

i-26ALT

I-26 Fixed Guideway Alternatives Analysis

CHAPTER V: Screen Two – Financial Analysis

Draft Report – February 2016



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Table of Contents

1	Introduction	1
1.1	Local Financial Commitment Rating.....	1
1.2	Screen Two Financial Analysis.....	1
2	Screen Two Build Alternatives Overview	1
2.1	BRT Alternatives:.....	2
2.2	LRT Alternatives	2
3	Current Capital and Operating Condition	2
4	Capital and Operating Costs	3
4.1	Capital Cost Estimation Methodology.....	3
4.2	BRT Alternatives Capital Cost Assumptions	4
4.2.1	Guideway Assumptions.....	4
4.2.2	Station Assumptions	5
4.2.3	Support Facilities Assumptions.....	5
4.2.4	Sitework and Special Conditions	5
4.2.5	Systems	6
4.2.6	ROW & Land.....	6
4.2.7	Vehicles	6
4.2.8	Professional Services.....	6
4.3	LRT Alternatives Capital Cost Assumptions	7
4.3.1	Guideway Assumptions.....	7
4.3.2	Station Assumptions	8
4.3.3	Support Facilities Assumptions.....	8
4.3.4	Sitework and Special Conditions	8
4.3.5	Systems	9
4.3.6	ROW & Land.....	9
4.3.7	Vehicles	9
4.3.8	Professional Services.....	9
4.4	Estimated Capital Costs.....	9
4.5	Operating & Maintenance (O&M) Costs	12
4.5.1	BRT Operating Costs.....	12
4.5.2	LRT Operating Costs	13
5	Funding Analysis	13

5.1	Federal Funding.....	13
5.1.1	New Starts Program (Section 5309).....	13
5.1.2	Small Starts Program (Section 5309).....	15
5.1.3	Bus and Bus Facilities Formula Program	17
5.1.4	CMAQ – Congestion Mitigation and Air Quality Improvement Program	17
5.1.5	Surface Transportation Program.....	18
5.1.6	TIGER Grant.....	18
5.2	Local/State Funding	19
5.2.1	Property Taxes.....	19
5.2.2	Payroll / Employer Taxes.....	20
5.2.3	Sales Tax	20
5.2.4	Special Assessment Districts	22
5.2.5	Tax Increment Financing (TIF).....	23
5.3	Other Funding/Financing	24
5.3.1	Public-Private Partnership	24
5.3.2	Joint Development	25
5.3.3	Naming Rights.....	25
6	List of Appendices	27
	Appendix 5-A: Screen Two Build Alternatives	27
	Appendix 5-B: Alternatives Operating Statistics	27
	Appendix 5-C: Alignment Variation Exhibit- King Street Extension	27

List of Tables

Table 4 - 1: Screen Two BRT Alternatives Design Assumptions and Unit Costs6
Table 4 - 2: Screen Two LRT Alternatives Design Assumptions and Unit Costs*9
Table 4 - 3: BRT Alternatives Estimated Capital Cost Summary*10
Table 4 - 4: LRT Alternatives Estimated Capital Cost Summary* 11
Table 4 - 5: BRT and LRT Assumed Operating Plan 12
Table 4 - 6: BRT Alternatives Annual O&M Costs 12
Table 4 - 7: LRT Alternatives Annual O&M Costs 13

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1 Introduction

The Berkeley-Charleston-Dorchester Council of Governments (BCDCOG) initiated the I-26 Regional Fixed Guideway Transit Alternatives Analysis Study (i-26ALT) to improve transit options for residents and businesses along the I-26 Corridor. The purpose of the I-26 Alternatives Analysis is to improve transit service and enhance regional mobility along the I-26 Corridor connecting Summerville, North Charleston, and Charleston in South Carolina.

Upon the conclusion of this Alternatives Analysis and selection of a preferred alternative, the project sponsor intends to submit a request for entry into Project Development under the Federal Transit Administration (FTA's) Capital Investment Program, which provides grant funding for capital projects on a competitive basis and uses a set of Project Justification and Financial Commitment Criteria to rate projects. Projects must receive a project rating of medium or better in order to move forward in each phase of the process.

Although projects do not need to be rated in order to begin project development, this Screen Two Analysis ranks each potential alternative using the FTA's Project Justification and Financial Commitment criteria to aid in the selection of a locally preferred alternative that can compete for federal funds. Once the preferred alternative enters into the Project Development phase of the Capital Investment Grant Program, project sponsors have two years to complete NEPA, develop preliminary engineering, obtain required funding commitments, and meet the required "medium" rating or better to move forward into Engineering.

1.1 Local Financial Commitment Rating

The measures FTA uses for the evaluation of local financial commitment for proposed New Starts projects are:

- The proposed share of total project capital costs from sources other than the Section 5309 CIG program;
- The current financial condition, both capital and operating, of the project sponsor and/or relevant project partners when more than one entity is involved in construction or operations;
- The commitment of funds for both the capital cost of the proposed project and the ongoing transit system operation and maintenance, including consideration of whether there is significant private participation;
- The reasonableness of the financial plan, including planning assumptions, cost estimates, and the capacity to withstand funding shortfalls or cost overruns.

1.2 Screen Two Financial Analysis

This Screen Two Financial Analysis is intended to review the three BRT alternatives and three LRT alternatives, as well as their variants, based on current planning levels to understand how each alternative ranks using the FTA financial commitment ratings. Section 2.0 provides a brief summary of the Screen Two Alternatives. Section 3.0 discusses the rating criteria applied under the current capital and operating conditions. Section 4.0 provides the capital construction and operating Cost assumptions used in the Screen Two Analysis and discusses the criteria for reasonableness of assumptions and financial capacity ratings. Section 5.0 provides a review of select non-FTA funding sources that have been used with success by other projects, in an effort to provide some insight on potential funding sources.

It is important to note that cost estimates used in the Screen Two Analysis are planning level estimates and not based on engineering or design drawings. Cost estimates will be updated as design progresses during project development. This analysis is for planning purposes only, as projects do not need to be rated to enter into the project development phase.

2 Screen Two Build Alternatives Overview

A total of 20 alternatives were evaluated in the Initial Alternatives Screening: Screen One Analysis. This phase of screening utilized a combination of subjective and objective analyses to identify those modes and alignments that best meet the project goals and objectives and warrant a more detailed Screen Two Analysis.

Results from the Screen One Analysis, input from the I-26 Alternative Analysis Steering and Technical Advisory Committees, and community feedback identified 12 Build alternatives to move forward into the Screen Two Analysis. A detailed description of the alternatives can be found in the I-26ALT Screen Two Alternatives Report.

2.1 BRT Alternatives:

The following BRT alternatives are analyzed in this Screen Two Analysis. Figures A-1 through A-6 (Appendix 5-A) show the BRT Screen Two Build Alternatives.

- Alternative B-1: US 78/US 52/Meeting– BRT
- Alternative B-3: US 78/US 52/East Bay – BRT
- Alternative C-1: US 176/US 52/Meeting – BRT
- Alternative C-3: US 176/US 52/East Bay – BRT
- Alternative D-1: Dorchester Rd/US 52/Meeting – BRT
- Alternative D-3: Dorchester Rd/US 52/East Bay – BRT

2.2 LRT Alternatives

The following LRT alternatives are analyzed in this Screen Two Analysis. Figures A-1 through A-6 (Appendix 5-A) show the LRT Screen Two Build Alternatives.

- Alternative B-2: US 78/US 52/Meeting – LRT
- Alternative B-4: US 78/US 52/East Bay – LRT
- Alternative C-2: US 176/US 52/Meeting – LRT
- Alternative C-4: US 176/US 52/East Bay – LRT
- Alternative D-2: Dorchester Rd/US 52/Meeting – LRT
- Alternative D-4: Dorchester Rd /US 52/East Bay – LRT

3 Current Capital and Operating Condition

The rating for current capital and operating conditions of the existing transit system includes measures of average fleet age, bond ratings within the last two years, ratio of current assets to current liabilities, and recent service history. Greater emphasis is placed on fleet age and current ratio than on bond rating and service history. At this planning level evaluation, the rating under these criteria would be the same for all of the Screen Two alternatives. In order to get a medium rating (or better), the following criteria must be met:

- Average bus fleet age under 8 years: CARTA's average fleet age is 13+ years. For a medium rating or better, the fleet age should be under 8 years. An average bus fleet age over 12 years results in a low rating.
- Current ratio exceeding 1.2: The current ratio identifies the agency's liquidity and ability to pay short-term liabilities (debts and payables) with its short-term assets (cash, inventory, receivables). The ratio of current assets to current liabilities should be 1.2 for a medium rating. A current ratio of less than 1.0 results in a low rating.
- Bond ratings of A (Fitch/S&P) or A3 (Moody's) or better: These ratings identify the financial strength of bond issuers. A low rating is given to bond ratings of BBB (Fitch/S&F) or Baa3 (Moody's) or below.
- Historical positive cash flow/no cash flow shortfalls: Sponsors that have recent historical cash flow problems receive a low rating.
- Only minor service adjustments in recent years: Agencies that have had major service cutbacks in recent years receive a low rating.

To address capital needs from an aging fleet and to ensure a strong financial position, CARTA is undergoing a Comprehensive Operational Analysis (COA) intended to address route performance and efficiencies as a result of a growing region and ridership base, while setting aside a capital reserve to modernize its fleet. The COA short

range recommendations over the next several years should help to improve the projected rating under this category.

4 Capital and Operating Costs

The reasonableness of capital and operating cost estimates and planning assumptions/capital funding capacity make up 50 percent of the local financial commitment rating. To receive a medium rating, a project must have a financial plan that contains planning assumptions and cost estimates that are consistent with recent historic experience and includes committed funds to cover project cost shortfalls and operating expenses. The following provides the methodology and assumptions used to estimate the planning level costs for the Screen Two alternatives.

4.1 Capital Cost Estimation Methodology

Capital cost estimates were developed based on the Federal Transit Administration (FTA) Standard Cost Categories (SCC) database, estimates from projects under development, and local conditions. Standard Cost Categories utilize a database of cost information gathered from recent FTA projects across the country in a consistent format that can be used as a cost estimating resource for the transit industry. Costs are grouped into categories as follows:

- 1) Dedicated Guideway: Includes costs associated with construction of the guideway structures, roadbed, and pavement or track.
- 2) Stations: Includes costs associated with station platforms, ramps, fixtures, canopies, and passenger amenities as well as elevators and stairs.
- 3) Support Facilities: Includes operations, maintenance and storage facilities.
- 4) Sitework & Special Conditions: Includes all other construction activities that are not accounted for in categories 1 through 3 such as demolition, utility and other sitework.
- 5) Systems: Includes train control signals, communication systems, central control, hardware and software, traction power substations, overhead catenary systems, underground duct banks, automated fare collection, grade crossing protection and roadway traffic signal systems.
- 6) ROW, Land, & Existing Improvements: Includes acquisition and right-of-way costs.
- 7) Vehicles: Includes costs for LRT Vehicles and low-floor 60-foot articulated BRT buses.
- 8) Professional Services: Includes soft costs such as preliminary engineering, final design, project management, insurance, permitting, surveys and inspection, and other services.

Although the Screen Two cost estimates are at a planning level, capital costs are organized using these same categories in order to develop an annualized cost for the project justification criteria preliminary ratings, as well as to compare major project element costs.

4.2 BRT Alternatives Capital Cost Assumptions

The Screen Two BRT alternatives' cost estimates are based on unit costs for recent projects under development or completed to determine typical unit costs based on major standard cost categories as described below.

4.2.1 Guideway Assumptions

The guideway costs for the BRT alternatives are based on a cost of \$4.2M per mile for all alternatives. Guideway assumptions for BRT alternatives are described in segments from west (Summerville) to east (Charleston) as follows:

Alternative B-1: US 78/US 52/Meeting BRT

Segment 1-Main & Richardson to US 78 & 165 (Berlin G Myers): This segment is assumed to operate in mixed traffic with one-way service circulating Summerville Square and curb-side lanes to Berlin G Myers.

Segment 2-US 78 (Berlin G Myers to Otranto): This segment is assumed to operate in an at-grade semi-exclusive guideway with cross traffic and curb-side lanes.

Segment 3-US 52 (Otranto to Carner): This segment is assumed to operate in an at-grade semi-exclusive guideway in the median with cross traffic.

Segment 4-US 52 (Carner to Mt. Pleasant): All BRT alternatives assume a semi-exclusive dedicated guideway. See design variant note below for more information on design variations along this segment.

Segment 5-US 52 (Mt. Pleasant to Line Street): This segment assumes curb-side mixed traffic operations.

Alternative B-3: US 78/US 52/East Bay BRT

Alternative B-3 shares the same alignment as Alternative B-1 for Segments 1 through 4. Segment 5 assumes a partial at-grade semi-exclusive guideway converting to mixed traffic close to Calhoun. The alternative would operate in dual lanes with one-way circulation at Calhoun for the turnaround.

Alternative C-1: US 176/US 52/Meeting BRT

Segment 1-US 176 (US 17A to Otranto): This segment is assumed to operate in an at-grade semi-exclusive guideway with curbside allowing mixed traffic.

Segment 2-US 52 (Otranto to Carner): This segment is assumed to operate in an at-grade semi-exclusive guideway in the median with cross traffic.

Segment 3-US 52 (Carner to Mt. Pleasant): All BRT alternatives assume a semi-exclusive dedicated guideway. See design variant note below for more information on design variations along this segment.

Segment 4-US 52 (Mt. Pleasant to Line Street): This segment assumes mixed traffic operations in curbside lanes.

Alternative C-3: US 176/US 52/East Bay BRT

This alternative shares the same alignment as Alternative C-1 for Segments 1 through 4. Segment 5 assumes a partial at-grade semi-exclusive guideway converting to mixed traffic closer to Calhoun. The alternative would operate in curbside lanes with one-way circulation at Calhoun for the turnaround.

Alternative D-1: Dorchester/US 52/Meeting BRT

Segment 1-Dt. Summerville (Main to Berlin G Myers): This segment is assumed to operate in mixed traffic with a one-way guideway operation circulating the Summerville Square and curbside lanes to Berlin G Myers.

Segment 2-Old Trolley (Berlin G Myers to Dorchester Rd): This segment is assumed to operate in an at-grade semi-exclusive guideway with cross traffic and curbside lanes.

Segment 3-Dorchester Road (Old Trolley to W. Montague): This segment is assumed to operate in an at-grade semi-exclusive guideway with cross traffic in the center median.

Segment 4-Dorchester Road (W. Montague to Rivers Avenue): This segment is assumed to operate in an at-grade semi-exclusive guideway with dual lanes and cross traffic for portions of the alignment. Sections where ROW narrows due to railroad, bridges, or other limitations are assumed to operate in mixed traffic operations.

Segment 5-US 52 (Dorchester to Carner): This segment is assumed to operate in an at-grade semi-exclusive dual lane guideway.

Segment 6-US 52 (Carner to Mt. Pleasant): All BRT alternatives assume a semi-exclusive dedicated guideway. See design variant note below for more information on design variations along this segment.

Segment 7-US 52 (Mt. Pleasant to Line Street): This segment assumes mixed traffic operations in dual lanes.

Alternative D-2: Dorchester/US 52/East Bay BRT

This alternative shares the same alignment as Alternative D-1 for Segments 1 through 6. Segment 7 assumes a partial at-grade semi-exclusive guideway converting to mixed traffic closer to Calhoun. The alternative would operate in dual lanes with one-way circulation at Calhoun for the turnaround.

***Design Variant Note:* Stakeholder outreach revealed a desire to operate the service along the US 78/King Street Extension segment between Stromboli and Mt. Pleasant, to serve future development at Braswell Street (Appendix 5-C). Due to limited available ROW and the presence of active rail lines on either side of this segment, mixed traffic operations would likely be required. Norfolk Southern expressed a concern for safety and traffic impacts on the King Street variant. Alternatively, the Meeting Street variant raises concerns over multiple rail crossings along that segment. Additionally, a pedestrian walkway over the rail ROW would be needed to allow safe access to the station. This variant will need to be resolved for all of the alternatives during project development for the preferred alternative. For the planning phase, the Meeting Street alternative is assumed in an at-grade semi-exclusive guideway for BRT and on an elevated guideway for LRT.

4.2.2 Station Assumptions

The BRT station alternatives are grouped into three station types for cost estimation purposes:

- 1) Neighborhood Stations: These stations are the simplest stops with enhanced shelters, benches, platforms, and other amenities. These are assumed to cost \$150,000 per station.
- 2) Transit Nodes: These stations include additional amenities as they provide connections to other routes and are assumed to provide additional space for bus pullouts and larger waiting areas. They are assumed to be twice the cost of a neighborhood station at \$300,000 per station.
- 3) PNR/Major Transfer Center: These stations are assumed to include park & ride facilities and transfer facilities for bus connections. These stations are assumed to be \$1.8M per station to account for parking areas and transfer facilities.

4.2.3 Support Facilities Assumptions

The BRT alternatives assume the existing maintenance and storage facility would be expanded to accommodate the new larger vehicle types. The estimated capital cost is assumed to be \$1,000,000 per vehicle.

4.2.4 Sitework and Special Conditions

Sitework costs include demolition, clearing, earthwork, sight utilities and utility relocation, hazardous material removal and mitigation, environmental mitigation, site structures and other sitework related to the project. For this planning level analysis, a cost of \$400 per linear foot of guideway is assumed.

4.2.5 Systems

Systems costs include technological improvements such as traffic signal prioritization and crossing protections, passenger information systems, and fare payment systems. For the BRT planning level cost estimation, this cost is assumed at \$150,000 per major intersection to account for these costs.

4.2.6 ROW & Land

For this planning level analysis, ROW acquisition is not known. A 50 percent contingency on construction costs of the project is applied for the analysis.

4.2.7 Vehicles

BRT vehicles assume a cost of \$800,000 per vehicle for 60' articulated vehicles. Vehicle totals are based on the proposed operating plan for each alternative with a 1.2 spare ratio.

4.2.8 Professional Services

Professional services make up project development, engineering, project management, construction administration, legal and permitting, startup and other “soft” costs for the project. For this planning level analysis these costs are assumed to be 50 percent of the estimated construction costs.

The following Table 4-1 shows the design and cost assumptions for the Screen Two BRT alternatives used to develop the planning level capital cost estimates.

Table 4 - 1: Screen Two BRT Alternatives Design Assumptions and Unit Costs

Screen Two BRT Alternatives	Unit Cost	Measure	Alt B-1: US 78/Mtg BRT	Alt B-3: US 78/EB BRT	Alt C-1: US 176/Mtg BRT	Alt C-3: US 176/EB BRT	Alt D-1: Dorch/Mtg BRT	Alt D-3: Dorch/EB BRT
1.0 Dedicated Guideway	\$4,200,000	Guideway Mile	23.12	24.30	22.06	23.24	24.61	25.79
2.0 Stations			18	19	16	17	16	17
<i>Neighborhood</i>	<i>\$150,000</i>	<i>Station</i>	6	6	6	6	9	9
<i>Node</i>	<i>\$300,000</i>	<i>Station</i>	6	8	4	6	3	5
<i>PNR</i>	<i>\$1,800,000</i>	<i>Station</i>	6	5	6	5	4	3
3.0 Light Maintenance Facility	\$1,000,000	Vehicle	16	17	14	15	17	18
4.0 Sitework	\$400	Linear Ft	123,422	129,678	116,419	122,674	129,924	136,179
5.0 Systems	\$150,000	Intersection	98	100	83	86	125	128
6.0 Real Estate & ROW	50%	Hard Costs	1	1	1	1	1	1
7.0 Vehicles	\$800,000	Per Vehicle	16	17	14	15	17	18
8.0 Professional Services	50%	Hard Costs	1	1	1	1	1	1

**Note – Reflects planning level capital costs*

4.3 LRT Alternatives Capital Cost Assumptions

The Screen Two LRT Alternative cost estimates are based on unit costs for recently completed projects and local conditions to determine typical unit costs based on major standard cost categories.

4.3.1 Guideway Assumptions

The LRT alternatives' guideway costs are based on the guideway type and the track type. These costs assume a linear foot cost per guideway by type: at-grade semi-exclusive right of way (\$4,500), at-grade in mixed traffic (\$2,700), and aerial (\$9,500). Light rail tracks may include either ballasted tracks or embedded tracks. Ballasted track is the most prevalent track type used consisting of rail, tie plates or fastening, crossties, and a sub-ballast bed supported on a prepared subgrade and is generally the standard on exclusive right-of-way. Embedded track is a track structure that is completely covered – except for the top of the rails - with pavement and is typically used for routes in public streets, pedestrian/transit malls, or any area where rubber tired traffic must operate. Embedded track is more expensive to design and construct. While the LRT alternatives would likely use a combination of ballasted and embedded tracks, for this planning level analysis, the more expensive embedded track cost is assumed at \$650 per track foot. The following describes the design assumptions for the guideway and track for the LRT alternatives.

Alternative B-2: US 78/US 52/Meeting LRT

Segment 1-Main & Richardson to US 78 & 165 (Berlin G Myers): This segment is assumed to operate in mixed traffic with single track circulating the Summerville Square and dual tracks to Berlin G Myers.

Segment 2-US 78 (Berlin G Myers to Otranto): This segment is assumed to operate in an at-grade semi-exclusive guideway with cross traffic and dual tracks.

Segment 3-US 52 (Otranto to Carner): This segment is assumed to operate in an at-grade semi-exclusive guideway with cross traffic and dual tracks.

Segment 4-US 52 (Carner to Mt. Pleasant): LRT alternatives assume an elevated dedicated guideway with dual tracks. See design variant note in Section 4.2 for more information on this segment.

Segment 5-US 52 (Mt. Pleasant to Line Street): This segment assumes mixed traffic operations with dual tracks.

Alternative B-4: US 78/US 52/East Bay LRT

Alternative B-4 shares the same alignment as Alternative B-2 for Segments 1 through 4. Segment 5 assumes a partial at-grade semi-exclusive guideway converting to mixed traffic closer to Calhoun. The alternative would operate with dual tracks to Calhoun with single tracks assumed for the turnaround. More detailed engineering analysis is needed during project development to determine appropriate turnaround alternatives for this area.

Alternative C-2: US 176/US 52/Meeting LRT

Segment 1-US 176 (US 17A to Otranto): This segment is assumed to operate in an at-grade semi-exclusive guideway allowing cross traffic and dual tracks.

Segment 2-US 52 (Otranto to Carner): This segment is assumed to operate in an at-grade semi-exclusive guideway with cross traffic and dual tracks.

Segment 3-US 52 (Carner to Mt. Pleasant): LRT alternatives assume an elevated dedicated guideway with dual tracks. See design variant note in Section 4.2 for more information on this segment.

Segment 4-US 52 (Mt. Pleasant to Line Street): This segment assumes mixed traffic operations with dual tracks.

Alternative C-4: US 176/US 52/East Bay LRT

This alternative shares the same alignment as Alternative C-2 for Segments 1 through 4. Segment 5 assumes a partial at-grade semi-exclusive guideway converting to mixed traffic closer to Calhoun. The alternative would operate with dual tracks to Calhoun and single tracks for the turnaround. More detailed engineering analysis is needed to determine appropriate turnaround alternatives for this area.

Alternative D-2: Dorchester/US 52/Meeting LRT

Segment 1-Dt. Summerville (Main to Berlin G Myers): This segment is assumed to operate in mixed traffic with single track operations circulating the Summerville Square and dual track service to Berlin G Myers.

Segment 2-Old Trolley (Berlin G Myers to Dorchester Rd): This segment is assumed to operate in at-grade semi-exclusive guideway with cross traffic on dual tracks.

Segment 3-Dorchester Road (Old Trolley to W. Montague): This segment is assumed to operate in at-grade semi-exclusive guideway with cross traffic on dual tracks.

Segment 4-Dorchester Road (W. Montague to Rivers Avenue): This segment is assumed to operate in at-grade semi-exclusive guideway with cross traffic and dual tracks for portions of the alignment. Sections where ROW narrows due to railroad, bridges, or other limitations are assumed to operate with mixed traffic operations.

Segment 5-US 52 (Dorchester to Carner): This segment is assumed to operate in at-grade semi-exclusive dual track guideway.

Segment 6-US 52 (Carner to Mt. Pleasant): LRT alternatives assume an elevated dedicated guideway with dual tracks. See design variant note in Section 4.2 for more information on this segment.

Segment 7-US 52 (Mt. Pleasant to Line Street): This segment assumes mixed traffic operations with dual tracks.

Alternative D-4: Dorchester/US 52/East Bay LRT

This alternative shares the same alignment as Alternative D-2 for Segments 1 through 6. Segment 7 assumes partial at-grade semi-exclusive guideway with mixed traffic close to Calhoun. The alternative would operate with dual tracks to Calhoun and single tracks for the turnaround. More detailed engineering analysis is needed to determine appropriate turnaround alternatives for this area.

4.3.2 Station Assumptions

The LRT alternatives' station costs include stop, shelter, mall, terminal, platform, parking garages, passenger overpasses, signage and graphics. Although stations are classified to include park & ride and transfer facilities at some locations, this planning level analysis normalizes the cost per station to \$4.0 million based on historical project cost ranges of \$1.5M to \$8.5M, some of which are inclusive of these facilities.

4.3.3 Support Facilities Assumptions

The LRT alternatives assume one heavy maintenance facility and yard will be needed. The planning level capital cost estimate for these facilities assumes a cost of \$1.8M per vehicle.

4.3.4 Sitework and Special Conditions

Sitework costs include demolition, clearing, earthwork, sight utilities and utility relocation, hazardous material removal and mitigation, environmental mitigation, site structures and other sitework related to the project. For this planning level analysis, a cost of \$420 per linear foot of guideway is assumed.

4.3.5 Systems

Systems costs include train control and signals, traction power supply and distribution, communications, fare collection systems, and central control systems, and are estimated based on track feet. Based on historical projects, this planning level cost estimate assumes a capital cost of \$750 per track foot.

4.3.6 ROW & Land

For this planning level analysis, ROW acquisition costs are not known. A 50 percent contingency on construction costs of the project is applied.

4.3.7 Vehicles

Vehicle cost assumptions are \$5 million per vehicle for light rail vehicles. Vehicle totals are based on the proposed operating plan for each alternative with a 1.2 spare ratio.

4.3.8 Professional Services

Professional services make up project development, engineering, project management, construction administration, legal and permitting fees, startup costs and other “soft costs” for the project. For this planning level analysis these costs are assumed to be 50 percent of the estimated construction costs.

The following Table 4-2 shows the design and cost assumptions for the Screen Two LRT Alternatives used to develop the planning level capital cost estimates.

Table 4 - 2: Screen Two LRT Alternatives Design Assumptions and Unit Costs*

Screen Two LRT Alternatives	Unit Cost	Measure	Alt B-2: US 78/Mtg LRT	Alt B-4: US 78/EB LRT	Alt C-2: US 176/Mtg LRT	Alt C-4: US 176/EB LRT	Alt D-2: Dorch/Mtg LRT	Alt D-4: Dorch/EB LRT
1.0 Dedicated Guideway			367,435	383,040	345,414	361,020	386,977	402,582
Guideway: At-grade semi-exclusive right-of-way	\$4,500	Linear Feet	93493.5	101253.5	93214.7	100974.7	97076.12	104836.12
Guideway: At-grade in mixed traffic	\$2,700	Linear Feet	13433.55	11929.25	6691	5186.72	16334.7	14830.42
Guideway: Aerial	\$9,500	Linear Feet	16342.7	16342.7	16342.7	16342.7	16342.7	16342.7
Track: Embedded	\$650	Track Feet	244165.01	253514.74	229165.86	238515.63	257223.29	266573.06
2.0 Stations	\$4,000,000	Station	18	19	16	17	16	17
3.0 Support Facilities: Yards, Shops, Admin, Bldgs	\$2,200,000	Vehicles	15	16	14	15	16	17
4.0 Sitework	\$420	Linear Feet	123,270	129,508	116,249	122,504	129,754	136,009
5.0 Systems	\$750	Track Feet	244,165	253,515	229,166	238,516	257,223	266,573
6.0 Real Estate & ROW	\$1	Hard Costs						
Vehicles	\$5,000,000	Vehicles	15	16	14	15	16	17
8.0 Professional Services	50%	Hard Costs	1	1	1	1	1	1

*Note – Estimates reflect planning level capital costs

4.4 Estimated Capital Costs

The following (Tables 4-3 and 4-4) show the planning level capital cost estimates for each of the BRT and LRT alternatives. A 30 percent contingency is added to the construction costs for all alternatives.

Table 4 - 3: BRT Alternatives Estimated Capital Cost Summary*

BRT Estimated Capital Cost Summary (Base Year 2015)		Alternative B-1: US 78/Meeting BRT	Alternative B-3: US 78/East Bay BRT	Alternative C-1: US 176/Meeting BRT	Alternative C-3: US 176/East Bay BRT	Alternative D-1: Dorchester/Meeting BRT	Alternative D-3: Dorchester/East Bay BRT
10 GUIDEWAY & TRACK ELEMENTS (route miles)		\$97,104,000	\$102,060,000	\$92,652,000	\$97,608,000	\$103,362,000	\$108,318,000
10.02	Guideway: At-grade semi-exclusive (allows cross-traffic)	\$97,104,000	\$102,060,000	\$92,652,000	\$97,608,000	\$103,362,000	\$108,318,000
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)		\$13,500,000	\$12,300,000	\$12,900,000	\$11,700,000	\$9,450,000	\$8,250,000
20.01	Neighborhood Station	\$900,000	\$900,000	\$900,000	\$900,000	\$1,350,000	\$1,350,000
20.02	Transit Node Station	\$1,800,000	\$2,400,000	\$1,200,000	\$1,800,000	\$900,000	\$1,500,000
20.04	PNR Ride Station	\$10,800,000	\$9,000,000	\$10,800,000	\$9,000,000	\$7,200,000	\$5,400,000
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS		\$16,000,000	\$17,000,000	\$14,000,000	\$15,000,000	\$17,000,000	\$18,000,000
30.02	Expansion of Maintenance Facility	\$16,000,000	\$17,000,000	\$14,000,000	\$15,000,000	\$17,000,000	\$18,000,000
40 SITEWORK & SPECIAL CONDITIONS		\$49,368,832	\$51,871,112	\$46,567,496	\$49,069,772	\$51,969,512	\$54,471,792
40.01	Sitework (Linear Feet)	\$49,368,832	\$51,871,112	\$46,567,496	\$49,069,772	\$51,969,512	\$54,471,792
50 SYSTEMS		\$14,700,000	\$15,000,000	\$12,450,000	\$12,900,000	\$18,750,000	\$19,200,000
50.01	Traffic Signal prioritization, crossing protection, etc.	\$14,700,000	\$15,000,000	\$12,450,000	\$12,900,000	\$18,750,000	\$19,200,000
Construction Subtotal (10 - 50)		\$190,672,832	\$198,231,112	\$178,569,496	\$186,277,772	\$200,531,512	\$208,239,792
60 ROW, LAND, EXISTING IMPROVEMENTS		\$3,050,200	\$2,998,884	\$3,078,325	\$3,019,318	\$2,970,513	\$2,917,847
60.01	Purchase or lease of real estate	\$3,050,200	\$2,998,884	\$3,078,325	\$3,019,318	\$2,970,513	\$2,917,847
70 VEHICLES (number)		\$12,800,000	\$13,600,000	\$11,200,000	\$12,000,000	\$13,600,000	\$14,400,000
70.04	Bus	\$12,800,000	\$13,600,000	\$11,200,000	\$12,000,000	\$13,600,000	\$14,400,000
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)		\$95,336,416	\$99,115,556	\$89,284,748	\$93,138,886	\$100,265,756	\$104,119,896
80.01	Project Dev., Engineering, Project Mgmt, Construction Admin, etc.	\$95,336,416	\$99,115,556	\$89,284,748	\$93,138,886	\$100,265,756	\$104,119,896
Subtotal (10 - 80)		\$301,859,448	\$313,945,552	\$282,132,569	\$294,435,976	\$317,367,781	\$329,677,535
90 UNALLOCATED CONTINGENCY		\$57,201,850	\$59,469,334	\$53,570,849	\$55,883,332	\$60,159,454	\$62,471,938
Subtotal (10 - 90)		\$359,061,298	\$373,414,886	\$335,703,418	\$350,319,307	\$377,527,234	\$392,149,473
Cost per Mile (In Millions)		\$15.5	\$15.4	\$15.2	\$15.1	\$15.3	\$15.2

*Note – Estimates reflect planning level capital costs

Notes:

- 1) 60 ROW, Land, Existing Improvements assumes 50% of construction costs
- 2) 70 Vehicles: Cost is inclusive of contingency
- 3) 80 Professional Services: Assumes 50% of Construction Costs
- 4) 90 Unallocated Contingency: 30% contingency is distributed across all construction cost categories

Table 4 - 4: LRT Alternatives Estimated Capital Cost Summary*

LRT Estimated Capital Cost Summary (Base Year 2015)		Alternative B-2: US 78/Meeting LRT	Alternative B-4: US 78/East Bay LRT	Alternative C-2: US 176/Meeting LRT	Alternative C-4: US 176/East Bay LRT	Alternative D-2: Dorchester/Meeting LRT	Alternative D-4: Dorchester/Eastbay LRT
10 GUIDEWAY & TRACK ELEMENTS		\$770,954,242	\$807,889,956	\$741,745,309	\$778,681,104	\$803,397,019	\$840,332,813
10.02	Guideway: At-grade semi-exclusive (allows cross-traffic)	\$420,720,750	\$455,640,750	\$419,466,150	\$454,386,150	\$436,842,540	\$471,762,540
10.03	Guideway: At-grade in mixed traffic	\$36,270,585	\$32,208,975	\$18,065,700	\$14,004,144	\$44,103,690	\$40,042,134
10.04	Guideway: Aerial structure	\$155,255,650	\$155,255,650	\$155,255,650	\$155,255,650	\$155,255,650	\$155,255,650
10.11	Track: Embedded	\$158,707,257	\$164,784,581	\$148,957,809	\$155,035,160	\$167,195,139	\$173,272,489
20 STATIONS, STOPS, TERMINALS, INTERMODAL		\$72,000,000	\$76,000,000	\$64,000,000	\$68,000,000	\$64,000,000	\$68,000,000
20.01	At-grade station stop, shelter, mall terminal, platform	\$72,000,000	\$76,000,000	\$64,000,000	\$68,000,000	\$64,000,000	\$68,000,000
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS		\$33,000,000	\$35,200,000	\$30,800,000	\$33,000,000	\$35,200,000	\$37,400,000
30.03	Heavy Maintenance Facility & Storage Yard	\$33,000,000	\$35,200,000	\$30,800,000	\$33,000,000	\$35,200,000	\$37,400,000
40 SITEWORK & SPECIAL CONDITIONS		\$51,773,295	\$54,393,179	\$48,824,378	\$51,451,772	\$54,496,499	\$57,123,893
40.01	Sitework	\$51,773,295	\$54,393,179	\$48,824,378	\$51,451,772	\$54,496,499	\$57,123,893
50 SYSTEMS		\$183,123,758	\$190,136,055	\$171,874,395	\$178,886,723	\$192,917,468	\$199,929,795
50.01	Train control & signals, traction power, communications, etc.	\$183,123,758	\$190,136,055	\$171,874,395	\$178,886,723	\$192,917,468	\$199,929,795
Construction Subtotal (10 - 50)		\$1,110,851,294	\$1,163,619,190	\$1,057,244,082	\$1,110,019,598	\$1,150,010,985	\$1,202,786,501
60 ROW, LAND, EXISTING IMPROVEMENTS		\$3,104,708	\$3,104,574	\$3,104,564	\$3,104,441	\$3,104,723	\$3,104,593
60.01	Purchase or lease of real estate, relocations	\$3,104,708	\$3,104,574	\$3,104,564	\$3,104,441	\$3,104,723	\$3,104,593
70 VEHICLES (number)		\$75,000,000	\$80,000,000	\$70,000,000	\$75,000,000	\$80,000,000	\$85,000,000
70.01	Light Rail	\$75,000,000	\$80,000,000	\$70,000,000	\$75,000,000	\$80,000,000	\$85,000,000
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)		\$555,425,647	\$581,809,595	\$528,622,041	\$555,009,799	\$575,005,493	\$601,393,251
80.01	Project Dev., Engineering, Project Mgmt, Construction Admin, etc.	\$555,425,647	\$581,809,595	\$528,622,041	\$555,009,799	\$575,005,493	\$601,393,251
Subtotal (10 - 80)		\$1,744,381,649	\$1,828,533,360	\$1,658,970,687	\$1,743,133,838	\$1,808,121,201	\$1,892,284,345
90 UNALLOCATED CONTINGENCY		\$333,255,388	\$349,085,757	\$317,173,225	\$333,005,880	\$345,003,296	\$360,835,950
Subtotal (10 - 90)		\$2,077,637,037	\$2,177,619,117	\$1,976,143,912	\$2,076,139,718	\$2,153,124,497	\$2,253,120,295
Cost per Mile (In Millions)		\$90.0	\$89.7	\$89.7	\$89.5	\$87.6	\$87.5

*Note – Estimates reflect planning level capital costs

Notes:

- 1) 60 ROW, Land, Existing Improvements assumes 50% of construction costs
- 2) 70 Vehicles: Cost is inclusive of contingency
- 3) 80 Professional Services: Assumes 50% of Construction Costs
- 4) 90 Unallocated Contingency: 30% contingency is distributed across all construction cost categories

4.5 Operating & Maintenance (O&M) Costs

Operating and maintenance costs are developed based on a cost allocation model using typical and reasonable cost drivers, such as revenue hours, revenue miles, man-hours and other such variables. In the absence of historical costs at the agency level, costs are developed using other peer systems. For this planning level analysis, operating costs are based on the peer system review conducted in Screen One and use the revenue hour variable. The operating plan assumptions are the same for all alternatives as shown in Table 4-5.

Table 4 - 5: BRT and LRT Assumed Operating Plan

Span of Service		Peak	Base	Early/Late
		6 AM - 9 AM 4 PM - 7 PM	9 AM- 4 PM 7 PM - 9 PM	4 AM-6 AM 9 PM - 1 AM
Weekday	4:00 AM - 1:00 AM	10 Minutes	20 Minutes	30 Minutes
Saturday	6:00 AM - 1:00 AM	20 Minutes	20 Minutes	30 Minutes
Sunday & Holiday	7:00 AM- 11:00 PM	30 Minutes	30 Minutes	30 Minutes

4.5.1 BRT Operating Costs

BRT operating costs are assumed to be \$120 per vehicle revenue hour. Table 5-2 shows the anticipated annual O&M costs for the BRT Alternatives. Appendix 5-B shows the operating statistics based on the travel time data and operating plans described in the Screen Two Alternatives Report. These cost measures are used in the Project Justification Preliminary Rating.

Table 4 - 6: BRT Alternatives Annual O&M Costs

Alternative	Annual Statistics		Operating Cost
	Total Revenue Hours	Total Revenue Miles	\$120
B-1 US 78/US 52/Meeting BRT	48,752	1,096,830.86	\$5,850,240
B-3 US 78/US 52/East Bay BRT	55,454	1,137,759.14	\$6,654,480
C-1 US 176/US 52/Meeting BRT	45,544	1,017,561.72	\$5,465,280
C-3 US 176/US 52/East Bay BRT	47,044	1,058,490.00	\$5,645,280
D-1 Dorchester Rd/US 52/Meeting BRT	55,790	1,201,503.76	\$6,694,800
D-3 Dorchester Rd/US 52/East Bay BRT	57,290	1,242,432.04	\$6,874,800

4.5.2 LRT Operating Costs

LRT operating costs are assumed to be \$291.14 per train revenue hour. Table 5-3 shows the anticipated annual O&M costs for the BRT Alternatives. Appendix 5-B shows the operating statistics based on the travel time data and operating plans described in the Screen Two Alternatives Report.

Table 4 - 7: LRT Alternatives Annual O&M Costs

Alternative	Annual Statistics		Operating Cost
	Total Vehicle Revenue Hours	Total Vehicle Revenue Miles	\$291.14
B-2 US 78/US 52/Meeting LRT	47,044	1,096,830.86	\$13,696,390.16
B-4 US 78/US 52/East Bay LRT	54,290	1,137,759.14	\$15,805,990.60
C-2 US 176/US 52/Meeting LRT	45,544	1,017,561.72	\$13,259,680.16
C-4 US 176/US 52/East Bay LRT	47,044	1,058,490.00	\$13,696,390.16
D-2 Dorchester Rd/US 52/Meeting LRT	54,290	1,201,503.76	\$15,805,990.60
D-4 Dorchester Rd/US 52/East Bay LRT	55,790	1,242,432.04	\$16,242,700.60

5 Funding Analysis

The Capital Investment Grant Program can fund up to 80 percent of the capital costs for a project; however, a project with a greater proportion of local funds has a better chance of competing for limited federal funds. Additionally, financial commitment ratings require varying levels of committed matching funds depending on the stage of development. While no local funding source commitment is needed for entry into project development, the project must have at least 30 percent of the matching funds committed at the end of the Project Development phase under New Starts, and 50 percent under Small Starts. This section provides a summary of federal funding sources that have been used to fund fixed guideway transit projects, as well as state, local, and other funding mechanisms that have been successfully utilized by other project. Note, this summary is not all inclusive and does not include financing or bonding options.

5.1 Federal Funding

5.1.1 New Starts Program (Section 5309)

Description

The FTA New Starts Program, the largest discretionary funding source for major transit capital investment, provides funding to support the construction of new fixed guideway projects or extensions to existing fixed guideway systems. Funds cannot be used to support operating expenses. These projects include commuter rail, light rail, heavy rail, bus rapid transit, streetcars, and ferry. New Starts projects are those with a total estimated capital cost greater than \$300 million and are seeking \$100 million or more in Section 5309 Capital Improvement Grant (CIG) program funds. Capital funds are provided on a competitive basis to projects that complete the application and review process. The FTA formally submits an annual report to Congress with approved projects and their ratings, and the Administration’s funding recommendations. Final funding for individual projects is determined by Congress.

Local financial commitment is a major rating criterion for projects seeking federal support through the New Starts Program. The statutory match for New Starts funding is 60 percent Federal CIG (up to 80 percent combined with

other federal sources) and 20 percent local; however, most projects come in under that in order to be more competitive. On average, the program provides roughly 50 to 60 percent of project capital costs.

Example

HealthLine BRT (Cleveland, OH).

The 9.3-mile Cleveland HealthLine was constructed as part of the Euclid Corridor Transportation Enhancement Project at a capital cost of roughly \$168.4 million. The Euclid Corridor Project was designed to improve transit service as well as increase the development and redevelopment potential along Euclid Avenue. The corridor project included the implementation of a BRT line as well as establishment of a downtown transit zone with infrastructure improvements (sidewalks, bike lanes, streetscape, upgraded sewer and water lines, and installation of fiber optic lines), an East Side Transit Center with customer amenity improvements (waiting areas and bike racks), traffic signal technology enhancements, and peak hour parking restrictions. Roughly 25 percent of the project cost included BRT vehicles, stations, and platforms, and 75 percent of costs were attributed to infrastructure and street-level improvements¹.

The Euclid Corridor Transportation Project was able to secure 50 percent of project funds from federal sources with a 50 percent local match. The HealthLine funding sources include:

- Federal – FTA New Starts: \$82.2 million
- Federal – FTA Rail Modernization: \$0.6 million
- State – Ohio DOT: \$50 million
- Greater Cleveland RTA: \$17.6 million
- Northeast Ohio Areawide Coordinating Agency (NOACA): \$10 million
- City of Cleveland: \$8 million

An additional \$31.6 million was also secured, but not included under the FTA Full Funding Grant Agreement, to fund elements such as streetscapes, utilities, and public art. The Ohio DOT contributed \$25 million, GCRTA contributed \$3.75 million, and \$3 million came from Cleveland Clinic.

A developed case study of the Cleveland HealthLine produced by the Institute for Sustainable Communities identified that the initial project package presented for consideration included a mix of rail station upgrades and a robust multi-modal project which included two downtown transit centers that connected BRT to both light and heavy rail. This initial program, estimated at \$350 million, was deemed too expensive and the project needed to be redefined to lower the cost. The project team made the rail stations and a transit center stand-alone projects that would seek alternative funding at a later date. The project design team also engaged in a cost reduction exercise to lower the cost of implementing the BRT line without impacting ridership. Attention was placed on “low-hanging fruit” such as installing less expensive sidewalk treatments along certain extents of the corridor. Through this process, the team was able to reduce the project cost to a more acceptable level. The GCRTA was also challenged with a series of rule changes from the FTA throughout the alternatives analysis. The original cost share presented included an 80 percent federal grant, with a 20 percent local match. This ratio was modified to a 63 percent federal share, with 37 percent local match, and then modified again to a 60 percent federal share, with a 40 percent local match. By the time the project moved into final design the cost share was set at a 50 percent federal match, with a 50 percent local match.

The CEO of the Greater Cleveland RTA, Joe Calabrese, attributed the success of implementing the HealthLine BRT to the committed leadership from local and state governments, businesses and local citizens. A major leader of the project was George Voinovich, who was a strong proponent of the project during his tenure as Mayor,

¹ Hook, W., S. Lotshaw, and A. Weinstock. *More Development for Your Transit Dollars: An Analysis of 21 North American Transit Corridors*. Institute for Transportation & Development Policy (ITDP), 2013. Retrieved July 5, 2015 from https://www.itdp.org/wp-content/uploads/2013/11/More-Development-For-Your-Transit-Dollar_ITDP.pdf

Governor and US Senator. As Governor, Voinovich advanced the project by setting aside \$70 million to fund the BRT project through the Ohio DOT. As Senator, Voinovich also advanced the project's New Starts funding by lobbying the FTA. As local leadership changed over the span of the project's design and construction, the GCRTA was very active in educating new administrations on the value of BRT and kept the local leaders engaged in the project².

5.1.2 Small Starts Program (Section 5309)

Description

The Small Starts Program is a federal-aid grant program that provides funding to state and local authorities for new fixed guideway projects, extensions to existing fixed guideway systems, or corridor-based bus rapid transit projects. The intent of this program is to expedite these small-scaled, low cost capital projects through use of a shorter and more simplified evaluation and approval process in comparison to the New Starts program. Small Starts projects must have a total estimated capital cost of \$300 million or less and must be seeking less than \$100 million in Section 5309 Capital Improvement Grant (CIG) program funds.

Examples

Emerald Express (EmX) (Eugene, OR)

In 2007 the region's first BRT system, the Emerald Express (EmX) line, began operating a 4-mile route along the Franklin Corridor between downtown Eugene and Springfield. The capital cost of the line was approximately \$25 million and the project was able to secure funding from both Federal (80%) and local (20%) sources. Project funding sources are as follows:

- Federal – FTA New Starts: \$13.3 million
- Federal – Formula Funds: \$6.7 million
- Local – Lane Transit District (LTD): \$5 million

The route was originally envisioned to be an 11.5-mile corridor between Eugene and Springfield; however, the corridor was re-scoped due to the scale of planning and the level of funding required to successfully implement a BRT line of that length. The line operates 60 percent over dedicated transit lanes and forms the foundation corridor from which future BRT lines could connect to form a regional BRT system. The remaining 40 percent of the route operates in mixed traffic and utilizes curbside bus lanes with queue jumping and signal priority technology. During project development, the 20-year EmX projected average weekday ridership was estimated at approximately 4,000 riders. During its first year of operation (2007-2008) ridership on the Emerald EmX was at a level above the 20-year projections.

Since the implementation of the initial Green Line, LTD has introduced the Gateway EmX Extension, a 3.8-mile extension BRT line which opened in 2011 at a cost of \$41 million. The Gateway EmX was the first project in the country to receive Small Starts funding and secured \$32.8 million or 80 percent federal support (the largest match allowed). Thirteen percent of project funds were secured through a statewide transportation infrastructure funding program, and seven percent was contributed by the LTD. The third corridor expansion, West Eugene EmX is currently under construction with an anticipated 2017 completion date. Funding for this latest 5.8-mile corridor totals roughly \$94.4 million of which \$75 million comes from Federal sources, \$17.8 million from Oregon Lottery Bonds, and \$1.6 million through the State's ConnectOregon program, to build two new bike-pedestrian bridges.

The EmX BRT line was the first of its kind implemented in a medium-sized city in the United States and as such there were no concrete examples from which the system could reference or prove that the system would succeed.

² *The Cleveland HealthLine: Transforming an Historic Corridor*. Institute for Sustainable Communities. Retrieved July 7, 2015 from http://sustainablecommunitiesleadershipacademy.org/resource_files/documents/the-cleveland-healthline.pdf

The project was met with a challenge from the Springfield Mayor, who at that time had expressed uncertainty about BRT and believed that LTD had not effectively communicated the impacts that the EmX system would have on the local communities. The Springfield Chamber of Commerce Executive Director helped in championing the project by assisting the Mayor and Springfield City Council to better understand and support the project. In retrospect, LTD acknowledged that their expertise at that time was mainly as a bus operator. They had not fully defined the role it would play as a BRT operator and what that role entailed. Today, the agency is more engaged with partners and is able to guide a more collaborative dialogue concerning city, regional or economic development priorities and the role the system will play in achieving local and regional goals. This challenge ultimately helped LTD to redefine itself and better assert its authority as a new BRT operator.

Learning from prior experience, the LTD engaged in a large public outreach effort directed at area residents during the West Eugene extension outreach. These efforts focused on educating the public about the project and gaining community support. However, as the project progressed, the LTD realized that they failed to successfully engage the local business community in participating in the process. They ultimately failed to recognize the unique needs of the business community and as a result did not effectively market the project to this stakeholder group. Opposing groups were thus able to recruit adjacent businesses to oppose the extension project. The LTD has since crafted an outreach program that is specifically geared toward the needs of the business community and has, as a result, gained more support for the project. The agency has committed to more one-on-one outreach to businesses that would be most impacted by future projects to foster greater community support and commitment³.

North Corridor (First Coast Flyer) BRT (Jacksonville, FL).

In December 2015, the Jacksonville Transportation Authority (JTA) opened its new 9.3-mile Green Line premium BRT service. The Green Line features transit signal priority, real-time passenger information, off-board fare collection, a park-and-ride facility, and new low-floor compressed natural gas buses. The project cost was an estimated \$33.32 million to construct. The project funding sources are as follow:

- Federal – FTA Small Starts: \$20.2 million
- Federal – FTA Bus and Bus Facility fund : \$6.4 million
- State – Florida New Starts Transit Program: \$3.32 million
- Local – JTA Local Discretionary Gas and Sales Tax fund: \$3.32 million

Soon after the opening of the Green Line BRT, the FTA announced that that the JTA Southeast Corridor BRT was awarded a \$19.1 million Small Starts grant to fund the next corridor in the First Flyer BRT system. The federal funds cover 80 percent of the project cost. The 20 percent local match will be provided by the Florida New Starts Transit Program (\$2.39 million) and the JTA Local Discretionary Gas and Sales Tax fund (\$2.39 million). The 11-mile Southeast Corridor BRT is anticipated to open by December 2016. Once completed, the First Cost Flyer BRT system will cover roughly 57 miles at an estimated cost of \$134 million, connecting users in the region to downtown Jacksonville. It was important for the JTA that that BRT projects developed were achievable and fundable.

³ Crowley, M. *The Emerald Express: Overcoming Growing Pains and Opposition to Bus Rapid Transit* (Case Study: Springfield and Eugene, Oregon). Institute for Sustainable Communities. Retrieved July 9, 2015 from http://sustainablecommunitiesleadershipacademy.org/resource_file/documants/springfiled-eugene-oregon-emerald-express.pdf

5.1.3 Bus and Bus Facilities Formula Program

Description

Established under MAP-21, Section 5339 Bus and Bus Facilities Program is a new bus program which changes the program from a discretionary grant program to a formula based program. Funding is allocated to States and Territories and designated urbanized areas. This program seeks to provide capital funding to replace, rehabilitate, and purchase buses and related equipment and to construct bus-related facilities. Funds are not available for operating assistance. Funds are available to designated recipients and states that operate or allocate funding to fixed-route bus operators. Sub-recipients include public agencies or private nonprofit organizations engaged in public transportation, including services to segments of the general public, as defined by age, disability or low income. The statutory match for Bus Program funds is 80 percent with a required 20 percent local match. Although single grants may be small, funding from the Bus and Bus Facility program has proven to be a good source of supplemental support for some BRT projects.

Example

Main Street MAX BRT (Kansas City, MI)

Operated by the Kansas City Area Transportation Authority (KCATA), the Metro Area Express (MAX) is an approximate 9-mile BRT route serving the Main Street corridor in Kansas City. The MAX operates within a combination of full-time dedicated bus lanes in the downtown area and peak hour “bus only” lanes in the Midtown area. These bus lanes make up 52 percent of the BRT route. The corridor also utilizes traffic signal priority technology at 31 intersections. At an estimated capital cost of \$21 million, the project secured 80 percent federal funding with a 20 percent local funding match. The project funding sources are as follow:

- Federal – FTA New Starts: \$3.4 million
- Federal – Bus and Bus Facilities (5309): \$8.3 million
- Federal – Revenue Aligned Budget Authority (RABA) (Section 330): \$5 million
- Local – The City and KCATA: \$4 million

The local match provided by the City was used for street re-paving and traffic signal priority. The largest budget item for the Main Street MAX was associated with vehicle procurement and inspection, and stop construction and installation. Approximately \$13 million or 60 percent of the project cost was related to these items. Thus the use of Bus and Bus Facility program funds was sufficient to fund a sizable portion of the overall project capital cost.

5.1.4 CMAQ – Congestion Mitigation and Air Quality Improvement Program

Description

Jointly administered by FHWA and the Federal Transit Authority (FTA), the CMAQ was implemented to support surface transportation projects and other related efforts that contribute to air quality improvements and provide congestion relief. CMAQ is a federal-aid funding program that provides a flexible funding source to State and local governments for transportation projects and programs that will contribute to attainment or maintenance of the National Ambient Air Quality Standards (NAAQS) for ozone, carbon monoxide (CO), and particulate matter. Funds generally may not be used for projects that result in the construction of new road capacity available to single-occupancy vehicles. These funds can be used for capital investments, operating assistance, travel demand management strategies, and bike and pedestrian facilities/ programs.

5.1.5 Surface Transportation Program

Description

The Surface Transportation Program (STP) provides flexible funding that may be used by States and localities for projects to preserve and improve the conditions and performance on Federal-aid highways, bridge and tunnel projects on any public road, pedestrian and bicycle infrastructure, and transit capital projects, including intercity bus terminals⁴.

5.1.6 TIGER Grant

Description

Transportation Investment Generating Economic Recovery (TIGER) grants are highly competitive and are awarded to fund capital investments in surface transportation infrastructure that will have significant impact on the Nation, a region, or metropolitan area. Grants are awarded to projects that will advance key transportation goals such as safety, innovation, and opportunity. Funding is provided on a competitive basis for highway, transit, freight, port, bike/pedestrian, and multimodal projects. Since the program's introduction in 2009, roughly \$4.6 billion has been provided to 381 projects of which \$1.31 billion has been awarded to 71 transit projects (28.5%).

The TIGER program encourages States and localities to work together to bring more innovative, cross modal proposals to the table. Priority is given to transportation projects that demonstrate strong collaboration among a broad range of participants, integration of transportation with other public services efforts, and/or projects that are a product of a robust planning process. Project sponsors at the state and local level are able to obtain funding for multi-modal, multi-jurisdictional projects that are difficult to support through traditional federal funding programs. TIGER can provide capital funding directly to any public entity, including municipalities, counties, port authorities, tribal governments, or MPOs. Funds typically require a local match of at least 20 percent.

Example

Broad Street BRT (Richmond, VA)

The Broad Street BRT (GRTC Pulse) is a 7.6-mile BRT route that is set to begin operational service by 2017. The proposed route will utilize a mix of dedicated bus lanes (median and curb running lanes) and mixed traffic operations. Estimated ridership for the new BRT line is projected at more than 3,000 daily boardings with 500 new daily riders. The system will also utilize signal priority at intersections along the corridor and queue jumping at select locations. The project reflects a regional collaboration between Greater Richmond Transit Company (GRTC), the Virginia Department of Rail and Public Transportation (DRPT), the City of Richmond and Henrico County. Preliminary engineering of the project cost roughly \$4 million of which \$3.2 million was funded by the Surface Transportation Program (state flexible funds), \$640,000 was funded by a DRPT grant, and \$160,000 was funded by the City of Richmond.

The final design and construction phase of the project is expected to cost \$49.8 million. The project partners were able to secure 50 percent Federal funding from a TIGER Grant and 50 percent non-federal funding from both state and local commitments. A breakdown of project funding for final design and construction is as follows:

- Federal – TIGER Grant: \$24.9 million
- State – Commonwealth of Virginia (DRPT): \$16.9 million
- Local – City of Richmond: \$7.6 million
- Local – Henrico County: \$400,000

GRTC is a public service company owned by the City of Richmond and Chesterfield County, and provides transit service to the City of Richmond, and areas of Chesterfield and Henrico Counties. Henrico County currently

⁴ <https://www.fhwa.dot.gov/map21/factsheets/stp.cfm>

purchases services from GRTC and contributes local funds to operate the system based on the service operating in its jurisdiction.

Use in Region

The I-26 Corridor connects a number of jurisdictions between Summerville and downtown Charleston. The 22-mile corridor passes through three counties (Berkeley, Charleston and Dorchester) and six local municipalities (Summerville, Lincolnton, Goose Creek, City of North Charleston, Hanahan, and the City of Charleston). Development of a premium transit system that will improve regional mobility will undoubtedly involve a regional, multi-jurisdictional approach. Though challenging, the region is presented with the opportunity to develop an innovative collaborative project that would advance the region.

5.2 Local/State Funding

5.2.1 Property Taxes

Description

Typically levied by municipal governments, property taxes are assessed on the value of land and buildings. It usually serves as the principle source of revenue for local governments and is typically unrestricted in its use. Portions of local property taxes are, however, widely authorized for use by special districts and authorities including transit and school districts, and for other specified uses such as police and sanitation. Some jurisdictions require state or provincial legislation or voter approval to raise property tax rates.

Example

Silver Line BRT (Grand Rapids, MI)

The Interurban Transit Partnership (ITP) operates the public transit system, The Rapid, in the Grand Rapids metro area and surroundings. The Rapid serves six municipalities located within its service area including Grand Rapids, East Grand Rapids, Grandville, Kentwood, Walker and Wyoming.

The Silver Line BRT, which opened in 2014, is the first BRT line in Michigan. It operates along a 9.6-mile corridor connecting the Grand Rapids central business district to communities in the cities of Kentwood and Wyoming. Buses operate in dedicated lanes over 65 percent of the corridor. The project includes 18 transit stations, traffic signal priority, off-board fare collection, and 10 low-floor hybrid BRT buses. The project's total cost is estimated at \$39.86 million, and was funded from the following sources:

- Federal – FTA Very Small Starts: \$18.99 million
- Federal – Bus Discretionary Funds: \$12.89
- State – Michigan DOT State Comprehensive Transportation Fund: \$7.97 million

The Rapid transit system is funded in part by a voter-approved property tax which helps to support transit operations. In 2011 local voters (in all municipalities) approved a referendum to increase the existing property millage from 1.12 mills to a total 1.47 mills to help fund the BRT line's operating expenses.

Major project support came from local mayors, the business community, major regional employers and local advocacy groups. In addition to the Grand Rapid central business district, the Silver Line serves major destinations such as Michigan State University, Grand Rapids Community College, and the DeVos Place Convention Center and Performance Hall. The City of Grand Rapids, in anticipation of the BRT line, created a TOD zone in its zoning code for the areas around BRT stops to help provide the necessary mass of riders and destinations, with increased height limits and the ability to waive parking requirements. The city and transit

agency also engaged regularly with the business community and citizens' groups to help educate these stakeholders about the project and foster community support⁵.

5.2.2 Payroll / Employer Taxes

Description

Payroll taxes are typically imposed on employers based on the amount of gross payroll within a specific region and can be enacted in transit districts and used to fund both capital and operations. Specific regulations and guidelines in each state's legislation determine the types of wages and payments to which the tax can be applied as well as the organizations that can claim exemption. Usually, these taxes are administered by state revenue agencies on behalf of the transit agencies. Payroll taxes are generally easy to administer, difficult to evade, and are responsive to inflation over time. However, they may serve as a disincentive for new business to locate within the transit jurisdictional boundary, and this funding source is directly linked to the state of the economy. Thus during times of economic contraction or high rates of unemployment revenues from payroll taxes are affected⁶.

Example

Lane Transit District (LTD) (Lane County, OR).

The Lane Transit District (LTD) provides public transportation in Lane County, Oregon. It serves the metro areas of Eugene and Springfield, as well as the cities of Coburg, Junction City, Creswell, Cottage Grove, Veneta and Lowell. Implemented in 1971, a funding ordinance established a payroll tax on employers within the LTD service district. A comparable self-employment tax ordinance was established in 1994. These taxes are administered by the Oregon Department of Revenue on behalf of the transit district. Originally the payroll tax rate was capped at 0.6 percent; however, in 2003 the State Legislature approved an increase in the maximum payroll tax rate to 0.7 percent and required a phased implementation of the rate change with the maximum rate being achieved in 2014.

The payroll and self-employment taxes represent the largest single contributor to LTD's revenues and accounts for roughly 70 percent of the agency's non-operating revenues⁷. Revenue from these sources covers much of the day-to-day operating expenses of the system. In 2014 the District recorded roughly \$25 million collected from the employer payroll tax and \$1.6 million collected from the self-employment tax. In 2009 the Legislature approved an increase in the maximum payroll tax to 0.8 percent to help fund a comprehensive transportation funding package proposed by State Governor Kulongoski, which also proposes increases in the gas tax, and vehicle licensing and registration fees. The eventual increase to 0.8 percent can only be made if the LTD board makes a finding that the economy in the district has recovered to an extent sufficient to warrant an increase in tax. It also requires that the increase be phased in over a ten-year period.

5.2.3 Sales Tax

Description

Sales taxes are the most widely used and broadly accepted source of dedicated local and regional funding for transit in the United States. They typically provide the greatest revenue yield and stability in comparison to other funding sources. Sales taxes are a broad-based revenue source that is capable of generating substantial revenue due to the large number of transactions that occur each year. Many states require the legislature to pass an enabling statute that provides local jurisdictions the authority to impose a dedicated sales tax to support transit. At the local and regional level, additional sales taxes enacted for transit typically range from 0.25 percent to one percent. While some sales taxes are perpetual others require reenactment or extension through periodic voter approval. Typically these taxes may exempt various combinations of food, clothing, and prescription drugs or

⁵ <http://www.reconnectingamerica.org/assets/Uploads/20121206midsizefinal.pdf>

⁶ http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_129.pdf

⁷ Lane Transit District. 2013-2014 Comprehensive Annual Financial Report.

apply a lower rate to selected goods and services. Revenue generated from sales taxes can be used to support new transportation projects, ongoing operations, and capital maintenance.

Example

San Diego Association of Governments (SANDAG) (San Diego, CA)

In 1988, county voters enacted TransNet, a 20-year half-cent sales tax which was used to expand regional transit service and commuter rail, upgrade highway networks, improve and maintain local streets and fund regional bike and pedestrian projects. In light of the continued growth in the region and the pending sunset of the original TransNet measure, in 2004 county voters approved a 40-year TransNet Program Extension measure which extends the half-cent TransNet sales tax to fund a comprehensive program of transportation projects. The new TransNet program will consist of a blend of highway projects (HOV/Express lanes), highway widening projects, transit projects (rail and BRT), local streets and roads projects, and bike and pedestrian projects. The tax revenue collected will be evenly apportioned to transit, highway, and local street and roads projects; with dedicated amounts toward bike and pedestrian improvements. The measure was approved by voters in 2004 by a 67 percent margin. Major highway and transit projects are undertaken at the regional level and must contribute to reduce congestion and increase mobility. Local road revenues however, are appropriated annually to each of the region's 18 member jurisdictions using a formula based on population and the linear road miles within the various jurisdictions⁸.

Use in Region

Berkeley, Charleston and Dorchester Counties each currently levy a transportation sales tax within their jurisdiction. In 2004 Charleston County approved a 0.5 cent transportation sales tax set to sunset in 2030. Revenue collected from the local option tax is used to fund roadways (65%), transit (18%), and greenways projects (17%). In 2008, Berkeley County passed a one cent sales and use tax for "financing the costs of highways, roads, bridges, and other transportation-related project facilities, and [related] drainage facilities." The transportation tax is set to last for seven years and the revenue generated is used to construct roadway improvements including the projects listed in the approved 2008 referendum. As of November 2014, Berkeley County residents voted on an extension of the penny sales tax which was set to expire in 2015 by a 67 percent margin. Dorchester County residents approved a one cent sales tax in 2004. The revenue collected from this levy funds a program of 22 road improvement projects which includes a mix of roadway construction and widening, intersection and sidewalk improvements, and roadway resurfacing and paving projects.

The current use of local option transportation sales taxes within the region makes the use of sales taxes a promising funding option for transit, although use of these funds in Dorchester and Berkeley counties has been primarily used for roadway projects. Having approved prior measures, the public has been exposed to its use and are likely to be more receptive to a new measure that includes transit projects. Research has also shown that communication and well developed campaign strategies are important factors that can significantly influence the success of transportation or transit sales tax initiatives. The region will undoubtedly need a well define community "buy-in" strategy that focuses on educating the public as well as garnering support from residents, businesses, and local leaders for a regional transit system. The current transportation sales taxes are currently levied by individual counties in the region. A regional tax initiative could be an option to funding a transit project/program that would cross multiple jurisdictions and would require a strong collaborative effort. Citizens will have to be presented with a clearly defined regional transit initiative with a well-defined list of projects and benefits that can be gained from its implementation.

⁸SANDAG. TransNet Extension Ordinance and Expenditure Plan. SANDAG.org

5.2.4 Special Assessment Districts

Description

Special Assessment Districts is a value capture instrument which assesses an additional tax on properties located within a defined zone around a transportation project. These properties are assessed with a higher tax rate or a flat fee to fund improvements that benefit those properties as a result of the transportation investment. The revenue generated by the district can be used to directly pay for area improvements or enhancements, or can be utilized to repay bonds that may have been issued to finance the project. The amount of the tax assessed to properties are directly related to the benefits realized by each and are typically influenced by the distance of the property from the investment, and the cost of the improvement. A major challenge associated with introducing an assessment district is the effort needed to convince landowners and businesses that the tax is worth the value of the infrastructure improvement.

Examples

Downtown Denver 16th Street Mall (Denver, CO).

The Downtown Denver 16th Street Mall is a “rubber-tired” transit mall that is surrounded by a mix of residential properties, retail and high-rise offices. A special assessment district was formed around this mall area and is made up of the properties immediately adjacent to the mall. This district was created in an effort to fund the necessary maintenance costs associated with the facility. The district encompasses roughly 120 city blocks and is composed of 677 commercial parcels, 2.6 million square feet of retail space, 23 million square feet of office space, 14 hotels, 4,000 residential units and approximately 34,000 parking spaces. Assessment rates for properties within the district vary from \$0.05 to \$0.45 per square feet and depend on the amount of land area occupied by the property as well as its distance from the transit mall⁹. Revenue generated from this assessment cannot be utilized for capital expenses.

Dulles Corridor Metrorail Expansion (Washington, D.C.).

One of the nation’s largest transit projects to utilize value capture financing is the Dulles Metrorail expansion. The Dulles Corridor Metrorail expansion, located in the Washington, DC region, entails a 23-mile extension of the existing heavy rail Metrorail system to the Dulles Airport and the Tysons Corner, Reston and Herndon areas. The estimated cost of the extension is roughly \$5.2 billion and will be implemented in two phases. A special assessment district was created to help fund part of the Fairfax County local share for Phase I and II construction. Under the Code of Virginia, commercial and industrial property owners are allowed to petition the Virginia Board of Supervisors to be taxed, to raise funds for transportation improvements in the area. For the tax district to be considered at least 51 percent of property owners (measured by land area or assessed value) of the proposed district must support or approve the taxing district. In 2004, more than 64 percent of commercial and industrial property owners, (by assessed value) around Tysons Corner (a large retail shopping and employment center), petitioned to create the Dulles Rail Transportation Improvement District where all funds generated will go toward the Metrorail extension (Phase I). Commercial and industrial property owners were charged an additional \$0.21 per \$100 assessed value over the base property tax rate. The amount that could be raised under this Phase I special assessment was capped at \$400 million. In 2009 through a similar petition process, commercial and industrial property owners in the Reston and Herndon areas created the Phase II Dulles Rail Transportation District to help fund the rail extension through Reston, Herndon, and the Dulles Airport. The Phase II special assessment is capped at \$330 million^{10, 11}.

⁹ http://www.tcronline.org/PDFDocuments/TCRP_RPT_9ov2.pdf

¹⁰ <http://www.fairfaxcounty.gov/dmb/fy2016/advertised/volume2/40110.pdf>

¹¹ <http://www.metroplanning.org/news/6384/Value-Capture-Case-Studies-Washington-DC-Metro-expansion-to-Dulles-Airport>

5.2.5 Tax Increment Financing (TIF)

Description

Tax increment financing is a value capture instrument which allows jurisdictions to collect revenue in specific areas and direct that revenue toward specific area improvements. It does not involve a tax rate increase. Instead, it applies the additional tax revenue generated by the rise in property values resulting from public investments to help pay or fund the improvements that led to the increase in property value and tax returns. Tax increment funds are usually set aside from properties within a defined geographic zone, such as the area surrounding a transit station, or in a corridor. The TIF district is established for a set number of years and can involve residential, commercial or industrial uses.

At the establishment of a TIF district, the value of properties is assessed and set as the base. As the district develops, the value of properties within the district increases, which in turn, increases the amount of taxes collected. The incremental rise in tax revenue resulting from the investment in the District is then dedicated to further improvements in or around the district. As more improvements are made in the area, property values and collected taxes should again increase, thus generating more funds for further improvements in the TIF district. This cycle is maintained over the life of the district. TIF revenues allow state and local governments to fund new projects without having to tap into existing revenue sources or raising area wide taxes. It can also provide an equitable form of raising revenue from property owners that are most likely to benefit from the transit improvements undertaken. One disadvantage of TIF financing is the need for an initial investment in the district to spur an increase in property values. This may require agencies to use public revenues to fund the initial investment¹².

Example

City of Dallas TIF District (Dallas, TX)

The City of Dallas has established a 558-acre TOD Tax Increment District around eight of its Dallas Area Transit (DART) light rail stations. The District, created in 2008 and set to terminate in 2038, seeks to encourage high-density, pedestrian friendly transit oriented developments adjacent to DART stations. Potential improvements covered by the TIF include the construction of new streets, sidewalk upgrades, utilities, lighting, public landscaping, historic preservation, environmental remediation, fees associated with architectural, planning, and engineering work related to eligible TIF funded public improvements, additional costs associated with high density projects, etc. This corridor-based TIF helps to redistribute the revenues generated in “stronger” neighborhoods to help encourage development in weaker areas. This approach applied to the DART station areas helps to promote the improvements and development needed around station areas, which in turn improves transit ridership and revenues at otherwise underutilized station areas.

Use in Region

There is a need to promote more Transit Oriented Development (TOD) within the region especially around proposed station area locations to help support a premium transit service provided by a fixed guideway system. Use of TIF districts could help finance the necessary TOD investments that would be necessary at identified stations in the region.

South Carolina has TIF enabling legislation which allows the establishment of Districts to support redevelopment with up to 30 years to retire TIF debt.

¹² <http://www.apta.com/mc/annual/previous/2012/presentations/Presentations/Team-Two-Innovative-Funding-Sources-for-Transit-Final-Report.pdf>

5.3 Other Funding/Financing

5.3.1 Public-Private Partnership

Description

Public-Private Partnership is an innovative financing and project delivery method in which a contractual arrangement is made between a public or governmental agency and a private entity that facilitates greater participation by the private entity in the delivery and operation of an infrastructure project, facility, or service. Within the transport sector such an arrangement involves one or more aspects of the funding, financing, planning, design, construction, operation and maintenance of a transportation facility. In general, the contractual arrangement underlying a transit-related public-private partnership transfers certain risks and provides certain financial opportunities to the private sector. In exchange, public partners are able to realize or benefit from a reduction of financial risk, improved service quality, efficient deployment of new technologies, innovative or cost-effective business practices and increased management expertise¹³.

Example

Eagle P3 Project (Denver, CO).

The Denver Eagle P3 is part of the Denver Regional Transit District (RTD) voter-approved FasTracks plan to expand transit across the Denver metropolitan region. In 2004, voters in the Denver region approved a 0.4 percent sales tax increase to provide the necessary funds to help implement the FasTracks program. The complete FasTracks plan includes 122 miles of commuter rail and light rail, 18 miles of BRT service, station area redevelopment, parking facility infrastructure to serve the system, and other system improvements.

The Eagle P3 project is comprised of two commuter rail corridors (23-mile East Rail Line and 11.2-mile Gold Line), an initial 6.2-mile segment of the Northeast Rail Line commuter corridor, a commuter rail maintenance facility and the procurement of 54 commuter rail cars. At an estimated total cost of \$2.2 billion the project was able to secure \$1.03 billion in federal funds and roughly \$450 million in private financing.

The project funding breakdown is as follows:

- Federal – New Starts FFGA: \$1.03 billion
- Federal – Other federal grants: \$57 million
- RTD sales tax revenue: \$128.1 million
- Private Activity Bonds: \$396.1 million
- TIFIA loan: \$280 million
- Revenue bond proceeds: \$56.8 million
- Local/CDOT/other contributions: \$40.3 million
- Equity: \$54.3 million

Much of the support for the FasTracks plan stemmed from the great success of its predecessor, the Transportation Expansion (T-REX) Project. T-REX (1999) was a RTD and Colorado DOT initiative to improve the transportation infrastructure of the region through a program of combined light rail and highway expansion projects. The T-REX program in its size, scope, and innovation served as a model case of collaborative planning and was finished on-time and under budget.

The Eagle P3 Project is being delivered and operated under a concession agreement between RTD and a “concessionaire” that was selected through a competitive proposal process. The selected concessionaire is known as the Denver Transit Partnership (DTP), a specialty company owned by Fluor Enterprises, Uberior Investments and Laing Investments and includes other leading firms on the team. Through the agreement DTP is required to

¹³Public-Private Partnerships in Public Transportation: Policies and Principles for the Transit Industry. APTA Task Force on Public-Private Partnerships.

design-build-finance-operate-maintain (DBFOM) the commuter rail lines and commuter rail maintenance facility projects under a single contact. The RTD will retain ownership of all assets while most of the risk of designing and building the project is shifted to the DTP. The near \$450 million of private financing arranged by DTP to help fund the project allows the RTD to spread out the large upfront capital costs over a 30-year period. The DTP will operate and maintain the projects it designs and builds over the agreed 30 year period.

5.3.2 Joint Development

Description

Joint development commonly refers to the coordinated development of public transportation facilities with other, non-transit development including commercial, residential, and mixed-use development. Joint development may include partnerships for public or private development associated with any mode of transit system that is being improved through new construction, renovation, or extension. It may also include intermodal facilities, intercity bus and rail facilities, transit malls, or historic transportation facilities¹⁴. Joint development strategies are generally not used for overall system finance, but are intended to provide a revenue stream for the transit system as well as promote appropriate growth around transit stations. A "revenue-sharing" initiative secures a stream of revenue to the transit agency that can be used for operating expenses. A "cost-sharing" agreement aims to relieve the transit agency of some cost burden of constructing, maintaining, or rehabilitating transit facilities.

5.3.3 Naming Rights

Description

Naming rights arrangements involve fees paid for the right to name a component of a transportation project, usually a transit line or station name. Although the revenue generated from naming rights is typically insufficient to fund capital investment, it can be utilized to support maintenance and operations expenses. Revenues secured through the agreement may be used for capital or operating expenses as agreed upon.

Examples

HealthLine BRT (Cleveland, OH).

The HealthLine obtained its name as a result of a Naming Rights Partnership with the Cleveland Clinic and University Hospitals; both of which are located along the Euclid corridor and are served by the premium transit line. In 2008 the Greater Cleveland Regional Transit Authority (GCRTA) entered into a naming-rights deal with both the Cleveland Clinic and University Hospitals for \$6.25 million over 25 years to name the Euclid Corridor BRT line the HealthLine. The agreement provides for the marketing of the HealthLine logo on all vehicles, stations, schedules and other promotional material of the system. Use of the naming-rights deal has lent itself to the "clean and sleek" image of the system and ultimately avoids the clutter associated with traditional system advertising. The revenue generated from the agreement will cover most of the revenue forgone as a result of the loss of traditional advertising and will help with system maintenance and landscaping expenses.

Cleveland State BRT Line (Cleveland, OH).

Building upon the years of collaboration between Greater Cleveland Regional Transit Authority (GCRTA) and Cleveland State University (CSU), the educational institute secured the naming rights for a new bus rapid transit line connecting the Cleveland State University downtown campus to Cleveland's west side communities. Through the agreement CSU will be paying \$150,000 annually to the RTA and provides for CSU branding at BRT stops and stations, a total vehicle graphic package on 16 custom designed BRT buses, and other related material. CSU also has a U-Pass program through RTA that provides free rides to students on all RTA buses and trains for a charge of \$25 per semester.

Flatiron Flyer BRT and A-Line Commuter Line (Denver Regional Transportation District).

¹⁴ FTA Circular 7050. Federal Transit Administration Guidance on Joint Development (2014).

Under the agreement between the Denver Regional Transit District (RTD) and Colorado University, the RTD will receive \$5 million over five years to support its service with a provision for a five-year extension should both parties agree. Revenue will be collected in the RTD Board of Directors reserve account and its use will be determined by the Board. The naming rights secured by Colorado University is for the Denver A Line commuter rail however the agreement also includes dominant advertising on the Flatiron Flyer BRT buses, exterior advertising on rail and bus vehicles, and CU's name and logo use on RTD digital assets and printed materials associated with the A Line.

Use in Region

Given the current partnerships that exist between the local transit agency and major regional employers such as MUSC and College of Charleston there is an opportunity to pursue naming rights arrangements with these active transit partners. Other large regional employers such as Charleston Southern University and Boeing, may also provide opportunity for this funding source.

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6 List of Appendices

Appendix 5-A: Screen Two Build Alternatives

Appendix 5-B: Alternatives Operating Statistics

Appendix 5-C: Alignment Variation Exhibit- King Street Extension

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Appendix 5-A
(Screen Two Build Alternatives)

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Appendix 5-B
(Alternatives Operating Statistics)

Appendix 5-C

(Alignment Variation Exhibit- King Street Extension)

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