

CENTRAL **BROWARD** EAST-WEST TRANSIT ANALYSIS

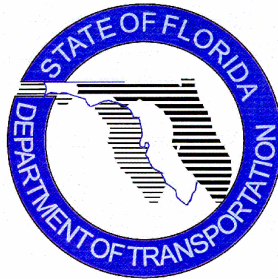


FINANCIAL FEASIBILITY REPORT

CENTRAL BROWARD
EAST-WEST TRANSIT ANALYSIS
BROWARD COUNTY, FLORIDA

FINANCIAL PROJECT ID NUMBER 411189-2-22-01

FLORIDA DEPARTMENT OF TRANSPORTATION
DISTRICT 4



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1.0 OBJECTIVES OF ANALYSIS

This technical memorandum summarizes the preliminary financial analysis of proposed improvements for the Central Broward East-West Transit Analysis. The analysis addresses the costs to Broward County Transit, the primary provider of bus transit services in the County, to continue to operate existing and expanded underlying bus services and the costs to construct, operate, and maintain the Build and Transportation System Management (TSM) alternatives. This report documents a limited examination of funding options presented to the Steering Committee that provides policy direction to the study. The objectives of the analysis were to identify potential sources of local funding to support capital and operations and to quantify the rate of taxation necessary should any of the potential sources be selected as the source of funding. **The entire analysis is performed in 2004 dollars and differential inflation in construction and operating & maintenance costs and sources of funding are not addressed.**

No recommendation as to a particular funding source was made in this analysis. Additional analysis will be required for a financial plan for eventual submittal to the Federal Transit Administration (FTA) to support an application for Section 5309 New Starts funding. Such additional analysis will include addressing the following:

- Implementation schedule of the build alternatives
- Rate of growth of current service to the design year level of service
- Year-by-year projections of capital costs, level of service and resulting operating and maintenance cost, ridership and resulting fare revenue, and grant revenues
- Detailed pay-as-you-go versus debt financing
- Hard assumptions regarding annual FDOT funding of operations and capital (both infrastructure and construction)
- Extent to which other major capital investments outside the East-West corridor are addressed in the analysis (e.g., County funding of Tri-Rail and other transportation investments)

This document begins with a description of the transit alternatives addressed in the financial analysis. Next, the assumptions and the results of the capital and operating sources and uses of funds analysis are presented. Finally, alternative sources of local funding are examined, the rates of taxation required for each are determined, and some conclusions are described.

Appendix A summarizes the sources of funding applied to transit capital and operations from a national perspective, for transit agencies operating, building, or planning new fixed guideway projects, for Florida transit agencies, and for Broward County Transit.

2.0 TRANSIT ALTERNATIVES EXAMINED

The financial analysis was performed in the context of a Baseline Alternative (composed of continued and expanded bus and paratransit services operated by Broward County Transit) and an overlay of the TSM (see Figure 1) and Build (see Figure 2) alternatives (incremental services in the form of the following six physical alternatives):

- TSM
- BRT At-Grade
- BRT Dedicated
- LRT Minimum Operating Segment (MOS) (see Figure 3)
- LRT At-Grade
- LRT Dedicated

Each of these alternatives was composed of specific assumptions regarding the growth in underlying bus service, capital costs for construction and infrastructure reinvestment, and funding from existing and proposed sources.

3.0 CAPITAL FUNDING REQUIREMENTS

3.1 INTRODUCTION

Capital funding requirements were estimated on the basis of the annualized cost for capital assets. This is summarized in Table 1. In the case of buses, this was accomplished in the context of assuming that one-twelfth of the bus fleet would be replaced each year. In the case of construction, this was accomplished by assuming that the local share of project funding would be debt financed. Funding needs were broken down into the funding for continued reinvestment in existing infrastructure and funding for new assets associated with each of the six physical alternatives analyzed in the study.

3.2 BASELINE INFRASTRUCTURE REINVESTMENT

Funding requirements for existing assets was broken down into requirements for buses and facilities:

- **Buses:** This included the periodic replacement of the existing fleet and the expanded fleet in the cases of the TSM, BRT At-Grade, and BRT Elevated alternatives
 - **Total fleet size:** The existing fleet of 255 40-foot buses was assumed, with 75, 18, and 27 additional articulated buses in the cases of the TSM, BRT At-Grade, and BRT Elevated alternatives, respectively. These fleet requirements were based on the routings and service frequencies applied in the travel demand analysis.
 - **Annual cost:** Buses were assumed to have a 12-year life (the transit industry standard and the minimum required by the FTA). Accordingly, one-twelfth of the fleet is assumed to be replaced each year.
 - **Federal and State funding:** It was assumed that buses would be entirely funded by federal and state sources. In general, this would involve a mix of 80 percent federal (FTA Section 5309 Bus & Bus-Related Grants) and 20 percent FDOT funding. It should be recognized, however, that 5309 grants are discretionary and their availability on a regular and continuing basis cannot be assured. This unpredictability could affect when new bus purchases actually occur and/or the level of FDOT participation in future bus purchases.
- **Facilities:** This included the cost of reinvestment in the assets that are contained in the TSM and Build alternatives. These needs are estimated in the context of a steady-state condition, once these initially new assets begin to age and require infrastructure renewal, just as in the case of existing assets.
 - **Annual Cost:** It was assumed that the new assets would have an average economic life of 40 years, which reflects a mix of long-lived structural elements and shorter-lived building finishes, roofs, paving, equipment, and rolling stock. The construction cost was divided by 40; it is assumed that these funds, while not expended in the initial years of operation, while the facility is new, would be held in a reserve account, and expended as needs arise.

**Table 1: Summary of Capital Funding Required
(Millions of 2004 Dollars)**

	Baseline Infrastructure Reinvestment										Build/TSM Construction Cost				Total Net Cost to be Locally Funded
	Buses			Facilities			Net Cost to be Locally Funded	Total Construction Cost	Federal Participation (1)	State Participation (2)	Net Cost to be Locally Funded	Annual Net Cost as Bonds (3)			
	Total Fleet Size	Annual Cost (4)	Federal & State Funding (5)	Annual Cost (6)	Federal Funding (7)										
Low Estimate of Funding Needs	40-Foot Artic														
TSM	255	75	\$ 11.1	\$ (11.1)	\$ 3.9	\$ (0.8)	\$ 3.1	\$ 156	\$ -	\$ (39)	\$ 117	\$ 7.5	\$ 10.6		
BRT At-Grade	255	18	\$ 7.5	\$ (7.5)	\$ 16.4	\$ (3.3)	\$ 13.1	\$ 657	\$ (329)	\$ (164)	\$ 164	\$ 10.5	\$ 23.7		
BRT Dedicated	255	27	\$ 8.1	\$ (8.1)	\$ 22.1	\$ (4.4)	\$ 17.7	\$ 883	\$ (441)	\$ (221)	\$ 221	\$ 14.1	\$ 31.8		
LRT MOS	255		\$ 6.4	\$ (6.4)	\$ 17.1	\$ (3.4)	\$ 13.7	\$ 684	\$ (342)	\$ (171)	\$ 171	\$ 11.0	\$ 24.6		
LRT At-Grade	255		\$ 6.4	\$ (6.4)	\$ 21.7	\$ (4.3)	\$ 17.4	\$ 870	\$ (435)	\$ (217)	\$ 217	\$ 13.9	\$ 31.3		
LRT Dedicated	255		\$ 6.4	\$ (6.4)	\$ 26.8	\$ (5.4)	\$ 21.4	\$ 1,070	\$ (535)	\$ (268)	\$ 268	\$ 17.1	\$ 38.5		
High Estimate of Funding Needs															
TSM	255	75	\$ 11.1	\$ (11.1)	\$ 3.9	\$ (0.8)	\$ 3.1	\$ 156	\$ -	\$ -	\$ 156	\$ 10.0	\$ 13.1		
BRT At-Grade	255	18	\$ 7.5	\$ (7.5)	\$ 16.4	\$ (3.3)	\$ 13.1	\$ 657	\$ -	\$ -	\$ 657	\$ 42.1	\$ 55.2		
BRT Dedicated	255	27	\$ 8.1	\$ (8.1)	\$ 22.1	\$ (4.4)	\$ 17.7	\$ 883	\$ -	\$ -	\$ 883	\$ 56.5	\$ 74.2		
LRT MOS	255		\$ 6.4	\$ (6.4)	\$ 17.1	\$ (3.4)	\$ 13.7	\$ 684	\$ -	\$ -	\$ 684	\$ 43.8	\$ 57.5		
LRT At-Grade	255		\$ 6.4	\$ (6.4)	\$ 21.7	\$ (4.3)	\$ 17.4	\$ 870	\$ -	\$ -	\$ 870	\$ 55.7	\$ 73.1		
LRT Dedicated	255		\$ 6.4	\$ (6.4)	\$ 26.8	\$ (5.4)	\$ 21.4	\$ 1,070	\$ -	\$ -	\$ 1,070	\$ 68.5	\$ 89.9		

- Notes:
1. Low estimate of funding needs assumes 50% Federal participation; high estimate of funding needs assumes 0% Federal participation
 2. Low estimate of funding needs assumes 25% State participation; high estimate of funding needs assumes 0% State participation
 3. Assumes long-term simple mortgage 30-year bonds @ Bond Buyer Revenue Bond Index = 4.86% (02-Feb-05)
 4. Assumes 1/12th of fleet replaced every year @ \$300,000 per 40-foot bus and \$750,000 per articulated bus
 5. Assumes that Federal Bus & Bus-Related grants and state grants cover entire cost of replacing buses
 6. Assumes that 2.5% of Total Construction Costs is reinvested every year (weighted average economic life of assets = 40 years)
 7. Assumes that Federal grants cover 20% of infrastructure reinvestment costs

- **Federal Funding:** It was assumed that 20 percent of the funding needs for reinvestment in new facilities would come from FTA Section 5309 Fixed Guideway Modernization grants. These grants are approximated; actual grant revenues would be determined through the application of the 5309 grant formula, which is on the basis of fixed guideway vehicle revenue miles and fixed guideway directional route-miles.

3.3 TSM AND BUILD CONSTRUCTION COST

Annual local funding requirements were determined by subtracting federal and state grants from the total construction cost and assuming that the balance would be financed through long-term bonds:

- **Total Construction Cost:** This is the total cost of the project, including right-of-way, civil works, rolling stock, other equipment, and soft costs (including contingencies).
- **Federal Participation:** FTA Section 5309 New Starts funding is highly competitive, with 10 times the amount of funding being sought as is available. While the statutory limit for Federal participation is 80 percent, FTA will not rate a project as “Recommended” with Federal participation at 60 percent or higher. As a practical matter, agencies seriously considering New Starts funding propose Federal participation at 50 percent or lower. Two scenarios were considered:
 - Low estimate of funding needs: 50 percent
 - High estimate of funding needs: zero percent
- **State Participation:** State funding to partially match FTA Section 5309 New Starts funding is limited. Two scenarios were considered:
 - Low estimate of funding needs: 25 percent
 - High estimate of funding needs: zero percent
- **Net Cost to be Locally Funded:** This is the total construction cost less Federal and state participation.
- **Annual Net Cost as Bonds:** It was assumed that the Net Cost to be Locally Funded would be financed entirely through 30-year bonds at the current interest rate.

4.0 OPERATING FUNDING REQUIREMENTS

Annual operating and maintenance (O&M) funding requirements were estimated based on estimates of O&M costs and funding from operating sources and Federal and state grants. This is summarized in Table 2. Separate estimates were made for the base (bus-only) system and incremental of funding required for the TSM and Build alternatives.

Table 2: Summary of Operating Funding Required
(Millions of 2004 Dollars)

	Base System (Bus only)						Fixed Guideway (and TSM/Airport Exp & Ltd)					Total Net Cost to be Locally Funded	
	Operating Cost	Fares and Other Op Revenue (1)	Federal Funding (2)	Existing Local Funding		FDOT Grants (5,6)	Net Cost to be Funded Locally	Operating Cost	Fares and Other Op Revenue (1)	Federal Funding (2)	FDOT Grants (5,6)		Net Cost to be Funded Locally
				Gasoline Tax (3)	General Funds (4)								
Low Estimate (5)													
TSM	\$ 130.2	\$ (28.6)	\$ (9.1)	\$ (32.4)	\$ (15.6)	\$ (20.8)	\$ 23.6	\$ 16.7	\$ (3.7)	\$ (1.2)	\$ (2.7)	\$ 9.2	\$ 32.8
BRT At-Grade	\$ 130.2	\$ (28.6)	\$ (9.1)	\$ (32.4)	\$ (15.6)	\$ (20.8)	\$ 23.6	\$ 4.0	\$ (0.9)	\$ (0.3)	\$ (0.6)	\$ 2.2	\$ 25.8
BRT Dedicated	\$ 130.2	\$ (28.6)	\$ (9.1)	\$ (32.4)	\$ (15.6)	\$ (20.8)	\$ 23.6	\$ 4.0	\$ (0.9)	\$ (0.3)	\$ (0.6)	\$ 2.2	\$ 25.8
LRT MOS	\$ 130.2	\$ (28.6)	\$ (9.1)	\$ (32.4)	\$ (15.6)	\$ (20.8)	\$ 23.6	\$ 12.7	\$ (2.8)	\$ (0.9)	\$ (2.0)	\$ 7.0	\$ 30.6
LRT At-Grade	\$ 130.2	\$ (28.6)	\$ (9.1)	\$ (32.4)	\$ (15.6)	\$ (20.8)	\$ 23.6	\$ 19.7	\$ (4.3)	\$ (1.4)	\$ (3.1)	\$ 10.8	\$ 34.4
LRT Dedicated	\$ 130.2	\$ (28.6)	\$ (9.1)	\$ (32.4)	\$ (15.6)	\$ (20.8)	\$ 23.6	\$ 20.8	\$ (4.6)	\$ (1.5)	\$ (3.3)	\$ 11.4	\$ 35.1
High Estimate (6)													
TSM	\$ 130.2	\$ (28.6)	\$ (9.1)	\$ (32.4)	\$ (15.6)	\$ (13.7)	\$ 30.7	\$ 16.7	\$ (3.7)	\$ (1.2)	\$ -	\$ 11.8	\$ 42.5
BRT At-Grade	\$ 130.2	\$ (28.6)	\$ (9.1)	\$ (32.4)	\$ (15.6)	\$ (13.7)	\$ 30.7	\$ 4.0	\$ (0.9)	\$ (0.3)	\$ -	\$ 2.9	\$ 33.6
BRT Dedicated	\$ 130.2	\$ (28.6)	\$ (9.1)	\$ (32.4)	\$ (15.6)	\$ (13.7)	\$ 30.7	\$ 4.0	\$ (0.9)	\$ (0.3)	\$ -	\$ 2.9	\$ 33.6
LRT MOS	\$ 130.2	\$ (28.6)	\$ (9.1)	\$ (32.4)	\$ (15.6)	\$ (13.7)	\$ 30.7	\$ 12.7	\$ (2.8)	\$ (0.9)	\$ -	\$ 9.0	\$ 39.7
LRT At-Grade	\$ 130.2	\$ (28.6)	\$ (9.1)	\$ (32.4)	\$ (15.6)	\$ (13.7)	\$ 30.7	\$ 19.7	\$ (4.3)	\$ (1.4)	\$ -	\$ 14.0	\$ 44.7
LRT Dedicated	\$ 130.2	\$ (28.6)	\$ (9.1)	\$ (32.4)	\$ (15.6)	\$ (13.7)	\$ 30.7	\$ 20.8	\$ (4.6)	\$ (1.5)	\$ -	\$ 14.8	\$ 45.5

- Notes:
1. Assumes 22% of operating expense from fares and other operating revenue, based on FY02 experience
 2. Assume 7% of operating expense from Federal grants, based on FY02 experience
 3. Assumes \$32.4 million, based on FY02 experience
 4. Assumes \$15.6 million, based on FY02 experience
 5. Low estimate assumes 16% FDOT operating assistance (FY02 % value)
 6. High estimate assumes \$13.74 million FDOT operating assistance (FY02 \$ value)

4.1 BASELINE SYSTEM (BUS ONLY)

The analysis examined funding requirements for the existing service and addressed the following:

- **Operating Cost:** Annual O&M costs were estimated based on the projected design-year level of service and unit operating costs derived from the current BCT operating budget.
- **Fares and Other Operating Revenue:** It was assumed that BCT would continue to generate 22 percent of its operating expenses from fares, advertising, concessions, and other operating revenues.
- **Federal Funding:** It was assumed that FTA Section 5307 Urbanized Area Formula grant funding would be seven (7) percent of O&M costs (this is percent received in 2002 (in 2002 dollars). Such funding grows with the level of service provided; the unit grant amounts (e.g., grant dollars per unit of service) historically have grown at 5 percent per year and funding levels projected in current Reauthorization legislation (H.R. 3) continue this trend.
- **Existing Local Funding:** It is assumed that funding from the county motor fuels tax and County general fund revenues continue at the current level in 2004 dollars.
- **FDOT Grants:** Two scenarios were considered:
 - Low estimate of funding needs: 16 percent of O&M expense, which is consistent with 2002 experience in percentage terms. This scenario results in FDOT grants growing (as O&M costs grow) and a lower level of projected funding needs.
 - High estimate of funding needs: \$13.74 million per year, which is consistent with 2002 experience in absolute dollar terms. This level of FDOT grants is assumed to remain stable despite growing O&M costs and results in a higher level of projected funding needs.

4.2 FIXED GUIDEWAY (AND TSM AIRPORT EXPRESS AND LIMITED)

The analysis examined funding requirements for the TSM and Build alternative and addressed the following:

- **Operating Cost:** Annual O&M costs were estimated based on the projected design-year level of service and unit operating costs derived from representative light rail transit and BRT systems
- **Fares and Other Operating Revenues:** It was assumed that BCT would generate 22 percent of its operating expenses from fares, advertising, concessions, and other operating revenues. This is consistent with the experience for the existing bus service. (By comparison, the average percentage for new fixed guideway systems in 2002 was 32 percent).

- **Federal Funding:** As with the Baseline alternative, it was assumed that FTA Section 5307 Urbanized Area formula grant funding would be seven (7) percent of O&M costs.
- **FDOT Grants:** Two scenarios were considered:
 - Low estimate of funding needs: 16 percent of O&M expense, which is consistent with 2002 experience in percentage terms
 - High estimate of funding needs: zero funding (the current funding received would continue, but this would be applied to the baseline service)

5.0 REQUIRED TAX RATES TO LOCALLY FUND TRANSIT IMPROVEMENTS

5.1 POTENTIAL TAX BASES CONSIDERED

The analysis examined several commonly applied sources of dedicated funding to determine the rate of taxation required if each of these sources were to be applied as the sole source of local funding:

- **Retail sales:** tax computed as a percentage of retail sales dollars (examples include Miami-Dade County, Atlanta, New Orleans, Houston, Dallas, Los Angeles)
- **Real property:** tax computed as dollars per thousand dollars of assessed value (examples include San Francisco Bay Area Rapid Transit District)
- **Licensed drivers:** tax computed as annual fee per licensed driver
- **Registered Vehicles:** tax computed as annual fee per registered vehicle (examples include Triangle Transit Authority/Raleigh-Durham, State of Illinois)
- **Motor Fuel:** tax computed as cents per gallon (examples include Broward County and other Florida counties)

The last section of this technical memorandum summarizes national experience in selection of dedicated funding sources for transit capital and operations for all US transit systems and for transit systems with new fixed guideway system either in operation or being planned.

5.2 SUMMARY OF CAPITAL AND OPERATING FUNDING REQUIREMENTS

Table 3 summarizes the funding requirements in the following stratification:

- By type of expense: capital, operating, and total
- By funding level: low (with higher federal and state funding of the TSM and Build alternatives) and high (with lower federal and state funding)
- By alternative

Table 3: Combined Capital and Operating Funding Required
(Millions of 2004 Dollars)

	Capital			Operating			Grand Total		
	Baseline	Build/TSM	Total	Baseline	Build/TSM	Total	Baseline	Build/TSM	Total
Low Estimate									
TSM	\$ 3.1	\$ 7.5	\$ 10.6	\$ 23.6	\$ 9.2	\$ 32.8	\$ 26.7	\$ 16.7	\$ 43.4
BRT At-Grade	\$ 13.1	\$ 10.5	\$ 23.7	\$ (0.6)	\$ 2.2	\$ 25.8	\$ 12.5	\$ 12.7	\$ 49.5
BRT Dedicated	\$ 17.7	\$ 14.1	\$ 31.8	\$ 23.6	\$ 2.2	\$ 25.8	\$ 41.3	\$ 16.3	\$ 57.6
LRTMOS	\$ 13.7	\$ 11.0	\$ 24.6	\$ 23.6	\$ 7.0	\$ 30.6	\$ 37.3	\$ 18.0	\$ 55.3
LRT At-Grade	\$ 17.4	\$ 13.9	\$ 31.3	\$ 23.6	\$ 10.8	\$ 34.4	\$ 41.0	\$ 24.7	\$ 65.7
LRT Dedicated	\$ 21.4	\$ 17.1	\$ 38.5	\$ 23.6	\$ 11.4	\$ 35.1	\$ 45.0	\$ 28.6	\$ 73.6
High Estimate									
TSM	\$ 3.1	\$ 10.0	\$ 13.1	\$ 30.7	\$ 11.8	\$ 42.5	\$ 33.8	\$ 21.8	\$ 55.7
BRT At-Grade	\$ 13.1	\$ 42.1	\$ 55.2	\$ 30.7	\$ 2.9	\$ 33.6	\$ 43.8	\$ 44.9	\$ 88.8
BRT Dedicated	\$ 17.7	\$ 56.5	\$ 74.2	\$ 30.7	\$ 2.9	\$ 33.6	\$ 48.4	\$ 59.4	\$ 107.7
LRTMOS	\$ 13.7	\$ 43.8	\$ 57.5	\$ 30.7	\$ 9.0	\$ 39.7	\$ 44.4	\$ 52.8	\$ 97.2
LRT At-Grade	\$ 17.4	\$ 55.7	\$ 73.1	\$ 30.7	\$ 14.0	\$ 44.7	\$ 48.1	\$ 69.6	\$ 117.7
LRT Dedicated	\$ 21.4	\$ 68.5	\$ 89.9	\$ 30.7	\$ 14.8	\$ 45.5	\$ 52.1	\$ 83.3	\$ 135.4

5.3 REQUIRED TAX RATES

Tables 4, 5, and 6 summarize the required rates of taxation for each of the potential dedicated funding sources if each source was the sole source of additional local funding. Table 4 addresses funding for the baseline level of service. Table 5 addresses funding for the Build and TSM improvements only, exclusive of funding required for the baseline. Table 6 addresses funding the baseline level of service plus the Build and TSM improvements. Table 6 is the best representation of funding needs as it addresses the totality of transit services provided. The FTA requires that financial plans for proposed New Starts projects address system-wide funding needs, including the baseline level of service, and not simply the funding needs of the proposed improvements.

The Tables include the following columns:

- **Source:** each of the five sources identified above
- **2004 Estimate Tax Base:** the value of the tax base to which the required additional rate of taxation will be applied
- **Units:** describing how the tax base is measured (e.g., assessed value, registered vehicles)
- **Required Additional Tax Rate if Applied as Sole Source:**
 - **Example:** the tax rate required to generate a representative \$100 million in revenue per year
 - **By Alternative:** the rate required to fund each of the TSM and Build alternatives

Table 4: Required Additional Tax Rates – Baseline Only

Source	2004 Estimated Tax Base Units	Annual Local Funding Required (\$ millions) → \$ 25,668 Millions of Dollars \$ 85,310 Millions of Dollars	Required Additional Tax Rate if Applied as Sole Source											
			Example \$ 100.0 0.39%	TSM		BRT		MOS		LRT				
				At-Grade	Dedicated	At-Grade	Dedicated	At-Grade	Dedicated	At-Grade	Dedicated			
Real Property			26.7	12.5	41.3	37.3	41.0	45.0						
			0.10%	0.05%	0.16%	0.15%	0.16%	0.18%						
			0.031%	0.015%	0.048%	0.044%	0.048%	0.053%						
Licensed Drivers	1,447 Million Licenses		0.31	0.15	0.48	0.44	0.48	0.53						
Registered Vehicles	1,434 Million Vehicles		18.49	8.64	28.53	25.79	28.35	31.13						
Motor Fuel			18.65	8.72	28.79	26.02	28.60	31.40						
Gasoline	860,588 Million Gallons													
Diesel Fuel	96,226 Million Gallons													
Total Fuel	956,814 Million Gallons		0.028	0.013	0.043	0.039	0.043	0.047						
			\$ 0.105	\$	\$	\$	\$	\$						

Source	2004 Estimated Tax Base Units	Annual Local Funding Required (\$ millions) → \$ 25,668 Millions of Dollars \$ 85,310 Millions of Dollars	Required Additional Tax Rate if Applied as Sole Source											
			Example \$ 100.0 0.39%	TSM		BRT		MOS		LRT				
				At-Grade	Dedicated	At-Grade	Dedicated	At-Grade	Dedicated	At-Grade	Dedicated			
Real Property			33.8	43.8	48.4	44.4	48.1	52.1						
			0.13%	0.17%	0.19%	0.17%	0.19%	0.20%						
			0.040%	0.051%	0.057%	0.052%	0.056%	0.061%						
Licensed Drivers	1,447 Million Licenses		0.40	0.51	0.57	0.52	0.56	0.61						
Registered Vehicles	1,434 Million Vehicles		23.39	30.31	33.43	30.69	33.25	36.02						
Motor Fuel			23.60	30.58	33.73	30.96	33.55	36.35						
Gasoline	860,588 Million Gallons													
Diesel Fuel	96,226 Million Gallons													
Total Fuel	956,814 Million Gallons		0.035	0.046	0.051	0.046	0.050	0.054						
			\$ 0.105	\$	\$	\$	\$	\$						

Table 5: Required Additional Tax Rates – TSM and Build Alternatives Only

Source	2004 Estimated Tax Base Units	Annual Local Funding Required (\$ millions) →	Required Additional Tax Rate if Applied as Sole Source							
			TSM			BRT		LRT		
			Example	At-Grade	Dedicated	MOS	At-Grade	Dedicated		
Retail Sales	\$ 25,668	Millions of Dollars	\$100.0 0.39%	16.7 0.06%	\$ 12.7 0.05%	16.3 0.06%	18.0 0.07%	\$ 24.7 0.10%	28.6 0.11%	of retail sales
Real Property	\$ 85,310	Millions of Dollars	\$ 1.17 0.117%	\$ 0.20 0.020%	\$ 0.15 0.015%	\$ 0.19 0.019%	\$ 0.21 0.021%	\$ 0.29 0.029%	\$ 0.33 0.033%	of assessed value
Licensed Drivers	1,447	Million Licenses	\$ 69.13 69.74	\$ 11.52 11.63	\$ 8.80 8.87	\$ 11.29 11.39	\$ 12.41 12.52	\$ 17.09 17.25	\$ 19.75 19.93	mils (\$ per \$1,000 assessed value) per licensed driver per year per vehicle per year
Registered Vehicles	1,434	Million Vehicles	\$ 69.74	\$ 11.63	\$ 8.87	\$ 11.39	\$ 12.52	\$ 17.25	\$ 19.93	per vehicle per year
Motor Fuel										
Gasoline	860,588	Million Gallons								
Diesel Fuel	96,226	Million Gallons								
Total Fuel	956,814	Million Gallons	\$ 0.105	\$ 0.017	\$ 0.013	\$ 0.017	\$ 0.019	\$ 0.026	\$ 0.030	per gallon

Source	2004 Estimated Tax Base Units	Annual Local Funding Required (\$ millions) →	Required Additional Tax Rate if Applied as Sole Source							
			TSM			BRT		LRT		
			Example	At-Grade	Dedicated	MOS	At-Grade	Dedicated		
Retail Sales	\$ 25,668	Millions of Dollars	\$100.0 0.39%	21.8 0.09%	\$ 44.9 0.17%	59.4 0.23%	52.8 0.21%	\$ 69.6 0.27%	83.3 0.32%	of retail sales
Real Property	\$ 85,310	Millions of Dollars	\$ 1.17 0.117%	\$ 0.26 0.026%	\$ 0.53 0.053%	\$ 0.70 0.070%	\$ 0.62 0.062%	\$ 0.82 0.082%	\$ 0.98 0.098%	of assessed value
Licensed Drivers	1,447	Million Licenses	\$ 69.13 69.74	\$ 15.10 15.23	\$ 31.05 31.33	\$ 41.03 41.40	\$ 36.53 36.86	\$ 48.13 48.56	\$ 57.57 58.08	mils (\$ per \$1,000 assessed value) per licensed driver per year per vehicle per year
Registered Vehicles	1,434	Million Vehicles	\$ 69.74	\$ 15.23	\$ 31.33	\$ 41.40	\$ 36.86	\$ 48.56	\$ 58.08	per vehicle per year
Motor Fuel										
Gasoline	860,588	Million Gallons								
Diesel Fuel	96,226	Million Gallons								
Total Fuel	956,814	Million Gallons	\$ 0.105	\$ 0.023	\$ 0.047	\$ 0.062	\$ 0.055	\$ 0.073	\$ 0.087	per gallon

Table 6: Required Additional Tax Rates – Combined Baseline Plus TSM and Build Alternatives

Source	2004 Estimated Tax Base Units	Required Additional Tax Rate if Applied as Sole Source										
		Example	TSM			BRT			LRT			
				At-Grade	Dedicated	At-Grade	Dedicated	MOS	At-Grade	Dedicated	At-Grade	Dedicated
Annual Local Funding Required (\$ millions) →		\$ 100.0	\$ 43.4	\$ 49.5	\$ 57.6	\$ 55.3	\$ 65.7	\$ 73.6				
Retail Sales	\$ 25,668 Millions of Dollars	0.39%	0.17%	0.19%	0.22%	0.22%	0.26%	0.29%				
Real Property	\$ 85,310 Millions of Dollars	0.117%	0.051%	0.058%	0.068%	0.065%	0.077%	0.086%				
Licensed Drivers	1,447 Million Licenses	\$ 69.13	\$ 30.01	\$ 34.21	\$ 39.83	\$ 38.20	\$ 45.44	\$ 50.88				
Registered Vehicles	1,434 Million Vehicles	\$ 69.74	\$ 30.28	\$ 34.51	\$ 40.18	\$ 38.54	\$ 45.85	\$ 51.33				
Motor Fuel												
Gasoline	860,588 Million Gallons											
Diesel Fuel	96,226 Million Gallons											
Total Fuel	956,814 Million Gallons	\$ 0.105	\$ 0.045	\$ 0.052	\$ 0.060	\$ 0.058	\$ 0.069	\$ 0.077				

Source	2004 Estimated Tax Base Units	Required Additional Tax Rate if Applied as Sole Source										
		Example	TSM			BRT			LRT			
				At-Grade	Dedicated	At-Grade	Dedicated	MOS	At-Grade	Dedicated	At-Grade	Dedicated
Annual Local Funding Required (\$ millions) →		\$ 100.0	\$ 55.7	\$ 88.8	\$ 107.7	\$ 97.2	\$ 117.7	\$ 135.4				
Retail Sales	\$ 25,668 Millions of Dollars	0.39%	0.22%	0.35%	0.42%	0.38%	0.46%	0.53%				
Real Property	\$ 85,310 Millions of Dollars	0.117%	0.065%	0.104%	0.126%	0.114%	0.138%	0.159%				
Licensed Drivers	1,447 Million Licenses	\$ 69.13	\$ 38.49	\$ 61.36	\$ 74.47	\$ 67.22	\$ 81.38	\$ 93.60				
Registered Vehicles	1,434 Million Vehicles	\$ 69.74	\$ 38.83	\$ 61.91	\$ 75.13	\$ 67.82	\$ 82.10	\$ 94.43				
Motor Fuel												
Gasoline	860,588 Million Gallons											
Diesel Fuel	96,226 Million Gallons											
Total Fuel	956,814 Million Gallons	\$ 0.105	\$ 0.058	\$ 0.093	\$ 0.113	\$ 0.102	\$ 0.123	\$ 0.142				

6.0 CONCLUSIONS

6.1 FINDINGS OF ANALYSIS

This analysis has derived what the rate of taxation would have to be if a single new dedicated source of funding were to be selected as the sole source of non-Federal funding to support expansion of transit services in Broward County, including the funding of fixed guideway investment in the East-West corridor. While there is broad range of potential sources of funding, the sources identified for analysis are representative of the most commonly applied sources (e.g., sales taxes and real property taxes) and sources that have clear transportation nexus (e.g., taxes or fees on licensed drivers and registered vehicles and a tax on motor fuel). All of the sources identified are already taxed in Broward County. In general, the larger the tax base, the smaller the incremental rate of taxation required for transit investment.

On the basis of this analysis, the following conclusions can be made if each of the following sources was the sole source of non-Federal funding to support transit investment in Broward County:

- **Sales tax:** no more than 0.20 percent to support the Baseline alternative alone, no more than 0.32 percent to support the LRT/Dedicated ROW alternative (the most expensive build alternative), and no more than 0.53 percent to support the combined Baseline plus LRT/Dedicated ROW alternative.
- **Real property tax:** no more than 0.61 mills to support the Baseline alternative alone, no more than 0.98 mills to support the LRT/Dedicated ROW alternative (the most expensive build alternative), and no more than 1.59 mills to support the combined Baseline plus LRT/Dedicated ROW alternative.
- **Licensed driver fee:** no more than \$36.02 per year to support the Baseline alternative alone, no more than \$57.57 per year to support the LRT/Dedicated ROW alternative (the most expensive build alternative), and no more than \$93.60 per year to support the combined Baseline plus LRT/Dedicated ROW alternative.
- **Registered vehicle fee:** no more than \$36.35 per year to support the Baseline alternative alone, no more than \$58.08 per year to support the LRT/Dedicated ROW alternative (the most expensive build alternative), and no more than \$94.43 per year to support the combined Baseline plus LRT/Dedicated ROW alternative.
- **Motor fuels tax:** no more than \$0.054 per gallon to support the Baseline alternative alone, no more than \$0.087 per gallon to support the LRT/Dedicated ROW alternative (the most expensive build alternative), and no more than \$0.142 per gallon to support the combined Baseline plus LRT/Dedicated ROW alternative.

Compared to existing rates of taxation and fees, the incremental sales tax required would likely be viewed by stakeholders and the general public as the smallest absolute and relative increase. Selecting this source would be consistent with the experience of most transit agencies seeking to implement fixed guideway transit (see Appendix A) and is consistent with the most recent experience in South Florida, which is in Miami-Dade County, where a 0.5 percent tax was approved by the voters to fund the Peoples Transportation Plan.

6.2 CRITERIA FOR SELECTING FUNDING SOURCES

Selection of a funding source involves an overview of the ability of each funding, financing and implementation option to meet all or part of the revenue needs of the capital project and an evaluation of the political, legal/regulatory, construction staging and administrative/institutional issues. It focuses on developing funding, financing and implementation packages that can be used to develop a feasible financial plan.

Financial Criteria:

- **Revenue Yield:** The dollar magnitude of revenues a funding alternative may be expected to generate at different rates and coverage.
- **Stability of Revenue Flow:** The ability to generate a stable revenue stream over time that is not subject to major fluctuations.
- **Growth Potential:** The ability to respond to growth in the economy.
- **Response to Inflation:** The ability to respond to the general rate of inflation.

Political Criteria

- **Public Acceptance:** The anticipated degree of opposition to a funding, financing, or implementation alternative. This criterion considers the public's perception of dedicating a funding source, or issuing debt for the proposed transit investment.
- **Equity:** The match of burden to benefits and the ability to pay, which frequently is based on the progressivity, proportionality, or regressivity of a funding/financing alternative.
- **Incentive and Distortion Effects:** The probable impacts of a funding alternative impact on individual behaviors, location decisions and economic growth.
- **Benchmarking:** The prevalence of applications of the funding, financing and implementation options in Virginia and neighboring states and/or local jurisdictions.

Legal/Regulatory:

- **Legality:** The legal status of the funding, financing and implementation alternatives with respect to state statute and an assessment of the ease of implementation.
- **Regulatory Authorization:** The relationship of the funding, financing and implementation options to legislative authority.

Construction Staging:

- **Resource Availability:** The ability of the funding and financing options to provide sufficient resources to meet the project's construction timetable.
- **Debt Financing Impacts:** The project implementation/staging schedule's impact on debt requirements.

- **Timing for Service Implementation:** The project implementation schedule's relationship to the opening of a minimum operating segment and the initiation of full service.

Administrative Criteria:

- **Revenue Assessment and Collection Mechanisms:** This includes the administrative structures and procedures necessary to levy and collect the funds.
- **Evasion Potential:** The ease with which the levy can be evaded and the corresponding enforcement activities required.

Table 7 summarizes an initial evaluation of the funding sources analyzed. Financial evaluation is the initial input into the selection of an appropriate package of funding, financing and implementation options. While revenue yield is ultimately the most important factor, legal and regulatory issues must be accorded considerable weight. In some cases, legal barriers may prove to be insurmountable and thus grounds for eliminating an option from further consideration. Construction staging issues will affect the overall financing and resource needs for the project. Administrative barriers should be identified and treated as a negative factor, but generally do not represent an insurmountable obstacle.

7.0 LIMITATIONS OF THIS ANALYSIS

This analysis is limited to an examination of annualized expenses and revenue and represents a prototypical year of operations in base year dollars. The development of a complete financial plan must include consideration of cash flows for expenses and revenues, both capital and operating, on a year-by-year basis from the current year through and beyond the design year selected for the estimation of ridership. This analysis should examine alternative pay-as-you-go and debt financed scenarios, be conducted in year-of-expenditure dollars, and address the underlying uncertainties associated with inflation, interest rates, project cost (exclusive of inflation), ridership, grant funding levels and rates of payment, and other factors over which the project sponsor will have no direct control.

The assumptions and sources of information underlying the development of the capital and operating cost estimates are an integral part of the financial analyses documented in this report. Uncertainties associated with fluctuating economic conditions and other factors may result in the actual results of the financial program varying from the projections in the financial analyses, and the variations could be material.

The financial results presented in this report are intended to chart a general course of action regarding project implementation, transit service expansion, and initiation of activities to establish new funding and financing approaches. The financial analysis results should not be applied or referred to any party in connection with the issuance of securities.

Table 7: Evaluation of Potential Revenue Sources

Source/ Example	Financial			Political Public Perception/ Equity	Legal Legality/ Tie to Transportation	Administrative Assessment & Collection
	Revenue Growth/ Stability	Revenue Yield	Indexing			
Sales Tax Miami, FL Atlanta, GA Chicago, IL Dallas, TX Houston, TX Santa Clara, CA San Diego, CA	<ul style="list-style-type: none"> Tax revenue is affected by economic conditions. Provides reliable revenue flow if State economy remains strong. 	<ul style="list-style-type: none"> There is potential for large revenue yield, especially as population and median income levels grow. 	<ul style="list-style-type: none"> Sales tax revenues have a direct relationship to price levels and inflation. 	<ul style="list-style-type: none"> Tax is regressive; lower income individuals spend greater portion of disposable income. Tax is unpopular with local retailers who fear a negative impact business. 	<ul style="list-style-type: none"> Sales tax has no direct tie to transportation. Legislation would be required to impose new sales tax rates. 	<ul style="list-style-type: none"> Mechanism in-place to collect the local-generated tax revenue.
Real Estate Property Tax San Francisco, CA	<ul style="list-style-type: none"> Stable revenue source, but fluctuates with real estate trends and property values. Revenue growth contingent on property trends. 	<ul style="list-style-type: none"> Sufficient revenue yield, but any increase would tend to reduce municipal revenue potential. 	<ul style="list-style-type: none"> Property values do not always follow inflationary trends. 	<ul style="list-style-type: none"> Tax is already heavily burdened, potential for stiff public opposition. 	<ul style="list-style-type: none"> No direct tie to transportation. 	<ul style="list-style-type: none"> Collection mechanism in place.
Driver Licensing Fee Most states	<ul style="list-style-type: none"> Stable revenue if licensed drivers per capita remains stable. Aging population introduces an element of risk 	<ul style="list-style-type: none"> If fee is a fraction of current state fee, then yield would be low 	<ul style="list-style-type: none"> Fee would have to be indexed for inflation 	<ul style="list-style-type: none"> Tax would be viewed as particularly burdensome to low income household 	<ul style="list-style-type: none"> Applied by most states to fund statewide transportation responsibilities 	<ul style="list-style-type: none"> State collection mechanism in place.
Motor Vehicle Registration Fees Seattle, WA Raleigh-Durham, NC	<ul style="list-style-type: none"> Stable revenue if the per capita growth of automobiles grows with the State's economy. 	<ul style="list-style-type: none"> Potential exists for low revenue yield. 	<ul style="list-style-type: none"> Fee would have to be indexed for inflation. 	<ul style="list-style-type: none"> Tax would be viewed as particularly burdensome to low income household 	<ul style="list-style-type: none"> Registration fees have a direct tie to transportation. The levy is a user charge not a tax. 	<ul style="list-style-type: none"> State collection mechanism in place.
Motor Fuel Gallonage Tax All states Local option in FL	<ul style="list-style-type: none"> Stable revenue flow as long as economic conditions remain strong. Limited revenue growth potential as technical advances improve fuel efficiency. 	<ul style="list-style-type: none"> A local option fuel tax tends to reduce statewide tax increase potential. 	<ul style="list-style-type: none"> Must be indexed to inflation because tax is based on a gallonage method. Potential long run yield not as reliable as a % of motor fuel tax or other indexed bases. Larger revenue output if consumers were taxed on the % of fuel purchased. 	<ul style="list-style-type: none"> Reinstating a recently reduced tax may generate negative reactions. Opportunity to promote the tax as pro-environment (i.e.: represents effort to achieve clean air goals). 	<ul style="list-style-type: none"> Tax has a direct tie to transportation. Levy is actually a user charge rather than a "traditional" tax. 	<ul style="list-style-type: none"> State collection mechanism in place.