increase modal choice and accommodate future travel demand■ Reduce effects of increasing congestion■ Enhance regional transit connectivity

PROJECT PURPOSE

The Peninsula's transportation needs were identified through community workshops, an online survey, meetings with project stakeholders, a review of local and regional plans and studies, and an analysis of demographic and transportation data.

A purpose and need statement:

- Defines the transportation problem to be solved,
- Provides the foundation for decision-making and the basis of the evaluation process, and
- Guides the development and selection of transit improvements that best meet the needs of the community.

Peninsula Corridor Study

Evaluation Criteria

A series of qualitative and quantitative criteria tied to each element of the Purpose and Need Statement were developed to analyze potential alternatives for new high-capacity transit services on the Peninsula.

Project Need

Evaluation Criteria

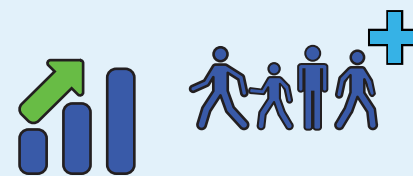
Provide reliable, frequent, and efficient travel choices on the Peninsula, connecting existing and planned activity centers

- Public facilities and popular destinations served (e.g., schools, libraries, parks)
- Transportation connections (transit centers, Amtrak station(s), Newport News/Williamsburg International Airport)
- Transit reliability
- Transit travel time savings



Support regional growth and promote concentrated transit-oriented development in accordance with City of Hampton and City of Newport News land use plans

- Existing employment served (total jobs)
- Average existing population density (persons/square mile)
- Future employment served (total forecast for 2040 jobs)
- Average future population density (2040 forecast persons/square mile)
- Amount of new development likely to occur because of transit
- Land use policies supporting transit-friendly development (compact, walkable)



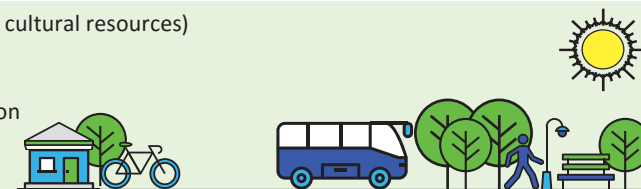
Help to mitigate increases in traffic congestion associated with growth by attracting a wider range of transit riders

- Corridor person throughput (number of people that a corridor can move with the proposed transit in place)
- Expected number of people who will ride the high-capacity transit
- Forecast reduction in overall vehicle miles traveled across the Peninsula
- Number of potential property impacts
- Impact on traffic operations



Contribute to a desirable place to live and work, both supporting existing and attracting new Peninsula residents including students, young professionals, and those who desire to age-in-place

- Impacts to environmental features (e.g., water resources, parks, cultural resources)
- Service to households likely to use public transportation
- Service to households without cars
- Average percentage of household income spent on transportation
- Proximity to sidewalks, trails, and dedicated bicycle lanes



Develop qualitative and quantitative data so that the future project(s) can effectively compete for federal funding

- One-time costs to construct the project (capital costs)
- Reoccurring annual costs to operate and maintain the service
- Prepare future ridership forecasts
- Cost effectiveness (cost per trip)

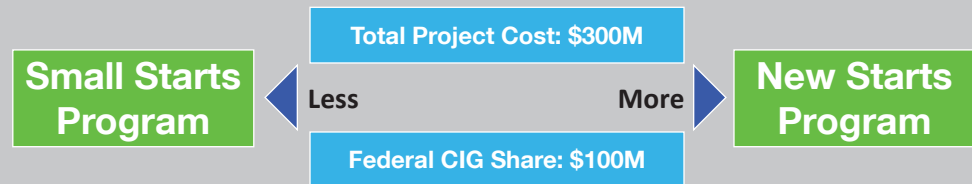


FEDERAL TRANSIT ADMINISTRATION NEW STARTS/SMALL STARTS PROGRAM

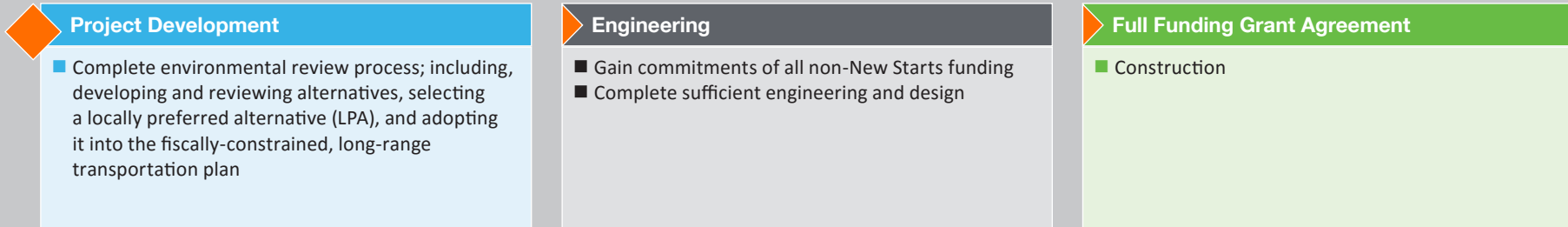
The Federal Transit Administration's (FTA) Capital Improvement Grant (CIG) program provides Federal funding for new transit projects.

New transit projects are generally funded under either the New Starts or Small Starts program. New Starts are intended for larger projects (more than \$300 million) while the Small Starts program is intended for smaller projects (less than \$300 million). These programs have historically been funded by Congress at approximately \$2 billion annually and are extremely competitive with demand substantially exceeding funding. Therefore, project sponsors must demonstrate a strong local financial commitment to compliment the federal funding request.

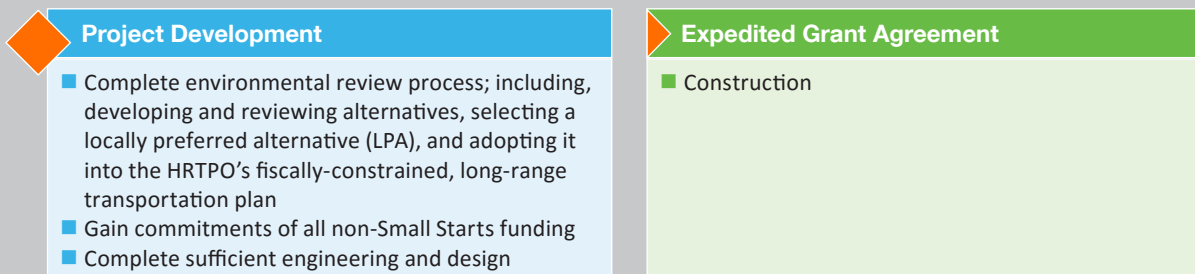
Small Starts and New Starts Program Eligibility



New Starts Process



Small Starts Process



Legend

- = FTA approval required
- = FTA evaluation, ratings, and approval

Peninsula Corridor Study

Engagement

This study's findings should reflect the needs and visions of the Hampton and Newport News residents and communities, its decision makers, and Hampton Roads Transit (HRT). The Peninsula Corridor Study included a range of outreach and community involvement strategies intended to obtain a broad base of participation and facilitate a meaningful and inclusive public involvement process.

In addition to gathering public input, the outreach approach emphasized providing and interpreting technical information for the public and stakeholders. The engagement process provided opportunities to learn about the study, its intent, and potential outcomes, while the study team gathered feedback on priorities, needs, and preferences from the public and stakeholders.

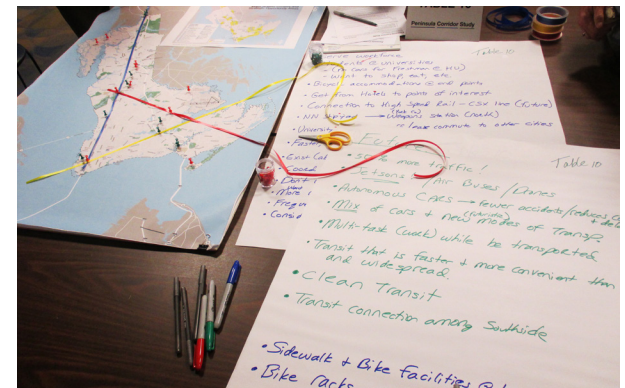
Specific outreach tools and strategies used during the study process included:

- Public meetings and workshops
- Committee outreach
- Group briefings
- Web and social media strategies
- Newsletters, fact sheets, and flyers
- Pop-up events
- Other events

The public's input helped:

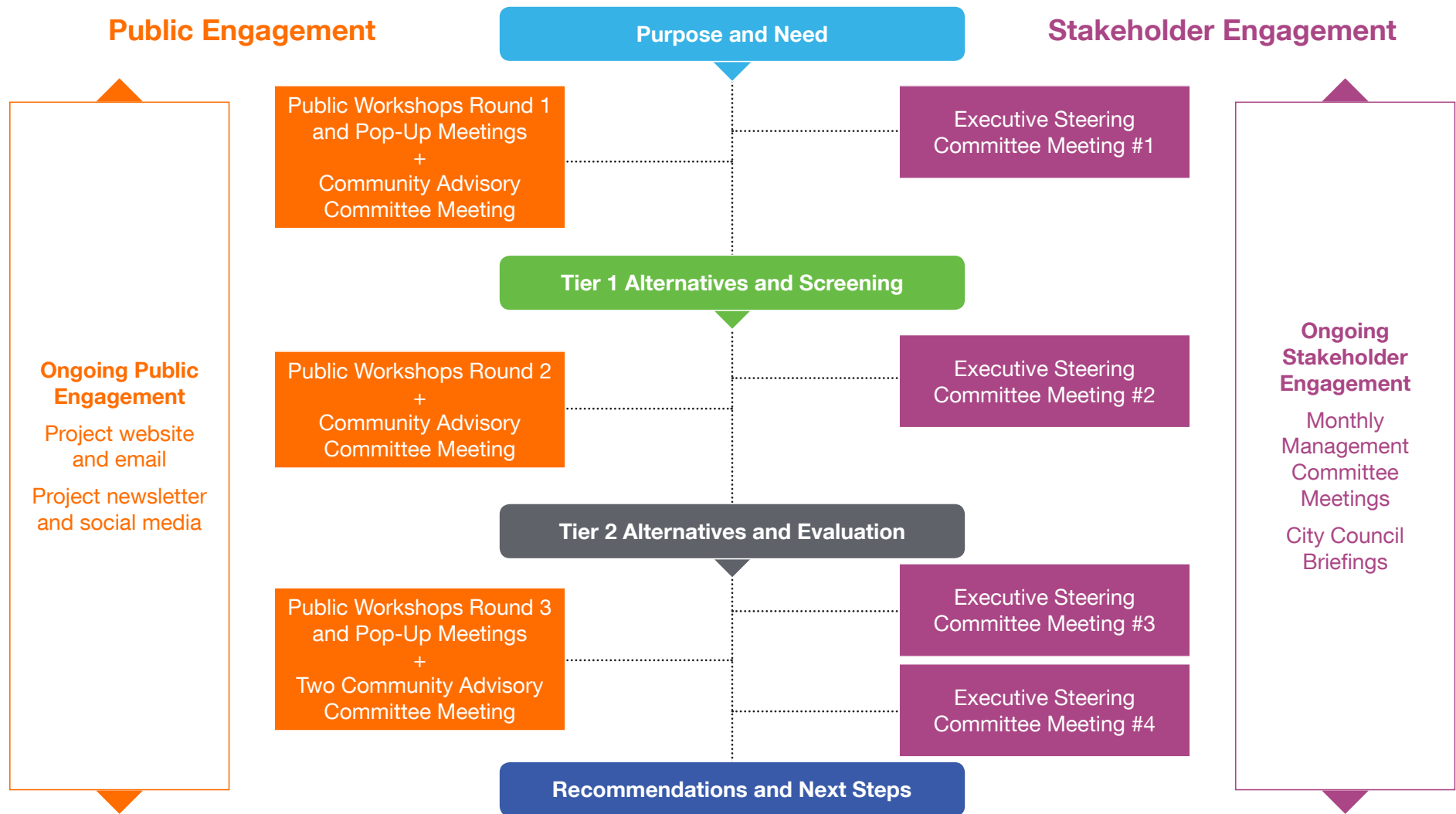
- Identify the project's purpose
- Outline travel paths that led to the development of Tier 1 alternatives
- Generate and weigh performance criteria
- Narrow down and reconfigure alternatives

Outreach efforts were a critical and formative part of the study process. The outreach activities increased awareness, offered opportunities to provide input, and began to build a broader constituency interested in the future of transit on the Peninsula. It is hoped that the momentum and interest generated by this phase of the project will carry forward and be useful in future project phases.








Engagement Process

Throughout the project, HRT coordinated continuously with members of the public and key stakeholders to ensure open dialogue and a collaborative decision-making process.



Transit Modes

There are a variety of transit technologies, or modes, which serve different purposes and require different levels of up front investment. The Peninsula corridor is currently served by local and express bus routes. The study considered high-capacity transit investments that carry the largest number of passengers: Bus Rapid Transit, Modern Streetcar, and Light Rail Transit.

TRANSIT MODES		EXAMPLES	TYPICAL STOP SPACING (MILES)	TYPICAL DAILY RIDERSHIP	
	Local Bus	HRT Bus System	0.25	100 to 5,000	Existing Bus Transit Services on the Peninsula
	Express Bus	HRT MAX Routes	0.25 to 1.0	2,500 to 10,000	
	Bus Rapid Transit (BRT)	Orlando - Lymmo Cleveland - Health Line Eugene - Emerald Express	0.25 to 1.0	5,000 to 15,000	High capacity transit modes considered in the study
	Modern Streetcar	Portland Seattle Charlotte	0.25 to 0.5	1,500 to 10,000	
	Light Rail Transit (LRT)	Norfolk - The Tide Minneapolis - Metro Transit Charlotte - Lynx Dallas - DART	0.25 to 1.0	5,000 to 30,000	



Alternatives

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The Peninsula Corridor Study's high-capacity transit alternatives were defined and screened through a two-tiered, data-driven process.

Eighteen (18) initial **Tier 1** alternatives were defined to respond to the project Purpose and Need and input from the public. The **Tier 1** alternatives relied on a number of baseline assumptions to provide a common ground for comparison:

- High-capacity transit, independent of mode (BRT, streetcar, LRT)
- Specific endpoints and assumed alignment
- Dedicated transit runningways, unless there were constraints such as bridges, tunnels, or other types of infrastructure that limited the feasibility of implementing a dedicated lane.

At the conclusion of **Tier 1**, alternatives were dismissed, retained, or modified on the basis of their technical rank, public comments, and potential fatal flaws. Six alternatives advanced to **Tier 2**.

The **Tier 2** evaluation assessed each of alternative's feasibility, benefits, and compliance with key FTA criteria, specifically cost effectiveness. The **Tier 2** alternatives included a more robust set of assumptions; including, transit mode, station locations, and amount of dedicated transit runningways. The **Tier 2** evaluation, in itself, followed a two-phased approach:

- Phase A — Alternative definition and testing based on FTA cost effectiveness criteria to address the project purpose of effectively competing for federal funding
 - Define transitway alternatives
 - Evaluate cost effectiveness criteria against FTA cost effectiveness thresholds based on projected ridership and cost
 - If necessary, redefine alternative to achieve a supportable cost
- Phase B — **Tier 2** evaluation based on the project's other purpose statements

At the conclusion of **Tier 2**, three BRT alignment alternatives were recommended for further development.

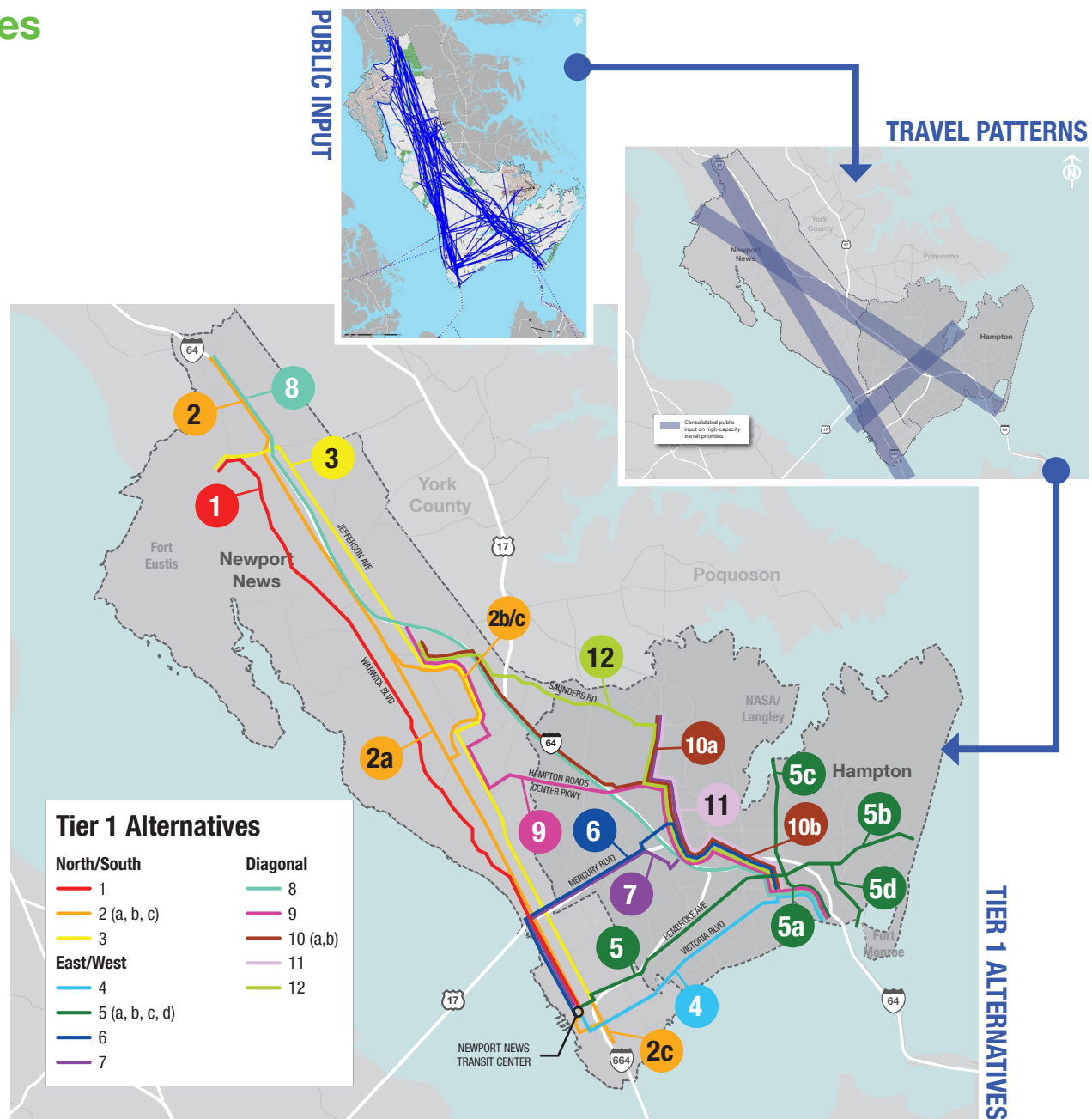
Peninsula Corridor Study

Developing Tier 1 Alternatives

The initial set of **Tier 1** alternatives was defined in response to public input that identified three general travel patterns on the Peninsula—north-south, east-west, and diagonal. These general concepts were refined to develop 18 corridor alternatives for evaluation in the **Tier 1** screening.

The **Tier 1** high-capacity transit alternatives were defined to connect existing activity centers such as retail centers, colleges and universities, large employers including military bases, and higher density residential. The alternatives generally follow existing transportation rights-of-way.

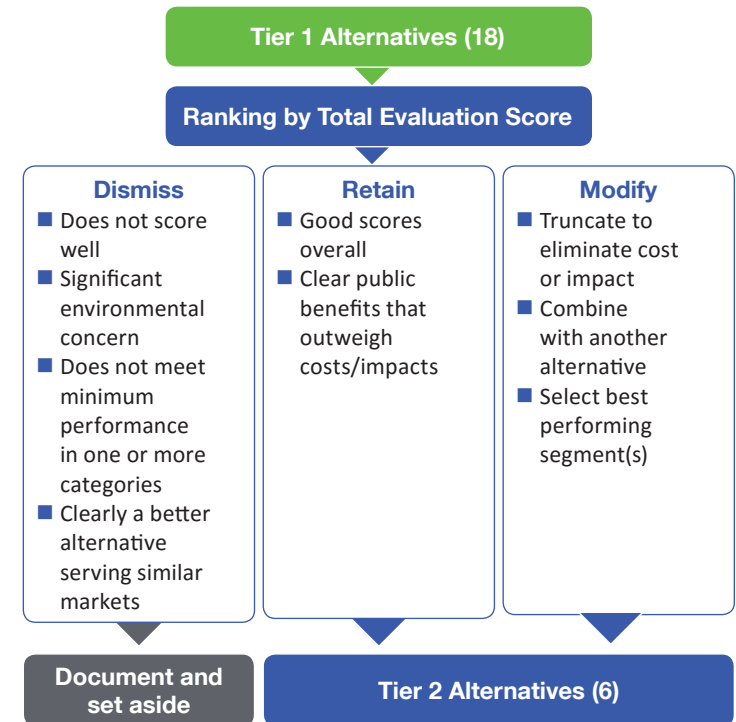
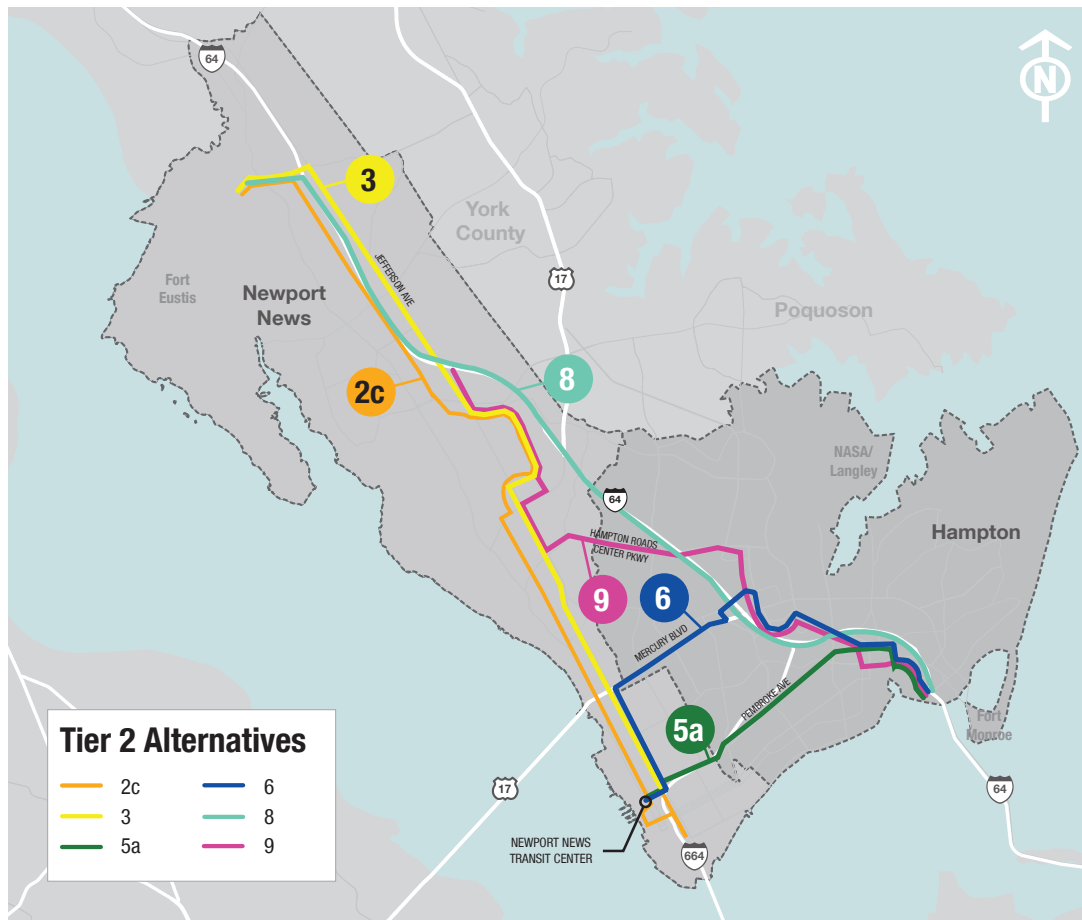
The **Tier 1** alternatives operate primarily in an exclusive guideway and could be implemented as either rail transit or bus rapid transit. For **Tier 1**, specific station sites were not identified; the corridors were evaluated based on the location of the alignment relative to adjacent population and employment.



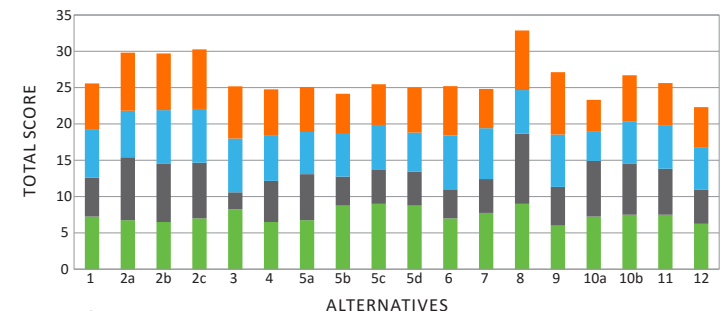
Peninsula Corridor Study

Developing Tier 2 Alternatives

Based on a technical screening of the 18 **Tier 1** alternatives and considering public and stakeholder input, six alternatives were carried forward for further analysis in the **Tier 2** evaluation. These six alternatives were defined in more detail by including potential station sites and assumptions about how the dedicated transit space could be constructed.



Tier 1 Screening Results of Each Alternative



Legend

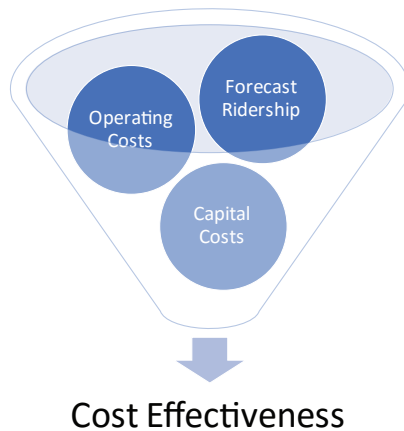


Peninsula Corridor Study

Advancing Alternatives

For a project to qualify for federal funding, it must show proven benefits from the investment it requires. Each of the **Tier 2** alternatives underwent a cost-effectiveness assessment to ensure that the alternatives that were ultimately recommended for further study could be competitive for federal funding. During the assessment, alternatives were refined to reduce costs and target investment in high-ridership areas. The three alternatives that best met the FTA thresholds for overall cost per trip were recommended for further study.

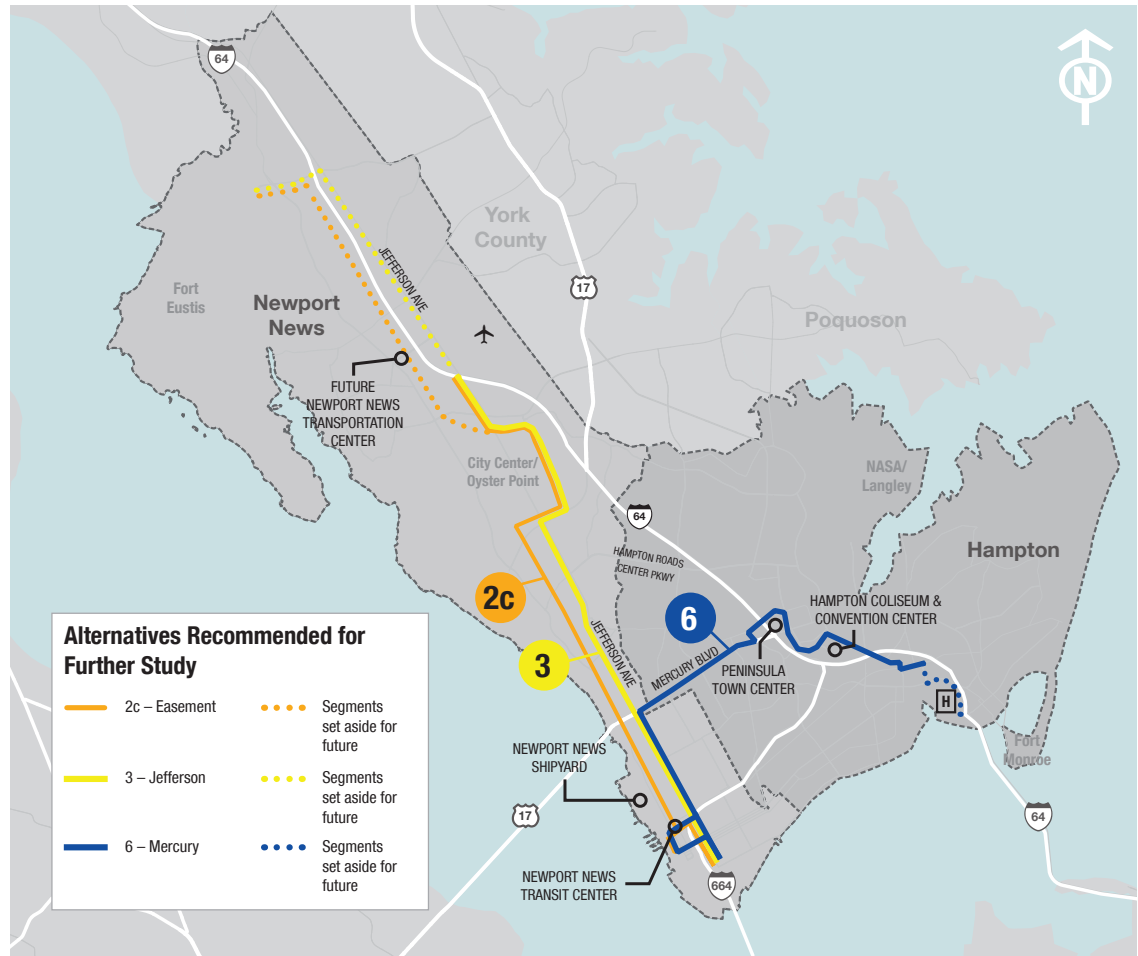
The pages that follow in this section describe the key components of the methodology used to conduct the cost-effectiveness assessment.



TRANSIT MODE IDENTIFICATION

LRT and streetcar were removed from consideration during Tier 2 due primarily to high capital cost. A high-level assessment was conducted and the capital costs of LRT and streetcar were substantially higher than the capital cost of BRT while ridership potential was similar for all technologies.

Some portions of the proposed alternatives are recommended to be set aside and reserved for a future phase. These segments are shown as dashed lines in the map.



RIDERSHIP FORECASTING

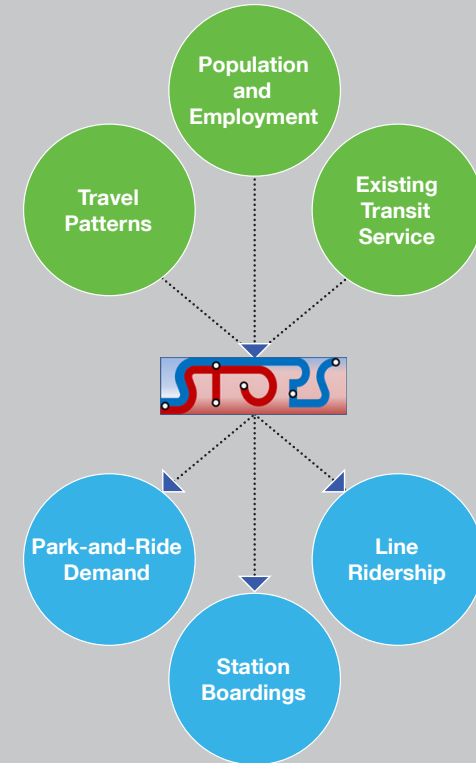
The ridership input to the cost-effectiveness assessment was developed based on output from the FTA recommended modeling program called Simplified Trips-on Projects Software (STOPS). STOPS is a tool that FTA developed to generate accurate ridership estimates of BRT and rail projects. The ridership methodology and results of this corridor study are documented in the Ridership Technical Report.

The model used the following inputs to generate results:

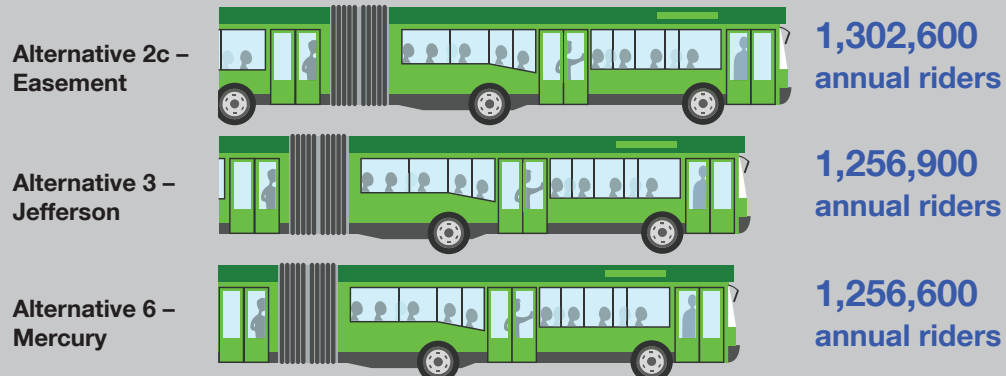
- 2009 and 2040 Population and Employment data from Hampton Roads Transportation Planning Organization (HRTPO)
- Transit travel patterns from 2016 Transit Origin and Destination Survey
- Transit ridership counts from Hampton Roads Transit (HRT) route-level ridership summaries for existing routes
- Existing transit service levels from HRT in General Transit Feed Specification (GTFS)¹ schedules (same data used by Google Maps route planner)
- Future transit service (with project) coded into GTFS to represent mobility benefits of the project

Data from national research helps ensure that the STOPS model is able to closely match local conditions.

Ridership outputs from STOPS that are used in the cost-effectiveness assessment are known as “linked transit trips”. Linked transit trips are the number of one-way trips on the system regardless of how many transfers are involved. STOPS also outputs other values such as boardings by station/stop and mode of access to transit. Current year (2016) ridership forecasts were considered in the cost-effectiveness assessment.



Ridership Results



¹ GTFS defines a common format to describe schedule, route, stop, fare, and calendar data for fixed-route transit.

TRANSIT OPERATIONS

BRT provides an improved experience of riding transit as compared to that of existing bus service. Buses will come more often throughout the day and dedicated lanes for transit will allow for a more reliable trip. The preliminary operating assumptions lead to the development of a travel time estimate. The travel time estimate then informs annual operating costs for the cost effectiveness assessment and capital costs such as the number of vehicles required to run the service.

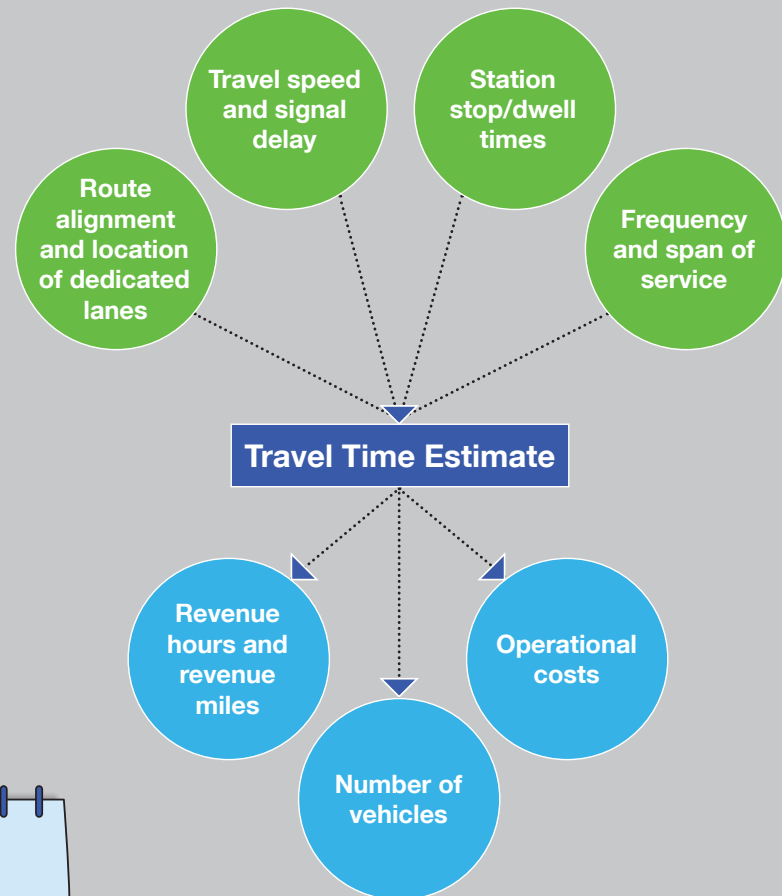
HOW DOES BRT IMPROVE BUS TRAVEL TIMES?

- Dedicated lanes
- Frequent service throughout the day
- Collecting payment before you board the bus
- Giving buses priority at intersections
- Multiple doors, level boarding

FREQUENT ALL-DAY SERVICE

MON-THUR: 17 hours/day
FRI-SAT: 18 hours/day
SUN: 10 hours/day

WEEKDAY PEAK:
Buses Every 10 Minutes
WEEKDAY OFF-PEAK
& WEEKENDS:
Buses Every 15-30 Minutes



CAPITAL AND OPERATING COSTS

The overall cost to construct and implement the alternatives is a key consideration in the cost-effectiveness assessment.

Using a methodology consistent with how FTA reviews capital cost data, a preliminary capital cost projection was prepared. Operating costs were calculated by multiplying the revenue hours (page 15) by an hourly cost for operating BRT. More detailed estimates will need to be conducted during future design and engineering phases of the project. More information on methodology and assumptions is included in the Capital Cost Technical Report and the Operations Technical Report.



BRT buses



Bus-only lanes



Traffic signal upgrades



Stations

Elements Included in Capital Costs Estimates



Right-of-way



Bus storage and maintenance facility



Park-and-ride facilities



Utilities

Preliminary Project Cost Projections (BRT)

BRT Alternative		2c – Easement	3 – Jefferson	6 – Mercury
2016	Length (miles)	12.9	13.3	12.2
	Capital Cost (2016 \$)	\$250M	\$225M	\$190M
	Annual Operations & Maintenance Cost (2016 \$)	\$4.5M	\$6.0M	\$6.0M
2024	Capital Cost (2024 \$)	\$315M	\$285M	\$240M
	Annual Operations & Maintenance Cost (2024 \$)	\$5.7M	\$7.6M	\$7.6M

Notes:

- 1. Costs should be used for general long-term planning only. More detailed studies will be needed to determine specifics for project programming.
- 2. Cost estimates include contingencies to account for lack of design detail.
- 3. Costs in 2016 dollars escalated to 2024 dollars using a 3.0% annual growth rate (consistent with VDOT Project Cost Estimating System).

Peninsula Corridor Study

Cost Effectiveness

The study's cost effectiveness assessment followed FTA guidance, factoring in estimated costs and projected ridership. FTA ranks projects on a five-tiered scale ranging from low to high. A "medium" rating is required for entry into both FTA's New and Small Starts programs.

The Peninsula alternatives were tested against both the New and Small Starts criteria. Alternatives 2c, 3, and 6 met the medium cost effectiveness criteria for the Small Starts program (capital cost less than \$300 million and federal contribution less than \$100 million). Should more than \$100 million in federal funding be sought, the alternatives would require further refinement to meet the New Starts criteria.

FTA Cost-Effectiveness Breakpoints (cost per trip)

FTA Rating	New Starts Range	Small Starts Range
High	< \$4.00	< \$1.00
Medium-High	\$4.00 to \$5.99	\$1.01 to \$1.99
Medium	\$6.00 to \$9.99	\$2.00 to \$3.99
Medium-Low	\$10.00 to \$14.99	\$4.00 to \$5.00
Low	>\$15.00	>\$5.00

Source: Final Interim Policy Guidance, Federal Transit Administration Capital Investment Grant Program, June 2016

FTA Cost-Effectiveness Guidance

	NEW STARTS PROGRAM	SMALL STARTS PROGRAM
Cost	Annualized capital cost using FTA-provided workbook plus annual operating cost	Annualized expected federal share of the capital cost (no operational cost)
Ridership	Annual riders (linked project trips) using FTA STOPS model	
Formula	$\frac{(\text{Annualized Capital Cost} + \text{Annual Operating Cost})}{\text{Annual Ridership}}$	$\frac{\text{Annualized Capital Federal Share}}{\text{Annual Ridership}}$
Threshold for Medium Rating	Below \$10 per trip	Below \$4 per trip

Cost-Effectiveness Ratings by Alternative (2016 Dollars)

Criteria	BRT Alternative		
	2c – Easement	3 – Jefferson	6 – Mercury
Total Capital Cost (Overall Project) (2016\$)	\$246,920,000	\$224,810,000	\$190,780,000
Annualized Capital Cost	\$8,728,000	\$9,174,000	\$8,018,000
Annualized Operational Cost	\$4,479,000	\$6,017,000	\$6,017,000
Total Annual Cost	\$13,207,000	\$15,191,000	\$14,035,000
Annual Ridership	1,302,600	1,256,900	1,256,600
NEW STARTS PROGRAM			
Cost per Trip	\$10.14	\$12.09	\$11.17
FTA Rating	Medium-Low	Medium-Low	Medium-Low
Cost Reduction Required (for Medium Rating)	1%	17%	10%
SMALL STARTS PROGRAM			
Assumed Federal Share*	\$100,000,000	\$100,000,000	\$95,390,000
Federal Cost per Trip	\$2.71	\$3.25	\$3.19
FTA Rating	Medium	Medium	Medium

*Based on a maximum Small Starts limit of \$100 million or 50% of the project cost



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The Peninsula Corridor Study found that BRT is the right solution to make it easier and faster to travel around the Peninsula. The study identified the three best performing BRT corridors — Alternatives **2c – Easement**, **3 – Jefferson**, and **6 – Mercury** — that effectively serve key destinations and activity centers and provide improved travel choices for residents, workers, and visitors traveling between the major housing, retail, and employment centers. The benefits to those who work in the Peninsula and/or call it home make it worth the investment on a BRT system.

The three corridors fulfill the elements of the project purpose by:

- Providing additional travel choices with reliable and frequent BRT service
- Supporting growth in accordance with plans by connecting existing and planned activity centers
- Mitigating increases in congestion by attracting additional riders to transit
- Contributing to making the Peninsula a more desirable place to live by supporting a more walkable, healthy lifestyle
- Effectively competing for federal funds by providing a cost effective high capacity transit option



Peninsula Corridor Study

WHAT IS BUS RAPID TRANSIT?

BRT is a high-capacity, bus-based public transportation system that's fast, reliable, and convenient. It can offer the benefits of rail transit at much lower costs.

BRT typically offers:

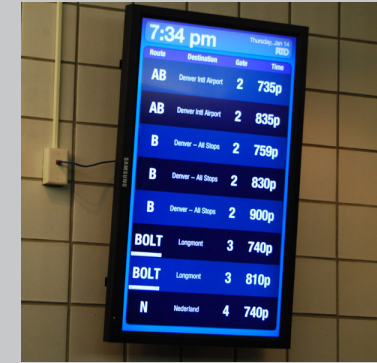
- Bus-only lanes along the majority of the corridor
- Enhanced vehicles with level boarding and multiple doors
- Substantial stations with seating, lighting, and real-time information of bus arrivals
- Improved technology such as preboard fare collection and signal enhancements at intersections



Bus-only lanes



Preboard fare collection
(source NYCDOT)



Real-time passenger information



Easily identified passenger stations



Well-lit stations



Level boarding

Peninsula Corridor Study

Cost-Effective Alternatives

The cost-effectiveness analysis identified portions of BRT Alternatives **2c – Easement**, **3 – Jefferson** and **6 – Mercury** that would likely qualify for FTA funding (shown in the map). These alternatives represent the Peninsula's best opportunity to meet community needs and effectively compete for needed FTA funding and meet the project's Purpose and Need.

Tier 2 Evaluation Results

After determining that the three BRT alternatives were cost-effective options, further evaluation was conducted to understand how well each alternative meets the project purpose. On the following pages, a comparative summary of the results for each alternative using a series of green arrows as shown below:

BEST →

BETTER →

GOOD →

More information is presented in the Tier 2 Technical Report.



Some portions of the proposed alternatives are recommended to be set aside and reserved for a future phase. These segments are shown as dashed lines in the map.

Peninsula Corridor Study

Alternative 2c – Easement

12.9 miles | 84% bus-only lanes | 4,200 opening year weekday trips (projected)

The Easement alternative connects Patrick Henry Mall and the Southeast community of Newport News. It also serves Tech Center, Oyster Point, Riverside Regional Medical Center, the Shipyard, and downtown Newport News, connecting to local buses at Newport News Transit Center. South of J. Clyde Morris Boulevard, it travels in a new exclusive bus alignment parallel to the existing rail corridor. An extension to Fort Eustis may be considered in the future.

TIER 2 EVALUATION RESULTS

Provide travel choices

BEST →

Support growth in accordance with plans

BETTER →

Mitigate increase in congestion by attracting riders

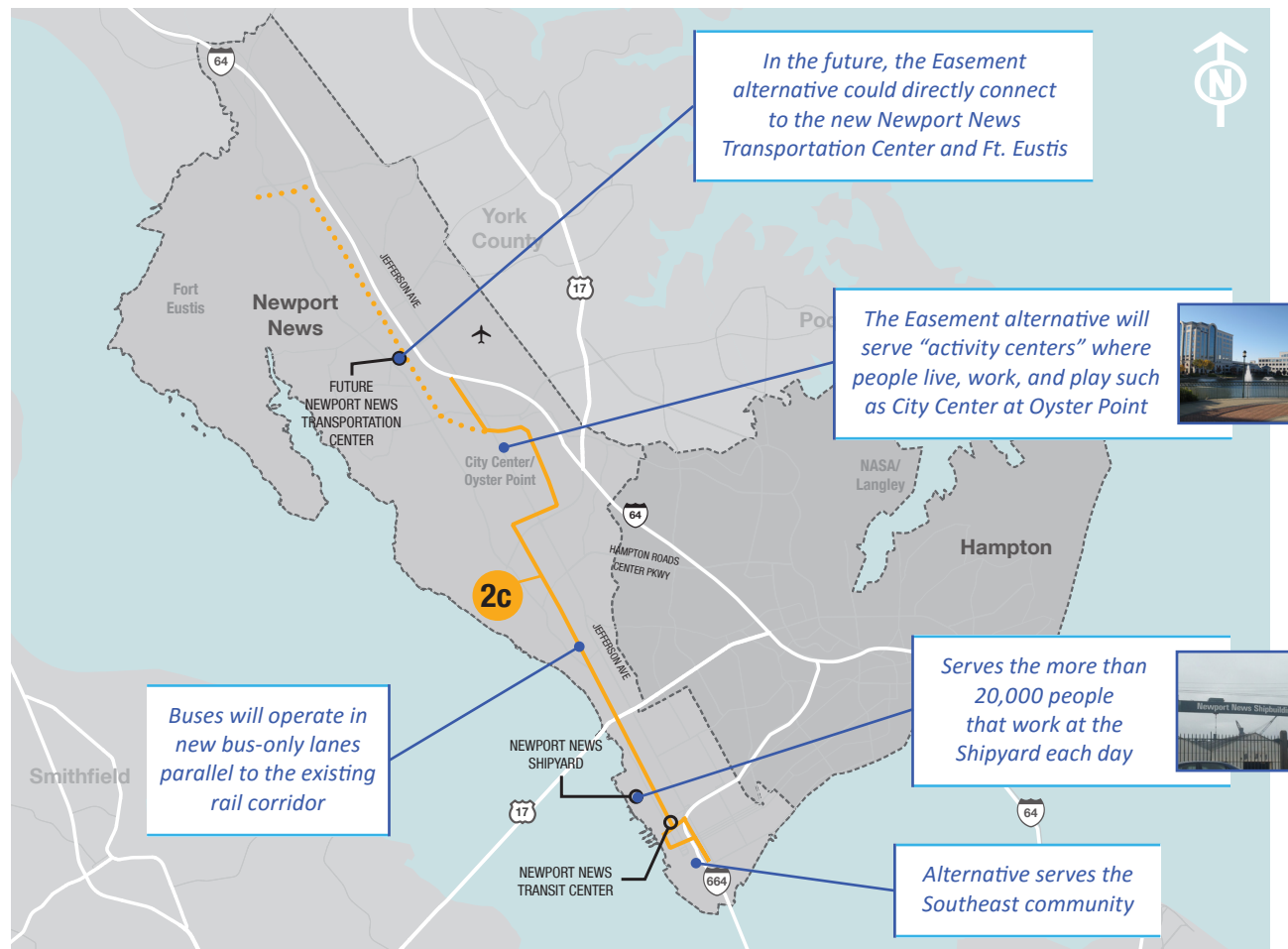
GOOD →

Contribute to desirable place and attract new residents

GOOD →

Effectively compete for federal funding

BEST →



Peninsula Corridor Study

Alternative 3 – Jefferson

13.3 miles | 76% bus-only lanes | 4,100 opening year weekday trips (projected)

The Jefferson alternative connects Patrick Henry Mall and the Southeast community of Newport News predominately using Jefferson Avenue. It also serves Tech Center, Oyster Point, Riverside Regional Medical Center, the Shipyard, and downtown Newport News, connecting to local buses at Newport News Transit Center. South of J. Clyde Morris Boulevard, it travels predominantly in dedicated bus lanes. An extension to Fort Eustis may be considered in the future.

TIER 2 EVALUATION RESULTS

Provide travel choices

BETTER

Support growth in accordance with plans

BETTER

Mitigate increase in congestion by attracting riders

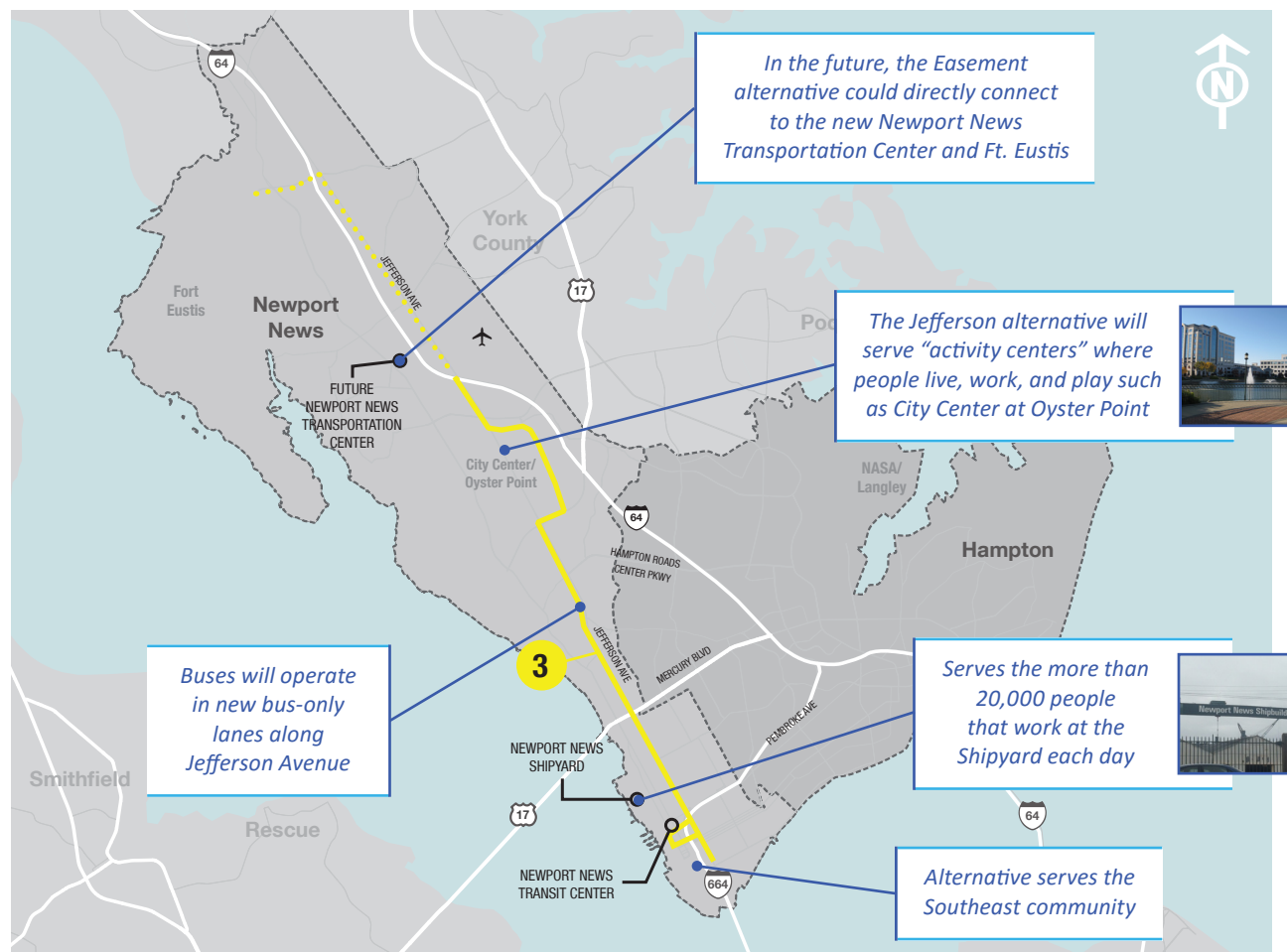
BETTER

Contribute to desirable place and attract new residents

BETTER

Effectively compete for federal funding

GOOD



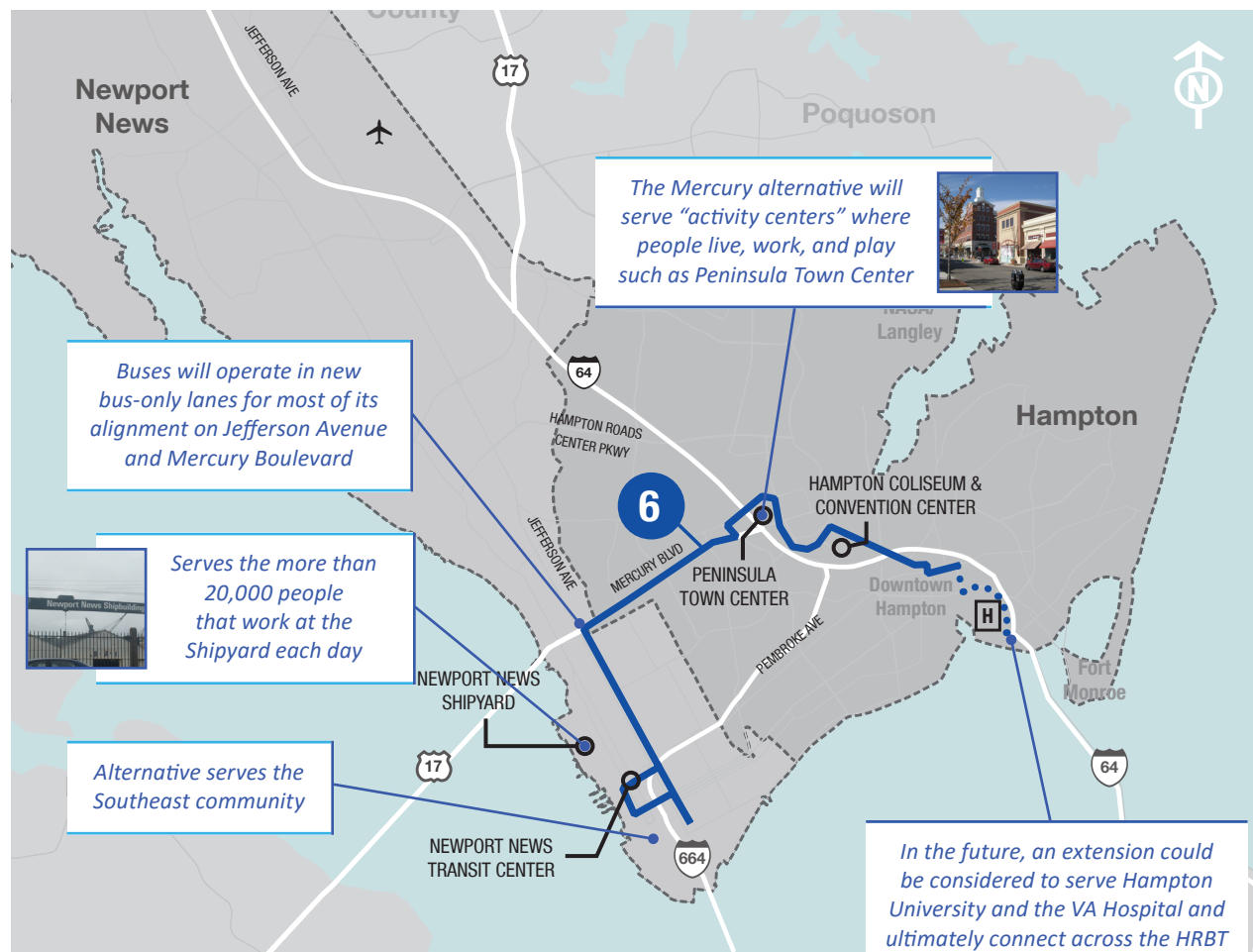
Some portions of the proposed alternatives are recommended to be set aside and reserved for a future phase. These segments are shown as dashed lines in the map.

Peninsula Corridor Study

Alternative 6 – Mercury

12.2 miles | 65% bus-only lanes | 4,100 opening year weekday trips (projected)

The Mercury alternative connects the Southeast community of Newport News and downtown Hampton. It also serves the downtown Newport News, Shipyard, Peninsula Town Center, and Hampton Coliseum, connecting to local buses at Newport News and Hampton Transit Centers. Along Jefferson Avenue north of I-664 and along Mercury Boulevard, the alternative runs in dedicated bus lanes. An extension to the VA Medical Center in Hampton can be considered in the future.



TIER 2 EVALUATION RESULTS

Provide travel choices

BETTER

Support growth in accordance with plans

BEST

Mitigate increase in congestion by attracting riders

BEST

Contribute to desirable place and attract new residents

BEST

Effectively compete for federal funding

BETTER

Some portions of the proposed alternatives are recommended to be set aside and reserved for a future phase. These segments are shown as dashed lines in the map.

Peninsula Corridor Study

Land Use Evaluation

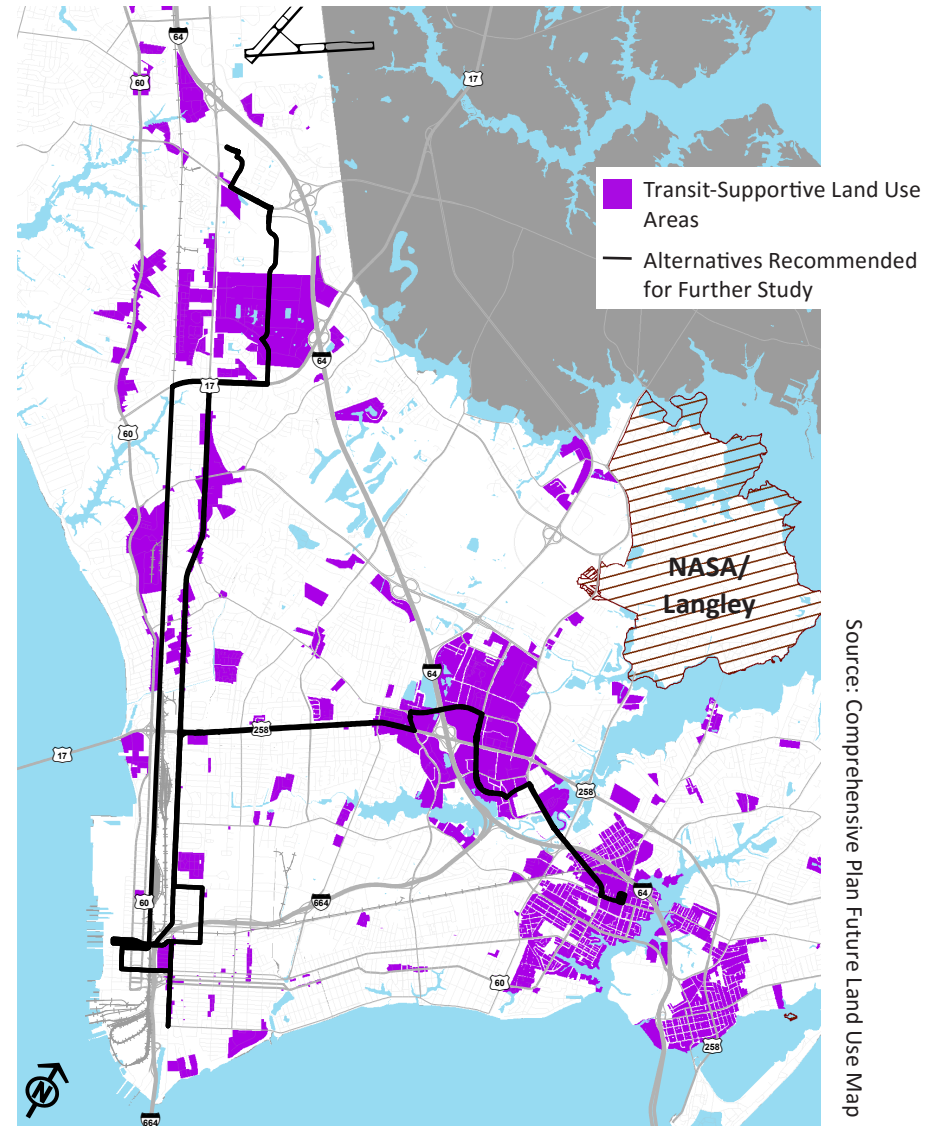
Land use is an important consideration in investing in high capacity transit. Appropriate land use can increase the success of transit by making it easier and more attractive to access transit stations.

The land use analysis first evaluated the suitability of existing land use plans, policies, and zoning to support a corridor transit investment. Existing city plans and policies were evaluated according to the extent to which they contained transit supportive features.

The areas shown in purple on the map are the areas with the highest potential to support a corridor transit investment.

Transit-supportive Features

- Stated goal of supporting transit
- Encouragement/allowance for mixed-use (office, retail, industrial, residential), especially vertical mixed-use
- Pedestrian-oriented environment including
 - Sidewalks
 - Small/no setbacks – buildings pulled up to the street
 - Parking behind buildings or structured parking
 - Ground floor activation (e.g., transparency, retail uses, etc.)
- Height (more than one story)
- Density (residential units/acre)



Source: Comprehensive Plan Future Land Use Map

Areas shown in purple are envisioned by the cities to support high capacity transit such as BRT. The three alternatives recommended for further study cover extensive areas designated as transit-supportive in the future land use plans.

Peninsula Corridor Study

Environmental Considerations

Summary of Potential Impacts

The evaluation of the transit corridor alternatives on the Peninsula included an analysis of potential environmental effects. Some of the key findings of this assessment include:

- All of the alternatives will cross a number of streams
- Alternative **2c – Easement** will likely impact about 1.3 acres of parkland
- All of the alternatives will pass by existing historic structures
- All of the alternatives will pass by noise sensitive areas
- All of the alternatives are likely to require additional right-of-way and some displacement of existing uses:
 - Alternative **2c – Easement** could impact up to 30 acres
 - Alternative **3 – Jefferson** could impact up to six acres
 - Alternative **6 – Mercury** could impact up to three acres
- All of the alternatives will have impacts to traffic operations

During the next phase of project development, more detailed design will be completed and measures to minimize and mitigate potential environmental effects will be identified and incorporated into the project as appropriate.



Potential NEPA Class of Action

The next phase of project development will further define corridor alternatives and complete an environmental review under the National Environmental Policy Act² (NEPA). A NEPA review is required because of the anticipated expenditure of federal funds for this project.

The table below identifies the NEPA Class of Action categories. Based on the preliminary environmental analysis, the likely Class of Action for Alternative **3 – Jefferson** and Alternative **6 – Mercury** would be either a categorical exclusion (CE) or an environmental assessment (EA). However, the extensive right-of-way requirements for Alternative **2c – Easement** would likely require an environmental impact statement (EIS).

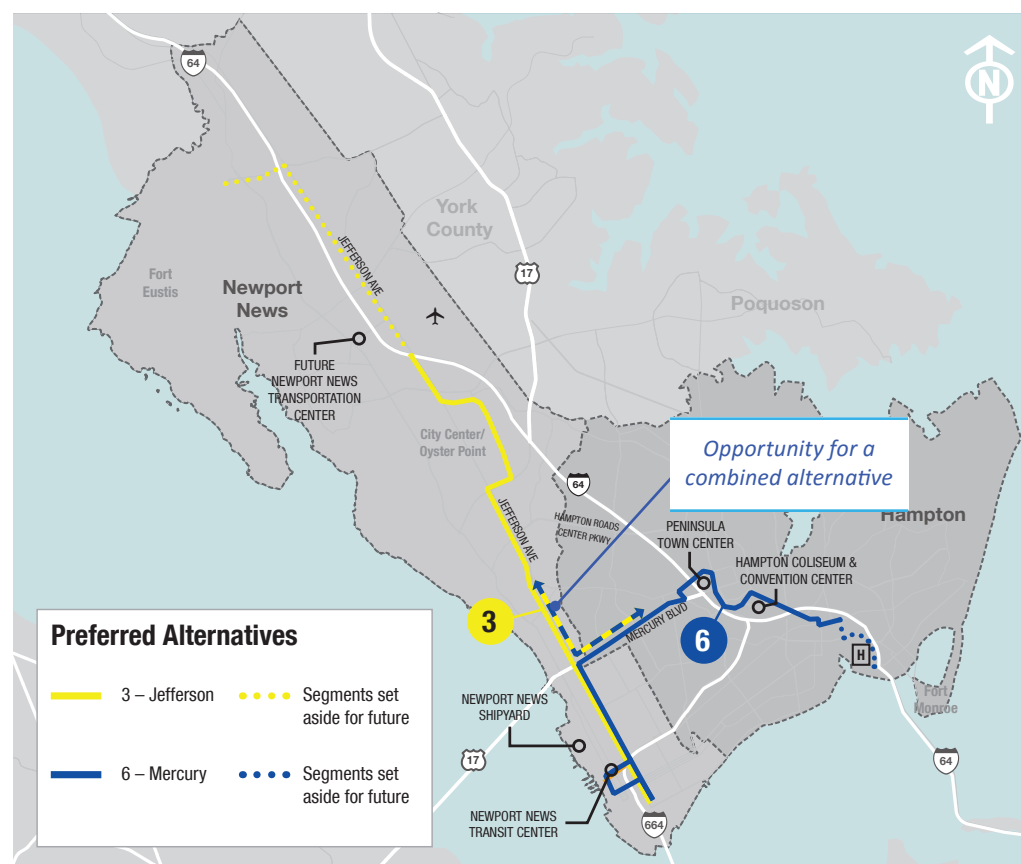
Type of Environmental Review	General Definition	How it Might Apply on the Peninsula	Estimated Duration
Environmental Impact Statement (EIS)	The highest level of environmental review. Required for large, complex projects with significant public controversy and/or with potential for significant environmental effects where the consideration of multiple alternatives is warranted.	A fixed guideway or 'new' right-of-way that impacts parks, wetlands, water bodies, floodplains, or historic resources or that requires displacement of existing uses.	24-36 months
Environmental Assessment (EA)	A less vigorous level of environmental review where the potential for environmental effects is low or can be substantially mitigated.	Minor 'new' right-of-way required and impacts are not on sensitive land uses.	12-18 months
Categorical Exclusion (CE)	Predefined actions that have been determined to have no significant environmental effect.	A fixed guideway that is entirely within existing transportation right-of-way.	> 6 months

Peninsula Corridor Study

Preferred Alternatives

The initial Tier 2 evaluation focused on cost effectiveness and identified three alternatives that would effectively serve the high capacity transit needs of the Peninsula: Alternatives **2c – Easement**, **3 – Jefferson** and **6 – Mercury**. More detailed evaluation of these alternatives yielded a preference for Alternative **3 – Jefferson** and Alternative **6 – Mercury** over Alternative **2c – Easement**. The reasons for this preference are discussed below:

- Alternative **2c – Easement** requires the acquisition of significant right of way (approximately 30 acres) to assemble a continuous corridor for BRT adjacent to the existing railroad right of way. While much of this corridor is in city easements, the property would need to be purchased outright to use as a BRT guideway. Over 200 existing residential parcels would likely be impacted.
- Alternative **3 – Jefferson** and Alternative **6 – Mercury** right-of-way impacts are significantly less and may be mitigated through design refinement. The Alternative **2c – Easement** right of way impacts cannot be mitigated through design refinement.
- The railroad corridor is a barrier to accessing the **2c – Easement** corridor from the east. Both Alternative **3 – Jefferson** and Alternative **6 – Mercury** have active uses on both sides of the BRT corridor.
- The railroad property along the east side of the **2c – Easement** corridor is unlikely to change to a transit supportive land use in the foreseeable future, limiting the potential economic development benefits of this alternative.
- There is an opportunity to form a combined alternative of Alternative **3 – Jefferson** and Alternative **6 – Mercury** to form a combined alternative that would effectively connect the Peninsula Town Center/Convention Center area in Hampton to the Oyster Point/Tech center area in Newport News. This connection could be established using existing roadway rights of way with minimal new construction.



Some portions of the proposed alternatives are recommended to be set aside and reserved for a future phase. These segments are shown as dashed lines in the map.

- Providing a similar connection between Alternative **2c – Easement** and Alternative **6 – Mercury** would require bridge structures to connect across the railroad and would likely require additional right of way.
- The combination of Alternative **3 – Jefferson** and Alternative **6 – Mercury** represents a high capacity solution that benefits both Hampton and Newport News. It provides a high level of community connectivity very consistent with the transportation needs expressed by the public during the study process.



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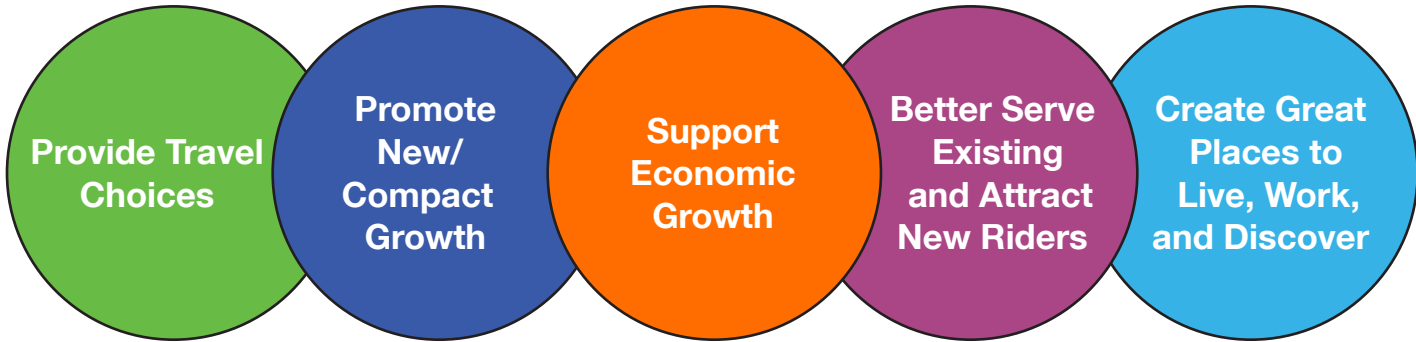
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The two preferred alternatives connect key destinations, address the project’s purpose, and meet the criteria for federal funding. These alternatives are an opportunity for the Peninsula to realize a multitude of benefits that an investment in bus rapid transit (BRT) can provide.



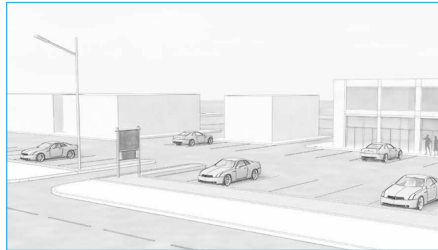
Peninsula Corridor Study

Creates More Desirable Places

The two preferred alternatives have the potential to positively contribute to existing and future land uses in the corridors.

In recent years, both Hampton and Newport News have placed an emphasis on their 'new downtown' areas – Oyster Point/City Center and Peninsula Town Center/Coliseum Central. In these areas, policy and regulation have aligned to focus and encourage growth while supporting walkable, mixed-use redevelopment. These alternative transit corridors can support the strong pedestrian orientation of these existing land use investments and support additional growth with similar characteristics. The cities can update the small area plans along these transit corridors to align the plans with the potential transit investment and help improve the project rating by addressing FTA criteria shown to the right.

Transit-oriented development (TOD) can improve market competitiveness by improving accessibility to/from employment opportunities, services, and amenities. For individuals, transit provides mobility benefits related to the time, cost, and quality of trips. The design qualities and character of the built environment associated with TOD also are key ingredients in establishing a sense of place and permanence that can be attractive to residents, businesses, and visitors.



BRT can help transform empty parking lots on the Peninsula into vibrant communities

FEDERAL TRANSIT ADMINISTRATION RATING CRITERIA

Land use and economic development are two of the criteria used by the FTA to rate transit projects for funding. The FTA rating is based on the following criteria:

FTA CRITERIA: LAND USE

The rating for the land use criterion is based on the existing:

- Corridor and station area development, and development character
- Station area pedestrian facilities including access for persons with disabilities
- Corridor and station area parking supply
- Proportion of existing legally binding affordability restricted housing in the corridor compared to the proportion of legally binding affordability restricted housing in the counties in which the project travels

FTA CRITERIA: ECONOMIC DEVELOPMENT

The rating for the economic development effects criterion is based on:

- Ratings for transit-supportive plans and policies
- Performance and impacts of policies
- Tools to maintain or increase the share of affordable housing in the project corridor

Peninsula Corridor Study

Contributes to Community Growth

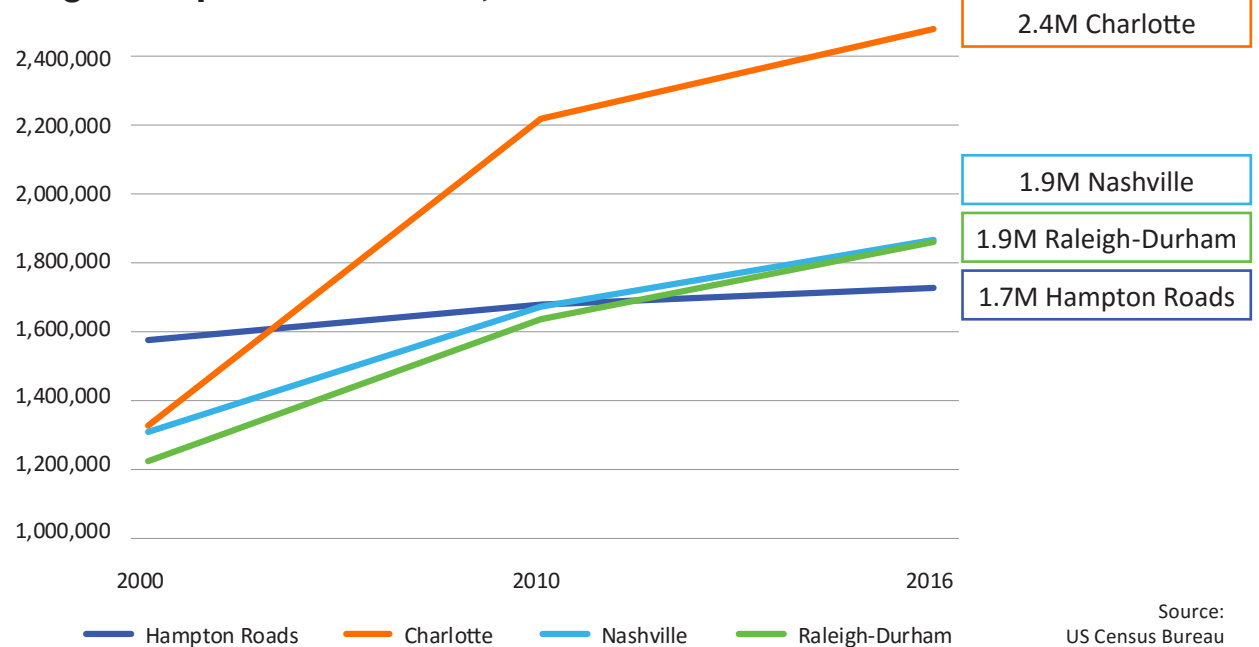
High-capacity, fixed guideway transit can support the economies of Hampton and Newport News by facilitating commuting, encouraging the growth of mixed-use job and employment centers that appeal to workers, and providing an alternative to roadway congestion and the costs it imposes on businesses.

Hampton and Newport News contain regionally significant job centers. They account for nearly 20 percent of total employment in the Hampton Roads region. Home to employers such as the Shipyard, Joint Base Eustis-Langley, Sentara CarePlex, higher education institutions, and Jefferson Labs, as well as other growing private sector industries, the cities are projected to experience employment growth of 13–15 percent through 2040.

However, as shown in the adjacent chart, the population of Hampton and Newport News are not projected to grow as fast as employment. This creates a geographic mismatch between where people live and work, leading to congestion by increasing commuting, and reduces funding available for infrastructure and services.

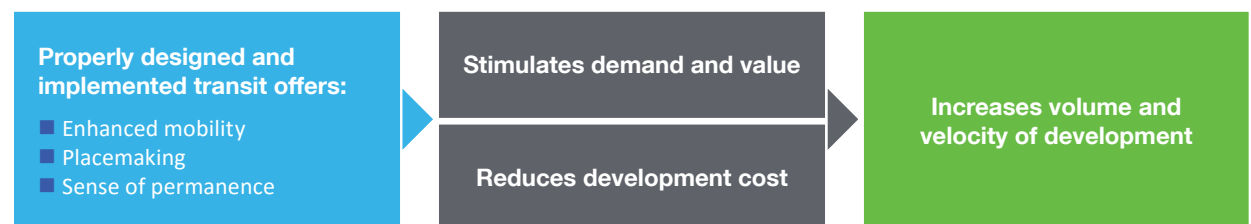
Properly designed and implemented BRT has the potential to positively impact real estate values along the selected corridors. Higher real estate values help to close the feasibility gap for new developments and translate into increased tax revenues for the cities.

Region Population Growth, 2000 – 2016



Although the Hampton Roads region is growing, it is doing so at a slower pace than peer regions. Since 2000, growth in Hampton Roads has fallen behind that of comparably-sized metro areas in the Southeast. Forward-looking transportation investments present an opportunity to attract residents and harness greater economic growth in Hampton and Newport News.

The Influence of Transit

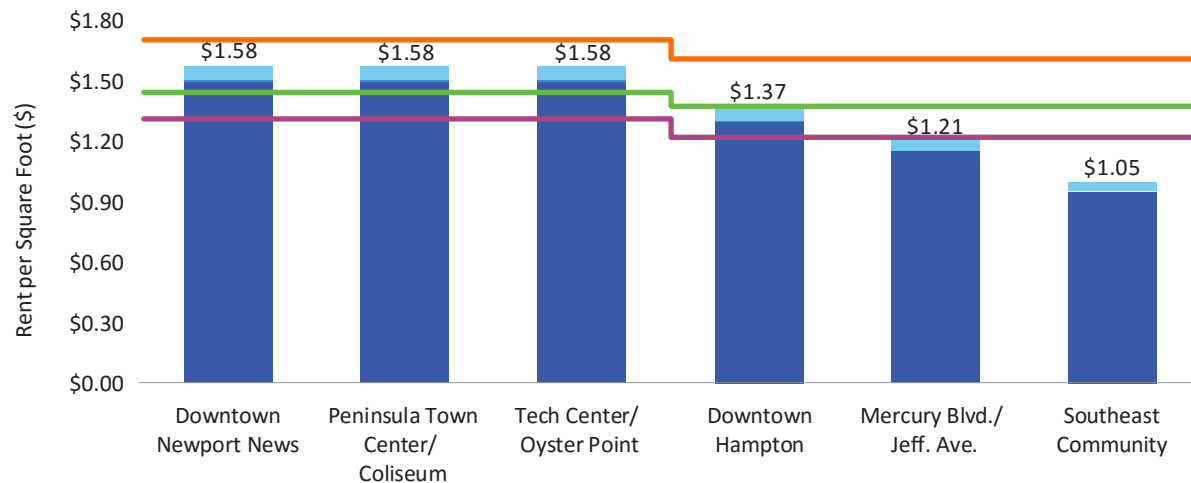


Increases the Value of Real Estate

Studies documenting the impact of BRT investments on nearby real estate values and new development have typically found that BRT will convey a five to ten percent real estate premium to adjacent properties, typically within one-quarter to one-half of a mile. Investment of this kind is important because it encourages investors to build and people to live in these communities. The real estate value increases result from the premium residents and businesses are willing to pay for the mobility and amenity benefits offered by high-capacity transit.

Assuming a more conservative estimate of a five percent value premium on real estate with the implementation of BRT in Hampton and Newport News, this would strengthen the feasibility of new development and reduce the potential need for public subsidy. Implementating transit will provide real estate and economic development benefits by delivering a value-added transit premium.

Rent Per Square Foot for Multifamily Apartments by Submarket

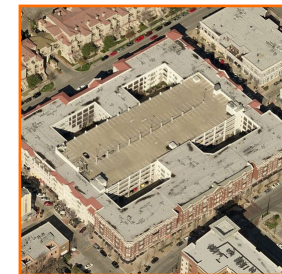


Estimated Rent Threshold Required to Support:

— Garden-style low-rise development

— Mid-rise with surface parking

— Mid-rise with structured parking



With the addition of BRT, the potential to support higher density development on the Peninsula increases.

Peninsula Corridor Study

Attracts Development

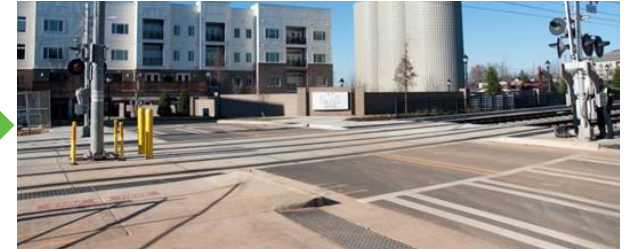
Mobility, infrastructure, and placemaking benefits of transit investments will make the corridor more attractive to residents and visitors as well as to businesses looking to attract a workforce that values transit. Higher demand for properties near transit from these groups results in higher rents and faster absorption. This translates into higher potential revenues for the developer.

At the same time, proximity to a transit line can help reduce development costs by lowering the amount of parking the project must deliver. In addition, the higher-density style of TOD can create further costs savings for the developer and the cities through infrastructure efficiencies. As a result, denser, urban development can be more feasible when proximate to transit.

Before



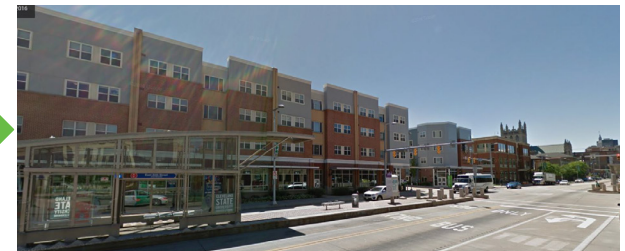
After



The 9.6-mile light rail transit line in Charlotte has generated new development.



A 9.3-mile extension to the University of North Carolina Charlotte campus is scheduled to open in 2018.



The Cleveland HealthLine offers some of the most robust BRT infrastructure in North America. Since the system was established in 2008, there has been significant private investment in new development.





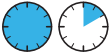


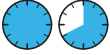



Bus rapid transit will help shape the future of development on the Peninsula.

Peninsula Corridor Study

Creates Opportunity

The two preferred Peninsula transit corridors will improve mobility for Peninsula residents. The corridors will provide connections between many Peninsula activity centers and will offer significantly reduced transit travel times.

Alternative	Existing Auto	Existing Bus	Proposed BRT
			
3 (Jefferson)	 36 minutes	 70 minutes	 39 minutes <small>(within 10% of auto time, 44% savings over existing bus)</small>
6 (Mercury)	 38 minutes	 101 minutes	 41 minutes <small>(within 10% of auto time, 60% savings over existing bus)</small>

Provides mobility and expanded transportation choices for continued growth

- Congestion is and will continue to be an issue in the region. High-capacity transit can help by providing more ways to move more people in fewer vehicles
- The regional transit vision plan, *Connect Hampton Roads*, envisions **116 miles of high-capacity transit** throughout the region that will bring new transit service within close proximity to hundreds of thousands of homes and jobs



Current congestion in the region causes more than 46 million hours of delay annually



The region is forecasted to see more growth in the number of cars (about 28 percent) than people by 2040

Source: *Connect Hampton Roads*, March 2015.

Attracts more users to transit with greater reliability and savings in commute cost and time

- Using **transit instead of driving a car can save you approximately \$10,100 per year¹**
- Transit signal priority (TSP) detects and gives preference to transit vehicles at intersections to provide more green time for transit

¹Source: American Public Transportation Association 2015 Fact Book.

More sustainable form of transportation that reduces your carbon footprint



Someone with a 20-mile round trip commute can reduce his or her annual carbon emissions by more than 4,800 pounds by switching from driving to public transit.

Source: APTA 2015 Fact Book.

ACCOMMODATING A CHANGING DEMOGRAPHIC

Approximately 12 percent of the Peninsula population are seniors. Good transit helps seniors to 'age in place' by providing understandable, easy-to-use services that allow access to their community benefits; including, activities, services, etc.

Younger generations are embracing a car-free lifestyle and have a greater preference for living and working in areas with robust transit choices.



Recommendations and Next Steps

BRT Alternatives **3 – Jefferson** and **6 – Mercury** represent the Peninsula’s best opportunity to meet the high capacity transit needs of the community and effectively compete for needed FTA funding. The next phase of project development will further refine corridor alternatives and complete environmental review under the National Environmental Policy Act (NEPA).

GUIDANCE FROM MANAGEMENT COMMITTEE ON FUTURE ACTION ITEMS

- Consider combining Alternative **6 – Mercury** with Alternative **3 – Jefferson** to effectively connect the Peninsula Town Center/Convention Center area in Hampton to the Oyster Point/Tech center area in Newport News
 - Minimize the need for additional right of way acquisition by adapting the BRT design to fit within available right of way
 - Minimize BRT travel times
 - Use exclusive guideway (added or converted lanes) where practical
 - Incorporate transit signal priority (TSP)
 - Continue coordination with FTA, local jurisdictions, and the public
- Take a closer look at impacts to traffic operations, particularly in the areas of:
 - Jefferson Avenue and J. Clyde Morris Boulevard
 - Mercury Boulevard near Todds Lane and Coliseum Drive
- Restructure existing bus service to best interface with the proposed new BRT service
 - Take advantage of new bus infrastructure as appropriate
- Reassess zoning near proposed station sites with the goal of optimizing opportunities for transit-oriented development
- Further investigate and document potential environmental impacts as part of a NEPA review process