

The MBTA's Capital Spending Crisis

Capital project delivery reforms are needed to deliver the T's most important ridership-boosting initiative—the Red and Orange Line Modernization Project—on time and on budget.

by Ian M. Ollis and Gregory W. Sullivan

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Introduction

Increasing MBTA ridership is critical if we are to deal with congestion in Boston and the environmental and economic consequences of a large, slow-moving commute. The T is the alternative to that congested commute. Buses and trains can move many more people and often do so much faster than being in your car stuck in traffic. Improving the efficiency of the MBTA, particularly the subway lines, will simultaneously

Improving the Red and Orange Lines could increase capacity by 50 and 40 percent, respectively.

reduce congestion, ease pressure on the environment and give the economy a boost for years to come.

The Red and Orange Lines are the workhorses of the MBTA, delivering 430,000 daily commuters back and forth to work, home and school. Capital projects aimed at improving these two

routes have the potential to provide service to another 200 000 riders, as a previous Pioneer Institute paper, “Public Comment on the Governor’s Commission on the Future of Transportation”¹ explained. That analysis concluded:

[T]he Red/Orange Line project delivers the biggest bang for the buck by far, delivering a capacity increase of 200,000 per day at a cost of \$2 billion, or \$1.28 per added capacity (All Day – Peak Service), amortized over 30 years at 260 peak days per year. By the same measure, the South Station Expansion project translates to \$12.05 per added capacity and the North South Connector translates to \$27.56 per added capacity.

Once completed, the MBTA believes the Red Line/Orange Line Improvement Program will increase capacity on the Red Line, which currently serves an average of 244,000 riders on weekdays, by 50 percent. The Orange Line, which currently accommodates 186,000 riders on an average weekday, is expected to see a 40 percent² rise in ridership.

The MBTA’s plan to increase ridership on the Red Line/Orange Lines requires reducing “headway” time between trainsets, increasing the number of trainsets and renewing the fleet, thereby facilitating more frequent service during rush hour commuting periods. In October 2018, T Deputy General Manager Jeff Gonneville explained:

“This is replacing 1970s-based analog signal systems along both the Orange Line and the Red Line. Beside the fact that we have components and relays that are obsolete now that we have to maintain in-house and overall reliability of the system is suffering, we are also limited in what we can do within the system in order to speed trains up.”³

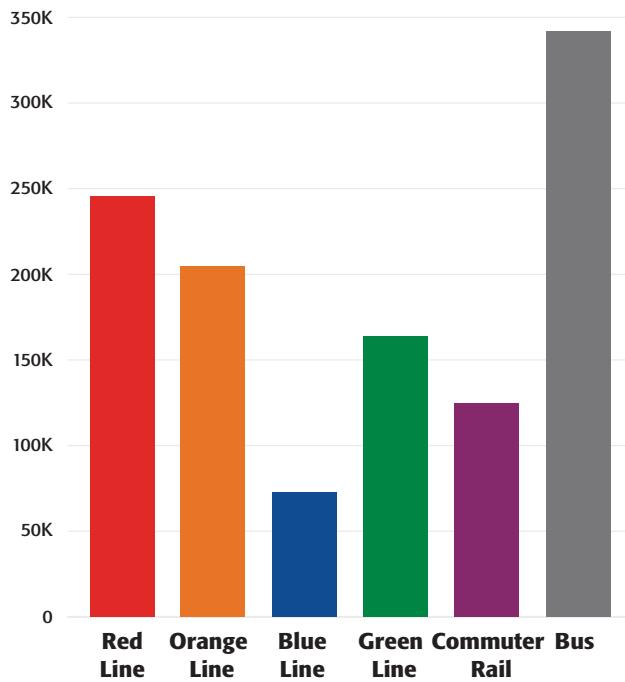
Gonneville added, “We have to upgrade our signaling system at the T. Period.”⁴

The MBTA expects signal upgrade work will be substantially complete on the Red Line by December 2021, and on the Orange Line by April 2022. Once paired with a fleet of brand new trains on both lines, the trains should be able to run three minutes apart in the downtown core of the Red Line and four-and-a-half minutes apart on the Orange Line.

“It gives us a modern system that allows us to actively manage the speeds when it comes to the signal process... and it provides us with a new way to provide analytics around how our system is performing and things that are causing signal warnings,” former MBTA General Manager Luis Ramirez told reporters in 2018. “It’s also exciting for us because once we get this in place and we also have the new vehicles with that technology in place, that’s what gets us to the three-minute headways.”⁵

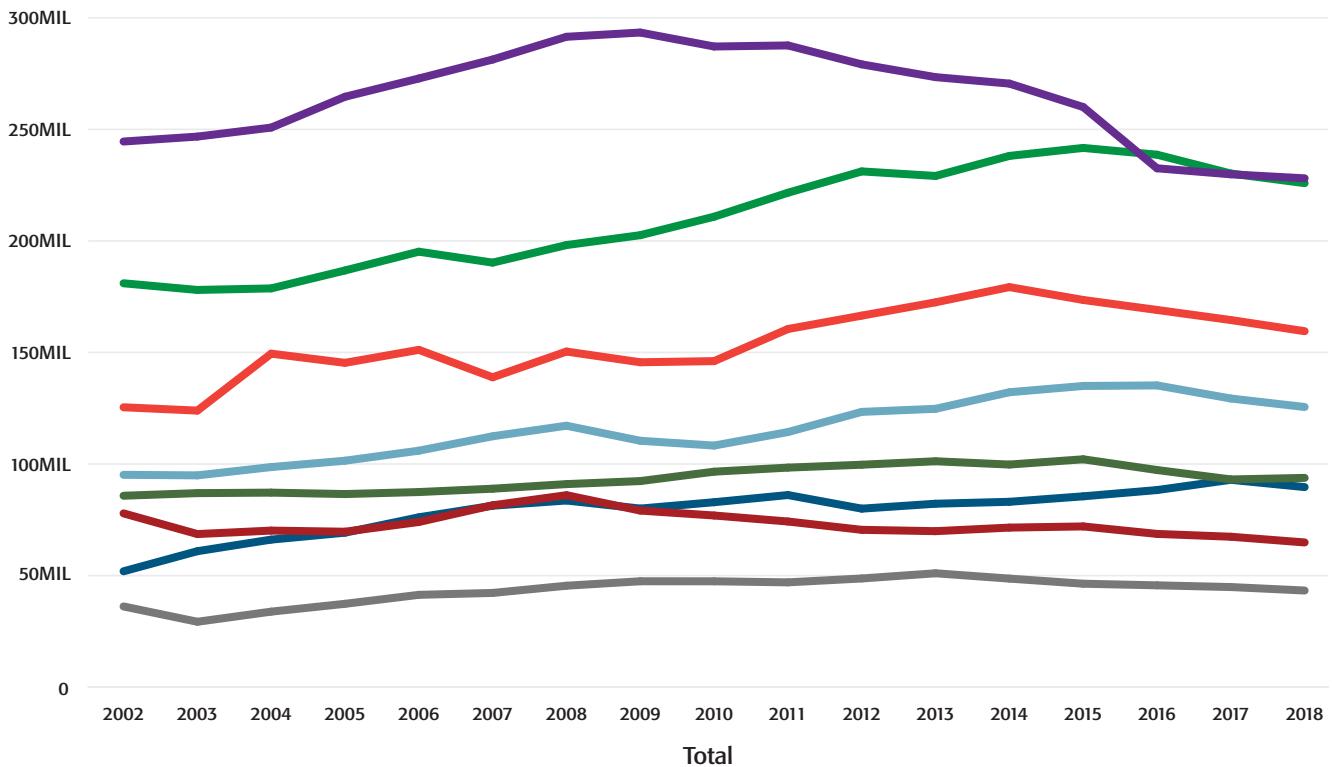
The MBTA has been modernizing and upgrading its infrastructure to grow ridership and improve service, especially the Red and Orange Lines. Upgrades include new trains, new signaling and power systems and some station modernization. However, a number of problems have come to light that are holding back this program. Figure 1 below shows the significance of the Red and Orange Lines in terms of the MBTA’s overall ridership numbers.

Figure 1. Current Ridership per T Line & Mode – Average Weekday 2018



Source: MassDOT Tracker; MBTA Performance Dashboard

Figure 2. Ridership of the nine largest U.S. rail transit systems, minus New York



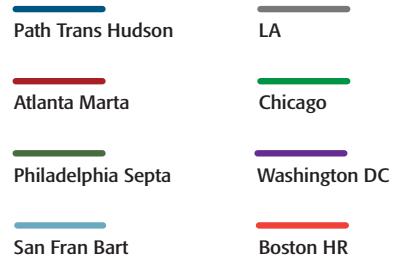
Why are the Red and Orange Lines so important?

There are several reasons why it is important for the T to maintain its focus on increasing ridership. Ridership of the MBTA heavy rail system, including Red, Orange and Blue Lines plateaued between 2013 and 2015 and has been slowly declining since, as the accompanying graphs indicate. The graphs first compare the MBTA to other large U.S. rail transit systems (except New York City, which is an outlier due to its size). Figure 2 shows a clearer picture of the other metro systems and Boston's relative size and ridership trend.

Ridership is also a function of total population growth or decline. As a result, one must view ridership trends in the context of population trends. In each of these cities, except perhaps Chicago, population has been rising. Apart from the global economic downturn of 2008, we would have expected ridership numbers to slowly increase as well.

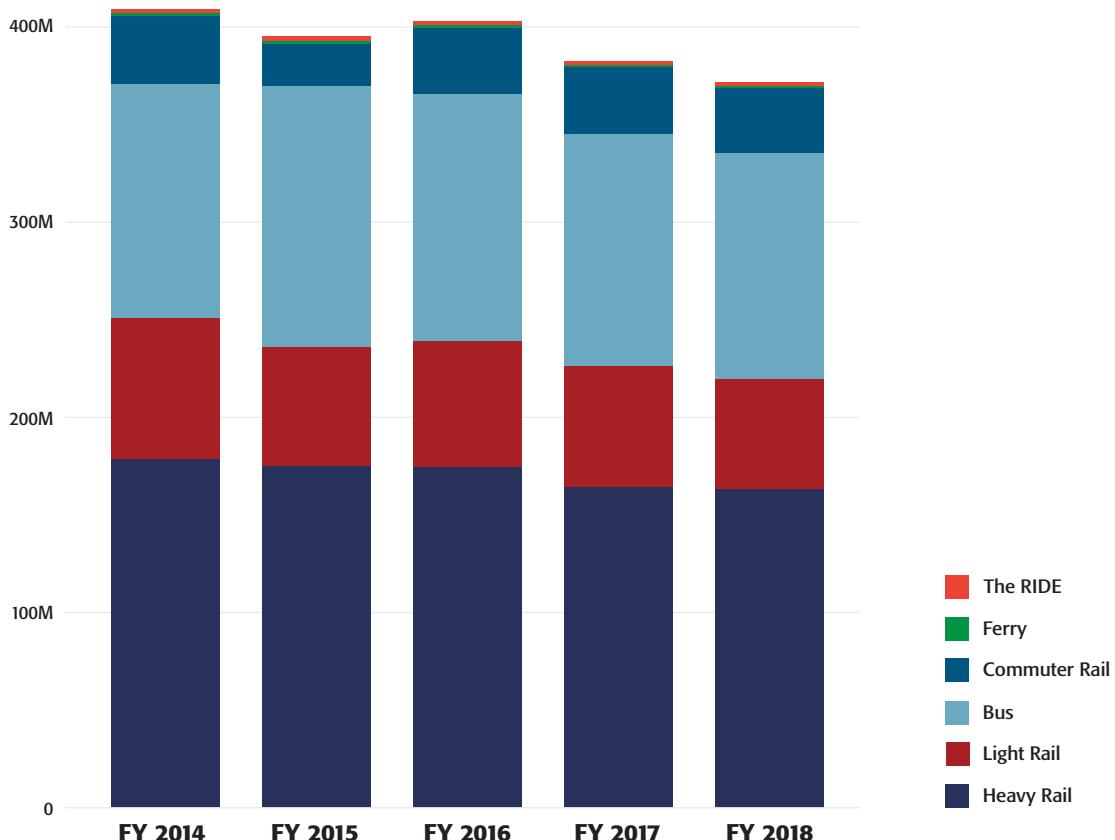
Figure 3 shows that the feeder systems to the Red and Orange Lines are also declining, which means fewer transferring passengers.

When comparing Boston subway heavy rail systems (the Red, Orange and Blue Lines) versus population growth, ridership is lagging. And has been dropping since around 2014.



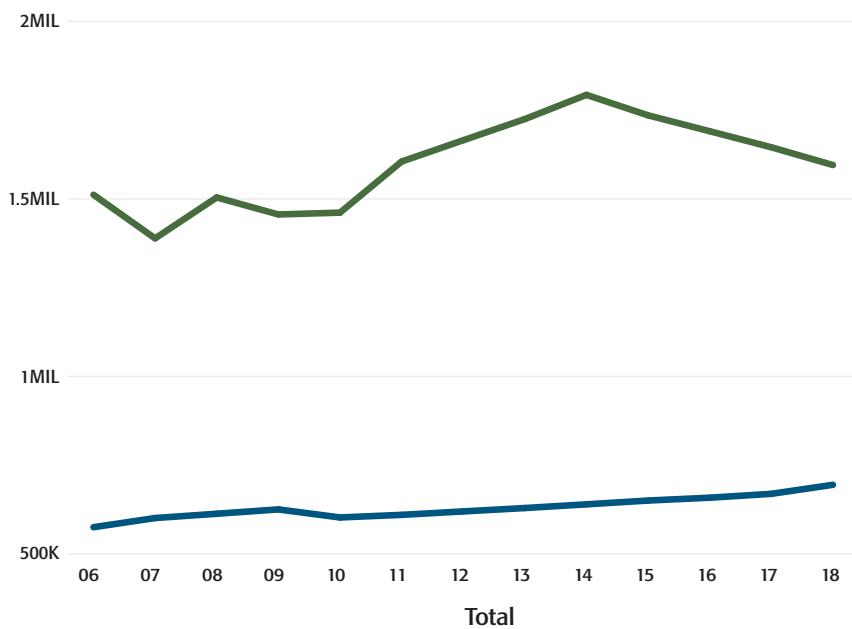
Graph: Ian Ollis, June 2019. Data from the Federal Transit Authority, 2019.

Figure 3. Graph of overall MBTA ridership trends



Source: the MassDOT | FY18 Tracker

Figure 4. Boston MBTA heavy rail versus Boston population.



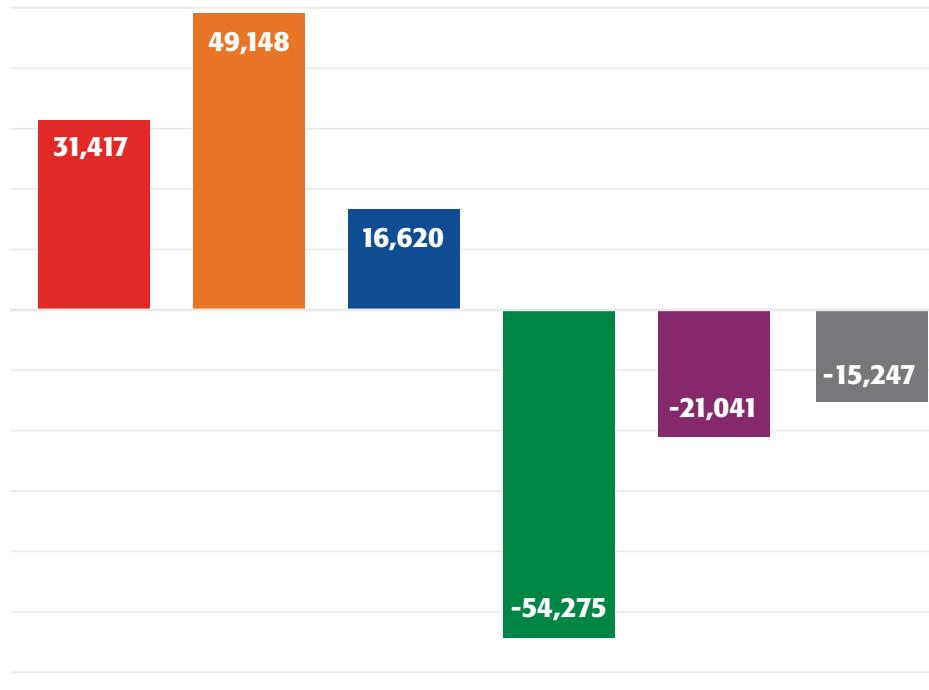
Population data: American Community Survey; Ridership from the National Transportation Database.

If the trend data tell us that the populations of the aforementioned cities (with the possible exception of Chicago) are experiencing slow to modest growth, while since 2015 their respective rail transit systems have, at best, plateaued and, at worst, fallen, the story on MBTA heavy rail is not terribly different. As Figure 4 to the left shows, MBTA heavy rail ridership has plateaued and is now dropping relative to population growth. If this is not addressed, the alternative will be even more road congestion, which is an obstacle to further growth in the local economy.

Total Population

Annual Ridership in 10,000's

Figure 5. Comparison of Average Typical Weekday Ridership, FY2003 vs FY2018

**Red Line****Orange Line****Blue Line****Green Line****Commuter Rail****Bus**Source: MBTA Blue Books/
MBTA Tracker

A longer-term view of the data shows that, from FY2003 to FY2018, the Red, Orange, and Blue Lines have gained 31,417, 49,148, and 16,620 average weekday riders, respectively. By comparison, over the same period, the Green Line lost 54,275 daily riders, commuter rail 21,041, and bus service 15,247 riders, according to data drawn from the MBTA's 2005 Ridership and Service Statistics (Blue Book), its capital investment program reports, and mbtabackontrack.com.

The MBTA initiative to expand ridership and service on Red & Orange Lines

Red and Orange Line ridership growth over the past 15 years has caused significant congestion on the line, with commuters packed in like sardines. But as the graphs above indicate, that growth plateaued in 2014 and ridership has begun to drop. Over the period of growth, the MBTA did not add additional trains, reduce headways (gaps) between trains or increase speeds on the lines. The Red and Orange Lines appear to have effectively reached rush-hour capacity in 2014.

However, the new trains, signals and power systems create the opportunity to increase the number of trains on these lines; reduce waiting times between trains (headways), especially during rush hour; and increase reliability. This will

translate to a more comfortable and faster trip for commuters and will undoubtedly increase ridership. Independent analyses by both Pioneer and the MBTA have estimated that a successful program of renovation and upgrades could yield a potential 50 percent ridership increase.

Contracts have been let and work is underway to upgrade key components of these heavy rail lines and, ultimately, to expand ridership. On June 25, 2019, the T presented a “[Red Line/Orange Line Improvement Program Update](#)” to the MBTA Fiscal and Management Control Board (FMCB), which outlined the significant expenditures needed to complete the work (outlined in Figure 6 below).⁶

Figure 6. Key components of the R & O Line upgrades, in \$M

Project Component	Cost
New vehicle procurement program	\$1,009
Infrastructure improvements program	\$470
Signals upgrade projects	\$351
State of good repair projects	\$152
Total	\$1,982

Expenditure to date (June 2019)	\$227
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Source: FMCB
Presentation
June 25, 2019

In reality, the plan to modernize the Red and Orange Lines (and the rest of the T) began years earlier. The design work for Orange and Red Line car replacement began in 2008, funding for detailed design of the cars appears in the capital plans from 2009.⁷ Work on the signals has been ongoing since 2009,⁸ and work on the signals and power system upgrades were itemized in the 2013–17 Capital Investment budget.⁹ Orange Line car procurement commenced in the 2014–2018 Capital Investment Program.¹⁰

A number of delays have set this program (and other upgrade projects) back several years. For example, the first Orange Line trains that are currently slated to enter service this summer were originally scheduled to go into use last year. The new fare collection system, which affects the Orange and Red Lines as well as the rest of the system, is now indefinitely delayed due to contractual changes and complications. As of this writing, virtually none of the major ticket items in the Red and Orange Line modernization program are complete and a number of high-profile derailments, power system and signaling problems continue to plague service quality.

The MBTA's capital delivery problem: Has Red Line/Orange Line modernization become a victim of protracted contract delays?

After one of the worst winter disruptions on record in 2015, Massachusetts Governor Charlie Baker appointed a “special panel” to investigate the financial status of the MBTA and its state of good repair program. On April 8, 2015, after engagement with stakeholders, benchmarking the T against peer agencies and performance analyses, the panel issued a multi-part report entitled “Back on Track: An Action Plan to Transform the MBTA,”¹¹ which examined the MBTA’s core functions, and compared results with other transit operations to assess the status of the system’s governance, finances, and capital planning. The panel found that the T had an unsustainable operating budget, ineffective workplace practices, a “shortsighted” expansion program, insufficient focus on its customers and inadequate accountability for results.

Directly related to the topic of this report, the special panel found that the T suffered from:

- **Chronic Capital Underinvestment:** The MBTA has not spent the capital funds already available to it, resulting in chronic underinvestment in its aging fleet and infrastructure.
- **Bottlenecked Project Delivery:** The MBTA struggles to get projects completed.
- **Organizational Instability:** The MBTA is hampered by frequent leadership changes, vacancies, and looming attrition.
- **Flawed Contracting Process:** The MBTA’s procurement and contract management is inefficient.

Included in the special panel’s report was a slide deck that focused on four key issues plaguing “Capital Project Delivery”:

1. Asset replacement and overhaul schedules are frequently modified due to funding and re-prioritization issues (un-funded mandates)
2. State of good repair vs. expansion is not always a direct choice as funds are not all re-allocable
3. Project timelines and budgets are often affected by continued, sometimes conflicted, input from internal and external stakeholders
4. Procurement laws and processes must be updated.

Since the 2015 passage of legislation establishing the FMCB to oversee and manage the authority, the MBTA has seen significant improvements in its overall financial stability (near closure of its annual operating deficit) and capital investment program (a significant increase in capital maintenance expenditures). That said, the T is still a long way from reaching the spending targets required to modernize the system, bring its infrastructure up to a good state of repair, and grow ridership. Some of the organizational deficiencies outlined in the special panel report continue to wreak havoc with the modernization program.

Eighteen months after the Special Panel’s report, on September 12, 2016, the MBTA’s then-newly established Capital Programs Office (CPO) issued a report entitled “Transforming Capital Delivery.”¹² In it, the Capital Programs Office outlined a plan to transform capital delivery to achieve targets included in the T’s Capital Improvement Plan (CIP), which would require raising expenditures from \$3 billion in the previous five years to \$6.5 billion in the next five. Its recommendations included developing organizational capability and structure to better integrate capital delivery and operations, strengthening capital program management and controls, and streamlining procurement and funding.

It also gave a status report detailing completed and ongoing initiatives to improve the MBTA’s capital delivery system. The report explained that the T had successfully established the executive-level Capital Program Office (CPO) pursuant to the special panel’s recommendations.

The MBTA recognized that more would need to be done after completing this to-do list of “short-term” steps. For example, the T would still need to align all capital delivery with maintenance and operations priorities, implement outcome-based goals and performance indicators to ensure accountability for results, and adopt more modern procurement methods.

This implementation was long overdue, considering that the MBTA had overseen \$8.3 billion in capital spending from FY2001 to FY2016 without having had a centralized capital program office.

The CPO recommendations concerned implementation of the then-current FY2016–2020 CIP, in the amount of \$6.5 billion. Since then, the size of five-year CIPs has grown to \$7.85 billion in the FY2018–2022 CIP and to \$8.53 billion in the FY2020–2024 CIP.

Takeaways from the September 2016 Capital Programs Office report, “Transforming Capital Delivery”

Three elements of the CPO report deserve attention. The first is the recommendation that the MBTA explore alternative procurement methods. Even as far back as the Special Panel Report, the T and its stakeholders understood that the authority “is strictly limited by state law in its use of many procurement processes.” Legislative constraints imposed on MBTA

capital procurement procedures prohibit it from using many proven practices approved by the Federal Transit Administration (FTA) and used every day by U.S. transit agencies. For example, the “Federal Transit Administration Best Practices Procurement and Lessons Learned Manual” (2016) outlines in great detail allowable

procurement procedures for all transit agencies.¹³ The Legislature would be well-advised to allow the T to use any federally approved procurement methodology identified as a best practice, following submittal of procedures by the MBTA to the Massachusetts Office of the Inspector General for review and approval, as the Legislature has allowed with respect to the Construction Manager at Risk and Design-Build procurement standards.

One particularly onerous requirement that slows down and constrains MBTA procurement is the legislative mandate providing that agencies must pre-qualify subcontractors for each project above a certain dollar value, a requirement of the “filed sub-bid law” that applies to the MBTA but no other U.S. transit agency. This requirement discourages sub-contractors from bidding on T contracts, delays procurement, wastes inordinate resources, and drives up prices. The Legislature has exempted MassPort, the Division of Capital Asset Management and Maintenance (DCAMM), the UMass Building Authority (UMBA), and State College Building Authority (SCBA) from this requirement. It should add the MBTA to the list of exempt agencies.

The second element of the CPO report that demands attention is the recommendation that the FMCB track all projects through interim portfolio monthly reporting and convert its tracking and reporting approach from funds-based

to project-based. The Governor’s Special Panel Report highlighted the need for the MBTA to develop a project-based tracking system. By establishing, measuring, and reporting timeline performance on projects, MassDOT, the MBTA, and the FMCB would receive monthly status reports, allowing them to focus attention on and ameliorate problems that cause delays throughout the design, procurement, and contract management stages of each project.

The third key recommendation in the CPO report is that the MBTA recruit critical capital delivery leaders and staff. The T’s capital underspending problem is related to its inability to recruit, hire, and retain experienced professionals to manage capital projects, especially as the MBTA significantly expands its capital program. Data presented later in this paper demonstrates that when the MBTA substantially increased the size of its five-year CIP, as it did in 2009 and 2014, it took approximately four years to restore its annual capital spend rate to an acceptable level of 90 percent or more of planned spending. This is particularly relevant now, as the MBTA significantly increased the size of its capital plan after the Special Panel Report was issued.

Most notably, lack of adequate personnel in the planning, design and procurement stages of projects results in the capital project pipeline going dry, making it impossible to achieve an adequate spend rate no matter how much funding is available.

Such reports indicate that the T has begun instituting the reforms needed to meet its capital spending goals. However, recent comments by new MBTA General Manager Steve Poftak and the business community point to a crisis resulting from the T’s inability to spend the required capital budget to achieve the modernization program in a reasonable time and on budget. In May 2019, the Greater Boston Chamber of Commerce wrote the FMCB asking them to reject yet more delays to the MBTA capital investment program and calling for bolder solutions to the problem. The fact that the Chamber has made such an appeal should be taken seriously, as it represents many employers who understand the economic impact of a dysfunctional transit system.¹⁴

In a May 6, 2019 article, *CommonWealth* magazine quoted Poftak: “We clearly need additional capacity throughout the organization. To spend \$1.5 billion annually on state-of-good-repair projects, the T will need to boost its own operational capabilities,” Poftak told the T’s Fiscal and Management Control Board... “We are currently under capacity. We are currently in a position where we have to triage projects at times because we do not have enough capacity.”¹⁵

As the CPO report made clear, the biggest problems seem to be restrictive regulations such as the filed sub-bid law,

The MBTA will need to increase annual spending by more than 80 percent from its FY2019 level to achieve an acceptable spend rate on its FY2020–2024 CIP.

The Legislature exempts MassPort, DCAM, the UMass Building Authority, and the State College Building Authority from the filed sub-bid law. It should give the same flexibility to the T.

inadequate staffing and management, and poor planning. The following sections will address those issues.

Overly restrictive procurement laws impede alternative methods that would improve MBTA capital delivery

In addition to inadequate project and contract management by the MBTA, capital project delivery suffers as a result of onerous legal constraints such as the filed sub-bid law and restrictions on the use of the design-build procurement methodology, which make the simultaneous implementation of 400 already complex contracts orders of magnitude more difficult.

Governor Baker's new transportation borrowing bond bill HD 4396 addresses the Design-Build restrictions by calling for this methodology to be approved for projects below \$5 million. This would ease the difficult procurement process somewhat.¹⁶

In addition, state law¹⁷ requires the use of so-called "filed sub-bid" procurement procedures for subcontracts over \$100,000 on contracts estimated to cost \$10 million or more. A full explanation has also been published by the Inspector General.¹⁸ The details are available in [Appendix A](#).

The law requires DCAMM to prequalify contractors and sub-contractors. Those that are prequalified must then be prequalified *again* by the MBTA for every subcontract of \$100,000 or more on contracts of \$10 million or more. MassPort, MWRA, MSCBA, UMBA, and DCAMM are exempt from this time-consuming and onerous step, but the T is not. Once the MBTA has pre-qualified sub-contractors, it provides the list and bid amounts of each in its solicitation of general

contractors, who then submit their bids, including their choice of pre-qualified sub-contractors. If there are fewer than three pre-qualified sub-contractors, however, the process has to be started all over again. If any sub-contractor is unhappy with the process, they can appeal to the Attorney General's Bid Protest Unit, which adds another level

of complexity. Under filed sub-bid law, the general contractor and sub-contractors may have never worked together before. Is it any wonder that so much finger pointing and litigation occurs on complex projects?¹⁹

Many federal procurement systems use much more efficient contracting processes that the T could adopt, and there is an already-established precedent for waiving specific procurement conditions under certain circumstances that would make this process simpler to manage.

For example, public agencies are required to submit a designer evaluation to DCAMM and the Designer Selection

Board upon completion of the evaluation for projects under their control. The MBTA is exempt from this additional step for design work.²⁰

In another case, the MBTA is exempt from obtaining approval from the Office of the Inspector General for public projects using the design-build and construction manager at risk project delivery methods, provided design-build procedures are submitted annually to the Inspector General for review.²¹

Requiring the MBTA to complete this full process each time a contract like this is entered into, slows down the process significantly in ways other state entities are not required to comply.

Inadequate staffing in key capital procurement and delivery positions

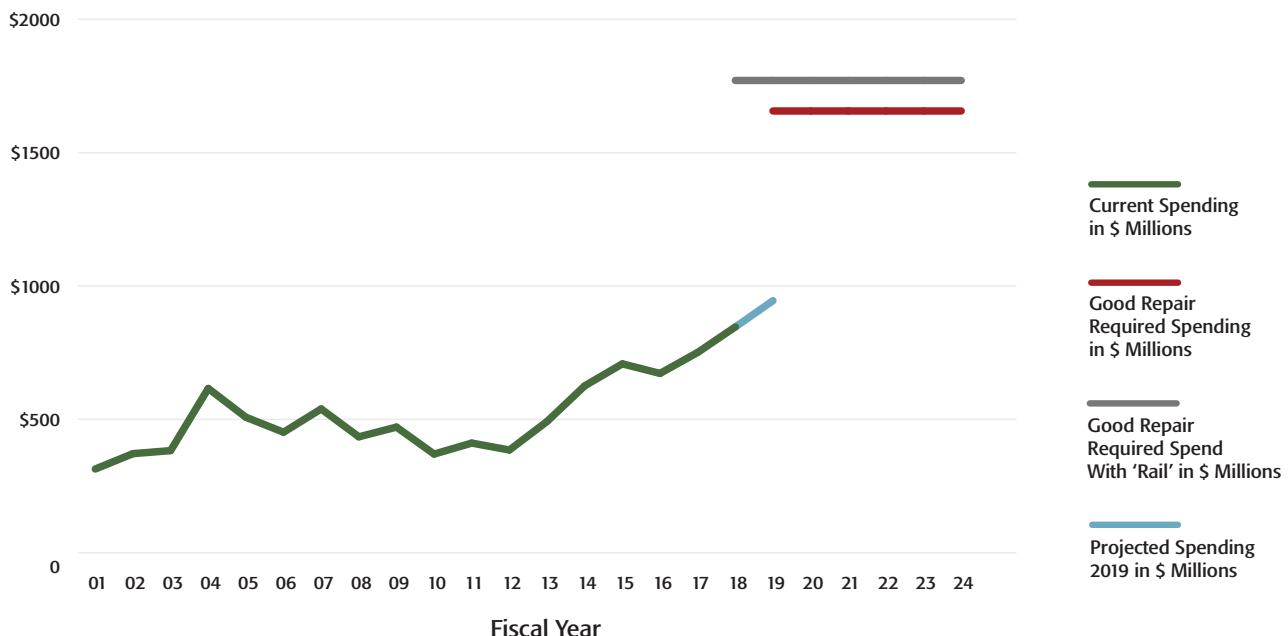
At a recent FMCB meeting, GM Poftak has noted that the T is hiring a chief of capital programs to lead the program, and it will also need to build up staffing for on-the-ground tasks such as signal and power maintenance. This shows that the new MBTA leadership is clearly aware of the capital spending²² problem. An overall chief of capital programs has subsequently been appointed. Poftak announced the chief of capital programs at the April 8, 2019 FMCB meeting, saying the new chief would "take responsibility for the program" and "also need to build up staffing for on-the-ground tasks such as flagging, and signal and power maintenance."²³ This individual will manage capital projects across 22 departments. The capital program plans to hire another 80 full-time staff

The MBTA is on track to fall about \$50 million short of its fiscal 2019 goal of spending \$1 billion on capital projects, according to Poftak. Under the existing capital plan, the T is due to grow spending to roughly \$2.3 billion on expansion and maintenance projects in FY2021, but in FY2023 that planned spending falls to \$861 million. "We have an out-year problem. We don't have the stuff in the pipeline," said Transportation Secretary Stephanie Pollack at the FMCB meeting. "We need a capital program that ramps up to that steady state, billion and a half."²⁴ A new strategy is needed for tackling long delays in the capital expenditure program.

In FY2018, the MBTA touted *spending 93 percent of its capital allotment*. However, this achievement is off a *much-reduced target*. While it does represent a large increase since FY 2013, it's only half of the spending needed by the start of the current fiscal year (July 1, 2019) to meet the 2020–2024 capital expenditure target. The gap between the bottom and top lines in Figure 13 below is the capital expenditure shortfall (Inability to spend all available funds).

The gap between the graphed "expenditure" above and the top "needed capital expenditure" line is effectively the "*we don't have the stuff in the pipeline*" spending gap. For Secretary Pollack

Figure 7. Actual spending in \$Millions versus budgeted 2020–2025 capital spending



and MBTA General Manager Poftak to admit their spending on upgrades and modernization will fall back dramatically in 2022 because they don't have enough projects in the pipeline or staff to handle additional projects is a significant problem. There is \$1.6 billion available, but annual spending is stuck between \$900 million and \$1 billion, and it had previously been far lower. This as power outages, signal failures, derailments, leaking stations, and service disruptions during increasingly powerful weather events plague the system, and parking for cars and bikes is insufficient.

Poftak's Capital Investment Plan (CIP) reforms hold the promise of ameliorating the long-standing capital backlog problem. He announced upon his appointment as GM that he would conduct a review of the CIP. Results of the five-month review were presented at the May 6, 2019 FMCB meeting, with eight findings.²⁵ Some of them must have been disappointing to the public, such as delayed implementation of the automated fare collection upgrade and the 2032 date by which the T plans to eliminate the maintenance and replacement backlog.

Many findings are directly related to the question of how to increase capital investments in maintenance and repair. In addition to the hiring of a capital program chief and acknowledging the need for other key staff, the T needs to improve its processes and execution. The GM and Chief of Capital Programs will need to: Formalize oversight of the capital program by:

- Completing bimonthly reviews of all projects
- Building a robust scheduling function
- Sequencing projects properly
- Developing small-project tracking

The Practice of Re-baselining

One of the unfortunate effects of numerous leadership changes (five general managers under Governor Baker alone) is the tendency to change MBTA policy. This is particularly evident in the practice of "re-baselining" budgets and development plans. It also often occurs when targets were not reached in a previous year. The rationale for and effectiveness of setting targets and attendant budgets are undermined by such constant change. Figure 8 shows the impact of this practice:

Clearly these five-year plans have all suffered by constantly reducing the spending targets.²⁶

The MBTA's tendency to continuously revise spending targets downwards points to an internal systems problem. A prime example is the 2016 annual budget. In the published 2015 to 2019 capital investment plan, the 2016 budget is listed as \$1.403 billion. However when the actual FY2016 budget was published, the budgeted capital spending was only \$1,046 billion. Approximately \$357 million worth of capital projects had suddenly been cut, a 25.5 percent reduction. Such budget manipulation makes the five-year capital investment plans look like little more than placeholders. These targets should be translated into one-year targets and not be so dramatically revised.

MBTA capital planning is plagued by sudden, unrealistic upsizing followed by years of trying to catch-up.

The MBTA capital plan is intended to facilitate renewal of the subway and other systems, with annual spending on replacement of infrastructure and rolling stock, large-scale ongoing maintenance, and system expansion. However, as indicated above, this has not been happening.

Figure 8. Examples of MBTA's Re-baselined capital spending Plan

5 year Baseline Period	Baseline value						
FY2017	\$811	FY2018	\$875	FY2019	\$950	FY2020	\$1,396
FY2018	\$875	FY2019	\$950	FY2020	\$1,396	FY2021	\$1,746
FY2019	\$950	FY2020	\$1,396	FY2021	\$1,746	FY2022	\$1,730
FY2020	\$1,396	FY2021	\$1,746	FY2022	\$1,730	FY2023	\$1,698
FY2021	\$1,746	FY2022	\$1,730	FY2023	\$1,698	FY2024	\$1,582
Re-baselined FY17–21	\$5,778	Re-baselined FY18–22	\$6,697	Re-baselined FY19–23	\$7,520	Re-baselined FY20–24	\$8,152
Original FY2017–21	\$7,569	Original FY2018–22	\$7,847	Original FY2019–23	\$8,441	Original FY2029–24	\$8,530
Reduction	-23.7%	Reduction	-14.7%	Reduction	-10.9%	Reduction	-4.4%

The MBTA's recent period of capital underspending (55.8 percent of available funds for the FY2014–2018 CIP) is not the first time the T has struggled to meet a five-year target. Rather than comparing capital spending to planned spending on a year-by-year basis, which is how most MBTA spending has been reported, this document reviews the T's performance against its five-year plans. The analysis, based on the MBTA's Audited Annual Statements, shows that it suffered growing pains 10 years ago when its five-year capital improvement plan was suddenly expanded from \$2.87 billion for the FY2008–2012 CIP to \$3.75 billion for the FY2009–2013 CIP, a 30.7 percent increase. After this very large increase, the T's spend rate dropped from 87.2 percent during the FY2008–2012 CIP to 60.1 percent during the FY2009–2013 CIP. It's one thing for the FMCB to suddenly upsize the capital plan on paper; it's another to develop the institutional and staffing capacity to execute it.

A review of how much the MBTA actually spent during the successive five-year capital plans is informative. For example, as Figure 9 shows, the MBTA enjoyed a relatively successful spend rate from the FY2001–2005 CIP through the FY2007–2011 CIP, when its capital budget was relatively stable in the \$2.5 to \$2.8 billion range. During each of these five-year periods, the T spent 90 percent or more of its budgeted amount, according to audited annual reports.

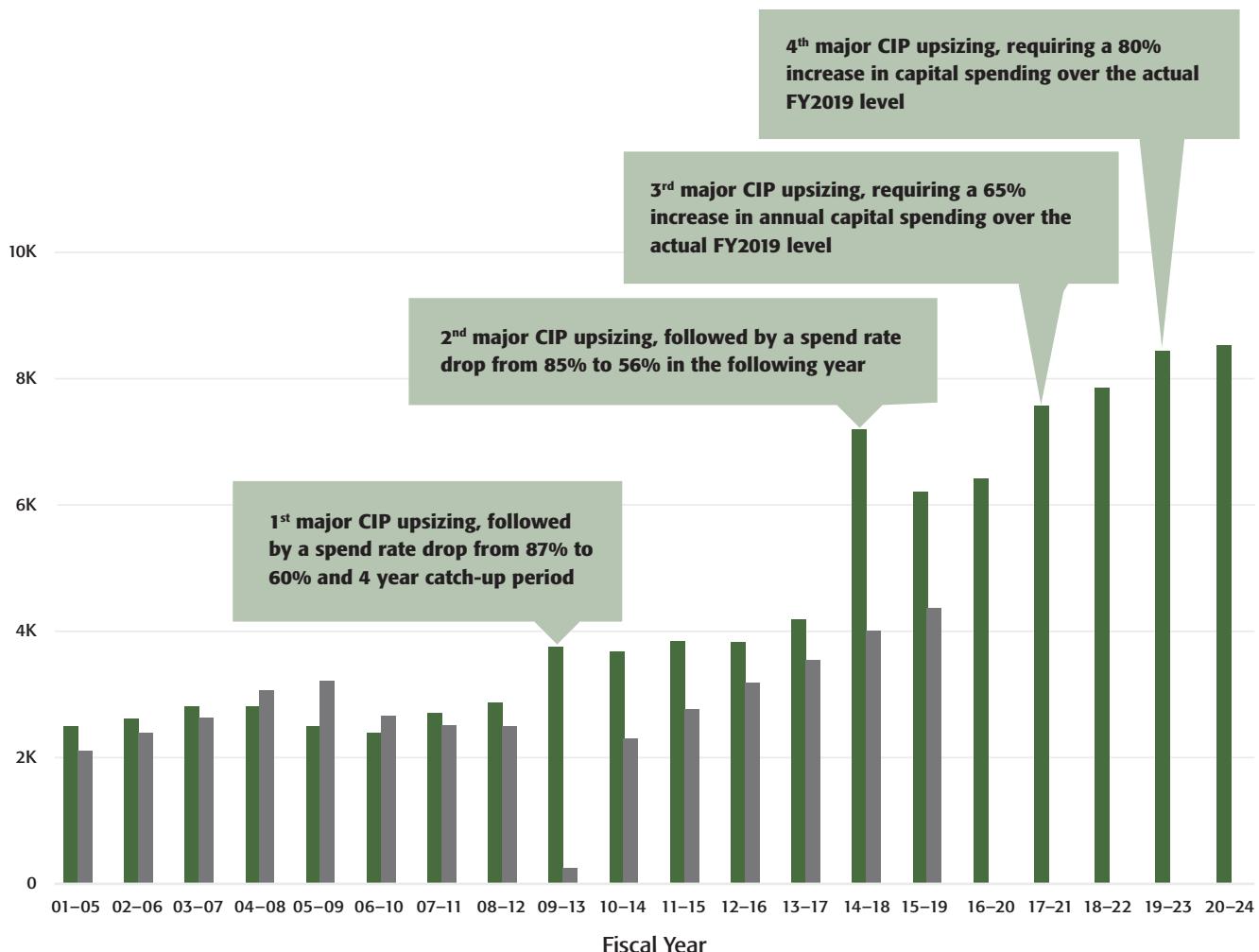
But when the MBTA increased its five-year CIP budget by 33.1 percent in FY2009, the capital division suffered growing pains, dropping its spend rate of 87.2 percent in FY2008–2012 to 60.1 percent in the FY2009–2013 CIP. It took four years to ramp up spending capacity and adjust to the much larger capital plan. Following the sudden expansion of the FY2009–2014 CIP, the T's spend rate slowly recovered, growing from 61.1 percent during FY2009–2014, to 62.4 percent during FY2010–2014, to 72.1 percent during FY2011–2015, and then to 83.4 percent during the FY2012–2016 CIP.

The MBTA's second recent major expansion of its five-year CIP occurred in FY2014, when the CIP rose from \$4.18 billion for FY2013–2017 to \$7.19 billion for the FY2014–2018 CIP, an increase of 72 percent. Just as happened when the CIP suddenly ballooned in FY2009, the T experienced growing pains following this sudden major resizing. During the FY2014–2018 CIP, the spend rate dropped from 84.6 percent to 55.8 percent. This is the low capital spend rate problem the FMCB and the MassDOT Board of Directors have been working to address. Audited records indicate that the MBTA has begun to recover, increasing its FY2015–2019 spend rate to 70.5 percent.

Based on the pattern of sudden MBTA capital plan expansions being followed by a period of growing pains, the T is currently confronted with an epic challenge.

To put this into perspective, the MBTA has nearly tripled its capital plan from the FY2008–2012 CIP amount of \$2.87 billion, when it achieved a spend rate of 87.2 percent, to the FY2020–2024 amount of \$8.53 billion.

Figure 9. Comparison of five-year actual spending to five-year CIP budgets, FY2001–05 through FY2020–24



Since FY2017 (see figure 9) the MBTA has adopted a third major upsizing of its capital plan, growing in four successive increments from \$6.41 billion in the FY2016–2020 CIP to \$8.53 billion in FY2020–2024, an increase of more than 33 percent.

Again, it is one thing for the FMCB to upsize the capital plan on paper, quite another to develop capacity to carry out that vision in practice. If the past is a prologue, the T is facing an inordinately difficult challenge.

MBTA Annual Audited Financial Statements report three key indicators of construction expenditures: 1) Expenditures for construction in progress, 2) Additions to transportation property; and 3) Construction work in progress. Annual expenditures for construction in progress increased substantially from FY2010 to FY2018, from \$364.5 million in FY2010 to \$937.3 million in FY2018, according to audited figures. By this important indicator, the T spent more than 2 ½ times as much for construction in progress in FY2018 than it did in FY2010. Another of the audited indicators, construction work in progress, shows even greater improvement, rising from \$479.2 million in FY2010 to \$2.04 billion in FY2018.

- Total amount of 5-year CIP
- Expended on completion of major construction projects and improvements over 5-Years CIP period

Source: MBTA Audited Financial Statements & successive 5 Year Capital Plans.

Figure 10. Data reported in MBTA Audited Financial Statements from FY2001 to FY2018

Fiscal Year	Expenditures for construction in progress (000s)	Additions to transportation property (000s)	Construction work in progress (000s)
FY2001	\$239,001	\$318,547	\$725,163
FY2002	\$268,243	\$376,191	\$869,331
FY2003	\$276,474	\$387,491	\$1,018,524
FY2004	\$395,780	\$620,654	\$1,262,027
FY2005	\$930,715	\$512,694	\$848,341
FY2006	\$510,097	\$456,588	\$846,334
FY2007	\$513,267	\$543,855	\$888,205
FY2008	\$713,204	\$439,274	\$544,902
FY2009	\$550,170	\$475,777	\$468,772
FY2010	\$364,514	\$374,553	\$479,187
FY2011	\$368,126	\$415,854	\$570,553
FY2012	\$502,413	\$389,842	\$525,328
FY2013	\$468,889	\$496,943	\$699,851
FY2014	\$591,382	\$630,510	\$863,649
FY2015	\$836,684	\$712,921	\$970,116
FY2016	\$786,734	\$677,041	\$1,232,231
FY2017	\$856,044	\$755,827	\$1,812,287
FY2018	\$937,255	\$851,384	\$2,040,030

Source: Audited Financial Statements 2001 to 2018

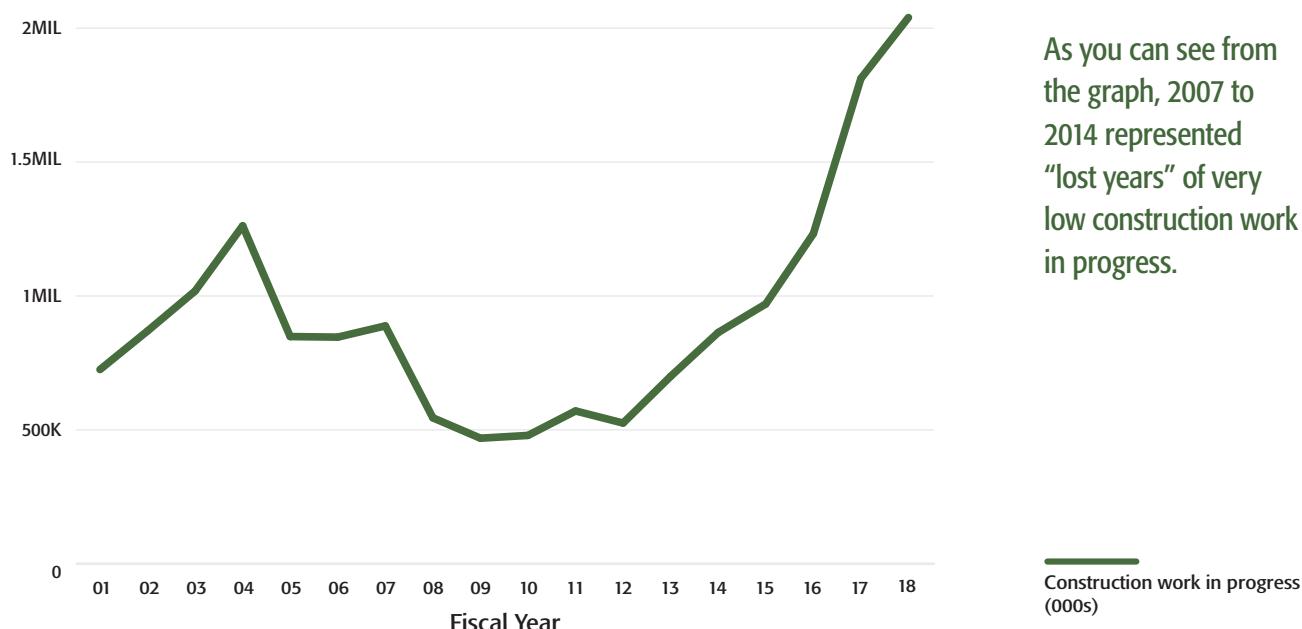
Strong evidence that the MBTA has made significant progress in increasing its capital project spending can be seen in Figure 11, which shows a pronounced increase in “Construction Work in Progress.” Between FY2010 and FY2018, the T increased investment in construction work in progress from \$479.2 million to \$2.04 billion.

The 2020–2024 CIP calls for a five-year capital target of \$8.306 billion²⁷, plus 472.2 million for a separate ‘Rail Program.’ Achieving this will require spending approximately \$1.6 billion annually (See Figure 7 above). Current spending is around \$950 million. To achieve these numbers would require larger spending increase than those already achieved and raises questions about the MBTA’s capacity for contract management, engineering management and project management. Is \$8 billion in annual spending possible given past experience?

Procuring projects in the correct sequence and in time for the next stage is equally important. The T should have implemented the power systems upgrade and new digital signaling system earlier to prepare for new Orange and Red Lines rolling stock that finally began rolling out in July 2019. While this project has begun, it is experiencing significant delays, meaning riders will continue to experience the same capacity and speed long after the new trains come online. New trains must now run with a legacy signaling system until 2022, 2024 or even later.

Unfortunately, the lack of tracking of key projects in tools such as tracker and the MBTA’s internal multi-modal Planning for Performance (PFP) management tool likely means the most important projects on Poftak’s desk will face delays and cost

Figure 11. Construction work in progress reported in MBTA Annual Audited Financial Statements FY2001 to FY2018



overruns. Key programs included in the vehicle and infrastructure investments needed to fully modernize the Red Line and Orange Line fleets and achieve three-minute headways on the Red Line and four-and-a-half minutes on the Orange Line²⁸ are not captured in Tracker or in the PFP. There is nearly \$2 billion to be spent on Red and Orange Line modernization over the next five years, if the budget is to be believed.

Transparency needed in measuring MBTA capital spending performance

It is virtually impossible for interested parties, including the MassDOT board, the FMCB, state legislators, municipal leaders, and citizens, to assess the MBTA's performance in implementing its five-year capital plans, and literally impossible to do so on a project-by-project basis because the MBTA does not report annual capital spending in a way that allows for a meaningful review.

Each year the MBTA promulgates a five-year capital plan that includes descriptions of myriad projects broken into categories detailing how much will be spent in the coming year and the total over the next four years. The manner of reporting often changes from year to year, breaking contracts into categories that change over time. Not until recently, beginning with the FY2018–2022 CIP, has the MBTA begun publishing capital budget items by project number. But even with this improvement, it is still confounding to attempt to track MBTA spending against the five-year capital spending schedule.

One obvious shortcoming is that the MBTA reports capital spending differently than how it is reported in its Audited Annual Financial Statements. These are audited statements promulgated in accordance with standards established by the Governmental Accounting Standards Board (GASB) that the FTA requires transit authorities to submit. For example, the MBTA's audited financial statement for FY2018 (the most recently filed statement) reported that the T dedicated \$937.3 million "towards completion of major construction projects and improvements in progress." This differs from the \$875 million the MBTA reported as having been spent in FY2018 on "Capital Spending—all categories."²⁹

Another obstacle is that the MBTA reports differing total dollar amounts for the same project. For example, the FY2018–2022 CIP describes Project P0285 as "Signal Program Red/Orange Line" and pegs total project spending at \$350 million, and FY2019–2022 expenditures at \$284 million. The next five-year CIP (FY2019–2023) describes Project P0285 total project spending as \$250.02 million, and \$236.42 in FY2020–2023. Total project spending in the five-year CIP after that (FY2020–2024) is listed as \$267.64 million planned and spending of \$284 million in FY2021–2024. In a June 24,

2019 "Red Line Orange Line Improvement Program Update" the Red Line/Orange Line signal upgrade project had a construction budget of \$216.67 million.³⁰ Annual changes in total project cost like this from one CIP to the next makes it difficult to measure MBTA capital division performance.

Complicating this example is ATO, or Automatic Train Operation. This is a safety system that allows train systems to be operated automatically without a human driver or engineer present. According to an August 13, 2018 PowerPoint slide deck the MBTA presented to the FMCB entitled "Red and Orange Line Future Reliability," ATO would be operational on the Red and Orange Lines in 2023. Given that the MBTA subsequently awarded the Barletta Heavy Division, Inc. contract for the Red Line/Orange Line Signal project that *did not* include ATO, and that the procurement stated that "the ATO System would be provided by others," it is reasonable to expect that the additional cost of the Red Line/Orange Line ATO contract would be included in its capital spending plan. Instead, a June 24, 2019 "Red Line Orange Line Improvement Program Update" presentation to the FMCB omits it.

The Red and Orange Line modernization program like this is very complex, as it includes digital signaling, power system upgrades, new technology trains, and all these systems have to talk to each other. Full deployment can only occur when all systems are operational and integrated. The sequence of delivery is key to success.

Reporting requirements should force capacity evaluation

New reporting requirements have been promulgated for the MBTA and MassDOT to enhance transparency and spur service delivery at the T. Chapter 25 and 26 of "Modernizing the Transportation Systems of the Commonwealth of Massachusetts," (Acts of 2009) and "Act Relative to Transportation Finance" (2013) require reporting to the Legislature on capital spending, timelines for individual projects and likely failures to meet budget spending and project completion.³¹

Such reporting should be an opportunity to develop detailed delivery timetables and schedules for each year of their five-year plans. There are functions such as procurement staff, engineering oversight and construction management that have to be budgeted for. The MBTA must face the harsh reality that it costs money to spend \$8 billion.

One recommendation of this report is that the T report capital spending strictly in accordance with GASB standards so the amount it reports each fiscal year to the Legislature, Governor, and the public aligns with its audited financial statements.

Canada, South Africa & Britain show complexity of modernization

Subway modernization programs are notorious for delays and cost over runs. Implementing new signal and power systems that need to integrate with new rolling stock is complex and prone to errors.

For example, chronic delays on the **Toronto subway** were meant to be resolved with a new signaling system, which is now three years behind schedule and \$98 million over budget. https://www.ttc.ca/About_the_TTC/Commission_reports_and_information/Commission_meetings/2019/April_11/Reports/17_Automatic_Train_Control_Re-Baselining_and_Transit_Systems.pdf

In **South Africa**, new trains are arriving before platforms have been modified and new signal systems completed. Security is not in place to receive the trains resulting in many being warehoused until other systems come on line. <https://howsouthafrica.com/new-train-manufacturing-plant-hailed-but-prasas-woes-could-delay-rollout-reports/>

In **Britain**, “bugs” in software for trains and signal systems could delay the opening of London’s new £17.6bn railway by more than two years. <https://www.ft.com/content/1358fa0a-675b-11e9-9adc-98bf1d35a056>

Senior Experience Project Management Executives are required to prevent these problems occurring in delivery

Project management crisis

While the hiring of a new chief of capital programs and plans to fully staff the office are to be applauded, 85 to 90 key positions have remained vacant for years. Eliminating the capital spending bottleneck will require hiring an additional cohort of executive project and contract managers who bring experience in construction and transportation fields and qualifications to manage highly complex procurement and contract management processes.

While the major contracts have been let on the Red and Orange Line Modernization Program, the work of managing contractors, sub-contractors, and sequencing project delivery to ensure efficiency have only just begun. Modern signaling, new power systems, trainsets and the new automated fare collection system are yet to be implemented. To get managers with the skills needed to manage a multitude of small projects in each system requires a senior team of experts, which the MBTA has been unable to attract. It is likely that the compensation members of such a team would command are above what the T has been able to offer in recent years.

To find an example of the problems that could bedevil

implementation, one must only look at the new signaling system contract and the claims that have been made to the public. The MBTA promises three-minute headways on the Red Line. The Downtown Crossing and Park Street Red Line stations are very close together. Signaling systems use “blocking” to restrict trains to a certain block of rail, preventing other trains from entering the “block” to prevent collisions. If the signaling system being purchased is using an older style blocking system, and the two stations are situated within the same ‘block’, the new system may prevent trains from entering one of the stations if there is a train at the other one. Who is going to monitor implementation to ensure that it follows the most modern blocking arrangement that would allow for three-minute headways between the Downtown Crossing and Park Street stations? A hands-on senior contract or project manager with executive-level experience will be needed to ensure that the project is delivered correctly, on time and on budget.

Converting problems into projects

The MBTA need to constantly ask what happens when the pipeline of projects runs dry and there are still unspent capital funds which, according to Secretary Pollack, is going to happen in 2022. A cursory review of social media produces a list of problems commuters’ experience, such as too few bicycle racks, leaking stations, flood damage, poor signage, broken turnstiles and elevators, broken air conditioning, and smoking Green and Blue Line trains. All these and more urgently need to be translated into projects and turned over to project management teams that can implement them. All need capital, and filling the coming project gap will require having contract design, engineering design, and procurement processes in place.

“At the T, the situation is exacerbated by “incrustation” – an accumulation of past practices and a culture that resists change. Managerial reforms may be placed at a lower priority”

Parking & bike lockup limitations.

While parking is being expanded on the southern portion of the Red Line, parking availability near Red and Orange Line stations in other areas needs to be studied. Red Line Alerts on twitter has been warning of the Alewife parking garage being at capacity on certain days. Other twitter users frequently complain of Alewife biking cages and parking spaces being full. Lack of biking or car parking facilities at the end of the line limits ridership growth among commuters. This study should inform the building of more parking and looking at bus, taxi, and ride hailing stopping spaces to drive traffic to the

Project delays are costly

The point is illustrated by an example: A sign on the closed elevator at the Central Square Red Line station reads, "Red Line April 9 2018 to spring 2020 Elevator 861 out of service."

Option 1: Use call box to request shuttle to Kendall/MIT.

Option 2: Take Alewife train to Harvard then use the ramps to transfer to Ashmont/Braintree train."

The cost of these shuttles is significant over such a long period. Alternatively, people with disabilities have given up and call a ride-hailing company or The Ride to assist.

If the Big Dig taught us anything, it's that delays and changes to contracts and construction timetables cause massive cost overruns. Many MBTA projects take too long to complete. This negatively impacts service delivery and increases costs.

Even conducting much-needed maintenance results in operational delays, which in turn affect ridership. It is clear from Washington Metropolitan Area Transit Authority in D.C., for example, that extended shutdowns after delayed maintenance result in ridership declines that are difficult to reverse. The rapid drop in riders on the D.C. Metro appears to correlate with system closures or partial closures for extended maintenance after several significant fire events.

The Red Line is currently being affected by the need to do maintenance work in the wake of a dramatic derailment. Red Line trains between the Harvard and Central stations also experience delays and "go slows" due to maintenance on the line, which is affecting service. Poor service means mode shifts as commuters look for more efficient alternatives to get to work, and that means a drop in subway ridership.



Let's remember that during World War II, the U.S. built 61 Aircraft carriers in the time the MBTA takes to replace one broken elevator!!

T. Stops at either end of the Green Line similarly have too few parking spaces in all but one case.

Recommendations:

1. *The MBTA must hire additional executive level project managers* to deal with projects in the capital spending plan. The new chief of capital programs is not enough. Pioneer Institute recommends the T ensure the appointment of separate executive project managers for at least the following projects:
 - Red Line Modernization program (Behind Schedule) Includes signals, power systems, rolling stock,
 - Orange Line Modernization program (Behind Schedule) Includes signals, power systems, rolling stock,
 - Green Line Extension project or GLX (Behind Schedule) Including all stations, track and systems, procurement, engineering, procurement, contract management, subcontractor management, delivery schedule & timelines, cost containment
 - Positive Train Control safety system or PTC (Behind Schedule)
 - AFC 2.0 (The new electronic fare collection system)

implementation (Behind Schedule) including integration of commuter rail, subways and buses under a single system.

- New signaling and ATO contracts
- New power systems for all trains, and trolleys.

They should report to the new Chief of Capital Programs (who should work closely with the head of finance and other departments) and be responsible for every aspect of this implementation including long-term and detailed planning, subcontractor management, deadlines and cost containment.

Lower-level project managers should focus on fewer projects each to focus their energies and expedite individual projects.

If there aren't sufficient qualified, experienced and empowered staff to manage procurement and implementation of the large projects ahead, the rise in capital spending will stall. *Current staff have pushed the T to double its capital spending, but additional expertise will be required to double it again.*

The staff capacity plan must of course follow the five-year Capital Investment Plans themselves. If these are detailed, they will give the current administration a feel

for how many additional staff will be required to fulfil these larger budget targets.

2. Contract out for missing expertise if necessary.

There are a large number of engineers, project managers, procurement specialists and contract managers in the world. However, if the T is unable to attract the requisite skills to manage many more and much larger contracts than is currently happening, they should contract some services out to the private sector to get projects completed on time. Senior management has already admitted that projects are being delayed due to insufficient internal capacity.

3. The MBTA must implement a detailed tracking system for all contracts associated with Red & Orange Line Modernization.

A detailed project-specific annual spending schedule for each year of every five-year plan should be submitted to the state Legislature. Pioneer institute is calling for the Fiscal and Management Control Board to establish and publish a project-specific timeline and annual spending schedule approved by the MBTA FMCB for **the full five years** (2020 to 2024) and full \$8.5 billion. In the past, the MBTA has lowered the annual capex budget as they were unable to spend it. If a realistic project-specific budget and timeline to spend an annual average of \$1.6 billion is not published, it will be difficult to hold the T accountable and the goal is unlikely to be achieved. All of these Items must be included and tracked in Tracker and the PFP to ensure delays are picked up almost immediately. There is currently no publicly disclosed way to track progress and spending that details how the \$8.5 billion spend will be operationalized on many line items.

4. The MBTA must report capital spending strictly in accordance with Governmental Accounting Standards Board (GASB) standards so the amounts it reports each fiscal year to the Legislature, Governor, and the public aligns with its audited financial statements, making the reporting easy to review.

5. Filed Sub-Bid Law.

Pioneer Institute is calling for a similar amendment to the procurement law to allow the MBTA to use the Federal Transit Agency's standard procurement procedures with the approval of the Inspector General of Massachusetts, which would put it effectively on a similar (and shorter) procurement footing as other Transit Agencies in the US. Similar waivers have already been granted to Massachusetts agencies.

The Federal Transit Administration has published a detailed document outlining recommended procurement procedures for all transit agencies called "Federal Transit Administration Best Practices Procurement and Lessons Learned Manual."³² The Massachusetts Legislature should allow the MBTA to make use of any federally approved procurement methodology identified in this document.

This would dramatically simplify the contracting process at the T and significantly expedite the modernization program. Such an amendment is essential to getting the capital expenditure program back on track and ending the current system breakdowns. If this option is not approved, the MBTA should at least be added to the list of agencies that are exempt from the requirement to pre-qualify sub-contractors already pre-qualified by DCAMM.

6. Increase spending on maintenance of current power systems and rolling stock until the new hardware is in place. Recent derailments and power outages demonstrate that maintenance is deficient. The age of current infrastructure means it will not continue to function without additional maintenance until the new hardware is installed. Rolling Stock and power systems are key areas that need attention. The Blue Line, Green Line and electric trolley bus fires, Red and Green Line derailments and other problems in June and July 2019 could, apart from one driver related problem, probably have been prevented with better maintenance of rolling stock and electrical systems.

Conclusion

This project is a high yield investment strategy. In terms of increasing MBTA ridership, the Orange and Red Lines represent the best bang for the buck with regard to effort versus reward and cost versus benefit. The problems are no secret. Getting projects designed, costed out and awarded, managed and completed on time and on budget is the problem. Capacity to complete the work, not funding, is the big challenge.

Appendix A

Pioneer Institute summary of requirements for pre-qualification of subcontractors under the filed sub-bid law
for full text see: [https://malegislature.gov/Laws/ General Laws/PartI/TitleXXI/Chapter149/Section44D3-4](https://malegislature.gov/Laws/GeneralLaws/PartI/TitleXXI/Chapter149/Section44D3-4)

A number of time-consuming and onerous conditions are found in the detail of the filed sub-bid regulations:

1. Separate project drawings, specifications and documents must be drawn up for each of 17 sub-bid classes of work in addition to total scope of work for the general contractor;
2. The awarding authority must initiate a *sub-contractor pre-qualification* process by issuing a request for qualifications (RFQ) of sub-contractors
 - a. the RFQ will be used to prequalify subcontractors that will be invited to submit a bid;
 - b. the awarding authority must establish a pre-qualification committee for each sub-contract estimated to cost not less than \$100,000;
 - c. the pre-qualification RFQ must include a description of the statutorily prescribed point rating system, and a schedule for the evaluation process;
 - d. Upon receipt of the statement of qualifications submitted by subcontractors, the prequalification committee established pursuant to subsection (c) shall evaluate each statement of qualifications using solely the criteria provided in the RFQ pursuant to paragraph (e). The prequalification committee shall select a minimum of 3 qualified subcontractors to submit bids pursuant to said section 44E. The subcontractor invited to submit a bid pursuant to this subsection shall be subject to section 44B.
3. If the awarding authority qualifies less than 3 subcontractors in a particular trade to submit bids,, the awarding authority shall reject all responses and issue at least 1 new request for qualifications
4. Only subcontractors achieving a minimum score of 70 shall be prequalified and invited to submit bids consistent with the provisions of section 44E. Following the pre-A list of the pre-qualified sub-bidders, and their sub-bid amounts, is then mailed to all those who have received the bidding documents for the general bids.
5. After screening the sub-bidders, the public owner provides a list of eligible sub-bidder and their sub-bid prices to all interested contractors. This list is called a filed sub-bid tabulation sheet. Each general contractor must select, in each sub-bid category, the subcontractor it wishes to use (provided it is not restricted by the subcontractor). The general contractor must list in its general bid the names of the selected subcontractors and the respective sub-bid amounts. General contractors are not required to take the lowest sub-bid in each category.
6. Separate project drawings, specifications and documents must be drawn up for each of 17 sub-bid classes of work in addition to total scope of work for the general contractor;
7. The awarding authority must initiate a sub-contractor pre-qualification process by issuing a request for qualifications (RFQ) of sub-contractors
 - a. the RFQ will be used to prequalify subcontractors that will be invited to submit a bid;
 - b. the awarding authority must establish a pre-qualification committee for each sub-contract estimated to cost not less than \$100,000;
 - c. the pre-qualification committee must be comprised of one representative of the designer and 3 of the awarding authority;
 - d. the pre-qualification RFQ must include a description of the statutorily-prescribed the point rating system, and the schedule for the evaluation process;
 - e. the pre-qualification committee must review each sub-contractor's statement of qualifications in response to the RFQ.
 - f. Upon receipt of the statement of qualifications submitted by subcontractors, the prequalification committee established pursuant to subsection (c) shall evaluate each statement of qualifications using solely the criteria provided in the RFQ pursuant to paragraph (e).. The prequalification committee shall select a minimum of 3 qualified subcontractors to submit bids pursuant to said section 44E. The subcontractor invited to submit a bid pursuant to this subsection shall be subject to section 44B.
 - g. The pre-qualification committee must assign scores to each submitted sub-contractor's statement of qualifications. Within each category of information, the awarding authorities may use discretion in allocating points among the subcategories, consistent with the total points for the category, as follows:
 - i. Management Experience (50 points; minimum of 25 required for approval):
 1. Business owners, The name, title, years with firm of the owner(s) of the business.
 2. Management personnel, The names, title, education and construction experience, years with firm, and list of projects completed by all management personnel.
 3. Similar project experience, The project name(s), description, description of scope, original trade contract sum, final trade contract sum with explanation and date completed of similar projects.

4. Terminations, A list of any projects on which the subcontractor was terminated or failed to complete the work.
5. Legal proceedings, A list of all legal or administrative proceedings currently pending against the subcontractor or concluded adversely to the subcontractor within the past 3 years which relate to the procurement or performance of any public or private construction contract. Legal proceedings shall not include any actions that primarily involve personal injury or workers' compensation claims, or where the sole cause of action involves the subcontractor's exercise of its rights for direct payment under section 39F of chapter 30.
6. Safety Record - The 3-year history of the subcontractor's workers' compensation experience modifier.
- ii. References (30 points; minimum of 15 required for approval):
 1. Project references, References from owners and architects for all projects listed in clause (iii) of paragraph (1) including project name, client's name, address, telephone and fax number, and contact person
 2. Credit references, A minimum of 5 credit references, including telephone and fax number of contact person from key suppliers, vendors and banks.
 3. Public project record, A list of all completed public building construction project as defined in section 44A during past 3 years with client's name, address, telephone and fax number and contact person.
 4. Capacity to Complete Projects (20 points; minimum of 10 required for approval):
 5. Annual revenue for prior 3 fiscal years, provided that financial information submitted shall remain confidential and shall not be a public record under section 7 of chapter 4. There shall be no requirement for submission of financial statements.
 6. Revenue under contract for the next 3 fiscal years.
 - iii. Capacity to Complete Projects (20 points; minimum of 10 required for approval):
 1. Annual revenue for prior 3 fiscal years, provided that financial information submitted shall remain confidential and shall not be a public record under section 7 of chapter 4.
 2. Revenue under contract for the next 3 fiscal years.
8. The statement of qualifications shall be signed under pains and penalties of perjury;
9. If the awarding authority qualifies less than 3 subcontractors in a particular trade to submit bids,, the awarding authority shall reject all responses and issue at least 1 new request for qualifications
10. Only subcontractors achieving a minimum score of 70 shall be prequalified and invited to submit bids consistent with the provisions of section 44E Following the pre-A list of the pre-qualified sub-bidders, and their sub-bid amounts, is then mailed to all those who have received the bidding documents for the general bids.
11. After screening the sub-bidders, the public owner provides a list of eligible sub-bidder and their sub-bid prices to all interested contractors. This list is called a filed sub-bid tabulation sheet. Each general contractor must select, in each sub-bid category, the subcontractor it wishes to use (provided it is not restricted by the subcontractor). The general contractor must list in its general bid the names of the selected subcontractors and the respective sub-bid amounts. General contractors are not required to take the lowest sub-bid in each category.
12. The law contains severe civil and criminal penalties for those public officials who seek to evade the requirements of the public construction laws by failing to publicly advertise contracts or by splitting contracts into smaller contracts in order to avoid competitive bidding. M.G.L. c. 149, § 44J(7).
13. Contracts awarded in violation of these requirements may be held unenforceable by a court regardless of whether the designer or contractor was acting in good faith. Any contract signed by an individual who lacks the authority to bind the jurisdiction will be legally unenforceable.

Endotes

1. https://pioneerinstitute.org/better_government/the-future-of-transportation-in-the-commonwealth/
2. <https://www.statehousenews.com/news/20181810>
3. <https://www.patriotledger.com/news/20181001/mbta-awards-contract-for-red-line-signal-improvements>
4. <https://www.patriotledger.com/news/20181001/mbta-awards-contract-for-red-line-signal-improvements>
5. <https://www.patriotledger.com/news/20181001/mbta-awards-contract-for-red-line-signal-improvements>
6. <https://cdn.mbta.com/sites/default/files/fmcb-meeting-docs/2019/06-june/2019-06-24/originals/2019-06-24-fmcb-G-red-orange-line-improvement-program-update.pdf>
7. https://www.ctps.org/data/pdf/studies/transit/pmt/PMT_Ch5.pdf. <https://cdn.mbta.com/sites/default/files/2017-10/fy09-fy13-capital-investment-program.pdf>
8. <https://cdn.mbta.com/sites/default/files/2017-10-fy09-fy13-capital-investment-program.pdf>
9. <https://cdn.mbta.com/sites/default/files/2017-10-fy13-fy17-capital-investment-program.pdf>
10. https://cdn.mbta.com/uploadedfiles/About_the_T/Financials/14-18%20Final%20CIP.pdf
11. <https://www.mbta.com/mbta-back-on-track>; also <https://cdn.mbta.com/sites/default/files/2017-10/back-on-track-action-plan-040815.pdf>
12. https://cdn.mbta.com/uploadedfiles/About_the_T/Board_Meetings/Capital%20Spending%20Update%209-12-16.pdf.
13. <https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/funding/procurement/8286/fta-best-practices-procurement-and-lessons-learned-manual-2016.pdf>
14. https://www.bostonchamber.com/media/policy/05_13_19-Letter-to-the-FMBCB.pdf
15. <https://commonwealthmagazine.org/uncategorized/poftak-mbta-needs-more-capacity-to-meet-spending-goals/>
16. <https://www.statehousenews.com/mobile/?mode=email&select=20191364&db=a&key=c79500>
17. See M.G.L. c. 149, §§44A-M); see particularly §§44F and 44D3/4.
18. <https://www.cambridgema.gov/~/media/Files/purchasingdepartment/forsitelaunch/Designing-and-Constructing-Public-Facilities.pdf>
19. <https://www.nycbar.org/images/stories/pdfs/Legislative/Construction/perini2.pdf>
20. <https://www.cambridgema.gov/~/media/Files/purchasingdepartment/forsitelaunch/Designing-and-Constructing-Public-Facilities.pdf>
21. <https://www.cambridgema.gov/~/media/Files/purchasingdepartment/forsitelaunch/Designing-and-Constructing-Public-Facilities.pdf>
22. <https://cdn.mbta.com/sites/default/files/fmcb-meeting-docs/2019/04-april/2018-04-08-fmcb-D-gm-accessible.pdf>
23. <https://commonwealthmagazine.org/uncategorized/poftak-mbta-needs-more-capacity-to-meet-spending-goals/>
24. <https://commonwealthmagazine.org/uncategorized/poftak-mbta-needs-more-capacity-to-meet-spending-goals/>
25. <https://www.mbta.com/events/2019-05-06/fiscal-and-management-control-board-meeting>
26. <https://cdn.mbta.com/sites/default/files/fmcb-meeting-docs/2019/05-may/2019-05-06-fmcb-F-capital-review-long-term-plan-accessible.pdf>
27. <https://www.mass.gov/service-details/capital-investment-plan-cip> (2020-2024 Capital Investment Plan (CIP)
28. <http://massdot.maps.arcgis.com/apps/MapJournal/index.html?appid=33a118c32b3f47b3b90a769498aa68bd>
29. <https://cdn.mbta.com/sites/default/files/fmcb-meeting-docs/2019/05-may/2019-05-06-fmcb-F-capital-review-long-term-plan-accessible.pdf>
30. <https://cdn.mbta.com/sites/default/files/fmcb-meeting-docs/2019/06-june/2019-06-24/originals/2019-06-24-fmcb-G-red-orange-line-improvement-program-update.pdf>
31. <https://malegislature.gov/Laws/SessionLaws/Acts/2009/Chapter25>
32. <https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/funding/procurement/8286/fta-best-practices-procurement-and-lessons-learned-manual-2016.pdf>

About the Authors

Gregory Sullivan is Pioneer's Research Director, and oversees PioneerPublic and PioneerOpportunity. Prior to joining Pioneer, Sullivan served two five-year terms as Inspector General of the Commonwealth of Massachusetts by appointment of the Governor, Attorney General, and Auditor. Prior to serving as Inspector General, Greg held several positions within the state Office of Inspector General. Sullivan was a 17-year member of the Massachusetts House of Representatives, serving on the committees of Ways and Means, Human Services, and Post-Audit and Oversight. Greg holds a bachelor's degree from Harvard College, a master's degree in public administration from The Kennedy School of Public Administration at Harvard, and a master's degree from the Sloan School at M.I.T., with a concentration in finance.

Ian Ollis is a former South African Member of Parliament having served two terms. He was the Shadow Minister of Transportation, Shadow Minister of Labor, and Shadow Minister Education during this time. In 2013 he drafted the Democratic Alliance national Transportation Policy. During his time as Member of Parliament Ian exposed a number of cases of corruption leading to major reforms. Previously Ian served as a City Councillor in Johannesburg, serving on the Transportation and City Planning Committees. He has a Masters Degree in Arts from the University of the Witwatersrand in South Africa. Ian is currently completing a City Planning Masters degree in transportation at M.I.T and interning at Pioneer Institute as a Senior Research Analyst developing a transportation policy platform.

About Pioneer

Pioneer Institute is an independent, non-partisan, privately funded research organization that seeks to improve the quality of life in Massachusetts through civic discourse and intellectually rigorous, data-driven public policy solutions based on free market principles, individual liberty and responsibility, and the ideal of effective, limited and accountable government.

