

OFFICE OF THE STATE AUDITOR

DIANA DIZOGLIO

Official Audit Report – Issued January 16, 2025

Massachusetts Bay Transportation Authority— Automated Fare Collection System 2.0 Project

For the period January 1, 2018 through September 30, 2023



OFFICE OF THE STATE AUDITOR

DIANA DIZOGLIO

January 16, 2025

Monica Tibbits-Nutt, Acting Secretary and Chief Executive Officer
Massachusetts Department of Transportation
State Transportation Building
10 Park Plaza, Suite 4160
Boston, MA 02116

Dear Secretary Tibbits-Nutt:

I am pleased to provide to you the results of the enclosed performance audit of the Massachusetts Bay Transportation Authority as it relates to the automated fare collection system 2.0 project. As is typically the case, this report details the audit objectives, scope, methodology, findings, and recommendations for the audit period, January 1, 2018 through September 30, 2023.

This is one of a series of reports that the Office of the State Auditor is issuing as part of a single performance audit of the MBTA. Other reports focus on high-risk areas such as Keolis contract provisions as well as topics focused on ensuring safety of MBTA riders, employees, and the general public. While all part of one audit, these topics are best addressed in incremental reports.

OSA audits over 200 state agencies as part of our statutory mandate. In doing so, we examine areas of risk, including program integrity, funding sources, spending, and potential operational weaknesses, including safety. We also re-examine previous audits to determine whether the agency has implemented our recommendations.

Based on our research, the MBTA is a “high-risk” agency that warrants consistent oversight due to the size of its budget, the complexity of its operations, and the risks related to the services it provides. While our resources are limited, making it difficult to provide the needed level of oversight, we continue to advocate for funding that would support the creation of a transportation audit unit within OSA. This unit would allow us to provide the MBTA with recommendations that help it provide for safer, more efficient, and more cost-effective programming for Massachusetts riders and taxpayers.

The mission of OSA is to help make government work better. In this report, we highlight several findings and recommendations related to the MBTA’s Automated Fare Collection 2.0 project. It is our team’s hope that you find this report helpful as we work together to improve services, now and in the future.

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We will share with you additional reports from this audit. We intend to identify other areas of risk and offer recommendations for performance enhancements.

We welcome the opportunity to discuss the findings and recommendations of this and our future reports with you.

Best regards,

A handwritten signature in dark ink, reading "Diana DiZoglio". The signature is fluid and cursive, with the first name "Diana" and last name "DiZoglio" clearly distinguishable.

Diana DiZoglio
Auditor of the Commonwealth

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LIST OF ABBREVIATIONS

AFC	Automated Fare Collection System
FMIS	Financial Management Information System
HR/CMS	Human Resources Compensation Management System
MBTA	Massachusetts Bay Transportation Authority
OIG	Massachusetts Office of the Inspector General
SI	Systems Integrator

EXECUTIVE SUMMARY

In accordance with Section 12 of Chapter 11 of the Massachusetts General Laws, the Office of the State Auditor has conducted a performance audit of the Massachusetts Bay Transportation Authority (MBTA) for the period January 1, 2018 through September 30, 2023.

This is one of a series of reports that the Office of the State Auditor is issuing as part of a performance audit of the MBTA. Other reports focus on high-risk areas such as Keolis¹ contract provisions, the MBTA's contract management of its contract with Block By Block, as well as topics focused on ensuring safety of MBTA riders, employees, and the general public.

This report focused on the MBTA's Automated Fare Collection System (AFC) 2.0 project, estimated to cost \$960.2 million, which includes an approximately \$935.4 million contract, known as the Amended and Restated Project Agreement. This project was created by the MBTA to replace the current Charlie Ticket / Charlie Card fare collection system with an advanced tap-and-go system that would allow the public to use multiple forms to pay fares. The new AFC 2.0 system will be installed on subway, commuter rail, bus, trolley, and ferry lines.

In this performance audit, our goal was to determine whether the MBTA was properly managing its financial risk associated with this contract. We examined this issue by auditing whether the MBTA was providing appropriate oversight on this contract and whether it adequately protected itself against financial loss by having a security bond in place. We focused on these areas to help determine whether the MBTA was properly monitoring the "day to day" of the project and to determine whether it structured its contract to ensure that it and the public were properly protected in the event of contractor failure. Our goal was also to determine whether the project costs stated in the contract fairly represented the actual costs of the project, or whether, and to what extent, the MBTA used its own employees to assist with the completion of the AFC 2.0 project. We further sought to determine whether the MBTA calculated the costs associated with using its own employees for this project.

During our initial audit work, we learned of a submittal process that occurred between the MBTA and the contractor. These submittals are sent to the MBTA, which then is required to provide a written determination for each submittal. These submittals are, in effect, work orders and change orders. As work

1. This is the company contracted by the MBTA to operate its commuter rail services.

progressed through the various stages, the MBTA received submittals from the contractor that the MBTA was required to approve or send back to the contractor to address deficiencies or inconsistencies identified by the MBTA within 15 days of receipt. This submittal and approval process documents and demonstrates the MBTA's oversight of the contract. Since this process is required to have written documentation, and thus we were able to collect evidence, we chose to audit this process to determine whether the MBTA provided appropriate oversight over the contract.

We also reviewed any security bonds in place to protect the MBTA. The purpose of security bonds for this project was to provide a financial recourse to the MBTA if the contractor did not fulfill its obligations.

During the audit, we learned that MBTA employees were being used to assist in completing the project. We chose to examine the costs associated with these employees because these would be additional costs incurred by the MBTA for the AFC 2.0 project and therefore would be information of interest to the public.

The purpose of this report on the MBTA was to determine the following:

- whether the MBTA follows the submittal review period stated in Section 8 of Appendix 7 of the Amended and Restated Project Agreement to determine compliance with this specific section of the contract;
- whether the MBTA has a security bond in place for the Amended and Restated Project Agreement and ensured that this bond was provided by an entity with no financial connection to the AFC 2.0 project contractor, consistent with good industry practices; and
- to what extent the MBTA used MBTA employees to assist with the completion of the AFC 2.0 project.

Below is a summary of our findings, the effects of our findings, and our recommendations, with links to each page listed.

Finding 1 Page 15	The MBTA's Amended and Restated Project Agreement allowed deadlines to be overridden.
Effect	By not having controls in place to verify and report on timely delivery of projects' milestones, the MBTA risks encountering significant delays related to contract delivery of the AFC 2.0 project. This affects the public by delaying their use of a more efficient system that will lead to quicker service and results in overspending of public funds because of change orders, price escalation because of inflation, and other cost pressures. Overuse of contract extensions may render project timelines meaningless and can have significant impacts on the timely delivery of such a large, complex project.

Recommendations Page <u>16</u>	<ol style="list-style-type: none"> 1. The MBTA should adopt an approach of a rigorous review and consideration before management makes the decision to override deadlines to ensure that this decision is used sparingly and only when necessary. 2. The MBTA should establish policies and procedures to ensure that public works projects are subject to strong controls, allowing for effective monitoring to prevent excessive delays and cost overruns.
Finding 2 Page <u>19</u>	The MBTA violated Section 29 of Chapter 149 of the General Laws by not ensuring that the SI obtained a surety bond for certain work performed on the new AFC.
Effect	By not obtaining a “security by bond” for the AFC 2.0 project, as required by law, the MBTA may not be able to recover money it paid for the \$935.4 million contract in the event that the contract is not completed. Additionally, a contractor may not fulfill the contract if a security bond is not in place. Typically, in a security bond, the contractor would turn over assets in the amount of the contract to the surety company. This would allow the MBTA to receive these assets as recourse if the contractor fails to fulfill its obligation. The lack of a “security by bond,” therefore, potentially puts a drain on public resources to complete a project for which the MBTA has already committed time and money. A security bond in place would at least allow the MBTA to recover some of its expended funds.
Recommendation Page <u>20</u>	The MBTA should follow state law and require all contractors performing construction, reconstruction, alteration, remodeling, repair, or demolition to MBTA public works projects to obtain security by bond to cover one half of the total contract price in accordance with Section 29 of Chapter 149 of the General Laws. The MBTA should, in the essence of ensuring that contractors have surety by bonds in place, detail the bond requirements in the procurement process documents. This could serve to notify any potential contractors of their obligation to obtain a surety by bond before a contract even begins.
Finding 3 Page <u>24</u>	The MBTA did not reconcile its payroll records to its general ledger.
Effect	If the MBTA does not reconcile payroll records to its general ledger, then payroll could be misstated and project costs attributed to the AFC 2.0 project and other MBTA projects and services could be inaccurate, making it difficult or impossible to determine the cost and cost effectiveness of different services offered to the public. Additionally, it is possible that MBTA employees could have been overpaid or underpaid if payroll records are inaccurate.
Recommendations Page <u>25</u>	<ol style="list-style-type: none"> 1. The MBTA should investigate and resolve the \$349,523 variance noted between HR/CMS and FMIS with regard to the AFC 2.0 project payroll expenses. 2. The MBTA should create policies and procedures to perform biweekly reconciliations for payroll records to its general ledger to ensure accurate accounting for all project costs. 3. The MBTA should ensure that payroll codes are appropriately applied to projects.
Finding 4 Page <u>26</u>	The MBTA did not ensure that all its information system users completed cybersecurity awareness training.
Effect	If the MBTA does not ensure that all its information system users complete cybersecurity awareness training, then the MBTA may expose itself to an increased risk of financial and/or reputational losses.
Recommendation Page <u>27</u>	The MBTA should ensure that all its information system users complete cybersecurity awareness training as part of initial training and on an annual basis.

OVERVIEW OF AUDITED ENTITY

The Massachusetts Bay Transportation Authority (MBTA) was created in 1964, pursuant to Chapter 161A of the Massachusetts General Laws. The agency provides the following: a rapid transit system, commuter rail services, bus services, ferry routes, and transit services for people with disabilities. According to its website, the MBTA is “one of the largest public transit systems in the country, serving nearly 200 cities and towns and over 1 million daily riders.”

According to Section 7 of Chapter 161A of the General Laws,² the MBTA is governed by a nine-member board of directors. This section states:

The board shall consist of: the secretary [of Transportation], who shall serve ex officio; 1 person to be appointed by the mayor of the city of Boston; 1 person to be appointed by the advisory board who shall have municipal government experience in the service area constituting the authority and experience in transportation operations, transportation planning, housing policy, urban planning or public or private finance; provided, however, that said person shall not represent the city of Boston; and 6 persons to be appointed by the governor, 1 of whom shall have experience in safety, 1 of whom shall have experience in transportation operations, 1 of whom shall have experience in public or private finance, 1 of whom shall be a rider as defined in section 1 and a resident of an environmental justice population as defined in section 62 of chapter 30, 1 of whom shall be a municipal official representing a city or town located in the area constituting the authority representing the service area . . . and 1 of whom shall be selected from a list of 3 persons recommended by the president of the Massachusetts State Labor Council. . . .

Not less than 2 of the appointed members shall also be members of the board of directors of the Massachusetts Department of Transportation.

The MBTA is also overseen by the Massachusetts Department of Transportation’s board of directors, whose 11 members are appointed by the Governor. According to Section 3(d) of Chapter 161A of the General Laws, the general manager of the MBTA is hired by the Secretary of Transportation and oversees the MBTA’s day-to-day activities.

Automated Fare Collection System 2.0

The automated fare collection system (AFC) 2.0 project was created by the MBTA to replace the current Charlie Ticket / Charlie Card fare collection system. The AFC project began in 2018 when the MBTA contracted with Boston AFC 2.0 OpCo LLC, a partnership of Cubic Transportation Systems, Inc., referred

2. This version of Section 7 of Chapter 161A of the General Laws became effective on July 1, 2023. Before this, there were seven members of the board.

to in this report as Cubic, and John Laing.³ Boston AFC 2.0 OpCo LLC would provide the MBTA with the financing, development, and operation of a next-generation fare payment system within the MBTA system. Both the MBTA and Boston AFC 2.0 OpCo LLC recognized that the contract was insufficient to satisfy the needs of the project, so in 2020 they entered into an amended contract, known as the Amended and Restated Project Agreement. Boston AFC 2.0 OpCo LLC served as the Systems Integrator (SI) and is 90% owned by John Laing and 10% owned by Cubic. Cubic served as the Implementation Contractor for the AFC 2.0 system.

The purpose of the Amended and Restated Project Agreement was to replace the existing fare collection system (Charlie Card) with an advanced tap-and-go system that would allow the public to pay fares using multiple modes of payment. The new AFC 2.0 system will be installed on subway, commuter rail, bus, trolley, and ferry lines.

The MBTA's website states, "Our current fare payment technology and policies are outdated and overly complex. Fare Transformation will completely replace this system to ensure equal access to an updated fare payment system that works—and will work for many years to come."

The MBTA's website also states that the new system will contribute to improving the MBTA's operational efficiency and will allow the MBTA to initiate new changes in the future geared toward growth and faster service.

Finally, the MBTA's website states the following:

The MBTA's Fare Transformation will make paying for transit easier and more convenient. Upon completion, you'll be able to:

- *Tap and board at any door with a fare card, smartphone, or contactless credit card*
- *Reload using cash or credit card at vending machines at all stations and some bus stops*
- *Manage your account online 24 hours a day.*

The contract between the MBTA and Boston AFC 2.0 OpCo LLC is known as a public-private partnership, or a P3. In a P3, a public entity, such as the MBTA, enters into a partnership with a private entity, such as Boston AFC 2.0 OpCo LLC, to collaborate and maintain a large public works project, such as the AFC 2.0

3. John Laing is a company based in London, England, that invests in infrastructure projects.

project. In this contract, Boston AFC 2.0 OpCo LLC would be responsible for installing the programming software and equipment and terminals in MBTA stations, on buses, and on subway cars. Boston AFC 2.0 OpCo LLC would earn most of its revenue from this project by maintaining the AFC 2.0 system after full implementation of the project. The table below shows a breakdown of the costs of the project, according to the MBTA.

Contract	Project Cost	Paid as of September 30, 2023*	Balance Due on Contract
Amended and Restated Project Agreement	\$ 935,400,000	\$ 20,769,242	\$914,630,758
Construction Contract	24,809,910	446,770	24,363,140
MBTA Employees**	N/A	7,942,487	N/A
Total	<u>\$960,209,910</u>	<u>\$ 29,158,499</u>	<u>\$938,993,898</u>

* We did not verify this information to an audit standard of verification because it is background information.

** The source of this information is data from the MBTA's Financial Management Information System.

We note that the New York Metropolitan Transportation Authority entered into an agreement with Cubic in October 2017 for a similar project. That project was completed in January 2021 and cost the New York Metropolitan Transportation Authority \$590 million. This project began only three months before the AFC 2.0 project but was completed in only a few years and for approximately 60% of the cost of the AFC 2.0 project.

Submittals to the MBTA

As stated in Section 5.7 of the Amended and Restated Project Agreement, "the Systems Integrator is obligated to deliver reports, records, designs, plans, drawings, specifications, proposals and other documentary submittals in connection with the performance of its duties." These submittals are sent to the MBTA, which then is required to provide a written determination for each submittal. These submittals are, in effect, work orders and change orders. As work progresses through the various stages, MBTA employees receive submittals from the SI that the MBTA is required to approve or send back to the SI to address deficiencies or inconsistencies identified by the MBTA within 15 days of receipt.

In addition, there are scheduled milestone payments that the MBTA must pay to the SI based on the stage of completion. The criteria for each of these milestones are listed in the Amended and Restated Project Agreement (Table 9: Payment Milestones of Appendix 8: Payment Mechanisms). However, these criteria are not readily apparent in the contract since they reference multiple sections of the contract. For example, Milestone A is complete when the following criteria are satisfied:

- *The SI achieves MBTA acceptance of the Design Addendum required in Section 3.6.1.14.2 of Appendix 3.6; and*
- *The SI achieves MBTA acceptance of the updated Endor worksheet required in Section 2.6.5.1.5 of Appendix 2.6.*

Please see Other Matters for more information on this issue and others we identified with the Amended and Restated Project Agreement.

During the audit, we asked the MBTA at which stage (milestone) the AFC 2.0 project was currently. The MBTA refused to answer this question, stating that this information was outside the audit period. However, the MBTA did begin to roll out the tap-and-go system for riders of buses, trolleys, and subway systems in August 2024. These milestones are detailed in the table below.

Milestone	Payment
A	\$ 8,000,000
B	4,000,000
C	2,500,000
D	1,000,000
E	1,000,000
F	3,000,000
G	4,325,000
H	3,955,000
I	4,780,000
J	2,000,000
K	5,940,000
L	2,010,000
M	174,817,352
Total	<u>\$ 217,327,352</u>

Bonds and Guarantees

According to the National Association of Surety Bond Producers website,

A surety bond is a promise to be liable for the debt, default, or failure of another. It is a three-party contract by which one party (the surety) guarantees the performance or obligations of a second party (the principal) to a third party (the obligee).

The third-party surety, sometimes called a surety company, is typically a financial institution that determines the creditworthiness of the principal before agreeing to issue a surety bond. In the case of AFC 2.0, a surety bond would protect the MBTA in the event that Boston AFC 2.0 OpCo LLC does not fulfill its obligations under contract. Typically, the second party, Boston AFC 2.0 OpCo LLC in this instance, would turn over assets to the third-party surety in the amount of the contract. The bond allows the MBTA to request the assets be turned over to the MBTA if Boston AFC 2.0 OpCo LLC does not fulfill its obligation.

The estimated cost of this project is \$935.4 million, which includes the \$217.3 million for scheduled milestone payments mentioned in the table on the previous page. The capital portion is \$597.5 million, and after the full implementation of the new system, a further \$337.9 million is expected for operations and management of the system.

The Amended and Restated Project Agreement also requires Boston OpCo LLC to name the MBTA as an additional obligee or beneficiary if it engages a subcontractor to perform some services as part of the AFC 2.0 project.

A demand bond in the amount of \$38.9 million is also in place and was written in June 2020. Cubic is the principal on this bond. The MBTA and Boston AFC 2.0 OpCo LLC are co-obligees. This relationship, with Cubic listed as both principal and as a co-obligee by way of the partnership, poses potential conflicting interests. Please see Other Matters for more information on the potential conflicting interests with this demand bond.

In addition, the MBTA has contracted with McDonald Electrical Corporation, referred to in this report as McDonald, an independent subcontractor, to provide electrical construction services. McDonald secured the required performance bond equal to the total value of its contract with the MBTA. The performance bond in question is dated June 22, 2022 and was created through Westfield Insurance Company as the surety entity. It holds McDonald, as principal, bound to the MBTA, as the obligee, in the amount of \$24.8 million. The bond would be enforceable if McDonald is declared by the MBTA to be in default under the contract.

McDonald's work consists of removing and/or relocating specific existing fare vending machines; the contract also states that McDonald is responsible for the following:

[Installing] new fare vending machines, station validators and transition gate readers including foundations, surface restoration, modification to existing network equipment and connections,

modifications to existing electrical and communications infrastructure, installation of new electrical and communications infrastructure and system testing to support the new AFC 2.0 system.

According to the contract document between the MBTA and McDonald, new equipment is to be provided by the MBTA while McDonald will perform work throughout the MBTA service area in Massachusetts, including transit stations, light rail transit, and buses, as well as bus stops, ferries, and nonstation locations.⁴

Using MBTA Employees to Perform Work on AFC 2.0 Project

The MBTA has used its employees to work on the AFC 2.0 project. The MBTA hiring process for the AFC 2.0 project is the same as it is for other departments within the MBTA. Before each fiscal year, all departments update their staffing by performing and documenting a headcount as part of the capital budgeting process. A request is then made to leadership. A separate department within the MBTA is tasked with handling the review and approval of these capital project requests. The AFC 2.0 project is assigned a separate code for payroll and, as such, MBTA employees in other departments or who are working on different projects, could be reassigned to the AFC 2.0 project and their payroll costs be allocated to AFC 2.0. In addition, the MBTA also hired people to work specifically on the AFC 2.0 project. The chart below details the money spent using MBTA employees in the AFC 2.0 project by fiscal year, according to the MBTA's Financial Management Information System (FMIS).

Fiscal Year	Amount
2018	\$ 5,495
2019	541,768
2020	1,235,112
2021	1,433,316
2022	1,874,518
2023	2,152,003
2024*	700,276
Total	<u>\$ 7,942,488</u>

* This includes data as of September 30, 2023.

4. Nonstation locations can replace subways during station closures. Shuttle buses are used at these nonstation locations to replace the closed subways.

This cost of \$7.9 million in MBTA staff, contractors, and subcontractors is in addition to the project costs stated above.

The MBTA uses the Commonwealth of Massachusetts's Human Resources Compensation Management System (HR/CMS) for its payroll ledger. Employees enter time worked on a weekly basis and certify that the information entered is accurate and complete, including codes for the projects on which employees worked. A supervisor reviews the timesheet and approves this electronic document. These employee payroll records from HR/CMS are summarized by the MBTA and recorded in the MBTA's FMIS. The payroll amounts recorded in FMIS should agree to the payroll amounts in HR/CMS. Adjustments can be made to the FMIS payroll costs if a later review determines that an employee charged the wrong project code for the work they performed. Our audit relied on the payroll costs entered by MBTA employees in HR/CMS and therefore may not reflect all costs related to this project, as employees may have erroneously entered in their time, which was later certified by their managers.

AUDIT OBJECTIVES, SCOPE, AND METHODOLOGY

In accordance with Section 12 of Chapter 11 of the Massachusetts General Laws, the Office of the State Auditor has conducted a performance audit of certain activities of the Massachusetts Bay Transportation Authority (MBTA) for the period January 1, 2018 through September 30, 2023.

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Below is a list of our audit objectives, indicating each question we intended our audit to answer; the conclusion we reached regarding each objective; and, if applicable, where each objective is discussed in the audit findings.

Objective	Conclusion
1. Does the MBTA follow the submittal review period stated in Section 8 of Appendix 7 of the Amended and Restated Project Agreement to determine whether Boston [Automated Fare Collection System (AFC)] 2.0 OpCo LLC is in compliance?	Partially; see Finding <u>1</u>
2. Does the MBTA have a security bond in place for the Amended and Restated Project Agreement and ensure that this bond is provided by an entity with no financial connection to the AFC 2.0 project contractor as good industry practices?	No; see Finding <u>2</u>
3. To what extent is the MBTA using MBTA employees to assist with the completion of the AFC 2.0 project?	To some extent; see Findings <u>3</u> and <u>4</u>

To achieve our objectives, we gained an understanding of the aspects of the MBTA's internal control environment that we determined to be relevant to our objectives by reviewing applicable policies and procedures and relevant contracts, by conducting interviews with management, and by reviewing the processes related to our objectives. We evaluated the design of controls over the oversight of development and construction contracts to ensure that contractors obtained bonds and guarantees, and the administration of MBTA employees working on the AFC 2.0 project. We evaluated the design and tested the operating effectiveness of controls over the approval of submittals for development work on the AFC 2.0 project. We selected a random, statistical sample of 47 submittals from a population of 1,001

and determined whether an approved MBTA representative signed the submittal response letters. All of the letters in our sample were signed by approved MBTA representatives.

To obtain sufficient, appropriate evidence to address our audit objectives, we performed the audit procedures described below.

Submittals

To determine whether the MBTA followed the submittal review period stated in Section 8 of Appendix 7 of the Amended and Restated Project Agreement and to determine whether AFC 2.0 project contractors were in compliance, we took the following actions.

We requested, and the MBTA provided us with, submittal data for the AFC 2.0 project. The MBTA uses an Excel spreadsheet called the Submittal Tracking Tool that captures all work orders and change orders performed by the Systems Integrator (SI) to develop the AFC 2.0 system. We reviewed this data and found that, during the audit period, there were 1,001 distinct submittals, which included project milestone dates, SI status, MBTA review status, scheduled review dates, and actual delivery and review dates. We selected a random, statistical sample of 93 submittals from the population of 1,001 using a 95% confidence level,⁵ a 0% expected error rate,⁶ and a 5% tolerable error rate.⁷ We used TeamMate Analytics⁸ to select the sample. For our sample population, we determined whether the MBTA received submission letters from the SI for completed work. We also reviewed copies of the MBTA response letters the MBTA sent to the SI that indicated whether the MBTA accepted the work performed or sent it back for further work. We captured the dates of these submission and response letters to calculate the number of days it took the MBTA to respond to the SI to determine whether they fell within the compliance period.

We did not identify any exceptions in our testing; therefore, we concluded that, during the audit period, the MBTA followed the submittal review period stated in Section 8 of Appendix 7 of the Amended and Restated Project Agreement to determine that the AFC 2.0 project contractors were in compliance.

5. Confidence level is a mathematically based measure of the auditor's assurance that the sample results (statistic) are representative of the population (parameter), expressed as a percentage.

6. Expected error rate is the number of errors that are expected in the population, expressed as a percentage. It is based on the auditor's knowledge of factors such as prior year results, the understanding of controls gained in planning, or a probe sample.

7. Tolerable error rate is the maximum error in the population that auditors would be willing to accept and still conclude that the result from the sample has achieved the audit objective.

8. This is a Microsoft Excel-based data analytics tool that allows auditors to execute advanced data analysis.

However, we noted that the Amended and Restated Project Agreement contract allows deadlines to be overridden by the MBTA and Boston AFC 2.0 OpCo LLC. See Finding [1](#).

Bonds and Guarantees

To determine whether the MBTA ensured that Cubic and McDonald had obtained bonds or other security guarantees for the work they were performing on the AFC 2.0 project, we obtained a list of the 143 vendors that the MBTA used on the AFC 2.0 project. We could not determine which of the vendors worked specifically on the AFC 2.0 contract because the work performed by many of the vendors was for multiple projects besides the AFC 2.0 project. We selected to examine the contract with Cubic as it was the primary vendor of the AFC 2.0 contract and McDonald which, as construction vendors, would both have a bond in accordance with Section 29 of Chapter 149 of the General Laws. We requested the contracts from the MBTA for these two contractors and any bonds or other forms of surety that would benefit the MBTA if the contractors defaulted on the contract for work on the AFC 2.0 project. We reviewed the two contracts we received and determined whether the bonds or other surety given were in compliance with the Amended and Restated Project Agreement. We also obtained the names of the bonding or surety companies for these contractors. We identified the parent companies of the bonding or surety companies and reviewed their audited financial statements to determine whether there were any disclosures related to Cubic or McDonald. We determined that these companies were international publicly traded insurance companies and there were no related party transactions with the contractors.

We noted that the MBTA did not ensure that Boston AFC 2.0 OpCo LLC obtained a surety bond as required by Section 29 of Chapter 149 of the General Laws. See Finding [2](#).

Using MBTA Employees to Perform Work on the AFC 2.0 Project

To determine whether the MBTA had assigned its own employees to work on the AFC 2.0 project, we interviewed MBTA employees about the AFC 2.0 project. We obtained employee data from the Human Resources Compensation Management System (HR/CMS), which captured 44 employees who charged time to the AFC 2.0 project during the audit period. This list was missing 10 employees who were reflected in the MBTA's Financial Management Information System (FMIS) data. We summarized HR/CMS wages paid to employees during the audit period. We obtained employee wage data from the MBTA's FMIS for 48 employees charging time to the AFC 2.0 project during the audit period. This list was missing 6 employees who were reflected in the HR/CMS data. We summarized FMIS wages paid to employees

during the audit period. We compared the wages paid to the 54 employees between HR/CMS and FMIS and identified a variance of \$349,523 (HR/CMS had a larger total than FMIS). We requested a reconciliation from the MBTA; however, the MBTA was unable to provide a reconciliation to us.

During our testing, we noted that the data for employees is not consistent between HR/CMS and FMIS. In fact, we identified a discrepancy of \$349,523 between the two systems. See Finding 3.

Data Reliability Assessment

To determine the reliability of data on the MBTA spreadsheets of submittals during the audit period, we interviewed management who were responsible for the source data. Further, we used electronic spreadsheet functionality to identify hidden cells, rows, and/or errors, noting no exceptions. We selected a random sample of 20 submittals from the Submittal Tracking Tool spreadsheet and compared the information from the list to the actual source (Asana, Box, and other repository folders). Comparison criteria included information such as submittal identification number and submittal name/description. We also selected a random sample of 20 submittals from the source (Asana) and compared the aforementioned information to the Submittal Tracking Tool spreadsheet.

To determine the reliability of the data the MBTA provided to us for its vendors, we requested a query of the spending for vendors from FMIS. We were unable to determine the completeness and accuracy of the list of vendors because the work performed by these vendors was not always exclusively for the AFC 2.0 project. See Finding 2.

To determine the reliability of the employee data from HR/CMS and FMIS, we tested the data for duplicates and missing data. We also tested select system controls for both systems related to access controls, configuration management, contingency planning, segregation of duties, and security management. See Finding 4. We attempted to trace a sample of 10 MBTA employees to source documentation; however, the MBTA did not provide documentation regarding wage information. We used the lists of employees that we obtained directly from MBTA, as that was the only source available for our audit purposes. See Finding 3.

Based on the results of the data reliability assessment procedures described above, we determined that the information we obtained was sufficiently reliable for the purposes of our audit.

DETAILED AUDIT FINDINGS WITH AUDITEE'S RESPONSE

1. The Massachusetts Bay Transportation Authority's Amended and Restated Project Agreement allowed deadlines to be overridden.

According to Section 8 of Appendix 7 of the Amended and Restated Project Agreement, the Massachusetts Bay Transportation Authority (MBTA) has a certain time frame to respond to each submittal that Cubic sends to the MBTA for review before project work can proceed. As part of our audit procedures, we tested the MBTA's submittal review process, noting that—while Appendix 7 of the Amended and Restated Project Agreement contains deadlines for the MBTA to respond to Cubic's submissions and resubmissions—Section 8.2 of Appendix 7 of the Amended and Restated Project Agreement also states that such deadlines can be overridden by mutual agreement between the two parties through letters sent by electronic transmission. We noted that deadlines could be waived by specific, key personnel members in the MBTA. We note that many organizations use a process to consider such requests for deadline extensions, especially in such a large and complex contract. As such, none of the postponed deadlines that we found during fieldwork could be characterized as exceptions because they were extended consistent with the requirements of the contract. However, proper contract management should ensure that this type of override is rarely used, only in cases where absolutely necessary. Proper contract management should include, and should enforce, repercussions for failing to meet deadlines. It should include and enforce penalties for the contractor if it is unable to satisfy deadlines.

By not having controls in place to verify and report on timely delivery of the projects' milestones, the MBTA risks encountering significant delays related to contract delivery of the Automated Fare Collection System (AFC) 2.0 project. This affects the public by delaying their use of a more efficient system that will lead to quicker service and results in overspending of public funds because of change orders, price escalation because of inflation, and other cost pressures. Overuse of contract extensions may render project timelines meaningless and can have significant impacts on the timely delivery of such a large, complex project.

Authoritative Guidance

The Amended and Restated Project Agreement includes contractual deadlines, and as a matter of best practice, these deadlines should be used to ensure that the contract is completed on time.

Reasons for Issues with Contract

The MBTA told us that rejecting submittals can lead to additional delays as the two parties resolve the differences in the submittals. In the MBTA's opinion, therefore, it may have prevented additional delays by agreeing to override the deadlines.

Recommendations

1. The MBTA should adopt an approach of a rigorous review and consideration before management makes the decision to override deadlines to ensure that this decision is used sparingly and only when necessary.
2. The MBTA should establish policies and procedures to ensure that public works projects are subject to strong controls, allowing for effective monitoring to prevent excessive delays and cost overruns.

Auditee's Response

The MBTA disagrees with the [Office of the State Auditor's (SAO's)] conclusions with respect to this finding. The Draft Report fails to provide sufficient evidence for the SAO's basis for this finding or the conclusions drawn from this finding. As discussed, the Draft Report's characterization of the MBTA's review periods prescribed by the [Amended and Restated Project Agreement (ARPA)] is incomplete and inaccurate. Furthermore, the report conflates the concept of the Parties agreeing to an alternative submittal review deadline, characterized as "overriding deadlines," with the concept of extended review periods prescribed by Section 3.3.1 of Appendix 7. If a submittal is (i) not listed on the Submittal Schedule, (ii) added to the Submittal Schedule less than 15 days prior to the submittal's delivery, or (iii) delivered after the date listed on the schedule as of 15 days prior to its delivery, the MBTA review period is automatically extended by ten business days from the date of delivery. The Draft Report fails to account for these extended review procedures of Section 3.3.1 of Appendix 7.

The majority of the sampled submittal response letters reviewed by the SAO that had a review period other than the standard review period were subject to the extended review periods prescribed by Section 3.3.1. The MBTA's adherence to these review periods was consistent with the MBTA's contractual right for extended review periods and does not result in "overridden" deadlines. The Draft Report also inaccurately describes such instances of extended review periods being "approved" by the MBTA when these extended review periods are automatically applied per the terms of Section 3.3.1 of Appendix 7. The Draft Report also fails to account for submittal responses that were provided early, before the expiration of the review periods afford to the MBTA under Appendix 7. Any perceived "delay" resulting from overridden deadlines or extended review periods should, in effect, be offset by responses that were sent early. Several early responses were included in the group of the letters sampled by the SAO.

Finally, page 12 of the Draft Report states, "[the SAO] noted no exceptions in our testing; therefore, we concluded that, during the audit period, the MBTA followed the Submittal review period stated in Section 8 of Appendix 7 of the Amended and Restated Project Agreement to determine that the AFC 2.0 project contracts were in compliance." This statement conflicts with the SAO's conclusion that the MBTA has only "partially" satisfied Objective No. 1 of the report. . . .

The Draft Report also admits "none of the postponed deadlines that [the SAO] found during fieldwork can be characterized as exceptions because they were approved consistent with the requirements of the contract." Finally, the Draft Report fails to identify any actual delays it can attribute to "overridden deadlines" yet claims the MBTA does not have "controls in place to verify and report on timely delivery of the project's milestones." As provided above, the MBTA has extensive controls in place that are outlined in the ARPA and the SAO's statement otherwise contradicts the SAO's own findings in the Draft Report.

Auditor's Reply

We disagree with the MBTA's claims that this report's characterization of the MBTA's review periods is incomplete and inaccurate. We thoroughly explained the process in the Overview section of this report and in the Audit Objectives, Scope, and Methodology section of this report. The MBTA claims that we are conflating the concepts of agreeing to an alternative submittal review deadline with overriding deadlines. This is not true. We understand the occasional need to agree to an alternative submittal review deadline, but we suggest that the MBTA and Boston AFC 2.0 OpCo LLC do so only when absolutely necessary to prevent extraneous delays. We also did not ignore the extended review procedures. In fact, we indicated that the Amended and Restated Project Agreement allows the two parties to override deadlines, but we are reiterating the need for the MBTA to ensure that these deadlines are only overridden, or extended if you will, when absolutely necessary. It is in the best interest of the public for a project, especially one as large, complex, and lengthy as the AFC 2.0 project, to adhere to its deadlines as much as possible; otherwise, taxpayers may foot the bill for unnecessary delays.

In its response, the MBTA suggests that the majority of the sampled submittal response letters were subject to the extended review period consistent with the contract. Further, the MBTA states that it is inaccurate to suggest that it approved these extended review periods or overridden deadlines. The MBTA could be misunderstanding our finding, or it could be distorting it by suggesting our audit team found something it did not, potentially to avoid addressing our actual finding. Regardless, the MBTA should get clear on our audit finding and recommendations. We clearly stated that the contract allows for deadlines to be overridden or extended; however, this ability to extend review periods can be abused, potentially resulting in financial loss to the taxpayers. Finally, the MBTA notes that we did not discuss the submittals that were provided early, before the expiration of the review periods. These are examples of the MBTA and Boston AFC 2.0 OpCo LLC adhering to the deadlines set forth in the contract. The MBTA suggests that delays from overriding deadlines should be offset with these early submittals. However, we do not believe it is appropriate to minimize potential deadline delays by offsetting those delays with instances in which

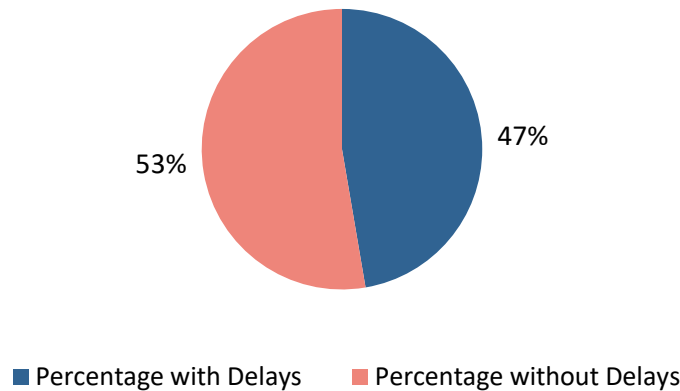
the two parties of the contract were able to meet deadlines early, just as we would not consider it appropriate to ignore employees arriving to work late two days per week because they report to the office on time three days per week. Similarly, one would not consider late trains acceptable because other trains were on time.

The MBTA further asserts in its response that it believes that the draft report provides a conflicting conclusion related to Objective 1. Our conclusion listed for Objective 1 is “partially” for several reasons. We agree that our audit testing did not find any exception using the criteria cited, the Amended and Restated Project Agreement, and we conclude as such. The audit finding is related to the fact that the contract allows deadlines to be overridden, and we believe this could contribute to significant delays related to contract delivery of the AFC 2.0 project. The Office of the State Auditor’s mission is to make government work better, and it is our duty and responsibility under generally accepted government auditing standards to provide recommendations to address issues we note in our audit. The weaknesses in the MBTA’s systems and processes related to contract extensions are what led to a determination of “partially” meeting our objective. The MBTA is following a process, but it is weak and insufficient.

Further, the MBTA states that the audit report fails to identify any actual delays it can attribute to overridden deadlines and that it claims that the MBTA does not have controls in place to verify and report on timely delivery of the project’s milestones. We would point out to the MBTA that New York City’s mass transportation authority, which, according to the American Public Transportation Association, is multiple times larger than MBTA on all metrics,⁹ entered into a contract with Cubic in 2017, only three months before the AFC 2.0 project began, for a similar project intended to upgrade its AFC. Yet, that contract was completed by 2021 at a cost of \$590 million, while the AFC 2.0 project was still underway in 2024 at a cost of over \$960 million. To suggest that we could not identify any delays would be an incorrect statement. In fact, 44 of the 93 submittals in our sample (47%) included some type of delay. The chart below summarizes this information.

9. Please see the American Public Transportation Association’s 2023 Public Transportation Fact Book, available at <https://www.apta.com/wp-content/uploads/APTA-2023-Public-Transportation-Fact-Book.pdf>.

Submitted Delays in Our Sample



2. The Massachusetts Bay Transportation Authority violated Section 29 of Chapter 149 of the Massachusetts General Laws by not ensuring that the Systems Integrator obtained a surety bond for certain work performed on the new Automated Fare Collection System.

The MBTA did not ensure that the Systems Integrator (SI) obtained a surety bond that would protect the MBTA in the event that certain work is not performed in developing and implementing the AFC 2.0 project. Further, the MBTA was unable to indicate the vendors that worked exclusively on the AFC 2.0 project. By not obtaining a “security by bond” for the AFC 2.0 project, as required by law, the MBTA may not be able to recover money it paid for the \$935.4 million contract in the event that the contract is not completed. Additionally, a contractor may not fulfill the contract if a security bond is not in place. Typically, in a security bond, the contractor would turn over assets in the amount of the contract to the surety company. This would allow the MBTA to receive these assets as recourse if the contractor fails to fulfill its obligation. The lack of a “security by bond,” therefore, potentially puts a drain on public resources to complete a project for which the MBTA has already committed time and money. A security bond in place would at least allow the MBTA to recover some of its expended funds.

Authoritative Guidance

Section 29 of Chapter 149 of the Massachusetts General Laws requires the MBTA to obtain, and therefore requires the system implementation contractor to provide, security by bond for the development and implementation of the new automated fare collection system. This law states,

Officers or agents contracting in behalf of the commonwealth or in behalf of any county, city, town, district or other political subdivision of the commonwealth or other public instrumentality for the construction, reconstruction, alteration, remodeling, repair or demolition of public buildings or other public works when the amount of the contract is more than \$25,000 shall obtain security by bond in an amount not less than one half of the total contract price.

Reasons for the Issue

MBTA management told us that Section 29 of Chapter 149 of the General Laws does not apply to them.

Recommendation

The MBTA should follow state law and require all contractors performing construction, reconstruction, alteration, remodeling, repair, or demolition to MBTA public works projects to obtain security by bond to cover one half of the total contract price in accordance with Section 29 of Chapter 149 of the General Laws. The MBTA should, in the essence of ensuring that contractors have surety by bonds in place, detail the bond requirements in the procurement process documents. This could serve to notify any potential contractors of their obligation to obtain a surety by bond before a contract even begins.

Auditee's Response

The MBTA disagreed with the SAO's finding, providing the following information:

1. Massachusetts G.L. c. 149, §29 Does Not Require Bonds for Performance Security.

General Laws. c. 149, §29 does not require performance bonds in any context. The title of the statute is "Bonds for payment for labor, materials, rentals or transportation charges; enforcement of claim; notice of claim; speedy trial, appeal, consolidation; dismissal; legal fees; posting statute." (Emphasis added). The statute requires a bond "for payment by the contractor and subcontractors for labor performed or furnished and materials used or employed" on public construction contracts. As the Supreme Judicial Court has observed:

An examination of the many decisions construing and applying G.L. c. 149, s 29, and the several predecessor statutes now merged therein reveals repeated statements that the statutes were intended to protect laborers and materialmen from nonpayment by contractors and subcontractors engaged in the construction of public buildings or public works.

American Air Filter Co. v. Innamorati Bros., Inc., 358 Mass. 146, 150 (1970); see G.M. Builders, Inc. v. Town of Barnstable, 18 Mass. App. Ct. 664, 668 (1984) ("The statute 'afford[s] security to subcontractors and materialmen in public works because they do not have the benefit of a mechanic's or materialman's lien, as would be the case in private construction work"), quoting Floors, Inc. v. B.G. Danis, Inc., 7 Mass. App. Ct. 356, 358, (1979).

The statute is unambiguous. It requires payment bonds on public construction projects for the benefit of persons and entities that provide labor, materials, and certain other services on such

projects. A payment bond is not the same as a performance bond and a payment bond does not guaranty a contractor's performance for the owner/awarding authority. The SAO's assertion that a G.L. c. 149, §29 payment bond would "guarantee the work performed" on AFC 2.0 is incorrect.

2. Massachusetts G.L. c. 149, §29 Does Not Apply to the ARPA Because That Contract Does Not Call for Construction of a Public Building or Public Works.

In addition, G.L. c. 149, §29 does not apply to the ARPA because the ARPA does not call for "construction, reconstruction, alteration, remodeling, repair or demolition of public buildings or other public works." This language in §29 covers "contracts involving the actual physical 'construction' (including reconstruction, alteration, maintenance, remodeling or repair) of public buildings and improvements on land owned by the Commonwealth or one of its subdivisions, and contracts for the materials that typically go into such construction projects." Andover Consultants, Inc. v. City of Lawrence, 10 Mass. App. Ct. 156, 160 (1980) (holding that a contract for the preparation of tax maps did not call for construction of buildings or public works, and therefore was not required to be procured pursuant to the statute governing procurement of public works contracts, G.L. c. 30, §39M); see G.M. Builders, Inc. v. Town of Barnstable, 18 Mass. App. Ct. 664, 668 (1984) (town was not required to obtain a G.L. c. 149, §29 payment bond when it entered into a lease and its tenant entered into a contract for construction).

As relevant to the SAO's examination, the MBTA's new fare collection system is the subject of two separate procurements. Pursuant to its enabling statute, G.L. c. 161A, the MBTA awarded the Project Agreement (later supplanted by the ARPA) to the Systems Integrator on a "best value" basis to design, implement, install, integrate, test, finance, operate, maintain and manage the new fare collection system. The Systems Integrator does not perform any construction work on public buildings or public works. . . . Rather, the MBTA awarded a separate contract to McDonald Electrical Corporation ("McDonald") for the public works construction aspect of the new system. In Thorn Transit Systems Intern., Ltd. v. MBTA, 40 Mass. App. Ct. 650 (1996), the Massachusetts Appeals Court determined the following qualified as public works:

physical removal and installation of station fare collection equipment and associated equipment at the rapid transit stations, the wiring of various types of station communications, computer and support equipment, the reconfiguration and remodeling of rapid transit stations to accommodate the new system, the coordination of work with and oversight of the contractor selected to perform station modification work, extensive design services, and money room design and installation.

Id. at 653.

The ARPA does not call for the Systems Integrator to perform physical removal, installation or wiring work at MBTA stations or on other public land. . . . Rather, the MBTA heeded the instruction of the Thorn Transit Court and contracted with McDonald to perform the demolition and construction work on MBTA land pursuant to a low bid G.L. c. 30, §39M procurement. McDonald furnished a performance bond and a G.L. c. 149, §29 payment bond in accordance with the requirements of the MBTA-McDonald contract. Thus, the MBTA required a G.L. c. 149, §29 payment bond for "public works"—the McDonald contract—and did not require a payment bond for the non-public works aspects of AFC 2.0. The MBTA's structure of its contracts conforms to the Thorn

Transit holding. General Laws c. 149, §29 does not require a payment bond for a project that is not a public building or public works project.

3. The Collection of Contracts Associated with AFC 2.0 Provide Security for Project Performance.

The ARPA requires the Systems Integrator to design, implement, install, integrate, test, finance, operate, maintain and manage the new automated fare collection system. Boston AFC 2.0 OpCo LLC, as Systems Integrator, has contracted with Cubic Transportation Systems, Inc. ("CTS"), as the Implementation Contractor and the O&M Contractor (collectively, "Project Contractors") to perform the Work. The MBTA did not require a performance bond from the Systems Integrator and the Systems Integrator did not require a performance bond from the Project Contractors. The SAO has not identified any statutory or regulatory requirement for performance bonds in this context. However, the structure of the AFC 2.0 Project provides several protections for the MBTA in the event of a Systems Integrator Default or other adverse event. . . .

The MBTA acknowledges that the security package associated with the ARPA is not as simple or straightforward as a performance bond for a design-bid-build or a design-build construction contract. However, the ARPA differs from these contracting methods because the Systems Integrator is required to finance the work under the ARPA. The MBTA does not make periodic progress payments as the Systems Integrator performs the Implementation Work. Rather, the MBTA makes milestone payments when the Systems Integrator delivers functionality, and availability payments for the Systems Integrator's services in respect of financing, implementing, operating and maintaining the new automated fare collection system once the functionality is delivered. In this way, the MBTA pays for deliverables and services when received, rather than making downpayments for expected future performance. Paying for deliverables and services upon receipt reduces the MBTA's exposure to financial loss if the Systems Integrator defaults before delivering functionality and services.

Auditor's Reply

We disagree that Section 29 of Chapter 149 of the General Laws is ambiguous regarding its requirements. The plain language of the statute states,

*Officers or agents contracting in behalf of the commonwealth or in behalf of any county, city, town, district or other political subdivision of the commonwealth or other public instrumentality for the construction, reconstruction, alteration, remodeling, repair or demolition of public buildings or other public works when the amount of the contract is more than \$25,000 shall obtain **security by bond** in an amount not less than one half of the total contract price. [Emphasis added.]*

We disagree that the "security by bond" on public construction projects and public works only provides protection for persons and entities that provide labor, materials, and certain other services related to public buildings and public works; the statute quite reasonably and rightly affords protections to the Commonwealth and its municipalities contracting on behalf of the public for these public buildings and public works. Even if this limitation existed, as argued by the MBTA, we believe it is a best practice for the

MBTA to protect itself, its riders, and the taxpayers of the Commonwealth from undue risk. We believe securing “security by bond” is a prudent and appropriate step to take, even if it were not required by statute.

As noted by the MBTA in its response above, *Thorn Transit Systems Intern., Ltd. v. MBTA*, 40 Mass. App. Ct. 650 (1996) provides a more expansive definition as to what constitutes “public work,” finding that,

The alteration and remodeling work on certain Massachusetts Bay Transportation Authority rapid transit stations, in connection with the proposed removal of the current fare collection system and the provision and installation of a new collection system, is a “public work.”

We disagree with the MBTA’s assertion that the SI does not perform any construction work on public buildings or works. Section 6.4 of the contract outlines the SI’s responsibilities related to “SI installation work,” including the “procurement, physical installations, commission and testing of System Elements on all Vehicles and at all Retail Reload Locations.” While there is a carve-out for “Site Installation Work,” the SI is still responsible for the installation and related removal work at retail reload locations, SI locations, and vehicles. This relates directly to “removal of the current fare collection system” and “provision and installation of a new collection system,” as described in *Thorn Transit Systems Intern., Ltd. v. MBTA*.

In a concurring opinion in *Thorn Transit Systems Intern., Ltd. v. MBTA*, Justice Brown recognized the public policy benefits and protections provided by statutes such as Section 29 of Chapter 149 of the General laws, writing that “deviations from the prescribed bidding process [in this instance, bond requirements] create grave uncertainty among all interested parties and arouse public suspicion that something is amiss. . . . [And] all too often the result of such lapses . . . is . . . needless expense of public money in litigation.” *Id.* at 657–658.

We agree.

Setting aside the legal requirements discussed above, and that are apparent in Section 29 of Chapter 149 of the General Laws, there are strong public policy considerations in favor of the MBTA obtaining a “security by bond”—the payment structure of the contract calls for a large “bullet payment” in the amount of \$174,817,352 due at Milestone M. This payment represents a risk that we believe the MBTA should insure itself (and ultimately, we the taxpayers) against, regardless of what the statute requires it to do.

This payment structure back-loads this large payment to Boston AFC 2.0 OpCo LLC, which may, before finishing the contract, cease operations as a result of financial problems, litigation, liquidation of the company, or for other reasons. If that were to happen, it is conceivable that the MBTA may not receive—immediately or at all—the benefit of a significant amount of work already completed under the contract. This would place the MBTA back at square one, as it were, creating delays and the potential of financial loss.

Some of these risks are addressed through contract language, but the risk remains that \$174,817,352 of work will be conducted with a partner who may or may not be in business at the end of the contract. Such an event would cause loss and disruption for the MBTA, against which we believe it should protect itself.

In its response, the MBTA indicates that it believes that the structure of the AFC 2.0 contract provides several protections for the MBTA in the event of an SI default or other adverse event. We received and reviewed the additional information regarding these protections, provided by the MBTA with its response. Ultimately, these additional protections are irrelevant to our finding that the MBTA failed to obtain a “security by bond” for certain work under the contract, as required by law.

We are concerned about the MBTA's indifference toward this law and disregard for best practices concerning this issue—especially considering the challenges the MBTA has faced. We find it disappointing that the MBTA has failed to acknowledge these areas for improvement and is instead choosing to defend the status quo. It is important to note that our findings and recommendations may be applicable to the way MBTA contracts beyond just the AFC 2.0 project. By refusing to adhere to best practices and the law in its contracting, the MBTA puts the taxpayers at risk for potential financial losses. Our finding and recommendations should be considered across all applicable MBTA contracts. The MBTA, according to its response, is missing an opportunity for improvement.

3. The Massachusetts Bay Transportation Authority did not reconcile its payroll records to its general ledger.

The MBTA does not reconcile its payroll records to its general ledger. We identified a discrepancy of \$349,523 in the AFC 2.0 project between the Human Resources Compensation Management System (HR/CMS) used by the MBTA for payroll and the MBTA's Financial Management Information System (FMIS) used by the MBTA for its general ledger. Additional payroll reconciliation discrepancies could exist in other areas of MBTA operations that were not subject to this audit.

If the MBTA does not reconcile payroll records to its general ledger, then payroll could be misstated and project costs attributed to the AFC 2.0 project and other MBTA projects and services could be inaccurate, making it difficult or impossible to determine the cost and cost effectiveness of different services offered to the public. Additionally, it is possible that MBTA employees could have been overpaid or underpaid if payroll records are inaccurate.

Authoritative Guidance

The Office of the Comptroller of the Commonwealth has issued payroll job aids and best practices to guide agencies through the appropriate biweekly reconciliation of payroll records to the general ledger system.

Reasons for Not Reconciling Payroll

The MBTA did not provide a reason as to why it did not reconcile its payroll records in HR/CMS to its general ledger in FMIS.

Recommendations

1. The MBTA should investigate and resolve the \$349,523 variance noted between HR/CMS and FMIS with regard to the AFC 2.0 project payroll expenses.
2. The MBTA should create policies and procedures to perform biweekly reconciliations for payroll records to its general ledger to ensure accurate accounting for all project costs.
3. The MBTA should ensure that payroll codes are appropriately applied to projects.

Auditee's Response

The data from the HRCMS that was provided to the [Office of the State Auditor (SAO)] was the raw timesheet data submitted by employees and was never meant to tie out with final financial cost entries that exist in the reporting from the MBTA's Financial & Materials Information System (FMIS). There are necessary adjustments made to this data to ensure accurate reporting prior to the closing of financial records in FMIS. Furthermore, the data from HRCMS initially included data from beyond the audit period. The AFC 2.0 system project payroll aligns with the general ledger of the MBTA. The MBTA agrees that improvements can be made to future communications around time reporting out of the MBTA's various systems.

Auditor's Reply

The MBTA states that the data from HR/CMS was never meant to tie to the data from FMIS. However, when asked why the variance of \$349,523 exists, the MBTA could not provide an explanation for the variance. The MBTA did not inform us that this data was "raw timesheet data" and therefore may be

unreliable and seemingly did not know this itself when asked. Performing a routine reconciliation of these two datasets (which is the focus of our recommendations above) will help ensure the accuracy of MBTA payroll and will further help ensure that project costs attributed to the AFC 2.0 project (and other MBTA projects and services) are accurate. Given these reasons, we urge the MBTA to adopt our recommendations in this area.

4. The Massachusetts Bay Transportation Authority did not ensure that all its information system users completed cybersecurity awareness training.

We discovered during our data reliability assessment that the MBTA did not ensure that all its information system users completed cybersecurity awareness training. Specifically, for the MBTA's payroll management system, 4 out of 10 randomly sampled newly hired MBTA employees did not complete new hire cybersecurity awareness training.

If the MBTA does not ensure that all its information system users complete cybersecurity awareness training, then the MBTA may expose itself to an increased risk of financial and/or reputational losses.

Authoritative Guidance

The National Institute of Standards and Technology's Special Publication 800-53r5, *Security and Privacy Controls for Information Systems and Organizations*, states,

AT-2 LITERACY TRAINING AND AWARENESS . . .

a. Provide security and privacy literacy training to system users (including managers, senior executives, and contractors):

1. As part of initial training for new users and . . . [organization-defined frequency] thereafter.

The Executive Office of Technology Services and Security's Information Security Risk Management Standard IS.010 states,

*6.2.3 New Hire Security Awareness Training: All new **personnel** must complete an Initial Security Awareness Training course. This course will be conducted via web-based learning or in-class training and will be included in the new hire orientation checklist. The New Hire Security Awareness course must be completed within 30 days of new hire orientation.*

*6.2.4 Annual Security Awareness Training: All **personnel** are required to complete Annual Security Awareness Training. Once implemented, automatic email reminders will be sent to personnel 12 months after course completion, alerting **personnel** to annual refresher training completion deadlines.*

Reasons for Issue

The MBTA did not provide a reason why the cybersecurity awareness training certificates for the sampled employees could not be provided to us.

Recommendation

The MBTA should ensure that all its information system users complete cybersecurity awareness training as part of initial training and on an annual basis.

Auditee's Response

The MBTA has identified the four individuals that the MBTA was unable to provide evidence of completion of the MBTA's cybersecurity training, none of whom are current employees. . . . The MBTA is reviewing to determine if these former employees did not complete cybersecurity training or the MBTA's report on the completion of cybersecurity training omitted these former employees. The MBTA notes that the HRCMS system which the SAO reviewed for its Data Reliability Assessment is not a program used directly for the AFC 2.0 project. The HRCMS system is used across the MBTA and across the Commonwealth of Massachusetts, most commonly for employees to enter their timesheets.

Auditor's Reply

The MBTA claims that none of the four individuals identified during testing are current employees. However, these individuals were employees during the audit period and thus should have received cybersecurity awareness training upon being hired. Their current employment status is irrelevant to the finding. We encourage the MBTA to follow our recommendation so that history does not repeat itself, with current or future employees not receiving needed training.

OTHER MATTERS

1. The Amended and Restated Project Agreement contract is unwieldy.

We found the Amended and Restated Project Agreement to be an unwieldy contract. It contains over 1,300 pages and includes over 20 articles and more than 15 appendices. Additionally, there were at least 10 change orders or amendments that modified the terms of the contract. Some sections of the contract include five subsections or contain numerous references to other sections of the contract. The length of the contract with so many appendices, amendments, and references, each of which can modify or be modified by the other, could make this contract more difficult for the Massachusetts Bay Transportation Authority (MBTA) to manage. Further, we noted that the Inspector General stated in the Massachusetts Office of the Inspector General's (OIG's) *MBTA Privatization Review #4* report issued November 21, 2024:

I remain deeply troubled by the MBTA's poor contract management practices, especially since the MBTA knew in advance that these contracts would face increased scrutiny by the OIG under the provisions of Chapter 46. It certainly raises questions about the state of hundreds of other routine MBTA procurements and contracts.

I understand that the three remaining contracts procured under the privatization waiver (pertaining to inventory, cash management, and automated fare collection) are already underway and that it is not possible to re-do the procurements. Although the contracts were procured under previous MBTA leadership, it is possible for the current leadership team to manage them appropriately. As such, current senior leadership must ensure that contract administrators, mid-managers, and staff are doing their jobs. It is critical that the MBTA hold vendors to performance standards.

We agree with the Inspector General's observations. The Automated Fare Collection System (AFC) 2.0 project is a large undertaking by the MBTA. With over \$900 million in public funds being used for this project, it is imperative that this contract is managed properly to prevent waste or abuse. Such an unwieldy contract can lead to issues with contract oversight. Some of these issues could include an unfulfillment of certain contract obligations or unnecessary delays or costs.

We recommend that MBTA management identify solutions to streamline future contracts to ensure that the contracts are more efficient, clear, and manageable.

Auditee's Response

The MBTA appreciates the [Office of the State Auditor's (SAO's)] commentary with respect to contract management. However, as noted in the Draft Report, in the SAO's testing of the submittal process, of which there were 1,001 distinct submittals during the audit period, the SAO found no exceptions. Further, even putting aside the MBTA's disagreement with characterizations of the

SAO's finding regarding deadlines, the SAO states that "none of the postponed deadlines . . . can be characterized as exceptions because they were approved consistent with the requirements of the contract." If anything, this audit has demonstrated that, despite the "unwieldiness" of the [Amended and Restated Project Agreement (ARPA)], the MBTA, specifically the AFC 2.0 team, has done an excellent job in managing this contract. Finally, MBTA notes that the OIG, in its publication MBTA Privatization Review #4, issued November 21, 2024, did not review the ARPA or the AFC 2.0 project as part of its review.

Auditor's Reply

The MBTA is correct when it states that we did not find any exceptions in our testing for the first audit objective. An exception would mean noncompliance with the test we ran—in this case, noncompliance with the MBTA's contract. Compliance with a contract may occur for multiple reasons, including good management to a strong contract or poor management to a weak contract. In this case, we believe the MBTA's contract provisions regarding postponement of deadlines is weak and the lack of exceptions relates more to compliance with weak contract terms than to good management to strong contract terms.

That said, we do not see the relevance of this response to the Other Matters section. In this section, we highlight to the MBTA the importance of contract management. We also highlight issues identified by OIG in its report that were specific to automated fare collection. There have been multiple reports over years from different offices and agencies that highlight issues and challenges with the MBTA, including contract procurement and management. We urge in the strongest terms possible that the MBTA take seriously both this audit report and the report issued by OIG. We also urge the MBTA to adopt the changes outlined in both reports for the benefit of the public. Unnecessary delays and increasing costs of poorly managed or structured contracts directly affect the citizens of the Commonwealth, who share the burden of poor contract management through tax dollars and/or who rely upon public transportation.

2. Potential conflicting interests exist with the demand bond.

A demand bond in the amount of \$38.9 million is in place and was written in June 2020. In this bond, Boston OpCo and the MBTA are listed as the obligee and co-obligee, respectively, while Cubic is listed as the principal. The bond was provided through three sureties: Federal Insurance Company, United States Fire Insurance Company, and Everest Reinsurance Company. Under this demand bond, either Boston OpCo or the MBTA can make demand for payment in case of an implementation default by completing a form signed by an authorized signatory and submitting it to the surety. The surety shall pay the bond within five business days of receiving the demand. Since Cubic is included in the partnership of Boston

OpCo LLC, there are potential conflicting interests. Cubic is listed as the principal of the bond. Boston OpCo LLC, of which Cubic is a partner, is listed as the obligee. Essentially, Cubic would be both paying for the bond and receiving the benefits of the bond if the contract is unfulfilled.

These potential conflicting interests could incentivize Cubic to claim an implementation default and therefore enact the terms of the bond. This could allow Cubic to cease its obligation to fulfill the terms of the contract. Additionally, Cubic would be compensated financially as the minority partner in the Boston OpCo LLC partnership. We spoke with a law professor well versed in insurance law who was unfamiliar with a demand bond that had such a relationship as this one has. We acknowledge that such a relationship may exist in other demand bonds, but the relationship between Cubic and the partnership gives the appearance of impropriety. Potential conflicting interests, such as this, further illustrate the necessity for the MBTA to examine its contracting processes and require a surety bond to protect itself and the taxpayers.