



A New Standard *Shapes* Commuter Rail in Boston

**Innovation, collaboration and dedication continue to push Boston's
commuter rail network through a transformative process.**

By **Mischa Wanek-Libman**, executive editor



K EOLIS COMMUTER SERVICES

(KCS), a unit of Keolis North America, has been responsible for the management, operation and maintenance of the Massachusetts Bay Transportation Authority's (MBTA) commuter rail service since July 2014. While statistics support the network's overall improvement during the past five years in everything from ridership to on-time performance, KCS tempers discussion of its work in Boston with a sentiment rooted in its commitment to continue the improvement efforts: Progress has been made, but there remains work to do.

The commuter rail network in July 2014 was not in great shape. There were challenges involving the network's aging locomotive fleet, infrastructure carried a significant backlog of state-of-good-repair work, staff levels were not ideal and maintenance facilities were not operating seven days per week. Then came the winter of 2015, when the city was clobbered by a series of historic snowstorms that halted operations and found everyone from maintenance personnel to station agents to KCS managers with shovels in hand, working to clear platforms and tracks to allow service to resume. On-time performance in February 2015 dipped to 33 percent.

The winter of 2015 brought a reckoning for all of Boston's transportation stakeholders. The result was the establishment of the Fiscal Management Control Board in July 2015 to provide oversight as MBTA and KCS worked to restore and improve the commuter rail system; \$100 million was invested in winter resiliency efforts and state-of-good-repair annual spending was increased between FY11-FY15, among other changes brought by the weather-related service failures.

"We know that our customers expect and deserve a safe and reliable trip and that is what we strive to provide every day. We believe that the increased focus from the Fiscal Management Control Board and our senior leadership has pushed us to both identify the long-term improvements that need to be made, but also to see if there are immediate smaller steps that can improve the service," said MBTA Executive Director of Commuter Rail Robert DiAdamo. "This mix of

THE COMMUTER rail network in Boston sees 10,000 more trains operated annually than it did five years ago.
Mass Transit/Mischa Wanek-Libman

short-term improvements along with a longer-term strategy can continue to make commuter rail the option that passengers want to choose to get [to] work, school, doctor's appointments or just the fun events around the Boston area."

DiAdamo points to recent efforts where MBTA worked with KCS to install dedicated staff to oversee daily operations of specific commuter lines.

"We have recently worked with our commuter rail contractor to institute 'line managers' for each commuter rail line to ensure that there is a single person whose daily focus is on the performance of that specific line. We piloted this initiative and have now expanded it throughout the network," said DiAdamo.

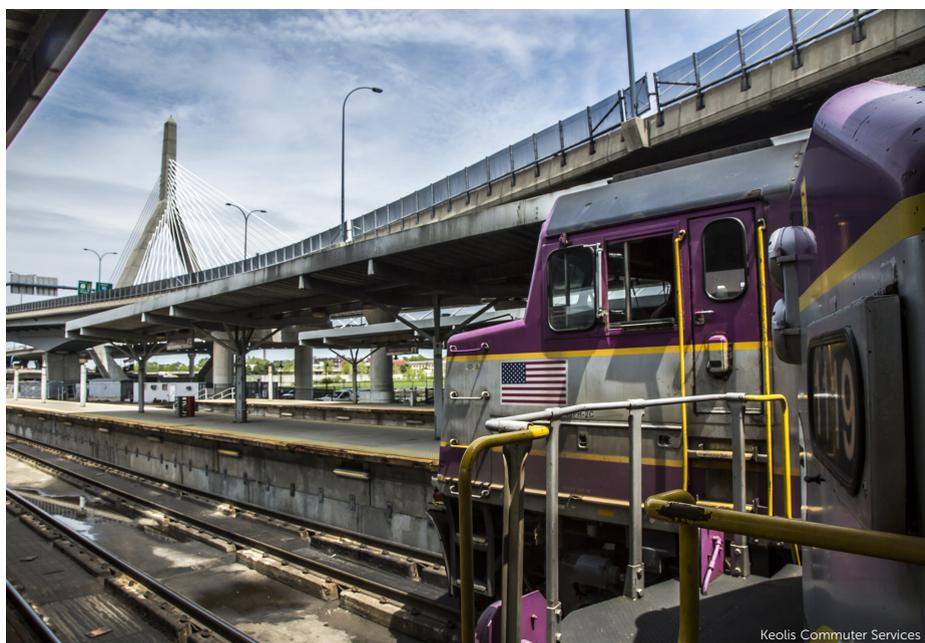
David Scorey, KCS general manager and CEO, Commuter Services, explains that Keolis took a strategic approach to long-term improvements to drive a series of well thought out deployment plans that covered all aspects of commuter rail.

"We invest in leadership, we invest in facilities and we invest in the human element," said Scorey.

Those investments have resulted in a rise of KCS staffing levels from under 2,000 employees in 2014 to 2,500 in 2019; the establishment of the Emergency Operations Center (EOC) and simulation lab within the Railroad Operations Facility and a concerted effort to implement better digital solutions.

MBTA and KCS have also established a revenue/risk sharing contract that, while a more common approach in Europe, was a first for a transit system in the U.S.

"In 2017, Ernst & Young reviewed the Commuter Rail Operating Agreement and made recommendations to incentivize ridership and increase revenue," explained MBTA Assistant General Manager for Strategic Initiatives Michael Muller. "The review found



Keolis Commuter Services

short- and long-term opportunities in the operating, commercial and financial areas of the Operating Agreement and included benchmarking against international peers; developing contracting alternatives and evaluating relative merits of each; and recommending short-term actions the MBTA could take to improve upon the existing operating agreement. The MBTA used Ernst & Young's recommendations as a roadmap for developing an agreement that better aligns MBTA's and Keolis's incentives to reduce fare evasion and increase ridership. The agreement includes provisions for increased marketing and promotion of commuter rail services, as well as enhanced and expanded fare collection efforts, including ticket verification checks at stations, handheld devices for onboard ticket sales and electronic fare gates at North Station, South Station and Back Bay Station, which will be installed in 2020."

Muller pointed to a recent analysis that estimated MBTA loses between \$10 million and \$20 million in annual commuter rail revenue through fare evasion and fare non-collection. The international industry average for

THE MBTA commuter rail network has 14 lines that operate over 400 miles of track.



**By The Numbers
MBTA
Commuter
Rail System**

- 400**
route miles
- 14**
lines
- 141**
stations
- 35 million**
annual passengers
- 86**
locomotives
- 427**
coaches

fare revenue "leakage" is three percent, but MBTA's is four percent to eight percent in potential commuter rail revenue lost.

"We recognize there is an opportunity for improved fare collection and revenue generation," added Muller. "Around 90 percent of commuter rail journeys pass through the three Boston hub stations, so we expect fare gates will significantly reduce ticketless travel from the current level. Our expectation is that the fare gates will recover some, but not all, of the estimated lost commuter rail revenue because only the three Boston terminal stations will be gated. And we expect additional revenue recovery with the implementation of AFC 2.0, when there will be tap-in/tap-out fare validators at all stations."

Scorey says KCS aims to reduce the level of fare leakage to between two percent and three percent, but notes the existing ticketing systems, which were largely cash only, did not lend to high revenue retention. To help combat this, the Revenue Growth agreement required KCS to introduce technology that allows its conductors to accept credit cards using an app onboard trains.

Move to digital platform

Working toward integration of mobile ticketing within the MBTA Commuter Rail app is one part of what KCS Vice President Digital Solutions Ric Salvatici calls an “unprecedented” app deployment effort. Salvatici says Keolis currently has 24 apps in total consisting of 18 operational apps, three administrative apps and three passenger apps.

The level of app deployment is an example of KCS’s larger digital transformation. Salvatici explains that utilizing specialty software has allowed for real-time data input, improvements in digital operations, scheduling and payroll, as well as the digitization of more than 2,000 paper records.

One of the more significant areas of impact involving the digital transformation can be found in its application to event management and passenger information.

In February 2019, the commuter rail system moved more than twice its usual weekday ridership – and the largest single day ridership ever – during the New England Patriots Super Bowl parade. Part of the move to digital includes a centrally located single source of information that can be accessed for events such as the Patriots parade. The information can be shared quickly with passengers and helps drive a templated response to major events.

Linda Dillon, KCS director of customer service, uses this information in the Passenger Information Center (PIC) on a daily basis and during special events.

“PIC provides a single source of truth to push information out to stations, to dispatch and to social media using customer-friendly language,” explained Dillon. “It’s a circle of communication.”

The same code providing PIC information also feeds information to the EOC during extreme weather events, which helps drive decisions based on real-time commuter rail information.



THE EMERGENCY Operations Center is activated during major events, such as extreme weather, and allows a total system overview from a single location.

A third area where digitalization is key is an Internet of Things project regarding “smart cars.” The project was jointly developed by KCS and MBTA and calls for all cars in the commuter rail fleet to be outfitted with sensors and transponders to deliver real-time information that includes an accurate passenger count by car, information on car temperatures, information on door opening and closings, vibration and noise levels and GPS. Salvatici says the systems, which are all rooted in passenger comfort, have been undergoing testing and the project should be mostly complete by December 2019.

cars, or the locomotives powering the trains, can’t operate. The maintenance management of the commuter rail fleet, as well as how the maintenance facilities operate, have seen major improvements during the past five years.

Ernest Piper, chief mechanical officer at KCS, explains that it took a full 18 months to deliver improved processes on the mechanical side of the commuter rail network. One of his first objectives was to fully implement an asset management data system to build historical data on which trends, costs and labor hours could be planned and based.

“Prior to Keolis taking over the contract, work wasn’t planned or recorded, and you need good historical data to plan properly,” said Piper.

The commuter rail fleet consists of four classes of locomotives ranging in age between five years and 42 years old and five coach classes ranging from the 42-year-old Pullman cars to the five-year-old Rotem cars. The Commuter Rail Maintenance Facility (CRMF) can perform full overhauls or rebuilds of coach cars, as well as light to medium locomotive repairs and partial overhauls.

The range of fleet that requires maintenance coupled with the fact that the CRMF services and

**By The Numbers
Commuter Rail
Performance**

91.3 percent
On-Time Performance*

99.8 percent
service delivery*

21 percent
increase in ridership since 2012

10,000
more train services operated annually since July 2014

*Q1 2019

Better fleet management

All the technology being put into “smart cars” will be useless if the



THE PIC provides a single source of truth from which information is provided to passengers, dispatchers and station representatives.

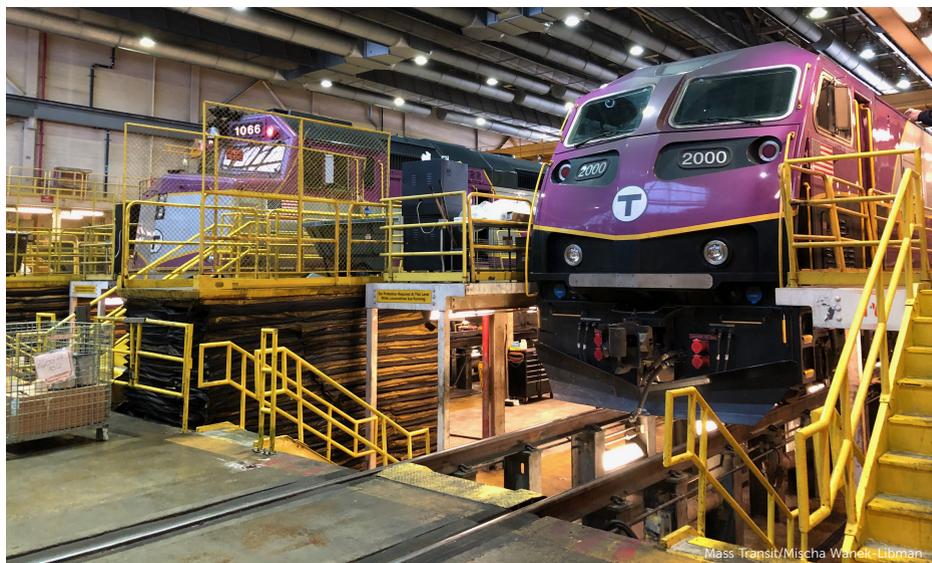
COMMUTER RAIL

repairs 22 train-sets every day, makes planning and organization a top priority. For this, KCS introduced lean management techniques and created a technical group to apply engineering and science to maintenance problems.

The result of these efforts, based on FY17-18 numbers, is that locomotive availability is at its highest level ever with locomotive production up 26 percent. There were 28 more coaches available per day on average in FY17-18 than FY14-15; 2018 produced the lowest mechanical accident frequency ratio and the network is operating 10,000 more scheduled trains annually compared to 2014.

Future

“I think Massachusetts has a gem with a network that has huge potential to [further] weave the social fabric of the state,” said



Bernard Tabary, CEO of Keolis International. “We feel it could probably do more and we are keen to help there. The network can be used far beyond its commuting capabilities.”

Tabary also notes that practices put in place along Boston’s commuter rail network can serve as models for others. He points to the success seen with developing and sharing passenger informa-

THE CRMF services and repairs 22 train-sets every day.

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FOLLOWING
THE difficult winter of 2015, 10 additional snowfighters were purchased to help keep the commuter rail network open during inclement weather.

tion, attitude of staff, specifically within the customer service center, and enhanced data management as examples.

“Transportation is a gold mine for data and here we have data scientists who are able to do data analysis that helps us identify trends – be it on equipment or ridership or on behaviors,” said Tabary.

In June, the commonwealth approved a five-year Capital Improvement Plan for MBTA, which

included \$538.6 million in investments to improve the safety and resiliency of the commuter rail system and \$1 billion for Phase 1 of the South Coast Rail Project, which broke ground on July 3. In May, the FMCB approved a contract option to overhaul an additional 27 F40 commuter rail locomotives. The original contract was awarded in 2017 for the overhaul of 10 locomotives to improve equipment reliability and to support Rail Vision, MBTA’s strategic plan to identify cost-effective strategies to better support improved mobility and economic competitiveness of the commuter rail system.

“We are in the midst of a substantial planning process called Rail Vision that is designed to look at the types of investments that we could make in the future to potentially change the nature of the service that we are providing – every-

thing from maximizing the assets that we have today to reimagining a new, electric, high-frequency service. There will be a robust process to determine the next steps and the timing on that initiative going forward. While we plan for the future, in the meantime, we are continuing to push the ‘meat and potatoes’ improvements that will improve daily service – upgrade our fleet of coaches and locomotives, modernize our stations, and enhance our track and signal in the course of this five-year capital plan. Delivery of the plan will be a challenge, but we have the support of the general manager and his team and the coordination among the agency departments to deliver. If there are challenges, we are meeting in multi-disciplinary teams early in the process to identify and solve the problems,” said DiAdamo. ^{MT}

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