OFFICE OF THE INSPECTOR GENERAL
COMMONWEALTH OF MASSACHUSETTS

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Internal Special Audit Unit
2019 Annual Report

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EXECUTIVE SUMMARY

The Internal Special Audit Unit ("ISAU") within the Massachusetts Office of the Inspector General ("Office") respectfully submits the following annual report in accordance with Section 9(e) of Chapter 6C of the Massachusetts General Laws.

In 2019, the ISAU conducted a variety of investigations, reviews and audits related to the use of public and private transportation funds. The unit also worked collaboratively with the Massachusetts Department of Transportation ("MassDOT") and the Massachusetts Bay Transportation Authority ("MBTA") to help strengthen internal controls, procurement practices and contract administration.

As part of its mandate under Section 196 of Chapter 46 of the Acts of 2015 to evaluate the MBTA's outsourcing of services, the ISAU conducted a preliminary review of the MBTA's contract to privatize its warehouse operations. "Warehouse operations" refers to storing, tracking and delivering the parts, equipment and other supplies necessary for maintaining and repairing the MBTA's buses, trolleys and subway cars.

The ISAU's preliminary review focused on the MBTA's contract with its third-party vendor, Management Consulting, Inc. ("Mancon"), Mancon's compliance with the contract and the MBTA's oversight of Mancon's performance. Pursuant to its legislative mandate, the ISAU also reviewed the MBTA's analysis of the costs to privatize its warehouse operations and to perform these functions in-house. The ISAU interviewed MBTA and Mancon employees; observed warehousing processes at the MBTA's and Mancon's facilities; and reviewed bidding, contract, financial and performance documentation. At the end of its preliminary review, the ISAU shared with MBTA senior management opportunities to improve contract and vendor oversight, enhance vendor performance and accountability, expand MBTA management communication with field employees and promote successful execution of the privatization contract.

The ISAU also shared its preliminary cost analyses with MBTA senior management. The ISAU could not validate the MBTA's calculation of its pre-privatization costs because the authority could not provide the documents or information underlying the calculation. The ISAU did, however, identify certain costs that should not have been included in the calculation, leading to an overstatement of the annual costs. The ISAU also found that the MBTA's estimated cost to privatize understated some expenses, especially the costs to hire consultants to help with the initial phase of the privatization.

In October 2019, the ISAU began an in-depth review of the Merit Rating Board ("MRB") in order to provide recommendations to improve the MRB's operations, practices, procedures and internal controls. The review began at the request of the board ("Board") that oversees the MRB.[1] The Board also

[1] Confusingly, the statute that created the Merit Rating Board provides that it is governed by a board, which is also named "Merit Rating Board." To avoid confusion, the Office refers to the unit as the "MRB" and its governing board as the "Board."

asked the Office to review the MRB's current role and responsibilities, as well as to identify potential risks to or gaps in the MRB's ability to meet its statutory obligations.

As part of this ongoing review, the ISAU performed policy and document reviews; observed the MRB's procedures for document control, citation processing and quality control; and attended Board meetings. The ISAU also reviewed the MRB's statutory obligations, analyzed financial and budget records, and met with MRB staff to understand their roles and daily procedures. The Office has shared preliminary observations and recommendations with the Board and the interim MRB Director. The Office will continue to be actively engaged in this review throughout calendar year 2020.

During 2019, moreover, the ISAU collaborated with the MBTA to review and improve its administration of passenger vehicles that are assigned to specific employees, assigned to departments or used as pool vehicles (collectively, "non-revenue fleet"). At the time of the ISAU's review, the non-revenue fleet included 558 passenger vehicles ranging from sedans to pickup trucks that MBTA staff use during transit operations.

MBTA staff were receptive to the ISAU's concerns and recommendations. The ISAU worked with the MBTA to develop a more robust and detailed vehicle assignment form. The new form requires employees to document the need for a full-time or domicile vehicle and to obtain approval from both their supervisor and MBTA management. The MBTA required all staff who currently have domicile privileges (*i.e.*, who are allowed to drive their vehicles to and from work) to complete the new vehicle assignment form. As of the end of 2019, the MBTA continued to collect the completed forms and to update the fleet's electronic records.

Related to the ISAU's mission to prevent fraud, waste and abuse of transportation funds, in March 2019 the ISAU created fraud prevention training for MassDOT highway staff who oversee highway maintenance and construction projects. The ISAU led two training sessions, which explored common fraud schemes, fraud prevention techniques and red flags for vendor fraud.

Finally, the ISAU continues to operate public and internal hotlines for individuals to confidentially report suspected fraud, waste or abuse in the expenditure of transportation funds. In 2019, the unit received 207 complaints that it reviewed for possible action.

BACKGROUND

I. Internal Special Audit Unit

The Massachusetts Office of the Inspector General ("Office") is an independent agency charged with preventing and detecting fraud, waste and abuse in the use of public funds and public property. In keeping with its broad statutory mandate, the Office investigates allegations of fraud, waste and abuse at all levels of government; reviews programs and practices in state and local agencies to identify systemic vulnerabilities and opportunities for improvement; and provides training and assistance to both the public and private sectors to help prevent the misuse of government funds.

The legislature created the ISAU in 2009 to monitor the quality, efficiency and integrity of the Massachusetts Department of Transportation's ("MassDOT") operating and capital programs. The ISAU has a staff of six professionals dedicated to performing audits, investigations and reviews to prevent, detect and correct fraud, waste and abuse in the expenditure of public and private transportation funds. The ISAU assists the Commonwealth, the public, MassDOT and the Massachusetts Bay Transportation Authority ("MBTA") by identifying potential cost savings, waste and misuse of transportation funds. The ISAU's activities include, but are not limited to:

- Investigating allegations of fraud, waste and abuse in the expenditure of public and private transportation funds. This includes handling complaints from members of the public, as well as from MassDOT and MBTA employees, regarding suspected wrongdoing.
- Reviewing MassDOT's operations and programs to ascertain whether they are efficient, cost-effective and achieve established results. This includes reviewing the MBTA's operations, as well as the operations of other divisions within MassDOT and regional transit authorities.
- Determining whether MassDOT and the MBTA are complying with applicable policies, procedures, laws and regulations.
- Evaluating the MBTA's outsourcing of services under Section 196 of Chapter 46 of the Acts of 2015 to review the quality of the services provided, the expected and actual cost of the contract, and whether the cost of the contract exceeded the benefits derived from it.
- Working with MassDOT and the MBTA to strengthen internal controls, contract administration and procurement practices.
- Auditing, investigating and reviewing specific operations at the request of the Inspector General Council, the legislature, MassDOT's Board of Directors and MassDOT's management, as appropriate.
- Participating in the Registry of Motor Vehicles' ("RMV") Disability Placard Abuse Task Force and supporting its placard abuse hotline.

II. Massachusetts Department of Transportation

Created as part of Transportation Reform in 2009, MassDOT manages the Commonwealth's roadways, public transit systems, and transportation licensing and registration. It is made up of four divisions: the Highway Division, the RMV, the Aeronautics Division, and the Rail and Transit Division. The Massachusetts Bay Transportation Authority is responsible for operating public transportation services in Greater Boston; it also falls under MassDOT's governance.

The Highway Division is responsible for the roadways, bridges and tunnels of the former Massachusetts Highway Department and the former Massachusetts Turnpike Authority. Among other duties, the RMV is responsible for the administration of driver's licenses, motor vehicle registrations and vehicle inspections across the state. The Aeronautics Division coordinates aviation policy and oversees the safety, security and infrastructure of 37 public airports across Massachusetts. The Rail and Transit Division oversees the state's 15 regional transit authorities.

The ISAU conducts a variety of investigations, reviews and audits related to the use of public and private transportation funds. Some of the ISAU's work results in public reports and letters, while some activities include collaborative efforts to improve MassDOT and MBTA policies, procedures and internal controls over transportation-related activities and procurements. Additionally, some ISAU activities lead to referrals to other divisions for administrative, civil or criminal action. The summaries below are representative of the ISAU's work during 2019.

I. The MBTA's Privatization of Its Warehouse Operations

A. The Taxpayer Protection Act

In 1993, the Massachusetts legislature passed the Act Providing for the Delivery of State Services in a Fiscally Responsible Manner (the "Taxpayer Protection Act").[2] The Taxpayer Protection Act outlines the process that agencies and applicable authorities must follow when seeking to hire a vendor to perform a service that public employees currently perform.[3] Replacing public employees with a private vendor is commonly referred to as privatization.

In 2015, the legislature passed a law exempting the MBTA from the Taxpayer Protection Act for three years.[4] The 2015 law also requires the Office of the Inspector General to review all contracts that the MBTA enters into pursuant to this exemption. Specifically, within 90 days after the complete performance of a contract, the Office must file a report addressing the following:

- The competitiveness and fairness of the procurement process resulting in the contract;
- The quality of the services provided;
- The expected and actual cost of the contract; and
- The actual cost of the contract compared to the benefits derived from the contract.

During 2019, the ISAU conducted a preliminary review of the MBTA's contract to privatize its warehouse operations.[5] Although the contract is ongoing, the ISAU conducted the review to identify areas of concern and provide recommendations that will help the MBTA to successfully administer the contract.

[2] M.G.L. c. 7, §§ 52-55.

[3] One part of this process, for example, requires the State Auditor to review all agency requests to privatize services.

[4] Section 196 of Chapter 46 of the Acts of 2015.

[5] "Warehouse operations" refers to storing and controlling inventory at a central warehouse, providing staff to maintain inventory at MBTA repair and maintenance locations, tracking and delivering bus and rail parts to MBTA facilities.

B. The MBTA's Privatization Contracts

The MBTA maintains and repairs the majority of its buses, trolleys and subway cars at its garages and car houses in the Boston area.[6] Until 2017, the MBTA operated central warehouses in Everett and Charlestown for the parts, equipment and other supplies necessary for maintaining and repairing buses, trolleys and subway cars. MBTA employees staffed the warehouses and delivered parts, equipment and other supplies to the 14 garages and car houses (collectively referred to as "base locations"). Each base location also had – and continues to have – a smaller inventory room for these supplies.[7]

A "material planner" manages the inventory room at each base location. Their primary role is to assist with maintaining the MBTA's buses and trains by providing mechanics with the correct parts in a timely manner, as well as by requesting needed bus and rail supplies from the central warehouse. Material planners also conduct inventory control, perform data entry and provide customer service to base-location staff who need bus and rail supplies.

The MBTA hired a consultant in February 2016 to review its warehouse operations. The MBTA then had a second consulting company that it works with on a regular basis review the first consultant's work. The MBTA subsequently provided the first consultant's report to its Fiscal and Management Control Board ("Board") and recommended hiring a vendor to handle its warehouse operations. Based on the consultants' work, the MBTA reported that it expected that privatization would improve its warehouse operations and increase the efficiency of its bus, trolley and subway car maintenance. All told, the MBTA estimated that hiring a vendor would save the MBTA an estimated $64 million over five years.

On June 30, 2016, the MBTA issued a request for proposals ("RFP") seeking a vendor to administer its warehouse operations.[8] The RFP sought a vendor to operate both its central warehouse and the inventory rooms at the base locations, including tracking the inventory and delivering bus and rail supplies from the warehouse to the base locations. The RFP detailed the required services and outlined performance expectations. The RFP also established performance metrics and baseline service levels that the selected vendor would have to meet, including an inventory accuracy rate and maximum delivery times for regular and emergency deliveries.

Management Consulting, Inc. ("Mancon") was one of five vendors that submitted a response to the RFP.[9] The MBTA formed a selection committee to evaluate vendor proposals. At the end of this two-month process, the committee recommended awarding the contract to Mancon.

[6] A car house is a garage for subway and trolley cars.

[7] For ease of reference, parts, equipment and other supplies used to repair and maintain the MBTA's buses, trolleys and subway cars are referred to herein as "parts," "supplies" or "bus and rail supplies."

[8] MBTA RFP # 79-16: Third-Party Administration of MTBA Warehousing and Logistics.

[9] Mancon's response was in the form of a PowerPoint presentation.

1. The 2017 MBTA-Mancon contract

On February 1, 2017, the MBTA executed a contract with Mancon (the "2017 MBTA-Mancon contract"). The term of the contract was from February 1, 2017 through January 31, 2022. The 2017 MBTA-Mancon contract was comprised of the Commonwealth's standard terms and conditions, the MBTA's RFP (including all attachments) and Mancon's response to the RFP.[10] Pursuant to the 2017 MBTA-Mancon contract, some of Mancon's key obligations were to:

- Establish, staff and operate a central warehouse for the MBTA's bus and rail supplies;
- Staff and operate the inventory rooms at the MBTA's 14 base locations;
- Track and manage inventory for the MBTA's bus and rail supplies, including controlling inventory quantities at all locations;
- Deliver parts to the base locations; and
- Meet certain service-level agreements ("SLAs") that set performance expectations, including:
    - Inventory accuracy;
    - Normal delivery time; and
    - Expedited (emergency) delivery time

The MBTA's procurement and materials management department retained responsibility for purchasing bus and rail supplies, assigning inventory codes for supplies, and adjusting minimum and maximum stock levels.

2. The 2017 Alvarez & Marsal contract

Contract oversight and vendor management is vital to safeguard public funds from fraud, waste and abuse. When a state agency contracts with a vendor, the agency must adequately oversee the vendor to ensure that the agency receives all of the services and outcomes for which it pays. In this case, the MBTA did not have some of the necessary experience, resources and capabilities to fully perform contract administration and oversight of Mancon. The MBTA therefore retained an outside consultant in December 2017 to assist with oversight throughout calendar year 2018. The MBTA's contract required the consultant, Alvarez & Marsal, to support the MBTA-Mancon contract by:

- Providing third-party logistics expertise;
- Identifying, prioritizing and addressing issues critical to integrating the MBTA's and Mancon's inventory systems;
- Providing project management support;
- Serving as a liaison between the MBTA's and Mancon's integration teams;

[10] Contract number 79-16: Third-Party Administration of MBTA Warehousing and Logistics.

- Prioritizing processes that needed immediate changes; and
- Recommending modifications to the MBTA-Mancon contract, such as key performance indicators, defined customer service expectations, rigor of cycle counts and staff training.

Over the course of the engagement, the MBTA paid Alvarez & Marsal more than $1.8 million to assist with the administration of the MBTA-Mancon contract. The MBTA did not include these consulting services in the cost estimates it presented to the Fiscal and Management Control Board when advocating for the privatization of its warehouse operations.[11]

3. The 2018 MBTA-Mancon contract

As set forth in more detail below, Mancon did not meet many of the requirements set forth in the 2017 MBTA-Mancon contract. In addition, the 2017 MBTA-Mancon contract lacked a clear scope of services and agreement on the work to be performed throughout the contract. This lack of clarity clouded the performance expectations for Mancon and hindered the MBTA's ability to enforce contract terms. For instance, many base location staff indicated to the ISAU that they were unsure of what work Mancon was contractually required to perform.

Alvarez & Marsal helped the MBTA to develop and execute a new, more robust warehouse contract with Mancon (the "2018 MBTA-Mancon contract"). The 2018 MBTA-Mancon contract included a restated scope of services and clearly identified service expectations. Specifically, the 2018 MBTA-Mancon contract included important performance provisions, such as key performance indicators ("KPIs") to measure Mancon's performance, service-level agreements ("SLAs") that set performance expectations, rigor of cycle counts to ensure accurate inventory tracking and staff training. The 2018 MBTA-Mancon contract also extended the time that Mancon had to make regular (as opposed to emergency) deliveries to the base locations (discussed below).

For ease of reference, the ISAU will refer to both contracts collectively as the "MBTA-Mancon contract." The MBTA reported that its contract with Mancon will cost $28.5 million over its five-year term.

C. Methodology

The ISAU's interim review focused on the terms of the MBTA-Mancon contract, Mancon's compliance with its contractual obligations, the MBTA's oversight of Mancon's warehouse operations, the MBTA's cost estimates for privatization and the actual costs the MBTA has incurred to privatize its warehouse operations.[12] The ISAU's review encompassed Mancon's performance from the inception of the contract through July 2019. The purpose of the review was to identify areas of concern and provide recommendations to help the MBTA successfully administer the contract.

[11] As part of its interim review, the ISAU did not evaluate whether Alvarez & Marsal completed all of the activities listed above.

[12] Pursuant to Section 196 of Chapter 46 of the Acts of 2015, the ISAU will issue its final report after Mancon's performance of the contract.

As part of this review, the ISAU conducted:

- 57 meetings with individuals at the MBTA's headquarters and Mancon's central warehouse;
- 26 discussions with MBTA garage superintendents, forepersons and staff;
- 17 interviews with the Mancon material planners who manage the inventory rooms at the base locations;
- 14 site visits to MBTA base locations;
- four site visits to Mancon's central warehouse in Stoughton; and
- two site visits to the former MBTA warehouse in Everett.

The ISAU team observed Mancon's operations at all MBTA base locations and the vendor's central warehouse in Stoughton. The ISAU also observed how the MBTA staff requested parts, as well as the processing and retrieval of the requested parts by Mancon's material planners. The site visits included interviews and walk-throughs with MBTA and Mancon staff to understand how Mancon performs its contractual duties.

Following its work, the Office discussed the ISAU's observations with MBTA leadership, including procurement, vendor-management and warehouse operations managers, and provided recommendations for improvement. The information below summarizes the ISAU's key observations and recommendations, as well as the measures the MBTA has taken to address the ISAU's recommendations.

D. Overview of Mancon's Performance

Mancon took over the MBTA's warehouse operations in February 2017. Pursuant to the MBTA-Mancon contract, Mancon leases a warehouse in Stoughton. At the beginning of the contract, Mancon moved all inventory from the MBTA's former warehouses in Everett and Charlestown to this central warehouse. Since that time, Mancon has made both scheduled and emergency deliveries from the central warehouse to the MBTA's 14 base locations.

At each of the base locations, Mancon's material planners manage the inventory rooms. Their primary role is to assist the mechanics who maintain the MBTA's buses and trains by providing correct parts in a timely manner, as well as by requesting needed parts and equipment from the central warehouse. Mancon's material planners also conduct inventory control, perform data entry and provide customer service to staff who need parts and equipment.

To manage the MBTA's inventory, Mancon uses the MBTA's materials management system, the Financial and Materials Inventory System ("FMIS"). FMIS is an electronic records system for tracking inventory, ordering parts and maintaining detailed records of the quantity and location of the MBTA's bus and rail supplies. Mancon's employees use FMIS in two ways. First, staff at the central warehouse use FMIS for daily inventory counting. Second, Mancon staff at the MBTA's 14 base locations use FMIS to request parts from the central warehouse.

1. Mancon's performance fell short of its contractual obligations in six significant ways.

The MBTA-Mancon contract outlined service-level agreements ("SLAs") and included three key performance indicators ("KPIs") with associated penalties if Mancon failed to meet the agreed-upon levels. *See* Appendix A, which contains a chart outlining Mancon's expected performance and the MBTA's associated penalties by contract year.

Although the 2017 MBTA-Mancon contract outlined performance metrics for three KPIs, the MBTA did not begin calculating and evaluating Mancon's performance until September 2018.[13] Further, the MBTA did not begin enforcing the penalties for the failure to meet these standards until September 2018, meaning that Mancon's performance went unpenalized (and largely unmeasured) for the first 19 months of the contract.

The ISAU examined Mancon's compliance with key contract provisions, including with the KPIs. The ISAU found that Mancon's performance was lacking in six respects.

a. Mancon did not conduct a complete inventory of bus and rail parts before moving the parts to its central warehouse.

The MBTA-Mancon contract required Mancon to perform a "wall-to-wall inventory" of all the MBTA's bus and rail parts at the central warehouse and the 14 base locations. During interviews with Mancon staff, the ISAU learned that it is industry practice to shut down an entire warehouse to do a full wall-to-wall inventory of parts.

Mancon proposed completing the inventory in stages: first, by conducting an inventory of the MBTA's warehouse; second, by validating inventory quantities at the MBTA base locations; and third, by moving the inventory from the MBTA's warehouse to its own central warehouse. That did not happen, however.

Instead, Mancon moved all parts and supplies from the MBTA's warehouse to its Stoughton warehouse in 2017, without conducting the required inventory. It was not until September 2018, 19 months after the start of the contract, that the MBTA's outside consultant (Alvarez & Marsal) required Mancon to complete a wall-to-wall inventory.

As a result, there was no accurate inventory of the MBTA's central warehouse at the beginning of the contract, as required by the contract. The lack of an accurate inventory at the beginning of the contract likely contributed to Mancon's inability to meet the inventory KPIs noted throughout this review.

Recommendation: Mancon did not comply with a key requirement in the contract. The MBTA should consult with counsel regarding its legal options.

[13] The MBTA used historical data to evaluate performance for June, July and August 2018.

b. Mancon does not properly "cycle count" MBTA inventory.

The MBTA-Mancon contract includes inventory accuracy[14] as a KPI to measure performance. Inventory accuracy is critical to ensuring the MBTA has the parts it needs to service and repair its buses and trains, which in turn allows the MBTA to provide on-time service to its customers. Thus, one of Mancon's contractual obligations is to provide accurate inventory tracking and stocking at both the central warehouse and all 14 base locations.

Inventory tracking and stocking depend on "cycle counting." Cycle counting involves counting a small subset of inventory in the central warehouse and at the base locations each day, with the intent of counting the entire inventory over a period of time. Every morning, MBTA staff identify which items Mancon staff should include in the cycle count for base locations and the central warehouse. In each cycle count, Mancon staff may count anywhere from 40 to 125 parts, depending on the size and location of the particular parts.

Cycle counting starts by scanning the barcode for a specific inventory item (such as a specific type of air filter), counting the number of that item that are in stock and then entering the quantity into a handheld scanner that communicates with the Financial and Materials Inventory System ("FMIS"). The portable FMIS scanners contain pertinent information for cycle counting, including the location of the item, barcode information and how many items the FMIS indicates are in stock. When Mancon finds a discrepancy between the cycle count and the FMIS inventory records, Mancon is supposed to update FMIS with the data from the cycle count.

When cycle counting, Mancon employees are supposed to read the item description on the FMIS scanner to ensure they count the correct item. Although the FMIS scanners display the quantity of each item, cycle counts must be "blind." This means that Mancon staff should not look at the hand scanners to learn the current number of items listed in FMIS before counting.

The ISAU observed multiple cycle counts across various shifts in Mancon's central warehouse. During the ISAU's observations, material planners did not always conduct blind cycle counts. Instead of counting a part or supply and entering that number into the scanner, the material planners looked at the hand scanners, read the number of items, and re-entered that number into the scanners. This occurred especially with large bus and rail parts.

Mancon's failure to properly conduct the cycle counts is important for three reasons. First, inventory accuracy and correct cycle counting drive the MBTA's purchasing decisions; if the inventory records are inaccurate, the MBTA may not order needed supplies or order too many, resulting in unnecessary spending. Second, inaccurate inventory records have a direct and negative impact on base locations' budgets because the MBTA charges missing inventory to the base locations' budgets (*see* Section D(2)(c) below). Third, the MBTA evaluates Mancon's performance and assesses penalties based

[14] Inventory accuracy refers to a comparison between the inventory physically present in the central warehouse and the inventory listed in FMIS. When an inventory is 100% accurate, the quantity of all parts listed in FMIS matches the quantity of parts physically present in the central warehouse.

on inventory accuracy. If Mancon improperly conducts cycle counts, then the MBTA's KPI calculation will be incorrect, which in turn prevents the MBTA from identifying and correcting performance problems.

Recommendation: Mancon and the MBTA must ensure that Mancon's material planners conduct the cycle counts. To this end, Mancon must reinforce the requirement of blind cycle counting and provide greater supervision over those who perform this function.

c. Mancon did not achieve the required inventory accuracy until April 2019.

As discussed in the previous section, the first KPI in the MBTA-Mancon contract measures Mancon's inventory accuracy. Beginning in February 2017, Mancon's obligation was to produce 92% inventory accuracy every month. In February 2018, Mancon's obligation was to produce 93% inventory accuracy, and in February 2019, Mancon's obligation was to produce 94% inventory accuracy.[15] This KPI only reflects accuracy of the inventory at Mancon's central warehouse. It does not include inventory accuracy at the base locations.

To measure how Mancon meets the KPI for inventory accuracy, the MBTA uses data that the material planners enter into FMIS at the central warehouse. Since the MBTA began calculating inventory accuracy in September 2018, Mancon did not meet this KPI until April 2019, 10 months after its obligation to do so. Further, as discussed above, the ISAU questions the accuracy of the KPI calculation because Mancon does not always perform the cycle counts properly.

Figure 1. Inventory Accuracy Performance by Service Month

		Inventory Accuracy 93% Accuracy	**Penalty Assessed**
Service Month	**June 2018**	Did Not Meet	None
	July 2018	Did Not Meet	None
	August 2018	Did Not Meet	None
	September 2018	Did Not Meet	Warning
	October 2018	Did Not Meet	$4,880
	November 2018	Did Not Meet	$12,200
	December 2018	Did Not Meet	$12,200
	January 2019	Did Not Meet	$12,200
	February 2019[16]	Did Not Meet	$12,566
	March 2019	Did Not Meet	$12,566
	April 2019	Met	
	May 2019	Met	
	June 2019	Met	
	July 2019	Met	
	Total		$66,612

[15] The MBTA began calculating inventory accuracy in September 2018, but used historical data to evaluate performance for June, July and August 2018.

[16] Per the contract, the KPI for inventory accuracy increased to 94% in the third contract year, which began in February 2019.

Beginning in September 2018, the MBTA warned and then penalized Mancon for each month that the company did not meet the KPI for inventory accuracy. Between October 2018 and March 2019, the MBTA assessed $66,612 in penalties.

Recommendation: The MBTA must hold Mancon accountable to this KPI by continuing to use FMIS to check Mancon's accuracy each month and impose the appropriate penalty for lack of compliance with this KPI. Further, as discussed in the previous section, the MBTA must ensure that Mancon performs the cycle counts correctly. In addition, the MBTA should consult with counsel to determine whether it can amend the MBTA-Mancon contract so that this KPI includes accuracy of inventory at the base locations. Including the base locations in this KPI will ensure that Mancon is accurately counting and reporting inventory across locations.

d. Mancon met its contractual obligation to delivery regular, non-emergency parts in 10 out of 14 months. However, the MBTA should examine this KPI to determine whether it meets the authority's need for the timely delivery of parts and supplies.

Another of the KPIs established under the MBTA-Mancon contract was "normal pick to receipt time" ("regular deliveries"). A "pick" refers to Mancon retrieving a requested item from the central warehouse or an inventory room at a base location. A "normal pick" means retrieving the requested item from its location at the central warehouse as part of the MBTA's regular (non-emergency) delivery process.

Initially, this KPI required Mancon to deliver regular, non-emergency parts from the central warehouse to the base locations within 10 hours of a material planner's request. Having a 10-hour window for regular part delivery provided the bus and rail mechanics with the necessary parts to repair buses and trains quickly and get them back into service.

The 2018 MBTA-Mancon contract changed the time for normal deliveries from a 10-hour turnaround to delivery by 10:00 a.m. the next day on which a Mancon material planner is at the base location.[17] The MBTA agreed to this modification because Mancon material planners are not in the base locations overnight, when most of the deliveries occur. As a result, no one from Mancon was able to document the receipt of deliveries.

The MBTA began calculating the KPI for regular deliveries in June 2018, 15 months after Mancon took over warehouse operations. Using the 10:00 a.m. delivery time as the performance measure, the MBTA determined that Mancon had met the KPI in 10 out of 14 months. The MBTA issued one warning to Mancon but never assessed a penalty.

[17] Some base locations do not have a Mancon material planner present on the weekends.

Figure 2. Normal Pick-to-Receipt Performance by Service Month

		Normal Pick to Receipt	Penalty Assessed
Service Month	June 2018	Did Not Meet	None
	July 2018	Did Not Meet	None
	August 2018	Did Not Meet	None
	September 2018	Met	
	October 2018	Met	
	November 2018	Met	
	December 2018	Did Not Meet	Warning
	January 2019	Met	
	February 2019	Met	
	March 2019	Met	
	April 2019	Met	
	May 2019	Met	
	June 2019	Met	
	July 2019	Met	

While Mancon has been able to meet the new KPI, extending the delivery time has a direct, negative impact on the mechanics' ability to maintain and repair buses and trains in a timely manner. It therefore negatively impacts the MBTA's ability to put the vehicles back into service as soon as possible. The intent of the original 10-hour turnaround was to provide bus and rail mechanics with all necessary parts the same day. By allowing for delivery by 10:00 a.m. the next day that a Mancon employee is at a base location, mechanics may wait idle without the necessary parts to make repairs. As a result, the mechanics may not be able to quickly perform the necessary repairs to put buses and trains back into service.

Finally, the KPI does not capture incorrect deliveries that have to be sent back to Mancon's warehouse. When Mancon delivers an incorrect part or supply, the material planner closes the original request from FMIS and puts in a new request. This skews the delivery data in favor of Mancon.[18] Moreover, during the ISAU's site visits to the base locations, staff reported that it is not uncommon for Mancon to deliver the wrong parts or supplies. As one example, MBTA staff reported ordering radiators but receiving fuel tanks instead. After returning the fuel tanks and waiting three days, Mancon re-delivered the same group of fuel tanks with a new label reading "radiators." The ISAU did not verify whether, or how frequently, Mancon delivers incorrect parts or supplies.

Recommendation: The MBTA should consider developing an automated method for recording and tracking delivery times to ensure that Mancon is meeting this KPI. Further, the MBTA should evaluate whether the 10:00 a.m. delivery time is causing substantial delays in getting buses and trains back into

[18] For instance, if a mechanic orders a part on Monday and the wrong part is delivered on Tuesday, that request is closed in the system. If the material planner puts in a new request on Tuesday and the correct part is delivered on Wednesday, the KPI will calculate that as an on-time delivery, even though the mechanic requested the part two days before it was delivered.

service. If it is, the MBTA should consult with counsel to discuss amending the contract to return to a 10-hour delivery window for regular parts. Automated delivery tracking could allow the MBTA to return to the 10-hour window because the MBTA and Mancon could track delivery times even when Mancon's material planners were not at the base locations.

In addition, the MBTA should implement a system to monitor deliveries of incorrect bus and rail parts. Finally, if the MBTA's monitoring of incorrect bus and rail parts demonstrates that this is a significant issue, the MBTA should raise and resolve this with Mancon.

e. Mancon did not meet its obligation to deliver emergency parts in 12 out of 14 months.

The third KPI from the MBTA-Mancon contract measures whether Mancon delivers parts to base locations for emergency repairs within two hours of a request. Mancon self-reports information about this KPI in a spreadsheet by manually recording the time the central warehouse receives an email request from a material planner at a base location, along with the time when Mancon completes the delivery. The delivery time is supposed to be the moment when the base location material planner receives the part and scans it into FMIS, the MBTA's electronic materials management system.

The MBTA uses Mancon's spreadsheet to calculate performance for this KPI; it does not independently measure this KPI. The table below outlines Mancon's reported emergency delivery performance for the months that the ISAU reviewed.

Figure 3. Emergency Delivery Performance by Service Month

		Emergency Delivery Time (≤ 2 hours)	Penalty Assessed
Service Month	June 2018	Did Not Meet	None
	July 2018	Did Not Meet	None
	August 2018	Did Not Meet	None
	September 2018	Did Not Meet	$144
	October 2018	Did Not Meet	$720
	November 2018	Did Not Meet	$432
	December 2018	Did Not Meet	$144
	January 2019	Did Not Meet	$144
	February 2019	Did Not Meet	$447
	March 2019	Met	
	April 2019	Did Not Meet	$298
	May 2019	Did Not Meet	$745
	June 2019	Did Not Meet	$298
	July 2019	Met	
	Total		$3,372

Beginning in September 2018, the MBTA penalized Mancon $144 for each emergency delivery that arrived more than two hours after the receipt of the request. For the months that the ISAU reviewed, the MBTA assessed $3,372 in penalties for late deliveries.

To verify whether Mancon's self-reporting was accurate, the ISAU analyzed a random sample of 204 emergency deliveries. The objective of this review was to determine whether the data the MBTA used to evaluate Mancon was accurate and fully represented Mancon's performance in meeting the KPI. The ISAU reviewed a sample of requests sent to an email account the MBTA set up specifically for emergency deliveries. Of the 204 emergency deliveries that the ISAU sampled, Mancon incorrectly recorded the time of 13 requests (6% of the sample). Accuracy is important because the email request starts the two-hour window for delivery.[19]

In addition, the ISAU also identified numerous email requests for emergency deliveries that Mancon did not record on its tracking spreadsheet. Furthermore, MBTA staff and Mancon material planners occasionally request emergency parts outside of the email request process by making, for example, a request by telephone. Mancon does not record telephone requests on the spreadsheet. As a result, Mancon's tracking spreadsheet was not a complete list of all emergency deliveries requested and consequently, was not an accurate indicator of whether Mancon met this KPI.

Recommendation: The MBTA should implement an automated system to record when emergency parts are requested and when they are delivered. If unable to automatically collect this information, the MBTA should establish, communicate and enforce clear times for the following events that occur during an emergency delivery:

- The time when base location makes the emergency request to the material planner, which should start the two-hour window for delivery; and
- The time when the delivery has occurred, defined either as the time the part arrives at the location, the time the material planner receives and enters the part into FMIS, or some other appropriate event that marks the delivery time.

Further, the MBTA should require that the material planners send the emergency email request within 15 minutes after the mechanic or foreperson requests a part. Finally, the MBTA should consider increasing the penalty for missed emergency deliveries above the current rates. Penalties should be high enough to incentivize good performance.

f. Mancon is not accountable for MBTA inventory that it loses or damages.

As described above, the KPIs measure inventory accuracy and delivery times. However, the MBTA does not formally evaluate other aspects of Mancon's performance. For example, it does not track inventory that Mancon damages or loses.[20] In fact, there is no clause in the MBTA-Mancon contract that holds Mancon accountable for lost or damaged MBTA property.

During the ISAU's review, MBTA base-location staff provided examples of damaged parts that Mancon delivered, some of which the ISAU observed. For example, at a bus maintenance garage, the ISAU

[19] Of the thirteen errors, two of the emergency deliveries would not have met the two-hour requirement by one minute.

[20] Missing inventory refers to parts that appear in FMIS but that are not at the warehouse or base location.

observed a windshield damaged during a Mancon delivery; at the central warehouse, the ISAU observed another windshield that Mancon staff had broken. For the broken windshield at the bus maintenance garage, Mancon did not have any protection for the glass or a specialized vehicle to use when delivering only one windshield.[21] Based on information provided to the ISAU, Mancon did not reimburse the MBTA for these damages or provide replacement windshields.

Recommendation: The MBTA should require that Mancon safely deliver all materials requested and be responsible for damaged and lost inventory. Specifically, the MBTA should explore implementing a system that tracks inventory that Mancon damages or loses. The MBTA also should consult with counsel to determine if it should amend the contract to deduct the costs of damaged and lost inventory from future payments to Mancon.

2. Mancon failed to put systems and trainings in place as required by the MBTA-Mancon contract.

The MBTA-Mancon contract required Mancon to (a) provide the MBTA with an inventory system that was compatible with the Financial and Materials Information System ("FMIS"); (b) establish a secure area in the central warehouse for valuable items and sensitive data; (c) provide adequate supervision for its staff; and (d) staff the base locations with personnel knowledgeable about bus and rail parts and maintenance. Mancon has failed to comply with these contractual requirements.

a. Mancon could not provide an inventory system that was compatible with the MBTA's inventory system.

The MBTA-Mancon contract required Mancon to provide a robust warehouse management system to work with FMIS, the MBTA's existing inventory system. To meet this requirement, Mancon provided a date on which it would begin receiving and converting MBTA inventory records into Mancon's own inventory system. However, during this process, Mancon's system turned out to be less robust than Mancon had represented. Ultimately, Mancon's system was too simplistic to meet the MBTA's needs and could not work with the existing FMIS.

Because the MBTA could not utilize Mancon's warehouse inventory system, it had to bring in a vendor to upgrade FMIS, which it had not planned on doing. The MBTA did not recover this cost from Mancon or negotiate a lower contract price since Mancon could not meet one of the key deliverables (*i.e.*, the inventory system).

Recommendation: The MBTA-Mancon contract provided that Mancon would use its own system for tracking inventory. Because Mancon did not comply with this contractual requirement, the MBTA should consult with counsel regarding its legal options.

[21] Deliveries of fragile glass should be with a truck or van having special shelves or racks to transport panes of glass.

b. Mancon failed to establish a secure area in the central warehouse.

The MBTA-Mancon contract required Mancon to establish an area in its central warehouse to store valuable items and secure sensitive customer materials. Mancon did not create such a storage area. MBTA staff indicated that the entirety of Mancon's central warehouse was secure because the company installed video cameras around the facility.

Recommendation: Mancon should comply with the contract terms and create a secure area in the central warehouse to store valuable items and secure sensitive customer materials.

c. Mancon staff did not have the requisite knowledge about bus and rail parts.

Mancon material planners are located at the 14 base locations. Their primary role is to provide mechanics with the correct bus and rail parts in a timely manner. As described above, they also perform daily parts counting for inventory control, enter data, make emergency and routine equipment requests to the central warehouse, and provide customer service to base-location staff. Accordingly, the material planners' knowledge of the parts used for maintenance and repairs is crucial. In its response to the MBTA's RFP, Mancon represented that its staff had the requisite logistics, parts and rail knowledge to manage the MBTA's warehouse operations.

Despite these representations, the material planners at the base locations generally lack the necessary knowledge and skills to perform their jobs. At all base locations, MBTA staff ranked the material planners' performance as below grade. Specifically, MBTA staff reported that the material planners were unfamiliar with bus and rail parts and supplies, which led to the slow and incorrect retrieval of inventory. The lack of training and experience also has an impact on the MBTA's productivity and on the budgets at the base locations.

The ISAU observed material planners perform multiple "picks" at base locations. A "pick" involves the material planner receiving a request for a part, which they then find and retrieve. In one instance that the ISAU observed, retrieving one part took a material planner 50 minutes to perform, which was a significant amount of time. The ISAU learned during all base location visits that materials planners' lack of parts knowledge leads to slow retrieval. Slow retrieval prevents MBTA mechanics from being able to perform maintenance and repairs in a timely manner, which leads to delays in getting buses and trains back into service.

Material planners are also responsible for daily cycle counts at the base locations. As discussed in Section D(1)(b) above, cycle counts are the key internal control to ensure that the MBTA has an accurate inventory. However, MBTA staff at all base locations reported that because the material planners were unfamiliar with bus and rail parts and supplies, they often miscounted items or counted the wrong items. The ISAU's review corroborated these reports.

As previously discussed, incorrect counting leads to inadequate inventory control. In addition, MBTA forepersons and superintendents have to spend time fixing cycle count issues and verifying

inventory levels. Inaccurate inventories and incorrect cycle counting also have a direct impact on the base locations' budgets.

When a cycle count indicates that inventory is missing, it can take a significant time to resolve. The process includes the following:

1. The material planner conducts the first daily count of specified inventory items every morning by 11:00 a.m.
2. MBTA staff reconciles the cycle count against the inventory listed in FMIS.
3. When inventory appears to be missing, the material planner conducts a second cycle count by 9:00 a.m. the next workday if the value of the inventory variance is more than $500 or exceeds 20% of the quantity listed in FMIS.
4. MBTA staff perform a second reconciliation, comparing the recounted quantities against the quantities in FMIS.
5. If the "missing" inventory is found, the quantities are updated in FMIS.
6. If the inventory is not found and the discrepancy is greater than $2,500, a supervisor or foreperson at the base location must approve the inventory change in FMIS.

In addition, the MBTA charges the cost of missing or lost inventory to the base location's budget. For example, if inventory records in FMIS list six mirrors at a base location but the material planner counts only four mirrors, the MBTA will charge two "missing" mirrors to the base location's budget.

Consequently, when the cycle count is incorrect because of an error by the material planner, it can cost the base location time and money. Superintendents at the base locations reported to the ISAU that their budgets have had large adjustments because of inaccurate cycle counting. The ISAU reviewed one such variance related to approximately $60,000 of allegedly missing inventory. The foreperson and superintendent at the base location spent time searching for the missing parts and ultimately determined that the material planner had counted a different part altogether. If the MBTA staff had not resolved the discrepancy in a timely manner, the MBTA would have charged the base location's budget $60,000.

Furthermore, because the material planners lack the requisite knowledge and experience, staff at base locations have had to spend time training them. In particular, because some material planners were not adequately trained, some MBTA forepersons and superintendents provided on-the-job training for them. This was not the MBTA employees' responsibilities, was not part of the MBTA-Mancon contract, and takes MBTA employees away from their regular job duties.

Finally, the MBTA-Mancon contract requires Mancon to employ two supervisors for the base locations: one for the car houses and another for the bus garages. These supervisors are supposed to train and oversee material planners at the 14 base locations. At the time of the ISAU's review, however,

Mancon had only hired one supervisor to train and oversee all of the material planners at the base locations.

Recommendation: Mancon is responsible for hiring and training qualified staff. The MBTA should require Mancon to develop an on-boarding process that prepares the material planners for all aspects of their responsibilities. Mancon also should provide regular training to existing staff.

The MBTA also should hold Mancon accountable for its material planners' performance. The MBTA should create metrics that, at a minimum, measure pick times, cycle counting, inventory accuracy and parts knowledge. Tracking and evaluating this data would both identify areas in which the material planners require training and create accountability for Mancon.

The ISAU also recommends that MBTA management conduct periodic, unannounced visits to observe Mancon's performance at both the central warehouse and the base locations. Specifically, MBTA management should evaluate the material planners' ability to conduct cycle counts and to timely retrieve items from the inventory rooms. The MBTA also should observe the process for requesting both normal and emergency deliveries. This would help the MBTA assess the material planners' skills, including their knowledge of the MBTA's parts and supplies. The MBTA should provide the results from its visits with Mancon and require that Mancon provide the necessary education and training.

Finally, the MBTA should require Mancon to provide more regular supervision at the base locations. Hiring a second supervisor for the base locations, as required under the contract, would be an important first step.

E. The MBTA's Oversight of Mancon

The 2018 MBTA-Mancon contract added quantifiable metrics and penalties. In doing so, the contract reflected the MBTA's vision for future contracts, including robust KPIs to hold vendors accountable and to create positive results. However, the ISAU identified problems with the MBTA's current oversight of Mancon that the MBTA needs to improve to ensure that Mancon meets its contractual obligations. As set forth below, the MBTA needs to better understand how the KPIs are calculated, evaluate how well the KPIs measure Mancon's performance, and improve communication with its staff regarding the contract.

1. The MBTA should independently verify the results of the KPIs and work with its consultant to understand how certain KPIs are calculated.

The MBTA does not independently verify that the data used to calculate the KPIs is accurate and complete. Nor does the MBTA understand how two of the KPIs are calculated and therefore it cannot verify that the calculations are accurate.

First, the MBTA uses a spreadsheet that Mancon created in order to calculate the KPIs for emergency delivery times. The MBTA does not independently verify the accuracy of the spreadsheet. A vendor cannot "self-audit;" that is the MBTA's responsibility. As discussed above, moreover, the ISAU

found that Mancon's spreadsheet was incomplete and had slight inaccuracies. This highlights the importance of the MBTA's need to independently calculate the KPIs with data it has verified.

Second, as noted previously, the MBTA hired Alvarez & Marsal to develop a methodology for measuring Mancon's performance. As a result, Alvarez & Marsal created customized queries to calculate the KPIs for inventory accuracy and regular parts deliveries. During the ISAU's review, however, MBTA staff did not exhibit an understanding of how the queries work or whether they accurately calculate the KPIs. Similarly, MBTA staff had limited knowledge about the completeness or accuracy of the data that is used in these KPI calculations. By way of example, MBTA staff could not explain the various data fields used to calculate the KPIs, did not know what the data represented and could not indicate the source of the data. MBTA staff explained that the MBTA relied on Alvarez & Marsal to properly develop the queries for the KPIs. This indicates both that the MBTA did not ensure Alvarez & Marsal performed its contract satisfactorily and that the MBTA currently does not have the capability to determine whether the KPIs are being calculated accurately.

Recommendation: The KPIs are the key metrics used to measure Mancon's performance. The MBTA therefore should thoroughly understand the queries used to calculate the KPIs. MBTA staff also need to understand which data fields make up the KPI calculations, what the data represents and where the data comes from. The ISAU also recommends that MBTA staff test and audit the data used to calculate the KPIs.

As indicated in Section D(1)(d) above, the MBTA also should automate the tracking of emergency deliveries using verifiable and accurate data. As part of this, the MBTA should utilize specific events that accurately reflect when a base location requests an emergency part and when Mancon delivers it.

2. The KPIs do not fully measure Mancon's performance.

As noted in Section D above, the ISAU evaluated how the MBTA assesses Mancon's performance under the contract, as well as the underlying information used for the monthly metrics. The ISAU found that the MBTA-Mancon contract's three performance metrics do not fully evaluate Mancon's performance.

First, the KPI that measures inventory accuracy does not fully reflect Mancon's performance. As previously discussed, Mancon did not do a full wall-to-wall inventory before it moved the inventory from the MBTA's Everett warehouse to Mancon's central warehouse. Because Mancon did not start with an accurate count of its initial inventory, it cannot be certain that its inventory records in FMIS are accurate.

Moreover, this KPI only includes the warehouse inventory; it does not measure inventory accuracy at the base locations.

Second, the KPI for normal deliveries does not take into account deliveries of incorrect or damaged parts. When Mancon staff deliver an incorrect or damaged part, the material planners at the base locations return the part to Mancon's central warehouse and make a second request for a new delivery. The KPI does not capture these deliveries because Mancon staff only enter correct deliveries

into FMIS. Consequently, the MBTA does not track, and Mancon is not accountable for, deliveries of incorrect or damaged parts to base-location staff.

Third, the emergency-delivery KPI also does not fully measure Mancon's performance of this contract requirement. For emergency requests, Mancon must deliver the parts within two hours of receiving the request from the base location. During the ISAU's review, MBTA and Mancon staff differed on when the two-hour time window begins because the MBTA-Mancon contract does not explicitly identify the event that starts the clock running. MBTA base-location staff considered the two hours to start when the foreperson or mechanic verbally requested the part from the material planner. However, Mancon employees stated that the two-hour window begins when staff at the central warehouse receives the email request from the material planner at the base location.

Additionally, base-location staff reported to the ISAU that emergency requests go unreported because MBTA forepersons and mechanics retrieve their own emergency parts without Mancon assistance on occasion. Instead of using the emergency request process, MBTA employees may use FMIS to identify other base locations that have the needed part and retrieve the part on their own. Several MBTA employees reported using this workaround, which causes the MBTA's emergency delivery needs to be underreported.

Recommendation: Because the MBTA needs to ensure that all of its inventory is accounted for, it should measure inventory accuracy at all base locations. Additionally, the MBTA should consider consulting with legal counsel to determine whether it can amend the MBTA-Mancon contract to alter this KPI to include inventory accuracy at the base locations.

For normal deliveries, the Office recommends that the MBTA develop a method to record delivery times automatically to ensure that Mancon is meeting this KPI. In addition, the MBTA should track deliveries of incorrect and damaged parts. If the MBTA's tracking demonstrates that this is a significant issue, the MBTA should address this with Mancon.

Finally, the MBTA should implement an automated system to record when emergency parts are requested and when they are delivered. If it is unable to automatically collect this information, the MBTA should establish, communicate and enforce clear times for when requests and deliveries occur.

3. The MBTA should improve its communications with its employees regarding how the privatization contract should function.

Clearly articulating the scope of work and expectations is key for the MBTA to effectively manage Mancon. As described above, the primary end users of Mancon's work are the base-location staff who need bus and rail parts in order to repair and maintain the buses, subways and trolleys. Nevertheless, MBTA management and base-location staff have different understandings of Mancon's contractual obligations, specifically related to contract terms, the scope of the contract and the responsibilities of Mancon's material planners. For instance, staff at the base locations did not know the supervisory structure for the material planners who work at the base locations. Staff often did not have a point of

contact at Mancon for personnel issues involving the material planners, including absenteeism, accidents and theft.

The MBTA attempted to address the personnel issues by stating in the 2018 MBTA-Mancon contract that Mancon's material planners will comply with MBTA personnel standards and policies. However, during its review the ISAU found no evidence that the MBTA has taken any steps to enforce this contract provision. It also was unclear whether the MBTA staff at the base locations or Mancon staff are aware of this change.

Recommendation: The MBTA would benefit from better communication between management and staff at the base locations regarding Mancon's obligations and performance. If it has not already done so, moreover, the MBTA also should ensure that supervisors at the base locations have a point of contact at Mancon for personnel issues concerning the material planners.

F. The MBTA's Analysis of the Cost of Privatization

Economic impact was one of the MBTA's principal reasons for privatizing its warehouse operations. During presentations to its Fiscal and Management Control Board ("FMCB"), the MBTA estimated that privatization could save the MBTA $25.4 million in operating costs over five years. The MBTA further reported that when it factored in capital savings, the total savings and avoided costs would be $64.2 million.

More specifically, the MBTA reported that handling and staffing the warehouse operations internally cost the MBTA $12.1 million a year. By contrast, the MBTA estimated that it would cost $7.1 million a year to privatize the warehouse operations. The MBTA further reported that by outsourcing warehouse operations, it would avoid capital costs, including upgrades to the current warehouse and upgrades to inventory software. It also expected to save on capital costs by appropriately managing inventory levels and selling off excess and obsolete inventory.

Figures 4 and 5 below break down the MBTA's estimates for operating the warehouse internally and for privatizing warehouse operations.

Figure 4. MBTA's Calculation of the In-House Annual Costs for Warehouse Operations

MBTA's Calculation of the In-House Costs for Warehouse Operations			
Operating Costs			**TOTAL**
Personnel Costs	Warehouse Salaries	$3,250,000	
	Warehouse Overtime	$368,000	
	Fringe Benefits	$1,413,000	
	Retiree Healthcare and Pension	$1,872,000	**$6,903,000**
Other Operating Costs	Damages	$700,000	
	Utilities	$200,000	
	Supplies and Other	$110,000	**$1,010,000**
Capital Costs			**$1,318,000**
Mechanic Unproductive Time Costs			**$2,000,000**
Internal MBTA Administrative Costs			**$900,000**
		MBTA's ESTIMATED TOTAL	**$12,131,000**

Figure 5. MBTA's Estimate of the Annual Costs to Privatize Warehouse Operations

MBTA's Estimate of the Cost to Privatize Warehouse Operations	
Cost Type	**TOTAL**
Costs to Take Over the MBTA's Then-Current Warehouse Operations	$5,200,000
Costs for Expanded Scope of Services[22]	$400,000
Internal MBTA Administrative Costs	$1,500,000
MBTA's ESTIMATED TOTAL	**$7,100,000**

Pursuant to Section 196(c)(iv) of Chapter 46 of the Acts of 2015, the Office must conduct "an analysis of whether the cost of the contract exceeded the benefits derived from the [privatization] contract[.]" Consistent with this mandate, the ISAU reviewed the MBTA's reported in-house costs for handling warehouse operations and the costs the MBTA incurred to privatize these functions.

The ISAU's analysis and findings are set forth in the rest of this section and in Section G.

1. The MBTA could not validate its in-house costs; some costs appear overstated or unwarranted.

The MBTA could not provide the information and documentation necessary to validate its calculation that it cost $12.1 million a year to operate the warehouse in-house. Specifically, the ISAU

[22] The expanded scope of work included industry-standard services beyond the MBTA's in-house operations, including expanded coverage at base locations, a dedicated transportation model, emergency delivery services and active inventory management.

requested the documentation that the MBTA used to calculate the $12.1 million outlined in the table above, including a breakdown of the $9.2 million in operating and capital costs, $2 million in wasted salaries for mechanic unproductivity time and $900,000 for internal MBTA administrative costs.[23] The MBTA was unable to provide specific support or documentation for any of these figures. The MBTA did not retain supporting documentation and staff could not explain the backup for these figures.

Consequently, the ISAU cannot substantiate the accuracy of the dollar amounts that make up the $12.1 million figure. Nevertheless, the ISAU was able to reach certain conclusions. First, the ISAU determined that the MBTA based its in-house cost estimate on budget numbers and not actual costs. Consequently, the $12.1 million figure cannot reflect the actual annual cost the MBTA expended for its warehouse operations.

Second, as set forth in subsections a through c, some of the dollar figures in the $12.1 million are overstated or should not have been included at all.

a. "Personnel Costs"

The MBTA reported that its annual personnel costs for warehouse operations were $5.03 million (excluding retiree healthcare and pensions, discussed below). Although requested, the MBTA could not identify whose salaries it included in personnel costs. As set forth above, the ISAU therefore could not validate that the MBTA included the correct staff at the correct salaries. However, the MBTA did note that "personnel costs" included the salary, overtime and fringe benefits for 14 stockpersons who managed the inventory rooms at the base locations. The MBTA reported to the FMCB that it would save millions of dollars in salaries and related insurance with the departure of these 14 stockpersons.

However, 12 of the stockpersons were re-assigned to newly created roles at the MBTA. They now work as car cleaners or other garage staff, positions that the MBTA created for them when Mancon took over warehouse operations. They continue to earn their warehouse salaries and are eligible to earn overtime. As a result, their salaries, overtime and fringe benefits are ongoing MBTA expenses. These salaries therefore should not have been included in personnel costs. Or, alternatively, they should have been included in the MBTA's annual costs after privatization. As outlined in Figure 7 below, the ISAU estimated that these 12 former stockpersons' employment costs after privatization totaled $1.96 million in 2017, $1.75 million in 2018 and $1.36 million in 2019 (through October 1).

b. "Retiree Healthcare and Pension"

The MBTA attributed $1.87 million a year to "retiree healthcare and pension." During the ISAU's review, however, the MBTA could not explain what this line item refers to or provide documentation to support it. In fact, it is unclear whether the expense is related to existing employees or retirees and how

[23] The MBTA considered mechanic unproductivity as the time mechanics spent searching for parts in disorganized base location stockrooms and waiting for the MBTA's central warehouse staff to locate and deliver parts.

the costs are an annual operating expense. Therefore, the ISAU could not confirm the appropriateness of the MBTA including these retiree costs in its annual cost of operating the warehouse.

c. "Mechanic Unproductive Time Cost"

As part of its annual costs, the MBTA included $2 million for "lost work time." In particular, the MBTA alleged that mechanics lost 2% of their work time searching for parts due to poorly-organized inventory rooms at the base locations and waiting for staff at the central warehouse to locate and deliver parts. This is not a valid cost because the MBTA pays mechanics the same fixed salary regardless of their productivity. Thus, the $2 million attributed to unproductive or lost time is not an accurate portrayal of the MBTA's annual costs to manage its own warehouse operations. The ISAU also notes that the MBTA could not provide its methodology or any documentation underlying the 2% figure.

2. The potential capital savings were overstated.

a. Sale of obsolete and excess inventory

In seeking FMCB's approval to privatize warehouse operations, the MBTA estimated that it would recover $22.7 million by selling its obsolete and excess inventory. It presented this as a cost savings bought about by privatization.

There are three flaws with the inclusion of this inventory as a potential cost savings. First, selling obsolete and excess inventory is not related to privatization. The MBTA could have sold this inventory with or without privatization. Second, the $22.7 million was the original price the MBTA paid for this inventory. The MBTA could not substantiate its representation that it would recover the entire $22.7 million when it disposed of its obsolete and unnecessary inventory. Rather, the resale value of the obsolete and unnecessary parts likely would be far less than the original purchase price. This is especially likely because, as the MBTA has recognized, the transit industry no longer uses many of the obsolete parts. In fact, the MBTA auctioned 75 types of obsolete inventory and received only $2,750.[24]

Finally, the MBTA did not account for the cost of handling, transporting, storing and then auctioning the obsolete inventory. The MBTA paid Mancon an additional $51,747 to move obsolete inventory from the original Everett warehouse to Mancon's central warehouse, then to transport items to an auction site in Medford. Although this is a small cost in the overall privatization effort, the $51,747 highlights an additional unreported cost.

b. Additional inventory storage and auctioning costs

The MBTA also estimated that it would save capital costs because it would not have to store its obsolete and excess inventory. The MBTA later realized that it still needed space for storing the obsolete equipment, as well as for storing spare parts delivered with trains. The MBTA therefore entered into an

[24] Throughout the ISAU's preliminary review, the MBTA continued to refer to the value of its inactive and obsolete inventory. For instance, in March 2019 the MBTA's chief procurement officer estimated that the value of inactive parts was $24.7 million. The MBTA calculated this new figure by identifying inactive parts that the MBTA had not used within the last 24 months.

agreement with Fellsway Realty to lease space in Medford for these purposes. As the MBTA represented disposition of obsolete inventory as a cost savings resulting from privatization, the ISAU included these lease payments in its post-privatization analysis in Figure 7.

3. The MBTA's privatization cost estimate did not include all consultants and new staff.

As discussed above, the MBTA estimated that it would cost $7.1 million a year to privatize its warehouse operations. The ISAU found that the $7.1 million figure did not include certain costs. The first of these was the cost of consultants that the MBTA brought on to assist with privatization.

The ISAU has documented the additional consulting costs the MBTA expended to help it privatize its warehouse operations. The table below summarizes the $2.5 million in additional costs relating to the privatization; descriptions of each vendor appear below the table.

Figure 6. MBTA's Added Privatization Costs for Consultants

Added Privatization Costs				
	CY 2016	CY 2017	CY 2018	**TOTALS**
Optio Tempore	$32,825	$287,218		**$320,043**
Alvarez & Marsal			$1,845,594	**$1,845,594**
Daniel H. Collins		$129,634		**$129,634**
Beacon Application Services		$242,945	$7,800	**$250,745**
TOTALS	$32,825	$659,797	$1,853,394	**$2,546,016**

Before awarding the contract to Mancon, the MBTA enlisted a consulting company, Optio Tempore, to guide the MBTA through its outsourcing and competitive bid process, to assist with developing the original RFP, as well as to help with the transition of operations to the third-party vendor. The MBTA paid a total of $320,043 to Optio Tempore. The MBTA also used an already-retained accounting consultant, KPMG, to assist with compiling the MBTA's in-house costs for warehouse operations. Because of the lack of detail on invoices, however, the ISAU could not identify which costs were associated solely with their work on privatization efforts.

After awarding the contract to Mancon, the MBTA realized that it needed a vendor with management experience to help the MBTA oversee the contract. The MBTA therefore hired two consulting firms, Alvarez & Marsal and Daniel H. Collins. Some staff from these two firms served as the MBTA's interim warehouse oversight staff during the transitional period, with one consultant from Alvarez & Marsal staying on until September 2018 as the interim senior director of warehouse and inventory management. The MBTA paid Alvarez & Marsal over $1.8 million and Daniel H. Collins almost $130,000 for consulting services.

A second additional cost relates to FMIS. As noted earlier, the MBTA could not use Mancon's warehouse management system because it was too simplistic and was not compatible with FMIS. The MBTA therefore hired consultants to update and reconfigure FMIS so it could be used for the warehouse

operations. The MBTA did not include such an expense in its $7.1 million estimate. To the contrary, the MBTA had reported to the Board that privatization would save $1 million because the MBTA would not have to upgrade its existing FMIS system.

Because of lack of recordkeeping and the lack of detail on invoices, the ISAU had difficulty quantifying how much the upgrades cost. MBTA staff identified three different consultants that assisted the MBTA in data and information technology integration within FMIS.[25] MBTA staff also reported to the ISAU that two additional consultants, both of which were already engaged with the MBTA for other technology-related services, worked extensively on warehouse-related technology tasks.[26] The ISAU reviewed these two consultants' invoices, but the ISAU could not quantify a specific number of hours worked or funds expended for warehouse-specific tasks.

In addition to hiring consultants to assist it with the privatization project, the MBTA hired four new full-time employees and one part-time employee specifically for warehouse oversight. The MBTA also transferred three existing employees to support the warehouse operations. The ISAU reviewed and included these salaries, pension contributions and healthcare costs as the total cost of these employees.

Although the ISAU was able to accurately quantify the cost of these new employees, it was unable to quantify the precise amount that the MBTA paid for the multiple consultants it engaged to assist with this privatization project. The ISAU's best estimate, based on the information that the MBTA made available, is $2,546,016.

In summary, the ISAU found that the MBTA's original cost estimate understated the cost to privatize. The ISAU's analysis of the MBTA's cost to date is set forth in Section G below.

G. The ISAU's preliminary analysis of privatization costs.

Pursuant to Section 196(c)(iv) of Chapter 46 of the Acts of 2015, the Office must conduct "an analysis of whether the cost of the contract exceeded the benefits derived from the [privatization] contract[.]" Consistent with this mandate, the ISAU analyzed the actual MBTA costs incurred relating to the contract with Mancon for the privatization of the warehouse operations. This evaluation included an expansive review of invoices and other procurement documents, as well as employee payroll information. The ISAU included all money paid to Mancon for its contracted work, as well as all associated consultants, current MBTA warehouse oversight staff, new MBTA hires for warehouse oversight and additional administrative costs for privatizing the MBTA's warehousing operations. The table below summarizes this analysis.

[25] Alvarez & Marsal, Daniel H. Collins and Beacon Application Services.

[26] Cherryroad Technologies and a private consultant, Ed Kelley.

Figure 7. ISAU's Analysis of the MBTA's Costs to Privatization Warehouse Operations

Privatization Costs				
	CY 2016	CY 2017	CY 2018	CY 2019 (to Oct. 1)
Mancon		$4,490,535	$5,554,458	$3,456,142
Optio Tempore	$32,825	$287,218		
Alvarez & Marsal			$1,845,594	
Daniel H. Collins		$129,634		
Beacon Application Services		$242,945	$7,800	
MBTA New Hires for Warehouse Oversight		$380,825	$667,700	$658,313
MBTA Employees Transferred to Warehouse Oversight		$488,765	$553,269	$388,908
MBTA Retained Employees (former Stockpersons)		$1,937,605	$1,592,831	$1,204,186
Overtime for Retained Employees (former Stockpersons)		$19,820	$152,977	$151,399
Medford Rent		$174,652	$189,866	$48,442
(Everett Lease to Encore)		($51,785)	($630,735)	($219,752)
TOTALS	**$32,825**	**$8,100,214**	**$9,933,760**	**$5,687,638 (through Oct. 1)**

As noted earlier, the MBTA did not include consulting expenses in its overall costs to privatize the warehouse functions. These consulting costs directly supported the MBTA's warehouse contract oversight and therefore are part of the actual cost of the warehouse privatization. Additionally, the ISAU learned that additional consultants worked on the warehouse privatization; however, the consultants did not track their actual hours spent on these tasks so the ISAU could not evaluate and include these costs. For this reason, the ISAU believes that consultant costs are likely higher than listed above.

In addition, the MBTA hired four new staff specifically for warehouse oversight and transferred three existing staff to support warehouse operations. The ISAU reviewed and included these salaries and related employment costs (pension and healthcare), as the MBTA used these salaries and costs when presenting their MBTA in-house costs. The ISAU also included an additional employee at 50% of their salary because they spend at least 50% of their time on warehouse operation.

Also, as noted previously, 12 of the 14 former stockpersons remained with the MBTA after privatization in the newly-created positions. The ISAU included their salaries, healthcare costs and pension contributions in this analysis because the MBTA continues to have these expenses after privatization. Stated differently, because the MBTA included these expenses in its in-house costs, inclusion here allows for a more apples-to-apples comparison.

The ISAU also included the added rental costs for the warehouse in Medford where the MBTA stores obsolete inventory and stages items for auction.

Finally, because of privatization, the MBTA was able to lease a section of its former Everett warehouse to Encore Boston Harbor. The ISAU included this lease revenue because the warehouse space became available as the direct result of outsourcing warehouse operations.

H. MBTA Response

As previously noted, the Office discussed the ISAU's observations with MBTA leadership and provided recommendations for improvement following this review. MBTA staff were receptive to the ISAU's concerns and recommendations.

During the ISAU's review, MBTA warehouse oversight staff began developing a train-the-trainer program for experienced MBTA staff to educate Mancon staff on bus and rail parts, as well as process efficiencies to improve Mancon's performance under the contract. Further, MBTA staff created a presentation regarding Mancon contract requirements for the chief mechanical officer who oversees all base locations.

The MBTA also noted that there were many lessons learned from the contract development for the warehouse operations privatization. Procurement staff are committed to including more incentivized performance goals on future MBTA projects.

The ISAU appreciates the MBTA's cooperation throughout this review and its commitment to work with the Office in the future to facilitate process improvements.

I. Conclusion

As a result of this preliminary review, the ISAU identified opportunities for the MBTA to bring Mancon's performance in line with its contractual obligations, improve its oversight of Mancon and promote a successful partnership. The ISAU appreciates the MBTA's and Mancon's time and cooperation throughout the review.

The MBTA could improve its oversight of Mancon's performance and should hold Mancon accountable for its work. The MBTA should enforce all terms of the MBTA-Mancon contract and enforce the penalties for non-compliance. This review also highlighted aspects of Mancon's performance that the MBTA does not formally evaluate, document or pursue corrective actions for. The Office recommends that the MBTA consult with legal counsel about amending the MBTA-Mancon contract to include specific language requiring Mancon to correct these operational challenges.

As part of this review, the ISAU also evaluated the cost estimates that the MBTA provided to the Fiscal and Management Control Board when it sought approval to privatize its warehouse operations. First, the MBTA reported to the board that it cost $12.1 million a year to conduct the warehouse

operations in-house. The MBTA could not provide the documents or information that it used to make that calculation.

As a result, the ISAU could not substantiate the validity of that calculation. Nevertheless, the ISAU did identify certain costs that should not have been included. In addition, the ISAU identified costs, including consulting services and new hires at the MBTA, that were needed to execute the warehouse contract but that the MBTA did not include in its $7.1 million estimate to privatize warehouse operations.

II. The Merit Rating Board

Following a tragic accident in June 2019 involving a Massachusetts driver in the state of New Hampshire, the Registry of Motor Vehicles ("RMV") came under scrutiny for failing to process out-of-state notifications for motor vehicle incidents. The driver who allegedly caused the June 2019 accident held a Massachusetts Commercial Driver's License ("CDL"). In May 2019, the driver had refused to submit to a chemical test in the state of Connecticut. This refusal should have led the RMV to revoke the driver's license, but that did not happen.[27]

At the time of the accident, the Merit Rating Board ("MRB") handled out-of-state notices of motor vehicle violations, including citations related to speeding, moving violations, vehicular manslaughter and operating under the influence. Pursuant to Section 57A of Chapter 6C of the Massachusetts General Laws, the MRB's primary mission is to administer the Safe Driver Insurance Plan. To do this, the MRB is responsible for compiling, gathering, and disseminating information, operator records and histories, and such other data pertaining to motor vehicle accidents, insurance claims under motor vehicle policies, and motor vehicle violations as is necessary to facilitate the Safe Driver Insurance Plan.

After the accident, it came to light that neither the MRB nor any unit at the RMV had processed out-of-state motor vehicle incident notifications since March 2018. At the request of the MRB's Board, the Office began an in-depth review of the MRB in order to provide recommendations to improve its operations, practices, procedures and internal controls. The Board also asked the Office to review the MRB's current role and responsibilities, as well as to identify potential risks to or gaps in the MRB's ability to meet its statutory obligations.[28]

As part of this ongoing review, the ISAU performed policy and document reviews; observed the MRB's procedures for document control, citation processing and quality control; attended Board meetings; reviewed the MRB's statutory obligations; and analyzed financial and budget records. During 2019, the ISAU held 13 meetings and interviews with MRB staff to understand their roles and daily

[27] Pursuant to M.G.L. c. 90F, § 9, as well as Conn. Gen. Stat. Ann. § 14-44k(c), a person who holds a CDL is disqualified for at least one year (for first-time refusals) from operating a commercial motor vehicle for refusing to submit to a chemical test. Additionally, M.G.L. c. 90F, § 8, provides that if the "registrar receives official notice, in any form which he deems appropriate, including electronic transmission that a [CDL holding] resident of the commonwealth … has had his license or right to operate suspended, revoked or canceled in another state or country, the registrar shall … revoke said license immediately without a hearing."

[28] The Office's review does not encompass the causes of the failure to process out-of-state notifications; the RMV hired a consultant to undertake that analysis.

procedures. The Office has shared preliminary observations and recommendations with the Board and the interim MRB Director. The Office will continue to be actively engaged in this review in calendar year 2020.

III. The MBTA's Fleet of Non-Revenue Vehicles

During 2019, the ISAU collaborated with the MBTA to review and improve the administration of its inventory of non-revenue fleet vehicles. At the time of the ISAU's review, the non-revenue fleet included 558 passenger vehicles ranging from sedans to pickup trucks. The vehicles are either assigned full-time to an MBTA employee, assigned to a specific department or used as a pool vehicle. At the time of the ISAU's review, 46 employees had full-time domicile (or take-home) privileges. An additional 29 employees had domicile privileges during the snow and ice season. The MBTA's chief operating officer ("COO") is responsible for the non-revenue fleet and the MBTA employs a superintendent who handles the inventory and maintenance of the vehicles in this fleet.

The ISAU sought to determine whether the MBTA has an accurate inventory of its non-revenue fleet vehicles. The ISAU also reviewed whether the MBTA has accurate records for vehicle assignments to individuals and departments. Finally, the ISAU sought to understand the MBTA's procedures and guidelines for assigning vehicles to individuals, including giving employees domicile (or take-home) privileges.

The ISAU identified opportunities for the MBTA to strengthen its recordkeeping and vehicle assignment process. Within the MBTA's fleet asset management system, the ISAU found inaccurate and incomplete records, vehicles assigned to employees who no longer work at the MBTA, instances of multiple vehicles assigned to one employee, and vehicles assigned to MBTA contractors.

The ISAU also found the MBTA did not have procedures or guidelines for determining when an employee needs a state vehicle (for instance, which job functions require a vehicle). The MBTA form for requesting a vehicle did have a "justification" section for requesting a domiciled vehicle, but that section typically was left blank or contained skeletal information.

MBTA staff were receptive to the ISAU's concerns and recommendations. The ISAU worked with the MBTA's COO and the superintendent to develop a more robust and detailed vehicle assignment form. The new form requires employees to document the need for a full-time or domicile vehicle and to obtain approval from both their supervisor and the COO.

The MBTA required all staff who currently have domicile privileges (*i.e.*, who are allowed to drive their vehicle to and from work) to complete the new vehicle assignment form. As of the end of 2019, the superintendent continued to collect the completed forms and to update the fleet's electronic records.

This initial review highlighted the need to have accurate fleet records and increased accountability, including a need for the MBTA to have guidelines for assigning vehicles to employees. The ISAU will continue its review in 2020.

IV. Investigations Referred to the Office of the Inspector General and Attorney General's Office

In accordance with Section 9(d) of Chapter 6C of the Massachusetts General Laws, the ISAU may report and refer findings to the investigative division of the Office, and the results of such investigations may be referred to the Attorney General for appropriate action. During 2019, the ISAU continued to work collaboratively with the Office's other divisions on a number of matters, referring cases to those divisions as appropriate.

OTHER ACTIVITIES

I. Fraud Prevention Training

Related to the ISAU's mission to prevent fraud, waste and abuse of transportation funds, the ISAU developed and delivered fraud prevention training at the request of MassDOT's Highway Division. In March 2019, the ISAU team led two training sessions for MassDOT Highway field staff who oversee highway maintenance and construction contracts. The sessions outlined common fraud schemes, fraud prevention techniques and red flags of vendor fraud. The ISAU has continued to lead these trainings and will continue to educate the MassDOT and MBTA staff about fraud.

II. Hotlines

The ISAU maintains two hotlines for members of the public to confidentially report suspected fraud, waste or abuse in the expenditure of MassDOT funds; the hotlines are available on the Office's, MassDOT's and the MBTA's websites. The ISAU also maintains employee hotlines on MassDOT's and the MBTA's intranets. The ISAU evaluates each complaint received to determine whether it falls within its jurisdiction and whether it merits action. Some complaints lead to extensive investigations, some are referred to other agencies and others are closed if a preliminary inquiry fails to substantiate the allegations. During 2019, the ISAU received 126 complaints from the public and employees.

The ISAU also monitors the RMV's disability parking placard abuse hotline and receives reports of suspected placard abuse from the public. The RMV's Medical Affairs Bureau processes this information for further investigation. In 2019, the ISAU received 81 reports of alleged placard abuse.

APPENDIX A: INCENTIVIZED PERFORMANCE AND PENALTIES

Contract Year	Key Performance Indicator	Target	Penalties
Year 1 *(Feb. 2017–Jan. 2018)*	Inventory Accuracy at Central Warehouse[29]	92%	No Penalties (deemed Transition Year)
	Regular Deliveries	Not Enforced (No Mechanism to Track and Measure)	
	Emergency Deliveries	Not Enforced (No Mechanism to Track and Measure)	
Year 2 *(Feb. 2018–Jan. 2019)*	Inventory Accuracy at Central Warehouse	93%	1st Missed Month: Warning and Letter 2nd Consecutive Month: 2% Penalty *Missed Inventory Accuracy KPI: $4,880* *Missed Regular Deliveries KPI: $401 00* 3rd Consecutive Month: 5% Penalty *Missed Inventory Accuracy KPI: $12,200* *Missed Regular Deliveries KPI: $1,002*
	Regular Deliveries	Receive 98% of Requests by 10:00 a.m. the Next Day that a Mancon Employee is at the Base Location	
	Emergency Deliveries	Delivered within Two Hours of Request	$144 per Missed Delivery
Year 3 *(Feb. 2019–Jan. 2020)*	Inventory Accuracy at Central Warehouse	94%	1st Missed Month: Warning & Letter 2nd Consecutive Month: 2% Penalty *Missed Inventory Accuracy KPI: $5,027* *Missed Regular Deliveries KPI: $413* 3rd Consecutive Month: 5% Penalty *Missed Inventory Accuracy KPI: $12,566* *Missed Regular Deliveries KPI: $1,032*
	Regular Deliveries	Deliver 98% of Requests by 10:00 a.m. the Next Day that a Mancon Employee is at the Base Location	
	Emergency Deliveries	Delivered within Two Hours of Request	$149 per Missed Delivery
Year 4 *(Feb. 2020–Jan. 2021)*	Inventory Accuracy at Central Warehouse	95%	1st Missed Month: Warning & Letter 2nd Consecutive Month: 2% Penalty *Missed Inventory Accuracy KPI: $5,177* *Missed Regular Deliveries KPI: $425* 3rd Consecutive Month: 5% Penalty *Missed Inventory Accuracy KPI: $12,943*
	Regular Deliveries	Deliver 98% of Requests by 10:00 a.m. the Next Day that a Mancon Employee is at the Base Location	

[29] Inventory accuracy refers to a comparison between the inventory physically present in the central warehouse and the inventory listed in FMIS. When an inventory is 100% accurate, the quantity of all parts listed in FMIS matches the quantity of parts physically present in the central warehouse.

			Missed Regular Deliveries KPI: $1,063
	Emergency Deliveries	Delivered within Two Hours of Request	$153 per Missed Delivery
Year 5 *(Feb. 2021–Jan. 2022)*	Inventory Accuracy at Central Warehouse	95%	1st Missed Month: Warning and Letter 2nd Consecutive Month: 2% Penalty *Missed Inventory Accuracy KPI: $5,333* *Missed Regular Deliveries KPI: $438* 3rd Consecutive Month: 5% Penalty *Missed Inventory Accuracy KPI: $13,332* *Missed Regular Deliveries KPI: $1,095*
	Regular Deliveries	Deliver 98% of Requests by 10:00 a.m. the Next Day that a Mancon Employee is at the Base Location	
	Emergency Deliveries	Delivered within Two Hours of Request	$158 per Missed Delivery