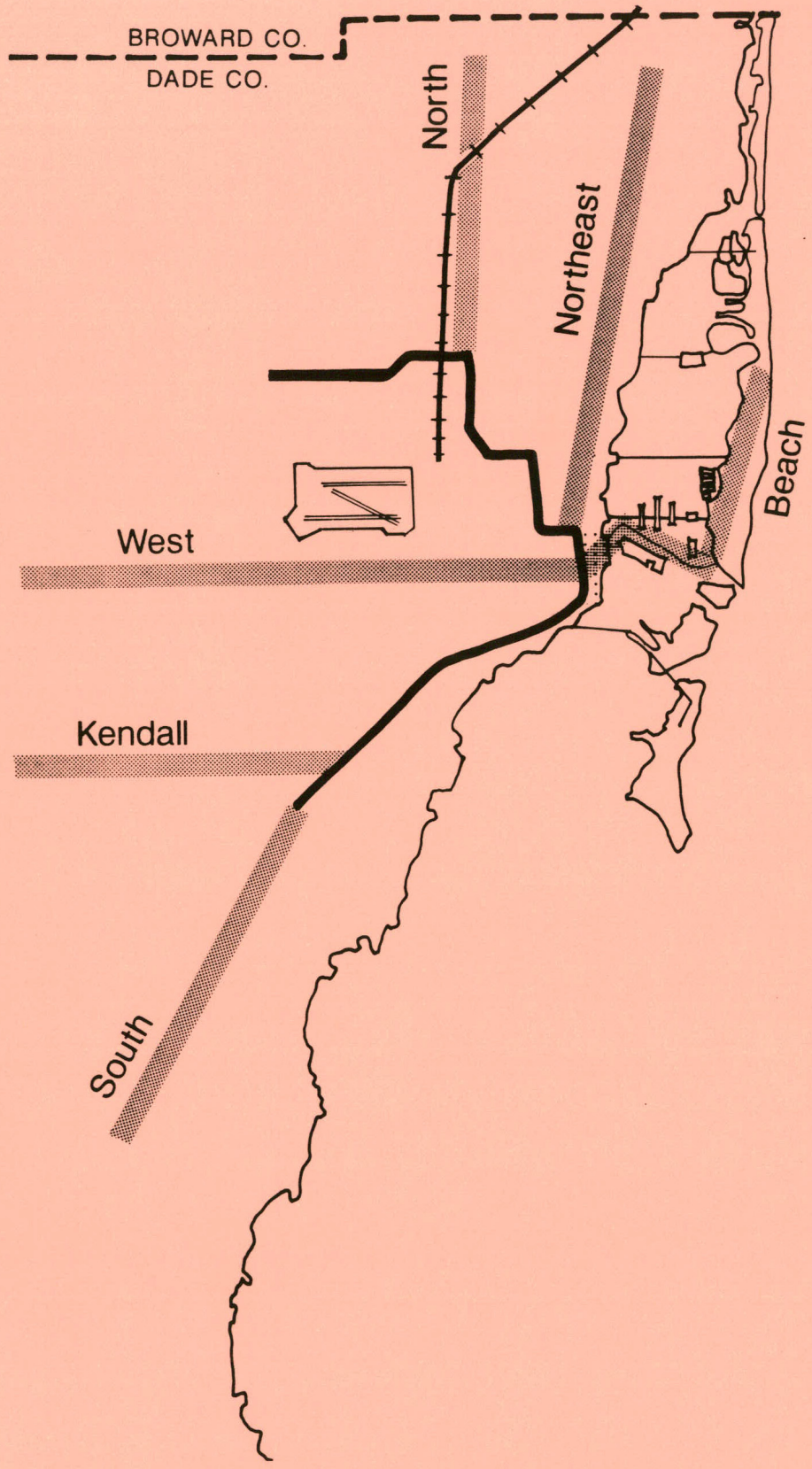

METRO-DADE

Dade County
Metropolitan Planning
Organization

Dade County Transit Corridors Transitional Analysis

Technical Memorandum Task 6:

Financial Analysis

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DADE COUNTY TRANSIT CORRIDORS TRANSITIONAL ANALYSIS
FINANCIAL ANALYSIS

1.0 OVERVIEW

This study evaluates the financial requirements and implications of undertaking a major long term expansion of fixed guideway transit in the greater Miami metropolitan area. It focuses on the six-corridor transit program, as defined in the Corridor Evaluation Report. That program includes transit alternatives in the South, Kendall, North, Northeast, West, and Beach Corridors. The analysis assumes that some form of major transit investment will be undertaken in each of the six corridors. Within each corridor, investment alternatives include any of the various modes considered in the Evaluation Report, including extensions of the existing MetroRail system, light rail transit, a "hybrid" rail transit technology that could operate in dual-mode over MetroRail right-of-way and within street right-of-way, busway, and TSM measures. Because planning for these corridors is at an early stage, no specific "preferred" program of priority corridors or technologies is assumed.

This report analyzes the entire six-corridor program *as a whole*. The analysis focuses on broad-based local, state, and federal financial sources. A follow-up study, which is beyond the scope of this study, could assess unique funding opportunities in each corridor. The objectives of this latter study will be to: 1) identify unique funding sources which may be available within each corridor (where such opportunities exist); 2) identify special requirements and constraints associated with these sources; and 3) estimate the potential amounts of funding that could be obtained from each source.

The analysis which follows considers three alternative development "scenarios", each of which may be considered a full regional program of transit investments. These include:

- a full MetroRail program -- i.e., MetroRail extensions in each corridor;

- a "least cost" program using the most inexpensive fixed guideway technology available in each corridor (e.g., busway where possible, LRT, or hybrid rail); and

- a "mixed program" of MetroRail, light rail, busway, and TSM improvements, as set forth in the preliminary recommendations in the most recent Corridors Evaluation Report. This program

includes busways in the Northeast and South Corridors, LRT in the West-Beach Corridor, direct MetroRail in the North Corridor, and TSM improvements in the Kendall Corridor.

These scenarios are representative of the range of costs and financial burdens for a full build-out program. For purposes of describing the complete development program, the report utilizes the costs and revenues estimated for the combined West-Beach Corridor.

This report contains the following sections:

1. estimates of the yearly flow of capital and operating funding requirements for the full program, including an assessment of the minimum time likely to be required to complete the full development program;

2. an analysis of federal funding prospects, including sources and potential amounts of funding;

3. estimates of state and local/regional funding required; and

4. development of alternative state/local/regional funding packages, focusing on broad-based sources of funding, particularly potential areawide taxes or fees.

2.0 TOTAL AND YEARLY CAPITAL AND OPERATING FUNDING REQUIREMENTS OF THE FULL TRANSIT CORRIDOR PROGRAM

This analysis begins by arraying capital expenditures and operating costs and revenues for the full six-corridor transit development program over time. This task requires some initial assumption about the minimum time frame for constructing and financing the full program. The question is *how long* it would take to develop the entire expansion program from a "technical" standpoint, assuming that most of the funding would be available when needed. Because of the substantial technical, regulatory, and administrative demands of designing, procuring, and building a very large urban rail expansion program (such as envisioned in Dade County), the construction and capital funding will likely extend over many years. Operating subsidy requirements would also reflect the pace of implementation. This "technically-driven" schedule of capital and operating expenditures provides the initial framework for assessing the financial constraints. Among other things, it provides a basis for identifying funding gaps and, if such gaps are projected, for defining a more realistic schedule that matches funding need with funding availability.

To illustrate the potential demands of implementing the entire transit corridor capital program in Dade County, the combined capital cost of MetroRail extensions in each of the six corridors is about $3.5 billion in 1992 prices. This is the upper bound for cost; less expensive options are also available in each corridor. In physical terms, the full rail program would involve constructing approximately 78 miles of dedicated right-of-way, much of it elevated.

By comparison, detailed planning for Atlanta's MARTA system was begun in 1971, when the Metropolitan Rapid Transit Plan concept was adopted. Phases A through C, which included the North-South line from Doraville to Hartsfield International Airport and the East-West line from Avondale to Hightower, comprised the initial core of the MARTA system. That core system, consisting of 34 miles of right-of-way and 30 stations at a cost of $2.4 billion (or about $4 billion in current prices), was not substantially completed until 1988 -- 17 years after the initial concept plan for the MARTA system was adopted. Phases A through C of MARTA serve as a good model for Dade County's transit corridor program, since they are about the same size and the costs are comparable. Moreover, MARTA's core system is a good illustration of a technically, as opposed to a financially, constrained multi-corridor rail construction program, as funding was largely in place with 60% from earmarked federal grants and the rest obtained from revenues and bonds backed by an already-approved regional dedicated sales tax.

Based on the Atlanta experience and the size of the proposed Dade County program, it appears that a minimum of twenty years would be required to fully plan, design, and construct the entire six-corridor transit program in Miami.

The next step is to identify the total capital and operating costs and the passenger revenues for each of the three program development scenarios. These estimates are summarized in Table 1. The costs and revenues, which are in constant year (1992) dollars, are obtained from the Corridors Evaluation Report.

Next, in Table 2, the capital and operating expenditures and revenues have been arrayed over the twenty year period. Again, there are three sets of financial flows, corresponding to each of the three program development scenarios.

The quantities shown in Table 2 may be best interpreted as long-run annual averages. The cost and revenue streams give a highly generic representation of the construction phasing. Construction would be phased in gradually and sequentially but no specific schedule of construction or preference-ordering among the alternatives is assumed. This simplification is simulated in Table 2 as a four year cycle of investment, with each cycle roughly representing construction and completion of one of the five corridors. (As noted, the West and Beach corridors are combined for analytic purposes). One-fifth of the entire program would be built every four years and during each four year period, one quarter of that particular phase would be completed. For the construction costs, this is very simply represented as one-twentieth of the total cost spent each year over the entire twenty year period. Operating costs, increase every four years as each new phase comes on line after the four year construction period. Of course, the operating costs for each phase are cumulative.

The costs and revenues are depicted in constant year (1992) dollars. Costs and revenues might also have been expressed in current year, or inflated, dollars. Neither a current nor a constant price methodology of financial analysis is ideal. Using constant dollars, for example, can lead to some distortion when debt financing options are considered. However, attempting to estimate costs in inflated dollars often produces much greater distortion, since long-term inflation forecasts are almost entirely guesswork. Moreover, it is very hard to meaningfully interpret long term results when the figures are not expressed on a common price-level basis.

As shown in Table 2, total annual capital expenditures over a twenty year development period would range from a high of nearly $175 million for the full Metrorail program to $59 million for the least cost program. For the full Metrorail development program, operating deficits would grow with each

Table 1: Dade County Transit Corridors Transitional Analysis: Costs and Fare Revenues of Alternative Development Programs

(Thousands, 1992 Dollars)

Corridor	Full Metrorail			Least Cost			Mixed**		
	Capital	Operating	Fare Revenue	Capital	Operating	Fare Revenue	Capital	Operating	Fare Revenue
South	831,736	11,592	0	30,752	1,493	575	30,752	1,493	575
Kendall	474,586	8,638	185	22,003	85	423	nominal	nominal	nominal
North*	529,974	8,154	1,302	26,971	2,455	933	495,478	7,948	933
Northeast	653,053	7,025	1,305	87,379	3,408	4,957	87,379	3,408	4,957
West/Beach	1,007,013	39,949	6,380	1,007,013	39,949	6,380	1,139,052	29,594	7,005
TOTAL:	3,496,362	75,358	9,172	1,174,118	47,390	13,268	1,752,661	42,443	13,470

* LRT not available in North Corridor. Costs in the table are for the busway.

** The mixed program includes the preliminary recommendations in the Corridors Evaluation Report, including:

- Busway in the Northeast Corridor
- LRT in the West-Beach Corridor
- Busway in the South Corridor
- Direct MetroRail in the North Corridor
- Minor TSM improvements in the Kendall Corridor.

Because the mixed program does not include a major investment in the Kendall Corridor, operating costs are less than the Least Cost program.

Table 2: Dade County Transit Corridors Transitional Analysis: Annual Costs and Fare Revenues Over 20 Years

(Thousands, 1992 Dollars)

Year (1=First Year)	Full Metrorail				Least Cost				Mixed			
	Capital	Operating	Fare Rev.	Op. Def.	Capital	Operating	Fare Rev.	Op. Def.	Capital	Operating	Fare Rev.	Op. Def.
1	174,818	0	0	0	58,706	0	0	0	87,633	0	0	0
2	174,818	0	0	0	58,706	0	0	0	87,633	0	0	0
3	174,818	0	0	0	58,706	0	0	0	87,633	0	0	0
4	174,818	0	0	0	58,706	0	0	0	87,633	0	0	0
5	174,818	15,072	1,835	13,237	58,706	9,478	2,654	6,824	87,633	8,489	2,694	5,795
6	174,818	15,072	1,835	13,237	58,706	9,478	2,654	6,824	87,633	8,489	2,694	5,795
7	174,818	15,072	1,835	13,237	58,706	9,478	2,654	6,824	87,633	8,489	2,694	5,795
8	174,818	15,072	1,835	13,237	58,706	9,478	2,654	6,824	87,633	8,489	2,694	5,795
9	174,818	30,144	3,670	26,474	58,706	18,956	5,308	13,648	87,633	16,978	5,388	11,590
10	174,818	30,144	3,670	26,474	58,706	18,956	5,308	13,648	87,633	16,978	5,388	11,590
11	174,818	30,144	3,670	26,474	58,706	18,956	5,308	13,648	87,633	16,978	5,388	11,590
12	174,818	30,144	3,670	26,474	58,706	18,956	5,308	13,648	87,633	16,978	5,388	11,590
13	174,818	45,216	5,505	39,711	58,706	28,434	7,962	20,472	87,633	25,467	8,082	17,385
14	174,818	45,216	5,505	39,711	58,706	28,434	7,962	20,472	87,633	25,467	8,082	17,385
15	174,818	45,216	5,505	39,711	58,706	28,434	7,962	20,472	87,633	25,467	8,082	17,385
16	174,818	45,216	5,505	39,711	58,706	28,434	7,962	20,472	87,633	25,467	8,082	17,385
17	174,818	60,288	7,340	52,948	58,706	37,912	10,616	27,296	87,633	33,956	10,776	23,180
18	174,818	60,288	7,340	52,948	58,706	37,912	10,616	27,296	87,633	33,956	10,776	23,180
19	174,818	60,288	7,340	52,948	58,706	37,912	10,616	27,296	87,633	33,956	10,776	23,180
20	174,818	60,288	7,340	52,948	58,706	37,912	10,616	27,296	87,633	33,956	10,776	23,180
21	0	75,360	9,175	66,185	0	47,390	13,270	34,120	0	42,445	13,470	28,975
22	0	75,360	9,175	66,185	0	47,390	13,270	34,120	0	42,445	13,470	28,975
23	0	75,360	9,175	66,185	0	47,390	13,270	34,120	0	42,445	13,470	28,975
24	0	75,360	9,175	66,185	0	47,390	13,270	34,120	0	42,445	13,470	28,975

phase from more than $13 million per year after the first phase to more than $66 million per year. The operating deficit for the least cost program would grow from $6.8 million at the start to about $34 million after completing all phases. (The mixed program has a slightly lower operating deficit than the least cost program, since only TSM measures would be implemented in the Kendall Corridor.)

3.0 FEDERAL FUNDING

3.1 Capital Funding

Prior to ISTEA, federal funds for major urban rail system development or expansion came principally from the Section 3 discretionary program. This program has been retained in ISTEA, and is funded at somewhat higher levels than under prior authorization legislation. In addition, ISTEA provides for substantial "flexible" funding -- i.e., Surface Transportation Program (STP) funding that may be used either for highway or transit projects -- as well as additional resources under the Congestion Mitigation and Air Quality (CMAQ) fund for projects that improve air quality in non-attainment areas, and funding for toll facilities.

This part of the analysis begins with estimates of federal funding requirements, assuming the following two scenarios:

- **Full Federal Funding**: Under ISTEA, most capital funding programs, including Section 3, CMAQ, and the STP program, have a statutory matching rate of 80% federal/20% state and local funding. This scenario assumes the maximum 80% federal share.

- **Fifty Percent Federal Funding**: This is regarded as the maximum feasible level of state and local participation.

Table 3 translates these scenarios into average absolute dollar amounts of federal capital funding. Assuming an ambitious development schedule of twenty years, 80 percent federal funding would translate into anywhere from $140 million per year over twenty years for the full MetroRail program to an average of $47 million per year for the least costly program; the mixed program would require about $70 million per year from the federal government at 80% funding. For the same 20-year schedule, 50 percent federal participation would require average annual federal outlays of from $87 million for the full MetroRail program to $29 million for the least costly program; the mixed program would require $70 million and $44 million at 80% and 50% federal participation, respectively.

Table 3 also shows the annual federal subsidy assuming longer development periods. For example, by extending the mixed development program timetable to 30 years, the annual federal subsidy would range from $46 million with an 80% federal share down to $29 million at 50% federal participation. Of course, total federal outlays over the entire period would be the same, ignoring the effects of inflation and the time value of money.

Table 3: Dade County Transit Corridors Transitional Analysis: Average Annual Federal Capital Subsidies

Development Period	% Federal	Average Annual Federal Capital Subsidy					
		Full Metrorail		Least Cost		Mixed	
20 Years	80%	139,854	(16.9%)	46,965	(5.7%)	70,106	(8.5%)
20 Years	50%	87,409	(10.6%)	29,353	(3.5%)	43,817	(5.3%)
30 Years	80%	93,236	(11.3%)	31,310	(3.8%)	46,738	(5.6%)
30 Years	50%	58,273	(7.0%)	19,569	(2.4%)	29,211	(3.5%)
40 Years	80%	69,927	(8.4%)	23,482	(2.8%)	35,053	(4.2%)
40 Years	50%	43,705	(5.3%)	14,677	(1.8%)	21,908	(2.6%)

3.1.1 Discretionary New Starts Funding

One way to assess these federal subsidy requirements is to view them relative to the total amount of discretionary New Starts funds available nationwide. This is highlighted in Table 3 by the numbers in parentheses, which show each amount as a percentage of the total nationwide authorization for New Starts, using the average annual authorization level from ISTEA (roughly $830 million per year). At 80% federal participation, for example, the full MetroRail program would require 17 percent of the total federal authorization for New Starts, while a 50% federal share would take nearly 11% of the nationwide total. The least cost program would require 5.7% of the total at an 80% federal matching rate and 3.5% of the total at a 50% rate of federal participation.

In order to gauge the probability of such levels of commitment to one city by the federal government, it is useful to review Miami's past federal support, as well as the experiences of several other cities that have initiated major rail transit programs. These data are summarized in Table 4.

As shown in Table 4, Miami received substantial federal support from the discretionary program prior to 1983, when the basic MetroRail system was constructed. Between roughly 1970 (when federal capital grants began to expand) and 1983, Miami received a total of nearly $800 million in New Starts discretionary funding, or about $60 million per year on average over 13 years. In 1992 dollars, that would be equivalent to roughly $1.2 billion or $90 million per year. Miami's New Start funding amounted to nearly a quarter of total nationwide New Starts funding over the entire time period.

Since then, federal discretionary funding for New Starts in Miami has continued, although the transit program there has not been as intensive as during the construction of the original MetroRail system. Between 1983 and 1991, Miami received nearly $150 million in federal New Start grants, or an annual average of about $19 million per year, much of it for construction of the MetroMover. Annual post-ISTEA authorizations for FY 92 and 93 are less, reflecting a lower level of need as the MetroMover extensions near completion.

Although Miami's program has been well supported by the federal government from discretionary funds, several other cities have done even better. As shown in Table 4, Atlanta captured nearly 30 percent of nationwide New Starts funding prior to 1983, and it continued to receive nearly 20 percent of the New Starts funding between 1983 and 1992. On average, Atlanta was able to capture over 20 percent of the total funds available nationwide for a period lasting more than 20 years. Baltimore has also seen extended periods of federal support, particularly prior to 1983 when the first phase of its Metro system was being constructed. Since 1983, Los Angeles has

Table 4: Dade County Transit Corridors Transitional Analysis:

Federal Capital Funding for Transit in Miami and Selected Other Metropolitan Areas, 1965 Thru Present

	Pre–ISTEA				Post–ISTEA			
	Thru FY 1983		FY 1983–1991		FY 1992		FY 1993 (House)	
	Amount (millions)	% of Total U.S.	Amount (millions)	% of Total U.S.	Amount (millions)	% of Total U.S.	Amount (millions)	% of Total U.S.
Miami Urbanized Area								
– Total Capital Funding	906.2	3.85%	260.0	1.34%	18.4	0.78%	41.2	1.47%
– Discretionary Capital Funding*	887.4	5.41%	164.2	2.05%	7.0	0.52%	29.8	1.60%
– New Starts Discretionary Funding**	795.5	23.59%	148.1	5.28%	5.6	1.04%	8.4	0.94%
All Urbanized Areas > 1 Million								
– Total Capital Funding***	21,124.1	89.75%	16,313.3	83.88%	2,352.1	99.56%	2,811.0	100.00%
– Discretionary Capital Funding*	14,774.1	90.09%	7,352.6	91.87%	1,332.1	99.25%	1,857.0	100.00%
– New Starts Discretionary Funding**	3,372.6	100.00%	2,805.9	100.00%	536.9	100.00%	721.8	80.47%
Total United States**								
– Total Capital Funding***	23,536.0	–	19,448.3	–	2,362.5	–	2,811.0	–
– Discretionary Capital Funding*	16,399.3	–	8,003.0	–	1,342.2	–	1,857.0	–
– New Starts Discretionary Funding**	3,372.6	–	2,805.9	–	536.9	–	897.0	–
Atlanta Urbanized Area								
– Total Capital Funding	1077.6	4.58%	1,760.4	9.05%	28.3	1.20%	64.7	2.30%
– Discretionary Capital Funding*	1060.1	6.46%	553.7	6.92%	13.0	0.97%	49.4	2.66%
– New Starts Discretionary Funding**	979.5	29.04%	547.8	19.52%	10.4	1.94%	35.0	3.90%
Baltimore Urbanized Area								
– Total Capital Funding	820.7	3.49%	1,325.8	6.82%	19.0	0.80%	53.0	1.89%
– Discretionary Capital Funding*	735.8	4.49%	75.8	0.95%	12.0	0.89%	46.0	2.48%
– New Starts Discretionary Funding**	632.9	18.77%	6.1	0.22%	2.6	0.48%	30.0	3.34%
Los Angeles Urbanized Area								
– Total Capital Funding	731.8	3.11%	2,255.1	11.60%	132.7	5.62%	173.5	6.17%
– Discretionary Capital Funding*	536.7	3.27%	1,036.0	12.95%	89.2	6.65%	130.0	7.00%
– New Starts Discretionary Funding**	71.1	2.11%	1,013.2	36.11%	79.1	14.73%	115.0	12.82%

* Includes all Section 3 funding, including rail modernization and bus programs.
** Section 3 funding for New Starts.
*** Excludes Stark–Harris funding, but including Interstate Transfers, FAUS funds, and Section 9 and other formula funds for capital projects.

emerged as the single largest recipient of federal funding for New Starts: between 1983 and 1991, rail projects in Los Angeles captured 36 percent of total New Starts funding. Federal support of rail construction in Los Angeles has continued through to the ISTEA era, with nearly 15 percent of nationwide funding in FY 1992 and nearly 13 percent in FY 1993.

While these data clearly show that there is past precedent for sustained high levels of federal New Start funding in one location, the experiences in Atlanta and more recently Los Angeles reflect highly extraordinary and unusual circumstances. Indeed, the stated policy of UMTA and now FTA has been to spread New Starts funding widely among applicant cities. In the future it may be extremely difficult for Miami (or any other city) to command such large shares for such extended periods of time. Meritorious projects or programs of projects are likely to continue to receive strong federal support both within Congress and possibly within the administration, but more moderate shares may be anticipated in the future.

3.1.2 Flexible Funding

In addition to Section 3 New Starts funding, transit development in Miami may be able to draw on additional federal resources through the flexible funding provisions of ISTEA. Since the ISTEA legislation only runs through 1997, twenty year funding projections based on ISTEA authorizations cannot be taken literally. However, assuming that ISTEA will be the precedent for future transportation bills, some perspective can be gained by analyzing the current program. Moreover, some funds from the current ISTEA authorization may be applied to the first stages of the development program for planning and engineering.

ISTEA created new categories of flexible funds which can be used either for highway or transit projects. The most likely source of transit funding from these sources is the Surface Transportation Program, or STP. Nationally, the six-year authorization for the STP program is $23.9 billion, or about $4 billion per year. The nationwide pool of STP funding is allocated to each state based on previous federal highway funding formulas. Within each state, 20 percent of the STP funds are reserved for statewide safety programs and specific transit enhancements as defined in Section 1007 of ISTEA. Another 30 percent is available to each state for projects anywhere within the state. The remaining 50 percent is allocated to large and small urban areas based on population. The metropolitan planning organization (MPO) has the primary responsibility, in consultation with the state, for programming regional STP funds. STP funds include adjustments for states that receive less highway funding from the allocation formula than they pay into the Highway Trust Fund. There is also a minimum allocation adjustment.

In addition, funds from several highway authorizations may be transferred, at the discretion of state officials, to the STP fund. In particular, states may transfer up to half of their allocations from the interstate highway maintenance program, the bridge maintenance program, and the national highway system fund to the STP. These funds would then become eligible for transit. Finally, states may use Congestion Mitigation and Air Quality Management (CMAQ) funds for transit projects provided the project is included in the state air-quality implementation plan (SIP).

Table 5 summarizes the potential flexible funding that might be available for transit in Miami, based on the provisions and authorizations contained in the current ISTEA. These figures are presented for illustration purposes only, and are intended merely to show what the outer limits of funding could be assuming transportation legislation comparable to ISTEA were to continue indefinitely into the future. These estimates, although based on FY 1992 authorization levels, do not in any way represent actual funding levels or commitments by the state or county.

For each individual funding program (STP, Donor State Bonus, Minimum Allocation, etc.), the potential amounts that could be available for transit in Miami are shown. The first column on the left shows the amounts that, under full authorization, would be distributed directly to the Miami metropolitan area. The next column shows the estimated authorized funding available statewide (after subtracting out amounts dedicated for safety programs and specific transit enhancements). Since these funds could be used anywhere in Florida, it is necessary to make some assumption about the amounts that might be allocated by the state to transportation projects in the Miami urban area. This is shown in the last three columns, which indicate the amounts of funding assuming that 10, 20, and 30 percent of the statewide funds would be allocated to Miami. The 20 percent figure is a reasonable middle estimate since it approximately equals Miami's current share of the urban portion of the STP fund.

As shown in Table 5, the urban portion of the STP program could yield approximately $19 million per year in additional capital funding, all or a portion of which could be used for transit. In addition, anywhere from $34 million to perhaps as much as $100 million more could be made eligible for transit projects in Miami from the statewide pool, depending on the assumptions about the percentage of statewide funds allocated to the Miami area.

Use of any of these funds for transit construction in Miami would be subject to many discretionary hurdles. The urbanized area portion would be the most likely potential source, since it is allocated to the Miami area by formula. However, these

Table 5: Dade County Transit Corridors Transitional Analysis:

Flexible Federal Funding Opportunities Under ISTEA, Maimai Urbanized Area, Estimates for FY 1992

	Miami Urbanized Area (1000s of Dollars)	State of Florida: Statewide (1000s of Dollars)	Potential Flex Funds Available in Miami Assuming: 10% State Share	20% State Share*	30% State Share
Surface Transp. Program	10,243	41,529	14,396	18,549	22,702
Donor State Bonus	1,928	28,656	4,794	7,659	10,525
Minimum Allocation	6,925	102,941	17,219	27,513	37,807
Interstate Maintenance	–	16,730	1,673	3,346	5,019
Transferable Bridge Funds	–	16,066	1,607	3,213	4,820
National Highway System	–	108,455	10,846	21,691	32,537
CMAQ	–	24,155	2,416	4,831	7,247
TOTAL POTENTIAL FLEXIBLE FUNDS	19,096	338,532	52,949	86,803	120,656

Source Note: Information obtained from estimates by FTA at the start of FY 1992.

funds would have to compete with highway projects as well as other transit needs, including maintenance and rehabilitation of the baseline rail and bus system. Funding from the statewide programs would have an even more difficult time reaching the Miami transit development program, since there would be stiff competition from highway and transit projects elsewhere in the state. Moreover, it is probably unlikely that large amounts would be transferred from the highway funding categories -- the Interstate Maintenance, Bridge, and National Highway System -- to the flexible funding category, given the needs of the state highway program.

3.2 Operating Funding

Unless there are major unforeseen changes in federal policy, additional federal subsidies will not be available to cover operating deficits associated with the transit corridor program. At present, Dade County, like virtually all other metropolitan areas, receives limited federal support for transit operating expenses under the Section 9 formula program. These monies, which have been declining in absolute dollar amounts since 1980 and which are subject to a cap based on prior years' allocations, will almost certainly continue to be used in their entirety to support Metro Dade's baseline transit system.

3.3 Federal Funding: Conclusion

Although Miami's ability to attract New Starts discretionary funding cannot be predicted, one can reasonably guess at the limitations. Based on the analysis in Section 3.1.1, it is probably safe to assume that no city will receive more than 10 percent of the nationwide pool of Section 3 New Starts funding for very long periods of time, say more than ten years. This constraint would make it extremely difficult for Miami to implement a full MetroRail program in twenty years unless the bulk of the funding is derived from state and local sources. By extending the development program to 30 years or more, however, it might be possible to complete a full MetroRail program using Section 3 funds, provided at least half of the funding comes from state and/or local sources, possibly supplemented by some flexible federal funding.

From a planning perspective, it may be useful for MDTA and other local and state officials to establish a benchmark goal of 5% of the national Section 3 total (about $40 million per year), and to develop transportation and financing options around that parameter. It may also be prudent to assume that an 80% federal share will not be maintained over many years and to plan based on a target of 50% federal discretionary funding rather than the full 80% statutory match. This might mean, for example, that local and state plans would focus on a

4.0 STATE AND LOCAL FUNDING

4.1 Total State and Local Funding Requirements

Tables 6A and 6B indicate the average annual state and local capital and operating funding that would be required for the alternative development programs, given the discussion above regarding the availability of federal funding. Table 6A shows the combined state and local requirements for a 20 year schedule, while Table 6B indicates non-federal funding for a 30 year schedule. Consistent with the discussion in Section 3.0, federal subsidies equal 50 percent of the total capital cost, with no additional federal subsidy available for operating deficits.

Table 6A includes only the least-cost and the mixed programs; the full MetroRail program is not shown, since the 20 year schedule would require substantially more than five percent of the nationwide Section 3 authorization, even at a fifty percent federal share. Table 6B, the thirty year development scenario, includes the full MetroRail program, as well as the mixed program and the least-cost program.

For the twenty year program, total state and local expenditures for capital construction would range from an average of nearly $30 million per year over twenty years for the least cost program to about $44 million per year for the mixed program. For the thirty year program, state and local capital funding would range from $58 million per year for the full MetroRail program to nearly $20 million per year for the least cost program. It should be noted that these figures would represent actual capital outlays. Cash flow (as discussed in the next section) could be different if all or part of the capital costs were financed through state and local debt. Alternatively, the capital cost figures shown in Table 6A and 6B can be interpreted as cash flow for a pay-as-you-go program.

While the capital requirements would be substantial, the need for additional state and local operating funding would, over time, become even greater. At the end of the twenty year period of development, operating subsidies would increase to about $34 million per year for the least cost program and nearly $29 million for the mixed program. For the thirty year program, these same levels would be reached after thirty years. Also, the operating subsidy after thirty years for the full MetroRail program would be as high as $63 million per year.

4.2 Potential State Funding

Table 6A: Dade County Transit Corridors Transitional Analysis: Annual State and Local Funding Requirements

(Thousands, 1992 Dollars)
Twenty Year Development Program

Year	Least Cost			Mixed		
	Capital		Op. Def.	Capital		Op. Def.
(1=First Year)	Federal	State & Local	State & Local	Federal	State & Local	State & Local
1	29,353	29,353	0	43,817	43,817	0
2	29,353	29,353	0	43,817	43,817	0
3	29,353	29,353	0	43,817	43,817	0
4	29,353	29,353	0	43,817	43,817	0
5	29,353	29,353	6,824	43,817	43,817	5,795
6	29,353	29,353	6,824	43,817	43,817	5,795
7	29,353	29,353	6,824	43,817	43,817	5,795
8	29,353	29,353	6,824	43,817	43,817	5,795
9	29,353	29,353	13,648	43,817	43,817	11,590
10	29,353	29,353	13,648	43,817	43,817	11,590
11	29,353	29,353	13,648	43,817	43,817	11,590
12	29,353	29,353	13,648	43,817	43,817	11,590
13	29,353	29,353	20,472	43,817	43,817	17,385
14	29,353	29,353	20,472	43,817	43,817	17,385
15	29,353	29,353	20,472	43,817	43,817	17,385
16	29,353	29,353	20,472	43,817	43,817	17,385
17	29,353	29,353	27,296	43,817	43,817	23,180
18	29,353	29,353	27,296	43,817	43,817	23,180
19	29,353	29,353	27,296	43,817	43,817	23,180
20	29,353	29,353	27,296	43,817	43,817	23,180
21	0	0	34,120	0	0	28,975

Table 6B: Dade County Transit Corridors Transitional Analysis: Annual State and Local Funding Requirements

(Thousands, 1992 Dollars)
Thirty Year Development Program

Year	Full Metrorail			Least Cost			Mixed		
	Capital		Op. Def.	Capital		Op. Def.	Capital		Op. Def.
	Federal	State & Local	State & Local	Federal	State & Local	State & Local	Federal	State & Local	State & Local
1	58,273	58,273	0	19,569	19,569	0	29,211	29,211	0
2	58,273	58,273	0	19,569	19,569	0	29,211	29,211	0
3	58,273	58,273	0	19,569	19,569	0	29,211	29,211	0
4	58,273	58,273	0	19,569	19,569	0	29,211	29,211	0
5	58,273	58,273	0	19,569	19,569	0	29,211	29,211	0
6	58,273	58,273	0	19,569	19,569	0	29,211	29,211	0
7	58,273	58,273	13,237	19,569	19,569	6,824	29,211	29,211	5,795
8	58,273	58,273	13,237	19,569	19,569	6,824	29,211	29,211	5,795
9	58,273	58,273	13,237	19,569	19,569	6,824	29,211	29,211	5,795
10	58,273	58,273	13,237	19,569	19,569	6,824	29,211	29,211	5,795
11	58,273	58,273	13,237	19,569	19,569	6,824	29,211	29,211	5,795
12	58,273	58,273	13,237	19,569	19,569	6,824	29,211	29,211	5,795
13	58,273	58,273	26,474	19,569	19,569	13,648	29,211	29,211	11,590
14	58,273	58,273	26,474	19,569	19,569	13,648	29,211	29,211	11,590
15	58,273	58,273	26,474	19,569	19,569	13,648	29,211	29,211	11,590
16	58,273	58,273	26,474	19,569	19,569	13,648	29,211	29,211	11,590
17	58,273	58,273	26,474	19,569	19,569	13,648	29,211	29,211	11,590
18	58,273	58,273	26,474	19,569	19,569	13,648	29,211	29,211	11,590
19	58,273	58,273	39,711	19,569	19,569	20,472	29,211	29,211	17,385
20	58,273	58,273	39,711	19,569	19,569	20,472	29,211	29,211	17,385
21	58,273	58,273	39,711	19,569	19,569	20,472	29,211	29,211	17,385
22	58,273	58,273	39,711	19,569	19,569	20,472	29,211	29,211	17,385
23	58,273	58,273	39,711	19,569	19,569	20,472	29,211	29,211	17,385
24	58,273	58,273	39,711	19,569	19,569	20,472	29,211	29,211	17,385
25	58,273	58,273	52,948	19,569	19,569	27,296	29,211	29,211	23,180
26	58,273	58,273	52,948	19,569	19,569	27,296	29,211	29,211	23,180
27	58,273	58,273	52,948	19,569	19,569	27,296	29,211	29,211	23,180
28	58,273	58,273	52,948	19,569	19,569	27,296	29,211	29,211	23,180
29	58,273	58,273	52,948	19,569	19,569	27,296	29,211	29,211	23,180
30	58,273	58,273	52,948	19,569	19,569	27,296	29,211	29,211	28,975
31			66,185			34,120			28,975

Historically, the State of Florida has provided a small but significant share of transit funding in Dade County, both for capital and operating expenditures. A similar level of state participation is assumed in Dade County's most recent five-year Transit Development Program (Metro-Dade Transit Agency, Transit Development Program, 1992). Although the 1992-1996 five year plan does not include construction of any of the transit corridor proposals, it does include financing for the completion of the MetroMover extensions, as well as funding for expansion and reconfiguration of bus services and for increases in MetroRail frequencies, especially during off-peak periods.

The county's five year plan assumes that the cumulative costs of the 1992-1996 "discretionary" capital program (i.e., capital expenditures not related to normal rehabilitation and replacement) will be funded at a rate of slightly more than 20% by the State of Florida. In fact, this is higher than the actual rate of state participation in previous periods, which was generally in the range of 10% to 12%. However, the state has demonstrated an increasing commitment to transit development in its urban areas; that growing commitment, together with the push to state and local government from ISTEA and the Clean Air Act toward greater focus on transit development, suggests that 20% state participation may be a reasonable assumption.

State funding for transit operations is assumed in the five year plan to be at a lower level than capital funding -- slightly more than 6 percent of the cumulative five year operating deficit will, according to the five year plan, be covered by state operating subsidies.

In the absence of other long term proposals for changes in state transit funding methods, the five-year TDP provides the best available basis for projecting future state funding for new transit investments beyond 1996, after which the transit corridor development program could be undertaken. Accordingly, this analysis assumes that a maximum of 20% of the capital costs of the transit corridor program will be financed by the state, and that 5 percent of the operating deficit will be covered by state operating subsidies.

4.2 Potential Local Funding

Table 7 summarizes the average annual local capital and operating funding that would be required for the alternative transit development programs, assuming that the state would contribute 20% of the capital funding and 5% of the operating funding. For the full MetroRail program, only a thirty year schedule is shown; for the mixed program and the least cost program, local funding requirements for both a twenty year and a thirty year schedule are shown.

Table 7: Dade County Transit Corridors Transitional Analysis: Annual Local Funding Requirements

(Thousands, 1992 Dollars)

Year	Full MetroRail		Least Cost				Mixed			
	30 Years		20 Years		30 Years		20 Years		30 Years	
	Capital	Operating	Capital	Operating	Capital	Operating	Capital	Operating	Capital	Operating
1	46,618	0	23,482	0	15,655	0	35,053	0	23,369	0
2	46,618	0	23,482	0	15,655	0	35,053	0	23,369	0
3	46,618	0	23,482	0	15,655	0	35,053	0	23,369	0
4	46,618	0	23,482	0	15,655	0	35,053	0	23,369	0
5	46,618	0	23,482	6,483	15,655	0	35,053	5,505	23,369	0
6	46,618	0	23,482	6,483	15,655	0	35,053	5,505	23,369	0
7	46,618	12,575	23,482	6,483	15,655	6,483	35,053	5,505	23,369	5,505
8	46,618	12,575	23,482	6,483	15,655	6,483	35,053	5,505	23,369	5,505
9	46,618	12,575	23,482	12,966	15,655	6,483	35,053	11,011	23,369	5,505
10	46,618	12,575	23,482	12,966	15,655	6,483	35,053	11,011	23,369	5,505
11	46,618	12,575	23,482	12,966	15,655	6,483	35,053	11,011	23,369	5,505
12	46,618	12,575	23,482	12,966	15,655	6,483	35,053	11,011	23,369	5,505
13	46,618	25,150	23,482	19,448	15,655	12,966	35,053	16,516	23,369	11,011
14	46,618	25,150	23,482	19,448	15,655	12,966	35,053	16,516	23,369	11,011
15	46,618	25,150	23,482	19,448	15,655	12,966	35,053	16,516	23,369	11,011
16	46,618	25,150	23,482	19,448	15,655	12,966	35,053	16,516	23,369	11,011
17	46,618	25,150	23,482	25,931	15,655	12,966	35,053	22,021	23,369	11,011
18	46,618	25,150	23,482	25,931	15,655	12,966	35,053	22,021	23,369	11,011
19	46,618	37,725	23,482	25,931	15,655	19,448	35,053	22,021	23,369	16,516
20	46,618	37,725	23,482	25,931	15,655	19,448	35,053	22,021	23,369	16,516
21	46,618	37,725	0	32,414	15,655	19,448	0	27,526	23,369	16,516
22	46,618	37,725			15,655	19,448			23,369	16,516
23	46,618	37,725			15,655	19,448			23,369	16,516
24	46,618	37,725			15,655	19,448			23,369	16,516
25	46,618	50,301			15,655	25,931			23,369	22,021
26	46,618	50,301			15,655	25,931			23,369	22,021
27	46,618	50,301			15,655	25,931			23,369	22,021
28	46,618	50,301			15,655	25,931			23,369	22,021
29	46,618	50,301			15,655	25,931			23,369	22,021
30	46,618	50,301			15,655	25,931			23,369	27,526
31		62,876				32,414				27,526

4.2.1 Bond Financing

Before identifying various local tax packages to satisfy these requirements, it is useful to consider briefly the implications of funding the local portion of the capital costs of each program through bond financing versus pay-as-you-go funding. This is analyzed in Tables 8A and 8B. For illustration purposes, Tables 8A and 8B consider only the thirty year development program.

Table 8A compares the financial requirements of pay-as-you-go-financing versus debt financing. Table 8A assumes that bonds for the local share would be sold every six years -- roughly one issue for each corridor or phase of the development program. It further assumes that bonds would be amortized over thirty years at a coupon rate of 6 percent. The total time period represented in the table is 55 years, after which the final issue (made in year 25 of the construction program) would be fully amortized (assuming no refinancing). As shown in the table, when debt financing is utilized, annual expenditures are substantially less in the first twelve years than when funding is on a pay-as-you-go basis. After that, however, debt financing becomes considerable more expensive as previous borrowings must still be retired. This pattern holds true for each of the three development programs. Debt financing, of course, also extends the total time period over which capital expenditures must be made. As also shown in the table, the pay-as-you-go approach is less costly in net present value terms, although the differences in NPV are not excessive. For the less costly options, the NPV is relatively close whether funding is on a pay-as-you-go basis or through debt.

Table 8B illustrates the flow of expenditures when one-half of the local share of capital costs is funded on a pay-as-you-go basis and the other half is financed through bonds. The column labelled "Total" is the sum of each year's pay-as-you-go expenditure plus debt service payment. Comparing Table 8B with 8A, it can be seen that the combined approach yields a less steeply graded expenditure curve than when the entire amount is financed through debt. For example, the total capital outlay for the full MetroRail program in year 30 is $74 million for the blended financing approach, versus more than $100 million when the entire program is financed through debt. Moreover, the NPV is only slightly higher than the pay-as-you-go method of financing.

An equally important constraint on borrowing, in addition to the yearly cost, is the total amount of debt that may be carried at any given time. For the full MetroRail program, for example, the total amount of outstanding debt in the thirtieth year would be $700 million when half of the costs are funded by borrowing.

mixed program extended over more than twenty years, or a more accelerated but lower cost program. Additional state and local financial resources cam then be sized to provide both the 50% match for construction as well as gradually increasing funds to cover the operating deficit. This planning should include the potential contribution from flexible funds at the disposal of both the MPO and the state. If Dade County is successful in attracting more than 50% federal funding, the additional revenues would almost certainly be put to good use.

Table 8A: Dade County Transit Corridors Transitional Analysis: Debt Financing Versus Pay-as-You Go

(Thousands, 1992 Dollars)

Year	Full MetroRail		Least Cost		Mixed	
	PAYG	Bond Amort.	PAYG	Bond Amort.	PAYG	Bond Amort.
1 *	46,618	20,321	15,655	6,824	23,369	10,186
2	46,618	20,321	15,655	6,824	23,369	10,186
3	46,618	20,321	15,655	6,824	23,369	10,186
4	46,618	20,321	15,655	6,824	23,369	10,186
5	46,618	20,321	15,655	6,824	23,369	10,186
6	46,618	20,321	15,655	6,824	23,369	10,186
7 *	46,618	40,642	15,655	13,648	23,369	20,373
8	46,618	40,642	15,655	13,648	23,369	20,373
9	46,618	40,642	15,655	13,648	23,369	20,373
10	46,618	40,642	15,655	13,648	23,369	20,373
11	46,618	40,642	15,655	13,648	23,369	20,373
12	46,618	40,642	15,655	13,648	23,369	20,373
13 *	46,618	60,962	15,655	20,472	23,369	30,559
14	46,618	60,962	15,655	20,472	23,369	30,559
15	46,618	60,962	15,655	20,472	23,369	30,559
16	46,618	60,962	15,655	20,472	23,369	30,559
17	46,618	60,962	15,655	20,472	23,369	30,559
18	46,618	60,962	15,655	20,472	23,369	30,559
19 *	46,618	81,283	15,655	27,296	23,369	40,746
20	46,618	81,283	15,655	27,296	23,369	40,746
21	46,618	81,283	15,655	27,296	23,369	40,746
22	46,618	81,283	15,655	27,296	23,369	40,746
23	46,618	81,283	15,655	27,296	23,369	40,746
24	46,618	81,283	15,655	27,296	23,369	40,746
25 *	46,618	101,604	15,655	34,120	23,369	50,932
26	46,618	101,604	15,655	34,120	23,369	50,932
27	46,618	101,604	15,655	34,120	23,369	50,932
28	46,618	101,604	15,655	34,120	23,369	50,932
29	46,618	101,604	15,655	34,120	23,369	50,932
30	46,618	101,604	15,655	34,120	23,369	50,932
31		81,283		27,296		40,746
32		81,283		27,296		40,746
33		81,283		27,296		40,746
34		81,283		27,296		40,746
35		81,283		27,296		40,746
36		81,283		27,296		40,746
37		81,283		27,296		40,746
38		60,962		20,472		30,559
39		60,962		20,472		30,559
40		60,962		20,472		30,559
41		60,962		20,472		30,559
42		60,962		20,472		30,559
43		60,962		20,472		30,559
44		40,642		13,648		20,373
45		40,642		13,648		20,373
46		40,642		13,648		20,373
47		40,642		13,648		20,373
48		40,642		13,648		20,373
49		40,642		13,648		20,373
50		20,321		6,824		10,186
51		20,321		6,824		10,186
52		20,321		6,824		10,186
53		20,321		6,824		10,186
54		20,321		6,824		10,186
55		20,321		6,824		10,186
Net Present Value	524,815	559,784	176,238	187,981	263,081	280,610

Table 8B: Dade County Transit Corridors Transitional Analysis: Debt Financing Versus Pay-as-You-Go (1/2 debt financing)

(Thousands, 1992 Dollars)

Year	Full MetroRail			Least Cost			Mixed		
	PAYG	Bond Amort.	Total	PAYG	Bond Amort	Total	PAYG	Bond Amort.	Total
1 *	23,309	10,160	33,469	7,827	3,412	11,239	11,684	5,093	16,778
2	23,309	10,160	33,469	7,827	3,412	11,239	11,684	5,093	16,778
3	23,309	10,160	33,469	7,827	3,412	11,239	11,684	5,093	16,778
4	23,309	10,160	33,469	7,827	3,412	11,239	11,684	5,093	16,778
5	23,309	10,160	33,469	7,827	3,412	11,239	11,684	5,093	16,778
6	23,309	10,160	33,469	7,827	3,412	11,239	11,684	5,093	16,778
7 *	23,309	20,321	43,630	7,827	6,824	14,651	11,684	10,186	21,871
8	23,309	20,321	43,630	7,827	6,824	14,651	11,684	10,186	21,871
9	23,309	20,321	43,630	7,827	6,824	14,651	11,684	10,186	21,871
10	23,309	20,321	43,630	7,827	6,824	14,651	11,684	10,186	21,871
11	23,309	20,321	43,630	7,827	6,824	14,651	11,684	10,186	21,871
12	23,309	20,321	43,630	7,827	6,824	14,651	11,684	10,186	21,871
13 *	23,309	30,481	53,790	7,827	10,236	18,063	11,684	15,280	26,964
14	23,309	30,481	53,790	7,827	10,236	18,063	11,684	15,280	26,964
15	23,309	30,481	53,790	7,827	10,236	18,063	11,684	15,280	26,964
16	23,309	30,481	53,790	7,827	10,236	18,063	11,684	15,280	26,964
17	23,309	30,481	53,790	7,827	10,236	18,063	11,684	15,280	26,964
18	23,309	30,481	53,790	7,827	10,236	18,063	11,684	15,280	26,964
19 *	23,309	40,642	63,951	7,827	13,648	21,475	11,684	20,373	32,057
20	23,309	40,642	63,951	7,827	13,648	21,475	11,684	20,373	32,057
21	23,309	40,642	63,951	7,827	13,648	21,475	11,684	20,373	32,057
22	23,309	40,642	63,951	7,827	13,648	21,475	11,684	20,373	32,057
23	23,309	40,642	63,951	7,827	13,648	21,475	11,684	20,373	32,057
24	23,309	40,642	63,951	7,827	13,648	21,475	11,684	20,373	32,057
25 *	23,309	50,802	74,111	7,827	17,060	24,887	11,684	25,466	37,151
26	23,309	50,802	74,111	7,827	17,060	24,887	11,684	25,466	37,151
27	23,309	50,802	74,111	7,827	17,060	24,887	11,684	25,466	37,151
28	23,309	50,802	74,111	7,827	17,060	24,887	11,684	25,466	37,151
29	23,309	50,802	74,111	7,827	17,060	24,887	11,684	25,466	37,151
30	23,309	50,802	74,111	7,827	17,060	24,887	11,684	25,466	37,151
31		40,642	40,642		13,648	13,648		20,373	20,373
32		40,642	40,642		13,648	13,648		20,373	20,373
33		40,642	40,642		13,648	13,648		20,373	20,373
34		40,642	40,642		13,648	13,648		20,373	20,373
35		40,642	40,642		13,648	13,648		20,373	20,373
36		40,642	40,642		13,648	13,648		20,373	20,373
37		40,642	40,642		13,648	13,648		20,373	20,373
38		30,481	30,481		10,236	10,236		15,280	15,280
39		30,481	30,481		10,236	10,236		15,280	15,280
40		30,481	30,481		10,236	10,236		15,280	15,280
41		30,481	30,481		10,236	10,236		15,280	15,280
42		30,481	30,481		10,236	10,236		15,280	15,280
43		30,481	30,481		10,236	10,236		15,280	15,280
44		20,321	20,321		6,824	6,824		10,186	10,186
45		20,321	20,321		6,824	6,824		10,186	10,186
46		20,321	20,321		6,824	6,824		10,186	10,186
47		20,321	20,321		6,824	6,824		10,186	10,186
48		20,321	20,321		6,824	6,824		10,186	10,186
49		20,321	20,321		6,824	6,824		10,186	10,186
50		10,160	10,160		3,412	3,412		5,093	5,093
51		10,160	10,160		3,412	3,412		5,093	5,093
52		10,160	10,160		3,412	3,412		5,093	5,093
53		10,160	10,160		3,412	3,412		5,093	5,093
54		10,160	10,160		3,412	3,412		5,093	5,093
55		10,160	10,160		3,412	3,412		5,093	5,093
Net Present Valu	262,408	279,892	542,300	88,119	93,991	182,110	131,540	140,305	271,846

As a practical matter, at least some of the capital program should probably be financed through borrowing. In fact, Tables 8A and 8B are somewhat misleading in that they show pay-as-you-go expenditures as a constant amount. More typically, costs peak in the middle years of a large construction project, so that in some years the capital requirements for any particular phase could be much higher than the yearly average. For example, for the full MetroRail program, pay-as-you-go expenditures in the third and fourth years might equal as much as $50 million, rather than the $23 million shown in the table. Some debt financing is thus usually needed to smooth out these cost peaks.

Nevertheless, the fundamental point of the tables remains -- namely, that a high ratio of debt financing to pay-as-you-go funding would lead to a steeply peaked long-term expenditure gradient, whereby costs would be much lower in the first ten to fifteen years but would increase to very high levels sometime between the twentieth and the thirtieth year, when the cumulative outstanding debt would be at a maximum. Since bond rating agencies may require a collateral stream of revenues that is twice the debt service, the financial burden of large amounts of debt would be further amplified. Moreover, the total amount of outstanding debt would also peak in later years, representing another potential constraint on borrowing.

4.2.2 Alternative Local Funding Sources

Table 9 compares the estimated local funding needed, as derived above, with available revenue projections for a number of local funding sources that have been considered in Dade County. The estimates of local funding need, which are shown for each development program and for various years, assume a thirty year development time frame. In addition, these estimates assume that one-half of the capital costs would be financed through debt and one-half would be funded on a pay-as-you-go basis.

The revenue sources and the projections of yield were obtained from the Transportation, Infrastructure and Concurrency Task Force Final Report (December 15, 1992). This report, which was provided to the consultant by the MDTA Management and Information Services Department, represents the best and most current information that could be obtained within the scope of the present analysis. No attempt has been made in this study to independently verify these projections or to examine underlying assumptions. In the absence of detailed supporting documentation for these estimates, they are assumed for purposes of this analysis to be approximately correct.

As shown in Table 9, a one cent dedicated transit sales tax in the county would raise more than enough revenue to satisfy the requirements of even the full MetroRail expansion program,

Table 9: Dade County Transit Corridors Transitional Analysis: Local Funding Options

Thirty Year Development Program, One–Half Capital Funding From Pay–As–You–Go and One–Half Bond Funding

NEEDS

Development Program	Total Annual Local Funding Required (Capital & Operating) Year 1	Year 10	Year 20	Year 30	Year 40
Full MetroRail	33,469	56,205	101,676	124,412	93,357
Least Cost	11,239	21,134	40,923	50,818	42,650
Mixed	16,778	27,376	48,573	64,677	42,806

SOURCES

Source	Yield (Rate) Year 1	Year 10	Year 20	Year 30	Year 40
Transportation Utility Fee	90,000 (n.a)	90,000 (n.a)	90,000 (n.a)	90,000 (n.a)	90,000 (n.a)
Expressway Authority	30,000 (n.a.)	30,000 (n.a.)	30,000 (n.a.)	30,000 (n.a.)	30,000 (n.a.)
Local Legislated Gasoline Tax	7,500 ($.01)	7,500 ($.01)	7,500 ($.01)	7,500 ($.01)	7,500 ($.01)
Parking Space Surtax	5,000 ($100/sp)	5,000 ($100/sp)	5,000 ($100/sp)	5,000 ($100/sp)	5,000 ($100/sp)
Dedicated Sales Tax	165,000 (1.0%)	165,000 (1.0%)	165,000 (1.0%)	165,000 (1.0%)	165,000 (1.0%)

including debt service, pay-as-you-go capital costs, and operating subsidy. However, a referendum for that tax was defeated in Miami last year, and thus the prospects for a renewal of that proposal must be considered unlikely.

The Task Force Final Report cites a number of other revenue sources that have not yet been formally presented to the public. Of these, a Transportation Utility Fee (TUF) would raise the most revenue, and would come closest to meeting the funding requirements of the transportation development program. A transportation utility fee is essentially an impact fee on development, with assessment based on trip generation rates. Unlike special assessments, these fees would be ongoing and would be collected in a manner similar to water or sewer fees. According to the Task Force Report, the TUF could yield as much as $90 million for transit each year. The report does not identify the tax rate or the size of the tax base that corresponds to this estimate of total yield.

The report also indicates that a local option gasoline tax, which would require state enabling legislation as well as approval through a local referendum, would raise about $7.5 million for each cent per gallon. This means, for example, that the least cost program could be financed by an increase in local gasoline taxes of less than two cents per gallon in the first year, with further modest increases to three cents after ten years, six cents after twenty years, and a maximum of seven cents in the thirtieth year. The requisite rates for the full MetroRail program would, of course, be higher: after 30 years, for example, the local gasoline tax would have to be raised about seventeen cents per gallon, a large but possibly acceptable increase.

Of course, various combinations of taxes and fees at various rates would also yield the necessary revenues. The key point, however, is that major local funding would have to come from some combination of increases in local sales or gasoline taxes, transportation utility fees, or cross-subsidies from the Expressway Authority. Local financing of the least cost and mixed programs could apparently be accomplished without extraordinary increases in local taxes. Funding for the full MetroRail program, on the other hand, would require considerably greater local tax effort such as a nearly twenty cent increase in local gasoline taxes over time.

Of the various revenue sources, sales and gasoline taxes are the most broad based, and in many other cities have been found to be the most politically acceptable (or least unacceptable). On the other hand, developer impact fees or assessments, especially when permanent, would probably be less appealing since they are less broad based and appear to be similar to property taxes, which are almost always unpopular. Cross-subsidies from highway tolls are reasonably acceptable in many locations, such as New York City, where most of the tolls

collected by the Triborough Bridge and Tunnel Authority are used to cross subsidize the city's subway and bus system. Many economists and transportation planners also advocate use of gasoline taxes and road tolls as a means of financing mass transit, since these internalize some of the congestion and environmental costs associated with automobile use.