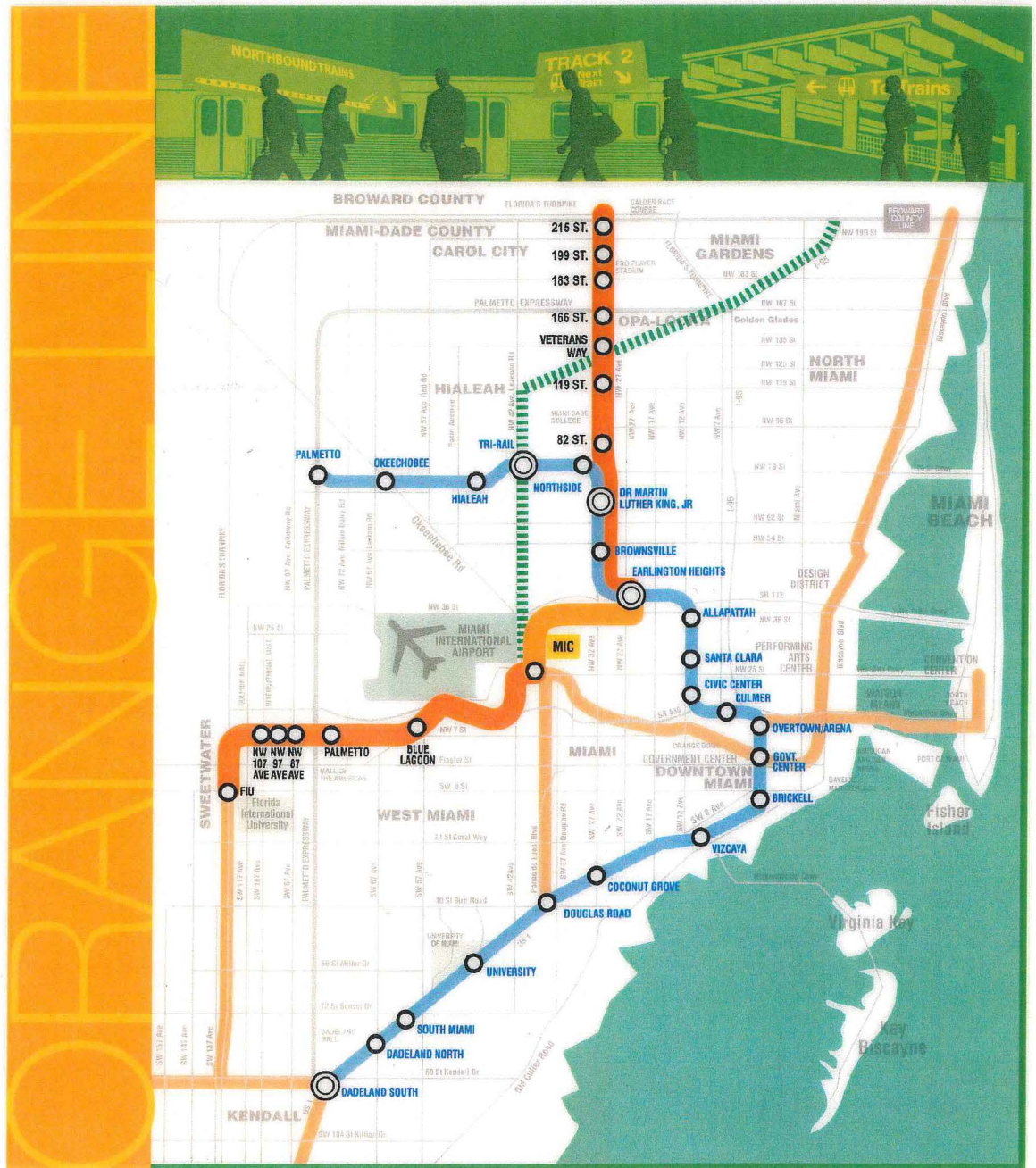




Orange Line Phase 2: North Corridor Metrorail Extension New Starts Financial Plan

September 2007



**ORANGE LINE PHASE 2:
NORTH CORRIDOR METRORAIL EXTENSION**

**FY 2009 NEW STARTS
FINANCIAL PLAN**

**Miami-Dade Transit
Overtown Transit Village
701 NW 1st Court
Miami, FL 33136**

September 2007

Miami-Dade Transit's Position on Project Funding

The Federal participation amount in the Financial Plan for Miami-Dade Transit's (MDT) Orange Line Phase 2: North Corridor Metrorail Extension project is based on input received from the Federal Transit Administration (FTA) in June 2007. Specifically, MDT was directed by FTA that the 5309 New Starts funding level for the North Corridor should not exceed \$700,000,000 and that the annual allocation of 5309 New Starts funds should not exceed \$100,000,000 annually.

It is MDT's understanding that the rationale for these limits was to "level the playing field" for the purpose of this submission but not necessarily as a point of departure for negotiating a Full Funding Grant Agreement (FFGA).

The enclosed documents reflect this FTA directive. Please note that MDT does not accept that this represents the final decision on the Federal share of the project cost. Given the County's commitment to the expansion of the transit system – as evidenced by the passage of the ½-cent sales tax by its constituents – and the continued commitment at the State level to provide matching funding, the County is of the belief that the total project cap suggested by FTA for this submission does not meet the overall objective of the FFGA program. In keeping with the spirit of FTA's Section 5309 New Starts program, MDT expects that FTA will fund up to 59 percent of the total capital cost of the North Corridor project, which is consistent with direction to project sponsors from FTA. A lower level of Federal participation would unduly burden the State and the County by increasing their required level of participation.

MDT looks forward to continue to meet with FTA to further discuss the level of Federal participation to the Orange Line Phase 2: North Corridor Metrorail Extension project.

September 26, 2007

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SUMMARY OF FY 2009 FINANCIAL PLAN CHANGES AND IMPROVEMENTS

The financial plan for the Orange Line Phase 2: North Corridor Metrorail Extension which was submitted to the Federal Transit Administration (FTA) during the FY 2008 New Starts cycle was based directly on the 2006 People's Transportation Plan (PTP) Pro Forma, a financial planning document prepared by Miami Dade Transit (MDT) and its consultants. The County Manager presents an updated Pro Forma to the Board of County Commissioners annually. The Pro Forma is a 30-year financial plan which describes the projected revenues and planned uses of the dedicated one-half percent PTP sales tax which was approved by Miami-Dade County voters in 2002. The Pro Forma also provides projections of the capital and operating expenditures and other revenue sources of MDT, so that the uses of the dedicated sales tax can be assessed in the larger context of MDT's total financial capacity.

Following MDT's submission of the FY 2008 North Corridor Financial Plan, FTA raised significant concerns with MDT regarding some aspects of the financial assumptions applied in the Pro Forma. FTA's primary concern centered on a lack of consistency between the ridership estimates generated by the travel demand model and the resulting projections of fare revenue. FTA was also concerned about assumptions regarding growth in operating and maintenance (O&M) costs and growth in fares in base year dollars.

The FY 2009 North Corridor Financial Plan addresses all of the concerns expressed by FTA regarding the prior submission. In particular, the FY 2009 Financial Plan establishes direct and consistent linkages between the key service assumptions (assumed transit service hours, miles, and fare policies); the ridership estimates from the travel demand model; capital project implementation schedules; funding from Federal, State, and local sources; and the major outputs of the financial model (capital costs, operating costs, fare revenues, and the required funding from local sources and debt proceeds). By establishing these linkages, the FY 2009 plan presents a consistent picture of MDT's financial capacity to undertake the North Corridor project.

Assumptions Retained from Previous Plan

While a number of assumptions from the previous Financial Plan have been modified for this submission, many other assumptions have been retained. The critical financial plan assumptions which either match the Pro Forma or conform very closely to it include:

- Commitment of Local Funds: Funds from Miami-Dade County are committed through dedicated revenue from the one-half percent sales tax. When necessary, the County will issue bonds backed by the one-half percent sales tax revenues to finance the Orange Line Phase 2: North Corridor Metrorail Extension and other major capital investments. The County also has access to Sunshine State Loans and other financing instruments.
- Growth of PTP Dedicated Tax Revenue: The Pro Forma assumed a long-run growth rate for the PTP sales tax base of 5.50 percent per year. An independent projection of the growth in the PTP sales tax base was purchased from Moody's Economy.com, a leading provider of economic analysis and forecasting data.

Their projection, while varying from year to year, resulted in an average annual growth rate of 5.57 percent.

- Non-Farebox Operating Revenues: The FY 2009 Financial Plan assumes non-farebox operating revenues from the same four sources as the Pro Forma – advertising, parking at rail stations, joint development revenues, and interest on the agency’s working capital balance.
- State and Local Grant Sources: The FY 2009 Financial Plan matches the Pro Forma in its assumptions about the type and amount of state and local grants available to MDT. The FY 2009 Financial Plan assumes the following sources of assistance:
 - *State Block Grant*: Grows at 1.9 percent annually from a base of \$16.5 million in FY 2009.
 - *State Transportation Disadvantaged & Corridor Enhancement Grant*: Grows at 2.0 percent annually from a base of \$8.4 million in 2007.
 - *MDT Local Option Gas Tax (LOGT)*: Grows at 1.5 percent annually from a base of \$17.3 million in 2007.
 - *MDT General Fund Revenues*: Grows at 3.5 percent annually from a base of \$132 million in 2007, based on a January 2005 Resolution by the Board of County Commissioners.
- Near-Term Infrastructure Renewal: Both the FY 2009 Financial Plan and the Pro Forma use MDT’s 2007-2012 Capital Improvement Program (CIP) as the basis for modeling near-term capital investment costs, including bus and rail fleet renewal and other non-fleet renewal costs (such as guideway maintenance, facilities maintenance, ADA improvements, and many other capital investments).
- Tax-Exempt Debt Financing: Both the FY 2009 Financial Plan and the Pro Forma utilize long-term, tax-exempt debt financing to provide funding for MDT in years where the projected uses of funds (particularly in years of major rail corridor construction) are greater than the total projected sources of funds.
- Planned Rail Corridor Implementation Schedule: The planned implementation dates for the three phases of the Orange Line remain unchanged. Orange Line Phase 1: Miami Intermodal Center (MIC)-Earlington Heights Connector will open in July of 2011, and Orange Line Phase 2: North Corridor will open in November 2014. The implementation date of Orange Line Phase 3: East-West Metrorail Extension (from Florida International University to the MIC) is less certain, but is currently projected to open in 2016.

Revised Assumptions and New MDT Initiatives

While many assumptions have been retained from the Pro Forma, the FY 2009 Financial Plan also contains significant variances from the Pro Forma. These updated assumptions underlie the consistent presentation of MDT’s financial capacity to undertake the North Corridor project. The key variances include:

- Capital Cost Estimate: The capital cost estimate has been updated to reflect the completion of 30 percent design plans as part of the preliminary engineering

project development phase. The base year cost estimate is \$1,311.8 million (inclusive of prior year expenditures) and the year-of-expenditure (YOE) cost estimate is \$1,605.4 million (again, inclusive of prior year expenditures). The capital cost estimate also includes estimated financing costs that will be incurred by MDT for bonding and the implementation of a debt financing program in response to a maximum federal annual funding allocation of \$100 million¹.

- Baseline Levels of Service: While Metromover service is projected to remain constant, the baseline levels of Metrobus and Metrorail service reflected in the FY 2009 Financial Plan are the result of a series of management directives regarding cost growth as well as efforts to prevent long-run service degradation:
 - Based on discussions with MDT staff, the FY 2009 Financial Plan includes anticipated near-term reductions in bus service of approximately 1.4 million revenue vehicle miles in FY 2008. These reductions are intended to eliminate poorly performing routes and improve system-wide financial performance. These reductions have already been publicly announced.
 - Based on budget directives received by MDT staff, the annualized rate of increase in operating costs for the system should be no greater than 4.5 percent between 2008 and 2023. In order to achieve cost growth at this rate, baseline Metrobus and Metrorail service are gradually reduced over the period. Metrobus revenue hours, for example, are projected to decline from 2.63 million hours to 2.45 million hours during that period. Metrorail baseline service (i.e., service on the existing network) will also decline slightly, but this will be significantly outweighed by the service additions on the new rail corridors.
 - Finally, the 2030 design year level of bus service has been modeled so that scheduled headways remain the same as they are currently. However, because of projected increases in traffic volumes and slower traffic speeds (as revealed in the travel demand analysis), maintaining these headways in the design year requires a significant increase in service – a 21 percent increase in revenue vehicle miles and a 39 percent increase in revenue vehicle hours as compared to 2007 levels. This ramp-up in service begins in 2024 and continues through the design year in 2030.
- Fare Policy and Fare Revenues: The Pro Forma assumed an aggressive schedule of fare increases in the near term (\$0.50 increases for bus and rail in 2009, 2011, and 2013) and then repeated smaller increases in later years (\$0.25 increases every other year from 2015 to 2025). The FY 2009 Financial Plan has modified that schedule significantly so that fare increases are tied to service expansions, and so that the average real fare per linked passenger trip is same in the design year as it is currently. The plan assumes a \$0.50 increase in the

¹ The County has capped the New Starts funding amount as suggested through communications with the FTA staff. The County fully intends to actively pursue and negotiate a greater funding amount at the time a Full Funding Grant Agreement is agreed upon. Please see MDT's Position on Project Funding at the beginning of this document.

cash fare in 2009, \$0.25 increases in the years immediately preceding the opening of Orange Line Phases 1 and 2 (2011 and 2014, respectively), and a \$0.13 increase in 2016 when Phase 3 opens. After 2016, fares are assumed to be flat until the 2030 design year. After 2030, fares are assumed to grow with inflation. This results in an average real fare at the same level in the design year as in the base year. In other words, the FY 2009 Financial Plan assumes no real growth in fare between base year and design year, which is consistent with the travel demand analysis. This assumed schedule of fare increases is more consistent with MDT's historical experience in raising fares.

Projected annual growth in average fare per passenger was based on this schedule of fare increases.

Annual ridership projections were based on current ridership and design year modeled ridership for the Orange Phases 1, 2 and 3, and interpolations based on underlying demographic growth. The projected annual fare per passenger was multiplied by annual ridership in each analysis years to project annual fare revenue. This analytical approach is distinct from the Pro Forma's methodology for forecasting fare revenues (which did not tie fare revenue growth directly to ridership growth), and the overall impact of this approach is significant. The Pro Forma projected total YOE operating revenue over the 30-year period of approximately \$12.3 billion. The FY 2009 Financial Plan projects \$6.9 billion in operating revenue, a reduction of \$5.4 billion.

- Full Funding Grant Agreements (FFGAs)²: Based on discussions with FTA staff, the FY 2009 Financial Plan assumes that the maximum amount of FFGA funding available to MDT for the Orange Line in any year will be \$100 million. This annual cap will apply even in years when MDT may be simultaneously pursuing both Orange Line Phase 2: North Corridor Metrorail Extension and Orange Line Phase 3: East-West Metrorail Extension. In addition, FTA staff also indicated that the maximum total amount available to the Phase 2: North Corridor Metrorail Extension project will be \$700 million. The Pro Forma had assumed higher amounts of federal funding for both the Phase 2 and Phase 3 projects. In addition, the FY 2009 Financial Plan also assumes that the maximum total FFGA amount that will be available to the Orange Line Phase 3 project is \$700 million.
- Modification of Public Works Projects: The Miami-Dade County ordinances establishing the People's Transportation Plan (PTP) and the PTP dedicated sales tax require that 20 percent of the revenues generated by the PTP sales tax be immediately transferred to the municipalities of Miami-Dade County for their use on local transportation projects. In addition, a portion of the remaining funds are designated for projects by the Miami-Dade Public Works Department. In the Pro Forma, these projects were spread over seven years, from 2007 to 2013, and the expenditures were heavily front-loaded in the 2007-2009 period. Based

² The County has capped the New Starts funding amount as suggested through communications with the FTA staff. The County fully intends to actively pursue and negotiate a greater funding amount at the time a Full Funding Grant Agreement is agreed upon. Please see MDT's Position on Project Funding at the beginning of this document.

on discussions with MDT staff, these projects are spread more evenly over an 11 year period in the FY 2009 Financial Plan.

- MDT Initiatives to Improve Efficiency and Increase Revenues: Following discussions with MDT staff, additional assumptions have been included in the FY 2009 Financial Plan which reflect initiatives the agency is undertaking to improve agency efficiency and increase revenues:
 - *Wage inflation assumptions:* The Pro Forma assumed total labor cost growth of 5.5 percent per year, or roughly 2-3 percent above expected inflation levels. The FY 2009 Financial Plan breaks out labor cost growth into wages and fringe benefits. Fringe benefits are assumed to grow at rate well above inflation (10 percent in the near-term and double the rate of CPI inflation thereafter) due to increasing costs of health care, but based on MDT's historical experience; basic wage growth is expected to increase at only 0.24 percent above inflation per year.
 - *Impact of new fare collection equipment:* The MDT Capital Improvement Program includes a major near-term expenditure for new fare collection equipment. Based on the experience of other transit agencies, including MARTA in Atlanta and MBTA in Boston, MDT expects this new equipment to have a significant positive impact on fare revenues without impacting ridership (due to reduced fare evasion and revenue-positive pricing incentives). Therefore, by 2010, average fare paid per passenger is projected to increase by 15 percent over what would be expected without the new equipment.
 - *Reduced bus vehicle operations costs:* MDT is currently implementing new procedures to reduce bus operator absenteeism and is also implementing new bus scheduling and dispatching software. The combined effect of these initiatives is expected to be a 5 percent reduction in bus vehicle operations cost per hour by 2010.
 - *Reduced rail vehicle maintenance costs:* As MDT rehabilitates its existing rail vehicles and purchases new vehicles to support its rail expansion, it will switch over from direct current (DC) propulsion to alternating current (AC) propulsion. This change is expected to result in a 5 percent reduction in rail vehicle maintenance costs per mile, beginning in 2010.
- Reduced Cost of the Phase 3: East-West Metrorail Extension Project: The cost of the Phase 3 project as shown in the Pro Forma was \$2.2 billion (YOE). Based on discussions with MDT staff and consultants, a reduction in the Phase 3 project cost will be required for the project to be cost-effective under FTA guidelines and to qualify for FFGA funding. For the purposes of this North Corridor Financial Plan, the Phase 3 project cost is estimated at \$1.77 billion (YOE), including all finance charges.
- Commitment of State Funds: State funds in the amount of \$305 million have been budgeted for the Orange Line Phase 2: North Corridor Metrorail Extension as part of the Florida Department of Transportation's (FDOT) adopted FY 2008-FY 2012 State Transportation Program. MDT will request an additional \$148 million contribution from FDOT to fulfill its 50 percent match of the non-federal funding share.

- Projection of Future FTA Section 5307 Formula Funds: The Pro Forma simply increased FTA Section 5307 Formula Funds at a fixed annual growth rate. The FY 2009 Financial Plan builds up the projected FTA Section 5307 funds from modeled data on service area population and density, bus revenue miles, fixed guideway revenue miles, and fixed guideway directional route miles. This approach directly accounts for the growth in service and population that is projected over the 30-year period of the Plan.
- Risk and Uncertainties: The FY 2009 Financial Plan includes expanded analysis and discussion of risks and uncertainties that could potentially impact the financial viability of the project. This included additional sensitivity analyses, in the form of Monte Carlo simulations, of revenue sources and expenses to indicate the impact of potential cost increases and revenue shortfalls. The Monte Carlo simulation addresses the following:
 - Baseline, optimistic and pessimistic scenarios for inflation, interest rates, and sales tax growth (spanning 80-85 percent of likely outcomes).
 - Changes in ridership (5 percent higher than projected and 25 percent lower than projected).
 - Changes in project capital cost (5 percent lower than projected and 10 percent higher than projected).
 - Changes to the FFGA annual cap (+/- \$20 million from the projected cap of \$100 million).

1.0 INTRODUCTION

This report provides a Financial Plan for implementing and operating the Orange Line Phase 2: North Corridor Metrorail Extension of the Miami-Dade Transit (MDT) Metrorail System. The North Corridor Metrorail Extension is listed in the Miami-Dade Metropolitan Planning Organization's (MPO) 2030 Long Range Transportation Plan (LRTP) as a Priority I project (with funding to be initiated before 2009), and it was listed as the highest priority in the People's Transportation Plan (PTP) that formed the basis for the county sales tax initiative passed in November 2002. This report supports MDT's submittal to the Federal Transit Administration (FTA) for a FY 2009 New Starts rating.

Both the federal and the county fiscal year extend from October 1 through September 30, and the State of Florida conforms to a fiscal year beginning July 1 and extending through June 30. All year references in this report refer to MDT's fiscal year unless otherwise noted.

The Financial Plan does not consider costs, resources, or funding strategies associated with transit service provided by entities other than MDT.

1.1 Project Sponsor

The project sponsor is Miami-Dade County (the County) through MDT, a department of the County. MDT is the designated recipient for FTA grants to the urbanized area. As the largest transit agency in the State of Florida and the 14th largest in the nation, MDT operates Metrorail, Metromover and Metrobus service, as well as providing contracted paratransit/access service, throughout Miami-Dade County. In FY 2006, total transit ridership was approximately 339,000 unlinked trips on an average weekday, plus 4,800 daily access passengers on the County's Special Transportation System (STS) – about 344,000 total daily trips.

MDT is a successor to the County's initial public transit system organized in 1960, when the Dade County Commission passed an ordinance creating the Metropolitan Transit Authority (MTA) to unify existing private and public operations into a countywide service. In 1974, Coral Gables Transit, a municipal system, was merged into the MTA. Since 1960, the MTA evolved into the Metro-Dade Transportation Administration, the Metro-Dade Transit Agency, the Miami-Dade Transit Agency, and currently MDT.

MDT's existing 22-mile Stage 1 Metrorail system operates with 136 cars and 22 stations. The system runs from the Dadeland South Station near Kendall Drive (SW 88th Street) to the Palmetto Station near NW 79th Avenue and NW 79th Street. Metrorail service runs 19 hours a day, seven days a week. Service frequency is currently 6-minutes during weekday peak hours, 10-minutes during weekday midday hours, 15-minutes during weekends, and 30-minutes after 8:00 PM. During FY 2006, Metrorail averaged about 57,500 daily boardings. The Metromover – the automated guideway system in downtown Miami – carried about 25,900 daily riders in 2006, with 29 cars on 4.25 miles of two-way guideway.

In FY 2006, 112 bus routes served all of Miami-Dade County. The MDT Metrobus fleet includes 1,108 vehicles, with a peak-period vehicle requirement of 823 buses. During FY 2006, Metrobus averaged 255,900 daily boardings. Paratransit services carried another

4,800 daily riders through contracted service agreements. Since the PTP improvements were implemented starting in 2003, which includes more frequent bus service, ridership has grown by about 26 percent, and this growth is continuing into FY 2008.

1.2 Project Funding

1.2.1 Project Funding Partners

Local funding for the North Corridor project was authorized in 2002, when voters approved a one-half percent sales tax to fund transit projects throughout Miami-Dade County. These funds are included in the County budgeting process and are available for capital and operating expenses associated with projects in the PTP. The PTP also recognizes the North Corridor as the highest priority project.

State capital funds will also be used to support the North Corridor project. FDOT has budgeted \$305 million for this project as part of the State's Transportation Work Program, and these funds are considered fully committed. MDT expects to request an additional \$148 million from FDOT under this Financial Plan.

1.2.2 Capacity of Partners to Fund the Proposed Project

The current estimated capital cost for the North Corridor Metrorail Extension is \$1,311.8 million in current year dollars and \$1,605.4 million in year-of-expenditure (YOE) dollars, including finance charges and prior year expenditures. The County's share of the project costs from 2007-2020 will be \$452.7 million in YOE dollars (including both direct project expenditures and finance charges).

In FY 2006, the PTP sales tax generated \$189 million, an 11 percent increase from FY 2005 receipts of \$170 million. Economic projections of the continued growth in the County sales tax base show a long-term average annual growth rate of 5.5 percent. In addition, the County is committed to an annual General Fund allocation as Maintenance of Effort (MOE), as existed before the passage of the 2002 PTP sales tax. In FY 2006, the County contributed \$132 million in General Funds toward transit.³ MDT also receives a share of the County's Local Option Gas Tax (LOGT) revenues, which totaled approximately \$17 million in FY 2006.

Table 1.1 shows major local funding sources for existing transit operations in the County, which totaled approximately \$447 million in report year 2006 according to the FTA's National Transit Database.

³ Miami-Dade County Budget, FY 2006-2007

Table 1.1: Miami-Dade Transit's Operating Resources (FY 2006)

Revenue Sources	Revenue (000s)
Dedicated Surtax	\$97,007
Farebox and Operating Revenues	\$104,541
State Operations Assistance	\$24,613
County General Revenues	\$181,902
Federal Funds (FTA and Other USDOT)	\$39,087
Total	\$447,150

Source: Federal Transit Administration, National Transit Database Report Year 2006

In addition to the Orange Line Phase 2: North Corridor Metrorail Extension, MDT intends to undertake several other major capital investments using PTP funds. Other planned Metrorail extensions include Orange Line Phase 1: Miami Intermodal Center (MIC)-Earlington Heights Connector and Orange Line Phase 3: East-West Metrorail Extension. To demonstrate MDT's financial capacity, the capital and operating costs associated with these projects have been included in this plan.

1.3 Project Description

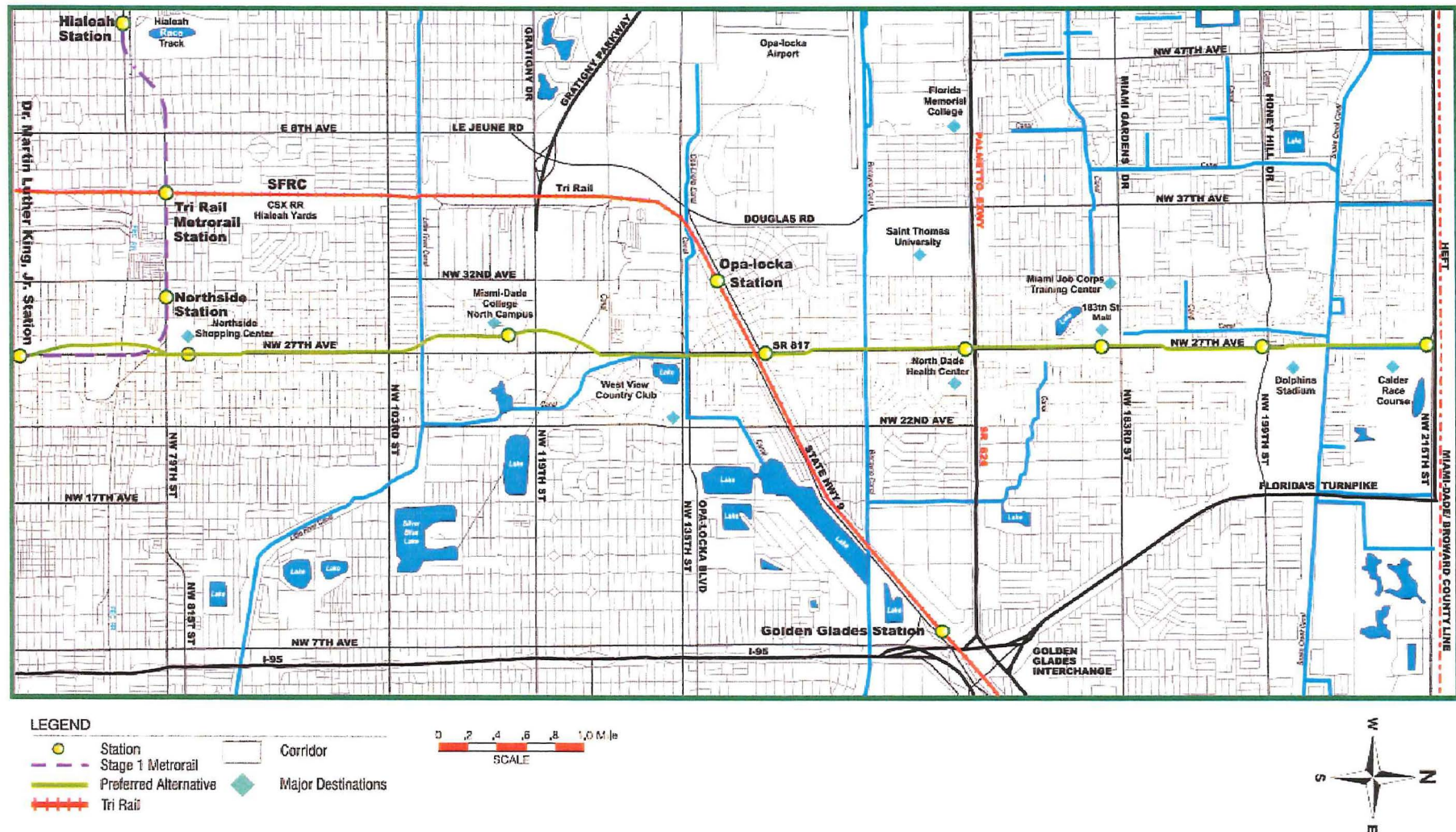
The Orange Line Phase 2: North Corridor Metrorail Extension is a 9.5-mile elevated extension of MDT's existing heavy rail Metrorail system along NW 27th Avenue between the existing Dr. Martin Luther King, Jr. Metrorail station and the Broward County line. There will be seven stations on this extension with park-and-ride and kiss-and-ride facilities. The project will require 36 additional railcars for peak period revenue operations, and the North Corridor service will run from the Broward County line to the Brickell Metrorail Station (south of Miami's central business district) every 6.5 minutes during the peak period. The project is scheduled to enter final design at the end of 2008, and to be built largely during fiscal years 2010 through 2014, with revenue service beginning in November 2014. Figure 1.1 shows the alignment of the project.

1.4 Project Purpose and Need

The Orange Line Phase 2: North Corridor Metrorail Extension is recognized by Miami-Dade and Broward Counties as a regional transit link where inter-county transit services connect in their respective long-range transportation plans. The North Corridor has heavy two-directional travel potential where currently there are about 20,000 daily bus trips in the corridor, with many transferring to and from the existing Stage 1 MDT Metrorail system.

Miami-Dade County's 2000 population of 2.4 million is expected to increase to over 3 million by 2030. Population in the three-county (Miami-Dade, Broward and Palm Beach) region is expected to climb to 7.6 million by the same year. A system expansion of Metrorail can help shape this corridor's growth, while providing transit service to a low-income area.

Figure 1.1: Orange Line Phase 2: North Corridor Metrorail Extension



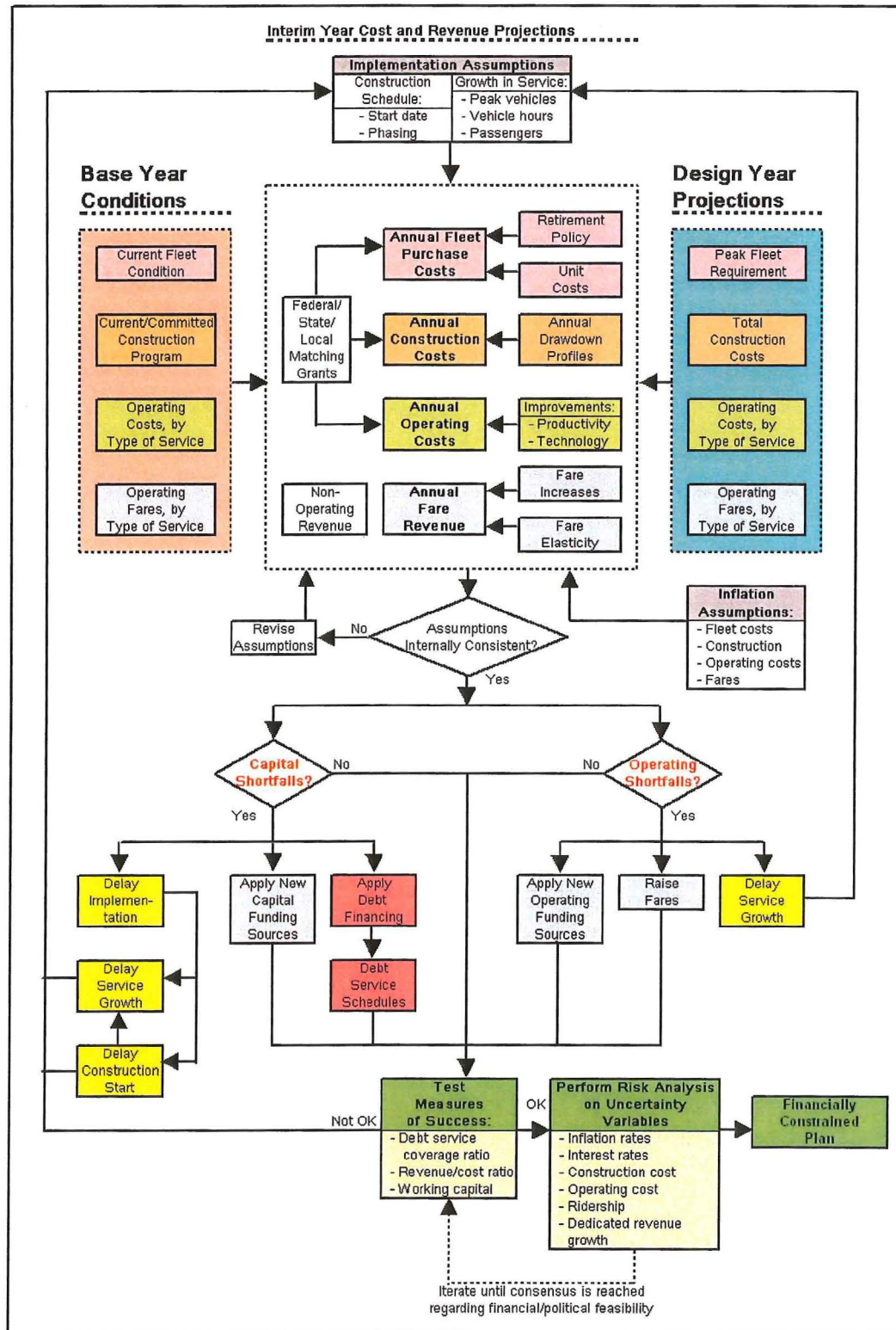
1.5 Financial Planning Process

The objective of the financial analysis is to demonstrate that MDT has the financial capacity, over a 30-year period from 2007 to 2036, to build and operate the Orange Line Phase 2: North Corridor Metrorail Extension, as well as the other phases of the Orange Line, while continuing to operate and maintain its baseline system. Figure 1.2 summarizes the transportation financial planning process applied in the financial analysis. The process emphasizes a comprehensive approach to the integration of expenses and revenues, both capital and operating, for major transportation investments and was considered prudent given the magnitude of revenues to be applied.

The following three major project components served as the basis for the description used in the analysis:

1. Construction Program. Annual costs for the transit facilities construction program which include:
 - *Capital expansion projects*
 - Total construction cost in base year dollars; and
 - Distribution of annual construction costs, which was used when advancing or delaying project construction assumptions
 - *The remainder of the Capital Investment Program*
 - Total construction cost in base year dollars; and
 - Distribution of annual construction costs, which was used when advancing or delaying project construction assumptions.
2. Operating Costs. Incremental operating and maintenance costs associated with the Orange Line Phase 2: North Corridor Metrorail Extension, the other Orange Line projects, the baseline system, and other operational initiatives and planned service expansion projects.
3. Operating Revenues. Growth in fare revenue is projected based on a combination of operational initiatives underway, growth in service, and travel demand forecasts.

Figure 1.2: Financial Planning Process



The computation of costs and revenues was defined by two sets of project implementation assumptions:

- Construction Schedule. Includes the start date and opportunities for construction phasing; and
- Implementation of Transit Service. Includes the forecast growth in annual miles and hours of service and growth in fleet size that, in turn, will drive growth in new vehicle costs, operating and maintenance costs, and operating revenues.

The sources and uses of funds analysis and debt service computations are performed in year-of-expenditure dollars. In addition to projecting a baseline rate of inflation, inflation assumptions were applied to construction and vehicle capital costs and for operating costs and revenues. Applied inflation assumptions are discussed throughout this report and are summarized in Appendix A.

A sources and uses of funds analysis were then undertaken and the year-end balance was reviewed to determine in what years capital or operating fund shortfalls were predicted. For the purposes of the financial analysis, the following responses to shortfalls were considered:

- Potential Responses to Capital Funding Shortfalls.
 - *Increase the Annual Amount of Capital Funding to the Program*. If existing funding sources are inadequate, additional sources can be assumed. These sources could include: increasing the rate of taxation of an existing tax; assuming a new revenue source; extending the period of implementation of a dedicated revenue source; and/or assuming higher levels of grant funding from federal, state, or local sources. Note that some of these approaches may require approval from the Miami-Dade County Board of County Commissioners, the State of Florida, and/or Miami-Dade County voters.
 - *Apply Debt Financing*. When pay-as-you-go financing (where available revenue sources fund the construction and implementation of the project) is not possible, financing through the issuance of debt may be a means to fund the shortfall. The use of debt financing provides the ability to advance project implementation by borrowing against projected future revenue surpluses. In this analysis, it is assumed that any new debt issued to fund the rail corridor projects is backed by the revenues generated by the Peoples Transportation Plan's one-half percent dedicated sales tax.
 - *Delay Service Growth and/or Delay Construction*. Short-term delays in the implementation of new services and the construction of new facilities results in a decrease in the demand for available funds, and an increase in the ability to finance on a pay-as-you-go basis that would, in turn, reduce interest costs. Taking into account such delays in the capital and operating plan involves re-computation of the annual cost and revenue projections, adhering to the same set of underlying assumptions regarding vehicle

retirement policy, cost distribution functions, operating cost containment, and fare increases.

Potential Responses to Operating and Maintenance Shortfalls.

- *Delay Service Growth.* As with capital funding shortfalls, delays in the growth of transit service would result in less demand on available funds. Such delays also would result in lower annual operating and maintenance subsidies.
- *Increase the Amount of Non-Fare Box Funding Sources.* Increased levels of non-fare box revenues would address the operating subsidy needs of the transit service. This could include the implementation of new or expanded non-fare box revenue sources (e.g., parking fines and fees, advertising, concessions, or joint development).
- *Increase Fare Assumptions.* Increased fares could be assumed by using a higher target fare box recovery ratio. The use of a higher fare box recovery ratio, however, could reduce ridership.
- *Improve Operational Practices and Efficiencies.* Various changes in current business practices and processes are underway to improve collection of revenues including automation and replacement of non-functional infrastructure, such as fareboxes and fare gates. Additionally, revising policies and procedures related to enforcement, parking management and performance objectives will improve operational revenues.

As the following chapters will discuss, the FY 2009 Financial Plan has utilized a number of these approaches to address potential capital and operating funding shortfalls. The financial analysis took into account these potential remedies until no further capital and operating shortfalls remained and MDT's sources and uses of funds over the 30-year period of the plan were in balance. To ensure that the financial plan is feasible, the financial analysis is structured to ensure that a positive cash balance is maintained and that this balance equals at least \$50 million. This dollar figure was selected in consultation with MDT staff and MDT's financial advisors.

The funding scenario was examined for the Orange Line Phase 2: North Corridor Metrorail Extension, based on a most likely set of cost and revenue projections, underlying policies on vehicle fleet management, implementation of construction projects, capital investment, operating efficiencies, fares and fare box recovery, project implementation schedule, and inflation. Many uncertainties can affect this most likely scenario, however. These uncertainties include factors beyond the control of MDT, its management, and governing board, including inflation and interest rates, construction and operating costs, ridership, and dedicated revenue growth.

1.6 Summary of the Financial Plan

1.6.1 North Corridor Capital Funding Plan

The total cost for the Orange Line Phase 2: North Corridor Metrorail Extension is \$1,605.4 million in YOE dollars. This figure includes \$12.6 million in prior year expenses and \$271.3 million in finance charges. This cost will be funded from federal, state, and local sources. \$700.0 million⁴ in funding will come from Section 5309 New Starts funds provided by the FTA under a Full Funding Grant Agreement. State funding of \$452.7 million will be supplied by FDOT (which has already committed \$305.0 million to the project). Local funding of \$452.7 million will then provide the remainder of the necessary funds, and debt financing (through FFGA bonding, tax exempt commercial paper, and sales tax revenue bonds) is assumed in years where total capital funding resources are less than capital funding needs.

1.6.2 Plan for Funding Operating and Maintenance Costs

Operating resources for the project will come from county general funds (maintenance of effort funding), PTP sales tax funds, state operations assistance, and MDT operating revenues. Operating revenue includes: cash fares, special transportation services fares, tokens, prepaid passes, pass revenue, token revenue, Medicaid pass revenue, rail station parking, joint development leasing, and advertising`.

⁴ The County has capped the New Starts funding amount as suggested through communications with the FTA staff. The County fully intends to actively pursue and negotiate a greater funding amount at the time a Full Funding Grant Agreement is agreed upon. Please see MDT's Position on Project Funding at the beginning of this document.

2.0 CAPITAL PLAN

This section of the Financial Plan summarizes the project cost estimation process and the capital cost estimate, and presents the sources of funding assumed to be available for implementation. The capital cost estimate has been prepared in accordance with the FTA "Standard Cost Categories for Major Capital Projects" and is based on engineering that is equivalent to 30 percent of project design. The components of the construction costs include track and guideway elements, stations, sitework and special conditions and communications systems. Additional cost items categories include right-of-way, vehicles, professional services and unallocated contingency.

2.1 Capital Cost Assumptions

Unit costs for the capital cost estimates are based on local FDOT and other estimated rates for the months of December 2006 and January 2007. Several items of the unit costs were escalated to current dollars from previous use on other transit projects throughout the country. The specific costs and escalation rates were prepared for the Orange Line Phase 2: North Corridor Metrorail Extension project as a result of preliminary engineering.

2.2 Base Year and Year-of-Expenditure Cost Estimate

Capital costs were estimated in base year (2007) dollars and inflated to year-of-expenditure (YOE) in accordance with the most recent MDT project schedule. Major construction of the North Corridor Metrorail Extension is projected to occur between 2010 and 2014.

Based on updated construction cost indices provided by FDOT, the base year cost estimate is escalated at a rate of 7.0 percent in 2008, 5.0 percent in 2009, 4.5 percent in 2010, 4.0 percent in 2011, 3.5 percent in 2012, and 3.3 percent in 2013 and all subsequent years.

2.3 Capital Cost Categories and Cash Flow

The project's capital cost by major category in current year and YOE dollars is summarized in Table 2.1.

**Table 2.1: North Corridor Project Cost Summary
(000s)**

	Expenditure Category	Quantity	Base Year (2007) Dollars	Base Year Dollar Percentage of Total Project Cost	Year-of-Expenditure Dollars
1.0	Guideway and Track	9.5 miles	\$243,965	19 percent	\$297,989
2.0	Stations, Stops, Terminals, etc.	7 Stations	\$97,134	7 percent	\$118,486
3.0	Yards, Shops & Admin Facilities		\$4,500	0 percent	\$5,212
4.0	Site work and Special Conditions		\$79,944	6 percent	\$95,561
5.0	Systems		\$116,469	9 percent	\$146,753
6.0	R-O-W, Land, Existing Improvements		\$182,971	14 percent	\$199,256
7.0	Vehicles	36	\$97,729	7 percent	\$118,294
8.0	Professional Services		\$164,366	13 percent	\$190,233
9.0	Unallocated Contingency		\$127,948	10 percent	\$162,352
10.0	Finance Charges		\$196,764	15 percent	\$271,287
	Total Project Cost		\$1,311,790	100 percent	\$1,605,422

Table 2.2 presents the project cash flow between 2005 to 2020 in YOE dollars.

**Table 2.2: North Corridor Project Cash Flow
(YOE, 000s)**

Year	Annual Project Cash Flow
2005	\$5,420
2006	7,211
2007	61,078
2008	121,311
2009	123,277
2010	254,781
2011	331,225
2012	284,656
2013	154,195
2014	115,469
2015	15,885
2016	13,138
2017	66,295
2018	20,190
2019	16,873
2020	14,418
Total	\$1,605,422

2.4 Project Schedule

The North Corridor Metrorail Extension is scheduled to begin revenue operations in November 2014. Continuing preliminary engineering design was initiated in 2005 and has been completed, and in April 2007, MDT and its corridor consultant were authorized to begin New Starts Preliminary Engineering, which will continue through September 2008. Final design is scheduled for September 2008 through July 2010. Property acquisition and site work are anticipated to begin in 2008, and major construction will begin in 2010. The vehicle acquisition and testing process will also begin in 2008 and continue through project completion and start-up at the end of 2014. A detailed FTA cost estimate worksheet in Table 2.3 provides the YOE costs associated with the various elements of project development.



Table 2.3: Capital Cost Worksheet

INFLATION WORKSHEET			(Rev.9, Feb. 6, 2007)																				
Miami-Dade Transit			Today's Date 9/19/07																				
Orange Line Phase 2: North Corridor Metrorail Extension, Miami, Florida			Yr of Base Year \$ 2007																				
Current Phase: PE			Yr of Revenue Ops 2014																				
Below, show all project costs in the year in which they occurred or are planned to occur through the completion of the project or the fulfillment of the New Starts funding commitment, whichever is expected to occur later in time.																							
BASE YEAR DOLLARS (\$X000)	Base Yr Dollars	Double-Check Total	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
10 GUIDEWAY & TRACK ELEMENTS (route miles)	243,965	243,965	0	0	0	0	0	0	0	0		0	68,380	101,644	70,234	3,707						0	
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	97,134	97,134	0	0	0	0	0	0	0	0		0	27,753	41,629	27,753	0						0	
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	4,500	4,500	0	0	0	0	0	0	0	0	643	1,286	1,286	1,286	0							0	
40 SITEWORK & SPECIAL CONDITIONS	79,944	79,944	0	0	0	0	0	0	0	0	5,244	10,488	20,843	26,021	17,347	0						0	
50 SYSTEMS	116,469	116,469	0	0	0	0	0	0	0	0		0	18,282	27,879	27,879	27,879	14,548					0	
60 ROW, LAND, EXISTING IMPROVEMENTS	182,971	182,971	0	0	0	0	0	0	0	30,890	65,875	65,875	20,330									0	
70 VEHICLES (number)	97,729	97,729	0	0	0	0	0	0	0	0	8,498	16,996	16,996	16,996	16,996	16,996	4,249					0	
80 PROFESSIONAL SERVICES	164,366	164,366	0	0	0	0	0	5,420	7,211	30,188	29,080	8,484	14,865	14,865	17,124	22,265						0	
90 UNALLOCATED CONTINGENCY	127,948	127,948	0	0	0	0	0	0	0	0	0	0	18,278	27,417	27,417	27,417	27,417					0	
100 FINANCE CHARGES	196,764	196,764	0	0	0	0	0	0	0	0	4,034	6,596	9,998	13,531	22,754	24,991	17,145	11,403	9,130	44,598	13,148	10,637	8,799
Total Project Cost (10 - 100)	1,311,790	1,311,790	0	0	0	0	0	5,420	7,211	61,078	113,375	109,726	217,009	271,269	225,246	118,115	85,625	11,403	9,130	44,598	13,148	10,637	8,799
Below insert estimated inflation rates for each year. For 2007 and beyond, the YOY dollars are calculated automatically. For 2006 and previous years, the Base Year dollars are automatically inflated to reflect the value of past expenditures in 2007 doll																							
Inflation Rate											0.07000	0.05000	0.04500	0.04000	0.03500	0.03300	0.03300	0.03300	0.03300	0.03300	0.03300	0.03300	0.03300
Compounded Inflation Factor			1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.07000	1.12350	1.17406	1.22102	1.26376	1.30546	1.34854	1.39304	1.43901	1.48650	1.53555	1.58623	1.63857
YEAR OF EXPENDITURE DOLLARS (\$X000)	YOY Dollars		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
10 GUIDEWAY & TRACK ELEMENTS (route miles)	297,989									0	0	0	80,282	124,109	88,758	4,839	0	0	0	0	0	0	0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	118,486									0	0	0	32,583	50,830	35,073	0	0	0	0	0	0	0	0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	5,212									0	688	1,445	1,510	1,570	0	0	0	0	0	0	0	0	0
40 SITEWORK & SPECIAL CONDITIONS	95,561									0	5,611	11,784	24,471	31,772	21,923	0	0	0	0	0	0	0	0
50 SYSTEMS	146,753									0	0	0	21,464	34,041	35,233	36,396	19,619	0	0	0	0	0	0
60 ROW, LAND, EXISTING IMPROVEMENTS	199,256								0	30,890	70,487	74,011	23,869	0	0	0	0	0	0	0	0	0	0
70 VEHICLES (number)	118,294								0	9,093	19,095	19,955	20,753	21,479	22,188	5,730	0	0	0	0	0	0	0
80 PROFESSIONAL SERVICES	190,233							5,420	7,211	30,188	31,116	9,531	17,452	18,150	18,785	22,354	30,025	0	0	0	0	0	0
90 UNALLOCATED CONTINGENCY	162,352								0	0	0	0	21,460	33,477	34,649	35,792	36,974	0	0	0	0	0	0
100 FINANCE CHARGES	271,287								0	4,316	7,411	11,735	16,522	28,756	32,625	23,121	15,885	13,138	66,295	20,190	16,873	14,418	
Total Project Cost (10 - 100)	1,605,422		0	0	0	0	0	5,420	7,211	61,078	121,311	123,277	254,781	331,225	284,656	154,195	115,469	15,885	13,138	66,295	20,190	16,873	14,418

2.5 Capital Cost Contingencies

The capital cost estimate includes allowances for contingencies as detailed in the North Corridor Metrorail Extension's preliminary engineering cost estimates. Having reached a more detailed level of design, the allocated contingencies have been significantly reduced versus the FY 2008 Financial Plan. Some small allocated contingencies do remain in the Guideway & Track Elements, Sitework & Special Conditions, and Professional Services cost categories. In addition, an unallocated contingency has been set at twenty percent of total construction costs and vehicle costs. This unallocated contingency totals \$162.35 million in YOE dollars. The estimated costs for preliminary engineering and final design are at 2.6 percent and 7.6 percent of total construction costs, respectively.

2.6 Capital Funding Sources

The County proposes to meet capital requirements with a combination of local, state and Federal Section 5309 New Starts funds as shown in Table 2.4. Based on guidance received from FTA staff, the New Starts funding has been capped at a maximum amount of \$700 million⁵. This results in New Starts funding share of 44 percent. This calculation follows FTA's prescribed method for taking into account state funds contributed to the Orange Line Phase 1: MIC-Earlington Heights project. (SAFETEA-LU provides that the \$100 million that FDOT contributed to the MIC-Earlington Heights project can be credited as non-federal share for the North and East-West Corridors, and MDT is applying \$50 million of that credit to the North Corridor.) It is assumed that MDT and FDOT will each contribute half of the non-federal share of remaining project costs.

**Table 2.4: Sources of Capital Funds
(YOE, 000s)**

Sources of Funds	Amount of Funding	Level of Commitment
Federal 5309 New Starts	\$700,000	N/A
State Grants	\$452,700	\$305.0 million committed in the Adopted State Transportation Work Program (FY 2008-FY 2012)
Local	\$452,722	Committed – Local Sales Tax Revenues
Total	\$1,605,422	

⁵ The County has capped the New Starts funding amount as suggested through communications with the FTA staff. The County fully intends to actively pursue and negotiate a greater funding amount at the time a Full Funding Grant Agreement is agreed upon. Please see MDT's Position on Project Funding at the beginning of this document.

The FDOT share is to be provided through the State's various transit funding programs, as described in Section 2.6.2. To date, FDOT has committed \$305.0 million to the North Corridor project. Based on the latest cost estimate, MDT intends to request an additional \$148 million from FDOT.

Table 2.5 shows the sources of funding by year. Annual amounts are subject to further negotiation to reach a Full Funding Grant Agreement with FTA, and are dependent upon future annual Congressional appropriations. MDT recognizes that the \$100 million annual cap and \$700 million total funding cap for the Orange Line Phase 2 represent the maximum funding that will be available, and that the funding schedule may need adjustment if lower amounts are ultimately appropriated⁶. The risk analysis in Section 4 addresses this issue. It is also assumed that the New Starts program is reauthorized when the SAFETEA-LU authorization expires in September 2009.

Finally, as the table indicates, it is assumed that MDT will not begin receiving funds through a Full Funding Grant Agreement for the Orange Line Phase 2 until 2009 (at the earliest). In addition, this Plan anticipates that MDT will apply for and receive a Full Funding Grant Agreement for Orange Line Phase 3: East-West Metrorail extension. Due to the assumed annual \$100 million cap on FFGA funds that can be received by MDT, these two projects must share FFGA funds during years when the projects' construction schedules overlap. All together, these restrictions and project timing assumptions stretch out MDT's receipt of FFGA funds for the Orange Line Phase 2 through 2016, two years beyond the project's assumed opening date. Thus, the "Local Sources" section of the table shows negative funding amounts in later years. These represent federal payback for costs incurred previously that were not covered by federal funds at the time of expenditure due to the restrictions on the flow of FFGA funds.

⁶ The County has capped the New Starts funding amount as suggested through communications with the FTA staff. The County fully intends to actively pursue and negotiate a greater funding amount at the time a Full Funding Grant Agreement is agreed upon. Please see MDT's Position on Project Funding at the beginning of this document.

**Table 2.5: Annual Capital Outlay and Funding Sources
(YOE, 000s)**

Year	YOE Capital Expenditure	Annual Funding Source and Amount			
		5309 New Starts FFGA	State Matching Grant	Local Sources	Total
2005	\$5,420	\$0	\$0	\$5,420	\$5,420
2006	7,211	0	0	7,211	7,211
2007	61,078	0	20,923	40,155	61,078
2008	121,311	0	40,078	81,233	121,311
2009	123,277	76,239	39,692	7,346	123,277
2010	254,781	76,286	83,259	95,236	254,781
2011	331,225	76,714	107,806	146,705	331,225
2012	284,656	70,378	87,662	126,616	284,656
2013	154,195	63,980	41,645	48,569	154,195
2014	115,469	58,289	31,635	25,545	115,469
2015	15,885	52,250	0	(36,366)	15,885
2016	13,138	48,566	0	(35,428)	13,138
2017	66,295	48,566	0	17,729	66,295
2018	20,190	48,566	0	(28,376)	20,190
2019	16,873	48,566	0	(31,693)	16,873
2020	14,418	31,597	0	(17,179)	14,418
Total	\$1,605,422	\$700,000	\$452,700	\$452,722	\$1,605,422

[Negative values represent federal payback for costs incurred previously that were not covered by federal funds at the time of expenditure due to the restrictions on the flow of FFGA funds]

Local Funds – Countywide Sales Tax

In 1976, the State of Florida authorized the Counties of Broward, Dade, Duval, Sarasota and Volusia to levy up to 1 cent of the taxable transactions for transit needs including fixed guideway construction, and County-wide bus systems, which serve fixed guideway systems. On November 5, 2002, a ballot measure passed in the Miami-Dade County general election, which authorized MDT to charge a one-half of one per cent discretionary sales transit surtax in accordance with by Section 212.055(1), Florida Statutes. The ballot measure called for the County to implement the People's Transportation Plan (PTP). The PTP included the purchase of new buses, improved traffic signalization, neighborhood roads and highways, and funds to municipalities for road and transportation projects, as well as major transit capital improvement projects.

The PTP sales tax revenues provide a dedicated revenue source for the expansion and improvement of the Miami-Dade transit network. However, 20 percent of the revenue generated by the dedicated tax is immediately allocated among the County's incorporated cities based on population. These municipal funds must be used for transit-related purposes, but they cannot be used directly by MDT. (These funds are shown as a "Municipal Contribution" in the operating expenditures of MDT.) The ordinance does not contain a sunset provision.

The transit sales tax is levied on all sales transactions except certain medicines and food products. In FY 2005, about \$170 million in one-half percent sales tax revenues were received, an increase of 5.3 percent from FY 2004. Table 2.6 presents quarterly sales tax collections since the tax was first levied on January 1, 2003.

**Table 2.6: One-Half Percent Transit Surtax Collections
(millions)**

Year	FY 2003	FY 2004	FY 2005	FY 2006
Total Surtax Collected	\$105.2	\$161.3	\$169.9	\$189.0
Annual Increase		53.3 percent	5.3 percent	11.2 percent

Source: Citizens Independent Transportation Trust, 2007 (FY03 represents a partial year of collections following the approval of the dedicated tax.)

Miami-Dade County is a highly urbanized area diversified by an economic base with major industries of tourism, international trade, finance and manufacturing. The local economy is anticipated to continue to expand with national economic cycles while the population steadily increases. Baseline sales tax growth estimates from Moody's Economy.com show that the tax base for the dedicated surtax is projected to continue growing at an average annual rate of 5.57 percent during the 30-year period of the Plan (though the annual rate varies from year to year). Table 2.7 presents the projected total transit sales surtax receipts for the County.

**Table 2.7: One-Half Percent Transit Sales Tax Revenue Projections
(YOE, 000s)**

Year	PTP Sales Tax Revenue	Annual Growth	Year	PTP Sales Tax Revenue	Annual Growth
2007	\$199,941.1		2022	\$476,566.3	6.91 percent
2008	\$209,970.0	5.02 percent	2023	\$503,230.0	5.59 percent
2009	\$223,212.8	6.31 percent	2024	\$526,239.1	4.57 percent
2010	\$240,675.4	7.82 percent	2025	\$556,161.8	5.69 percent
2011	\$252,504.4	4.91 percent	2026	\$587,736.6	5.68 percent
2012	\$263,858.9	4.5 percent	2027	\$617,148.3	5 percent
2013	\$282,797.1	7.18 percent	2028	\$657,543.3	6.55 percent
2014	\$298,519.0	5.56 percent	2029	\$694,311.7	5.59 percent
2015	\$314,087.9	5.22 percent	2030	\$728,222.5	4.88 percent
2016	\$337,691.1	7.51 percent	2031	\$769,530.1	5.67 percent
2017	\$354,831.0	5.08 percent	2032	\$814,994.8	5.91 percent
2018	\$371,066.0	4.58 percent	2033	\$855,248.3	4.94 percent
2019	\$396,922.8	6.97 percent	2034	\$907,263.9	6.08 percent
2020	\$423,302.1	6.65 percent	2035	\$944,242.8	4.08 percent
2021	\$445,769.5	5.31 percent	2036	\$963,794.6	2.07 percent

Source: Moody's Economy.com economic projections, 2007

This projected growth in the transit tax is supported by data for the Public Health Trust (PHT). Table 2.8 shows the historical tax receipts from the PHT sales tax which has

been in place since 1995 and is collected from the same tax base as the dedicated transit sales tax. The PHT sales tax has experienced an average annual growth rate of 5.09 percent, although the year-to-year change was variable over the period.

Table 2.8: Public Health Trust Tax Historical Receipts (1995 to 2005)

Year	Surtax Receipts	Growth Rate
1995	\$103,827,720	
1996	\$111,055,653	6.96 percent
1997	\$112,826,579	1.59 percent
1998	\$120,563,433	6.86 percent
1999	\$128,463,243	6.55 percent
2000	\$140,254,014	9.18 percent
2001	\$147,283,914	5.01 percent
2002	\$146,528,984	-0.51 percent
2003	\$146,268,119	-0.18 percent
2004	\$161,811,763	10.63 percent
2005	\$170,539,048	5.39 percent
Average Growth Rate		5.09 percent

Source: Miami-Dade County, 2006

The projection of PTP sales tax revenues prepared by Economy.com includes a baseline, optimistic, and pessimistic projection of sales tax base growth rates. This range of projections is summarized below in Table 2.9. The risk analysis described in Section 4 addresses how this range of tax revenues was applied in the FY 2009 Financial Plan.⁷

⁷ The table is correct in showing a lower tax base growth rate in the optimistic projection as compared to the baseline, although this seems counter-intuitive. The Economy.com financial model produces unified and linked projections, and the "optimistic" scenario in their model includes lower inflation rates and lower interest rates. This lower inflation is reflected in a lower YOY value of the sales tax base, and thus a lower annual growth rate. The converse is true for the "pessimistic" scenario.

Table 2.9: Range of PTP Sales Tax Growth Projections

Year	Baseline	Optimistic	Pessimistic	Year	Baseline	Optimistic	Pessimistic
2007				2022	6.91 percent	6.33 percent	9.46 percent
2008	5.02 percent	4.32 percent	7.13 percent	2023	5.59 percent	5.11 percent	8.09 percent
2009	6.31 percent	5.55 percent	8.1 percent	2024	4.57 percent	3.7 percent	6.96 percent
2010	7.82 percent	6.84 percent	9.86 percent	2025	5.69 percent	4.92 percent	8.47 percent
2011	4.91 percent	3.96 percent	6.9 percent	2026	5.68 percent	5.15 percent	7.94 percent
2012	4.5 percent	3.54 percent	6.48 percent	2027	5 percent	4.47 percent	7.26 percent
2013	7.18 percent	6.2 percent	9.21 percent	2028	6.55 percent	5.97 percent	9.09 percent
2014	5.56 percent	4.74 percent	7.4 percent	2029	5.59 percent	4.79 percent	7.88 percent
2015	5.22 percent	4.39 percent	7.07 percent	2030	4.88 percent	3.86 percent	6.88 percent
2016	7.51 percent	6.53 percent	9.55 percent	2031	5.67 percent	5.17 percent	8.27 percent
2017	5.08 percent	4.12 percent	7.06 percent	2032	5.91 percent	5.51 percent	8.3 percent
2018	4.58 percent	3.84 percent	6.78 percent	2033	4.94 percent	4.43 percent	7.07 percent
2019	6.97 percent	5.84 percent	8.85 percent	2034	6.08 percent	5.51 percent	8.62 percent
2020	6.65 percent	5.7 percent	8.63 percent	2035	4.08 percent	3.56 percent	6.42 percent
2021	5.31 percent	4.7 percent	7.41 percent	2036	2.07 percent	1.58 percent	3.87 percent

2.6.1 Local Funds – Existing Infrastructure Funding Needs

MDT has identified a set of capital investments through FY 2013 that are needed in order to maintain, upgrade, and rehabilitate its existing Metrobus, Metrorail, and Metromover services. These needs are separate and distinct from the system expansion needs identified in the PTP, and MDT is committed to funding these near-term capital investments out of its existing funding sources. However, MDT's long-term capital funding sources have not kept up with the system's needs. In order to achieve and maintain a state of good repair on its existing system while meeting the mandate of the PTP and the County voters to construct and operate the three phases of the Orange Line, MDT will require additional infrastructure funding beyond what is currently available. The funding source has not yet been identified. MDT is in the process of identifying specific system needs, costs, and funding sources.

The FY 2009 Financial Plan assumes that this funding for existing infrastructure needs will be provided beginning in 2014 and continuing through the remaining period of the financial plan. The total capital funding needed from this source is approximately \$1.1 billion over the period, as Table 2.10 shows.

**Table 2.10: Existing Infrastructure Funding Needs 2014-2036
(YOE, 000s)**

Year	Existing Infrastructure Funding Needs
2014	\$32,500
2015	\$33,572
2016	\$34,680
2017	\$35,825
2018	\$37,007
2019	\$38,228
2020	\$39,490
2021	\$40,793
2022	\$42,139
2023	\$43,530
2024	\$44,966
2025	\$46,450
2026	\$47,983
2027	\$49,566
2028	\$51,202
2029	\$52,892
2030	\$54,637
2031	\$56,440
2032	\$58,303
2033	\$60,227
2034	\$62,214
2035	\$64,267
2036	\$66,388
Total	\$1,093,301

2.6.2 State Funds

The State of Florida has committed approximately \$305 million through the adopted FDOT Work Program for FY 2008 to FY 2012 for the Orange Line Phase 2: North Corridor Metrorail Extension. Additional state funding assistance will be requested for a total state contribution of approximately \$453 million for the North Corridor project. The State of Florida supports transit through the several programs described below:

Florida Public Transit Block Grant Program

The State's Public Transit Block Grant Program provides capital and operating assistance to public transit providers in the State of Florida, and funds may be used for fixed guideway capital projects. MDT estimates that it will receive \$16.5 million in state block grant funds for 2006. These funds are programmed annually for Miami-Dade County and are estimated to increase at an annual rate of 1.9 percent through the end of the plan. Currently, the block grant program is not being utilized as part of the state match to a Full Funding Grant Agreement (FFGA), and these funds are being used to support MDT's ongoing operations.

There are provisions within state legislation that provide for supplemental funding. Under the block grant legislation, FDOT may supplement a transit agency's block grant allocation if funds are available, if the MPO and County request them, and if FDOT concurs. Supplemental funds must be approved by the state legislature as part of the annual work program submitted by FDOT to the legislature.

Florida Growth Management Legislation

The State of Florida Growth Management Bill (SB 360) amended on June 24, 2005, establishes growth management laws to ensure critical transportation infrastructure and services are in place to accommodate future urban growth and redevelopment.

SB 360 establishes a statewide allocation each fiscal year for the State Transportation Trust Fund. Ten percent of these funds are authorized to finance specific fixed guideway and bus rapid transit projects as part of the Federal Section 5309 New Starts program. Between FY 2006 and FY 2015, \$709 million has been committed for the Statewide New Starts Transit program. Additional funds are also authorized for New Starts projects under the Transportation Regional Incentive Program (TRIP) which is described below. The state participation has been established at a maximum of 50 percent of the non-federal share of eligible capital costs for a project. Projects that receive a recommended rating from FTA are eligible to receive funding from this program. The North Corridor project qualifies for these funds since the FY 2007 New Starts submittal received a recommended rating from FTA.

Transportation Regional Incentive Program (TRIP)

In June 2005, as a companion to SB 360, the Florida Legislature promulgated TRIP to facilitate growth management planning and funding. TRIP was established to provide incentives to local government and private industry to assist in the financing of infrastructure projects that improve regional travel and commerce. This program is funded through State General Revenue Funds established from growth management legislation. For FY 2006 through FY 2015, approximately \$1.6 billion has been allocated to TRIP.

2.6.3 Federal Transit Administration Grants

The FTA administers several grant programs pursuant to SAFETEA-LU, which authorizes the programs through FY 2009. For the purpose of this FY 2009 Financial Plan, it is assumed that the grant programs will continue and that funding formulas will remain essentially unchanged when SAFETEA-LU is reauthorized.

Section 5307 Urbanized Area Formula

These funds are allocated to designated recipients based on service level and ridership variables, and may be used for capital investments, capital replacement, and preventative maintenance. In this Financial Plan, Section 5307 dollars are assumed to be applied to the bus system, largely for preventive maintenance.

As a designated recipient, MDT receives Section 5307 funds directly from the FTA. According to the National Transit Database, the 5307 funds received by MDT have fluctuated in recent years, from \$57.6 million in 2004 to \$51.0 million in 2005 to \$63.7

million in 2006. The FY 2009 Financial Plan projects \$47.0 million in 5307 funds in 2008 and then average annual growth of 4.1 percent throughout the 30 years of the plan. Overall, this is similar to the FY 2008 Financial Plan assumption of constant 4.5 percent growth. However, year-to-year growth rates in the current Plan can and do change significantly based on changes in service. Again, this forecasting method assumes that SAFETEA-LU will be reauthorized and that the 5307 funding formulas will remain essentially unchanged.

Section 5309 New Starts

New Starts funds are available for fixed guideway projects, such as the Orange Line Phase 2: North Corridor Metrorail Extension. Funding is discretionary, and the program is highly competitive. FTA recommends projects for funding each year based upon project justification, financial commitment, and readiness. Funding is subject to congressional appropriations.

While SAFETEA-LU allows grants of up to 80 percent, funding availability and competition has pushed the New Starts share down, and the typical New Starts project has a share of closer to 50 percent. This Financial Plan assumes a 44 percent New Starts share for the Orange Line Phase 2 project.

For modeling purposes at this stage of the financial analysis, this financial plan assumes an annual cap of \$100 million⁸ on New Starts funds for MDT's entire transit program. This cap applies even in the few years when both the Orange Line Phase 2 and Phase 3 projects are being simultaneously constructed.

Section 5309 Rail Modernization

These funds are apportioned by a formula, specified in SAFETEA-LU, which takes into account transit vehicle revenue miles, fixed guideway route-miles and other factors. MDT currently receives an apportionment based on the Stage 1 system. Its apportionment will increase seven years after each new segment of rail enters revenue service. Rail modernization funds are used for miscellaneous operating capital and for preventative maintenance.

The FY 2009 Financial Plan assumes that MDT will receive \$12.1 million in Fixed Guideway Modernization funds in 2007 and \$14.1 million in 2008. As with the 5307 formula funds, the Plan applies the SAFETEA-LU formulas to the service statistics of the rail system to forecast modernization funding.

Section 5309 Bus Related

These discretionary funds are applied to the purchase of buses and bus-related assets and are assumed to cover part of the costs for the replacement of existing buses and purchase of buses for expanded service. Discretionary funding is difficult to project in the future, and MDT's historical experience with 5309 Bus funds shows wide variation.

⁸ The County has capped the New Starts funding amount as suggested through communications with the FTA staff. The County fully intends to actively pursue and negotiate a greater funding amount at the time a Full Funding Grant Agreement is agreed upon. Please see MDT's Position on Project Funding at the beginning of this document.

- Fully funded cash Debt Service Reserve Fund (based on maximum Annual Debt Service)
- Cost of issuance of 130 basis points (1.30 percent) of Par Amount
- Rating interest penalty of 50 basis points (0.50 percent) of Par Amount

The sales tax revenue bond issued in 2017 is projected to be refinanced after 10 years, in 2027.

Full Funding Grant Agreement (FFGA) Bonds

In addition to TECP and sales tax revenue bonds, FFGA bonds provide a mechanism for MDT to borrow against the future stream of federal payments of Section 5309 New Starts funds. This mechanism is particularly attractive when it is likely that federal payments will not be proportionate to the rate of expenditure of funds for the project (i.e., federal payments will lag beyond the completion of the project). Given the \$100 million cap on New Starts funds⁹, this is very likely to be the case for MDT. In this financing mechanism, the FFGA grant payments are treated as a dedicated revenue stream and securities are issued backed by this revenue stream. The amount of the project financed with FFGA bonds is limited so that the coverage on the FFGA bond (the ratio of annual FFGA grant divided by debt service) is maintained at a conservative 2.00.

In the FY 2009 Financial Plan, a total of \$448 million in FFGA proceeds are received in 2009 following the assumed execution of an FFGA for Orange Line Phase 2: North Corridor Extension between Miami-Dade County and the FTA. Given the fact that Orange Line Phase 3: East-West Metrorail Extension is not as far along in the project development process and the FTA New Starts application process, FFGA bonding is not assumed for that project.

Sunshine State Loan

MDT is projected to receive \$91.7 million in 2007 in proceeds through the Sunshine State Governmental Financing Commission (the "Sunshine State loan"). The Sunshine State Loan is variable rate financing with a final maturity of 2019. The debt is currently secured by a junior lien on sales tax revenues. The projects financed have an expected useful life between 12 and 15 years. The Sunshine State Loan was a more efficient financing program than long-term revenue bonds.

Debt Service Coverage

Two key measures of debt service coverage are applied to evaluate the feasibility of the debt financing structure. The first is gross coverage, which is the ratio of dedicated sales tax revenues in a given year to the required debt service in that year. The second is an additional bonds test, sometimes referred to as a "parity test," that must be satisfied under the bond covenants as a condition to issuing additional bonds. The test requires that

⁹ The County has capped the New Starts funding amount as suggested through communications with the FTA staff. The County fully intends to actively pursue and negotiate a greater funding amount at the time a Full Funding Grant Agreement is agreed upon. Please see MDT's Position on Project Funding at the beginning of this document.

dedicated tax revenues exceed projected debt service requirements for both the outstanding issue and the proposed issue by a certain ratio. Based on discussions with MDT's financial advisors, the preferred minimum ratio for both the gross coverage test and the additional bonds test is [1.5x].

The minimum debt service coverage ratios are exceeded in all years of the analysis, covering both the revenue bond debt and the commercial paper, demonstrating that MDT has taken an appropriately conservative approach to its debt financing. (As the risk analysis in Section 4 will show, appropriate coverage levels are still maintained even when negative risks are realized on key cost and revenue assumptions.) The gross coverage ratio reaches its minimum value of [1.51x] in 2017. The additional bonds test also reaches its minimum value of [1.92x] in 2017. This "bottoming-out" of the debt service coverage ratios is to be expected given the intensity of Orange Line Phase 2 and Phase 3 capital construction expenditures in the previous years. After the completion of the Orange Line, a portion of the outstanding debt is paid off, but there are debt issuances projected in later years as initial debt is refinanced and additional borrowing is needed to support the capital program.

Table 2.11 presents the 30-year schedule of debt financing proceeds for the planned expansion of the MDT system under the PTP. A portion of this bonding supports the Orange Line Phase 2: North Corridor Metrorail Extension project, but a significant portion also supports the other rail corridor expansion projects as well as the necessary capital improvements on the existing system.

**Table 2.11: Projected Bond Proceeds
(YOE, 000s)**

Year	Sunshine State Bonds	FFGA Bonds	Commercial Paper	Sales Tax Revenue Bonds
2007	\$91,700.4	\$0.0	\$0.0	\$0.0
2008	\$0.0	\$0.0	\$369,331.7	\$0.0
2009	\$0.0	\$448,011.9	\$0.0	\$0.0
2010	\$0.0	\$0.0	\$344,982.1	\$0.0
2011	\$0.0	\$0.0	\$417,276.7	\$0.0
2012	\$0.0	\$0.0	\$355,384.2	\$0.0
2013	\$0.0	\$0.0	\$328,280.7	\$0.0
2014	\$0.0	\$0.0	\$235,436.0	\$0.0
2015	\$0.0	\$0.0	\$179,333.2	\$0.0
2016	\$0.0	\$0.0	\$148,399.6	\$0.0
2017	\$0.0	\$0.0	\$0.0	\$2,746,580.8
2018	\$0.0	\$0.0	\$40,656.7	\$0.0
2019	\$0.0	\$0.0	\$31,036.1	\$0.0
2020	\$0.0	\$0.0	\$3,885.6	\$0.0
2021	\$0.0	\$0.0	\$1,657.4	\$0.0
2022	\$0.0	\$0.0	\$0.0	\$0.0
2023	\$0.0	\$0.0	\$0.0	\$49,120.5
2024	\$0.0	\$0.0	\$13,861.5	\$37,469.9
2025	\$0.0	\$0.0	\$125,897.9	\$4,759.0
2026	\$0.0	\$0.0	\$143,175.1	\$1,987.5
2027	\$0.0	\$0.0	\$2,387,621.8	\$0.0
2028	\$0.0	\$0.0	\$65,962.4	\$0.0
2029	\$0.0	\$0.0	\$142,802.9	\$16,792.0
2030	\$0.0	\$0.0	\$177,564.6	\$151,196.1
2031	\$0.0	\$0.0	\$162,626.3	\$174,078.4
2032	\$0.0	\$0.0	\$67,737.1	\$2,868,149.3
2033	\$0.0	\$0.0	\$157,454.9	\$79,622.7
2034	\$0.0	\$0.0	\$218,025.1	\$172,593.5
2035	\$0.0	\$0.0	\$200,616.2	\$210,152.7
2036	\$0.0	\$0.0	\$213,422.2	\$195,092.6
Total	\$91,700.4	\$448,011.9	\$6,532,427.8	\$6,707,594.9

2.7 Agency-Wide Capital Investments

In addition to the Orange Line Phase 2: North Corridor Metrorail Extension project, MDT's major capital improvement program includes:

1. Rail Service Expansion Projects
2. Capital Improvement Program for the Existing System
3. Bus Acquisition/Renewal/Replacement
4. Rail Rehabilitation (New Corridors)
5. Public Works Projects

An overview of these components is presented below. The costs associated with these major improvements and projects have been included in this FY 2009 Financial Plan.

2.7.1 Rail Service Expansion Projects

As part of the overall Orange Line project, the County is developing an East-West Metrorail line that operates from the Earlington Heights Station to Florida International University (FIU). The line is divided into two separate but linked projects. The first project, the Orange Line Phase 1: MIC-Earlington Heights Connector will be funded entirely with state and local funds and is scheduled to be open for revenue service in 2011. The second, extending from the MIC to FIU (known as the East-West Corridor), will be proposed for New Starts funds. These PTP projects are in various stages of project development, and capital cost estimates at various levels of detail have been prepared.

Orange Line Phase 1: Miami Intermodal Center-Earlington Heights Connector

This project will provide a 2.6-mile heavy rail connection between the planned Miami Intermodal Center (MIC) to the existing Earlington Heights Metrorail station. This extension of Metrorail service will improve the transit connection to and from Miami International Airport and other stations on the Metrorail system. Project completion is scheduled for 2011. The capital cost estimate for this project in YOE dollars (not including finance charges) is \$526.5 million. The project is supported by a \$100 million grant from FDOT, with the remainder of the project cost being borne by MDT. The project is not receiving any federal funds.

In addition, a bus plaza at the MIC is also being separately constructed and funded, at a YOE cost of \$15.2 million (not including finance charges). This project is receiving approximately \$5.5 million in funding from a Federal 5309 Bus earmark grant and approximately \$4.8 million from FDOT.

Orange Line Phase 3: East-West Metrorail Extension (MIC to FIU)

The East-West Corridor is a 10.1-mile heavy rail extension from the MIC to Florida International University (FIU). Seven stations are planned for the alignment that extends the length of SR 836 (Dolphin Expressway) and turns south once reaching the Florida's Turnpike to the FIU campus. The scheduled completion date for this project is 2016.

The projected capital cost estimate for this project in YOE dollars is now \$1.40 billion (not including any finance charges), and Phase 3 is assumed to be funded in a similar fashion to Phase 2. Phase 3 is assumed to receive \$700 million in FFGA funding (subject to the \$100 million annual cap), with the remaining non-federal share being split between FDOT and MDT.

Miami-Dade Transit's Orange Line rail expansion program will result in approximately \$3.3 billion of capital improvement projects (exclusive of finance charges). The estimated capital costs for the three major Orange Line phases, as well as the MIC bus plaza, are presented in Table 2.12 in YOE dollars. These costs are only direct expenditures and do not include any finance charges that are allocated to any of the projects.

**Table 2.12: Rail Corridor Expansion Direct Expenditures
(YOE, 000s)**

Year	Orange Line Phase 1: MIC-Earlinton Heights	MIC Bus Plaza	Orange Line Phase 2: North Corridor	Orange Line Phase 3: East-West	Total Requirement
2005	\$5,567	\$0	\$5,420	\$0	\$10,987
2006	\$14,000	\$0	\$7,211	\$0	\$21,211
2007	\$43,462	\$0	\$61,078	\$9,440	\$113,980
2008	\$114,069	\$2,260	\$116,995	\$10,101	\$243,425
2009	\$146,781	\$396	\$115,866	\$72,069	\$335,111
2010	\$103,184	\$9,606	\$243,046	\$75,312	\$431,148
2011	\$99,472	\$2,900	\$314,703	\$91,600	\$508,675
2012	\$0	\$0	\$255,900	\$207,652	\$463,552
2013	\$0	\$0	\$121,570	\$225,828	\$347,398
2014	\$0	\$0	\$92,348	\$253,651	\$345,998
2015	\$0	\$0	\$0	\$262,021	\$262,021
2016	\$0	\$0	\$0	\$191,849	\$191,849
2017	\$0	\$0	\$0	\$0	\$0
Total	\$526,534	\$15,162	\$1,334,136	\$1,399,523	\$3,275,355

2.7.2 Capital Improvement Program for Existing System

Miami-Dade Transit has a well-defined short-term capital improvement program (CIP) for the period 2007-2012. This CIP covers the rehabilitation, replacement, and repair of the existing transit system, as well as small to medium expansion projects that are not part of the PTP. Table 2.13 shows the details of the 2007-2012 CIP. (The rail corridor expansion projects and the bus fleet replacement, which are present in the original CIP, have been removed from this table and are addressed separately in the financial model and in this Plan.) It should be noted that this CIP includes a number of large “one-time” items that will not need to be repeated in future years, such as the new fare collection equipment, the central control overhaul, the Metromover vehicle replacement, and particularly the Metrorail car rehabilitation/replacement effort. The Metrorail car investments are projected to continue into 2013 (totaling \$57.2 million in that year).

For the years after 2013, MDT has not yet projected its CIP needs at a line-item level of detail. MDT has assumed, for the purposes of the FY 2009 Financial Plan, a level of investment equivalent to \$32.5 million per year beginning in 2014 and growing at the FDOT construction cost inflation rate annually thereafter.

This schedule results in total CIP investments for the existing system of approximately \$1.8 billion over the 30-year period of the plan.

**Table 2.13: MDT 2007-2012 CIP for Existing System
(YOE, 000s)**

Capital Improvement Project	2007	2008	2009	2010	2011	2012
ADA Improvements and Equipment	\$670	\$1,410	\$870	\$250	\$250	\$300
Bus Facilities	148	4,480	8,500	24,500	5,755	0
Bus Stop Signage Enhancement/Replacement	200	200	200	200	276	0
Bus Washer and Vacuum Replacement	2,270	231	0	0	0	0
Facility and Equipment Rehabilitations	200	400	375	275	225	400
Information Technology Equipment	200	400	400	450	450	550
AVL/Monitoring/Radio System	50	100	125	100	100	100
Bus Tools and Equipment	350	450	450	500	525	600
Fare Collection Equipment	1,286	52,308	29,375	0	0	0
Metrorail and Metromove Tools/Equipment	525	552	579	608	638	670
Service Vehicles	334	300	350	400	400	400
Treasury Service Equipment	39	100	100	100	100	100
Facilities Roof Projects	480	525	525	525	525	525
Metrorail Station Refurbishment	2,374	1,420	696	640	584	603
Paint and Refurbish Bus and Rail Facilities	330	330	330	330	330	330
Passenger Amenities and Transit Enhancements	532	200	250	225	200	350
Replace Bus Garage Lifts	586	595	585	264	0	0
Replace Metrorail/Metromover/Bus Elevators	770	1,500	1,500	2,222	0	0
UPS/Emergency Lighting Battery Replacement	253	367	0	0	0	0
Upgrade Illumination	0	0	0	0	0	0
Bus Pull-out Bays	974	2,152	2,280	999	0	0
Capital Project Admin/Planning/Monitoring	300	1,200	1,950	900	1,300	1,300
Contingency	5,500	1,485	1,900	1,750	1,650	1,000
South Miami-Dade Busway Extension - Phase II	14,507	0	0	0	0	0
Metromover Station Canopies and Escalator Replacement	310	2,425	2,300	1,690	0	0
Mover Vehicle Replacement	6,422	11,819	7,419	0	0	0
Central Control Overhaul	5,146	11,685	11,687	0	0	0
Metrorail Guideway Painting	0	0	0	0	0	0
Metrorail Piers and Guideway Coating	0	0	0	0	0	0
Rail 5-Year and 10-Year Maintenance	2,634	0	0	0	0	0
Rail Vehicle Mid-Life Rehabilitation	3,189	15,862	87,358	67,167	61,330	42,066
Replace Acoustical Barriers	0	0	0	0	0	0
Test Track for Metrorail	2,000	1,785	0	0	0	0
Track and Guideway Rehabilitation	8,427	7,379	5,078	5,077	4,552	0
Park and Ride Lots Kendall Drive and Miami Gardens Drive	1,750	825	725	0	0	0
Passenger Activity Center at NW 7 Ave and NW 62 St	0	5,000	4,600	0	0	0
Passenger Activity Centers	0	6,031	1,800	300	2,700	716
Pedestrian Overpass at Dadeland North	0	0	300	1,631	1,000	0
Pedestrian Overpass at Coconut Grove and Dadeland South	0	0	0	200	500	7,000
Pedestrian Overpass at University and South Miami	6,330	5,849	3,669	0	0	0
Park and Ride Lots - Along Busway	2,458	2,458	3,870	0	0	0
Park and Ride Lots - Dadeland South and Dadeland North	750	2,500	4,152	0	0	0
Security and Safety Equipment	850	1,235	1,500	790	100	100
TOTAL	\$73,144	\$145,558	\$185,798	\$112,093	\$83,490	\$57,110

Note: The only programmed CIP activity in 2013 is the Rail Vehicle Mid-Life Rehabilitation at \$57.2 million in that year.

2.7.3 Bus Acquisition/Renewal/Replacement

Replacement of Existing Fleet

Miami-Dade Transit has a detailed procurement and replacement schedule for the buses in its existing Metrobus fleet, which has grown significantly following the passage of the PTP and its mandate for additional local bus service.

Table 2.14 summarizes the existing bus acquisition schedule.

**Table 2.14: MDT 2007-2036 Existing Fleet Replacement Costs
(YOE, 000s)**

Year	Small Buses (30'-32')	Larger Buses (40'-42')	Articulated Buses (60')	Commuter Coaches (45')	Total
2007	\$21,750	\$0	\$0	\$0	\$21,750
2008	\$0	\$22,630	\$17,550	\$0	\$40,180
2009	\$0	\$14,570	\$12,150	\$0	\$26,720
2010	\$0	\$28,830	\$0	\$0	\$28,830
2011	\$0	\$29,760	\$0	\$0	\$29,760
2012	\$0	\$0	\$0	\$0	\$0
2013	\$0	\$34,100	\$0	\$0	\$34,100
2014	\$20,300	\$31,000	\$0	\$0	\$51,300
2015	\$0	\$34,100	\$0	\$0	\$34,100
2016	\$0	\$33,790	\$0	\$0	\$33,790
2017	\$0	\$23,560	\$0	\$8,450	\$32,010
2018	\$21,750	\$0	\$0	\$0	\$21,750
2019	\$0	\$22,630	\$17,550	\$0	\$40,180
2020	\$0	\$14,570	\$12,150	\$0	\$26,720
2021	\$0	\$28,830	\$0	\$0	\$28,830
2022	\$0	\$29,760	\$0	\$0	\$29,760
2023	\$0	\$0	\$0	\$0	\$0
2024	\$0	\$34,100	\$0	\$0	\$34,100
2025	\$20,300	\$31,000	\$0	\$0	\$51,300
2026	\$0	\$34,100	\$0	\$0	\$34,100
2027	\$0	\$33,790	\$0	\$0	\$33,790
2028	\$21,750	\$23,560	\$0	\$8,450	\$53,760
2029	\$0	\$0	\$0	\$0	\$0
2030	\$0	\$22,630	\$17,550	\$0	\$40,180
2031	\$0	\$14,570	\$12,150	\$0	\$26,720
2032	\$0	\$28,830	\$0	\$0	\$28,830
2033	\$0	\$29,760	\$0	\$0	\$29,760
2034	\$20,300	\$0	\$0	\$0	\$20,300
2035	\$0	\$34,100	\$0	\$0	\$34,100
2036	\$0	\$31,000	\$0	\$0	\$31,000
Total	\$126,150	\$665,570	\$89,100	\$16,900	\$897,720

Fleet Expansion

Due to increased traffic congestion on arterial streets, operating speeds for the Miami bus network are projected to decline substantially by the design year (2030). This will require a significant increase in bus service levels (revenue miles, revenue hours, and peak vehicles) just to provide the same quality of service to riders (as measured by headways) as is currently provided. In particular, the travel demand modeling has estimated that hours of service and peak vehicles are projected to need to increase by 38.8 percent over current levels by 2030. This service expansion is costly, on both the capital and operating side, and the FY 2009 Financial Plan assumes that this service ramp-up does not begin until 2024. MDT is reviewing the prospect of purchasing cost-effective buses such as hybrids. Table 2.15 summarizes the fleet expansion costs.

**Table 2.15: Bus Fleet Expansion Costs
(YOE, 000s)**

Year	Bus Fleet Expansion Expenditures	Year	Bus Fleet Expansion Expenditures
2007	\$0.0	2023	\$0.0
2008	\$0.0	2024	\$37,931.9
2009	\$0.0	2025	\$38,983.4
2010	\$0.0	2026	\$39,621.8
2011	\$0.0	2027	\$40,532.1
2012	\$0.0	2028	\$41,514.3
2013	\$0.0	2029	\$41,781.5
2014	\$0.0	2030	\$43,187.7
2015	\$0.0	2031	\$10,369.8
2016	\$0.0	2032	\$9,839.0
2017	\$0.0	2033	\$10,751.7
2018	\$0.0	2034	\$10,242.4
2019	\$0.0	2035	\$10,299.9
2020	\$0.0	2036	\$11,206.7
2021	\$0.0	Total	\$346,262.3
2022	\$0.0		

2.7.4 Rail Rehabilitation (New Corridors)

In addition to the rehabilitation of the existing system that was described above, MDT will also face future expenses for the rehabilitation of its new rail corridors. These rehabilitation expenses are assumed to begin seven years after the rail corridor opens for service, which is also when MDT will begin to receive Federal 5309 Rail Modernization funds for the new services. These rehabilitation expenses are projected at 2 percent annually of the cumulative construction cost of the rail corridor. Table 2.16 summarizes these annual rail rehab expenses.

**Table 2.16: Rail Rehabilitation Costs
(YOE, 000s)**

Year	Rail Rehabilitation Expenditures	Year	Rail Rehabilitation Expenditures
2007	\$0	2023	\$36,328
2008	\$0	2024	\$45,599
2009	\$0	2025	\$53,399
2010	\$0	2026	\$61,602
2011	\$0	2027	\$67,695
2012	\$0	2028	\$72,376
2013	\$0	2029	\$73,177
2014	\$0	2030	\$73,720
2015	\$0	2031	\$74,725
2016	\$0	2032	\$75,393
2017	\$0	2033	\$76,114
2018	\$0	2034	\$76,858
2019	\$2,823	2035	\$76,858
2020	\$8,696	2036	\$78,658
2021	\$16,067	Total	\$995,497
2022	\$25,410		

2.7.5 Public Works Projects

As required by the PTP ordinance, 20 percent of the revenues generated by the PTP sales tax are immediately transferred to the municipalities of Miami-Dade County for their use on local transportation projects. (These funds are treated as mandatory operating expenses in the FY 2009 Financial Plan.) In addition, a portion of the remaining funds are designated for projects by the Miami-Dade Public Works Department. In the Pro Forma, these projects were spread over seven years, from 2007 to 2013, and the expenditures were heavily front-loaded in the 2007-2009 period. Based on discussions with MDT staff, these projects are spread more evenly over an 11-year period in the FY 2009 Financial Plan.

The total value of the Public Works projects is \$725 million. However, the Pro Forma assumes matching funds from FDOT totaling \$60 million for the projects, so MDT's net funding responsibility of \$665 million is shown here.

**Table 2.17: Public Works Projects – Net of FDOT Share
(YOE, 000s)**

Year	Public Works Projects
2007	\$52,268
2008	\$55,927
2009	\$58,723
2010	\$61,366
2011	\$63,820
2012	\$66,054
2013	\$68,234
2014	\$70,485
2015	\$72,811
2016	\$75,214
2017	\$19,709
Total	\$664,612

2.8 MDT 30-Year Capital Plan

Based on the above assumptions regarding capital funding sources and uses for MDT, a 30-year capital plan for the agency is presented in Table 2.18 below.

**Table 2.18: MDT 30-Year Capital Plan
(YOE, millions)**

CAPITAL FUNDING SOURCES	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	Total	
<u>Grant Funds & Subsidies</u>																																
Federal																																
5309 New Starts	\$0.0	\$0.0	\$100.0	\$100.0	\$100.0	\$100.0	\$100.0	\$100.0	\$100.0	\$100.0	\$100.0	\$100.0	\$100.0	\$100.0	\$100.0	\$100.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$1,400.0	
5309 Rail Mod	12.1	14.1	14.9	15.6	17.5	18.6	19.4	20.5	21.0	21.6	22.2	22.8	27.2	28.1	29.0	35.2	42.6	44.2	45.7	47.4	49.2	51.0	53.0	55.0	57.2	59.5	61.9	64.4	67.0	67.0	1,105.0	
5309 Bus Capital (incl. Bus Plaza)	4.4	8.9	5.5	9.3	7.0	0.0	6.8	10.3	6.8	6.8	6.4	4.4	8.0	5.3	5.8	6.0	0.0	14.4	18.1	14.7	14.9	19.1	8.4	16.7	7.4	7.7	8.1	6.1	8.9	8.4	254.3	
5307 Formula Funds (Not Used for PM)	44.5	47.0	49.3	51.1	53.0	56.6	55.4	57.4	62.2	67.5	69.9	72.4	75.1	77.8	80.7	83.7	84.4	88.4	92.6	97.0	101.5	106.3	111.2	116.4	121.0	125.9	127.2	132.2	137.5	143.1	2,588.2	
State																																
Project Matching Grants	33.1	67.2	96.4	135.6	163.5	167.4	128.3	129.0	100.6	73.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,094.6	
Bus Capital	2.7	4.0	2.7	3.3	3.5	0.0	4.0	6.1	4.0	3.9	3.2	2.7	4.0	2.7	3.3	3.5	0.0	6.8	9.0	6.8	6.8	8.8	2.8	6.9	3.3	4.0	4.1	3.2	4.6	4.3	125.0	
Local																																
Existing Infrastructure Funding Needs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	32.5	33.6	34.7	35.8	37.0	38.2	39.5	40.8	42.1	43.5	45.0	46.5	48.0	49.6	51.2	52.9	54.6	56.4	58.3	60.2	62.2	64.3	66.4	1,093.3	
Dedicated PTP Sales Tax Used for Capital	38.3	51.8	79.2	96.4	102.0	89.3	92.5	110.3	87.9	77.9	89.9	99.5	109.2	126.8	136.7	151.3	165.5	148.3	125.3	112.8	88.0	68.4	43.1	19.7	19.7	37.9	38.5	57.3	82.4	80.4	2,626.2	
<u>Debt Financing</u>																																
Conventional Bonds	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2,746.6	0.0	0.0	0.0	0.0	0.0	49.1	37.5	4.8	2.0	0.0	0.0	16.8	151.2	174.1	2,868.1	79.6	172.6	210.2	195.1	6,707.6	
Commercial Paper	0.0	369.3	0.0	345.0	417.3	355.4	328.3	235.4	179.3	148.4	0.0	40.7	31.0	3.9	1.7	0.0	0.0	13.9	125.9	143.2	2,387.6	66.0	142.8	177.6	162.6	67.7	157.5	218.0	200.6	213.4	6,532.4	
FFGA Bond	0.0	0.0	448.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	448.0	
Debt Service Sinking Fund Transfer	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.3	64.4	10.3	5.2	5.8	89.6	0.5	6.8	18.1	0.0	98.3	6.8	9.3	19.2	340.4	
Sunshine State	91.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	91.7	
TOTAL	\$226.8	\$562.4	\$796.0	\$756.3	\$863.7	\$787.3	\$734.7	\$701.5	\$595.3	\$534.3	\$3,074.0	\$379.4	\$392.7	\$384.1	\$398.0	\$421.8	\$391.4	\$462.8	\$478.1	\$477.1	\$2,703.4	\$460.3	\$431.5	\$604.8	\$619.9	\$3,229.2	\$635.4	\$722.8	\$784.7	\$797.3	\$24,406.9	
<u>CAPITAL EXPENDITURES</u>																																
<u>Capital Expenses</u>																																
Rail Service Expansion Projects																																
Phase 1: MIC-Earlington Heights	\$43.5	\$114.1	\$146.8	\$103.2	\$99.5	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$507.0	
MIC Bus Plaza	0.0	2.3	0.4	9.6	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.2	
Phase 2: North Corridor	0.0	0.0	31.3	65.6	85.0	69.1	32.8	24.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	308.7	
Phase 3: East-West	9.4	10.1	72.1	75.3	91.6	207.7	225.8	253.7	262.0	191.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,399.5	
Capital Improvement Program	73.1	145.6	185.8	112.1	83.5	57.1	57.2	32.5	33.6	34.7	35.8	37.0	38.2	39.5	40.8	42.1	43.5	45.0	46.5	48.0	49.6	51.2	52.9	54.6	56.4	58.3	60.2	62.2	64.3	66.4	1,807.7	
Rail Rehabilitation (New Corridors)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	8.7	16.1	25.4	36.3	45.6	53.4	61.6	67.7	72.4	73.2	73.7	74.7	75.4	76.1	76.9	76.9	78.7	995.5	
Bus Acquisition/Renewal/Replacement	21.8	40.2	26.7	28.8	29.8	0.0	34.1	51.3	34.1	33.8	32.0	21.8	40.2	26.7	28.8	29.8	0.0	72.0	90.3	73.7	74.3	95.3	41.8	83.4	37.1	38.7	40.5	30.5	44.4	42.2	1,244.0	
Net Public Works Projects	52.3	55.9	58.7	61.4	63.8	66.1	68.2	70.5	72.8	75.2	19.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	664.6	
<u>Debt Service</u>																																
Principal	21.3	21.3	41.8	43.1	44.6	41.8	43.4	40.3	42.1	43.1	80.1	84.4	87.5	88.0	93.1	98.5	55.1	58.5	61.6	64.8	1.6	1.7	2.0	4.5	7.1	51.7	55.4	60.6	67.3	73.7	1,480.3	
Interest	0.0	17.6	50.5	69.8	76.9	96.8	121.7	95.1	79.4	78.5	157.4	154.9	152.3	146.8	142.1	136.9	131.4	129.8	133.0	133.4	117.8	123.7	124.5	119.7	149.9	183.7	190.6	200.3	196.9	211.2	3,722.6	
Refinanced Future Debt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2,281.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2,281.3	
TECP Refinance/Reissue	0.0	0.0	2.0	2.0	3.9	6.2	8.2	10.0	11.3	12.3	2,391.5	13.1	0.2	0.4	0.4	0.4	41.1	31.5	4.2	2.5	1.6	14.7	28.9	141.7	159.9	2,404.6	82.5	147.1	182.7	168.0	5,872.7	
Surety/Issuance/Reserve Fund	0.0	2.0	5.9	1.9	2.3	2.0	1.8	1.3	1.0	0.8	290.3	0.2	0.2	0.0	0.0	0.0	5.2	4.0	1.2	1.0	13.1	0.4	2.6	16.6	19.8	297.3	9.3	19.5	21.5	21.3	742.5	
TOTAL CAPITAL EXPENDITURES	\$221.4	\$409.0	\$622.0	\$572.9	\$583.7	\$546.7	\$593.3	\$579.6	\$536.3	\$470.2	\$3,006.8	\$311.4	\$321.4	\$310.1	\$321.3	\$333.2	\$312.7	\$386.4	\$390.1	\$385.0	\$2,607.0	\$359.3	\$325.8	\$494.3	\$504.9	\$3,109.6	\$514.5	\$597.1	\$654.0	\$661.4	\$21,041.6	

3.0 OPERATIONS AND MAINTENANCE PLAN

With the development of the Orange Line Phase 2: North Corridor Metrorail Extension, the existing Metrorail system will be extended by 9.5 miles. Revenue operations on the North Corridor are expected to begin in November 2014. North Corridor trains will serve all seven new North Corridor stations every 6.5 minutes during peak periods, as well as provide service between Earlington Heights and the Brickell Metrorail stations.

Figure 3.1 illustrates this operation and other planned Metrorail extensions. The East-West Corridor is planned to provide through transit service from Florida International University to Dadeland South. Peak headways of 6.5 minutes and off-peak headways of 10 minutes are assumed. The existing Stage 1 Metrorail will operate with 7.5-minute headways during peak periods and 10-minute headways during off-peak periods. Although these headways are greater than the current headways, more frequent service is provided between Dadeland South and Martin Luther King Stations than currently. Including the East-West Corridor, the combined headway between the Dadeland South and Brickell Stations is approximately 3.5 minutes compared to 6 minutes today. Between the Brickell and Earlington Heights Stations, the headway is 2.25 minutes during the peak period.

3.1 Operating and Maintenance Costs

3.1.1 O&M Unit Costs

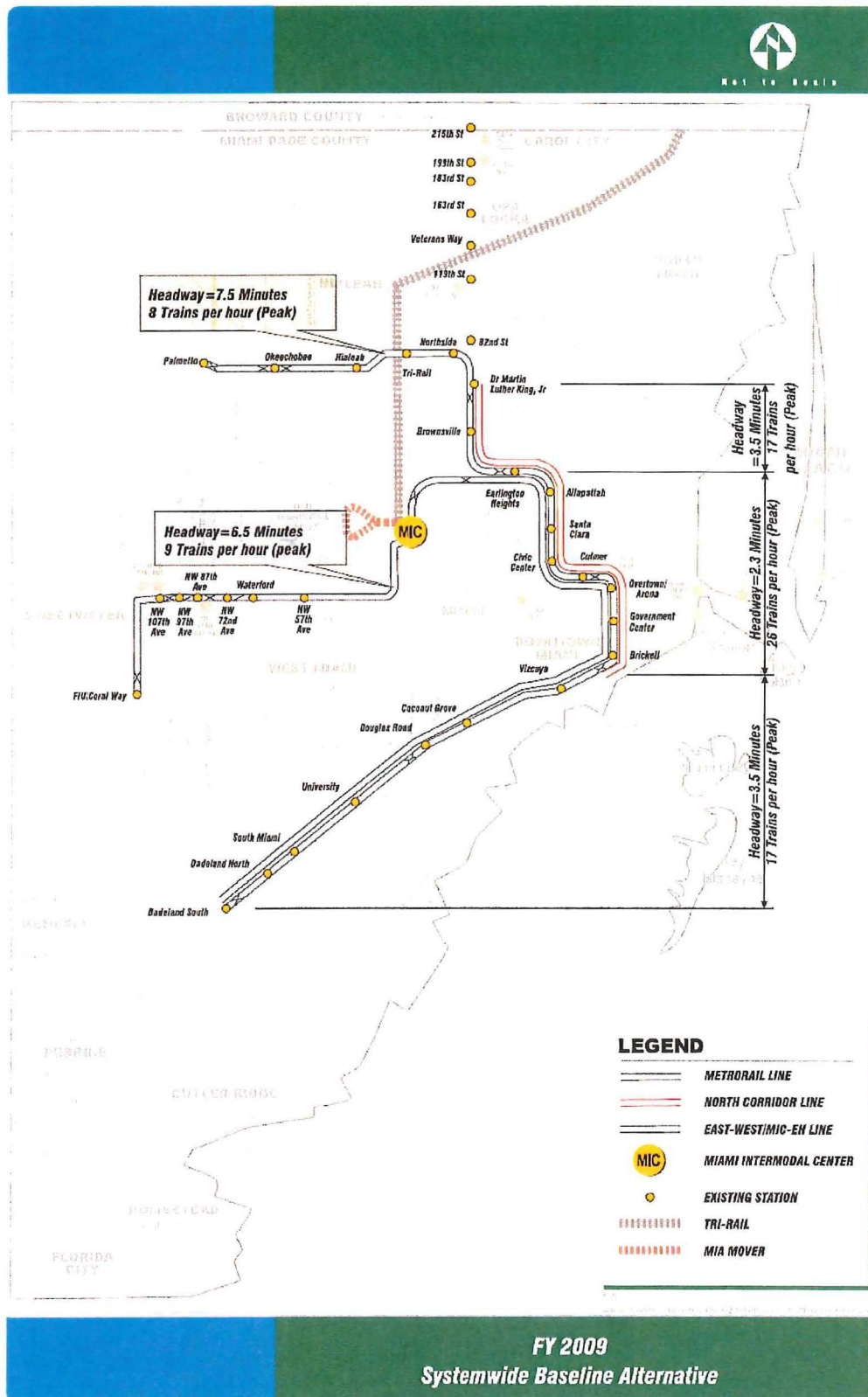
O&M costs for the North Corridor project were estimated by applying cost allocation model based on the 2006 National Transit Database report to develop unit costs and applying the unit costs to the level of service derived from the operating plan described above. This approach involves disaggregating O&M costs into categories that can be reasonably assumed to vary with transit service levels.

The bus model, for example, has costs that vary by miles of service (such as fuel costs), by hours of service (driver labor), and by the number of peak vehicles (bus cleaning). Productivity factors are broken out where reasonable, so that the impacts of various assumptions (such as differential inflation rates or efficiency initiatives) can be tested directly in the model. The disaggregated costs per unit of service are then summed to produce a cost model that can calculate future costs for each project alternative, based on the service characteristics and productivity assumptions defined for that alternative. The unit operating costs calculated for MDT bus operations are presented in Table 3.1.

**Table 3.1: MDT Bus Unit Operating Costs
(2007)**

Unit	Revenue Hours	Revenue Vehicle Miles	Peak Vehicles
Unit Cost	\$56.45	\$2.41	\$76,832

Figure 3.1: MDT Metrorail Operating Plan



The rail model distinguishes between labor costs and non-labor costs for operating characteristics, including: platform hours, vehicle hours, number of rail vehicles, and rail track miles. The unit operating costs calculated for MDT heavy rail operations are presented in Table 3.2.

**Table 3.2: MDT Metrorail Unit Operating Costs
(2007)**

Unit	Train Revenue-Hours	Revenue Car- Miles	Peak Vehicles	Track-Miles
Unit Cost	\$241.37	\$2.68	\$146,758	\$474,222

Service levels and operating practices on MDT's Metromover automated guideway system are projected to remain constant, and a multi-factor O&M cost model for this mode has little application. A simple one-factor model based on revenue vehicle hours is sufficient, as shown in Table 3.3.

**Table 3.3: MDT Metromover Unit Operating Costs
(2007)**

Unit	Revenue-Hours
Unit Cost	\$220.92

Similarly, a multi-factor O&M model is not required for the STS (paratransit) services since payment to the contractor is based on revenue vehicle hours. The unit cost of STS service is shown in Table 3.4.

**Table 3.4: MDT STS (Paratransit) Unit Operating Costs
(2007)**

Unit	Revenue-Hours
Unit Cost	\$43.00

3.1.2 Operating Service Levels

Table 3.5 summarizes the operating service level assumptions that are used in the model for the existing transit system. For each mode, the service statistics that correspond with the unit costs in the O&M cost model are presented. The table shows the service statistics for both 2007 and for the design year (2030). Table 3.6 then shows the additional service corresponding to each of the three phases of the Orange Line project.

Table 3.5: Operating Service Level Assumptions (Existing)

Baseline (2007)				
Service Statistic	Metrobus	STS	Metrorail	Metromover
Revenue Miles (000s)	35,130	n/a	10,221	949
Revenue Hours (000s)	2,837	910	63	90
Vehicles	854	n/a	102	15
Track Miles	n/a	n/a	45.0	8.5
Design Year (2030)				
Service Statistic	Metrobus	STS	Metrorail	Metromover
Revenue Miles (000s)	42,718	n/a	10,289	949
Revenue Hours (000s)	3,937	910	70	90
Vehicles	1,185	n/a	102	15
Track Miles	n/a	n/a	45.0	8.5

Table 3.6: Operating Service Level Assumptions (Orange Line)

Incremental Service Associated with New Orange Line Rail Corridor			
Service Statistic	Phase 1:	Phase 2:	Phase 3:
	MIC-EH	North Corridor	East-West
Revenue Miles (000s)	2,332	2,636	2,997
Revenue Hours (000s)	33.5	40.5	36.5
Vehicles	6	44	20
Track Miles	4.4	19.0	21.6

As summarized in Table 3.5, MDT is facing a significant ramp-up in its underlying level of local bus service towards the end of the 30-year period. As noted in the Section 2 Capital Plan, this ramp-up is assumed to begin in 2024.

3.1.3 O&M Cost Growth Assumptions

Utilizing the operating service level assumptions as well as the unit costs associated with each service statistic, base year O&M costs were projected through 2036. In order to project year-of-expenditure (YOE) O&M costs, further assumptions must be made about appropriate inflation rates. These assumptions are expressed as increments of inflation above or below the overall rate of inflation, as measured by the Consumer Price Index (CPI). In particular, the FY 2009 Financial Plan assumes the following:

- Wage growth will be 0.24 percent above the CPI. This assumption is based on an analysis of historical National Transit Database information for MDT on real growth in vehicle operator wages per revenue hour. Looking at the 11-year period from 2006 back to 1995, the average annualized real growth (increase over CPI) for wages per revenue hour was 0.24 percent.
- Growth in the costs of health benefits and other fringes will be 10 percent per year for the first five years of the Plan, and then twice the rate of CPI after that. This assumption is consistent with historic trends in health care costs at MDT and many U.S. transit agencies and is consistent with near-term trends suggested by MDT's insurance broker.

3.1.4 Efficiency Initiatives

As noted above, MDT is undertaking a number of initiatives to improve efficiency and lower operating costs. Two of the most notable, which have been accounted for in this FY 2009 Financial Plan, are:

- *Reduced bus vehicle operations costs:* MDT is currently implementing new procedures to reduce absenteeism in its bus operators and is also implementing new bus scheduling and dispatching software. The combined effect of these initiatives is expected to be a 5 percent reduction in bus vehicle operations cost per hour by 2010.
- *Reduced rail vehicle maintenance costs:* As MDT rehabilitates its existing rail vehicles and purchases new vehicles to support its rail expansion, it will switch over from direct current (DC) propulsion to alternating current (AC) propulsion. This change is expected to result in a 5 percent reduction in rail vehicle maintenance costs per mile, beginning in 2010. This savings is result of sealed motors with no commutator brushes, which eliminates brush replacement and cleaning of moving parts.

3.1.5 Municipal Contribution and Other Operating Costs

As noted above, the People's Transportation Plan requires that 20 percent of the revenues from the dedicated sales tax go directly to the municipalities in Miami-Dade County for their use on local transportation investments, including transit. This transfer of funds is shown as a required operating expense for MDT. This requirement reduces the amount of revenue available to MDT for either capital investments or support of ongoing operations. Over the course of the 30-year Plan, the municipalities will receive \$3.0 billion from their share of the dedicated PTP tax.

MDT also must support the Citizens' Independent Transportation Trust (CITT) and its staff. Based on the Pro Forma, this expense is estimated at \$2.5 million in 2007 and grows at 3 percent annually in subsequent years.

3.2 Projected Operating Revenue Sources

This section describes the range of O&M funding sources that are expected to be available to MDT.

3.2.1 Dedicated PTP Sales Tax

The PTP sales tax passed in 2002 is used for operating and capital funding, and for debt service.

3.2.2 County General Fund Support

Section 5 of the resolution establishing the ballot measure for the PTP, which was passed by the Miami-Dade Board of County Commissioners, requires a minimum Maintenance of Effort from the General Fund for O&M purposes. This is now a second dedicated source of revenue that did not exist previously. In January 2005, the Board of County Commissioners approved an amendment to the PTP that restores the MOE to

pre-tax levels of \$132 million in 2007 with an annual increase of 3.5 percent through 2036.

3.2.3 Florida Department of Transportation

As noted earlier, the State Block Grant funds are assumed to go towards operations in this Financial Plan, rather than towards capital. In addition, the State provides corridor enhancement funds and funds for the transportation disadvantaged through FDOT. These smaller operating grant funds are assumed to grow at 2.0 percent per year from a base of \$8.4 million in 2007.

3.2.4 Local Option Gas Tax

In 1983, the State of Florida authorized Counties to collect a Local Option Gas Tax (LOGT) on retail gasoline sales. Until 1993, the limit was a 6-cent per gallon tax on gasoline and a 6-cent per gallon tax on diesel, when the legislature authorized the imposition of up to another 5-cent per gallon for gasoline sales. Counties can now collect up to 11 cents per gallon. The first 6 cents per gallon can be levied by a simple majority of the County Commission or a countywide referendum or by municipalities representing more than 50 percent of the county's population.

To impose the remaining 5 cents per gallon, an extraordinary vote by the County Commission is required. Miami-Dade County collects 9 cents of the allowed 11 cents per gallon. The County Code Section 29-63.3 sets forth that 26 percent of the LOGT funds are to be distributed to the cities.

Each penny of LOGT returns approximately \$10.6 million to Miami-Dade County. Therefore, if the Board of County Commissioners restored the 2-cent per gallon LOGT, an additional \$21 million would be collected annually for transportation uses. The Florida statute that authorizes the collection of the LOGT also specifies how the funds can be spent.

The statute requires that county and municipal governments utilize monies received only for transportation expenditures needed to meet the requirements of the capital improvement element of an adopted comprehensive plan. The law defines transportation expenditures to include: public transportation operation and maintenance, roadway and right-of-way maintenance and equipment, roadway and right-of-way drainage, street lighting, traffic signs, traffic engineering, signalization, and pavement markings, bridge maintenance and operation, and debt service and current expenditures for transportation capital projects. The law excludes the routine maintenance of roads from the definition of expenditure.

Proceeds from the LOGT only respond to growth in population. The tax is collected on gallons of gasoline and not on the price of gasoline so the tax does not keep pace with inflation, unlike a sales tax. MDT collected \$16.8 million from the LOGT in 2005 and \$17.1 million in 2006 and is expected to receive \$17.3 million in 2007. An annual growth rate of 2.0 percent is projected from 2007 through 2036.

3.2.5 Federal 5307 Formula Funds

As noted above, these funds are allocated to designated recipients based on service level and ridership variables, and may be used for capital investments, capital

replacement, and preventative maintenance. In this Financial Plan, Section 5307 dollars are assumed to be applied to the bus system, largely for preventive maintenance within the operating budget.

3.2.6 Transit-Related Revenues

Passenger Revenues

Estimates of passenger revenues are based directly on ridership estimates from the travel demand model and on fare policy assumptions. The FY 2009 Financial Plan has modified the Pro Forma schedule of fare increases significantly so that fare increases occur in conjunction with service expansions and so that the average real fare per linked passenger trip is the same in the design year as it is currently. The plan assumes a \$0.50 increase in the cash fare in 2009, \$0.25 increases in the years immediately preceding the opening of Orange Line Phases 1 and 2 (2011 and 2014, respectively), and a \$0.13 increase in 2016 when Phase 3 opens. After 2016, fares are assumed to be flat until the 2030 design year. After 2030, fares grow with inflation. This results in an average real fare at the same level in the design year as in the base year. In other words, the FY 2009 Financial Plan assumes no real growth in fare between base year and design year, which is consistent with the travel demand analysis. This assumed schedule of fare increases is more in line with MDT's historical experience in raising fares.

This new fare schedule was applied in the travel demand model, and the resulting model ridership was applied to generate appropriate fare revenues over the 30-year period. The tables below show average fare paid by mode, ridership by mode, and total passenger revenue. Note that average fare paid is less than the base or cash fare, since many discounted fare media exist for travelers to travel for less than the full cash fare.

Also, as noted above, the MDT Capital Plan includes a major near-term expenditure for new fare collection equipment. Based on the experience of other transit agencies, including MARTA in Atlanta and MBTA in Boston, MDT expects this new equipment to have a significant positive impact on fare revenues without impacting ridership (due to reduced fare evasion and revenue-positive pricing incentives). Therefore, by 2010, average fare paid per passenger is projected to increase by 15 percent over what would be expected without the new equipment.

**Table 3.7: Average Fare Paid by Mode
(Exclusive of Impact of New Fare Collection Technology)**

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Metrobus	\$0.87	\$0.86	\$1.15	\$1.15	\$1.29	\$1.29	\$1.29	\$1.43	\$1.43	\$1.51
Metrorail	\$1.27	\$1.25	\$1.67	\$1.67	\$1.87	\$1.87	\$1.87	\$2.08	\$2.08	\$2.19
Metromover	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
STS	\$2.51	\$3.00	\$4.00	\$4.00	\$4.50	\$4.50	\$4.50	\$5.00	\$5.00	\$5.26
Year	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Metrobus	\$1.51	\$1.50	\$1.50	\$1.51	\$1.51	\$1.52	\$1.52	\$1.51	\$1.51	\$1.51
Metrorail	\$2.19	\$2.18	\$2.18	\$2.19	\$2.19	\$2.21	\$2.21	\$2.19	\$2.19	\$2.19
Metromover	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
STS	\$5.26	\$5.24	\$5.24	\$5.27	\$5.27	\$5.31	\$5.31	\$5.27	\$5.27	\$5.26
Year	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Metrobus	\$1.51	\$1.51	\$1.51	\$1.50	\$1.50	\$1.53	\$1.53	\$1.59	\$1.59	\$1.62
Metrorail	\$2.19	\$2.19	\$2.19	\$2.18	\$2.18	\$2.22	\$2.22	\$2.31	\$2.31	\$2.36
Metromover	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
STS	\$5.26	\$5.27	\$5.27	\$5.24	\$5.24	\$5.33	\$5.33	\$5.55	\$5.55	\$5.67

**Table 3.8: Ridership by Mode
(millions)**

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Bus	81.34	79.41	70.17	70.74	66.48	67.09	67.70	63.69	64.66	64.24
Metrorail	15.17	15.63	13.98	14.42	13.86	16.35	17.02	16.52	22.00	27.25
Metromover	1.70	1.65	1.47	1.56	1.51	3.12	3.36	3.43	5.17	7.36
Total	98.21	96.69	85.63	86.72	81.85	86.56	88.08	83.64	91.83	98.85
Year	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Bus	64.41	64.94	65.55	65.38	65.53	65.52	65.43	69.44	73.10	76.14
Metrorail	28.54	30.32	31.93	32.62	33.50	34.32	35.13	36.11	37.12	38.00
Metromover	7.77	8.31	8.82	9.04	9.29	9.54	9.79	10.07	10.35	10.62
Total	100.73	103.57	106.30	107.04	108.31	109.38	110.34	115.62	120.58	124.75
Year	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Bus	79.06	81.75	84.24	86.61	87.53	87.62	88.39	87.89	88.20	88.15
Metrorail	38.95	39.91	40.88	41.87	42.50	42.72	43.28	43.21	43.55	43.71
Metromover	10.90	11.19	11.49	11.80	12.12	12.39	12.71	12.89	13.18	13.42
Total	128.91	132.86	136.60	140.28	142.15	142.73	144.38	143.99	144.93	145.28

**Table 3.9: Passenger Fare Revenue
(Inclusive of Impact of New Fare Collection Technology)**

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Fare Revenue (000s)	\$94,880	\$93,333	\$117,812	\$127,154	\$135,062	\$141,637	\$144,312	\$152,061	\$167,167	\$188,325
Annual Growth		-1.6%	26.2%	7.9%	6.2%	4.9%	1.9%	5.4%	9.9%	12.7%
Year	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Fare Revenue (000s)	\$191,778	\$197,133	\$202,064	\$205,903	\$208,533	\$213,391	\$215,542	\$225,043	\$234,273	\$242,860
Annual Growth	1.8%	2.8%	2.5%	1.9%	1.3%	2.3%	1.0%	4.4%	4.1%	3.7%
Year	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Fare Revenue (000s)	\$250,705	\$259,855	\$267,059	\$273,917	\$277,704	\$284,903	\$288,395	\$299,957	\$302,267	\$309,909
Annual Growth	3.2%	3.6%	2.8%	2.6%	1.4%	2.6%	1.2%	4.0%	0.8%	2.5%

Interest

MDT earns interest on its working capital balance. Interest calculations are based on the interest rate projections for the 3-month Treasury bill. Interest income is applied to the operating budget, thereby enabling additional tax revenues to be leveraged to fund the capital program.

Other Operating Revenues

For MDT, this category includes advertising, joint development, and rail station parking.

- **Advertising Revenues:** MDT has an aggressive advertising program. Revenues are assumed to grow with the scope of the system (as measured by route-miles) and with inflation, from a base of \$6.9 million in 2007.
- **Joint Development/Permits/Leases:** These revenues from joint development and permits at existing transit facilities are projected to grow at the rate of inflation from a base of \$2.6 million in 2007.
- **Rail Parking:** Rail parking revenues are also assumed to grow with the scope of the system (as measured by route miles) and with inflation, from a base of \$1.5 million in 2007.

3.3 MDT 30-Year Operating Plan

Based on all of the above assumptions regarding operating funding sources and uses for MDT, a 30-year operating plan for the agency is presented in Table 3.10.

**Table 3.10: MDT 30-Year Operating Plan
(YOE, millions)**

OPERATING REVENUES	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	Total
Farebox Revenue	\$94.9	\$93.3	\$117.8	\$127.2	\$135.1	\$141.6	\$144.3	\$152.1	\$167.2	\$188.3	\$191.8	\$197.1	\$202.1	\$205.9	\$208.5	\$213.4	\$215.5	\$225.0	\$234.3	\$242.9	\$250.7	\$259.9	\$267.1	\$273.9	\$277.7	\$284.9	\$288.4	\$300.0	\$302.3	\$309.9	\$6,312.9
Other Operating Revenues	11.0	11.1	10.6	11.0	10.9	11.6	12.2	12.0	13.1	14.2	14.7	15.4	16.2	16.6	17.2	17.9	18.4	19.4	20.6	21.5	22.6	23.7	24.8	25.8	26.7	27.2	28.0	28.5	28.8	29.3	560.9
<u>Grant Funds & Subsidies</u>																															
<u>Federal</u>																															
5307 Formula Funds Used for PM	42.3	44.7	46.8	48.5	50.3	53.8	52.7	54.6	59.0	64.1	66.4	68.8	71.3	73.9	76.6	79.5	80.2	84.0	88.0	92.1	96.4	101.0	105.7	110.6	115.0	119.6	120.8	125.6	130.7	135.9	2,458.8
<u>State</u>																															
Block Grant & TD/CE	25.0	25.5	25.9	26.4	27.0	27.5	28.0	28.6	29.1	29.7	30.2	30.8	31.4	32.0	32.7	33.3	33.9	34.6	35.3	35.9	36.6	37.3	38.1	38.8	39.5	40.3	41.1	41.9	42.7	43.5	1,002.7
<u>Local</u>																															
LOGT	17.3	17.6	17.8	18.1	18.4	18.7	18.9	19.2	19.5	19.8	20.1	20.4	20.7	21.0	21.3	21.7	22.0	22.3	22.6	23.0	23.3	23.7	24.0	24.4	24.8	25.1	25.5	25.9	26.3	26.7	650.2
Miami-Dade General Funds	132.0	136.6	141.4	146.3	151.5	156.8	162.2	167.9	173.8	179.9	186.2	192.7	199.4	206.4	213.6	221.1	228.9	236.9	245.2	253.7	262.6	271.8	281.3	291.2	301.4	311.9	322.8	334.1	345.8	357.9	6,813.4
Dedicated PTP Sales Tax for Operations	161.7	158.1	144.0	144.3	150.5	174.6	190.3	188.3	226.2	259.8	264.9	271.6	287.8	296.5	309.0	325.2	337.8	377.9	430.8	475.0	529.1	589.1	651.2	708.6	749.9	777.1	816.7	850.0	861.9	883.4	12,591.2
Interest Income	7.6	3.0	2.9	5.4	2.1	2.3	2.6	1.8	2.4	2.5	1.9	2.2	2.6	2.0	2.2	2.5	2.4	2.3	2.4	1.8	2.1	2.3	2.1	1.9	2.2	1.8	2.0	2.2	1.3	1.8	74.9
TOTAL OPERATING REVENUE	\$491.7	\$489.9	\$507.3	\$527.3	\$545.6	\$586.8	\$611.3	\$624.4	\$690.4	\$758.3	\$776.3	\$799.1	\$831.5	\$854.5	\$881.3	\$914.5	\$939.0	\$1,002.4	\$1,079.1	\$1,146.0	\$1,223.5	\$1,308.7	\$1,394.3	\$1,475.1	\$1,537.1	\$1,588.0	\$1,645.3	\$1,708.1	\$1,739.7	\$1,788.5	\$30,465.0
OPERATING EXPENSES	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	Total
Metrobus	\$310.8	\$302.6	\$312.0	\$322.4	\$333.5	\$346.7	\$360.1	\$366.3	\$378.3	\$390.5	\$398.2	\$408.8	\$423.8	\$433.3	\$445.4	\$460.2	\$470.4	\$519.3	\$576.2	\$627.7	\$687.0	\$750.6	\$815.8	\$879.0	\$918.5	\$950.0	\$986.9	\$1,026.0	\$1,045.9	\$1,080.1	\$17,326.2
Metrorail & Metromover	99.0	102.5	106.4	111.1	114.9	139.4	145.1	148.0	197.5	247.0	252.8	260.5	270.9	278.0	286.8	297.3	305.0	313.6	325.6	333.5	344.3	356.1	367.5	377.0	389.4	398.4	409.3	420.9	424.6	433.8	8,256.2
STS	39.3	40.3	41.5	42.9	43.8	45.0	46.5	47.2	48.6	50.0	50.9	52.1	53.8	54.8	56.2	57.8	58.9	60.1	61.8	62.8	64.2	65.8	67.3	68.4	70.1	71.3	72.7	74.2	74.6	75.8	1,718.7
Other Operating Expenses (CITT)	2.5	2.6	2.7	2.8	2.9	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.1	4.2	4.3	4.4	4.6	4.7	4.9	5.0	5.2	5.3	5.5	5.6	5.8	6.0	120.6
Municipal Contribution	40.0	42.0	44.6	48.1	50.5	52.8	56.6	59.7	62.8	67.5	71.0	74.2	79.4	84.7	89.2	95.3	100.6	105.2	111.2	117.5	123.4	131.5	138.9	145.6	153.9	163.0	171.0	181.5	188.8	192.8	3,043.5
TOTAL OPERATING EXPENSES	\$491.7	\$489.9	\$507.3	\$527.3	\$545.6	\$586.8	\$611.3	\$624.4	\$690.4	\$758.3	\$776.3	\$799.1	\$831.5	\$854.5	\$881.3	\$914.5	\$939.0	\$1,002.4	\$1,079.1	\$1,146.0	\$1,223.5	\$1,308.7	\$1,394.3	\$1,475.1	\$1,537.1	\$1,588.0	\$1,645.3	\$1,708.1	\$1,739.7	\$1,788.5	\$30,465.0

4.0 CASH FLOW & RISK ANALYSIS

4.1 Introduction

This section summarizes the sources and uses of funds analysis and demonstrates that with the appropriate financial strategy that MDT has the financial capacity to operate and maintain its existing services and facilities and support the services with the opening of the Orange Line Phases 1, 2, and 3 projects.

This chapter discusses various capital and operating indicators that demonstrate MDT's financial capacity in greater detail.

4.2 Finance Structure

The financial analysis was structured to support three basic funding strategies related to the use of available funding sources:

- **First, fund the operating program:** MDT's basic objective is to provide quality transit service to all its customers. The operating revenues assumed in the analysis are applied to fully fund operational needs first.
- **Second, fund the capital program, including rehabilitation and replacement as well as new initiatives:** MDT's priority capital investment must be to preserve the existing infrastructure and to improve customer service and convenience on existing service.
- **Third, fund the construction of the Orange Line Phases 1, 2, and 3 projects:** The proposed capital program entails significant capital costs which MDT can finance through pay-as-you-go sources if required. To the extent the initiatives mentioned previously successfully identify additional revenues and options for short- and long-term financing, these offer additional methods to support the project costs.

The analytical component of this report was accomplished through the development and application of the new MDT financial analysis model. This is a Microsoft Excel spreadsheet which integrates projections of expenses and revenues, both capital and operating, and permits the rapid examination of alternative assumptions regarding policy and uncertainty variables:

- **Policy variables:** These variables are actions that could be taken by MDT management to directly control costs and revenues. These include service growth, construction schedules, and pricing of transit services.
- **Uncertainty variables:** These include factors beyond the immediate control of MDT management such as inflation, interest rates, and ridership.

The financial analysis model includes the following important features, vital for comprehensive analysis of transit costs and revenues in the context of underlying service expansion:

- Projection of bus and rail service operating and maintenance costs by type of service (e.g., motor coach, trolley coach, light rail transit, historic streetcar, and cable car) and by object class (e.g., wages and salaries, healthcare fringe benefits, other benefits, materials and supplies, energy costs, and other);

- Projection of construction costs by cost component (e.g., right-of-way, civil works, equipment, and engineering);
- Scheduling of construction costs by segment in terms of year when revenue service begins and drawdown of construction funds;
- Projection of local, state, and federal funds in the context of the rules and allocation procedures established in SAFETEA-LU and various state and local legislation and policies;
- Projection of inflation and interest rates based on an integrated national economic model by Economy.com; and
- Presentation of analytical results in both detailed and summary tabular formats as well as more than 140 graphs that vividly display important trends over time.

4.3 Cash Flow Results

4.3.1 30-Year Sources and Uses

Table 4.1 shows MDT's 30-year cash flow projection (sources and uses of funds) in YOE dollars. The table shows Miami-Dade County has sufficient revenues – if it receives additional funding in 2014 and following years for existing infrastructure – to fund the development and operation of the three phases of the Orange Line while maintaining and expanding the existing transit system.

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4.3.2 Operating Indicators

The model includes two key operating indicators: farebox recovery ratio and operating ratio. The farebox recovery ratio is the ratio of fare box revenues to operating expenses. Operating ratio is the ratio of operating revenues (i.e., passenger fares plus parking fees, advertising, commissions, interest income from capital and real estate reserves, and leases) to operating expenses.

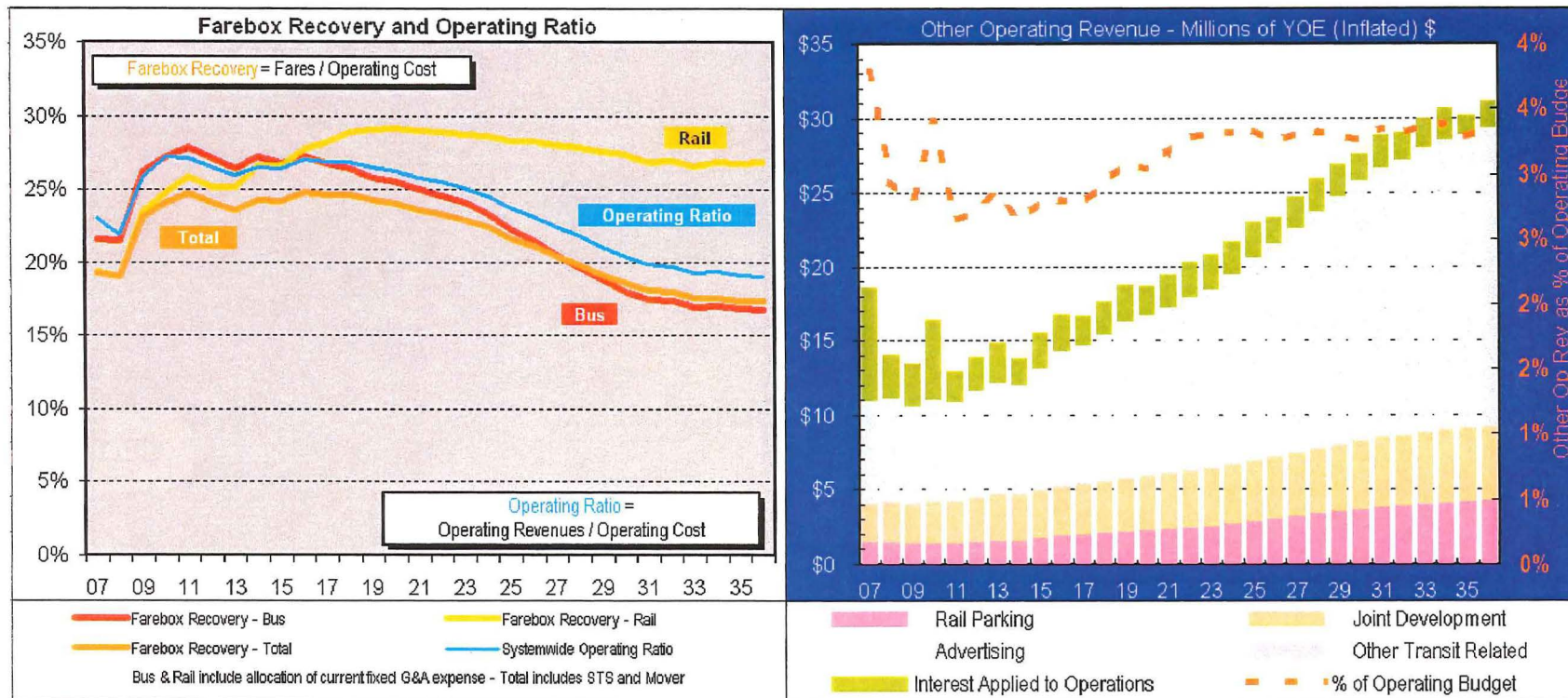
Figure 4.1 displays projected farebox recovery and operating ratios and other operating income. The left line graph projects the ratio of fare revenues to total operating cost by mode, as well as the agency's overall operating ratio. The right stacked bar graph projects the various sources of non-fare operating income in year-of-expenditure dollars and the percentage of the sum of these sources as a percentage of the operating budget.

As the graphs illustrate, the agency will see a moderate increase in farebox recovery and operating ratio during the period of 2008-2016 due to fare increases and additional ridership generated by the rail corridor expansions. Farebox recovery and operating ratio will then slowly decline during the remaining years of the plan as fares are held stable and additional bus service is added to address service degradation caused by arterial road congestion.

4.3.3 Cash Balances

Based on discussions with MDT staff and MDT's financial advisors, the FY 2009 Financial Plan maintains a working cash balance of \$50 million or more in each year of the financial plan. As Figure 4.1 indicates, MDT maintains its working cash balance at \$50 million in each year except 2009 (when the proceeds from the FFGA bond are received and the balance grows to \$85 million) and occasionally in years such as 2022 and 2023, when the balance slightly exceeds \$50 million due to the structure of debt payments.

Figure 4.1: Farebox Recovery and Operating Ratios; Other Operating Revenue



4.4 Risks and Uncertainties

4.4.1 Introduction

The FY 2009 Financial Plan has determined a set of strategies for the Orange Line Phase 2: North Corridor Metrorail Extension project that would provide funding to support the construction, operation and maintenance of the project. The financial analysis assumes substantial Federal participation in the construction of the project. The magnitude of this investment demands that MDT have complete assurance that Federal funds will be forthcoming once MDT commits to the project. Conversely, the FTA must have assurance that limited Federal funds will be fully and productively utilized and leveraged to the greatest extent possible. These mutual assurances will be negotiated and described in a Full Funding Grant Agreement between FTA and MDT.

Decision makers committing public resources to large-scale infrastructure investments must be informed as to the likely range of financial results that may occur. For this reason, an uncertainty analysis is undertaken to explore the range of possible outcomes in the financial analysis. It must be recognized that the achievement of any financial projection may be affected by fluctuating economic conditions and depends on the occurrence of future events that cannot be assured. Therefore, actual results achieved may vary from point estimates and the variations could be material.

There are a number of uncertainty variables that cannot be directly controlled by management and governing bodies. These include inflation; interest rates; construction costs; ridership; and federal, state, and local grant funding levels. Undertaking an uncertainty analysis reveals the combinations of management actions that result in financial outcomes that provide for the feasible implementation of the project, even in the more pessimistic of futures. Feasibility is measured by a set of politically and commercially acceptable strategies that result in favorable values for specific measures such as a minimum debt service coverage.

One-dimensional "sensitivity tests" are often insufficient in their depth of analysis because they implicitly assume that only one uncertainty variable changes at a time; in reality all sources uncertainty vary simultaneously. More sophisticated risk analyses are structured to permit the examination of the simultaneous varying of all uncertainty variables. One type of uncertainty analysis that has been demonstrated to work well in the financial analysis of transportation investments is the "Monte Carlo" simulation. In 100 or more iterations of the financial analysis model, the risk variables are randomly varied based upon their pre-determined range of possible values. In contrast to traditional forecasts of worst case, expected case, and best case scenarios, the results of the uncertainty analysis provides a continuum, or probability distribution of potential project financing out-comes that reflect all possible combinations of risk variable values.

The most significant advantage of more comprehensive risk analyses over simple point values of the most likely result is the opportunity to improve the understanding and "buy-in" by decision makers of the underlying assumptions as well as the results of the analysis.

The context of the results can be phrased as follows: "With this set of underlying assumptions, management actions result in an X percent likelihood that the financial

plan will be feasible. If management actions are adjusted, the result improves to a Y percent likelihood of feasibility." Because the values of the uncertainty variables are randomly selected using an approximation of a normal distribution function, the results of the uncertainty analysis are expressed in statistical terms. A convenient measure is the range of outcomes within one standard deviation of the mean, that is, the lower and upper values of roughly 67 percent of the outcomes closest to the most likely value. Thus, roughly 33 percent of the outcomes fall outside this range; roughly 16 percent higher and 16 percent lower. Similarly, two standard deviations capture roughly 95 percent of the outcomes; roughly 2.5 percent falling above and 2.5 percent below this range.

Applying the example above, the Monte Carlo simulation can provide the following finding: "With this set of management actions (construction schedule, level of taxation, transit service growth), there is a less than 16 percent (1-in-6) probability that Future Capital Revenues of more than \$x million (e.g., \$150 million) will be required. If construction is delayed by y years or if the level of taxation is raised to z percent, there is a less than 2.5 percent (1-in-40) probability that Future Capital Revenues of more than \$x million will be required."

When the analysis is conducted with close interaction between analysts and decision makers, an acceptable set of underlying assumptions regarding uncertainty variables and management actions can be agreed upon. Uncertainty analysis is therefore both an analytical technique and a process for reaching agreement leading to project implementation. The continuum of risk outcomes is structured to lead decision makers through a set of logical alternative scenarios which examine alternative implementation schedules, levels of taxation, rates of service growth, and other management actions.

Uncertainty analysis provides the context to obtain "buy-in" from stakeholders, including decision makers and the public, by providing the opportunity for the stakeholders to identify key uncertainty variables and to establish the "shape" of the uncertainty functions. The financial analysis is repeated until consensus is reached regarding the adequacy of the financial indicators and the probability of achieving desired results.

Successful completion of the uncertainty analysis results in a financially constrained plan that meets local requirements and, particularly in the case of debt financing, meets the requirements of the capital markets.

4.4.2 Risk Variables Applied in Uncertainty Analysis

Although the financial analysis has defined a most likely scenario based on the funding, financing and cost assumptions presented above, there are a number of operating and capital risks that could influence the financial plan. Application of Monte Carlo simulation to the FY 2009 Financial Plan involved replacing point estimates of various risk variables with probability density functions which represent the range and relative likelihood of future outcomes. These risk variables are fundamental input assumptions to the analysis.

Operating Risk

- *Fares, fare policy, and cost recovery:* Changes in fare level and structure affect ridership, fare revenue, and cost recovery. Changes in ridership affect the level of service required which, in turn, affects capital and operating costs.
- *Service levels:* The frequency of service and hours of operation affect ridership and fare revenue and capital and operating costs.
- *Operating costs:* Differences in operating costs (including labor, fringes, insurance and liabilities) may occur because of 1) differences among the requirements of the technologies, or 2) variations in labor productivity and unit cost.
- *Real inflation:* The rate of real inflation (i.e., the difference between the rate of inflation for a specific commodity or service and the baseline rate of inflation) may vary. These variations in the real rate of inflation are particularly important for certain commodities or services which constitute a significant element of the capital and operations and maintenance cost structure of the transit system (e.g., labor, electricity, fuel, parts and construction).

Construction Cost Risk

- *Construction costs:* Differences in construction costs may occur because of 1) unforeseen conditions such as soil conditions or utility relocation; 2) variations in construction unit costs, bid quantities and other contingencies; 3) changes in design elements, and 4) mitigation of environmental impacts.
- *Real inflation:* The rate of real inflation (i.e., the difference between the rate of inflation for a specific commodity or service and the baseline rate of inflation) may vary. These variations in the real rate of inflation are particularly important for certain commodities or services which constitute a significant element of the capital and operations and maintenance cost structure of the transit system (e.g., labor, electricity, fuel, parts and construction).
- *Dedicated revenues:* Variations in dedicated revenues affect the availability of resources to cover debt and to fund capital and operating needs.
- *Capital funding availability:* The availability of capital funds from various sources (e.g., Federal funding and non-Federal match from state and local sources) affects the timing and overall cost of the project. Insufficient annual allocations require an extension of the construction schedule so that costs do not exceed available resources.
- *Interest rates:* Variations in interest rates impact the level of working capital and the ability to both operate existing service and undertake new initiatives.

Table 4.2 summarizes the risk values applied in this analysis.

Table 4.2: Summary of Risk Uncertainty Variables

Parameter	Low Value	Mean Value	High Value
<i>Inflation and Interest Rates (Above/Below Baseline)</i>			
Consumer Inflation	-0.72 percent	0.00 percent	2.16 percent
Petroleum Products	-3.02 percent	0.00 percent	0.61 percent
Electricity	-4.61 percent	0.00 percent	4.29 percent
Construction	-0.52 percent	0.00 percent	1.52 percent
3-Month T-Bill (Interest Earnings)	-0.47 percent	0.00 percent	2.21 percent
<i>Fare and Service Elasticity</i>			
Fare Elasticity	-0.05	-0.15	-0.20
Service Elasticity	0.30	0.40	0.50
Ridership (relative to travel demand model results)	75 percent	100 percent	105 percent
<i>Capital Program Specifications</i>			
Project cost (relative to SCC value)	-5 percent	0 percent	10 percent
Annual Cap on New Starts Funding ¹⁰	\$80 million	\$100 million	\$120 million

This uncertainty analysis is highly dependent on the formulation of the macroeconomic model being used and its underlying assumptions describing Gross Domestic Product growth, federal surplus/deficit, Federal Reserve policies, foreign exchange rates, and oil prices. As the MDT approaches the time to commit funds toward future projects, additional risk analyses would be undertaken with more current economic projections.

4.4.3 Results of Risk Analysis

The risk analysis tested the two key indicators of the debt financing program, the gross coverage test and the additional bonds test. The results of the risk analysis are described in the text and graphs below. The graphs represent “uncertainty bands” which include the following measures:

- *Most likely outcome:* This is defined by the yellow line in the center of the range. This result can be interpreted as having a 50 percent probability of outcomes above the line and 50 percent probability of outcomes below the line.

¹⁰ The County has capped the New Starts funding amount as suggested through communications with the FTA staff. The County fully intends to actively pursue and negotiate a greater funding amount at the time a Full Funding Grant Agreement is agreed upon. Please see MDT's Position on Project Funding at the beginning of this document.

- *One standard deviation (brown) band:* This band represents approximately two-thirds of the outcomes. This results be interpreted as a having a 1-in-6 probability of outcomes above the brown band and a 1-in-6 probability of outcomes below the brown band.
- *Two standard deviation (green) band:* This band represents approximately 95 percent of the outcomes. This results be interpreted as a having a 1-in-40 probability of outcomes above the green band and a 1-in-40 probability of outcomes below the green band.

Figure 4.2: Range of Gross Coverage Test

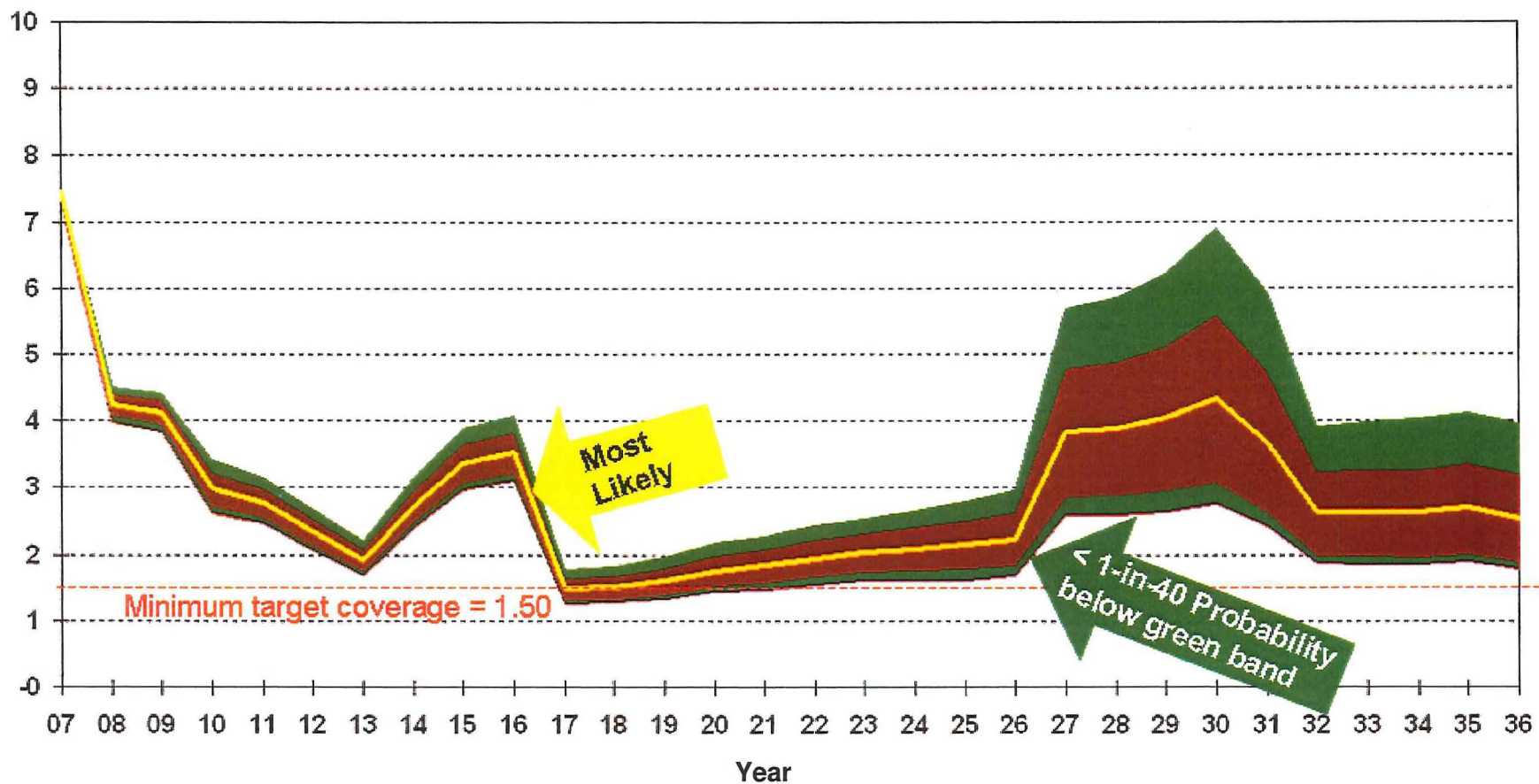
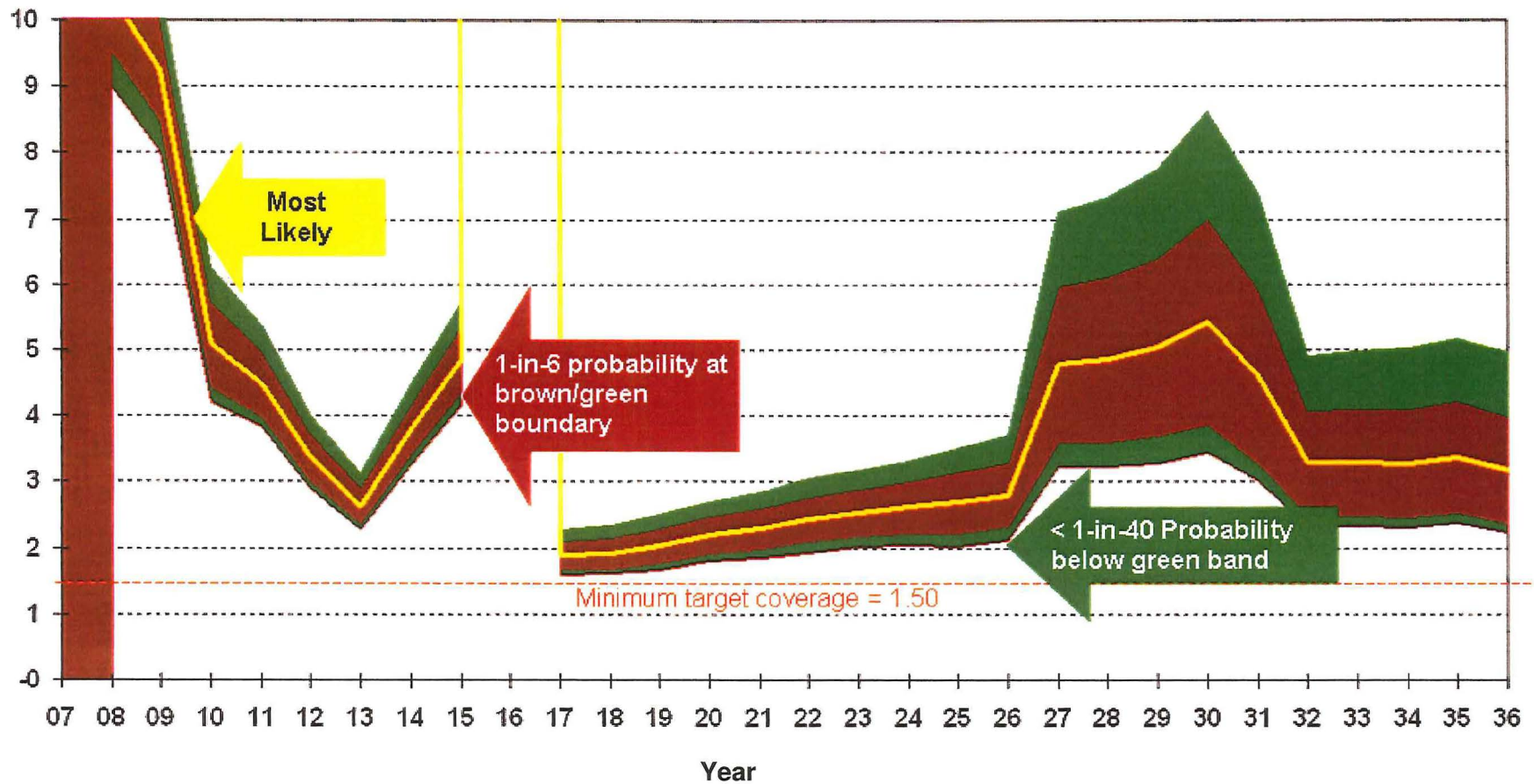


Figure 4.3: Range of Additional Bonds Test



The risk analysis indicates that the critical minimum coverage ratios are successfully achieved in the FY 2009 Financial Plan, as follows:

- The Additional Bonds Test is greater than 1.50 in every year in the most likely scenario.
- Gross Debt Service Coverage is greater than 1.50 in every year in the most likely scenario (reaching a minimum of 1.51 in 2017).
- The risk analysis reveals a less than 1-in-40 probability of failing to achieve adequate coverage (indicated by the green band above the target coverage line) for the Additional Bonds Test in all years and for Gross Debt Service Coverage in all years except the period between 2017 and 2021, where there is a slightly increased risk of falling below the preferred minimum ratio. However, should these risks manifest themselves, the issue could likely be resolved by MDT by deferring some principal payments.

4.4.4 Mitigating Risk

As the Orange Line Phase 2: North Corridor Metrorail Extension progresses, there are several strategies that MDT could utilize to address these risks, if one or more should manifest itself. These strategies include:

- Modifying the construction schedule for the Orange Line Phase 3: East-West Metrorail Extension;
- Slowing the long-term growth of Metrobus service;
- Raising fares;
- Introducing additional short and long term financing strategies.

4.5 Conclusion

This chapter establishes a strategy to fund the capital and operating needs of the Orange Line Phase 2: North Corridor Metrorail Extension within the context of MDT's underlying transit services. Overall, the strategy assumes that \$700 million¹¹ of the project's construction cost would be funded by FTA Section 5309 New Starts grants, with the remainder covered by a mixture of state and local funding. The annual operating needs would be funded with fare revenue from the project, as well as MDT's existing revenue sources.

As the Orange Line Phase 2 progresses through the project development process, MDT will work with its funding partners to further develop and refine this funding strategy, which would ultimately form the basis of a Full Funding Grant Agreement between MDT and FTA. Additionally, as the results of the initiatives underway become known, the

¹¹ The County has capped the New Starts funding amount as suggested through communications with the FTA staff. The County fully intends to actively pursue and negotiate a greater funding amount at the time a Full Funding Grant Agreement is agreed upon. Please see MDT's Position on Project Funding at the beginning of this document.

possibility of additional revenues and access to financing structures will affect the funding strategy both for the Project and for MDT's operating and capital budgets.

Should any of the project risks identified here manifest themselves, the County will have the ability to identify and evaluate the appropriate response. In any of these scenarios, the County could hypothetically take multiple actions, including: modification of the scope of the rail corridors; alteration of construction schedules; identification of alternate sources of revenue; identification of other innovative financing techniques and mechanisms; and adjustment of existing service. Most importantly, it should be emphasized that because of the County's diligence in continually monitoring the PTP, County officials will be able to take the appropriate measures to sustain a financially viable system.

5.0 INNOVATIVE FINANCING PROGRAMS

The allocation of federal funds for the construction of major transit improvement projects has become increasingly competitive nationwide. The federal grant funding process as governed by the Congressional authorization and appropriation process poses some risk for local transit operators regarding assumptions on the amount of projected federal funding participation. Therefore, the entire spectrum of local financing options needs to be examined and approaches that could be beneficial to financing transit projects need to be applied in the financial plan. In addition to the creative use of municipal debt financing, both FDOT and FTA encourage the use of innovative financing programs as part of an overall financial strategy.

The following describes several innovative programs for consideration by Miami-Dade County. These and other innovative programs and their specific project related implications will be evaluated in future iterations of the North Corridor Financial analysis.

5.1 Florida State Infrastructure Bank

Florida's State Infrastructure Bank (SIB) is an investment fund that offers loans, credit enhancements, and other forms of financial assistance to surface transportation projects that meet federal standards and are eligible for assistance under Title 23. Recent proposed Florida legislation increased state funding to the SIB in order to assist projects not eligible under Title 23 and also provided the capacity for the SIB to issue more loans. Loans can be made to public entities, private corporations or public-private partnerships. The SIB cannot offer grants. The SIB is a revolving loan fund whereby loans are repaid and these funds are then re-loaned to other approved projects.

The SIB is intended to support funding for only a portion of any given project, not to fund an entire project or replace otherwise creditworthy bonding capacity. If this financing option is pursued, a regional transportation agency would send an application to FDOT that identified the project, the timing and amount of loans, the source of loan repayments, and a loan repayment schedule.

FDOT operates both the federally funded and the state funded SIB, which are both escrow accounts. As of March 31, 2006, \$146.9 million was capitalized for the federally funded SIB, and \$334.6 million for the state funded SIB. The total amount in both accounts was \$481.5 million including interest.

5.2 County Government Incentives Program

The County Government Incentives Program recently passed in the Florida Legislature and although it is not necessarily a project specific program, this is for a potential source of funding for Miami-Dade County. The Incentives Program would be funded at the state level by reducing the general revenue service charge currently assessed against transportation funds. The intent of this program is to reward and encourage state-local partnerships through a matching fund program. The level of state match increases based on the level of local transportation funding effort.

The level of local transportation funding effort is based upon the levy of local option sales or gas taxes for transportation purposes or similar means of increasing local

funding for transportation beyond the traditional sources. Since Miami-Dade County levies a one-half percent local transit sales tax and 3 cents of the potential 5-cent 2nd LOGT, the County and MDT may qualify for the Incentives Program.

Appendix A: Inflation and Interest Rate Projections

Introduction

MDT and its consultants contracted with Moody's Economy.com to produce a custom economic forecast for MDT for use in the FY 2009 Financial Plan. The June 2007 forecast includes 30 years (2007 to 2036) of annual projections of national and local (Miami or Florida) inflation and national interest rates. This memorandum summarizes the forecast.

The following projected inflation and interest rates were included in the June 2007 forecast:

Inflation and Income

- US CPI: Urban Consumer - All Items, (Index 1982-84=100, SA)
- US NIPA: Personal consumption expenditures, (Bil. C\$, SAAR)
- US Personal Disposable Income, (\$ Ths.)
- Miami, FL CPI: Urban Consumer - All Items, (Index 1982-84=100, SA)

Energy Cost Indices

- US Petroleum Crude Oil Price: West Texas Intermediate - Sweet Wellhead, (\$)
- FL Petroleum Crude Oil Price, WTI Equivalent (\$)
- US Natural Gas: Henry Hub, (\$ per mmbtu)
- FL Natural Gas (\$ per mmbtu)
- US CPI: Urban Consumer - Electricity, (1982-84=100, SA)
- Miami, FL CPI: Urban Consumer - Electricity, (1982-84=100, SA)

Construction Cost Indices

- US ENR: Construction cost index, (Index 1913=100)
- US ENR: Building cost index, (Index 1913=100)
- Miami, FL RSMeans Construction Cost Index (Jan 1993=100)

Interest Rates (U.S. National)

- Bond Buyer Index: General Obligation 20-Years to Maturity, (%)
- Revenue Bond Index 20-Years to Maturity, (%)
- Interest Rates: Non-financial Commercial Paper - 1 Month, (%)
- 3-Month T-Bill, (%)
- 6-Month T-Bill, (%)
- 1-Year T-Note, (%)
- 2-Year T-Note, (%)
- 3-Year T-Note, (%)
- 5-Year T-Note, (%)
- 10-Year T-Bond, (%)
- 30-Year T-Bond, (%)

Unless otherwise noted, Miami-specific inflation forecasts and national interest rate forecasts are described and illustrated in this paper.

The Economy.com projections include a baseline trend and baseline cycle forecast. The baseline forecasts are based on assumptions regarding the most likely set of economic outcomes over the next 30 years. The trend forecast does not assume business cycle

peaks and troughs, while the cycle forecast does. In addition, high cycle (“pessimistic”) and low cycle (“optimistic”) forecasts are included. The range between the high and low forecasts is assumed to capture between 80 and 85 percent of likely economic outcomes. The high and low forecasts are applied as ranges in the financial plan risk analysis.

The remainder of this memorandum discusses the baseline, high, and low cycle inflation and interest rates forecast by Economy.com.

Inflation Rate Forecasts

Figure A-1 presents the Miami CPI inflation projections. In this figure, the left line graph summarizes the baseline (or most likely), optimistic, and pessimistic forecast by Economy.com while the right graph summarizes the annual and average variance between the Economy.com baseline and optimistic projection and between the Economy.com baseline and pessimistic projections. These variances are applied as parameters in the risk analysis.

Business cycle trends are apparent in this graph, with regular upswings and downswings in inflation resulting from assumed swings in the business cycle. The forecast shows a slowing trend in inflation over time. The pessimistic, or high cycle forecast, is approximately 2.0 percentage points higher than baseline inflation in each year, while the optimistic (low cycle) forecast is annually less than 1.0 percentage point lower than baseline inflation. This represents higher upside risk in inflation, which the risk analysis will address.

Figure A-1: Miami Consumer Price Index Inflation Projections

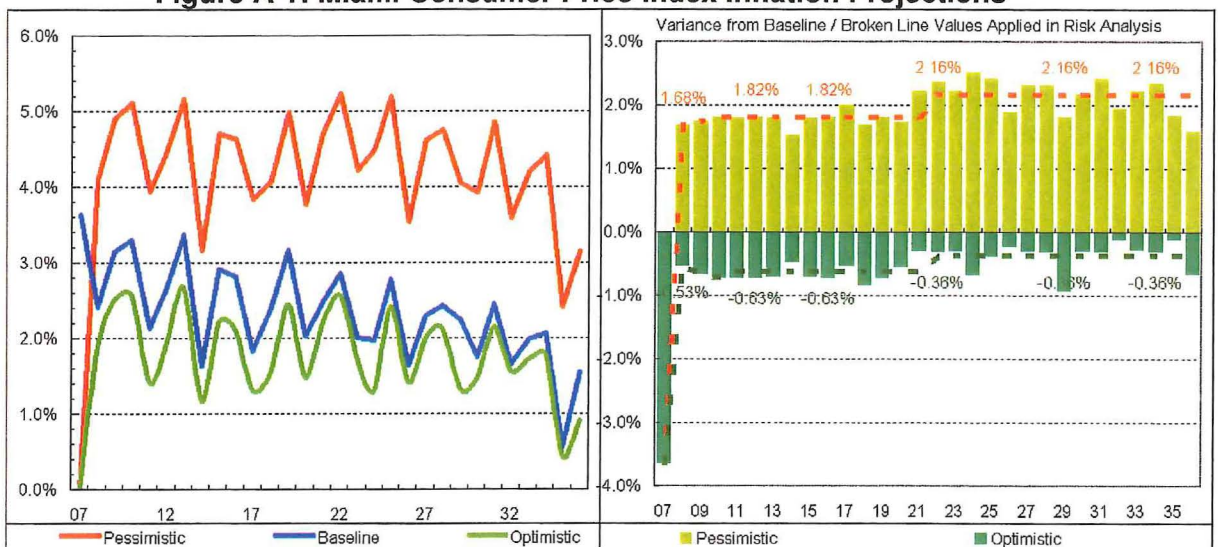


Figure A-2 displays natural gas inflation projections. The forecast is of Florida natural gas prices (in dollars per million BTU). For comparison, the CPI forecasts are presented in the left graph of this and subsequent inflation forecast exhibits as broken lines unless otherwise noted. As with CPI, there is a general downward trend in the rate of growth in natural gas prices over time. In general, natural gas prices are forecast to have a slightly lower rate of growth than CPI. The pessimistic forecast averages 1.0 percentage point

higher than the baseline forecast in each year. The optimistic forecast annually averages 2.5 percentage points lower than the baseline forecast, and shows decreasing nominal natural gas prices over time.

Figure A-2: Natural Gas Inflation Projections

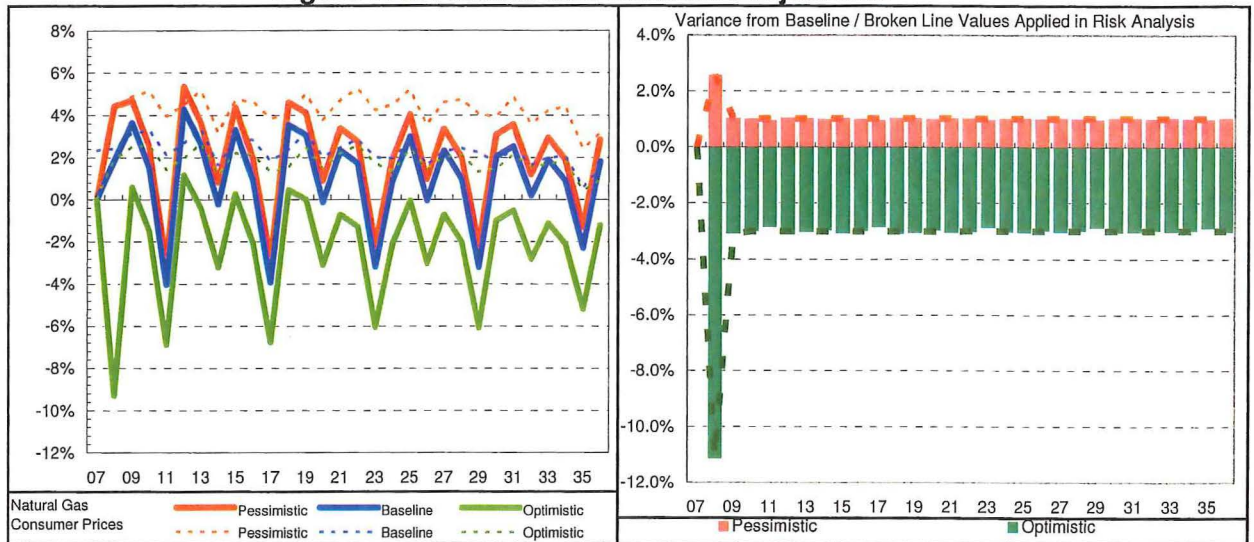


Figure A-3 shows petroleum products (diesel fuel) inflation projections. The forecast is of the California Petroleum Crude Oil Price: West Texas Intermediate - Sweet Wellhead equivalent (in dollars per barrel). The forecast assumes a marked, downward trend in nominal petroleum prices from their current historic highs. The pessimistic forecast is approximately 0.5 percentage points higher than the baseline forecast in each year, while the optimistic forecast is annually between 2.5 and 3.0 percentage points lower than the baseline forecast.

Figure A-3: Petroleum (Diesel) Inflation Projections

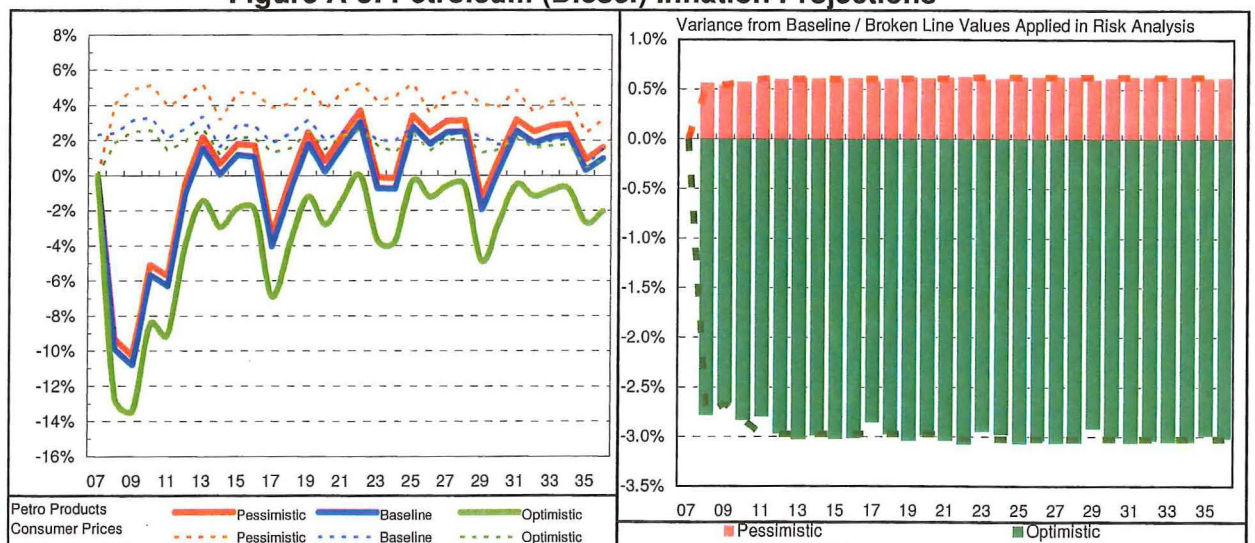


Figure A-4 illustrates electricity inflation projections. The forecast is of Miami CPI: Urban Consumer – Electricity. Electricity prices are forecast to have a significantly higher rate

of growth than CPI. Like CPI, however, there is a general downward trend in the rate of growth in electricity prices over time. Electricity has a wider range between the optimistic and pessimistic and baseline projections than CPI and the other energy price indices. The pessimistic forecast ranges between 2.0 and 6.25 percentage points higher than the baseline forecast in each year, while the optimistic forecast is between 0.5 and 5.0 percentage points lower than the baseline forecast.

Figure A-4: Electricity Inflation Projections

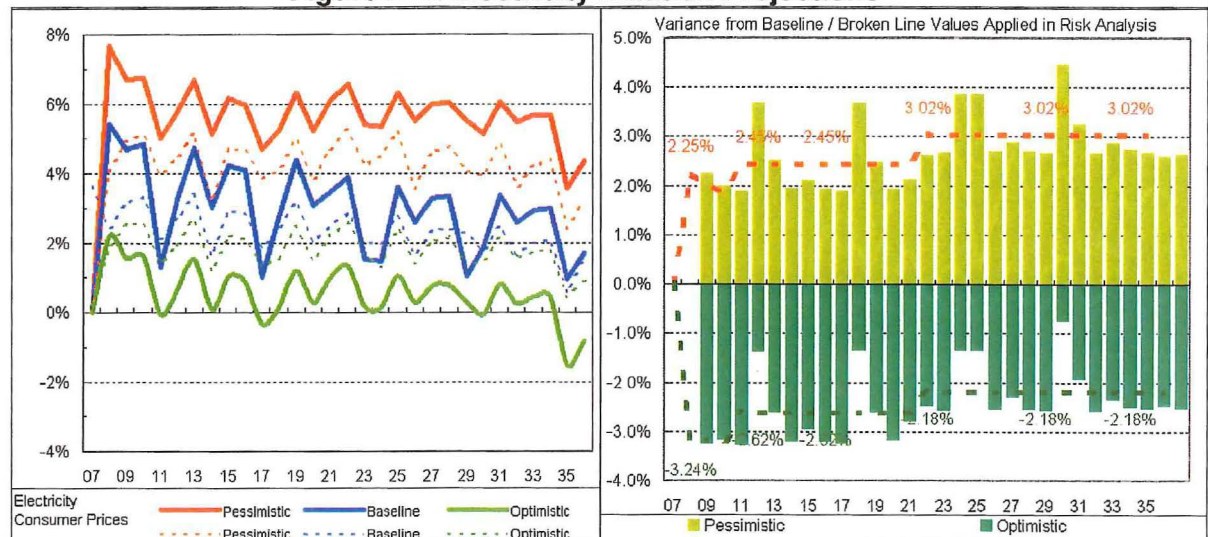
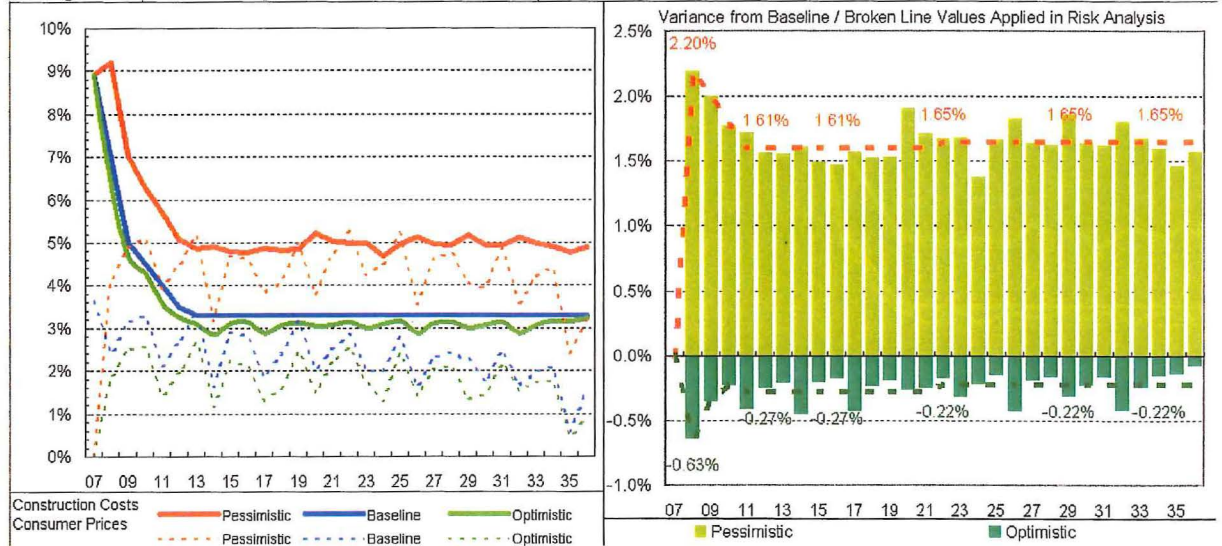


Figure A-5 shows the composite construction cost inflation projections used in the financial model. Baseline construction cost inflation projections were received directly from the Florida Department of Transportation (FDOT), and are shown in blue in the figure. FDOT projects continued high inflation through 2012, and then a flattening of inflation at 3.3% through the end of the financial plan period. FDOT did not provide optimistic and pessimistic projections, so these projections were created using the RS Means Construction Cost Index. The RS Means cost index is a weighted average of components of construction cost which gives more value to more expensive components of construction cost and less influence to those elements that are usually the least expensive. The index includes both skilled and unskilled labor, as well as commodities costs. The increment between the RSMeans baseline inflation projection and the optimistic projection was added to the FDOT baseline projection to create a composite FDOT/RSMeans optimistic projection, and a similar calculation was performed to create a composite pessimistic projection. As the figure makes clear, there is significant upside inflation risk, with the pessimistic inflation forecast averaging roughly 1.50 percent above the FDOT baseline, while there is very little likelihood that construction cost inflation will go below 3.0 percent during the period of the financial plan.

Figure A-5: Composite FDOT/RSMeans Construction Cost Inflation Projections



Interest Rate Forecasts

Figure A-6 displays five-year U.S. Treasury Note (T-Note) interest rate projections. Projected five-year T-Note interest rates are applied in the financial analysis model to calculate interest earnings. The average rate over the 30-year period is 5.13 percent. As with the inflation rates, there is a decline in interest rates over time. The pessimistic forecast generally ranges between 1.5 and 2.5 percentage points higher than baseline rates in each year, while the optimistic forecast ranges between 0.0 and 0.75 percentage points lower. As with inflation, this represents higher upside risk in interest rates.

Figure A-6: Five-Year U.S. Treasury Note (T-Note) Interest Rate Projections

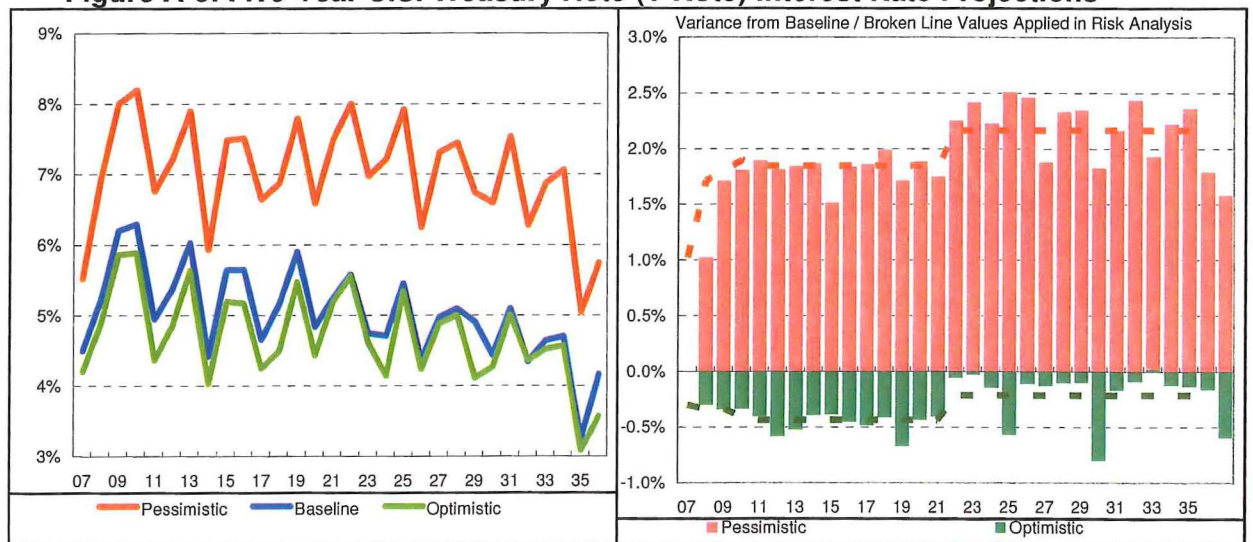


Figure A-7 shows Bond Buyer Index 20-year bond issue interest rate projections. For comparison, the five-year T-Note rate projection is also presented as broken lines. The Bond Buyer Index is applied in the financial analysis model as the interest rate for general obligation bonds. The average projected rate over the 30-year period is 5.35 percent, 22 basis points higher than the projected average interest rate for the five-year T-Note. The Bond Buyer 20 Index forecast shows a slight decline in interest rates over time. Like the five-year T-Note, the pessimistic forecast generally ranges between 1.5 and 2.5 percentage points higher than baseline rates in each year, while the optimistic forecast ranges between 0.0 and 0.75 percentage points lower.

Figure A-7: Revenue Bond Index Interest Rate Projections

