



**Massachusetts Bay
Transportation Authority**

Winthrop Routes 712/713

Update

March 2017



MBTA Bus Operations and Maintenance: Expansion Service Model

MBTA contracting with private bus company to run Winthrop routes 712/713

- Winthrop service has been contracted out by MBTA since 1991
- Private contractor (Paul Revere) has traditionally run service using own fleet

New model mirrors national best practices for contracted bus service

- MBTA will provide 6 New Flyer buses to private contractor to operate and maintain
- Service Level Agreements govern performance and maintenance
- Private company employees operate and maintain buses
- Contract runs for 4 years with up to 2 option years
- Fixed price contract caps costs at 2% annual growth over contract period

Consistent with the L589 12/19 agreement, the MBTA can utilize this model for all expansion bus service in the future

- Contract terms provide cost stability
- Assets are owned by MBTA while operated and maintained by private company



MBTA to provide 6 New Flyer Xcelsior XDE40 FT buses



Scope of Work and Service Information

SCOPE OF WORK:

- Contractor will provide full operation and maintenance of MBTA-owned vehicles for Routes 712/713
- For the first time, MBTA will provide six (6) new 40FT hybrid diesel/electric buses to contractor
 - Same New Flyer buses recently put into operation out of MBTA's Cabot garage
- Contract Length: FY2018-FY2021 (4 years) with two (2) one-year option years

SERVICE INFO:

- Number of Buses: 6
- Annual Revenue Hours: 18,115
- Annual Revenue Hour per Bus: 3,019
- Ridership (FY2016): 735,390 passengers





Service Level Agreements and Maintenance Requirements

SERVICE LEVEL AGREEMENTS:

- Penalties will be assessed for “missed trips”, defined as the vehicle never arriving or arriving more than 30 minutes after the scheduled pick-up time
- Amount of penalty will be equal to twice the contractor’s per trip rate (daily rate divided by # of trips that day, times 2)
- Contractor responsible for providing weekly list of missed trips

MAINTENANCE REQUIREMENTS:

- **Facility:** contractor responsible for providing maintenance facility within 10 miles of the route
- **Experience:** lead mechanic applicants hired will have a minimum of 5 years maintaining heavy duty buses (a master technician with ASE certification is required); supporting mechanics will have at least 1 year of experience
- **Other Requirements:** adhere to MBTA-authorized PM schedules, adhere to all OEM standards, and allow for bi-annual audits by MBTA staff



Maintenance Requirements: Stringent Requirements Governing Facilities, Employees and Maintenance Practices

FACILITY



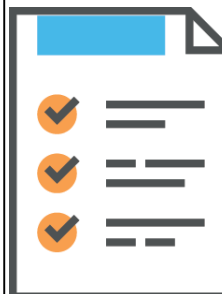
- Maintenance facility must be within 10 miles of routes
- Contractor required to maintain and garage buses at this facility
- MBTA reserves right to inspect buses at this facility at any time

EXPERIENCE AND TRAINING



- Lead mechanic(s) must have minimum 5 years' experience maintaining heavy duty buses
- A master technician with ASE certification is required
- Supporting mechanics must have at least 1 year experience
- Trainer staff required to attend MBTA training modules on BAE hybrid propulsion, Cummins engines, Multiplex, etc.

SAMPLE REQUIREMENTS



- ✓ Daily circle checks
- ✓ MBTA-authorized preventative maintenance (PM) schedules
- ✓ Adherence to all OEM requirements
- ✓ Electronic record-keeping in MIS system
- ✓ Monthly technical and engineering inspections
- ✓ Bi-annual maintenance audits by MBTA staff
- ✓ No body damage greater than 1" in length or that inhibits safe vehicle operation
- ✓ Passenger area free from excessively worn floor or broken seats
- ✓ Functioning heating and A/C
- ✓ Annual emission/opacity inspections
- ✓ Wheelchair ramp maintenance and performance
- ✓ Minimum 2 weeks parts inventory

Failure to comply with standards will result in "hefty fines and sanctions"



Maintenance Requirements: Private Operator Must Adhere To All Specified OEM Standards For New Buses



NEW FLYER

MBTA - BOSTON

SERVICE MANUAL

XCELSIOR® DIESEL-ELECTRIC 40FT. TRANSIT BUS



This service manual is effective for only those coaches with the following Identification Numbers:

- ✓ Preventative Maintenance
- ✓ Front Axle & Suspension
- ✓ Rear Axle & Suspension
- ✓ Steering System
- ✓ Engine System
- ✓ Hybrid Drive System
- ✓ Cooling System
- ✓ Fuel System
- ✓ Air System
- ✓ Electric System
- ✓ HVAC System
- ✓ Structures & Chassis
- ✓ Interior Panels & Applied Parts
- ✓ Exterior Panels & Applied Parts
- ✓ Windows
- ✓ Access Doors & Panels
- ✓ Entrance & Exit Doors
- ✓ Seating & Stanchions
- ✓ Destination Signs
- ✓ Driver's Controls
- ✓ Wheelchair Ramps


Source: MBTA RFP No. 140-16


Draft for Discussion & Policy Purposes Only



Maintenance Requirements: Private Operator To Use Daily/Weekly/Monthly Checklists Specified By OEM

DAILY CHECKLIST	
	
Daily Preventive Maintenance	
<p>2.6.6. Floor Covering</p> <div style="border: 1px solid black; background-color: yellow; padding: 2px; width: fit-content; margin: 5px 0;">CAUTION</div> <p>DO NOT clean the vehicle interior with pressure washing equipment. This type of cleaning causes excessive soaking of the floor covering and can result in separation of the rubber floor covering from the floor substrate, warping or deterioration of the floor substrate, and possible damage to floor mounted equipment such as floor heaters.</p> <p>Inspect the interior flooring for cleanliness on a regular basis depending on operating conditions. Exposure to salt, sand, or slush during the winter months may require</p>	<p>2.6.7. Crankcase Breather Tube</p> <p>Check breather tube for kinks, dents, or other damage. Also check inside of tube for sludge, debris, or ice formation (in freezing conditions). Clean or replace tube as required.</p> <p>2.6.8. Aftertreatment Exhaust Piping</p> <p>Inspect exhaust aftertreatment system for leaks cracks, and loose connections. Inspect for leaks at V-band connections and tighten clamps as necessary.</p> <p>2.6.9. Air Intake Piping</p> <p>Inspect air intake tubes and hoses, for evidence of wear, punctures, or other damage. Inspect for loose connections and</p>

WEEKLY CHECKLIST	
	
Weekly Preventive Maintenance	
<p>2.7. Weekly Preventive Maintenance</p> <p>2.7.1. Radiator</p> <p>Test the function of the fan reverse switch and LED indicator on a weekly basis or any time service work is being performed in the engine compartment. Operating the fan reverse switch will not only clear debris from the radiator core, but will also confirm operation of the LED indicator which is used to display diagnostic fault codes. If any active fault codes are indicated, refer to Section 6 of this manual for troubleshooting and vendor information.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Ensure that the support arm magnet contacts and retains the support arm. Adjust magnet position as required. <input type="checkbox"/> Ensure that the support arm hooks pull out smoothly, stop at the stop screw, slide easily into the stowed position, and self stow on the magnet when released. <input type="checkbox"/> Check the pivot bolt assemblies to ensure they are tight. <input type="checkbox"/> Check pivot bolt bronze oilite bushings for wear or cracks. Replace as necessary. <input type="checkbox"/> Check that all mounting bracket fasteners are tight, including the hardware for the

MONTHLY CHECKLIST	
	
Monthly Preventive Maintenance	
<p>2.8.2. Air Tanks</p> <p>It is recommended that all air tanks be drained monthly and a record of the contents collected be recorded. Performing these inspections on a regular basis will establish trend monitoring to assess the performance of the compressor (excessive oil passing) and air dryer (saturated desiccant cartridge).</p> <p>The following factors can influence that amount of water collected and should be taken into consideration before making an assessment:</p> <ul style="list-style-type: none"> <input type="checkbox"/> An outside air source was used to charge the system and did not pass through the air dryer. <input type="checkbox"/> Exceptionally high air usage, exceeding 25% compressor duty cycle due to either heavy accessory demand or system leakage <input type="checkbox"/> Daily temperature range exceeds 30°F (17°C) resulting in condensation. Under these conditions the presence of small amounts of moisture is normal and should not be considered as an indication that the air dryer is not functioning properly. <p>NOTE: <i>A small amount of oil in the system is not unusual and should not be considered a reason to replace the desiccant cartridge. Oil stained desiccant can function adequately.</i></p>	<p>5. Evaluate volume collected as follows:</p> <ul style="list-style-type: none"> a. More than one unit of oil in a 30 day period will require the desiccant cartridge to be changed and is considered cause for further inspection of the air compressor. Worn pistons or rings will allow oil bypass and may require repair if amount of oil bypassed is excessive. Also inspect compressor discharge line for excessive carbon buildup. b. More than one unit of water or emulsion will be cause to conduct an air system leakage test. Refer to Section 8 of this Service Manual for procedure. c. More than five units of water in a 30 day period indicates unsatisfactory air dryer performance. Replace air dryer desiccant cartridges. <p>2.8.3. Fire Suppression System</p> <ul style="list-style-type: none"> <input type="checkbox"/> Open access door behind streetside light panel, opposite the exit door, to access gauge. See "Fig. PM-1: Fire Suppression Cylinder Inspection" on page 19. <input type="checkbox"/> Check pressure gauge on agent cylinder to ensure it is in the operating (green) range. <input type="checkbox"/> Check all nameplates and instructional labels for legibility. <input type="checkbox"/> Check physical condition of all components for mechanical damage and security of mounting



Maintenance Requirements: Private Operator Must Use MBTA-Authorized Inspection Forms

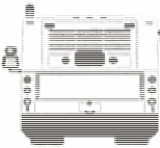
DAILY CIRCLE CHECK FORM

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
VEHICLE CONDITION REPORT
NEW FLYER D40LF SERIES

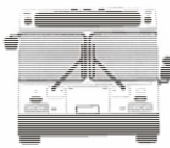
AREA: _____
DATE: _____
VEHICLE: **0043491**

OPERATOR NAME: _____ NUMBER: _____ RUN: _____ TIME: _____

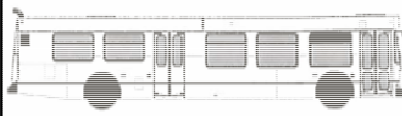
1. _____
2. _____
3. _____



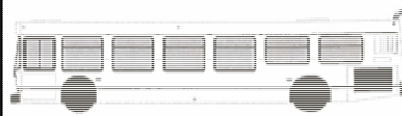
REAR END VIEW



FRONT END VIEW



RIGHT SIDE VIEW



LEFT SIDE VIEW

MBTA 58 8701 102 REV 1.04-04

Operators must perform routine safety check before bringing bus into service

MBTA PM INSPECTION FORM

QAF-011 BUS MAINTENANCE MILEAGE INSPECTION AUDIT
PILOT

VEHICLE NO. _____ MILEAGE _____ DATE _____

USE WITH MILEAGE INSPECTION AUDIT PROCEDURE QAF-004

INSTRUCTIONS:
1. Complete each item on sheet.
2. All bus repairs to be completed before audit. Bus to be audited "as-is". Audit Team shall not effect any repairs or adjustments to vehicle.
3. All audit discrepancies shall be reported.
4. All items must pass. A single failure or more constitutes a failed audit.
5. If bus is not in compliance with audit requirements it shall be held until released by Audit Team or Superintendent.
6. Forward audit report to Superintendent upon completion.
7. The completed audit shall be forwarded to the Quality Assurance Dept.
NOTE: FAILURES ARE REPORTED TO THE SAFETY DEPT. ON THE MILEAGE INSPECTION AUDIT NOTICE. REFER TO LAST PAGE OF THIS FORM.

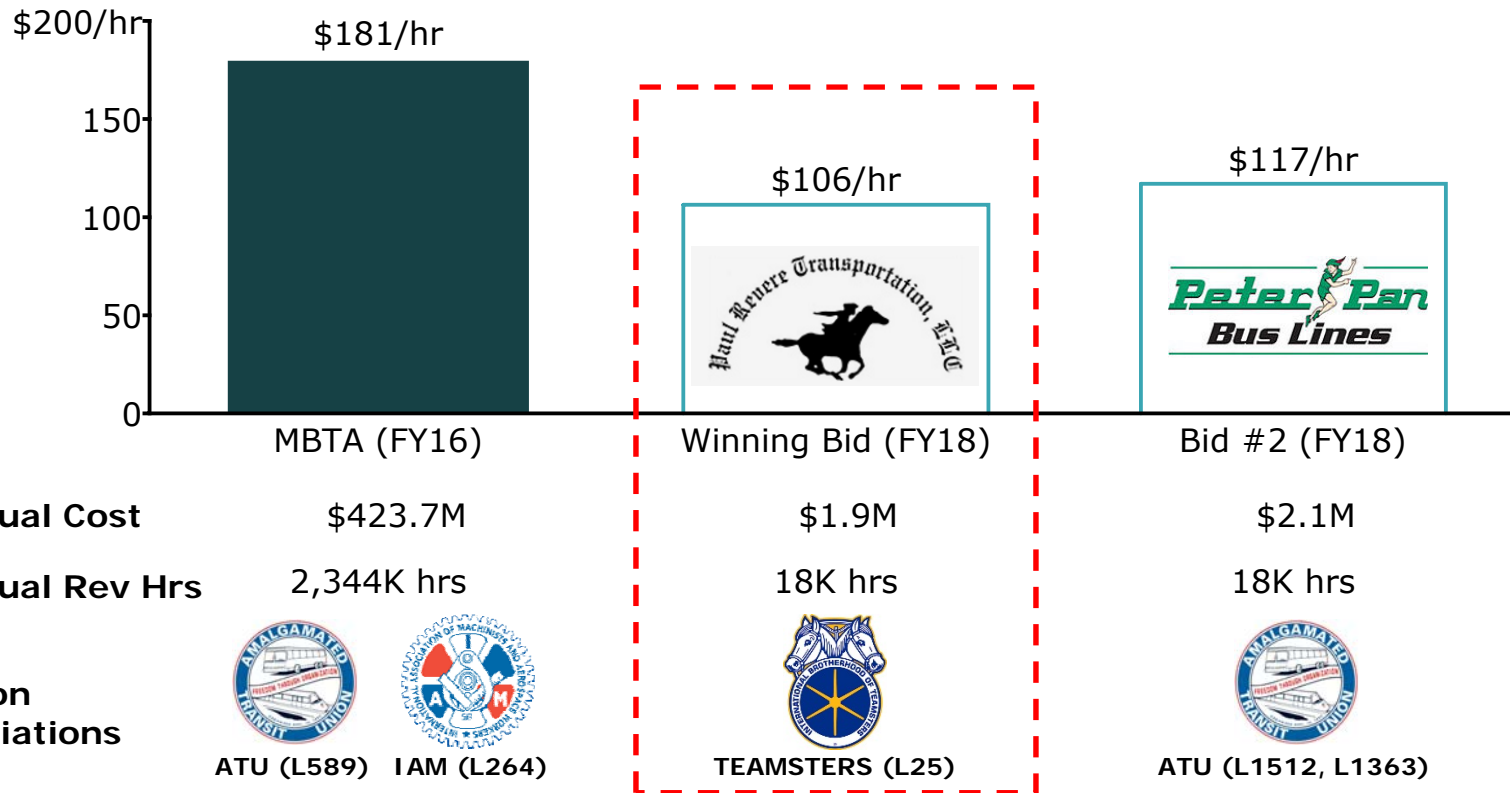
NO.	ITEM	CRITERIA	PASS / FAIL
BODY INTERIOR			
1	Bus Identification	Registration, permits and inspection sticker present and valid	
2	Brake Pedal / Accelerator Pedal	Buffers split freely, no lateral play, pad present and secure	
3	Wheelchair Lift	Operation, interlocks, passenger tie downs	
BODY EXTERIOR			
4	Front Tires / Rims	4/32" tread, even wear, no gouges or rot / No cracks, welds or dents in rims	
5	Rear Tires / Rims	2/32" tread, even wear, no gouges or rot / No cracks, welds or dents in rims	
6	Body Panels / Fittings	All secure	
ENGINE COMPARTMENT			
7	Engine / Transmission	Mounts and supports, fluid leaks, belts, cleanliness, secure hoses and fittings	
8	Battery, Starter, Alternator	Cables secure and operational / No chaffing or corrosion	
CHASSIS			
9	Steering	Gearbox, pump, hoses, leaks, pitman arm, draglink, tie rod ends, king-pins	
10	Air Brake System	Application valve, release valves, cams, chambers, hoses, lines, foundation brakes	
11	Front Axle	Springs, shackles, U-bolts, shock absorbers, air suspension, radius rods	
12	Axle 1 Brake Type	DISK WEDGE S-CAM	
13	Pushrod Throw (S-CAM)	RIGHT _____	
14	Pushrod Throw (S-CAM)	LEFT _____	
15	Brake Liner Pad	RIGHT _____	
16	Brake Liner Pad	LEFT _____	
17	Differential defects, leaks, springs, shackles, U-bolts, shock absorbers, seals, air suspension, radius rods and bushings		
18	Pushrod Throw (S-CAM)	RIGHT _____	
19	Pushrod Throw (S-CAM)	LEFT _____	
20	Brake Liner Pad	RIGHT _____	
21	Brake Liner Pad	LEFT _____	
22	Differential defects, leaks, springs, shackles, U-bolts, shock absorbers, seals, air suspension, radius rods and bushings		
23	Pushrod Throw (S-CAM)	RIGHT _____	
24	Pushrod Throw (S-CAM)	LEFT _____	
25	Brake Liner Pad	RIGHT _____	
26	Brake Liner Pad	LEFT _____	
VEHICLE OUT OF SERVICE YES / NO _____			
Audited by _____ Date _____			
Foreperson _____ Date _____			
Maint. Supervisor _____ Date _____			
COMPLETE THIS SECTION FOR FAILED AUDIT			
Enter item number(s) and reason for failure. Attach copy of all CAAs with any supporting information to audit report.			
NO.	Reason For Failure	CA# Number and Date	Corrected / Approved by

Private contractor's staff must perform MBTA-specified preventative maintenance



Best Value Bid Was Paul Revere at \$106 Per Revenue Hour

Total Cost per Revenue Hour

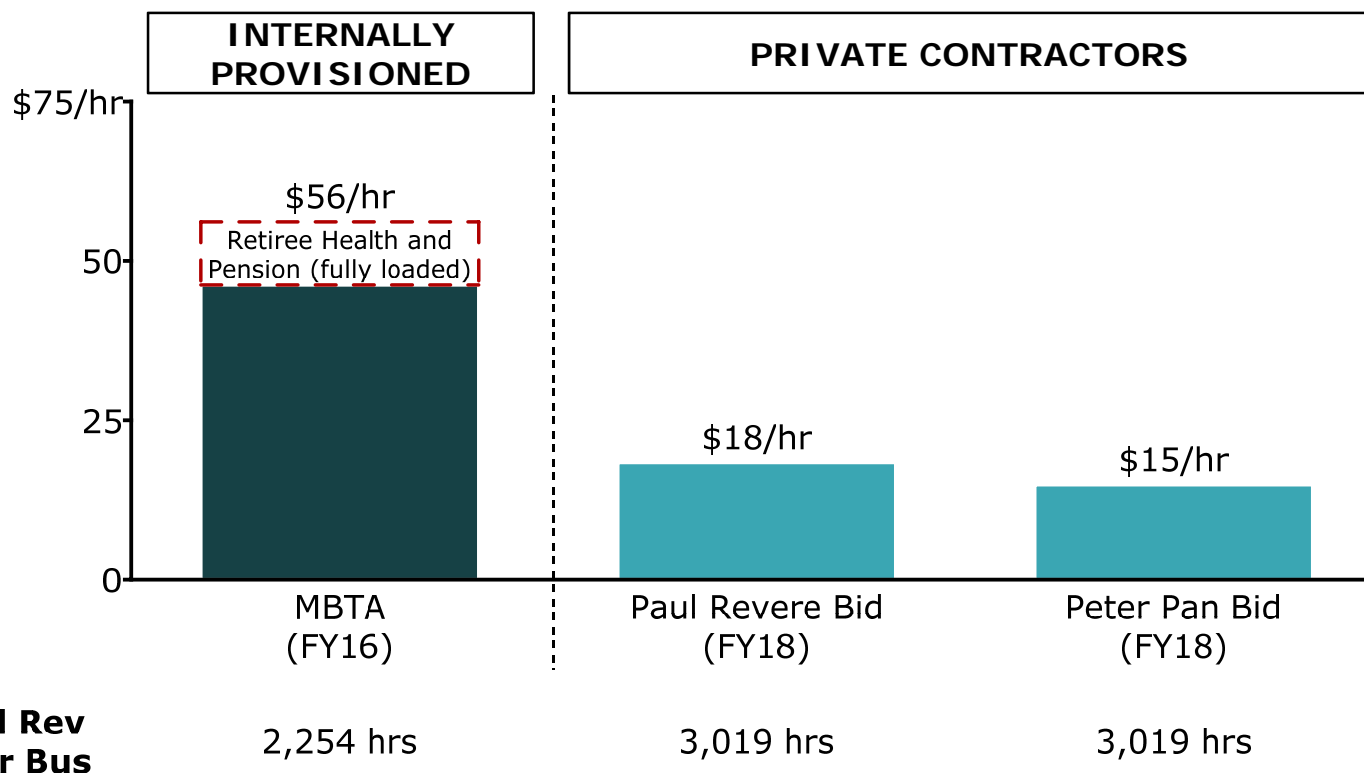


Note: MBTA FY16 costs include present value of fully funded pension and retiree health costs, include Everett Bus Shop, and exclude Non-Revenue Shops; MBTA internal costs only includes a portion of total bus G&A expense and reflect pure cost only (no profit margin)
 Source: MBTA Internal Data



Market Pricing: Lifecycle maintenance Costs New Flyer Xcelsior Diesel-Electric 40 Ft. Transit Bus

Maintenance Cost per Revenue Hour



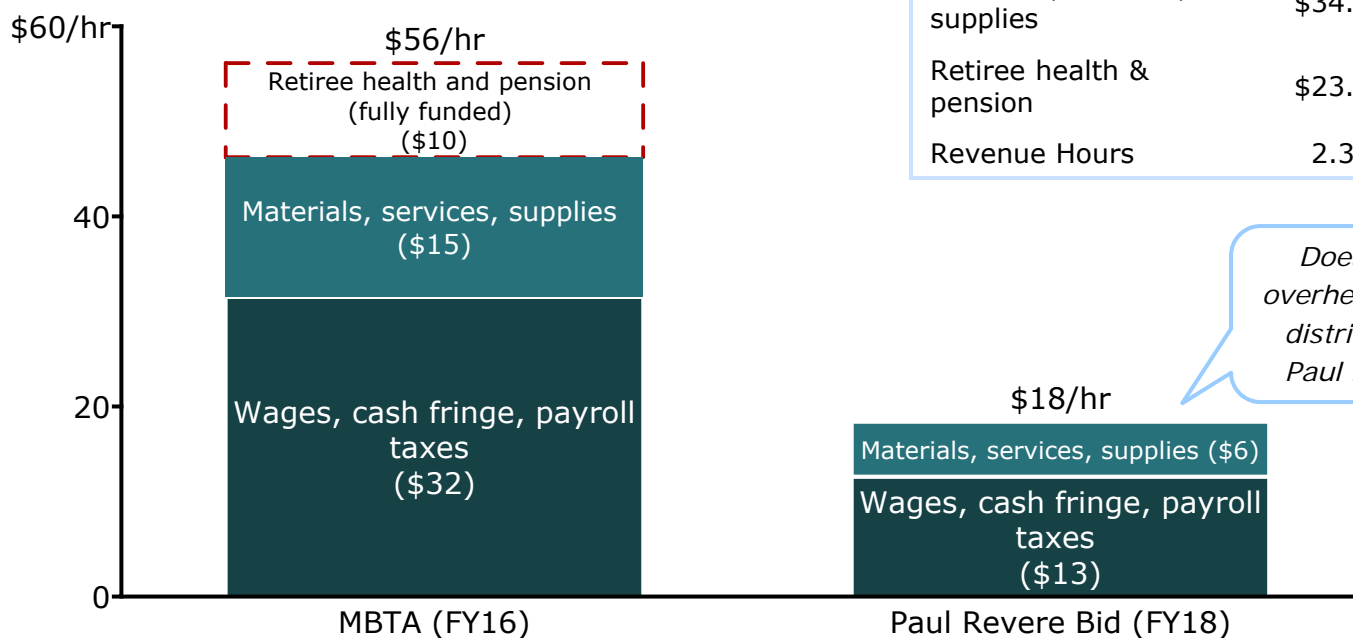
Note: MBTA FY16 costs include present value of fully funded pension and retiree health costs, include Everett Bus Shop, and exclude Non-Revenue Shops and fuel; MBTA internal costs only includes a portion of total bus G&A expense and reflect pure cost only (no profit margin)
Source: MBTA Internal Data

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Market Pricing: Lifecycle Maintenance Costs New Flyer Xcelsior Diesel-Electric 40 Ft. Transit Bus

Bus Maintenance Cost per Revenue Hour



	<u>MBTA</u>	<u>P. Revere</u>
Wages, fringe, taxes	\$74.4M	\$229K
Materials, services, supplies	\$34.5M	\$104K
Retiree health & pension	\$23.2M	-
Revenue Hours	2.34M	18.1K

Does not include all overhead expenses likely distributed over other Paul Revere contracts

**Annual Rev
Hrs per Bus**

2,254 hrs

3,019 hrs

Note: MBTA FY16 costs include present value of fully funded pension and retiree health costs, include Everett Bus Shop, and exclude Non-Revenue Shops and fuel; MBTA internal costs only includes a portion of total bus G&A expense and reflect pure cost only (no profit margin)
Source: MBTA Internal Data



Contracted operations-maintenance model: Budget Certainty and Fixed Pricing

Benefits of Contracted Service:

- Bus service costs will grow at 2% annually (vs. historical 4-5% MBTA bus cost growth)
- Provides budget certainty and predictability
- “Not to exceed” provision means contractor bears financial risk
- Aligns costs with MBTA’s own long-term cost targets (below 2% annual growth) and closer to historical revenue growth



Source: MBTA Internal Data

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