Massachusetts Taxpayers Foundation

MBTA Capital Spending: Derailed by Expansion?

February 2002

With Important Contributions from
Pioneer Institute for Public Policy Research

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The Massachusetts Taxpayers Foundation is an independent, nonprofit organization that conducts research on state and local taxes, government spending, and the economy. Founded in 1932, MTF ranks among the largest and most effective organizations of its kind in the country. The Foundation has won six prestigious national awards in as many years for its work on capital spending and the Central Artery, business costs, management of state budget surpluses, reform of the MBTA, and, most recently, the cost impact of Question 5, the universal health care ballot proposal rejected by voters in 2000.

Founded in 1988, Pioneer Institute publishes research that focuses on the application of free-market principles to Massachusetts public policy issues.

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EXECUTIVE SUMMARY

Fiscal Constraints The advent of forward funding in fiscal 2001—the most important fiscal reform adopted by the Legislature and administration in the last several years—brought about a sea change in the MBTA's capital finances. The old system of unlimited state support provided little reason to control spending, but the T now operates in a tight fiscal box, with finite revenue sources, a heavy debt load and high operating costs. Capital projects that were easy to support when their costs were covered by ever-increasing state subsidies now must be evaluated for their impact on the T's fragile bottom line. While forward funding places new constraints on the T's ability to finance capital improvements, it also creates powerful new incentives to pursue projects that help the T's finances by increasing revenues and reducing operating costs, and to reject those that do not. The new financial structure also necessitates fiscal reforms, particularly reducing the T's high labor costs and increasing revenues from fares and other internal sources.

The MBTA faces serious constraints on its ability to finance a capital program. With state support under forward funding now limited to one-fifth of the sales tax revenue and a fixed amount of assessments, the T no longer controls the level of state subsidy and must manage debt service costs within a finite budget. The Authority is still saddled with a heavy debt burden built up under the old system; nearly a third of its operating budget goes to debt service. Recognizing the dangers of dependence on debt financing, the T's long-range finance plan wisely aims to reduce the amount of future borrowing and gradually replace bond proceeds with pay-as-you-go funding of the capital program. However, achieving this financial strategy will be enormously difficult at a time when the pressures for capital spending continue to mount.

Another part of the legacy of the old blank-check approach to funding the MBTA is the Authority's high operating costs. Despite efforts to rein in costs, the T remains one of most expensive transit systems in the country. The MBTA has acknowledged the need to limit spending in its long-range finance plan, which assumes that the T will reduce its operating cost base by two percent annually. Labor costs, driven by high pay scales, growing headcounts, antiquated work rules and the state's anti-privatization statute are the T's most serious challenges. To date most of the Authority's significant efforts to brings costs under control have been stymied by political resistance.

Capital Demands Working within these fiscal constraints, the T attempts to juggle a host of competing demands for capital spending. An enormous backlog of maintenance and modernization needs vies for funding with a long list of expansion projects, most of them legally required as mitigation for the Central Artery project. Despite the magnitude of the T's capital spending, the Authority's resources fall far short of being able to satisfy all of the competing needs.

Sustaining existing services is the most fundamental requirement for the T's capital program. Aging buses and rail cars have to be replaced; crumbling subway stations need to be repaired. The combination of a decade of aggressive expansion and some of the oldest

transit infrastructure in the nation has left the MBTA with an enormously expensive system to maintain. The failure to invest adequately in vehicles, tracks, stations and other facilities has created a huge backlog of projects necessary not only to ensure the safety and reliability of operations, but simply to keep the system running. A systemwide condition assessment completed by the T in 1999 identified $3.2 billion in deferred projects and estimated that $505 million would be required annually to keep the T's infrastructure functioning.

Another critical goal of the T's capital plan is to eliminate the bottlenecks that limit the performance and carrying capacity of the present system. The T is mandated by the environmental permits for the Central Artery project to undertake a variety of efforts designed to allow existing lines to carry more passengers. Replacing obsolete signals and adding vehicles would allow for more frequent service on the Orange Line and longer trains on the Blue Line. Adding parking spaces would encourage more people to take advantage of transit throughout the system, particularly commuter rail.

Making the T's services more attractive and convenient is essential to the T's long-term fiscal health. The T desperately needs to renovate and enhance the system in order to improve the quality of services, which, together with expanded capacity, will increase ridership and revenues. Modern equipment and facilities also reduce operating costs, a critical requirement for stabilizing and strengthening the T's finances. Replacing the T's antiquated fare collection system is the single most important step the Authority can take toward achieving the twin objectives of forward funding: fiscal stability and improved customer service. In addition, the T is required by the Americans With Disabilities Act to improve the accessibility of many of its stations to disabled persons.

Despite the T's recent growth spurt, with new commuter rail lines to the South Shore, Worcester and Newburyport, the Authority remains under enormous pressure to continue to expand the system in order to support economic development, meet environmental requirements, and improve the equity of transit services. Construction of the new Silver Line in Boston is well under way, commuter rail extensions to Greenbush and New Bedford/Fall River are far along in the planning process, and a host of other megaprojects, such as the Urban Ring connecting major employment centers surrounding downtown Boston, are in the conceptual stage.

Even if the least likely projects are discounted, the proposed expansions would still cost at least $4.5 billion. Most of the expansion projects on the T's agenda, both past and present, are required by the Central Artery mitigation agreement. Completing all of the remaining Artery mitigation requirements would cost at least $3 billion.

The T is under great pressure to complete these expansion projects despite the host of financial problems created, in part, by the last round of expansion. With state subsidies now limited, the construction bill is coming due in the form of crippling debt service and

rising operating and maintenance costs. Since fares and other revenues never cover the full cost of operating a new commuter rail, subway or bus line, expansion invariably results in increased operating deficits.

Financial Capacity The MBTA's capital plan reflects the fundamental tension between the need to maintain and modernize the existing system on the one hand, and the pressure to expand and provide new services on the other. In order to assess the Authority's ability to address competing priorities while living within its fiscal constraints—and the extent of the tradeoffs—this report compared alternative projections of capital funding levels and different levels of spending on maintenance and modernization to estimate how much, if anything, the T could afford to spend on expansion.

The analysis concludes that the only way the T can pay for expansion projects is by failing to fund adequately maintenance and modernization of the current system. Using the T's funding assumptions regarding debt issuance, sales tax growth, fare increases and operating costs—and allowing for $500 million in annual maintenance and modernization spending—well below the $800 million recommended in the MBTA's own State of Good Repair report—leaves the T with a $1.7 billion capital funding shortfall over the next ten years before any of the highest priority expansion projects.

Under best case funding projections—the same fare increases and cost reductions but a slower decline in debt issuance and stronger sales tax growth—and the same moderate level of maintenance and modernization spending used above, the capital budget is nearly balanced. In other words, the T can afford a reasonable level of effort to sustain the current system only if the Authority elects to add even more to its already high debt burden, the sales tax returns to historic growth rates and the T foregoes any expansion projects other than the first phase of the Silver Line, which is nearly complete.

The T's own funding assumptions coupled with the minimal spending on maintenance and modernization included in its capital plan produces $600 million for expansion projects over the next ten years. This would barely be enough to fund Greenbush commuter rail line. In other words, the T can afford Greenbush—and nothing else—only if it continues inadequate levels of spending on the current system.

The only scenario that leaves a substantial amount for expansion—the combination of best case revenues and low spending on maintenance and modernization—assumes continued heavy borrowing, strong sales tax growth, unpopular fare increases, difficult-to-achieve cost savings, and continued neglect of the existing system. Even then, the amount of funding for expansion over the next ten years is less than half of the $4.5 billion cost of proposed expansion projects.

Despite its crucial importance to building ridership and maintaining the safety and reliability of the system, the T would be hard pressed to keep up with necessary investments

in maintenance and modernization even if the Authority had no expansion projects competing for its limited resources. In the capital plan, the T plans to spend an average of $350 million per year over the next five years on maintenance and modernization projects. At this level of spending, the repair and replacement backlog will continue to grow, reaching nearly $4 billion by 2006.

The financial projections clearly demonstrate the importance of the fare increases and cost savings included in the T's finance plan. Under the worst case funding scenario—the rapid debt reduction and minimum sales tax growth assumed by the T, but with no fare increases and no cost savings—the T could not afford any expansion project no matter how little it spent on maintenance and modernization. Worse yet, the T would experience operating budget deficits totaling $760 million over the decade.

Recommendations With insufficient resources to go around, difficult choices must be made and tradeoffs accepted. If the T is to achieve the primary purposes of forward funding—improved services and strengthened finances—it must weigh the cost of continued expansion against the need to address the massive backlog of maintenance and modernization projects for the current system.

Maintenance and modernization clearly needs to be the T's highest priority. The T has to make major investments to keep the current system running, increase capacity, improve customer service and cut costs. Improvements like the new automated fare collection system are critical to enhancing the performance of the system and to completing reform of the T's finances.

Failure to invest in maintenance and modernization would result in the continuing deterioration of the system and a decline in the quality of services, threatening the Authority's impressive record of increasing ridership—and fare revenues. Opportunities to reduce costs would be missed and deficits would continue to climb. The operating surpluses that the T is counting on to support its capital plan would not materialize and capital finances would grow even tighter.

Continued expansion of the T promises a host of transportation, economic and environmental benefits. Extending the reach of the T's services is—and should remain—a major focus of the state's transportation planning and capital spending. But the T cannot afford to build the proposed expansion projects without sacrificing critical maintenance and modernization efforts on the existing system or incurring an ever-higher mountain of debt and undermining its still-fragile finances.

If the Commonwealth wants to continue to expand the T—certainly a worthy goal—the state needs to fund those projects. The T should focus its limited capital resources on the upkeep of the existing system while the Commonwealth assumes responsibility for

expansion as part of a comprehensive, statewide transportation investment strategy. State funding for expansion would be above and beyond current subsidies for the T.

Under forward funding, pressure to expand the system continues unabated, but the Commonwealth no longer picks up the additional costs. The T is expected to fit the expansion projects into its capital plan and finance the entire package within its limited revenue streams. This creates an even greater incentive for advocates in the Legislature and administration to push the T to expand because the Commonwealth subsidy remains the same no matter how many projects the T takes on.

With the T struggling to finance maintenance and modernization needs before even considering expansion projects and a series of new lines still required under the Central Artery mitigation agreement, the expectation that the T will be able to meet roughly $3 billion in commitments by relying on its own capital resources is clearly unrealistic. If the Commonwealth is committed to completing the Artery mitigation projects, the state will have to identify a realistic strategy for financing them above and beyond the current MBTA subsidy.

This is not a problem created by forward funding. Forward funding has brought fiscal discipline to managing the T's operations and maintaining the existing system; shifting responsibility for expansion to the Commonwealth would bring the same discipline to the priority-setting process for expanding public transportation.

While forward funding imposes serious revenue constraints by limiting public subsidies, it also provides new incentives for the MBTA to get its fiscal house in order. The T has made tremendous strides in implementing the reforms, but still faces enormous challenges. The Authority must invest in capital improvements that lower operating costs, such as new fare collection equipment, rather than those that increase expenses, such as new transit lines. It has to reduce personnel costs through tough negotiating at the bargaining table and by cutting its headcount. It needs to seek out savings on expensive contracts such as commuter rail operations and maintenance. It has to build ridership through aggressive marketing and relentless attention to customer service. And it needs to be willing to adjust its fares and parking charges periodically, at least to keep up with inflation in operating costs, as promised to bondholders in the financial plan.

The T will need new tools to meet these objectives. Restoring management rights that were granted once and then partially taken back by the Legislature would allow the T to manage personnel more creatively and provide improved services at less cost. The T also needs to be able to contract for services if it can obtain better value for the same or less cost. The Pacheco law, which has largely stymied the T's efforts to save money, should be repealed or substantially modified. Absent that, the MBTA should be exempted from the law, as the Massachusetts Water Resources Authority is now.

The T is at a critical junction. If the Authority proceeds with expansion plans at the expense of maintaining and modernizing the existing system, lets its debt burden continue to mount, fails to get a grip on operating costs, and misses opportunities to generate more of its own revenue, the consequence will be a financially weak agency unable to cover operating costs or maintain the system without additional support from the Commonwealth. On the other hand, if the T gains control over operating spending and makes significant headway against its maintenance and modernization backlog, the Authority will improve the quality of services and emerge in a stronger fiscal position, fulfilling the promise of forward funding.

INTRODUCTION

By its very nature, the public policy business is an unpredictable one. The tragic events of September 11th are perhaps the most extreme example of how circumstances regularly force us to grapple with issues that just a short time ago seemed remote. Still, a few issues are constants at places like the Massachusetts Taxpayers Foundation and Pioneer Institute, and perhaps none fits that description better than the MBTA. This report is the latest chapter in a long history of involvement in the fiscal affairs of the T by MTF and Pioneer.

Following a series of reports over more than a decade, in 1996 MTF warned of the mounting cost of T expansion in *Capital Spending at the MBTA: Veering Off the Tracks?*. As spending on the T continued to spiral out of control, in 1999 the Foundation took a more in-depth look at the Authority's finances and made the case for sweeping fiscal reforms in *The Third Rail: Financing the MBTA*. In the wake of that report, which received a national award, MTF helped create and lead a diverse coalition of environmental, consumer advocacy and transportation planning organizations that was instrumental in breaking the legislative logjam on reform and securing the passage of historic forward funding legislation later that year. The reforms are reviewed in the first chapter of this report.

In 1997 a plan to out-source management of the MBTA's extensive real estate holdings was a winner of Pioneer's annual Better Government Competition. The following year Pioneer published *Missing the Bus: The Fight to Contract Competitively for MBTA Bus Service*, which analyzed the state Auditor's rejection under the Commonwealth's anti-privatization law of a proposed contract to out-source the operation of 40 percent of the T's bus lines. A year later, Pioneer was in the thick of the failed attempt to achieve dramatic savings by replacing Amtrak as the operator of MBTA commuter rail service.

With this background, it was not surprising that representatives from both MTF and Pioneer were asked to serve on the Blue Ribbon Committee on Forward Funding (BRC) created to advise the T on the implementation of the reforms and the transition to the new system. To chair the committee, the T called on former Senate Ways and Means Committee Chair Patricia McGovern, who had advocated for the switch to forward funding as far back as 1986.

The BRC recommended a comprehensive set of reforms in its April 2000 report, *Taking the T to the Next Level of Progress*. With the goal of increasing the T's revenues, the BRC urged tying a series of moderate, periodic fare increases to tangible service enhancements and undertaking a variety of cost-cutting measures. With an eye toward reducing the debt service that consumes almost a third of the T's operating budget, the committee recommended that maintenance and modernization take priority over further system expansion and proposed a moratorium on all capital projects except those that address critical maintenance needs, result in measurable increases in productivity or revenues, or are determined to be legally required. As the best example of a project that met these

criteria, the BRC recommended that installation of an automated fare collection system should be the top priority of the MBTA's capital plan.

The BRC report set priorities and provided a framework for MBTA operations under the new realities of forward funding. But the passage of fiscal reform legislation and publication of a set of recommendations were not enough. With the MBTA facing deteriorating infrastructure, exceedingly high labor costs, crippling debt, ongoing pressures to expand, and limited revenues with which to address these demands, the greatest challenges of forward funding clearly lie ahead.

A year-and-a-half into forward funding, its success is by no means guaranteed. In this report, the Massachusetts Taxpayers Foundation, with help from Pioneer Institute, provides a prescription that we believe will allow the T to overcome daunting challenges and realize the promise of this important fiscal reform. Only then will the MBTA be in a position to meet greater Boston's 21st century transportation needs.

Our recommendations will be controversial and reflect our belief that the MBTA needs to modify its capital priorities. At the same time, we want to emphasize the enormous credit due the Legislature and the administration for passing the sweeping reforms and setting the MBTA on a track to success.

FISCAL REALITIES

By adopting a comprehensive MBTA fiscal reform package as part of the fiscal 2000 state budget, the Legislature finally faced up to an enormous problem that had been building since the Authority was created 35 years earlier. With few constraints on the T's spending, the cost of supporting the system had been spiraling out of control. Before the reforms, state subsidies were projected to reach $650 million in fiscal 2001, a jump of $94 million or 17 percent over fiscal 2000, with no end to the increases in sight. Assessments on cities and towns in the T's district brought the total taxpayer subsidy to about $800 million. The old system of unlimited state support provided little reason to control spending, but the T now operates in a tight fiscal box, with finite revenue sources, heavy debt load and high operating costs. Capital projects that were easy to support when their costs were covered by ever-increasing state subsidies now must be evaluated for their impact on the T's fragile bottom line.

Forward Funding

Under the so-called forward funding plan, the Commonwealth ended the antiquated practice of reimbursing the MBTA for operating deficits 18 months after the fact, which gave the T no reason to control spending. Instead, the level of state support is now determined in advance and the T is required to live within a budget based on a limited amount of state aid and the T's own revenues.

The reform plan, which was championed by the House and the administration, protects the taxpayers from rapid cost increases while ensuring the long-term viability of the T. In fiscal 2001, the state's open-ended subsidies for debt service and operating costs were replaced with a dedicated revenue source—one cent of the sales tax—that put a limit on the taxpayers' costs and created powerful new incentives for better fiscal management at the MBTA.

The T's share of the sales tax was set so that in the first year under forward funding the amount would be equivalent to the level of state support the T would have received under the old system. However, future increases in state support are now based on growth in sales tax revenues rather than the pace of the T's spending, potentially generating hundreds of millions in savings for the state in the years ahead.

The T now receives 20 percent of the state's sales tax revenue or a minimum amount established in the forward funding legislation, whichever is more.[1] The floor was set at $645 million in fiscal 2001, approximately the same as the amount the T was expected to receive under the 20 percent formula. However, the floor should become moot within a

[1] The MBTA's share excludes the sales tax collected on meals.

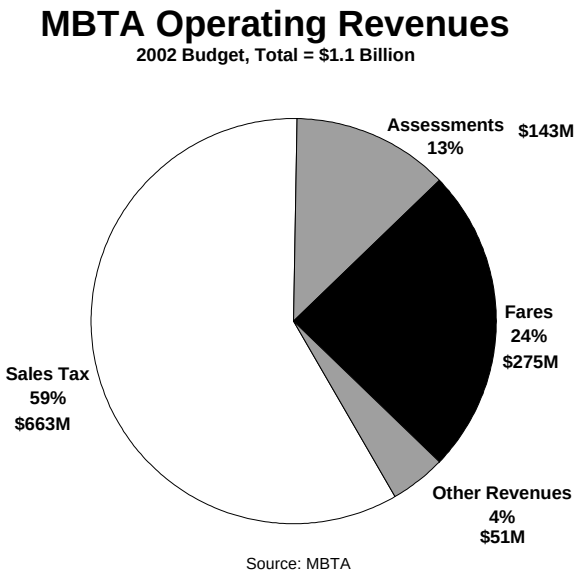
few years as actual sales tax collections grow faster than the floor, which increases at the rate of inflation or three percent annually, whichever is less.

While future increases in state support for the MBTA is limited to the growth in sales taxes, the Legislature could add to the Commonwealth's costs by mandating new or expanded services. Under the reform legislation, the Legislature is required to provide additional funds for any capital projects or new services it imposes on the T.

The reform plan also contains a fair and reasonable solution to the thorny problem of allocating assessments to cities and towns that benefit from the T's services. By phasing in nearly 100 new municipalities to the assessment base and greatly simplifying the allocation formula, the Legislature corrected the absurd inequities that characterized the old system. However, the price of expanding the T's district was a reduction in the total amount of assessments—from $144.6 million in fiscal 2000 to $136.0 million in 2006. After that, assessments will increase annually by 2.5 percent or the inflation rate, whichever is less.

Despite the new controls on state and local government support, the MBTA remains a heavily subsidized system. Even after fare increases are factored in, sales tax revenues and assessments together account for about 70 percent of the T's operating revenues (see Figure 1).

Figure 1



Source: MBTA

Replacing the blank-check Commonwealth subsidies with growing but limited revenue sources has also created clear incentives for the T to increase its own revenues from fares, parking, advertising and other operations. Under the old financial system, raising revenue would simply reduce the state subsidy by a like amount, giving the T little reason to focus on generating income. As a result, the T went a decade—1991 to 2000—without a fare increase. Periodic fare increases, as well as growth in other internal sources, will be necessary in the future, both to compensate for inflation and to help finance improved and expanded services, a reality recognized in the MBTA's long-term finance plan.

With two reliable and predictable sources of funds—sales taxes and assessments—the Authority is able to finance its capital program with bonds issued under its own credit rather than with a Commonwealth guarantee. MBTA bonds issued after July 1, 2000 are no

longer backed by the state. Stand-alone credit was intended to bring heightened market scrutiny and accountability to the Authority's capital spending, strengthening the imperative for fiscal responsibility.

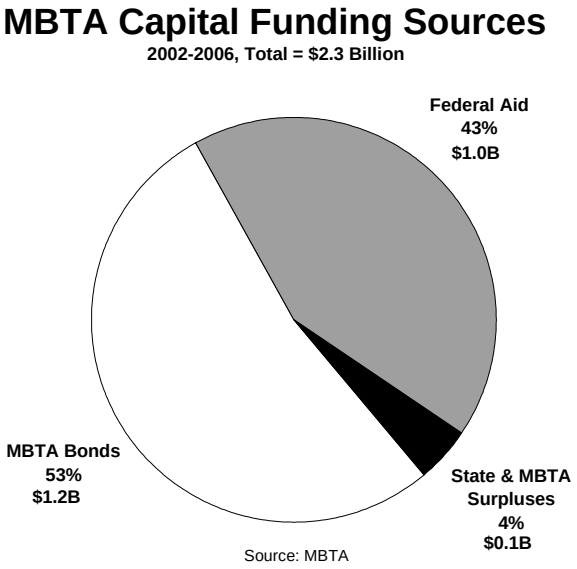
The forward funding legislation also provides guidance for the T's capital planning and priority-setting, putting a heavy emphasis on the need to keep up the current system and avoid adding to the backlog of deferred maintenance. The statute specifies that the highest priority for funding in the capital plan shall be given to projects that provide the greatest benefits at the least cost, that are required under Central Artery mitigation agreements (discussed later in this report) or the Americans With Disabilities Act, or that maintain equipment and facilities. The statutory language also spells out a set of criteria for the T to use in comparing costs and benefits: Each proposed project is to be evaluated for its impact on debt service and operating costs, deferred maintenance needs, the effectiveness of the Commonwealth's transportation system, service quality standards, health and safety, and the environment.

Increasing ridership and improving the quality of the T's services were also important objectives of the forward funding legislation. The reform plan includes requirements for more equitable fare policies, such as reduced-price transfers, and service quality standards intended to push the T to improve the value and benefits of its services to riders and the public at large.

Constraints on Capital Finances

The MBTA faces serious constraints on its ability to finance a capital program. Under forward funding, the T is expected to pay for capital projects with its own resources. Of the $2.3 billion the Authority anticipates having available for capital spending between fiscal 2002 and 2006, about $1.2 billion would be funded with bonds, $1.0 billion with federal transit aid, $67 million from fiscal 2000 state budget surplus, and $35 million on a pay-as-you-go basis, i.e., with surplus MBTA operating revenues (see Figure 2). With little control over the level of federal funding, the T determines the size of the capital program by

Figure 2



deciding how many bonds the Authority can afford to issue. The capacity to issue additional bonds, in turn, is sharply limited by the T's circumscribed revenue sources, heavy debt load and high operating costs.[2]

Finite Revenues The MBTA's capital bonds—both Commonwealth-guaranteed bonds issued before the advent of forward funding and new bonds issued under the T's own credit—are repaid from the dedicated sales tax and assessment revenues. Under the old system, state subsidies would automatically increase to cover rising debt service on the T's capital bonds. With state support now limited to one-fifth of sales tax revenue and a fixed amount of assessments, the T no longer controls the level of state subsidy and must manage debt service costs within a finite budget. While the dedicated sales tax gives the MBTA a reliable and predictable source of funding that will grow with the economy, the three percent annual growth guaranteed to the T through the statutory floor is a far cry from the double-digit increases in state support required before the reforms.

The fiscal reform package provided the T with dedicated revenue sources rather than a regular annual appropriation to ensure that the Authority would be as creditworthy as possible when it took responsibility for its capital finances. The sales tax was selected from among the Commonwealth's various revenue sources because the growth in revenue can be expected to keep pace with increases in the T's ridership and operating costs based on trends of the last several years. Since the pre-fiscal crisis peak in 1989, the state's sales tax revenues have grown at an average annual rate of 5.3 percent and declined in only two years—during the depths of the recession in 1990 and 1991. Future growth is likely be slower, at least in the short term, due to the weak economy and erosion of the sales tax base by mail-order and Internet sales, but the floor adopted as part of the forward funding legislation will protect the T from large fluctuations.

In forecasting future sales tax growth, the T has adopted the most conservative possible assumption: that sales tax will grow no faster than the statutory floor, or three percent. While the restrained projections increase the attractiveness of the T's bonds to potential investors, they also limit the amount of bonds that can be issued. The T plans to use any growth in sales tax above the projected three percent to fund capital projects on a pay-as-you-go basis, reducing the need for debt financing. However, the sales tax is a general revenue source for the T that also supports operations, and unrestrained increases in operating costs could consume any excess revenues.

In contrast to the sales tax, there is no potential for excess assessment revenues. Assessments will decline each year through 2006 by $1.7 million, or about 1.2 percent, as the reduction mandated in the forward funding legislation is phased in. Thereafter,

[2] The T's capital bonds are distinct from the Commonwealth's and are not governed by the administration's $1.2 billion annual bond cap.

increases in local government contributions are capped at 2.5 percent annually, as they were before forward funding, causing assessments to account for a smaller and smaller share of the T's revenues over time. On the other hand, assessments are effectively guaranteed, with virtually no chance of falling short of projections, leading the T to select assessments as the revenue source to back the bulk of its initial bond issues under forward funding in 2000. With a substantial history of stable assessment collections and statutory provisions for collecting assessments even in the event of a municipal default, the assessment bonds earned AAA/Aa1 ratings.

Federal transit aid, which accounts for about 40 percent of the T's planned capital spending, is also a known quantity, at least in the short term. Federal aid averaging $200 million per year is provided under the Transportation Equity Act for the 21st Century (TEA-21), which establishes funding levels for federal fiscal years 1998 through 2003. The bulk of federal transit aid is allocated to authorities through formula grants and can be spent on a wide variety of capital needs. The remainder is earmarked by Congress for specific projects, typically for high-cost undertakings that cannot be accommodated within an authority's formula allocation.

The level of federal aid provided to the T after TEA-21 expires in 2003 remains highly uncertain. Formula aid was increased significantly under TEA-21 (in sharp contrast to the state's federal highway aid), but the effect of the current economic slowdown and federal tax cuts makes another large increase in 2004 less likely. For planning purposes, the T has made the reasonable assumption that federal aid will continue at TEA-21 levels.

Project-specific earmarks are even more difficult to predict, but given the impact of recent Central Artery cost overruns, obtaining large federal grants for other major construction projects in Massachusetts will be difficult at best. Major expansion projects of the past, such as the Red Line extension to Alewife and the new Orange Line, were about 80 percent federally funded. However, Congress is urging state and local governments to more evenly match federal contributions to mass transit expansion, so past levels of federal assistance may not be available for the expansion projects currently under consideration.

Fares and other system revenues, such as parking, advertising and real estate rentals, are the only sources over which the T has some control. System revenues indirectly support the T's capital program by funding operating costs, thereby freeing up sales tax and assessment revenues to cover debt service on capital bonds or pay-as-you go capital spending. Growth in system revenues thus increases the T's capacity to meet its capital needs.

The T's finance plan assumes moderate fare increases of just under ten percent in 2003 and 2005, each of which would increase annual revenues by about $25 million. Nevertheless, it has been suggested that the T's $53 million budget surplus in 2001 indicates that the T does not need the additional fare revenue. However, the unexpectedly large surplus was more

the result of one-time savings from a restructuring of the T's debt than stronger-than-expected revenue performance.

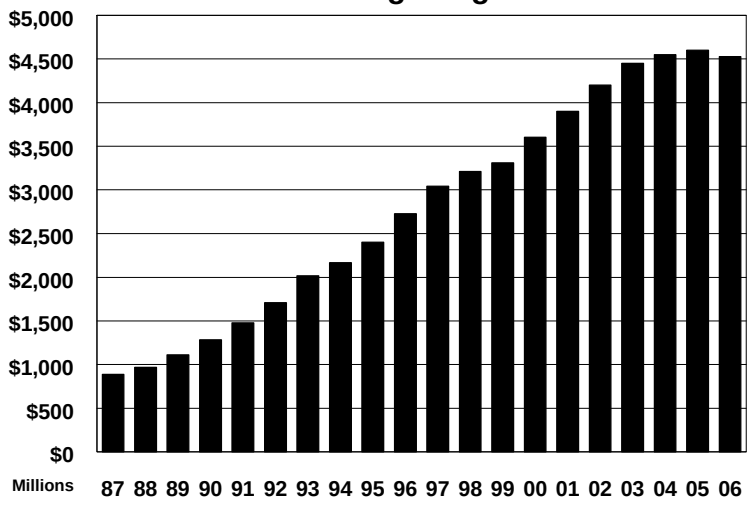
The forward funding legislation requires the Authority to take all necessary steps to maximize other, non-fare revenues, increase ridership and improve fare collection practices before implementing fare increases. Excessively steep fare increases would lead to reduced ridership, offsetting revenue gains and undermining one of the goals of forward funding. The Authority is prohibited from increasing fares if ridership has declined by more than four percent in the previous 12 months. Any fare hike that increases revenues by ten percent or more may be subjected to the environmental review process, potentially resulting in delays and restrictions on the increase.

The Blue Ribbon Committee recommended that the T tie fare increases to tangible improvements in service quality for its customers, such as a new automated fare collection system and improved information communication systems. The service improvements will help to justify fare increases which, in turn, will help to finance the service improvements, furthering the dual objectives of fiscal stability and enhanced service quality. Meanwhile, the T has funded several capital and operational improvements with fare increase revenues, including new cross-town bus routes, expanded commuter rail service to Worcester, three-car Green Line trains, double-decker commuter rail coaches, increased police presence, improved station maintenance and an enhanced customer service center.

Heavy Debt Burden While the reform legislation created a new set of fiscal rules for the MBTA, the Authority is still saddled with a heavy debt burden built up under the old system. This lingering consequence of unrestrained state support will compound the limits on the T's capital program and heighten the difficulty of achieving fiscal stability under forward funding.

Figure 3

Capital Spending Driving Up MBTA's Outstanding Long-Term Debt



Source: 1987-2000 - Actuals from Commonwealth Official Statements;
2001-2006 - Projections from MBTA Forward Funding Finance Plan

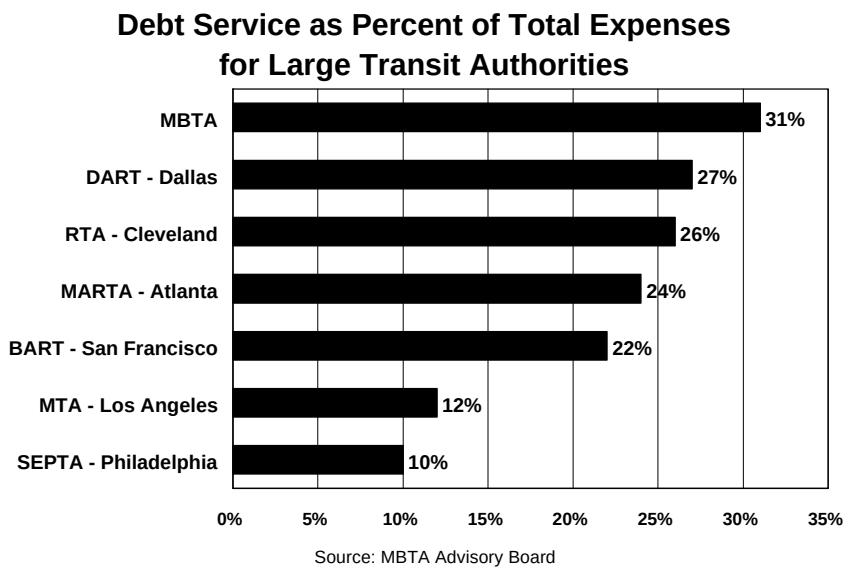
As a result of heavy capital spending, the T's outstanding debt will have more than quintupled during the two decades leading up to 2006, the end of the current capital planning period. Debt nearly tripled over the course of the 1990s alone. As illustrated in Figure 3, long-term obligations grew from under $900 million at the end of fiscal 1987 to over $3.6 billion at the outset of forward funding in fiscal 2001, an

average annual increase of 11.5 percent. The T's finance plan projects outstanding debt to continue to increase, reaching a peak in excess of $4.5 billion in 2005, as the Authority continues to issue new debt faster than old debt is retired.

Making payments on debt now consumes nearly a third of the T's operating budget—$342 million in fiscal 2002. The finance plan projects debt service to continue to escalate, reaching $440 million by 2006. Fearing a lawsuit would block the planned fare increase and cause a cash shortfall, the T restructured its bond payments in fiscal 2001, saving $32 million. However, restructuring only served to delay the payments and will add to future growth in debt service.

While public transit is by nature capital-intensive and debt financing is widely used to fund transit projects, a survey of several other major authorities found that the T spends the highest proportion of its budget on debt service (see Figure 4).

Figure 4



Source: MBTA Advisory Board

The T's high debt level limits the amount of new debt the Authority can issue by consuming resources that would otherwise be available for debt service on new bond issues. The heavy debt load also acts as a red flag for the financial markets that restricts the amount of new bonds that can be sold at an affordable price. However, with bond buyers assuming that the Commonwealth would never let the T default on its payments, the T is not in immediate danger of losing access to credit markets; the ability to afford the debt service is the primary constraint on the amount of bonds the T can issue.

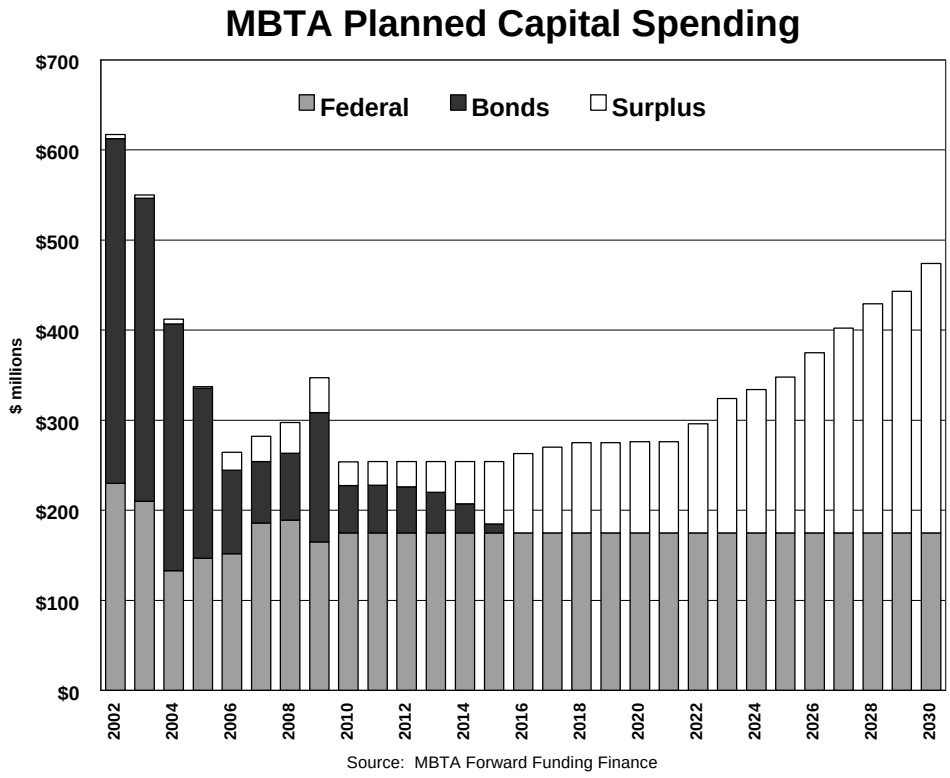
Paying off debt also compounds the T's challenges in balancing its operating budget and achieving fiscal stability. Before forward funding, the amount of debt issued by the T had no impact on the ability to fund its operations—the Commonwealth paid all of the debt service costs and any operating costs not covered by system revenues. Now, every dollar spent on debt service is a dollar less for providing services. The impact of debt on the operating budget is aggravated by the fact that many of the capital projects financed with

bonds—particularly expansion projects—add to the T's operating costs (see the discussion under Expansion below).

If the T continued to rely entirely on debt financing for the non-federal share of its capital program, rising debt service costs would consume an ever-increasing share of the Authority's revenues, soon leaving too little to operate the system. The finance plan projects that the T would begin to experience operating deficits by 2009 if it continued to issue $300 million in capital bonds every year, approximately the rate at which the Authority has borrowed for the last several years.

Recognizing the dangers of total dependence on debt, the T's finance plan attempts to reduce the amount of borrowing and gradually replace bond proceeds with pay-as-you-go funding of the capital program. The plan aims to phase out the use of debt financing by 2015 and increase cash outlays for capital from $3 million in 2001 to $300 million by 2030 (see Figure 5).

Figure 5



Even this extended timeline for weaning the T off of debt financing is ambitious. Continuing to generate larger and larger surpluses to fund the majority of the capital program will require a combination of sales tax growth, increased system revenues, and

controls on operating costs that will be challenging to achieve. The T's $53 million surplus in 2001, the first year under forward funding, was primarily the result of the one-time debt restructuring described above and does not set a precedent for future surpluses.

Even more difficult will be the discipline required to limit capital spending over the next two decades. The T cannot afford to wait until operating surpluses are in place before beginning to phase out the use of debt. The finance plan proposes to rapidly scale back borrowing between 2001 and 2006, while projected surpluses will not reach even $100 million until 2018. The result is a dramatic slowdown in planned capital spending from an average of $530 million per year (from all sources) between 2002 and 2005 to less than $300 million between 2006 and 2022. This is the period when expansion advocates expect the T to have several major projects under construction, including the New Bedford/Fall River commuter rail line, the Green Line extension to Somerville and the Urban Ring. While the long-term projections in the finance plan are subject to a host of assumptions and need to be treated as rough approximations, they make the T's impending capital funding crunch perfectly clear.

High Operating Costs Another part of the legacy of the old blank-check approach to funding the MBTA is the Authority's high operating costs. Just as the state's open-ended operating subsidies provided little reason to raise fares or limit debt, unlimited support gave the T few incentives for strong fiscal management. The higher operating costs that resulted from new rail and bus lines had no impact on the T's bottom line, they simply increased the state subsidy. When negotiating collective bargaining agreements or contracts for commuter rail services, the T could never argue that it could not afford to pay more because, no matter how much it spent, the Commonwealth would always pick up the tab.

Now, under forward funding, the T has to manage a finite budget like every other state agency. If costs are not kept under control, the Authority's ability to provide services and finance capital projects will both be impaired. The high cost of providing services adds to the constraints on the T's capital program by eating into revenues that would otherwise be available for debt service on capital bonds or for pay-as-you-go capital spending. High operating costs also make it more difficult for the T to absorb additional operating deficits generated by new and expanded services.

The MBTA has acknowledged the need to limit spending. The Authority's long-range finance plan assumes that the T will reduce its operating cost base by 2.0 percent—more than $15 million—each year from 2002 to 2006. However, the plan does not specify how the Authority will achieve this goal. The savings, which would offset cost growth from salary and benefit increases, are a critical component of the T's efforts to achieve fiscal stability and to finance its capital program. Failure to achieve the savings target would not

only eliminate surpluses the T is counting on to supplement its capital funds, but would reduce the amount of capital bonds the T could afford to issue.

Reversing—or even slowing—the inexorable growth in the T's spending will be a herculean task. The T's operating expenses (excluding debt service) have been growing much faster than the rate of inflation, averaging 6.3 percent annually over the last five years. The pace of growth has moderated recently, however, dropping from 10.8 percent in 1999 to 5.1 percent in the current 2002 budget (see Figure 6). The high growth rates in 1998 and 1999 were in part the result of the initiation of new services such as the Old Colony, Worcester and Newburyport commuter rail lines, and additional expansion projects on the drawing boards will cause similar jumps in spending as they come on line.

Figure 6

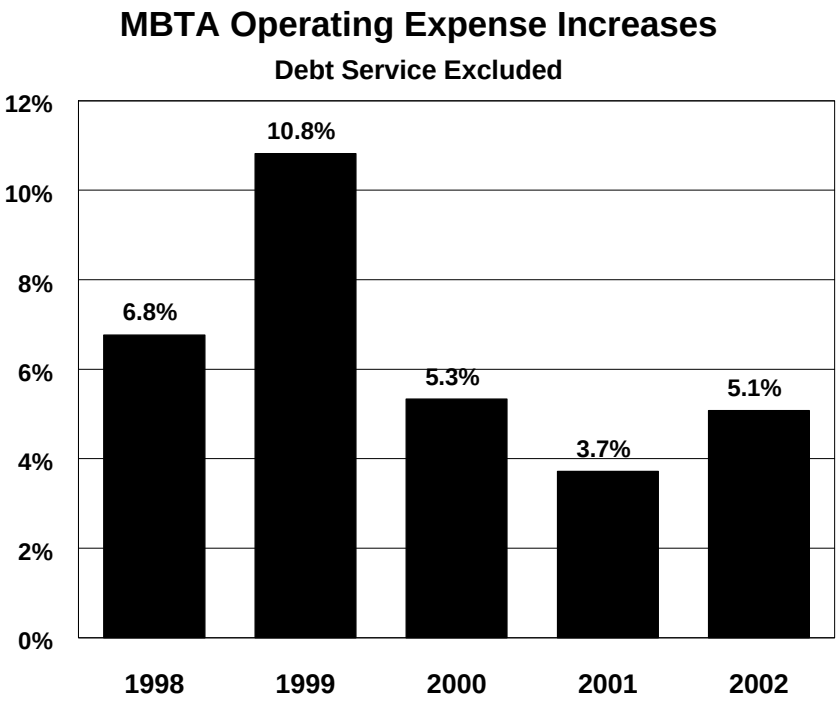
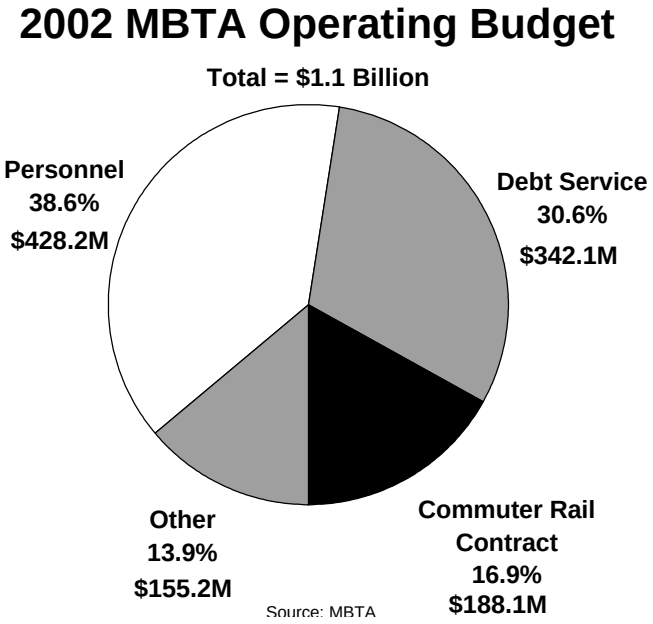


Figure 7



Operating costs total $774 million in 2002; debt service brings the

total budget to $1.116 billion (see Figure 7).

Despite efforts to rein in costs, the T remains one of most expensive transit systems in the country. Compared to the nation's largest systems, the T has the highest cost per hour of service and per mile of service, and is in the top half of systems in terms of costs per passenger-mile (see Table 1).

The T's cost-saving efforts need to focus on reducing labor expenses. With personnel accounting for about 55 percent of operating expenses (excluding debt service), labor costs are the T's most serious challenge.[3] One of the Blue Ribbon Committee's key recommendations was to bring salaries, wages and benefits in line with industry norms, adjusted for differences in the cost of living. With the contracts for most of the T's 27 collective bargaining units expiring at the end of fiscal 2002, the Authority will soon reach a critical juncture in its efforts to achieve fiscal stability.

The T has some of the highest pay scales in the nation. Surveys of large transit authorities found that the MBTA had the highest wage rates for bus operators among the 27 largest bus operators. The T ranked second out of 15 authorities for heavy rail maintenance workers, third out of 14 for heavy rail operators, and fourth out of 17 for bus maintenance workers (sources: John A. Dash & Associates and American Public Transit Association).

Table 1

MBTA Among Costliest Systems in Nation

	1998 Total Operating Expenditures per					
	Hour of Service	Rank	Mile of Service	Rank	Passenger -Mile	Rank
Boston (MBTA)	**$9.75**	**1**	**$161.20**	**1**	**$0.50**	**5**
Philadelphia (SEPTA)	9.08	2	125.24	6	0.57	3
New York (MTA)	8.42	3	133.28	3	0.34	13
Los Angeles (LACTMA)	8.33	4	105.00	8	0.47	7
Washington (WMATA)	8.30	5	127.50	5	0.45	8
San Francisco (BART+Muni)	7.46	6	131.47	4	0.43	10
Baltimore (MTA)	7.38	7	106.46	7	0.48	6
Cleveland (RTA)	7.31	8	94.52	12	0.69	1
New Jersey (NJT)	7.12	9	139.42	2	0.41	11
Chicago (RTA)	6.89	10	104.63	9	0.38	12
Houston (Metro)	6.46	11	99.22	11	0.59	2
Atlanta (MARTA)	6.29	12	103.89	10	0.43	9
Miami (MDTA)	5.63	13	81.13	13	0.56	4

Source: Federal Transit Agency

[3] The 55 percent figure understates the T's true labor costs because commuter rail and The Ride paratransit services are provided by contractors rather than MBTA personnel.

Lowering payroll costs will also require reducing the number of workers the T employs. The Blue Ribbon Committee recommended that the T conduct a top-to-bottom review of personnel needs in an effort to reduce the number of employees. The T did manage to cut its headcount from 7,040 in 1991 to 6,038 in 2000. However, the staffing level crept back up to 6,085 in fiscal 2001 and is budgeted at 6,151 in 2002. If for no other reason, reductions in the number of personnel will probably be necessary to offset the costs of salary and benefit increases stemming from future contract negotiations.

The T's bloated payroll is also attributable to collectively bargained work rules that limit management's flexibility in making assignments. As a result, the T has to carry positions that would otherwise be unnecessary and incurs additional overtime costs. Together these factors have been estimated to increase labor costs by 10 to 20 percent. Like wage rates, work rules will be a critical issue in upcoming contract negotiations.

The T's antiquated infrastructure contributes to the labor-intensive nature of its operations. Out-of-date equipment and facilities require more personnel to operate, maintain and repair. Substituting technology for labor by modernizing the T's physical plant is the key to reducing head counts and personnel costs. Improvements like the proposed automated fare collection system (described later) that allow the T to provide the same or better service with fewer people are absolutely necessary to achieve the cost reduction goals in the finance plan.

The sorry history of previous attempts by the T to save money does not bode well for the future. Most of the Authority's significant efforts to brings costs under control have been stymied by political resistance. In 2000 the T awarded the contract for maintaining commuter rail equipment to a private joint venture which bid $116 million less than the current contractor, Amtrak, and planned to put its even larger commuter rail operations and track maintenance contracts out to bid as well, potentially saving far more. However, as a result of fierce resistance from Amtrak and its labor unions, the U.S. Department of Transportation not only backed away from its original requirement for competitive bidding, but threatened to withhold federal aid for capital projects if the T followed through with the transition. Not surprisingly, the T renewed its contract with Amtrak, forgoing the potential savings.

The state's anti-privatization statute, commonly known as the Pacheco law, has led the T to largely abandon other efforts to achieve budget savings through competitive bidding of services. In 1997 the T's management had projected that competitive bidding for the operation of its 159 bus routes would produce savings of up to $28 million per year. Similar competitive procurement efforts in San Diego, Las Vegas, Indianapolis and Denver resulted in savings of 18 to 33 percent and expanded bus service. After a prolonged bidding process, the Authority approved two proposals to operate the Charlestown / Fellsway and Quincy routes. However, the state Auditor objected to the Authority's proposed contracts,

finding that they would not result in savings to the Commonwealth. Under the Pacheco law, the Auditor is required to review any privatization plan and may halt the initiative if he finds that it fails to meet any of several requirements. The MBTA filed suit, but the Supreme Judicial Court upheld the Auditor's challenge to the initiative, effectively killing the proposal. Since then, the administration has largely backed away from other, smaller privatization efforts.

After a budget crisis that many blamed on T labor practices shut down service in December 1980, the state Legislature passed legislation that expanded the powers of MBTA management. Among other things, the so-called management rights legislation preserved the Authority's right to subcontract, prohibited the T from bargaining away the right to hire part-time operators, and increased management's authority over employee assignments. By the end of the 1980's, T officials estimated that the legislation had saved at least $15 million per year, while others have estimated even greater savings.[4] Unfortunately, much of the management rights legislation has now been repealed. The right to subcontract has been severely restricted by passage of the Pacheco law in 1993 and language included in the Authority's 1998 contract with its biggest union. In 1995 amendments to the legislation itself took away much of management's authority over employee assignments. Today, the ability to hire part-time operators is the only important part of the management rights legislation that remains fully intact.

Legislative restrictions add to capital as well as operating costs. Like other state agencies, the T is generally prohibited from employing design-build contracts and other alternative contracting methods that would allow it to complete capital projects more quickly and with fewer cost overruns. Except when more innovative techniques are specifically authorized by the Legislature, the T is required to use the same traditional design-bid-build, low-bid construction procurement process that all too often results in protracted schedules, underbidding, change orders, delays and cost overruns. With a fixed capital budget, a cost overrun on one project means less money and likely delays for another.

[4] Jose A. Gomez-Ibanez, "Hard Choices: Boston's Transit Deficits and Ridership," A. Alfred Taubman Center for State and Local Government, John F. Kennedy School of Government, Harvard University, July 1994, pp. 88, 95, 97.

TRYING TO DO IT ALL IN THE CAPITAL PLAN

Few state agencies have more expected of them than the MBTA. Working within the fiscal constraints outlined in the previous chapter, the T attempts to juggle a host of competing demands for capital spending. An enormous backlog of maintenance and modernization needs vies for funding with a long list of expansion projects, most of them legally required as mitigation for the Central Artery. Despite the magnitude of the T's capital spending, the Authority's resources fall far short of being able to satisfy all of the competing priorities.

The T's capital needs generally fall into four broad, overlapping categories that reflect the basic requirements for the capital program: 1) maintaining, repairing and replacing existing infrastructure in order to sustain current operations; 2) replacing or renovating equipment and facilities to increase capacity; 3) modernizing the system to improve customer service; and 4) constructing new lines to expand the reach of the T's services.

Keeping the System Running Sustaining existing services is the most fundamental requirement for the T's capital program. Aging buses and rail cars have to be replaced; crumbling subway stations need to be repaired. Building on some of the oldest transit infrastructure in the nation, a decade of aggressive expansion has left the MBTA with an enormously expensive system to maintain. The failure to invest adequately in vehicles, tracks, stations and other facilities has created a huge backlog of projects necessary not only to ensure the safety and reliability of operations, but simply to keep the system running.

Increasing Capacity Another critical goal of the T's capital plan is to eliminate the bottlenecks that limit the performance and carrying capacity of the present system. The T is mandated by the environmental permits for the Central Artery project to undertake a variety of efforts designed to allow existing lines to carry more passengers. Replacing obsolete signals and adding vehicles would allow for more frequent service on the Orange Line and longer trains on the Blue Line. Adding parking spaces would encourage more people to take advantage of transit throughout the system, particularly commuter rail.

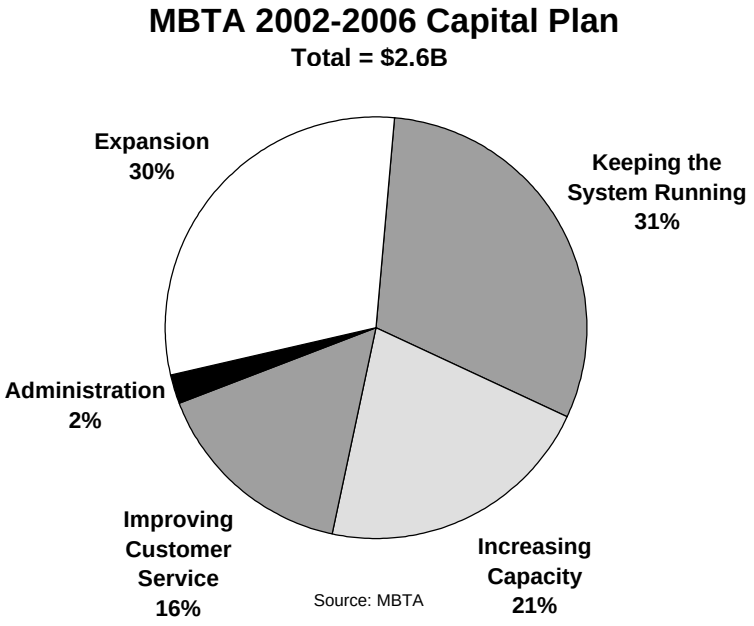
Improving Customer Service Making the T's services more attractive and convenient is essential to the T's long-term fiscal health. The T desperately needs to renovate and enhance the system in order to improve the quality of its services, which, together with expanded capacity, will increase ridership and revenues. Modern equipment and facilities, particularly a new fare collection system, also reduce operating costs, a critical requirement for stabilizing and strengthening the T's finances. In addition, the T is required by the Americans With Disabilities Act to improve accessibility of many stations to disabled persons.

Expanding the System Despite the T's recent growth spurt, with new commuter rail lines to the South Shore, Worcester and Newburyport, the Authority remains under enormous

pressure to continue to expand the system in order to support economic development, meet environmental requirements, and improve the equity of transit services. Construction of the new Silver Line in Boston is well under way, commuter rail extensions to Greenbush and New Bedford/Fall River are far along in the planning process, and a host of other megaprojects, such as the Urban Ring connecting major employment centers surrounding downtown Boston, are in the conceptual stage.

Projects in the first three categories, collectively referred to as maintenance and modernization in this report, frequently fulfill more than one of the key objectives of the capital plan. Replacing worn out tracks keeps the system running but may also allow for higher train speeds which increases capacity and improves customer service. Upgrading the signal system on the Orange Line is intended to increase capacity, but the existing signals are obsolete and frequently fail and would eventually need to be replaced simply to keep the system running. An automated fare collection system not only improves customer service but also replaces antiquated equipment that is increasingly unreliable. What these projects have in common is that they all serve to preserve and improve the existing system—and strengthen the T's finances at the same time.

Figure 8



The MBTA's capital plan reflects the fundamental tension between the need to maintain and modernize the existing system on the one hand, and pressure to expand the system and provide new services on the other. Just over half of the $2.6 billion in projects in the plan between 2002 and 2006 will support basic infrastructure projects needed to keep the system running or to increase capacity—enough to cover only a fraction of the need for maintenance, repair and replacement of existing equipment and facilities. The 16 percent allocated to customer service improvements covers only the first steps that the T needs to take to make the system more user-friendly.

The 30 percent of the plan devoted to expansion projects is just the tip of the iceberg of new lines and extensions waiting to be built. (see Figure 8).

Nearly $240 million or 11 percent of the spending on projects in the capital plan will have to be canceled or deferred until after 2006 due to inadequate financial resources. While the T's 2002-2006 capital plan contains a total of $2.6 billion in projects, the funding sources available for capital spending reviewed in the previous chapter total only $2.3 billion. The T elects to budget more capital spending than it can afford, referred to as over-programming, in order to preserve flexibility in managing spending. To balance spending with funding sources, approximately $240 million of projects in the plan would have to be scaled back or delayed.

Table 2

MBTA Capital Plan
$ millions

	Through 2001	2002	2003	2004	2005	2006	Total 2002 -2006	After 2006	Total All Years
Keeping the System Running									
Vehicle Replacement	$207	$104	$87	$123	$21	$4	$340	$103	$649
Track, Signals and Power	57	36	29	27	28	33	153	74	284
Maintenance Facilities	163	25	61	26	0	0	112	0	275
Subway Stations	1	19	28	27	8	0	82	0	83
Communications	6	1	23	23	9	0	58	0	64
Other	68	31	17	6	1	1	55	0	124
Subtotal	502	217	244	232	69	38	799	177	1,478
Increasing Capacity									
Blue Line Modernization	171	90	113	101	115	32	452	129	752
Orange Line Signals & Vehicles	2	12	23	19	19	18	90	6	99
Parking	30	12	6	1	0	0	19	1	50
Subtotal	204	114	142	121	134	50	561	136	901
Improving Customer Service									
Automated Fare Collection	9	16	34	36	22	12	120	0	128
Accessibility	30	33	64	46	21	1	165	2	197
North Station	142	16	37	27	14	1	94	0	236
Other	3	10	12	7	1	1	31	1	36
Subtotal	183	75	148	115	58	15	411	4	598
Expansion									
Silver Line	375	110	129	47	38	20	344	0	719
Greenbush Commuter Rail	13	14	49	89	189	49	390	6	409
Fall River-New Bedford Comm. Rail	19	17	6	4	0	0	27	0	46
Other	346	16	2	2	2	1	22	0	369
Subtotal	754	157	186	142	229	69	783	6	1,542
Administration	35	13	14	13	12	12	64	49	147
Total Capital Plan	1,678	576	734	622	502	184	2,617	371	4,666
Unallocated (Overprogramming)		(91)	(95)	(73)	(53)	30	(283)		(283)
Net Planned Spending	$1,678	$484	$639	$549	$448	$214	$2,334	$371	$4,383

Actual spending on the projects in the capital plan is likely to be even less than $2.3 billion, however, due to unintended delays in projects. Between 1999 and 2001, the T spent only about 60 percent of the dollars in its capital plan, and is on track to repeat this performance in 2002. The delays, which afflict a wide array of projects, are attributable to a variety of causes, such as permitting difficulties and procurement problems, and the readiness of individual projects for construction.

Because there is no way of knowing at this time which projects or categories will be reduced or delayed, all references to planned capital spending totals and breakdowns in this report refer to the total before accounting for over-programming, i.e., to $2.6 billion, unless noted otherwise (see Table 2).[5]

This chapter will explore each of the four categories of T capital projects and examine what the T is doing—and not doing—to meet its capital priorities.

Keeping the System Running

The most basic requirement—and thus the highest priority—for the T's capital program is to sustain current services by keeping existing equipment and facilities in working order. Yet despite spending over two-thirds of its capital resources on preservation and renewal of existing infrastructure, the T will only fall farther behind in its efforts to keep the system running.

The T faces an enormous backlog of maintenance, repair and replacement projects, and new needs crop up every year as equipment and facilities age and wear out. A systemwide condition assessment completed by the T in 1999 identified $3.2 billion in deferred projects and estimated that $505 million would be required annually to keep the T's infrastructure functioning (see Table 3).

Table 3

State of Good Repair Costs

$ millions

Mode	One-Time Backlog	Annual Needs
Subway	$1,685	$154
Commuter Rail	714	128
Bus	381	116
Systemwide	400	108
Total	$3,180	$505

Source: MBTA

The State of Good Repair (SGR) study may have understated the costs of maintaining the system going forward. Because the study assumed that the first phase of the Silver Line was the only expansion project that would be built over the next decade, it does not account for higher maintenance costs that will result from other expansion projects being planned, such as the Greenbush commuter rail extension.

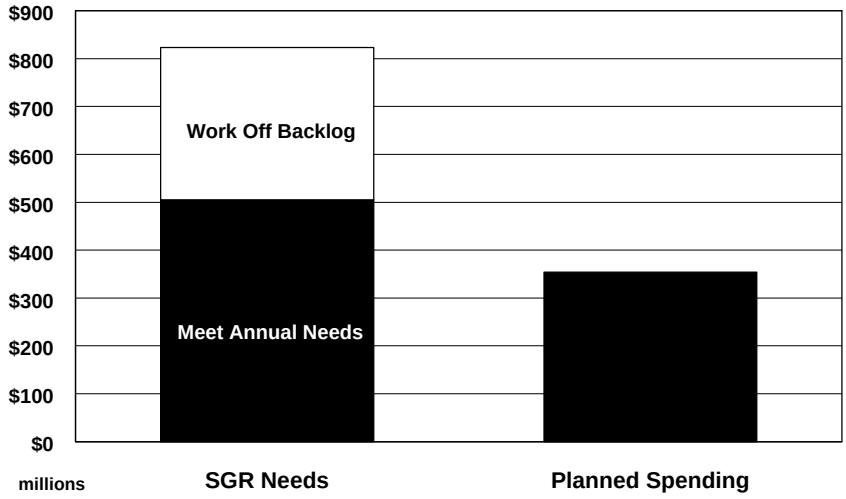
[5] The figures for the Silver Line and total spending on expansion projects differs from the figures in the MBTA's capital plan because vehicle acquisition for the Silver Line was included in the Vehicles category by the T.

The study assessed the condition of various components of each mode and line. The bus system was rated poor overall, with trackless trolleys (electric buses used on a few lines) at the point of failure. Vehicles and tracks on the Orange Line also earned a poor grade; the other subway and commuter rail lines were rated fair. Stations on the Red and Green lines were deemed in poor condition, the Blue Line and commuter rail, fair, and the Orange Line, satisfactory. Power systems on all subway lines were rated poor, as was fare collection equipment throughout the system. Signal and communication systems were assessed as poor on the Red and Orange lines, fair on the Green Line, and satisfactory on the Blue Line.

Nevertheless, the T's capital plan meets less than half of the needs identified in the SGR study. Addressing the backlog over ten years, as the analysis proposed, and meeting annual needs to keep from falling further behind would cost about $820 million per year, but the T plans to spend an average of only $350 million annually on maintenance and modernization projects over the next five years (see Figure 9). As the T continues to scale back capital spending to reduce its debt burden—to just $254 million by 2010—investments in the current system would fall even further.

Figure 9

Annual State of Good Repair Needs vs. Planned Spending



Source: MBTA State of Good Repair Report

About $800 million, or 31 percent, of the current capital plan is devoted to basic maintenance, repair and replacement projects over the next five years. Another $560 million, or 21 percent, will be spent replacing existing infrastructure specifically to increase capacity, and $411 million, or 16 percent, will be spent on projects to improve customer services, for a total of $1.8 billion, or 68 percent of the capital plan. Even making the generous assumption that all of these projects will address SGR needs, the planned spending on average meets only 43 percent of the need identified in the SGR study.

The study estimated the cost of bringing the system to a "state of good repair" and keeping it there. SGR was defined as a condition in which all assets perform their intended functions without limitation. No transit system—or any public infrastructure—is ever likely to attain this ideal state. Even if the T could achieve a state of good repair, it is debatable whether SGR is the best goal. The concept of SGR focuses on maintaining

existing equipment and facilities at original levels of functionality rather than replacing assets with more modern infrastructure that will provide higher levels of service or reduce operating and maintenance costs. Nevertheless, the SGR analysis provides a clear sense of the magnitude of the T's costs for keeping the existing system in working order.

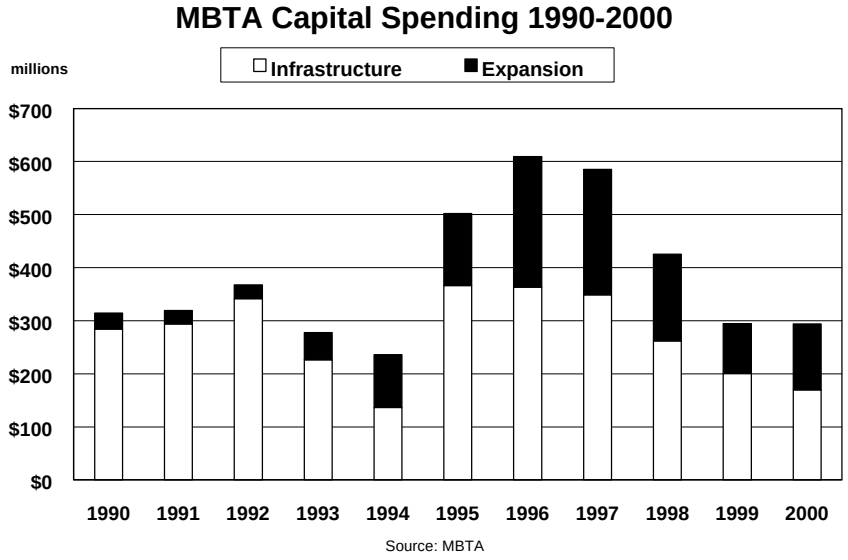
The SGR shortfall is the result of several factors. The T's long history of underinvesting in the system's maintenance and modernization accelerates the deterioration of aging infrastructure. The T's rapid expansion over the last decade not only diverted capital resources from the existing system, but left the Authority to care for a larger system. And public transit projects are, by their very nature, enormously expensive.

With the oldest transit system in the nation—the first segment of the Green Line between Park Street and Boylston opened in 1897—much of the T's aging facilities and equipment is reaching, or is long past, the end of its useful life:

- Nearly two-thirds (620) of the T's bus and trolley fleet is 12 or more years old;
- 18 commuter rail locomotives and 57 coaches are over 20 years old;
- All 70 of the Blue Line cars date from 1979;
- 74 of the Red Line's 218 cars go back to the line's opening in 1969;
- 11 Green Line vehicles acquired in 1945 and 1946 are still in service;
- Much of the Green Line's track predates World War II, some predates World War I;
- Fare collection equipment is 25 to 30 years old;
- The average age of Authority-maintained bridges is 70 years;
- The Orange Line signal system is about 25 years old and the Green Line's is even older—the oldest in the United States;
- Five of the T's bus garages are 60 or more years old—Fellsway (1925), Quincy (1930), Bartlett (1931), Lynn (1936) and Albany Street (1941);
- The overhead cranes in the main subway repair facility in Everett are 60 years old;
- The T's ten power substations were all built in the 1970s.

Not only are the T's facilities getting older, but there are now more facilities to maintain. The expansion projects of the last decade increased the number of miles served by nearly 70 percent, adding tremendously to the cost of sustaining the T's infrastructure. Each new subway and commuter rail line means more vehicles, stations, tracks and signals that need to be maintained, repaired and, eventually, replaced.

Figure 10



The focus on expansion in the 1990s redirected much of the T's limited capital funds away from maintenance and repair. Between 1994 and 2000, $1.1 billion—nearly 40 percent of the T's capital spending—was devoted to expansion projects. The expansion spending, however, only compounded a pattern of underinvestment in maintenance of capital assets that the T shares with much of the rest of state government. Between 1979 and 1998, the T spent an average of $300 million per year on infrastructure renewal, with spending failing to keep up with inflation or with the growth in the size of the system. Even if the T had spent all of its capital funds on maintenance and none on expansion, infrastructure spending would have reached the $500 million level called for in the SGR study in only three of the last 11 years (see Figure 10).

Keeping the system running is incredibly expensive. The T will spend a total of $800 million over the next five years simply to maintain existing services, even without counting the costs of infrastructure projects intended to increase capacity or improve services. In comparison, the Commonwealth's second most expensive current highway project after the Central Artery, the complete reconstruction and widening of Route 3 North from Burlington to the New Hampshire border, will cost about $400 million.

Replacing 369 of the T's buses and trolleys—nearly 40 percent of the entire fleet—will cost $170 million. The new vehicles will run on clean-burning compressed natural gas, adding to the cost of the buses and requiring another $115 million to be spent building new maintenance facilities and converting existing garages to serve the CNG-powered buses. Other major infrastructure outlays include $204 million for new low-floor cars for the Green Line; $123 million for commuter rail locomotives and coaches; $200 million for repairing and replacing tracks throughout the system; $42 million for bridge work, $189 million for signal improvements other than on the Orange and Blue lines (which are discussed in the next section); $149 million (almost entirely spent) for completing the massive new Boston Engine Terminal maintenance facility; $80 million for repairing and

restoring the Red Line stations in Dorchester; $59 million for radio system upgrades; and $19 million for environmental compliance projects.

Taking care of this infrastructure is expensive, but the cost of neglecting it is even higher. Deteriorated tracks reduce the maximum speed of the Green Line at congested grade crossings from 25 miles per hour to three, reducing service quality and capacity. Older diesel buses have substantial air quality impacts, offsetting the environmental benefits the T provides. Worn-out buses and rail cars require more frequent repairs, increasing down-time and operating costs. Jammed turnstiles encourage fare evasion and cost the T revenues. Failing facilities like the crumbling Red Line stations in Dorchester or broken escalators and elevators throughout the system reduce the quality of service, discourage ridership, and in some cases may even threaten the safety of riders.

The funding shortfall means a wide variety of maintenance, repair and replacement projects are not getting done. Several of the T's older vehicle fleets need major component replacements, overhauls or entirely new vehicles. In several cases, the T cannot meet its own standards for scheduled overhauls or replacement, particularly for the commuter rail and bus fleets. For example, 18 F40PH-2 locomotives and 57 Pullman coaches will reach 25 years of age—the T's standard for replacement—between 2003 and 2005, but are not scheduled for replacement, or even an overhaul, until after 2006. Other scheduled overhauls, such as for 67 MBB coaches that were due in 2000 and 2001, for 146 Bombardier coaches due between 2000 and 2003, and for 75 Kawasaki coaches due between 2003 and 2004, will not be completed under the T's 2002-2006 capital plan. Buses purchased in 1985 will be kept in service for at least 17 years, five years beyond the T's and the Federal Transit Administration's standard. The oldest Red Line vehicles, the No. 1 cars dating from 1969, will be retired at 40 years rather than the 35-year standard.

The plan accommodates only a small portion of the track replacement projects that are needed to maintain reliability and safety and reduce long-term costs. Some of the T's large fleet of maintenance vehicles, such as track repair cars, cranes, snowplows and brush cutters, are well beyond their useful lives but no replacements are included in the capital plan. The conditions of track and right-of-way will deteriorate if this equipment ceases to function. Even though the commuter rail signal system relies on obsolete control systems and open-wire poles that are susceptible to wind and ice damage, no improvements are planned. The Attorney General recently sued the T to force the Authority to clean up toxic contamination at the commuter rail maintenance facility in Readville—the latest in a series of legal actions by the AG—but the T has no cleanup funds in its capital plan.

Eight highway bridges are at least 70 years old and another 15 railroad bridges have been identified as high priorities for replacement or rehabilitation, including Washington Street, West Street, East Street, Talbot and Woodrow Avenue, Main Street in Concord and the Merrimack River bridge, but none of these is covered by the capital plan. All ten of the T's

power substations will be at or past the end of their 25-year useful lives within the next few years, but none is scheduled for replacement. Only one (Bartlett) of the T's seven bus garages, which have an average age of 56 years, will be replaced under the plan. No tunnel repair projects are planned even though water leaks, which eventually degrade the concrete walls of the tunnels, are common throughout the system. A list of unfunded infrastructure maintenance, repair and replacement projects is included as an appendix to this report.

Increasing Capacity

The need to mitigate the environmental impacts of the Central Artery project, reinforced by the priority-setting requirements of the forward funding legislation, drives much of the T's capital priorities. Nearly 60 percent of the $2.6 billion in the 2002-2006 capital plan will be spent on Artery mitigation projects, which fall under three of the four categories of capital spending described in this report (see Table 4). Future expansion projects not yet budgeted in the capital plan would bring the total required to complete the mitigation requirements to at least $3 billion (see the discussion under Expansion).[6]

Table 4

Central Artery Mitigation Projects in Capital Plan

$ millions

	Through 2001	2002 -2006	After 2006	Total
Keeping the System Running				
Bus Replacement	<$1	$140	$0	$141
Increasing Capacity				
Blue Line Modernization	171	452	129	752
Orange Line Signals & Vehicles	2	90	6	99
Parking	30	19	1	50
Expansion				
Silver Line	375	344	0	719
Greenbush	13	390	6	409
Other	234	26	0	259
Subtotal	622	759	6	1,387
Total Mitigation Projects	$826	$1,460	$142	$2,429

[6] The expenditures through 2001 do not include projects completed before 2002.

Table 5

Central Artery Mitigation Projects

Project	Due Date
Greenbush Commuter Rail	1999
Blue Line Modernization	2001
Silver Line Phase I - Washington St.	2002
Silver Line Phase I - South Boston	2003
Bus Replacement	2004
Orange Line Signals	2004
Worcester Commuter Rail Stations	2004
Silver Line Phase II (connecting tunnel)	2010
Green Line Extension to Somerville	2011
Blue Line/Red Line Connector	2011
Arborway Green Line Restoration	TBD

Source: Central Artery Environmental Oversight Committee

The mitigation requirements stem from the 1991 environmental permit for the massive Central Artery/Tunnel project in downtown Boston. In order to offset the air quality impacts of the increased traffic flow that the Artery would support, the administration committed to a series of transit improvements intended to increase ridership, ranging from building 20,000 new parking spaces at T stations to restoring the Old Colony commuter rail line, with specific due dates for each project. Many of the same projects were also incorporated into the state's implementation plan for complying with the federal Clean Air Act. While some of the commitments have been met or are nearly complete, such as the Worcester and Newburyport commuter rail lines, an improved bus terminal at South Station and the parking spaces, many of the projects are yet to be finished.

With environmental advocates threatening to sue over the delays, in 1999 the Executive Office of Transportation and Construction filed a request with the Executive Office of Environmental Affairs to substitute less expensive projects for some of the original requirements and to extend due dates for others. After an extended negotiating process, EOTC and EOEA signed an administrative consent order—an agreement with the legal force of a court settlement—that revised and restated the Artery commitments, established new due dates, and set out requirements for interim measures to compensate for the air quality impacts of the delays (see Table 5). While the T was given additional time to complete some of the projects and allowed to offer interim measures to compensate for the delays, in the long run the new agreement did little to reduce demands made on the T.

Two major projects in the T's capital plan— renovating the Blue Line and updating signals and adding vehicles to the Orange Line—are required under the agreement because they are

intended to boost ridership by increasing the capacity and attractiveness of the routes. Like the projects discussed in the preceding section, these undertakings entail the replacement of old and often failing infrastructure, but their purpose goes beyond preserving existing infrastructure and current levels of service.

The $750 million Blue Line modernization project ($452 million between 2002 and 2006), the costliest of all capital projects currently under way, entails reconstructing nearly all of the stations on the line to increase the maximum length of the trains from four cars to six, including building an entirely new Airport station, replacing all of the line's vehicles, and upgrading maintenance facilities and signal and power systems. The T recently announced that while the lengthening of platforms and the purchase of new vehicles would be complete by 2004 as planned, other station renovations, including accessibility improvements, would not be finished until 2008 due to the financial constraints on capital spending.

The T is also replacing the obsolete signal system on the Orange Line, which acts as a limit on the speed and frequency of service, and adding 24 additional cars at a combined cost of $97 million. While the original Artery commitment called for 46 new vehicles, the T succeeded in renegotiating the commitment by arguing that no cars could be added without addressing the signal constraints. As a cost-saving measure, the cars will be refurbished Blue Line vehicles that have been replaced by the new vehicles purchased as part of the Blue Line modernization.

Another Central Artery mitigation measure intended to lure drivers from their cars and onto the T is the addition of 20,000 parking spaces to the system. While this commitment has now been met, a variety of projects totaling $20 million, including parking facilities at the Wilmington, Gloucester and Walpole stations, are expected to add another 3,700 spaces. Other Artery mitigation projects are discussed below in the Expansion section.

Improving Service Quality

The need to stabilize and strengthen its finances requires the T to modernize the system and improve the quality of services for riders. By making the T more attractive, ridership—and fare revenues—can be increased without the additional operating costs that result from system expansion. While expansion projects invariably add to the T's deficits, investments in modern equipment and enhanced customer service can reduce operating costs and, in some cases, pay for themselves. Improvements that add value for riders also help justify fare increases the T needs to keep its budget in balance. In addition to helping to shore up the T's finances, increased ridership would heighten the positive environmental impacts of transit services.

Some service improvement projects offer opportunities to increase the T's revenues directly, on top of the indirect effects of increased ridership. The T's recent decision to

provide cellular phone access in subway tunnels, for example, will provide $2.5 million annually for the T in fees paid by the service provider.

Raising the bar for the quality of the T's services was an important objective of the forward funding legislation. Provisions of the new enabling act proposed by a coalition of supporters, including MTF and environmental and transit advocates, require the T to develop service quality standards and measure its performance against those standards, with the goal of increasing the value and benefits of the T for riders and the public at large. Other enhancements designed to improve the accessibility of T stations and vehicles are required by the federal Americans With Disabilities Act (ADA).

Service quality was also a primary focus for the Blue Ribbon Committee, which recommended that the T make continuous upgrades to service and facilities. The BRC called for a portion of revenues from fares to be targeted to system improvements, including automated fare collection, track repairs that allow for higher travel speeds, improved station maintenance and lighting, communication systems that provide information to riders, and additional bus shelters and bike racks to contribute to customer convenience.

The T has responded by devoting about 16 percent of its capital plan to service enhancement projects, though many of the projects in the two categories described above will also improve the quality of services. Automated fare collection, the centerpiece of the T's service improvement efforts, accounts for $120 million of 2002-2006 expenditures and is discussed in more detail below. The costliest single enhancement project is the long-running reconstruction of North Station to provide better connections between the Green and Orange subway lines and the Fitchburg, Lowell, Haverhill, Newburyport and Rockport commuter rail lines. This $254 million project, which has been progressing in a series of phases since the 1980s, accounts for $94 million of capital spending between 2002 and 2006 when the work is expected to be finished.

Accessibility improvements required under ADA account for another $165 million of the T's capital plan. ADA prohibits public transportation systems from discriminating against persons with disabilities and requires key stations to be made accessible. The T has brought 50 of the 80 identified key stations into compliance and has committed to completion dates for the remaining 30 stations. The Green Line is the focus of most of the planned spending with $118 million programmed for improvements to 29 stations, including seven underground stations. Another expensive key station project is the reconstruction of the Charles/MGH station on the Red Line at a cost of $27 million. The reconstruction of the Red Line stations in Dorchester and the new low-floor Green Line cars mentioned previously will also address access issues.

A variety of smaller projects will improve the customer experience and service quality at the T. An information system will provide real-time updates of schedules for commuter

rail passengers at a cost of $4.6 million. Another $4 million will be spent cleaning, painting and improving lighting, signs, and system and neighborhood maps in stations throughout the subway system. Installation of 300 bus shelters will cost $1 million. The capital plan includes the final $0.6 million of a $2.8 million project to renovate elevators and escalators throughout the system to improve customer access, safety and convenience and reduce operating costs. The T will also spend $2 million to upgrade its customer service phone system to better handle the 1.6 million calls the T receives annually and provide more accurate information, including enhanced services for hearing impaired customers.

Another service enhancement, extended hours of operation, would increase ridership, but would also entail additional operating costs and contribute to the T's operating deficit in much the same way as a new line. The T has long been under pressure from members of the Legislature and others to extend the hours of services to the early morning, or even to operate 24-hour service. The T estimated that 24-hour service would cost $27 million per year and expects to pay $2.8 million annually for the late-night bus service recently instituted as a compromise measure.

Automated Fare Collection Replacing the T's antiquated fare collection system is the single most important step the Authority can take toward achieving the twin objectives of forward funding: fiscal stability and improved customer service. The recommendation of the Blue Ribbon Committee on this question was straightforward: automated fare collection (AFC) should be the highest priority in the T's capital plan. After a number of false starts in replacing the fare system, the T has budgeted $120 million in the capital plan for a first phase of AFC for the subway and bus systems. Commuter rail would not be covered initially. The T has solicited bids on the project and expects to select a vendor to design and install the system by June of this year. Installation would begin in December 2003.

The T is far behind its peer transit agencies in modernizing fare collection and is one of the last of the country's major systems to use tokens. New York, Washington, Chicago and San Francisco—all old urban systems like the T—have put automated systems in place, in some cases many years ago.

The T's existing token collection equipment on subways and buses is more than 25 years old and is long overdue for replacement. Waiting in line to purchase tokens and negotiate jammed turnstiles makes the system inconvenient for riders and encourages fare evasion. This antiquated system makes it difficult for the T to collect and account for fares and prevents accurate tracking of ridership and revenues for individual lines. The reliance on tokens results in inefficient deployment of station personnel and limits the T to one-size-fits-all pricing strategies.

The customer response to the monthly pass system, which moved frequent riders to a somewhat more modern system, supports the contention that customers are eager to move beyond tokens. Monthly pass sales, which also provide discounts from single-ride fares, grew from 33,000 per month in 1978 to 210,000 per month in 1999. Revenue from pass sales doubled between 1987 and 1999, growing six times as fast as revenue from token sales.

An AFC system based on stored-value cards would provide a substantial benefit to riders. Cards could be purchased from a wide variety of retail outlets with debit and credit cards and would be reusable, i.e., more rides could be added to the card at any time. Next-generation smart cards would be even easier to use. The microchips in the cards would be read just by passing through a gateway without having to run the card through a reader, and fares would be automatically deducted from the rider's bank or credit card account, with no need to add value to the card.

AFC would provide major benefits for the T as well. The T estimates that reduced fare evasion and enhanced controls would increase revenues by $5.9 million, about three percent, in the first full year of operation. These projections are conservative; the transit systems in New York and Chicago, which have similar rider demographics to the T, replaced comparable outmoded fare equipment with AFC systems and experienced five to seven percent increases in revenue. The collection of revenue would be streamlined as well, with far less handling of cash. For the first time, the T would be able to accurately track ridership for each bus, station and line in the system.

A more sophisticated fare system would allow the T to use more creative pricing strategies that would enhance ridership and revenues. AFC would allow for more seamless transfers between modes, such as between a bus and a subway, facilitating the free or reduced price transfer policies required under the forward funding legislation and strongly endorsed by the Blue Ribbon Committee. Off-peak discounts, a form of congestion-based pricing, would encourage riders to use the system when excess capacity is available and reduce overcrowding during rush hour. Distance-based pricing, where higher fares are charged for longer trips, would allow longer routes to recover a larger share of costs. Equity among riders would also be enhanced, with riders who use the system more paying a fairer share of the costs.

AFC would also enable the T to reduce station personnel costs and improve service quality at the same time. Redeploying token sales agents as customer service representatives who can move around the station assisting riders and addressing problems would promote greater personal interaction with customers, reduce fare evasion and enhance station security. The shift in functions would allow the T to reduce the total number of personnel assigned to stations by more than 50, saving $6.2 million annually. The personnel reductions are planned to be phased in over three years through attrition.

Table 6

Projected Savings From Automated Fare Collection

$ millions

	2002-11 Ten-Year Total	2002-31 30-Year Total
Revenue Increase	$46.0	$171.0
Labor Savings	50.5	222.8
Debt Service	(76.8)	(207.1)
Maintenance Costs	(12.4)	(59.2)
Net Savings	$7.2	$127.4

Source: MBTA

The projected revenue increases and costs savings will be more than enough to cover the costs of procuring the system, even after accounting for the new system's higher maintenance costs. Debt service is projected to cost about $10 million per year; maintaining 350 ticket vending machines in subway stations will initially add about $1.7 million annually, including nine additional personnel. These costs will be more than offset by the increased revenues and reduced labor costs cited above, generating a net surplus ranging from $1 million to $3 million per year after the system is fully implemented. The benefit will jump to over $13 million annually after debt service payments are completed. The T projects saving a total of $7 million over the first ten years; the cumulative surplus will amount to $127 million after 30 years (see Table 6).

The forward funding legislation requires the MBTA to maintain its existing infrastructure before investing in new facilities or service expansion unless the expansion is required by law, produces environmental benefits or achieves quantifiable savings. The BRC was even more explicit, recommending a moratorium on all capital projects except those that meet critical maintenance needs, result in measurable increases in productivity or revenues, or are determined to be legally required. Installation of an automated fare collection system clearly passes muster under either set of criteria.

Expansion

Despite more than a decade of rapid system expansion—and despite the pressing needs to maintain and modernize the resulting system—the T faces a long list of additional expansion projects that are under way or have been proposed. Out of a total anticipated capital budget of $2.6 billion, the MBTA allocates $783 million, or 30 percent, to expansion projects between 2002 and 2006. The new Silver Line, which is currently under construction, and the Greenbush commuter rail extension, now in the final stages of planning, account for most of the planned expansion spending.

However, the capital plan greatly understates the magnitude of the expansion projects on the T's plate. The $400 million budgeted for Greenbush could be underestimated by as much as $200 million according to recent reports. Moreover, a host of other megaprojects that have been committed to or are under consideration—the New Bedford/Fall River commuter rail line, the Urban Ring, the second phase of the Silver Line, an extension of the

Green Line to Somerville, a connection between the Blue and Red lines in Boston, an extension of the Blue Line on the North Shore, and the North-South rail link—would cost billions more but receive only token planning or study dollars in the capital plan.

A variety of arguments are made in support of continued expansion. Environmental concerns, embodied in the Artery mitigation requirements, are an important factor in the state's transportation planning, with increased use of mass transit viewed as an important tool for reducing highway congestion and automobile emissions.

Transit can also help spur economic development. Access to a subway line can be crucial to the success of a new development project such as the South Boston waterfront or the continued growth of established employment centers like the Longwood medical area. A new commuter rail line can increase the desirability of a neighborhood, leading to higher property values, additional investment and increased tax revenues in areas like New Bedford and Fall River.

Additional arguments for expansion are based on fairness and equity issues. About 60 percent of MBTA expansion dollars in the 1990s went to commuter rail lines that serve the suburbs, and the percentage is nearly that high for currently funded projects. However, the availability of transit can also improve employment opportunities for low-income, inner-city residents without access to other transportation. Proponents of projects like the Washington Street replacement service and the Urban Ring argue for the need to invest in inner cities whose residents have suffered the most from the environmental impacts of automobiles and have reaped fewer of the economic benefits associated with increased transit access.

The T is under great pressure to achieve these objectives with new expansion projects despite the host of financial problems created, in part, by the last round of expansion. As shown in the previous chapters of this report, the T is already grappling with a heavy debt burden, increased operating deficits, and growing backlogs of deferred maintenance and modernization projects that are the legacy of the expansion of the last decade. The cost of expansion was one cause of the rapid increases in MBTA subsidies during the years leading up to forward funding when the Commonwealth picked up the tab no matter how fast it grew. With state subsidies now limited, the construction bill is coming due in the form of crippling debt service and rising operating and maintenance costs.

Given these fiscal realities, the T will be hard-pressed to finance the expansion projects in its five-year plan, much less those proposed beyond 2006. Spending even 30 percent of the Authority's capital resources on new lines over the next five years will sacrifice service improvements and other investments in the existing system that are crucial to sustaining the T's operations. Attempting to finance the post-2006 projects would leave no capital resources at all for critical maintenance and modernization needs.

Building all of the proposed expansion projects would cost far more than the T can afford— between $8.5 and $11.5 billion based on the most recent estimates. Some of the estimates were prepared several years ago and undoubtedly understate the full costs. Even if the North-South rail link, which the T has declared beyond its ability to fund, and the Blue Line-Red Line connection, which the T hopes to negotiate out of the Artery mitigation requirements, are excluded, the projects would still cost at least $4.2 to $4.8 billion, about six times what the T plans to spend on expansion over the next five years and nearly double the planned spending on all capital projects combined (see Table 7).

Construction spending represents only part of the true cost of expansion. Since fares and other revenues never cover the full cost of operating a new commuter rail, subway or bus line, expansion invariably results in increased operating deficits. Even excluding the one-third of the MBTA's budget that pays for debt service, system revenues cover only 42 percent of operating expenses.

Just the New Bedford/Fall River and Greenbush commuter rail lines, the Silver Line, the Urban Ring and the North-South rail link would add over $80 million to the MBTA's annual operating deficit. The other proposed expansion projects described here—the Arborway trolley service restoration, the Green and Blue Line extensions and the Blue Line-Red Line connection—would further increase operating costs.

Table 7

Major Expansion Projects

Project	Projected Cost $M	Artery Mitigation
Silver Line Phase I (South Boston and Washington St.)	$344 (+ $375 already spent)	**U**
Greenbush Commuter Rail	$400-$600	**U**
New Bedford/Fall River Commuter Rail	$610	
Arborway Green Line Restoration	$77-$85	**U**
Silver Line Phase II (connecting tunnel)	$600-$800	**U**
Green Line Extension to Somerville	$375 (old est.)	**U**
Urban Ring	$1,800-$2,000	
Total	$4,200-$4,800+	
Blue Line/Red Line Connector	$220 (old est.)	**U**
North-South Rail Link	$3,900-$6,200	
Blue Line North Shore Extension	$173-$281 (old est.)	
Grand Total	$8,500-$11,500+	

Source: MBTA

Unlike construction, which is a one-time expense, operating costs are recurring. The increased deficits would come at a time when the T hopes that growing operating surpluses will be available to help finance the capital program. Since public subsidies are essentially fixed under forward funding, rising deficits would threaten the MBTA's ability to achieve financial stability and translate into some combination of even more debt, higher fares, service cutbacks, deteriorating customer service, and decreased investment in maintenance.

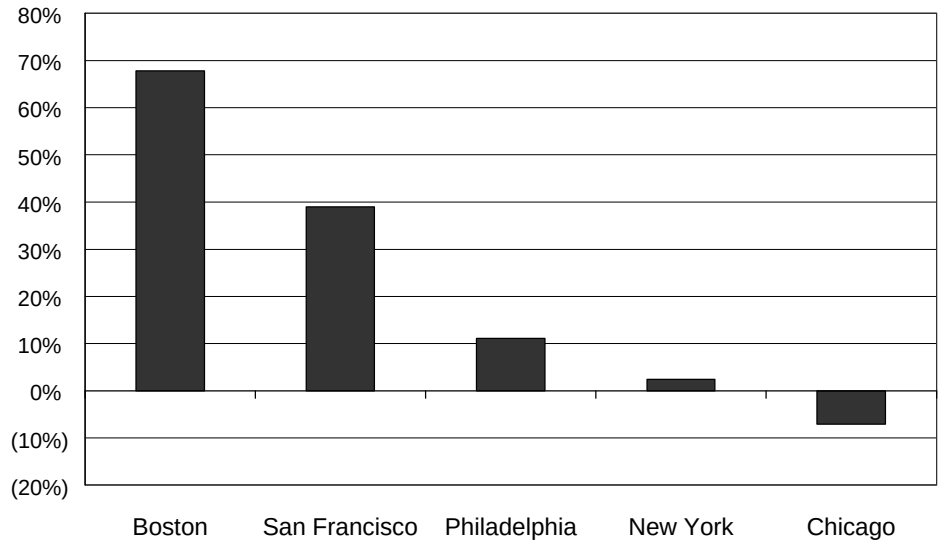
The T needs to reconsider the expansion spending on its agenda. With the first phase of the Silver Line more than half complete, it would be unrealistic to reconsider that project at this point. However, construction of Greenbush and the other proposed projects has not

yet begun, presenting an opportunity for the T to redirect limited capital resources to more critical maintenance and modernization needs.

Decade of Expansion The dramatic expansion planned for the MBTA follows a period in which the T grew more than any other major American transit system. As measured by route miles, the MBTA expanded by over two-thirds during the decade from 1988 to 1998, almost twice the rate of its closest competitor (see Figure 11). Commuter rail service was extended to Plymouth/Kingston, Middleborough/Lakeville, Worcester and Newburyport, the South Station bus terminal was completely rebuilt to accommodate increased service, and the South Boston Piers Transitway began construction.

Figure 11

Growth in Annual Revenue Vehicle Miles, 1988-1998



Source: National Transit Database

Expansion on this scale is costly. Between 1990 and 2000, the MBTA spent over $1.2 billion on 14 separate expansion projects. Commuter rail projects, primarily the Old Colony, Worcester and Newburyport extensions, accounted for about $750 million, or 60 percent of the expansion spending. The T spent $275 million on the Transitway and $130 million on the South Station bus terminal. Funding the rapid pace of expansion in the last half of the decade required about 40 percent of the T's capital budget. Those efforts came on the heels of yet another round of expansion during the 1980s. That decade saw the extension of the Red Line from Harvard to Alewife, at a cost of $562 million, and the bulk of the work on the new Orange Line subway, which totaled about $800 million.

Artery Mitigation Requirements Most of the expansion projects on the T's agenda, both past and present, are required by the Central Artery mitigation agreement (see the discussion above under Increasing Capacity). During the last decade, about 92 percent of the MBTA's expansion spending—a total of more than $1.1 billion—was on Artery mitigation requirements. Eight of the 14 expansion projects undertaken during the 1990s were required under terms of the agreement, including the five costliest expansion

projects: restoration of the Old Colony commuter rail line, work on the South Boston Piers Transitway, the enhanced South Station bus terminal, and the Worcester and Newburyport commuter rail extensions.

Of the $783 million budgeted for expansion in the 2002-2006 capital plan, 96 percent is allocated to Artery commitments, primarily for Greenbush and for the South Boston Transitway and the Washington Street replacement service, which together comprise the first phase of the Silver Line.[7] Nevertheless, completing these projects will not end the T's obligations. The Artery agreement also mandates completing the second phase of the Silver Line—a tunnel connecting the South Boston and Washington Street segments—by 2010 and extending the Green Line to near Tufts University in Somerville and connecting the Blue Line to the Red Line at Charles/MGH by 2011.

Completing all of the remaining Artery mitigation requirements would cost at least $3 billion. With the requirements spelled out in a legally enforceable administrative consent order and specified as a top priority for the T in the forward funding legislation, the T is under enormous pressure to build the projects. But, as the next chapter describes, meeting the Artery requirements, let alone completing other projects like New Bedford/Fall River and the Urban Ring while living within the fiscal constraints of forward funding and making necessary investments in the current system, will be next to impossible.

Current and Proposed Projects

The remainder of this section provides brief descriptions of each of the major projects, with cost estimates and expected operating impacts where available.

Silver Line Phase I The Silver Line is a three-part project with the ultimate goal of providing uninterrupted service from Dudley Square in Roxbury to the South Boston waterfront and Logan Airport. Two parts of the project, the South Boston Piers Transitway and the Washington Street replacement service, are currently under construction. The second phase (discussed separately below), a proposed tunnel connecting the two initial segments, would be built in the future if sufficient federal funds are made available.

With a Phase I budget of $719 million including previous expenditures, the Silver Line is the T's second most costly project after the massive Blue Line modernization. In addition to the $375 million already spent on the Silver Line, the capital plan allocates about $344 million for construction and vehicle acquisition over the next five years, including a $50 million reserve fund for Transitway cost overruns and $42 million for Phase II planning and design.

[7] The agreement also requires the T to conduct planning studies of the Urban Ring and the North-South rail link commuter rail line.

The South Boston Piers Transitway, which will operate from South Station to Logan Airport via South Boston, is by far the most costly element of the first phase at $601 million. The Transitway is being paid for entirely with federal aid under an unusual "full funding" grant agreement. However, the earmarked federal grant is capped at $413 million, requiring the T to devote nearly $190 million of its federal formula funds to cover cost increases on the project.

Beginning in 2003, the Transitway will provide service by dual-mode, diesel-electric low-floor buses via a tunnel between South Station and the South Boston waterfront. The custom-built vehicles will cost $42 million. Working together with Massport, the MBTA expects service from the waterfront to Logan Airport via the Ted Williams Tunnel to be operational in 2004.

Even though the South Boston leg of the Silver Line is still two years from completion, questions are already being raised about its ability to meet the transportation needs of the new convention center and the waterfront district. Adequate public transportation is crucial to the success of a host of massive redevelopment projects on the drawing boards, potentially including a new Red Sox stadium, that would otherwise cause exponential increases in traffic in the waterfront district. The need for expanded transit services and other transportation improvements was the key issue identified by the Executive Office of Environmental Affairs in its preliminary approval of the Fan Pier development. While the Transitway was designed to allow the line to be converted to higher-capacity light rail in the future, there are currently no plans or funds in place to do so.

As the name indicates, the Washington Street replacement service takes the place of the old elevated Orange Line, which was taken out of service in 1987 and replaced with a new line along the so-called Southwest Corridor. The new Washington Street service will be provided by 60-foot compressed natural gas-powered buses with a handicap-accessible, low-floor design and is scheduled to commence in 2002. The buses will operate in a combination of mixed traffic and a reserved lane between Dudley Square and Downtown Crossing. The T is spending $13 million for the buses and $12 million for stations and streetscaping; the Massachusetts Highway Department is funding the required street reconstruction at a cost of $13 million.

Commuter Rail Three commuter rail projects that are nearly finished account for $12.5 million of the spending in the capital plan. Work is being completed on the Old Colony Line rehabilitation that went into service in 1997 and the Newburyport extension, which opened in 1998. Also, three new stations are under construction on the Worcester Line, which opened in 1995.

Greenbush Environmental approval has been granted and a design-build construction contract was recently awarded for rehabilitation of the Greenbush branch of the Old Colony commuter rail line. Greenbush, which is scheduled to begin operation in 2005, would

restore service to a 17.1 mile stretch from Quincy to Scituate that had been provided by a private operator until 1959.

With planned expenditures of about $390 million over the next five years, Greenbush is the single largest funded expansion project and, after the multi-faceted Blue Line modernization, the second most expensive project of any kind in the 2002-2006 capital plan. The MBTA has already spent just over $13 million on design and planning for the line and another $6 million is budgeted for after 2006, bringing the total budget to $409 million. Although construction of the project has not yet begun, recent reports indicate that construction costs might be $200 million higher as a result of a variety of mitigation measures being negotiated with the towns along the route.

In addition to being the most expensive expansion project in the current capital plan, it may also be the most controversial. Critics, particularly in Hingham, Cohasset and Scituate, claim the line will be disruptive to their communities, attract few riders, and be prohibitively expensive. Particular controversy surrounds a proposed tunnel through historic Hingham Square that was added to the project to reduce the impact of the trains at a projected cost of $40 million. Even with the tunnel and mitigation measures demanded by other towns, continued opposition of local residents could delay the project, which would translate into even higher costs.

Like all of the expansion projects facing the T, completing Greenbush would add to the T's debt burden when the T needs to reduce its debt, redirect limited capital funds from maintenance and modernization projects when the T needs more than ever to reinvest in existing infrastructure, and add to operating deficits when the T is struggling to gain control over costs.

Arborway Replacement Service Another Central Artery mitigation requirement is the restoration of trolley service on the Arborway branch of the Green Line between Heath Street and Forest Hills Station. A 2001 MBTA study concluded that 60-foot compressed natural gas (CNG) buses would be a better option than restoring the trolley service that was suspended in 1985. Both would meet environmental targets and ridership was projected to be equal. But the study found that the CNG buses would be more cost effective, result in the loss of fewer parking spaces, and provide greater flexibility in terms of easing traffic congestion and allowing for passage by emergency vehicles.

However, the Central Artery mitigation agreement requires that trolley service be restored unless the Massachusetts Department of Environmental Protection deems it "infeasible," and in November 2001, DEP ruled that the MBTA had not proven that trolleys would be infeasible and ordered restoration of the service.

The MBTA estimated the total cost of introducing CNG bus service along the Arborway Line would be just over $24 million. Vehicle procurement would cost just under $18

million and the balance would fund infrastructure improvements to accommodate the new vehicles. The estimate for restoring trolley service is about $77 million: $46 million for vehicles and $31 million for infrastructure improvements, though T officials say it is likely to cost $85 million. The current capital plan includes only $10 million for capital improvements along the Arborway Line. The restored trolley service will also increase operating costs.

Silver Line Phase II The final stage of the Silver Line calls for connecting the Washington Street replacement service and the South Boston Piers Transitway, both currently under construction, with a tunnel between New England Medical Center and South Station via the Boylston Green Line station. The MBTA estimates phase II would cost an additional $600 to $800 million, but only $43 million for phase II planning is included in the current capital plan. The Artery mitigation agreement requires the T to complete a preliminary design by 2004, to make every effort to secure federal funds for the project, and to complete construction by 2010 if sufficient federal aid is available. If federal support is not adequate to complete the project, the T is required to spend amounts equal to the state's share of the tunnel's cost—at least 20 percent of the total—on other projects that improve transit access to the South Boston waterfront.

Green Line Extension to Somerville The Artery mitigation agreement also requires the MBTA to extend the Green Line north from Lechmere to the vicinity of Tufts University in Somerville by 2011, which would also require relocating the current Lechmere Station. The most recent cost estimate for this expansion is $375 million, but that dates back to 1993 and T officials believe actual costs would be significantly higher. With no planning efforts currently under way and none funded in the capital plan, the T would need to move very quickly to meet the deadline.

Blue Line Extension to Red Line Among the expansion projects that are not funded in the current capital plan but mandated by the Central Artery mitigation agreement is the extension of the Blue Line from Bowdoin to meet the Red Line at Charles/MGH. The goal of the Red Line/Blue Line connection is to provide access to Logan Airport from the Red Line. Since the Silver Line would do that by providing access from the Red Line at South Station, the T is attempting to substitute that less expensive option for the Blue Line-Red Line connection, the cost of which was estimated at $220 million almost a decade ago. An updated estimate would be substantially higher, according to T officials.

Proposed New Bedford/Fall River Commuter Rail Extension The MBTA currently estimates that it would cost around $610 million to extend commuter rail service to New Bedford and Fall River, but the T's 2002-2006 capital plan allocates only $27 million to the project. With the T planning to reduce its annual capital budget over the next decade, New Bedford/Fall River will have to compete with enormous maintenance needs and legally mandated projects for pieces of a shrinking pie.

Plans to build the extension are in the preliminary design phase. Adding to the complexity and uncertainty of the project is the fact that much of the existing infrastructure in need of upgrading is owned by the CSX Railroad. Until now, CSX and the T have been unable to hammer out the agreements that would be necessary to move forward with the infrastructure upgrades.

The proposed line would extend the current Stoughton Branch of the Attleboro line, splitting south of Taunton to provide service to both New Bedford and Fall River. Five train sets would need to be purchased to operate 16 daily round trips each to New Bedford and Fall River, as well as four trips each day that would terminate at an intermediate point.

According to MBTA projections, the 47-mile extension (about 34.5 miles to New Bedford, with 12.5 miles of track branching off to Fall River) would attract 8,560 riders each weekday, 69 percent of whom would be new transit riders. But it would also have the highest capital costs of any of the six options the T examined for providing the service, due to the need for extensive track reconstruction.

Three current commuter rail lines—Attleboro/ Stoughton, Worcester, and Fitchburg—are roughly the same length as the proposed New Bedford/ Fall River line. As Table 8 shows, Attleboro/ Stoughton has almost three times the ridership projected for New Bedford /Fall River. The Worcester line currently has about twice the number of riders anticipated for this proposed line, even though three stations along the route are not completed. Even the Fitchburg line, with far fewer riders than Attleboro or Worcester, has about five percent more passengers than forecast for New Bedford/Fall River.

Table 8

Average Weekday Ridership on Commuter Rail Lines

Line	Miles	Ridership
Attleboro/Stoughton	44.5	24,895
Framingham/Worcester	44.7	15,606
Fitchburg	49.6	9,022
New Bedford/Fall River (projected)	47.0	8,560

Source: MBTA

Even if the proposed line were to attract as many riders as predicted, the combination of route length and comparatively low ridership would make it a very expensive line to operate. The MBTA estimates that operating the line would add about $18 million to annual expenses. When debt service costs are included, the increase in annual costs rises to approximately $70 million. The MBTA projects that fare box revenues would recover only 37 percent of the cost of operating the line (excluding debt service), slightly less than the T's 39 percent average for commuter rail service.

Urban Ring Another of the Central Artery mitigation requirements is to study the feasibility of building an Urban Ring—a combination of rail and bus rapid transit that would surround downtown Boston, traveling through Cambridge, Somerville, Everett, Chelsea and several Boston neighborhoods. The Urban Ring represents an effort to adapt a system built for another time to 21st century demographics. Population and employment outside the urban core have grown dramatically in recent years, and the trend is expected to continue. But because of the "hub and spoke" structure of the region's transit system, commuters who neither live nor work in downtown Boston usually have to take a bus or subway into the city to connect with the transit that takes them to their ultimate destination. The Urban Ring would change that.

A major investment study of the Urban Ring was completed on July 31, 2001 and the project has moved into state and federal environmental review. The MIS recommends construction of the Urban Ring in three phases, over a 15-year period, at a projected cost of $2 billion. The first and least ambitious phase would entail creation of 12 new crosstown and two new express bus routes within five years, at a cost of $100 million.

In the second phase, 20 miles of bus rapid transit lines would be built, half of which would operate in dedicated busways. Bus rapid transit is high-tech bus service that includes features like increased passenger capacity, low-floor design, low emission propulsion systems, and faster boarding and fare collection. Phase two would be completed within ten years at an anticipated cost of $500 million.

Phase three, the rail piece, is by far the most ambitious part of the plan. It provides two alternatives for service between the Green Line extension and Dudley Station in Roxbury. Alternative A is an all-subway option along the most direct route with the fewest stops. Alternative B combines subway with trolley service, reducing the need for expensive tunneling. It is slightly longer and would require construction of more stations and grade crossings.

Phase three would be completed within 15 years, at a cost of at least $1.2 billion. This assumes completion of the currently unfunded Green Line extension to Somerville that was described earlier.

As always, the projected $2 billion in construction costs is only part of the picture. The MBTA estimates the Urban Ring would add between $15 and $46 million to annual operating costs, depending on the form it would ultimately take.

Nonetheless, the MBTA estimates that the Urban Ring would carry almost 300,000 riders per day, and luring those riders from other overtaxed modes of mass transit would be beneficial. By 2010, the T anticipates the Urban Ring would decrease local bus ridership by 24,550. Without the project, the T projects that peak ridership on parts of the four current subway lines would be well beyond capacity, with some stretches exceeding

capacity by more than 30 percent. With the Urban Ring, ridership is expected to remain at or below capacity.

Fairness is also a consideration. About 60 percent of both 1990s and currently funded expansions are commuter rail projects, viewed by many as benefiting mostly suburban residents. The Urban Ring would represent a major investment in Boston and other urban neighborhoods.

However, these facts cannot change the fiscal realities described throughout this paper. The brunt of this estimated $2 billion project would be undertaken when the MBTA's capital budget is expected to be half of current spending and half of what an internal study concluded would be necessary just to maintain the current system. The T has not identified funding for the additional conceptual, environmental and design studies that would be required, not to mention construction costs. It is unlikely that large amounts of federal money will be available for the project in the wake of the Central Artery project.

North-South Rail Link Achieving continuous interstate and commuter rail travel between points north and south of Boston has long been a major goal of rail transportation advocates. The North-South rail link would accomplish that objective by constructing a three-mile tunnel connecting North and South stations. Commuter rail routes that currently terminate at one of the two stations would be linked to points on the opposite side. Amtrak's Northeast Corridor would be extended through Boston, allowing uninterrupted service from Washington to Portland.

Nevertheless, the T has made it clear that the tunnel options are beyond its capacity to fund without new sources of capital dollars. The alternatives range from a single, two-track tunnel with two stops (North and South stations) to a two-tunnel, four-track option with a third stop in between. Each of these plans would require the construction of new underground stations. Cost estimates for these options range from $3.9 to $6.2 billion, including additional commuter rail trains. Operating costs would increase by $5.3 to $6.4 million annually.

The MBTA is currently exploring several less expensive options for connecting North and South stations, including running shuttle buses between the two and increasing the frequency of Orange Line service between Back Bay and North Station. These options would not achieve the goal of facilitating uninterrupted rail service between points north and south of Boston, but would, for example, make it easier for a commuter rail passenger traveling into North Station to get to South Station and points on the south side of downtown. Using the enhanced Orange Line service, a commuter rail passenger arriving in Boston from the south could get off at Back Bay and be at North Station within a few minutes. A 1999 feasibility study estimated that construction costs for the shuttle and Orange Line options would range from $8.6 million to $225 million. Although it would involve lower capital costs than a new rail tunnel, increasing Orange Line frequency would

result in an even steeper rise in annual operating costs—an estimated $8.2 million in 1998 dollars.

North Shore Blue Line Extension The Authority is currently engaged in a federally funded study of possible North Shore transit improvements, including an extension of the Blue Line to Central Square in Lynn. Cost estimates prepared in 1995 ranged from $173 million to $281 million, depending on the route. Less costly options under consideration include improvements to the Rockport/Newburyport commuter rail line and a connection between the subway and commuter rail to facilitate transfers between the two lines.

Other Commuter Rail Extensions The completion of commuter rail extensions to the South Shore, Worcester and Newburyport in the last few years has sparked a flood of proposals for additional system expansion. The Legislature required the MBTA to prepare feasibility studies for several of these projects in an MBTA bond bill passed in 2000 just prior to the advent of forward funding:

- Fitchburg to Gardner and Athol
- Haverhill to Reading
- Lawrence to Methuen
- Worcester to Providence
- Worcester to Webster
- South Shore to Cape Cod

Several other commuter rail extensions were proposed and examined by the MBTA in its 1993 Program for Mass Transportation. The capital cost for each of these projects was estimated to be between $65 and $75 million; their costs today would be much higher:

- Worcester to Marlborough
- Needham to Millis
- Franklin to Milford
- Lowell to Nashua, New Hampshire
- Haverhill to Plaistow, New Hampshire

While none of these projects is currently under development, they illustrate the incessant pressure the T feels to keep expanding at any cost.

* * *

The T's expansion plans place the Authority on a collision course with fiscal reality. The previous chapter presented an assortment of fiscal constraints—finite revenue sources, a

heavy debt burden and high costs—that combine to substantially limit the amount of capital spending the T can afford. A host of pressing needs to invest in the existing system spelled out in this chapter—repairing and replacing basic infrastructure, increasing the capacity of existing lines, and implementing automated fare collection and other customer service improvements—will require all of the resources the T is likely to muster and then some for at least the next decade. Neglecting these needs would lead to continued deterioration of the system, inferior services, and increasing difficulty attracting and retaining riders.

But at the same time, the T is under the gun to complete a long list of new routes and connections costing $5 billion or more. The T cannot do both under its new fiscal structure. The result would be an increasingly unbearable debt burden, escalating operating deficits, growing pressure on the Commonwealth to increase subsidies, and, inevitably, the failure of forward funding. The conclusion detailed in the next chapter is inescapable: with maintenance and modernization having first claim on capital resources, the T cannot afford further expansion.

HOW MUCH CAPITAL SPENDING CAN THE T AFFORD?

In its capital plan, the MBTA attempts to meet many of the spending demands while living within its fiscal constraints. Those constraints are real. The fixed revenue sources that replaced open-ended state subsidies under forward funding, together with the heavy debt burden and high operating costs that are the lingering after-effects of the old financial system, place limits on the amount of bonds the T can issue and on the size of operating surpluses the T can generate to support capital spending. The purpose of this chapter is to quantify the T's financial capacity and assess the Authority's ability to meet the demand for a long list of capital projects.

Factors Driving Capital Funding The funding available for capital projects depends on several factors. Because the majority of capital spending is financed with bonds, the rate at which the T issues debt has the most direct impact on funding levels. In order to reduce its heavy debt service costs, the T plans to sharply scale back debt issues over the next decade and expects to offset part of the reduction in capital funding with surplus funds from its operating budget. Whether these surpluses—projected to total $190 million over ten years—materialize will, in turn, largely depend on four other factors: the future growth in the sales tax, ridership expansion, the implementation of fare increases, and the success of the T's efforts to control operating costs. The level of federal funding, which is expected to cover about 40 percent of the T's capital spending, is also a major influence on the size of the capital program. Of these factors, only sales tax growth is completely outside of the T's control; the amount of debt issued, fare increases and operating cost savings are the subject of T policy and management decisions. The T can exert some influence on ridership through service quality improvements and marketing, and on federal funding through lobbying efforts.

The T's long-range financial plan makes a series of assumptions about these factors to project the Authority's capacity for capital spending. The assumptions about two of the key factors—the rate at which the T will issue debt and the rate of growth in sales tax—are conservative, holding out the possibility that the T could have more money than it expects to spend on capital projects. On the other hand, the assumptions regarding two other factors—that fares will be increased twice in the next five years and that operating costs will be steadily reduced over the same period—will be more difficult to realize, presenting a real risk that the T's capital funds will come up short.

Debt Issuance In order to reduce its staggering debt burden—approaching $4 billion—the T's finance plan calls for dramatic reductions in bond issues over the next several years, from roughly $300 million per year now to about $50 million annually starting in 2010. The T could finance more capital projects by scaling back debt issuance more gradually but at the cost of increased outstanding debt and higher debt service costs.

Sales Tax Growth The finance plan assumes only the minimum level of sales tax growth guaranteed under the forward funding legislation, 3.0 percent per year. While sales taxes may not increase faster than that during the current economic recession, growth is likely to exceed the forecast in the long term. Sales tax growth averaged 7.3 percent annually over the last decade and 5.3 percent since 1989, a period which includes the recession of the early 1990s. Sales tax revenues also increased 5.3 percent in 2001, the year in which the recent economic boom ended and the current slowdown began. Sales tax growth above 3.0 percent should increase the size of future operating surpluses available for pay-as-you-go spending on capital projects.

Fare Increases The finance plan assumes that the T will raise fares by about ten percent in 2003, increasing annual revenues by about $25 million, and by another ten percent in 2005. Failure to implement the fare hikes would reduce the likelihood of budget surpluses to support capital spending. However, the size of the 2001 budget surplus ($53 million) prompted officials to argue that further fare increases are not needed and should not be imposed.

Operating Cost Savings The finance plan also makes aggressive projections of cost savings: two percent reductions in base costs every year through 2006.[8] Given that the T has made little headway in its efforts to control the personnel and contract costs that account for most operating spending, the Authority is likely to find it difficult to achieve its cost-cutting goals, which would reduce any future surpluses and, thus, capital funding.

The T's assumptions about the two other key factors that will determine capital spending levels—federal funding and ridership growth—are neither particularly conservative nor aggressive.

Federal Funding Federal funds are expected to cover over 40 percent of capital costs, but the vagaries of the Congressional authorization and appropriation processes make the amount of future federal aid difficult to predict. An earmark for a major construction project like the second phase of the Silver Line could cause wide swings in the amount of future support. The T's forecast of federal funds averaging about $200 million annually over the next ten years is close to what the Authority currently receives and appears to be a reasonable estimate.

Ridership Growth in ridership, together with fare increases, drives the level of fare revenues and operating surpluses. The finance plan assumes two percent annual growth in ridership in years without fare increases and no growth in years with fare increases. While ridership has risen by about 3.5 percent per year for the last decade, some of that growth

[8] The projected reduction is applied to the T's operating budget before collective bargaining and other inflationary increases are added in. Therefore, the reductions would not result in actual declines in the budget's bottom line, but instead will offset cost increases and slow the rate of budget growth.

was due to the rapid expansion the T underwent during this period, making two percent a reasonable expectation for the long term.

Capital Funding Projections How much capital spending can the T afford? The level of funding will depend on all six of the factors described above: debt issuance, sales tax growth, fare increases, cost savings, federal support and ridership growth. Of these, the two factors for which the T has made conservative assumptions—debt issuance and sales tax growth—and the two factors where the T is more aggressive—fare increases and cost savings—are the sources of the greatest potential gains and risks. If the T cuts back on borrowing more slowly than it currently plans or if sales taxes perform better than the three percent minimum, the Authority would be able to finance more capital projects. If the T foregoes fare increases or is unable to achieve cost savings in the plan, the budget surpluses that the T intends to use to supplement capital funds could evaporate.

To estimate the range of likely capital funding levels, we have considered alternatives to the T's assumptions for these four key variables and developed three alternative projections of the T's financial capacity over the next ten years. The MBTA Plan is based on the projections of capital funds in the T's long-range financial plan. The Best Case combines more favorable assumptions to estimate how much additional capital resources the T might have. The Worst Case combines the least favorable assumptions to assess the magnitude of possible capital funding shortfalls. More specifically:

- The MBTA Plan assumes the rapid reduction in bond issues from $300 million to $50 million per year by 2010, three percent annual sales tax growth, fare increases in 2003 and 2005, and the two percent annual operating cost savings as described above. Using the T's own numbers allows us to evaluate the Authority's ability to meet its capital needs under its own assumptions and provides a baseline for comparing the other two scenarios.

- This Best Case assumes that the T will phase out debt issuance more slowly than in the financial plan—to $150 million per year by 2010 rather than $50 million—and that sales taxes will grow faster than the 3.0 percent floor after the current recession ends—by 4.5 percent in 2003 and by 5.5 percent each year thereafter. At the same time, the scenario optimistically assumes that the T implements the fare increases and achieves the operating savings included in the plan.

- The Worst Case uses the T's conservative projections of bond issues (declining to $50 million per year) and sales taxes (three percent growth every year) but assumes that the T elects not to implement the fare increases in 2003 or 2005 and fails to realize the two percent annual operating savings in its plan.

The T's projections regarding federal funding and ridership growth, discussed above, were incorporated in each scenario. The assumptions used in each scenario are summarized in Table 9.

Table 9

Scenario Assumptions

Factor	MBTA Plan	Best Case	Worst Case
Annual Debt Issuance	Rapid phase-down to $52M by 2010	Slower phase-down to $152M by 2010	Same as MBTA Plan
Sales Tax Growth	3.0% per year	3.0% in 2002, 4.5% in 2003, 5.5% thereafter	Same as MBTA Plan
Fare Increases	10% in both 2003 and 2005	Same as MBTA Plan	No fare increases
Cost Savings	2% per year	Same as MBTA Plan	No cost savings
Federal Funding	Average of $200M per year	Same as MBTA Plan	Same as MBTA Plan
Ridership Growth	2% increases in years without fare increases and 0% in years with fare increases	Same as MBTA Plan	Same as MBTA Plan

The differences in these assumptions result in dramatic differences in the T's projected fiscal capacity. The MBTA plan would provide $3.8 billion for capital projects over the next ten years. Compared to the MBTA plan, the Best Case results in $1.4 billion in additional capital resources—$560 million from additional bonds and $880 million from stronger sales tax growth—for a total of $5.2 billion. Under the Worst Case, the failure to implement fare increases and cost savings would reduce revenues and increase costs by a total of $950 million, eliminating the $190 million in operating surpluses the T is counting on to support capital spending. Worse yet, the T would experience operating budget deficits totaling $760 million over the decade, bankrupting the Authority and eliminating its ability to sell bonds and finance any capital program.

The amount of funding for capital generated under each scenario—and the operating deficit in the worst case scenario—is summarized in Table 10.

Table 10

Total Capital Funding

($ billions)

	Funding Scenario			
	MBTA Plan	**Best Case**	**Worst Case**	
				Operating Deficit
2002 to 2006	$2.4	$2.7	$2.3	($0.3)
2007 to 2011	1.4	2.6	1.3	(0.5)
Total	$3.8	$5.2	$3.6	($0.8)

Expansion vs. Maintenance and Modernization How well would these funding levels provide for the T's capital needs? As we have seen, the T is under enormous pressure on multiple fronts—to continue the rapid expansion of the last decade, to repair and replace aging infrastructure, and to improve customer service with modernized facilities—with many of these projects legally required under the Artery mitigation agreement.

A host of costly new rail lines, ranging from the New Bedford/Fall River commuter rail extension to the Urban Ring, are in the queue for funding. Even if the most improbable projects are excluded, completing the expansion projects on the T's plate would cost at least $5 billion. Of this long list, only two are funded in the T's capital plan: the first phase of the Silver Line, which is currently under way, and the Greenbush commuter rail extension, which is in the final stages of planning and about to begin design and construction.

At the same time, the Authority faces an enormous backlog of maintenance and modernization needs to keep the system running, increase capacity and improve customer service. Working through the backlog and keeping up with annual maintenance needs would cost $8.2 billion over ten years according to the T's State of Good Repair (SGR) report. Given that the T's capital plan includes only $1.7 billion for non-expansion projects in the next five years, the SGR goals will be next to impossible to achieve. A massive renovation of the Blue Line and replacement of vehicles, track and other facilities account for most of the planned spending.

The centerpiece of the T's modernization efforts is a new automated fare collection system which is budgeted at $120 million. The long-awaited AFC system is a critical element in the T's plan to improve customer service, increase ridership and revenues, and reduce

operating costs, and was recommended by the Blue Ribbon Committee on Forward Funding as the highest priority for the T's capital program.

Adding to the pressure, the Central Artery mitigation agreement requires the T to complete many of the proposed projects in both the expansion and modernization categories—including the Silver Line, Greenbush and the Blue Line overhaul—with a total cost of at least $3 billion. Even though 60 percent of the spending in the capital plan goes toward mitigation requirements, the plan will address less than half of the $3 billion total.

Comparing the total cost of these projects—at least $13 billion—to the capital funding levels projected above makes it clear that the T cannot afford all of this capital spending within the next decade. Even under the best-case funding scenario, revenues would amount to only 40 percent of the total costs. Under the T's planning assumptions, revenues would cover less than 30 percent of the total.

The T will clearly have to set priorities, pick the most critical projects and accept the tradeoffs. The T—and the Commonwealth—will have to determine:

- How much, if anything, can the T afford to spend on expansion?
- Will the T be able to sufficiently maintain and modernize its existing system?
- Can the T afford to meet the Central Artery mitigation requirements within its fiscal constraints?
- What fiscal reforms can the T undertake to enhance its ability to support its capital program?

There are two critical variables that together will determine the answers to these questions: the amount of funding available for capital projects and the level of spending required to maintain and modernize the existing system. Earlier we examined the factors that drive the T's capital resources and developed three alternative projections of funding levels over the next ten years, the MBTA Plan, Best Case and Worst Case.

With little consensus on how much the Authority needs to spend, there is a wide variation in potential spending on maintenance and modernization. In order to focus the discussion on a reasonable range of scenarios, we used three alternative levels of spending. We considered the recommendations of the State of Good Repair study—$8 billion over ten years—to be the ideal program, i.e., the maximum amount the T might spend. On the other hand, given the huge disparity between the SGR goals and the spending levels in the T's capital plan, we believe the capital plan represents the absolute minimum level of effort on maintenance and modernization. To bridge this enormous gap, we also used a middle level of spending in our projections, as follows:

- Low spending—the amount of non-expansion spending in the T's capital plan from 2002 to 2006—an average of $350 million per year—and a minimal $200 million per year from 2007 to 2011;
- Moderate spending—$500 million per year, equivalent to the amount of annual infrastructure needs identified in the SGR report without addressing the deferred maintenance backlog; and
- High spending—the ideal program—the full $824 million per year called for in the SGR report.

In order to assess the Authority's ability to address competing priorities while living within its fiscal constraints—and the extent of the tradeoffs—we compared the three funding projections with the three levels of spending on maintenance and modernization to estimate how much, if anything, the T could afford to spend on expansion.

In each of our projections of the amounts available for expansion projects, we assumed that the T would spend the $344 million it has budgeted to finish the first phase—the South Boston and Washington Street legs—of the Silver Line.[9] With the new route more than half complete, it would make no sense to halt the project at this point.

The results of each scenario are summarized in Table 11. Positive results indicate that under the assumptions of that scenario, revenues would be adequate to cover the projected maintenance and modernization spending, the Silver Line and administrative costs with funds left over for other expansion projects. Negative numbers indicate the T would face a capital funding shortfall and would be unable to cover all of the projected maintenance and modernization spending, with no funds available for expansion.

[9] We also assumed that capital program administrative costs averaging about $11 million per year would come off the top of the T's capital funding under each scenario.

Table 11

Capital Funding for Expansion, 2002 to 2011

($ billions)

Spending on Maintenance & Modernization	Funding Scenario		
	MBTA Plan	Best Case	Worst Case*
Low Spending			
Total Capital Funding	$3.8	$5.2	$3.6
Maintenance & Modernization	- 2.8	- 2.8	- 2.8
Silver Line & Administration	- 0.5	- 0.5	- 0.5
Available for Other Expansion	$0.6	$2.0	$0.4
Moderate Spending			
Total Capital Funding	$3.8	$5.2	$3.6
Maintenance & Modernization	- 5.0	- 5.0	- 5.0
Silver Line & Administration	-0.5	-0.5	-0.5
Available for Other Expansion	($1.7)	($0.2)	($1.8)
High Spending			
Total Capital Funding	$3.8	$5.2	$3.6
Maintenance & Modernization	- 8.2	- 8.2	- 8.2
Silver Line & Administration	- 0.5	- 0.5	- 0.5
Available for Other Expansion	($4.9)	($3.4)	($5.1)

* The T would also face operating deficits under the worst case funding scenario.

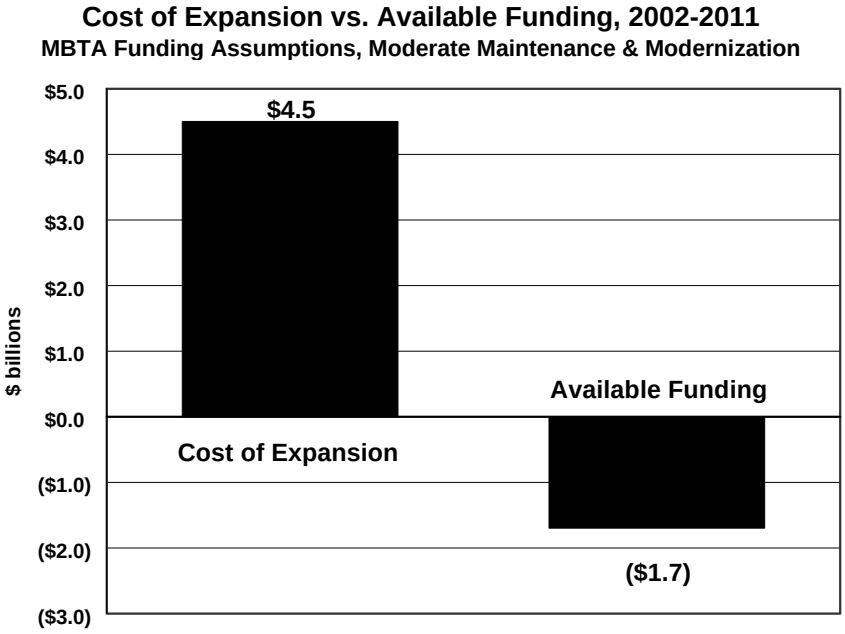
AT THE JUNCTION

Conclusions

The financial projections laid out in the previous chapter, together with the analysis of the T's capital resources and needs presented in this report, lead to several major conclusions.

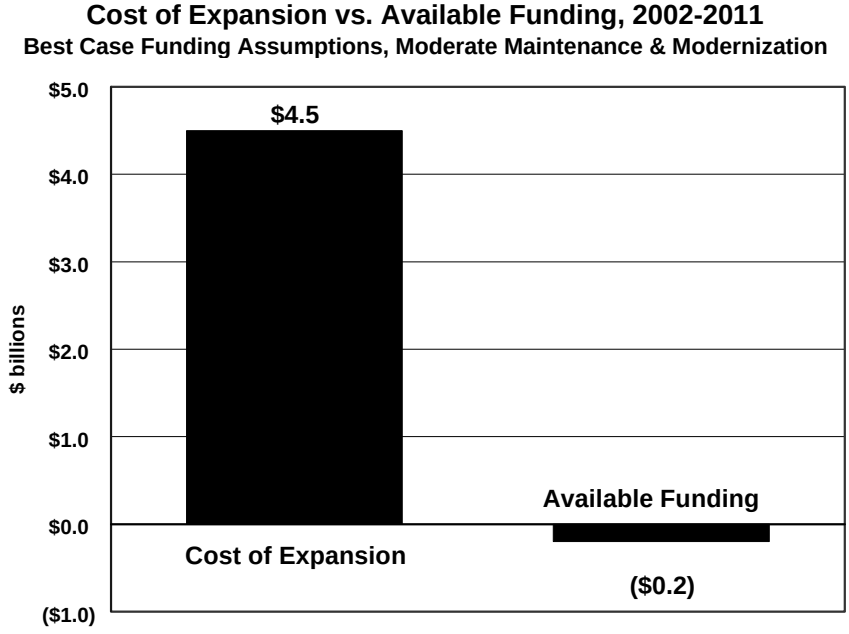
Expansion The only way the T can pay for expansion projects is by failing to fund adequately maintenance and modernization of the current system. The various scenarios illustrate the T's fiscal realities.

Figure 12



Using the T's funding assumptions regarding debt issuance, sales tax growth, fare increases and operating costs—and allowing for $500 million in annual maintenance and modernization spending—well below the $800 million recommended in the State of Good Repair report—leaves the T with a $1.7 billion capital funding shortfall over the next ten years. At the same time, the highest priority expansion projects would cost at least $4.5 billion to build (see Figure 12).

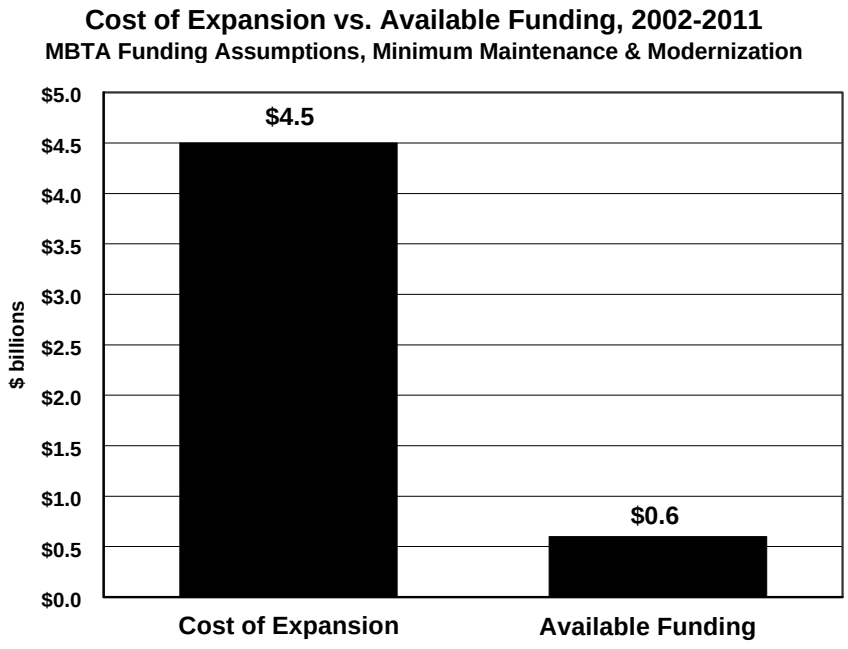
Figure 13



Suppose we believe that the T's funding assumptions are conservative and we use the best case funding projections—the same fare increases and cost reductions but a slower decline in debt issuance to $152 million and stronger sales tax growth (5.5 percent after the current recession ends)—and with the same moderate level of maintenance and modernization spending used above. In this optimistic scenario, the capital budget is nearly balanced—a funding shortfall of about $200 million over ten years (see Figure 13). In other words, the T can afford a reasonable level of effort to sustain the current system only if the Authority elects to add even more to its already high debt burden, the sales tax returns to historic growth rates and the T foregoes any expansion projects other than the first phase of the Silver Line.

Is there any scenario under which the T can afford new expansion projects? The T's own funding assumptions coupled with planned spending on maintenance and modernization of $350 million per year between 2002 and 2006 and a minimal $200 million per year from 2007 to 2011 produces $600 million for expansion projects over the next ten years (see Figure 14). This would barely be enough to fund Greenbush. In other words, the T can afford Greenbush—and nothing else—only if it continues inadequate levels of spending on the current system.[10]

Figure 14



The only scenario that leaves a substantial amount for expansion—the combination of best case revenues and low spending on maintenance and modernization—assumes continued heavy borrowing, strong sales tax growth, unpopular fare increases, difficult-to-achieve cost savings, and continued neglect of the existing system. Even then, the amount of

[10] Even these assumptions overstate the T's ability to finance Greenbush. Of the $600 million for expansion over the next ten years, only $200 million of those funds would be available between 2002 and 2006; the rest would be generated between 2007 and 2011. Therefore, spending $400 million on Greenbush within the next five years as budgeted in the capital plan would require deferring or canceling $200 million in other projects.

funding for expansion over the next ten years, $2 billion, is less than half of the $4.5 billion cost of the proposed expansion projects.

On the other hand, under the worst case funding scenario—the rapid debt reduction and minimum sales tax growth assumed by the T, but with no fare increases and no cost savings—the T could not afford any expansion project no matter how little it spent on maintenance and modernization.

This is not a problem that can be solved simply by deferring one of the more remote megaprojects like the Urban Ring or the Green Line extension. Just completing Greenbush, the next expansion project in line for funding, would require the T to continue to shortchange the existing system and would take all of the T's expansion funds for the next ten years.

The T cannot borrow its way out of this dilemma. In order to reduce its crushing debt burden, the Authority plans to reduce steadily capital borrowing in the coming years, reaching just half of current levels by 2005. If the T pursues the expansion plans, bond-funded spending would ramp up just as the T was trying to cut back on capital outlays. Failure to reduce the T's reliance on debt financing would mean ever larger portions of each dollar would be consumed for debt service before a penny of it was used to provide transit services, and within a few years the T would be left with insufficient funds to operate the system.

An infusion of federal funds to relieve the pressure on the T's capital finances is possible but not likely. Building support for transportation megaprojects in Massachusetts will be especially difficult in the wake of the Central Artery cost increases. Even the constant level of federal funding the T is counting on, while a reasonable planning assumption, is far from certain.

The true price of expansion is not limited to capital costs. Revenues from new lines do not come close to covering operating costs, much less paying for construction. With revenue recovery rates around 40 percent, new expansion projects would increase annual operating deficits by tens of millions, cutting into surpluses that the T is counting on to finance future capital spending and undermining the T's ability to achieve fiscal stability.

Maintenance and Modernization Despite its crucial importance to building ridership and maintaining the safety and reliability of the system, the T would be hard pressed to keep up with necessary investments in maintenance and modernization even if the Authority had no expansion projects competing for its limited resources. The T's State of Good Repair study found that after years of underfunding of maintenance, annual expenditures equal to the entire current capital budget—about $500 million per year—are needed just to maintain the status quo. Another $300 million per year for ten years—$3 billion in total—is needed to address the T's enormous backlog of deferred maintenance.

As part of its long-term strategy to shift from bond financing to pay-as-you-go funding, the T will be trying to reduce its capital budget to a level—$250 million per year—that is just half of what would be required to fund annual repair and replacement needs alone. Our financial projections demonstrate that the T can afford the $500 million in annual costs only under the most optimistic revenue scenario and only if it foregoes all of the proposed expansion projects. Under no funding scenario does the T even come close to having the $800 million per year required to meet the annual need and work through the backlog of projects over ten years, as the SGR report recommended. Meeting the study's targets would cost more than twice the T's total anticipated capital spending for the decade, and the T would face massive capital budget shortfalls under any of the funding scenarios.

In its capital plan, the T plans to spend an average of $350 million per year over the next five years on maintenance and modernization projects. At this level of spending, the repair and replacement backlog will continue to grow, reaching nearly $4 billion by 2006, despite dedicating almost 70 percent of its capital resources (under the MBTA Plan) to the existing system. Even this inadequate level of maintenance and modernization spending is in doubt if any expansion project other than the Silver Line and Greenbush is built in the next ten years.

Failing to make necessary investments in the current system, the T will only fall farther behind in its efforts to achieve a state of good repair. Projects already included in the capital plan will be deferred. For example, the T recently announced that the renovation of several Blue Line stations would be delayed from 2004 to 2008 due to fiscal constraints.[11] Projects not yet included in the plan, such as commuter rail vehicle replacements, track repair and others listed in the Appendix, will continue to languish on the waiting list for funds.

Even the planned level of maintenance and modernization spending, inadequate as it may be, is likely to be overstated. The T spent an average of almost 40 percent less on capital projects than it had planned between 1999 and 2001 and, as a result, made less progress towards meeting the state of good repair goals than previous capital plans would suggest. If this pattern of underspending continues in the future, the condition of the system will continue to deteriorate. Such underfunding cannot continue indefinitely without threatening the safety and integrity of the T's services.

The underspending relative to the capital plan does not mean more money is available for expansion projects. The T still has to complete the maintenance and modernization projects that were in its plan. If the T were to redirect unspent capital funds to expansion projects, it would have even less money for the existing system.

[11] Work on one of the stations, Maverick, was later accelerated in response to community pressure.

Artery Commitments The T cannot meet the Artery commitments within its fiscal constraints. With the T struggling to finance maintenance and modernization needs before even considering expansion projects, the expectation that the T will be able to meet roughly $3 billion in Central Artery mitigation commitments by relying on its own capital resources is clearly unrealistic. Attempting to finance the commitments would consume nearly all of the T's capital funds under all but the best case scenario, leaving almost nothing for other projects. If the T chose to meet the Artery requirements, no funding would be left for other expansion plans, such as the Urban Ring and New Bedford/Fall River, or critical maintenance and modernization projects such as automated fare collection and track maintenance.

Roughly three-quarters of the remaining cost of the commitments is directed to expansion. Nearly all of the expansion projects in the T's capital plan—including the first phase of the Silver Line and Greenbush—are legal commitments, as are the second phase of the Silver Line, the Green Line extension and the Blue Line-Red Line connection. As we have seen, the T cannot afford the expansion projects on its plate—Artery commitments or not—without continuing to underfund maintenance of the existing system.

The non-expansion Artery commitments, such as the Blue Line Modernization project and the replacement of the diesel bus fleet, are not the issue. These are projects the T should—and probably would—have undertaken anyway as part of efforts to renovate the existing system. The T would clearly need to complete these and other maintenance and modernization projects even if they were not legally mandated by the mitigation agreement.

Operating Revenues and Costs Increasing revenues and cutting costs are critical. The financial projections clearly demonstrate the importance of the fare increases and cost savings included in the T's finance plan. Failure to implement either of these steps would not only eliminate the budget surpluses the T is counting on to supplant bond funds in the capital program—$190 million over the next ten years—but would cause substantial operating deficits as well. Foregoing both—the worst case funding scenario—would cause staggering budget shortfalls—$760 million over the decade—in addition to eliminating operating surpluses for the capital program. Not only would the T be unable to issue bonds to finance capital improvements, it would need to cut back drastically on services just to stay afloat.

Recommendations

Forward funding is bringing accountability to a system that historically had none, but the old rules die hard. The T is still expected to meet all of the demands for new lines and services even though the Authority no longer has unlimited access to Commonwealth support. Expensive expansion projects with serious long-term consequences for the T's

budget are advanced under the assumption that the money to pay for them will somehow appear.

There is no way the T can meet these demands while living within its fiscal constraints. The Authority's restricted revenues, heavy debt load and high costs put real limits on its ability to finance its capital needs. Without sufficient resources to go around, difficult choices must be made and tradeoffs have to be accepted. If the T is to achieve the primary purposes of forward funding—improved services and strengthened finances—it must weigh the cost of continued expansion against the need to address the massive backlog of maintenance and modernization projects for the current system.

The financial projections presented above dramatically illustrate the difficult choices the MBTA faces. Under no scenario does the T have enough capital resources to move the system toward a state of good repair while continuing to spend on expansion, even with generous assumptions about available revenues.

Maintenance and Modernization Maintenance and modernization clearly needs to be the T's highest priority. Sustaining and improving the existing system has always been one of the key objectives of forward funding. The legislation that recreated the T under forward funding specifies that keeping up the current system and reducing the backlog of deferred maintenance is a top priority in the T's capital planning. The Blue Ribbon Committee went even further, recommending that the T make maintenance and modernization its core priority, with automated fare collection as the most critical project.

The promise of forward funding was a better system for the T's riders. The T has to make major investments to keep the current system running, increase capacity, improve customer service and cut costs. Improvements like the new automated fare collection system are critical to enhancing the performance of the system and completing reforms of the T's finances.

Failure to invest in maintenance and modernization would result in continuing deterioration of the system, which would have a domino-like effect on the T. The quality of services and, most importantly, public safety, would be eroded, threatening the Authority's impressive record of increasing ridership—and fare revenues. Without necessary investments in improving service, the periodic fare increases that are critical to the T's ongoing fiscal health would be difficult to justify. Opportunities to reduce costs would be missed and deficits would continue to climb. The operating surpluses that the T is counting on to support its capital plan would not materialize and capital finances would grow even tighter.

Many years of growing faster than any other major American transit authority have increased MBTA ridership and provided important economic and environmental benefits. But aggressive expansion has also resulted in massive debt and a huge backlog of maintenance needs. Simply meeting the essential requirements for the capital

program—sustaining basic operations by maintaining and repairing current infrastructure, increasing capacity by relieving bottlenecks in the present system, and implementing automated fare collection and other service improvements —will consume all of the T's capital resources, even before considering the costs of further system expansion.

Expansion Continued expansion of the T promises a host of transportation, economic and environmental benefits. Extending the reach of the T's services is—and should remain—a major focus of the state's transportation planning and capital spending. But the T cannot afford to build the proposed expansion projects without sacrificing critical maintenance and modernization efforts on the existing system or incurring an ever-higher mountain of debt and undermining the Authority's still-fragile finances.

If the Commonwealth wants to continue to expand the T—certainly a worthy goal—the state needs to fund those projects. The T should focus its limited capital resources on the upkeep of the existing system while the Commonwealth assumes responsibility for expansion as part of a comprehensive, statewide transportation investment strategy. State funding for expansion would be above and beyond the current subsidies for the T.

Most of the expansion projects under consideration originated outside of the T and made their way onto the T's agenda through the influence of the Legislature and the administration. While the old system of retroactive funding of the T made it all too easy to ignore the costs of expansion proposals, in the end the Commonwealth did pay for the projects in the form of increased debt service subsidies.

Now under forward funding, the pressure to expand the system continues unabated, but the Commonwealth no longer picks up the additional costs. The T is expected to fit the expansion projects into its capital plan and finance the entire package within its limited revenue streams. This creates an even greater incentive to push the T to expand because the Commonwealth subsidy remains the same no matter how many projects the T takes on. The state can have its cake and eat it too.

Forward funding was critical in creating incentives for strong fiscal discipline and management at the T, and the T has made tremendous strides in implementing the reforms. But the continued drive for expansion without the dollars to support the new services is threatening to undermine the success of forward funding and undo the good work of the Legislature, the administration and the T. The T can continue to transform itself into a first-class, fiscally responsible transit system or it can try to accommodate demands for expansion, but it cannot do both. Forward funding has brought fiscal discipline to managing the T's operations and maintaining the existing system; shifting responsibility for expansion to the Commonwealth would bring the same discipline to the priority-setting process for expansion.

Commonwealth funding of expansion also makes sense from a transportation planning perspective. Transit needs should compete for funding with highways and other transportation projects in the state's capital planning process and the proposals that offer the greatest benefits—transportation, economic and environmental—at the least cost should be given highest priority.

Finding the money in the Commonwealth's capital budget to fund MBTA expansion will be extremely difficult, especially in these fiscally challenging times. The Commonwealth's capital finances are no less stretched than the T's. But the Commonwealth has far more ability to identify and dedicate the revenues that will be necessary to finance a comprehensive transportation strategy.

The Commonwealth would also be in a better position than the T to take advantage of the possibilities of alternative financing methods that could supplement or perhaps replace bond issues and pay-as-you-go spending for some capital projects, another recommendation of the Blue Ribbon Committee. Alternatives include tax increment financing, in which increased tax revenues resulting from new development, higher property values or increased sales associated with a transit project are used as a revenue source for the project; and public-private partnerships, in which private sector investors finance a project in return for project revenues and tax advantages. Private involvement could also include private operation of specific services under a design-build-operate-transfer procurement, which is being used by the Commonwealth to complete reconstruction of Route 3 North.

Artery Commitments Most of the expansion projects on the T's plate are required by the Artery mitigation agreement. Until now, the Artery mitigation projects—which were agreed to by the Commonwealth's Executive Office of Transportation and Construction, not the MBTA Board of Directors—have been treated as the T's financial commitments. With the advent of forward funding, this presumption has to be questioned. When the commitments were included as a condition of the Artery's environmental permit a decade ago, the distinction did not really matter—the Commonwealth reimbursed the T in full for its expenditures, including all of the debt service costs for capital projects. Under forward funding, state support is fixed and does not increase to cover added capital costs, regardless of the grounds for the project. The Artery projects have been transformed into a set of unfunded mandates on the T.

With public subsidies limited, the cost of meeting these requirements has moved far beyond the T's ability to finance, necessitating an honest discussion of how these commitments are to be met. It is a pressing question that requires serious consideration. The Blue Ribbon Committee recommended that until financial stability is achieved, expansion should be pursued only if the project is self-financing or if it is tied to new appropriations from the Commonwealth.

If the Commonwealth is committed to completing the Artery mitigation projects, it will have to identify a realistic strategy for financing them above and beyond the current MBTA subsidy. In addition, the language of the forward funding legislation may have to be amended to eliminate the provision that allows mitigation and other expansion projects to take precedence over maintenance and modernization in the T's capital priorities.

Operating Revenues and Costs Together with sustaining and improving the T's services, the major goal of forward funding is strengthening the T's finances. While forward funding imposes serious revenue constraints by limiting public subsidies, it also provides new incentives for the MBTA to get its fiscal house in order. Under the old system, cutting costs or finding new sources of revenue simply meant a smaller state subsidy; now they produce additional funds for operations and capital projects. The shift to forward funding gives the T far more control over its own destiny, but also more responsibility. If the Authority resists pressure to expand beyond what it can afford, invests in system maintenance and modernization, reduces debt during these critical first years of forward funding, gets control over operating costs, and takes the necessary steps to build its own revenues, it will emerge better prepared to serve the region than at any time in its history.

The forward funding legislation was a good start, but only a start. The T needs to follow through with fiscal reforms. The steps the T has to take to achieve fiscal stability are clear. The Authority must invest in capital improvements that lower operating costs, such as new fare collection equipment, rather than those that increase expenses, such as new transit lines. It has to reduce personnel costs through tough negotiating at the bargaining table and by cutting its headcount. It needs to seek out savings on expensive contracts such as commuter rail operations and maintenance. It has to build ridership through aggressive marketing and relentless attention to customer service. It needs to be willing to adjust fares and parking charges periodically, at least to keep up with inflation in operating costs, as promised to bondholders in the financial plan. And it needs to examine seriously the potential of alternative financing to help stretch its limited capital dollars.

The T cannot reform its finances with one hand tied behind its back. Restoring the management rights that were granted once and then partially taken back by the Legislature would allow the T to effectively manage personnel and provide better services at less cost. The T also needs to be able to contract for services if it can obtain better value for the same or less cost. The Pacheco law, which has largely stymied the T's efforts to save money, should be repealed or substantially modified. Absent that, the MBTA should be exempted from the law, as the Massachusetts Water Resources Authority is now. Legislation would also be required for the T to employ design-build, design-build-operate-transfer or other alternative procurement methods or to use tax increment financing or private investment to finance new transit lines. If the T is going to succeed as an independent authority, it needs to be granted greater independence. And the highest capital priority must be to maintain the present system.

A lack of prudent management now would ultimately lead to the failure of forward funding. Rising deficits and growing inability to finance necessary capital improvements could require the Commonwealth to provide the T with additional subsidies beyond the current dedicated revenue streams. Chronic supplemental appropriations would mark a return to covering the T's costs no matter how fast they grew—the discredited system that led to the Authority's label of "budget buster."

The T is at a critical junction. If it proceeds with expansion plans at the expense of maintaining and modernizing the existing system, lets its debt burden continue to mount, fails to get a grip on operating costs, and misses opportunities to generate more of its own revenue, the consequence will be a financially weak agency unable to cover operating costs or maintain the system without additional support from the Commonwealth. On the other hand, if the T gains control over operating spending and makes significant headway against its maintenance and modernization backlog, the Authority will improve the quality of services and emerge in a stronger fiscal position, fulfilling the promise of forward funding.

The choice is clear. Given MBTA finances and maintenance and modernization needs, continued expansion at the T's expense could threaten the integrity of a system that provides transit services to 1.2 million people each day and is critical to the region's economy. Exercising discipline now will help ensure that future generations in eastern Massachusetts will have access to a safe, affordable and reliable public transit system.

EPILOGUE

In January 2002 the MBTA released a draft of an updated capital plan for fiscal 2002 to 2007. The plan totals $3.3 billion, an increase of $640 million over the 2002-2006 plan analyzed in this report. Only $280 million of the increase is the result of adding a sixth year to the planning period; the remaining $360 million represents an increase in planned capital spending through 2006.

The T clearly recognizes the importance of maintaining and modernizing the existing system in the new plan. The large majority of the increased spending is directed to infrastructure projects rather than expansion, including $90 million for additional replacement and renovation of the aging bus fleet, $55 million for commuter rail locomotive and coach overhauls, $13 million for Green Line car improvements and smaller amounts for the Mattapan line, track work throughout the system and environmental compliance requirements. As a result, the average annual spending on maintenance and modernization will increase from about $350 million in the current plan to $380 million in the new plan. Planned spending on expansion was increased by only $58 million in total.

However, the T is paying a price for beefing up spending on the current system while moving forward with expansion projects. The increased spending will be financed primarily with additional bond issues, bringing the amount of borrowing up to an average of $300 million per year, as much or more than the T has borrowed in the past, even when unlimited Commonwealth support was available to cover debt service costs. In its long-term finance plan, the T projected that if it continued to borrow at a rate of $300 million per year, rising debt service costs would cause the Authority to experience operating deficits by 2009.

Clearly, the goal of reducing borrowing to lower the T's heavy debt burden and generating a surplus to fund the capital program will be difficult to accomplish at the planned rate of borrowing. The T will only undercut its long-term fiscal well-being by increasing investments in the present system while also supporting expansion.

APPENDIX: UNFUNDED MAINTENANCE & MODERNIZATION NEEDS

Source: MBTA Capital Investment Program, FY2002 - FY2006

Red Line No. 1 Replacement Fleet
Red Line No. 2 Car Rehabilitation
Locomotive Growth Procurement
F40PH-2 Top Deck Overhaul
F40PH-2C Top Deck Overhaul
F40PH-2M Top Deck Overhaul
Commuter Rail Top Deck Overhaul
Bombardier Coach Overhaul
MBB Coach Midlife Overhaul
Kawasaki Truck Overhaul
Kawasaki Coaches Midlife Overhaul
Replace Pullman Fleet
Locomotive Procurement
CTC1B Suppression Mod-Control Cars
Bi-level Procurement
Switcher Locomotive Procurement Vehicle Needs
South Boston Transitway Vehicle Procurement (Option)
Silver Line Phase II Vehicles
1989 RTS Fleet Replacement
1994 RTS Fleet Replacement
1995 Nova Fleet Replacement
Subway Non-Revenue Vehicle Needs
Commuter Rail Non-Revenue Vehicle Needs
Replacement of M/W Work Equipment
Commuter Rail Non-Revenue Vehicle Needs
Replacement of M/W Work Equipment
Systemwide Non-Revenue Vehicle Needs
Maintenance of Way Work Equipment Purchase
Signals and Communications Signal Crew Equipment
Track Design Standards
Green Line Grade Crossing Reconstruction
Blue Line Rail Changing
Red Line Columbia Junction Interlocking
Green Line Tie Renewal Program
Blue Line Tie Renewal Airport-Wonderland
Orange Line Ties Replacement
Orange Line Community College/Oak Grove Tie Replacement
Green Line Track Rebuild
Red Line Surface Tamper/Mainline Thermite Weld/CWR
Orange Line Third Rail Upgrade
Green Line Track Rehabilitation
Blue Line Special Trackwork
Red Line Fully Guarded Switches
Blue Line Orient Heights Track Rebuild
Orange Line Special Track Work: Rebuild Wellington
Red Line Floating Slab Alignment Repair
Red Line Ashmont Line Rail Program
Red Line Clayton Street Curve Reconstruction
Subway De-watering Pump Replacement
Systemwide Track Charts
Lowell Junction/Frey Double Track
Winchester-Mishawum Rail Replacement
Fitchburg Main Line Rail Replacement
Ayers and Willows Rail Replacement
Rail Inventory Purchase
Elimination of Bleachery Interlocking
South Acton Station Double Track
Reading Station Double Track
Beverly Drawbridge: Upgrade Mechanical Devices
Three Stations (Salem, Manchester, Gloucester) Upgrade Approach
Commuter Rail Fencing
Montvale Yard Rehabilitation
Future Systemwide Tie Replacement Program
Systemwide Tie Renewal Program
Systemwide Grade Crossing Renewal
Red Line Signaling Standardization
Red Line JFK/UMASS/North Quincy
Evaluation of Future Technology Study
Green Line Systemwide Signal Improvements
Third Rail Heater Central Control
Systemwide Cable Replacement
Guilford Yard Signal Installation
North Station/Lechmere Stations Signal Upgrades
Haverhill Line West Route: Signal Improvements
Haverhill Line West Route Signal Code System Upgrade
Haverhill Line Andover/Rosemont Signal Upgrade
West Street Bridge Cable Replacement
Fitchburg Line Waltham Tower Elimination
Fitchburg/Willows Signal Upgrade
Gloucester Branch Signal Upgrade
Newburyport East Route Signal Upgrade
Lowell Line Wilmington and Shop Interlocking/Bi-directional Signals
Lowell Line Somerville/Winchester Bi-directional Signals
South Bay Track & Signal—Phase II
New Public Address System
Radio Purchase
OCC Backup Center
Active Train Summary System—Commuter Rail OCC (CROCC) Enhancement

Installation of Systemwide Emergency Wayside Telephones
Fire Alarm Upgrades
Communication Rooms Refurbishment
Fiber Optic Cable Network
Remote Control and Monitoring Units (RCMU) Replacement
Red Line Substation Improvements
Red Line Davis Square Upgrade
Red Line Traction Power Upgrade
Blue Line Power Upgrade
Blue Line Yard Catenary
Blue Line Power Supply (Wonderland)
Orange Line Substation Improvements
Orange Line Cable Upgrade
Orange Line Negative Return System Upgrade
Orange Line Power Improvements
Red Line Cabot DC Breaker Replacement
Red Line Cabot Carhouse Substation Replacement
Green Line Substation Improvements
Green Line Catenary Replacement
Green Line Cable Upgrade
Green Line Vent Shaft Upgrade
Green Line Highland Branch AC Replacement
Green Line Viaduct, Conduit, and Cable
Green Line Government Center Substation Replacement
Orange Line/Green Line Negative Return Cable
Green Line/Blue Line Section Insulator Replacement
VDC Emergency Lighting Systems Replacement
Exhaust Stack A Rehabilitation
Commuter Rail Systemwide Electrical Infrastructure Enhancements
Passenger Station Generator Purchase
Switch Heater Replacement
Newton Lighting Fixtures
Emergency Lighting Tower Purchase
Mystic Junction
Fitchburg Commuter Rail Layover Facility Power
Layover Unit Substations Fans & Vents Installation
Trackless Trolley Catenary and Pole Replacement
Systemwide Power Upgrades
Power Vehicle Replacement Program
Systemwide AC Cable Replacement Program
Charlestown Cable Storage Facility
Employee Facility Training Program
Systemwide Power Cable Replacement ProgramSystemwide Unit Substation Ventilation
Blue Line Orient Heights Car House—Phase II & III
Crane Replacement
Everett Compressor Systems Replacement
Systemwide Vehicle Washing Replacement
Red Line
Orange Line
Green Line
Maintenance Facility Upgrade Program—Readville
Maintenance Facility Upgrade Program—South Bay Service and Inspection
Mid-day Layover Facility
Lynn Garage Fire Alarm Upgrade
Charlestown Compressor Systems Replacement
Charlestown Heating Plant
Charlestown Roof Replacement
Back Bay Busway Repair
Bus Facility Ruggles Station Pavers
Red Line Ventilation Improvements—Phase II
Chilled Water System Modifications
45 High Street-HVAC Chiller Replacement
Kingston Layover Cable Extension
Fitchburg Roundhouse—Demolition
Hingham Terminal Improvements—Phase I
Elevators and Escalators
Escalator Safety Skirt Panels
Parking Lots and Garages
Systemwide Pump Room Rehabilitation Program
Systemwide Paving Program
Systemwide Tunnel Repair and Assignment
Commuter Rail Culverts and Retaining Wall Repair Program
Back Bay Station Tunnel Improvements
Needham Heights Retaining Wall Rehabilitation
Highway Bridges
Railroad Bridges
Transit Bridges
Columbia Road Signal Interlocking System
Dorchester Line Bridge Reconstruction
Beacon and Roger Bridges (Newton)
Fort Point Channel Bridge (MHD)
Merrimack River Bridge Redesign
Pedestrian/Utility Bridges Inspection