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A NEW STANDARD

Shapes Commuter Rail in Boston

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY

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

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➲ MassTransitmag.com/21091076

It's Time for Transit Agencies to (actually) Double Down on Rider Focus

▶ In order to grow ridership, public transit agencies need an unflinching devotion to the customer experience.

➲ MassTransitmag.com/21085554

Fare Capping: How it Works in Portland

▶ Fare capping relieves the rider of having to figure out the "right" fare, provides peace of mind that they are not paying too much, and delivers an equitable option to riders.

➲ MassTransitmag.com/21087563

Public Transport in the United Kingdom: What Can We learn?

▶ From allowing private transport companies to create public bus routes to contracting out more service to eliminating cash as a payment option, there is much to learn from leaders in the UK.

➲ MassTransitmag.com/21085372

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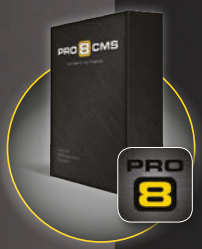

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Taking it all in

As far as skill sets go, very few of us have mastered how to listen.

To paraphrase a well-known adage: You have two ears and one mouth so you can listen twice as much as you speak. In theory, our constant contact society should help bolster this. Aren't we all simply a text, direct message or, if you want to go old school, phone call away from having any number of meaningful conversations?

However, our instantly available society is fraught with distractions and we know it. An unscientific search for "improving listening skills" among books on Amazon produces 121 available titles, which are also all sub-categorized as business books. The few samples I looked at all had the same general advice, which was to get rid of the distractions, usually by putting your phone down.

My intention is not to shame anyone as I cannot cast stones. I have developed an odd Pavlovian response to the notification sound Outlook makes to let me know a new message has arrived. Not only am I constantly checking my phone during meetings but this has had the unfortunate result of half-written responses sitting in my draft folder for an embarrassing amount of time.

I have developed an odd Pavlovian response to the notification sound Outlook makes to let me know a new message has arrived.

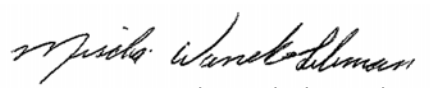
Nor is my intention to suggest that one needs to be able to hear to be able to listen. The ability to take in, absorb and understand another person's input is a skill that goes beyond the physical act of hearing sound.

I bring this up to draw your attention to an article included in this issue on how data-driven strategies are improving transit operations through better processes. The story begins on page 28 and, while the work being taken on by these specific transit teams is full of nuance, what struck me as this story came together was that five individuals at three different agencies, no matter the challenge, all began with the same task and, you guessed it, that task is to listen.

One example that could not be included due to the space constraints of a printed magazine involved the Washington Metropolitan Area Transit Authority's team holding conference calls at 5 a.m. or providing breakfast at even earlier meeting times in order to make sure the input and concerns of night duty workers, who perform their work during non-traditional hours, can be voiced.

Those who work in community outreach roles know what a powerful act listening can be. No transit provider plans, or successfully delivers, a project without first seeking feedback from the community where it operates.

Listening may be an intangible skill, but it brings immense value.



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“Found $100 on the bus!”

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TRIMET WAS awarded more than $2 million in funds to purchase zero-emission battery electric buses, which will be powered by wind energy.

FTA awards grants for FY19 Low-No program

The U.S. Department of Transportation's Federal Transit Administration (FTA) awarded $84.9 million in grants through the Low- or No-Emission (Low-No) Grant program, which funds the deployment of transit buses and infrastructure that use advanced propulsion technologies. Thirty-eight projects in 38 states will each receive funding through the program.

"These grants will help communities nationwide bring the next generation of bus technology to enhance their transportation systems," said Secretary Elaine L. Chao.

The awards range in value between slightly more than $284,000 to $3 million. Eligible projects include the purchase or lease of buses powered by modern, efficient technologies. These include hydrogen fuel cells, battery electric engines, and related infrastructure investments such as charging stations.

MassTransitmag.com/21090457

Long-term capital bill signed into law in Illinois

▶ Illinois Gov. J.B. Pritzker signed the Rebuild Illinois Capital Plan on June 28, marking the first time since 2009 that the state has had a comprehensive capital plan in place.

The six-year, $45-billion plan includes $4.5 billion for mass transit in the state, as well as $1 billion for passenger rail, including Amtrak and other intercity rail projects and $312 million for grade-crossing protection. The bill will be financed through an increased gas tax, as well as an increase on vehicle title and commercial distribution fees. The legislative package provides $22.6 billion in additional bonding authority, which will allow the state to fund much needed improvements in infrastructure in every region. Additionally, the package comes with protections in place that require local governments to use transportation revenues and fees for transportation purposes only.

Mass transit's $4.5 billion includes $3 billion in bonding and $1.5 billion in new pay-as-you-go funding to invest in mass transit throughout the state. The Regional Transportation Authority (RTA) will see more than $4 billion in funds while transit districts outside of RTA will share $450 million to maintain and improve their systems.

MassTransitmag.com/21086836

MTA Board approves agency's first reorganization

▶ The Metropolitan Transportation Authority (MTA) Chairman and CEO Patrick J. Foye declared that it was a "new day at MTA" following the MTA Board's approval of the agency's first reorganization plan on July 24.

"Now that the board has approved these recommendations, the work of transforming the MTA into a world-class organization that provides its customers with the service they deserve begins," Foye said.

The reorganization plan was developed by AlixPartners following an extensive evaluation process. The plan calls for MTA to refocus on core objectives and centralize many department functions.

MTA says the plan will prepare the agency to dramatically improve service, end project delays and cost overruns and establish the modern system customers deserve. In addition to the board's action of approving the plan, the MTA also released critical deadlines and milestones for several of the major initiatives to make the reorganization plan a reality.

MassTransitmag.com/21089968

THE 19-STATION route is just shy of 10 miles and serves as the core to the region's master plan for sustainable mobility.

ION light rail begins service

▶ On June 21, the Region of Waterloo began service on State 1 of the ION light-rail network, which runs between Conestoga station in Waterloo and Fairway station in Kitchener, Ontario, Canada with 19 stations along the route.

The vehicles will operate on a dedicated rapid route along tracks isolated from regular traffic, except at intersections and road crossings.

Stage 1 included an ION bus connection from Fairway station to Ainslie Street transit terminal in Cambridge. This connection will be converted to light rail as the second stage of the project.

MassTransitmag.com/21085914

MORE NEWS AT A GLANCE

▶ The San Francisco Municipal Transportation Agency's new Central Subway Program director, Nadeem Tahir, will lead a comprehensive review of the project's budget and schedule. The review is expected to take approximately six weeks to complete and will identify a revised start date for service, as well as evaluate the expected budget impacts of the delay.
➲ MassTransitmag.com/21090185

▶ Chicago Metra has awarded Duos Technologies, Inc. a contract to provide an Automated Pantograph Inspection System (apis) that will be installed to span four tracks and capture high-resolution video of critical pantographs located on the top of passenger railcars.
➲ MassTransitmag.com/21089270

▶ The San Mateo County Transit District has issued an order for 55 clean diesel, 60-foot Xcelsior® heavy-duty transit buses from New Flyer of America Inc., a subsidiary of NFI Group Inc. The buses will help increase service along El Camino Real on SamTrans' ECR Route, where 35 percent of all system boardings occur.
➲ MassTransitmag.com/21085562

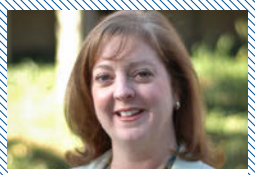
▶ Complete Coach Works (CCW) is collaborating with Halsey King & Associates for a new training initiative to further educate its employees on state-of-the-art electric transit vehicles and charging infrastructure. The partnership will enhance the skills of CCW's workforce by expanding its knowledge of complex electrical systems.
➲ MassTransitmag.com/21090128

▶ Gold Coast Transit District opened its new operations and maintenance facility, which includes an eight-bay maintenance and repair building, a compressed natural gas fuel station, bus wash and an operations and administrations building.
➲ MassTransitmag.com/21088918

People in the News


Gregory Elsborg


Inez Evans


Carolyn Gonot


India Birdsong


Rob Padgette

Dallas Area Rapid Transit (DART)

Gregory Elsborg has been named as Dallas Area Rapid Transit's first vice president and chief innovation officer where he will oversee business partnerships and spearhead innovation through technology. "I am tremendously excited to lead activities in this newly created role," he said. Elsborg brings experience from leadership roles in digital innovation and brand strategy from Fortune 500 companies where he proved his skills of driving ecommerce, mobile and innovation initiatives. He's originally from the UK where he studied marketing at Lancaster University Management School and moved to the United States in 2011.
➲ MassTransitMag.com/21087969

Indianapolis Public Transportation Corporation (IndyGo)

Inez Evans has been named president and CEO of the Indianapolis Public Transportation Corporation (IndyGo). She most recently served as chief operating officer at Santa Clara Valley Transportation Authority and will succeed Michael Terry. She was chosen after the board of directors conducted a national search to find a leader with the ability to build and nurture relationships, bring communities together and affect organizational change. Throughout her 25-year career, Evans has also worked with Southwest Ohio Regional Transit Authority and Metropolitan Atlanta Regional Transportation Authority.
➲ MassTransitMag.com/21087985

Utah Transit Authority (UTA)

Carolyn Gonot has joined the Utah Transit Authority (UTA) as the new executive director after the board of trustees completed a national search. She joins UTA after working at Santa Clara Valley Transportation Authority (SCVTA) for 22 years where she oversaw the funding and planning of the 16-mile, six-station extension of the San Francisco Bay Area Rapid Transit system. "[Her]...experience in the transit industry is extensive, ranging from service and program planning to managing and implementing major capital projects," said Carlton Christensen, UTA board chair. She brings 25 years of experience with a background in civil engineering.
➲ MassTransitMag.com/21086169

Greater Cleveland Regional Transit Authority (GCRTA)

The Greater Cleveland Regional Transit Authority (GCRTA) Board of Trustees unanimously voted to select India Birdsong to be the next CEO and general manager. Birdsong was a standout candidate because of her focus and emphasis on serving the riders of the buses and trains. She most recently was the chief operating officer of the Nashville Metropolitan Transit Authority where she oversaw the bus and rail operations, including maintenance, improvement and supporting the system's 25-year growth plan. Before that she spent nine years with the Chicago Transit Authority in a variety of roles.
➲ MassTransitMag.com/21087296

Capitol Corridor Joint Powers Authority (CCJPA)

The Capitol Corridor Joint Powers Authority (CCJPA) has selected Rob Padgette to be the new managing director where he will oversee management and operations of the 170-mile Capitol Corridor train route. Padgette was previously the deputy managing director where he worked to build relationships with key service partners and advance funding for train service expansion. Prior to CCJPA he was the deputy executive director of the Northeast Corridor Commission in Washington, D.C., where he worked administratively with the organization and execution of the commission's work.
➲ MassTransitMag.com/21085784

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**

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

KEOLIS 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

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 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."


Keolis Commuter Services

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

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 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.

By The Numbers MBTA Commuter Rail System

400
route miles

14
lines

141
stations

35 million
annual passengers

86
locomotives

427
coaches

NEW FLYER OF AMERICA

COMPANY PROFILE

Driving safe advancement *of transit technology with AV*

New developments in sensing technologies, machine learn-ing, and automation have shown extraordinary benefits across the automotive industry. While commercial operators are already among the safest, several studies have found that vehicles utilizing advanced driver-assistance systems ("ADAS") reduce the rate of accidents and injuries in both personal and commercial vehicles.

In one example from the California Department of Motor Vehicles' Annual Performance Report, self-driving cars navigated public roads without human intervention four times better in 2017 than 2016, showing a significant improvement in the application of automated technology.

As a leading mobility innovator with over 85 years of industry experience, New Flyer is stepping into a new era of mobility – one centered on connected and safety innovation. In May 2019, New Flyer announced its new AV Technology Program for heavy-duty transit buses, specifically focused on development and deployment of ADAS and AV technology, with a guiding principle focused on increasing public safety during bus operation.

Safer mobility ahead using advanced driver-assistance systems

The benefit of Automated Vehicle ("AV") technology is being validated by several studies utilizing ADAS to navigate everything from robotic shuttles to semi-trucks. On transit buses, these systems could enhance passenger experience and scheduling while assisting operators in spotting threats and safely maneuvering vehicles.

US consulting firm McKinsey & Company estimates that driverless vehicles could, by mid-century, reduce traffic fatalities by up to 90 percent. This opportunity for significant and positive impact on safety has driven New Flyer to undertake further development of ADAS with transit buses in mind – not just for passengers, but for all others sharing our roads.

To accomplish this vision, New Flyer announced its partnership with Robotic Research LLC in May 2019. Robotic Research is a provider of autonomous software and robotic solutions, and a proven industry leader in artificial intelligence-based technology. Based in Maryland, it has extensive experience delivering successful Level 5 autonomous vehicle applications, namely serving the U.S. Department of Defense.

With the collaboration of Robotic Research, New Flyer will bring sophisticated automated technology to the transit bus industry, with a guiding focus on improving safety for all.

Supporting the cities of the future with connected technology

As automation develops, so too does the awareness of potential risks around irresponsible deployment. To ensure safe interaction among transit buses and all other connected vehicles sharing the road, New Flyer will integrate and leverage the internet of things, an extension of internet connectivity to physical devices and everyday objects, to build connectivity in sharing public roadways.

New Flyer's AV program will also utilize Vehicle-to-Infrastructure technology, often referred to as "V2I", supported and deployed by the support of New Flyer Infrastructure Solutions™ - a critical element to successful deployment of AV transit buses and smart charging solutions.

As cities across the U.S. continue their evolution to full connectivity, New Flyer will continue engaging city leaders, advanced tech providers, and regulators to align with, support, and further America's technology roadmap.

New Flyer has built a legacy of innovation in public transit with advancements in passenger capacity, accessibility, sustainability, and connectivity over the past 90 years. Through a commitment to innovation spanning its legacy, New Flyer has not only engineered a smarter and more efficient bus, but now looks to its AV technology program to safely traverse the cities of the future. ■

SOURCES:

Vox: Self-driving cars are mostly getting better at navigating California's public roads

U.S. Department of Transportation: Bus Safety Data Report: Bus Transit Safety Data 2008-2016

McKinsey & Company: Ten Ways Autonomous Driving Could Redefine the Automotive World

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.

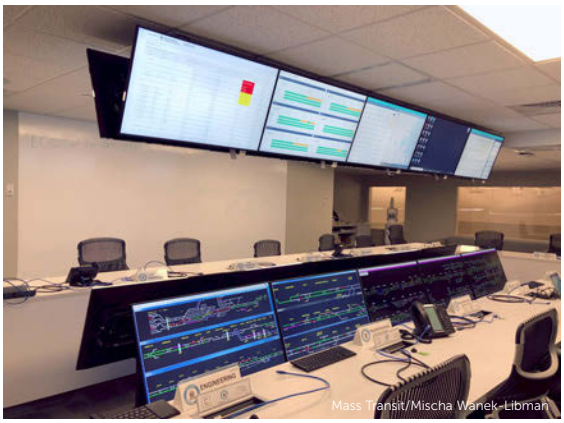
One of the more significant areas of impact involving the digital transformation can be found in its application to event management and passenger information.

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.



Mass Transit/Mischa Wanek-Libman

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

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

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.

Better fleet management

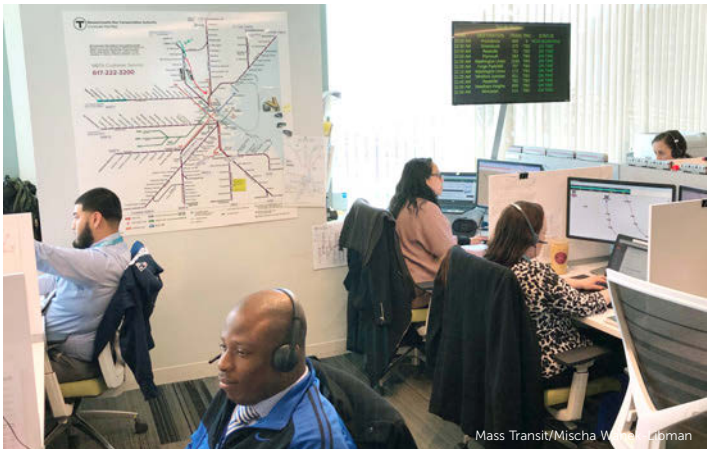
All the technology being put into "smart cars" will be useless if the cars, or the locomotives powering the trains, can't operate. The maintenance management of the commuter rail fleet, as well as how the maintenance facilities operate, have seen major improvements during the past five years.

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



Mass Transit/Mischa Wanek-Libman

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

GENFARE

CASE STUDY

TARC and Genfare Make Transit a Lot Easier *in Louisville*

Prior to 2019, the process to pay fares when boarding a Transit Authority of River City bus was complicated at best, and a hassle at worst. TARC bus operators were required to visually validate a wide variety of ID cards that allowed eligible passengers to board. There were also several different versions of paper passes that required validation, and the drivers often had issues with cash fare payment, occasionally even resulting in occasional conflicts between drivers and passengers attempting to board.

The system was also vulnerable to fraud and fare evasion. According to Geoffrey Hobin, TARC's Director of Grants & Capital Programs, the vulnerability to fraud even enabled some "creative counterfeiters" to target TARC. "At one point in time we decided to get a little creative with our paper passes, but the counterfeiters were even able to imitate those in an attempt to fraud our system," said Hobin.

"By far the largest issue with our fare payment process was the burden of issuing and validating paper transfers," said Hobin. "The paper transfers were confusing to our passengers, and our drivers were often placed into the position of having to challenge passengers."

Hobin also pointed out that it was incredibly difficult to track accurate fare payment data, but perhaps the worst effect was the occasional delay in service due to the cumbersome processes involved for the drivers.

"Tremendously Important Changes" Needed

The team at TARC knew the system had to be improved. They turned to their long-term fare payment technology partner Genfare for solutions, and over the course of several years they worked together to develop the MyTARC program.

The TARC project team, which was managed by Hobin, conducted focus groups, tested numerous fare payment cards and methodologies, and received a significant

amount of positive and constructive feedback from passengers. "It was obvious that massive and tremendously important changes were necessary," said Hobin.

The result of the research was a smart-card based solution that also allowed for cash payments and automated ID validation for those IDs with magnetic stripes. Paper passes and transfers would be eliminated entirely. "We decided to 'tear off the band-aid,' and we are so much better off for doing so," said Hobin.

Passengers Take Control

"Our solution needed to be robust and reliable," said Sabeena Haridas Genfare's Program Manager. "With TARC taking such a bold step toward improving their fare payment process, we knew the bar was raised for our team."

The solutions were developed on the Genfare side of the project, while Hobin's team at TARC branded it MyTARC (indicative of the control that passengers were gaining with the new system) and set about educating passengers and the community on the new program and its features. According to Angela Ubben, a Project Manager at TARC, the outreach included establishing a MyTARC branded bus, which served as a mobile customer service desk, complete with a camera and MyTARC card printer. "We took the MyTARC Bus out to the community every week leading up to the implementation of the new program to get people signed up and to issue MyTARC cards, right there on the bus." According to Ubben, the MyTARC Bus is still in use as the outreach continues.

One Weekend to Implement

Genfare installed pilot systems on five TARC vehicles to test the MyTARC solution. According to Genfare's Haridas, "both Genfare and TARC were completely satisfied with the testing, to the point that the team decided the complete implementation could occur over one weekend in early 2019."

To accomplish a seamless transition and to take the best possible care of passengers, TARC eliminated the need to pay fares that weekend, to avoid any concerns over inconsistent fare payment capabilities from one bus to another as the conversions were taking place.

"It was all-hands-on-deck," said Hobin, who cited the technical support teams from both TARC and Genfare as critical in accomplishing the swift implementation. "There were some long days and early mornings, and all of our administrative team members were riding buses and addressing concerns as they arose." All TARC buses had the new technology by the 4 a.m. pull-out on Monday, and the entire solution went live.

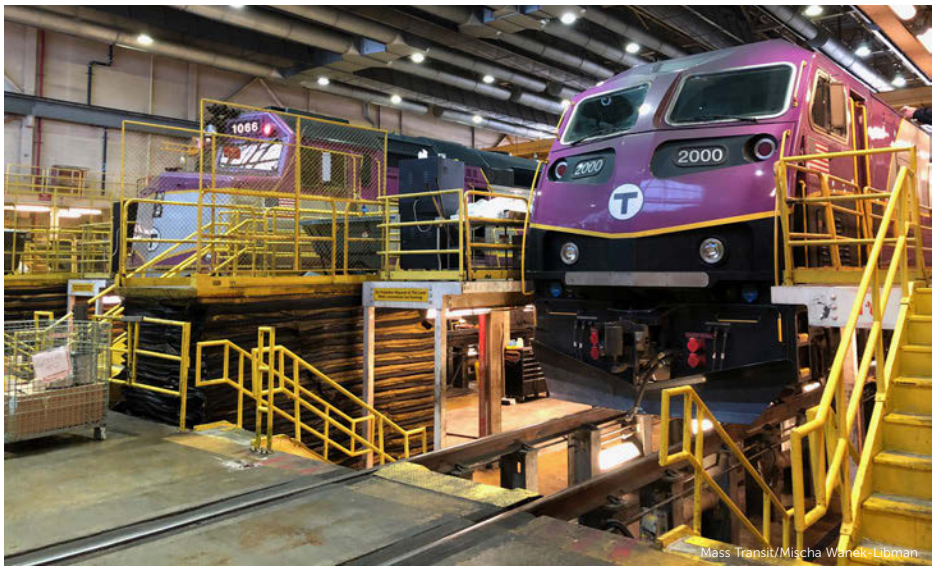
The passenger outreach and education paid off, but as with any significant shift in fare payment systems, there was a large number of passengers who needed to receive MyTARC cards that morning. The lines at TARC's Union Station location were long, but the team rose to the challenge and set up multiple lines to ensure everyone who needed a smart card received one.

Massive Improvement to Customer Service

Now that the "tremendously important changes" had been made, it was time for Hobin's team to assess the results. "We were so pleased that the vast majority of the customer feedback was positive, even regarding the elimination of paper transfers," said Hobin. Hobin said the bus operators even described the improvements as something just short of pure ecstasy, because TARC's bold decision-making and Genfare's technical solutions facilitated an entirely efficient boarding and fare payment process for everyone. ■

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.



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

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-


Keolis Commuter Services

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 – everything 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.

Smart CITIES Smart MOBILITY

SPECIAL REPORT

CONNECTED VEHICLES

Tampa

The THEA Connected Vehicle Pilot aims to transform the experience of drivers, transit riders and pedestrians in downtown Tampa by preventing crashes, enhancing traffic flow, improving transit trip times and reducing emissions of greenhouse gases.

By **Carol Brzozowski, contributor**

AUTOMOBILES, STREETCARS, buses, bicyclists, pedestrians and a cruise ship terminal present numerous transportation challenges in downtown Tampa, Fla.

Inbound commuters on the Lee Roy Selmon Expressway's Reversible Express Lanes encounter significant delays and numerous rear-end crashes during morning peak periods. Vehicle/pedestrian conflicts are common at a busy mid-block crosswalk near the Hillsborough County Courthouse. Drivers and pedestrians conflict with buses and streetcars traveling the central business district.

Such challenges became a driving factor in local authorities signing on to an agreement with the U.S. Department of Transportation (USDOT) to implement a Connected Vehicle (CV) Pilot Project for the Tampa Hillsborough Expressway Authority (THEA) in conjunction with the Hillsborough Regional Transit Authority to implement CV technology in U.S. regions to measure impact and uncover technical and non-technical deployment barriers.

Tampa was selected for CV pilot project by USDOT as one of three nationwide locations. In southern Wyoming, CV technologies are used to improve safe and efficient truck movement along I-80. In New York City, the technology exploits vehicle-to-vehicle and intersection communications to improve vehicle flow and pedestrian safety in high-priority corridors.

In Tampa, the goal is to deploy multiple safety and mobility applications on and in proximity to reversible freeway lanes. The THEA Connected Vehicle Pilot began in 2015 as an effort equipping nearly 1,000 privately-owned

A VIDEO still from the Tampa CV Pilot showing a connected vehicle being notified of a pedestrian in the crosswalk.
Photos by Tampa Hillsborough Expressway Authority

vehicles with onboard units as well as 10 buses, nine trolleys and 46 roadside signal systems to 'communicate' with each other and elements of the transportation infrastructure.

The project aims to transform the experience of drivers, transit riders and pedestrians in downtown Tampa by preventing crashes, enhancing traffic flow, improving transit trip times and reducing emissions of greenhouse gases.

"As an independent local toll authority, we've always been interested in innovation and what is the next step in technology that we can use to make our system safer and more efficient," noted Robert Frey, THEA director of planning and innovation.

The most recent example was adapting all-electronic tolling, "which has helped dramatically in terms of being able to use our existing system to its full capacity and providing safer trips for people by avoiding the toll booths," he said.

"We need to use what's available now and get it on the road so we're saving lives today. It's inevitable that there will always be better technology on the horizon. We will never get to the point of realizing the value and the benefits in terms of safety, operations and providing people with a more efficient way to move around if we continue to wait."

AN IN-VEHICLE warning of a streetcar moving ahead.

While it's up to vehicle manufacturers to incorporate connectivity technology in transportation products, where public agencies come into play is the ability to work with data from its public transportation vehicles, transit vehicles, pedestrian signal and traffic signals to improve the vehicles' infrastructure system in an effort to solve contemporary transportation challenges, said Frey.

In 2016, USDOT authorized THEA and its partner organizations to proceed with design, testing and deployment. In 2018, the final phase of the $21 million project ushered in a full-scale operation of CV technology throughout downtown Tampa.

THE CV Pilot incorporated the technology among transit vehicles, such as the TECO streetcar.

Bus and streetcar operators receive information on a dedicated display, while individual drivers get safety alerts in their vehicle's rearview mirror.

In choosing private vehicles for the private project, the toll agency targeted those using the toll system. "We knew we could get the frequency of them using it day in and day out to generate useful data," Frey said.

Through an agreement with Hillsborough Community College's automotive engineering program, qualified vehicles' mirrors were replaced with a connected mirror to communicate with the system.

CV applications include an:

- Emergency electronic brake light warning to alert drivers to hard braking ahead;
- End of ramp deceleration warning drivers to slow down to a recommended speed as the vehicle approaches the end of a queue;
- Forward collision warning of an imminent forward collision;
- Intelligent Signal System optimizing traffic signal timing based on connected vehicle data;
- Intersection Movement Assist warning the driver when it is not safe to enter an intersection;
- Pedestrian Collision Warning alerting the driver when a pedestrian is using a crosswalk in the vehicle's projected path;
- Pedestrian in a Crosswalk Vehicle Warning identifying potential conflicts between pedestrians in a crosswalk and approaching vehicles;
- Probe Data Enabled Traffic Monitoring, which gathers traffic data from connected vehicles to optimize transportation management;

- Transit Signal Priority, giving buses priority at traffic signals to keep them running on schedule;
- Vehicle Turning Right in Front of Transit Vehicle warning of the streetcar operator when a vehicle is turning right at an intersection as the streetcar approaches; and
- Wrong Way Entry warning the driver of a vehicle entering the reversible express lanes in the wrong direction and other equipped vehicles a wrong-way driver is approaching.

A BUS driver's point-of-view of the warning message.

Tampa Hillsborough Expressway Authority

For pedestrian safety, the pilot project at the midblock crosswalk on Twiggs Street at the Hillsborough County Courthouse – one of downtown Tampa's busiest crosswalks – uses Light Detection and Ranging (LiDAR) equipment for detecting pedestrians and a roadside unit for communicating with connected vehicles.

When an equipped vehicle approaches the crosswalk as a pedestrian crosses the street, the LiDAR system detects the pedestrian and the roadside unit broadcasts the information to any connected vehicles in the area through an audio and visual warning in the rearview mirror.

The approach of installing CV technology in vehicles using the toll roads has provided optimal frequency use and data for the pilot project, with some 500 vehicles moving through the study area daily of the 1,000 installed, said Frey.

"We do have connectivity," he said. "The onboard units in the vehicles and the roadside units' infrastructure are talking to each other. We don't have enough data and there hasn't been long enough time yet to make any determinations on the impacts to the corridor, but we know the system is operational, people are using it on a consistent basis and the data we are seeing does match what our traffic counts and our toll data reflect. The next step will be crunching that data to see the impacts to our corridor and to our system."

Frey pointed out that for all of the work required of connectivity technology, new autonomous vehicles are on the horizon that don't need to be connected because they're self-contained.

But there are cost barriers to adopting autonomous vehicles, whereas public agencies can leverage CV technology to provide data to get pedestrian signals, transit, public transportation and emergency vehicles to operate better and safer, Frey added.

The USDOT CV pilot program – in its third phase of operations and maintenance – lasts until May 2020 at which time as part of an agreement with USDOT, THEA will maintain and operate the system in perpetuity as well as seek ways to incorporate other vehicles, Frey said.

"As a small agency, we cannot install onboard units on enough vehicles to make a difference, so we are going to have to work with the auto manufacturers on rolling their connected vehicles coming off of the line into our system," he added.

"As a road operator, I have to serve all vehicles that show up on the ramps regardless of year, make and model. Whatever technology they're running, I've got to figure out a way to make that work. I know we can get a CV system up and operational – we're already doing it. I know the technology is safe."

As THEA goes through a replacement program, Frey will be looking at connectivity capability.

"General Motors right now has several vehicles coming out that are connected-capable vehicles. How do they come to Tampa, use the system and receive the benefits is the next step we have to work on so that those vehicles can come in and retrofits of the existing fleet will basically be whether or not people see value or want to do it," said Frey, adding he is unaware of other public agencies that may be doing so.

Frey says the pilot project changes the way transportation agencies do business.

"Ten years ago, I don't think you would have found a transportation agency with a software engineer," he said. "Now we're recognizing that we need them because so many of these apps being used are software-driven. Those are skill sets we never had before.

"I just awarded a miscellaneous emerging technologies support contract to five technology firms to support us going forward. Existing engineering firms just don't have the skill set or the technological information to provide us with the skill sets needed going forward with all of the communications, technology, and mobility as that's coming."

Changing the way transportation agencies do business means getting the technological means of changing from solely a civil engineering approach to a technological/civil combination, Frey said.

"It's important to get this technology on the streets actually working rather than having market share conversations and who's going to do what," said Frey. "We have a problem with transportation – crashes, injuries, fatalities. If there's technology that can help, we need to get it out on the streets to do that." MT

Proterra

PROTERRA CHARGING units installed and ready for e-buses.

BEYOND THE BUS: Charge Management

Planning and scheduling of electric fleets shouldn't be an art form; more tools are coming online to help transit providers optimize their zero emission programs.

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

INTEREST IN ZERO EMISSION bus fleets is growing as states and local municipalities mandate reductions in greenhouse gases and transit agencies develop their own sustainability initiatives. Complete mobility solutions developed on the supply side of the industry include planning and scheduling tools to help transit providers optimize their current fleets, while keeping options open for future growth.

Route simulation

INIT, Innovations in Transportation Inc., offers an integrated suite of electromobility tools to aid users through the many stages of e-bus integration including route planning, charge management, operations control and data collection/analysis.

One of the company's electromobility products, eMOBILE-PLAN, has been developed as a planning and simulation tool that allows transit agencies and OEM's to simulate and optimize numerous deployment block scenarios while considering the unique constraints that electric buses have.

"With eMOBILE-PLAN comparing all conceivable scenarios allows agencies to make sound deployment strategies both prior to and after procurement of electric buses," said Ryan Mackem, electromobility business development manager at INIT.

> **"With** eMOBILE-PLAN comparing all conceivable scenarios allows agencies to make sound deployment strategies both prior to and after procurement of electric buses."
>
> **-RYAN MACKEM,** electromobility business developmenet manager at INIT

Mackem explains that the eMOBILE-PLAN's optimizer considers an array of variables such as the types of electric buses, battery types, temperature ranges, route profiles, variable sizes of e-bus fleets and mixed fleets, different types of charging stations and their placement within the network, and electricity costs based on peaks in demand.

"One of the immediate advantages of eMOBILE-PLAN is the reduction in the amount of effort it takes to plan blocks for e-buses," said Mackem. "Rather than having the planner attempt to manually create time consuming blocks searching for both range and cost efficiency, eMOBILE-PLAN allows the planner to simply enter the parameters and run the optimizer to quickly produce the results. This gives the planner the ability to run multiple scenarios where they can analyze the efficiency of each block."

Mackem notes that finding the right block scenario is a matter of economics. He says that finding ways to deploy e-buses on longer or additional blocks will be required as an agency's percentage of e-buses in their fleet increases over time.

"As a planning tool, eMOBILE-PLAN has no limitations on the number of electric and conventional buses it can optimize simultaneously," said Mackem. "In addition, the system can deal with any number of routes, and the user can include or exclude specific routes."

Mackem says while the use of depot chargers is prevalent, on-route opportunity charging will be critical to the scalability of ze-

ro-emission fleets as more government mandates come into effect.

He added, "As an agency's electric fleet expands, the aim of eMOBILE-PLAN is to determine how many vehicles and charging stations are required for each strategy and locate the best position to place the stations."

Real-time data

New Flyer of America Inc., has more than five decades of experience manufacturing zero-emission buses. In January 2019, New Flyer Infrastructure Solutions™ was launched to "support mobility projects from start to finish and focus on energy management optimization as well as infrastructure planning and development."

Not only does New Flyer Infrastructure Solutions provide optimized energy management strategies but it can provide support throughout the entire design, installation and testing process to "ensure safe, reliable and cost-effective infrastructure projects."

Once an electric fleet has been established, David Warren, director, sustainable transportation, says access to real-time data is a key factor to a program's continued success.

"Real-time data can make the difference between a good versus great electric bus program, and harnessing data and performance metrics is key to efficient management and energy conservation," explained Warren. "New Flyer's over-the-air analytics dashboard, Connect 360™, is powered by its New Flyer Connect® technology and offers insight into the operation, charging and maintenance needs for new battery-electric buses. Key business analytics provided include battery state-of-charge, outside air temperature trends, GPS location and average speeds, HVAC energy consumption per mile, regenerative braking, range achieved and remaining and energy consumption (kWh/mile). Benefits of Connect 360™ business analytics provide operators additional range capability with ideal driver performance, decision-making information to optimize charging strategies and intelligence on how to preserve battery energy throughout the day; all resulting in reduced operating cost and maximum fleet utilization."

Warren says that with the continued transition to zero-emission fleets, the focus has shifted to buses that can meet longer range requirements, such as those traveling more than 150 miles without recharging.

"These buses will need more than 400 kWh battery packs, utilize more powerful depot chargers to reduce charging time and employ smart chargers that use software to optimize the charging strategy and reduce infrastructure and energy costs," said Warren.

INIT'S eMOBILE-PLAN as a planning and simulation tool that allows transit agencies and OEM's to simulate and optimize numerous deployment block scenarios.

> **"Real-**time data can make the difference between a good versus great electric bus program, and harnessing data and performance metrics is key to efficient management and energy conservation
>
> **-DAVID WARREN,** director, New Flyer

To help transit agencies transition their bus fleets to zero emission, New Flyer opened its Vehicle Innovation Center (VIC), where visitors interact with learning exhibits, classroom programs and hands-on bus demonstrations. Part of the VIC's program includes electric fleet planning, management and maintenance essentials. The facility also consists of a full-size transit bus simulator to help drivers learn to pilot an electric bus in a manner that increases range by up to 20 percent with the use of regenerative braking.

"The transition toward electric buses is not a revolution. It's an evolution requiring careful time and consideration that effectively charts the course of integration to existing fleets, and does so with prudent spending of taxpayer dollars," said Warren. "For New Flyer, it is no longer just about the bus – it's about providing complete, connected and sustainable mobility solutions."

Optimized scheduling

Optibus Ltd., notes that transitioning to an electric bus fleet can bring new challenges to transit planning and scheduling. The company specifically mentions the concern surrounding peak vehicle requirements as buses temporarily rotate out of service to charge.

"Schedulers must strategize when and where to charge to avoid the need for extra diesel buses," explained Amos Haggiag, co-founder and CEO of Optibus.

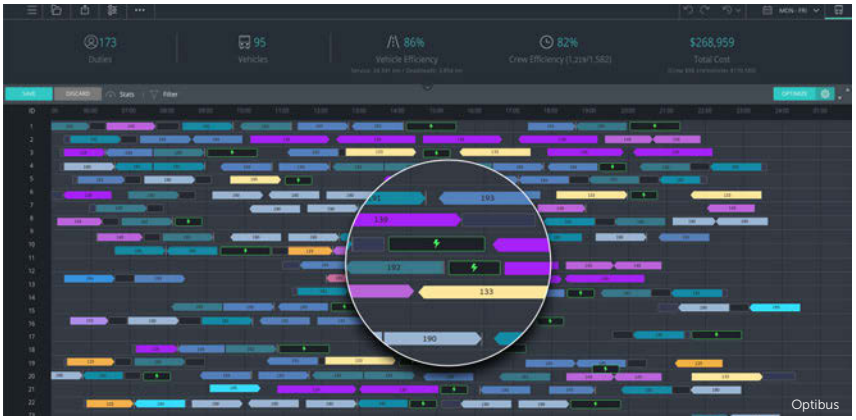
Haggiag also says the choice between returning a bus to the depot to charge or setting up charging stops along routes can be complicated. He says several considerations play into when and where a bus will be charged such as whether a bus battery will be brought to full charge or only partial charge, can driver breaks be scheduled to coincide with charge times and can charge times occur during low electricity-demand times.

"There's no doubt that the addition of these new parameters to planning and scheduling make an already complex process that much more complicated," said Haggiag. "And, good scheduling is paramount to the globalization of [battery electric buses]."

He continued, "Because of this, even more so than with traditional buses, optimization tools are necessary to minimize costs and allow electric vehicles to seamlessly integrate into existing transit systems. As most scheduling software lacks the algorithmic ability to address the intricacies of electric vehicles, these tools have been largely unavailable. However, a new generation of scheduling and planning software solves this problem by employing advanced optimization algorithms and AI."

Optibus Electric Vehicle Scheduling uses EV-specific metrics to create an integrated and optimized charging plan.

"Schedulers can address parameters specific to electric vehicles such as battery and charger types, the locations of charging stations, and variations in electricity prices throughout the day. Additionally, setting a minimum charge requirement can absolve driver's fears of running out of battery on-route," explained Haggiag.



A SCREENSHOT of Optibus' EV fleet scheduling software.

"The successful introduction of [battery electric buses] to public transportation is dependent on the use of technology and policy to support sustainable transit," said Haggiag. "For transit agencies, employing scheduling optimization software is necessary to maximize operational efficiency and take full advantage of the lower cost of electricity compared to diesel/natural gas. Additionally, improvements in battery and electric grid technologies, as well as economies-of-scale created by the expansion of the [battery electric bus] market, will further decrease both capital and operating costs, enabling global electric vehicle adoption."

Planning for scale

Proterra says transit customers have confidence that battery-electric technology has both the range and power

to meet route requirements. Instead of one to two bus pilot programs, Proterra is seeing larger deployments, between 10 to 50 buses, which makes the shift in focus to infrastructure and fleet planning more important.

"As more fleet operators transition a larger percentage of their fleet to electric vehicles, they encounter a new set of challenges and upfront costs beyond simply buying new vehicles. To meet this challenge, Proterra recently introduced Proterra Energy™ fleet solutions, a full suite of options that enable turnkey delivery of a complete energy ecosystem for heavy-duty electric fleets including design, build, financing, operations, maintenance and energy optimization," said Matt Horton, chief commercial officer for Proterra.

Proterra says its energy fleet solutions provide a customizable and comprehensive one-stop shop for customers transitioning to an electric fleet. Following the vehicle procurement process, Proterra can provide high-fidelity route simulations, fleet modeling and a detailed total cost of ownership analysis to determine the right vehicle, battery and charging configurations to meet individual route requirements.

Proterra also points to the implementation of smart tools as a way to help customers plan for scale of their electric bus programs.

"As the fleet grows, smart energy management, energy optimization and maintenance of vehicle batteries and charging systems becomes key," said Horton. "The Proterra APEX™ connected vehicle intelligence system integrates the data streams from vehicles, batteries and charging systems, and offers customers access to historical and real-time performance information about their electric vehicle fleet to improve vehicle and charging operational efficiency. Further, the APEX system offers charge management features such as scheduled charging, monitoring and control of charging stations, to manage power demand and reduce electricity costs."

On the topic of electricity costs, Proterra has seen transit agencies engaging with utilities earlier in the process, which helps to secure rates. Additionally, Proterra can recommend the appropriate charging solution, leveraging universal industry standards, to meet requirements of a given site with options available to incrementally scale.

On a final note regarding scalability, Proterra says more agencies are leveraging innovative financing solutions to deploy larger fleets in a shorter amount of time. Proterra recently partnered with Mitsui & Co, Ltd., to create a $200 million credit facility to support its battery lease program for transit buses. The company explains this enables electric buses to be competitively priced against diesel buses and introduces options for second life applications.

Driven by Data

Strategy Teams, Lean Teams - the names vary – but what is shared is the focus to do more and provide better service.

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

TAKING A DATA-DRIVEN APProach to improve transit operations is growing among agencies. How this is accomplished varies from agency to agency, but a few common themes emerged: The need to listen to all stakeholders involved to ensure the intended outcome is the correct outcome and the ability to empower frontline employees who will perpetuate best practices resulting in long-term solutions.

Focus on process

The Washington Metropolitan Area Transit Authority's (WMATA) Strategic Initiatives Team was established in 2017. Inspired by its namesake department in New York City Transit, the team drives strategic change in operations (rail, bus, paratransit, police and support services) to improve safety, customer service and efficiency. Its members say getting the message out about what the team can accomplish was difficult but has evolved into one of the more rewarding parts of the job.

"We arrived on individuals' doorsteps who had 25-30 years of experience in transit. We have different ideas and a task to change the way they do business. Initial conversations were tough," explained Jayme Johnson, director of Strategic Initiatives. "But once we demonstrated to our colleagues that there are other ways of doing things, and that our team can have a positive impact on the way you do business, trust grew and we started to get a lot of traction."

One area the team is working to improve is the challenge of track access. WMATA has a $1.75 billion capital program in Fiscal Year 2020 that will in part focus on the rebuild and repair of the rail system. But there are limited work windows available to get the work done during non-revenue hours. The team is focusing on increasing the number of hours spent working during those windows.

"As you can imagine, it's not all one problem. It's multiple, small things and some large things, as well," said Elissa McDade, senior program manager. "Some of it comes from the culture of how we plan work, and other parts of it are just the communication challenges or the coordination of work plans or it's something like getting a work train out of the yard earlier."

McDade explains that the team established a data baseline and then first targeted something relatively straight forward - defining the way the agency deals with what is referred to as emergency track access requests, which are last minute requests that bump long-planned scheduled work and cause a domino effect on work schedules.

"[We needed to understand] who and when an emergency request should be used, how it could be used, what authority needed to be in place to make those types of request, and then we needed to track and report how many people were using it. We have seen a dramatic improvement [from when the team began reporting the results]," said McDade.

> **"Some** of it comes from the culture of how we plan work, and other parts of it are just the communication challenges or the coordination of working plans or it's something like getting a work train out of the yard earlier."
>
> **-ELISSA MCDADE,** senior program manager

Since the team piloted and scaled the process, McDade says the number of people requesting last minute track access decreased 62 percent. Once the team proved that the data was useful and relatively accurate, they were able to use it for other things, which involved codifying processes to request access to the track. The team also implemented a performance management cycle where it reports monthly to senior managers on their teams' work window usage.

WMATA is also working to improve the safety and efficiency of its third rail power outages on the track, specifically in those cases known as 'red tags', where power needs to be turned off by temporarily removing breakers in the power substations. An innovative, automated process has been designed and is being evaluated, allowing an operator to shut the power off in the control center and

DATA HELPS shed light onto ways agencies can better operate.

save an estimated 60 minutes over the current manual process, while making the process safer for those who manually handle the 750V breakers every day.

Changing the culture of leadership also falls under the Strategic Initiatives Team. The Chief Operating Officer's Leadership Program empowers the agency's leaders, starting with communications.

"If you improve communications, you'll improve just about everything from morale to trust to procedures themselves," said Kevin Coyne, senior operations advisor.

As a veteran Naval helicopter pilot, Coyne's work includes establishing a formatted communication program where concerns can be voiced and addressed and where managers come out from behind their desks at least once every six weeks to work in the field with their teams.

"We're looking right now at implementing a simple but robust communication framework that can pretty much guarantee end-to-end communication," said Coyne. "We've had some success in targeting training and development at the mid-leadership level. And we've implemented a mission, vision, and values for the organization, which is important because in the end, it's not just what you do, it's the manner in which you do it."

One last example of a project the team is involved with is the three percent challenge. Johnson explains in exchange for a large amount of dedicated capital funding, the system's regional funding partners have capped the annual growth of WMATA's operating subsidy at three percent.

"What we're leading is a programmatic approach to identifying and then tracking and driving forward projects that are going to save us money or generate revenue," said Johnson. "We've got a small cross-department team that has identified 26 projects that amount to about $70 million in extra savings or revenue over 10 years. Are those projects the whole solution? No, they're part of the solution. But the 3% Challenge program is a more professional way of accounting for our dollars, by identifying promising projects early, tracking them, supporting the project managers doing the work, and coordinating them across the organization."

What good looks like

The Lean Strategy Team, led by Kat Benesh, chief of operations strategy, policy and oversight at the Massachusetts Bay Transportation Authority (MBTA), leverage their shared experiences as former management consultants, engineers and financial analysts to focus on different parts of operations to improve service and outcomes.

Benesh says her team spends around 80 percent of their time looking at how MBTA can do more with what it has.

"We're very much from the lean philosophy that we will bring in a lot of data and we will bring in the structure, but we're not people who grew up in transit. We firmly believe that the people who have the best answer about how we can operate more effectively are on the frontline," said Benesh.

She points to one example at MBTA's Southampton bus garage, which Benesh says has historically been a challenge to operate due to the complexity of the fleet. Her team partnered with the garage's superintendent and posed two questions to find the focus of their work: What does good look like? And what are we trying to accomplish?

The team determined the biggest indicator for an improved customer experience came down to ensuring the right number of buses operated on a given route every day, which led them to focus on improving the mean miles between failure.

"We looked at mean miles between failure and also looked at how much of that is driven by scheduled and unscheduled

work," said Benesh. "In the world of maintenance, variation is horrible, you want to pull it out of the system, which moves us to the mindset that scheduled work is good and unscheduled work is less good. So, how do we improve the level of scheduled work?"

To gather the needed information, the team embedded themselves on the shop floor observing the work being performed to determine how long certain tasks took to complete and why.

"We view our bus mechanics as surgeons, they're doing incredibly technical, complex work and we want to make sure that our skilled labor is not spending their time tracking parts or searching racks, but is focused on doing the work that will improve the customer's experience," explained Benesh.

The work Benesh's team performed at Southampton occurred through both small and big wins, but always with the input from frontline workers. The team addressed training, parts management and the order of how repairs are made among other variables. The result was scheduled versus unscheduled work improved by 40 percent and mean miles between failure nearly doubled.

MEMBERS OF the WMATA Strategic Initiatives Team meeting to discuss a challenge.

"That's a real tangible impact, but it's also a lot of hard work every day and trying to incrementally continuously improve, which we call Kaizen," explained Benesh.

There are situations where embedding the team with frontline forces would not be possible, such as when it comes to the more complex and decentralized maintenance surrounding rail.

One rail-related challenge being worked on is how to plan and schedule access for night work.

"My team will never be the expert in telling an electrician or a maintenance-of-way worker how to lay track, but what we do understand is processes and metrics and how to take the stuff that matters and help build tools to help people make better decisions," said Benesh. "Every moment of a track shutdown is such precious time. We're still creating the data to determine how much work we scheduled for a given night, did that work get done and how do we do more the next night."

Benesh notes that whatever the project may be, the data used must mean something and not just be interesting, otherwise it's noise.

"I'm constantly pushing the team to determine baselines and where are we starting from," explained Benesh. "Even in the absence of data, we spend a lot of time going out to create our own data set. I am a firm believer that everything is quantifiable, but it may take more time to ensure what you're quantifying is also meaningful. The work we do must be enough to drive decisions."

Benesh says progress, when viewed day-to-day, can seem a bit slow, but when the broader scope of effort is viewed, it's good to see how her and her team's work are positively impacting improved processes at MBTA.

"I think most importantly for us is that this change is embedded in our frontline leadership. There's an element of coaching and learning and having them take ownership and accountability and help them continue to grow," said Benesh. "Even after we finish a project, [the frontline workers] will continue to advance this grassroots philosophy of taking a data-driven approach to improve outcomes."

Mapping the course

"You can know where the finish line is, but if you don't know the course of the race, you may not get there," said David Schulze, chief of staff, Dallas Area Rapid Transit (DART).

Helping colleagues reach the finish line on projects that have an agency-wide impact has been one of Schulze's main functions during his time as DART's vice president Policy & Strategy, and now as chief

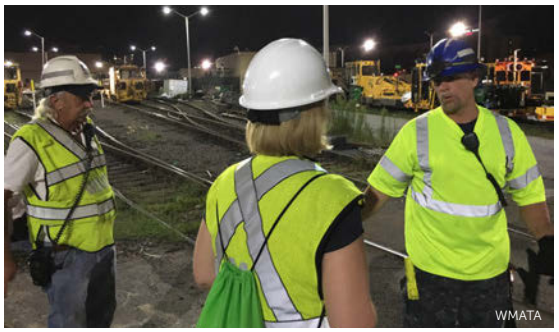
> **"We** view our bus mechanics as surgeons, they're doing incredibly technical, complex work and we want to make sure that our skilled labor is not spending their time tracking parts or searching racks, but is focused on doing the work that will improve the customer's experience."
>
> **-KAT BENESH,** chief of operations strategy, policy and oversight, MBTA

of staff where he leads strategic, tactical and operational initiatives among other responsibilities.

Schulze's first order of business following the establishment of the Office of Policy & Strategy about five years ago was to lay out the agency's goal setting processes.

"The way our process works here at DART is that the board of directors sets performance measures for our President/Executive Director Gary Thomas and then Mr. Thomas takes those priorities and rolls them out to staff, so that we have alignment all the way through our governing board down to the individual performance plans for the year," said Schulze.

He explained that it took a few years, but the agency has now implemented an improved process that has moved away from granular-type goals at the board level to much more high level, key performance indicators.



TRACK ACCESS is one of the issues WMATA's Strategic Initiatives Team has been working to improve. Here a team member speaks with MOW crew members.

> **"It's** important to understand what [a stakeholder's] thinking is; how they're reacting or responding to a problem, or an initiative, or a challenge. Because if I understand what their obstacles might be, then that helps us in setting reasonable goals for outcomes."
>
> **-DAVID SCHULZE,** chief of staff, DART

Schulze begins with a seemingly simple act: Listening. He listens to input from DART's board executives, the agency's managers on through to the community to see where the challenges may lie.

"It's an iterative process, with information coming from everybody who is a stakeholder in the process," said Schulze. "It's important to understand what their thinking is; how they're reacting or responding to a problem, or an initiative, or a challenge. Because if I understand what their obstacles might be, then that helps us in setting reasonable goals for outcomes."

Schulze believes helping leaders identify pinch points or problem areas has been the value created through the process. He explains that by elevating those problems to the level of a tracked and monitored performance measure, this provides leaders with a tool to either make a business case for funding or make a case to frontline teams that special attention is needed to accomplish a deliverable.

Another key element Schulze says needs to be included is the explanation of why an ask is being made.

"If you just ask somebody to do something and you don't tell them why, you're going to get pushback," said Schulze. "The next facet is making sure that everybody understands what you're asking them to do. And once they have helped with something, say thank you and show them how their individual contribution made a difference to the success of the effort."

Schulze points to several examples of how the Office of Policy & Strategy has delivered over the years beginning with DART's Records Management Program.

"We completely redid our Records Management plan and developed a small staff of experts who I believe have come to the position of being trusted advisors and welcome partners throughout the agency. That was critical to get that on the ground because we were looking at four significant, huge enterprise information systems," said Schulze.

The four systems included a project management system, enterprise document management system, enterprise learning system and enterprise asset management system.

"Without excellent records management protocols in place, trying to wrangle all the digital records that go into those systems would have been a nightmare, and I'm pleased to have asked for this body of work and seeing that if we didn't get Records Management right pretty quick, all of these other major investments would be at risk," he explained.

Following the successful delivery of the Records Management System, Schulze was tasked with the responsibility of preserving DART's historical records. The agency is 35 years old and its first generation of employees are retiring. Schulze explains when they leave, so does a part of DART's history.

"It was important at this particular moment in time that we start to take some steps to capture that memory before it leaves. What began as a casual inquiry about oral histories has developed into a full-blown creation of the DART Historical Archives," said Schulze.

DART has entered into an agreement with the University of North Texas to partner on the historical archives, which will be available to the public.

Schulze is also proud to have been a part of gathering together and codifying DART's administrative policies, which had broken down as the agency moved away from paper.

"These aren't things that guide employee behavior. These are things that guide business processes. For the first time in many years, we've gone through and gathered all that information and put it in a single place [and made it] available electronically so all our employees have access to what our policies are," said Schulze.

For agencies wanting to set up a similar strategic alignment department, Schulze notes there are as many ways to approach it as there are people for which it could be assigned.

"I think the key lies in giving the individual selected to lead that effort the trust and the freedom to bring their skills to bear," said Schulze. "I'm lucky in that I've been given the freedom to bring my best thinking and my way of thinking about strategic projects to this role."

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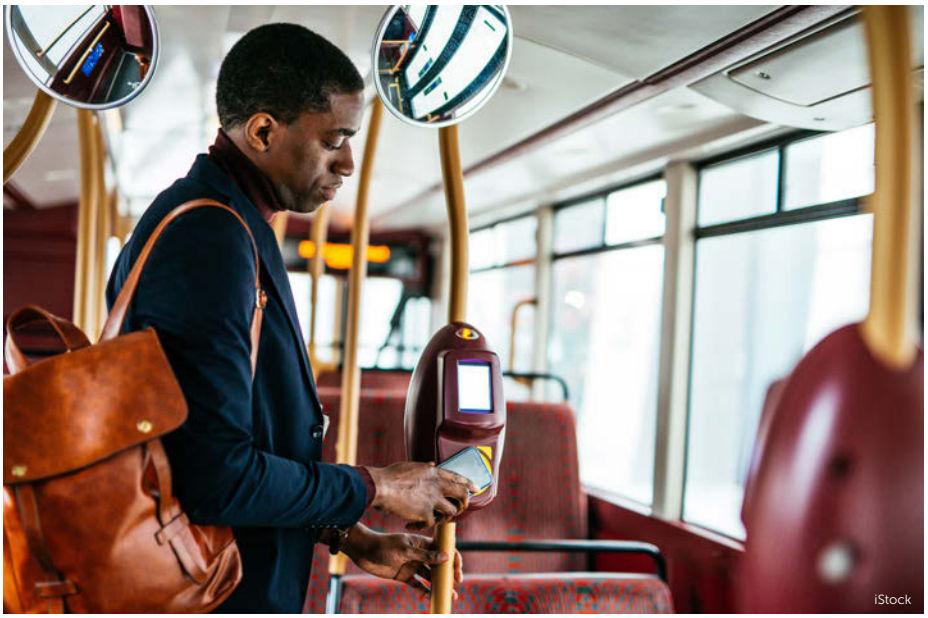

SERVICES FROM ticketing to loyalty schemes are increasingly converging onto mobile platforms.

Making the Case for Standardization in MaaS

As our digital and physical worlds continue to intertwine, fare-centric needs to become consumer-centric.

By **Philippe Martineau, contributor**

THE VISION OF A TRULY SEAM-less age of Mobility as a Service (MaaS) is coming into focus. But for many stakeholders in the traditional transport world, how to get there remains a blur.

Services from ticketing to loyalty schemes are increasingly converging onto mobile, and innovative new form factors, applications and services are emerging rapidly. As a result, demands of today's digital travelers are at an all-time high. But, for many in the transport world, keeping up with the pace of more advanced, inclusive and better-connected services is causing more than a few headaches.

In this new era of connected mobility, there's a real opportunity for stakeholders to enhance offerings and tap into new revenues. But the convergence of multiple players and industries is posing major technical and strategic challenges. To truly meet the levels of innovation delivered in adjacent industries – and, crucially, the expectations of consumers - transportation needs a new approach.

Openness will be central to realizing the full potential new age of MaaS. But to best understand why, its worth reviewing what's driving this change and what's creating the challenges.

The MaaS mindset

From how we pay and communicate to what we watch and listen to, the dramatic evolution of consumer behavior in recent years is changing how transport services need to be delivered and consumed.

The "MaaS mindset," as I like to think of it, is shaped by these changes. We're all operating more globally, with our physical and digital lives becoming inextricably entwined. Traditional local service providers need to think further afield and more "phygital" - how can existing services be complemented by digital ones, for example?

> **"We're** all operating more globally, with our physical and digital lives becoming inextricably entwined."

Services are also increasingly expected here and now, wherever and whenever they're needed. Driven by the growth of smartphones and the likes of Amazon, Netflix and Uber, the modern consumer is demanding services that are consistent, seamless and ubiquitous.

Tomorrow's transport

Trust and convenience underpin everything, with the consumer sitting at the heart of innovation. The everyday traveler is no longer patient and reliant on public transport services. Instead, we must consider the needs of the consumer, and how transport ticketing sits among a whole host of other trusted services.

MaaS needs to be more than just offering a means of getting from A to B. As a quick (and certainly not exhaustive!) checklist, public transport authorities and public transport organizations can consider the following:

- Journey planning
- Personalized services
- Loyalty schemes
- Contextual mobility (offering, for example, local travel services and a hotel with a flight booking)
- Seamless transactions
- Device agnostic support or BYOD

Consumers want to travel with minimal effort and planning: booking a hotel and connecting travel simply, with a free loyalty-scheme coffee en-route and live updates and travel times.

Fare-centric needs to become consumer-centric. But how can traditional transport players best adapt? And, what's been holding them back?

Bridging the innovation gap

For the last few decades, proprietary solutions have dominated

transport ticketing – the service at the heart of mobility services. Highly customized, complex and expensive, these solutions have proven to lack flexibility at any upgrade such as new fare policies, smartcard features, acceptance of other form factors or adding any new features to the system. Tied to single vendors, operators have also faced high costs and a speed of upgrade dictated by their vendor. All in all, not a recipe for innovation...

Enter, open standards: a proven approach to resolving such fragmentation, preventing overlap of work, and facilitating better collaboration, innovation and technology advancement.

MaaS requires the collaboration of many players to truly be a success; standardization is the perfect platform of interoperability to facilitate this across borders and industries. Longer term, migration to a standardized ecosystem also brings a better economy of scale, cost savings, and legal protections including liabilities, privacy compliance and patents. Not to mention that new vendors are empowered to compete in an open playing field, encouraging more competitive offerings and the advancements of new technologies.

Several industry players are already championing this move to openness, and OSPT Alliance is one organization leading the way.

Who is OSPT Alliance?

OSPT Alliance is a global member association that brings together stakeholders from across the mobility services ecosystem. It owns and manages the CIPURSE™ Specifications, a set of freely-available technical specifications initially defined to form the basis of more secure, innovative and interoperable public transport applications.

Having matured in the transport world in the past decade, the association's cornerstone standard has now become the open standard for transport ticketing. The CIPURSE standard, however, has applications far beyond across ID, access control, payments and more. Completely hardware-agnostic, it can be used in any ecosystem and market, making it perfect for the future of mobility services.

Transport remains at the heart of OSPT Alliance, but it is committed to embracing this rapidly transforming industry and enabling it to thrive. As such, it has broadened its mission to enabling the future of mobility services with a common secure platform fit for both the traditional transport world and new mobility stakeholders. MT

Philippe Martineau was elected as President of the OSPT Alliance Board in 2018. He is currently vice president of Ecosystem Business Development at Rambus, where he is responsible for bridging Rambus' core technology with the mobile world. His career started with the emergence of mobile technology in the early 90s, where he contributed to the GSM standardization bringing SIM technology to the market.

Mobile Payment

Transfers · Data collection · Parking

TriMet's Hop Fastpass®

By Rhyan Schaub
Director of Fare Revenue & Administrative Service, TriMet

PORTLAND, ORE. · Hop Fastpass® is a state-of-the-art, regional fare collection system, launched in the Portland, Ore., metro area in July 2017. Hop fulfilled TriMet's vision to build an innovative, best-in-class fare system that reduced costs and maintenance associated with collecting cash. The agency selected an open architecture design, which helped future-proof the system by fostering nimbleness in partnerships, vendor selection, integration and growth. For riders, Hop simplifies and improves the fare payment experience, reducing the need for cash and establishing a secure and convenient payment platform that provides cost savings and other benefits.

Use of open architecture expanded TriMet's Hop system for development as both a regional and multimodal transportation tool. It operates across TriMet's bus, light rail and commuter rail platforms, as well as with C-TRAN bus and bus rapid transit service. Hop also integrates with the city of Portland's streetcar network, offering seamless transfers throughout the region. If a rider moves from a mode with lower fare to a mode with higher fare, a tap of a Hop card deducts only the difference. Riders tap but pay no more if their transfer takes them from a mode with higher fare to one with lower fare.

Through the optimization of Hop's payment system, TriMet embarked on another industry leading feature—fare capping. Hop Fastpass users earn day and month passes as they ride. Fare capping introduces an equity-based incentive to frequent transit use. It eliminates the upfront and burdensome cost of purchasing day and month passes, replacing it with smart, hassle-free, pay-as-you-go infrastructure.

Hop cards are available at hundreds of local stores and through the Apple Pay or Google Play store. Riders have the option to load money to the card with cash at more than 500 retailers, online at myhopcard.com or the Hop mobile app. Hop does not require a bank account or smartphone. Registration is optional and provides additional benefits including lost-card protection. Hop collects anonymous travel pattern data, used in aggregate to analyze ridership trends. TriMet worked with legislators to protect Hop data under Oregon law and has committed not to sell the data to third parties.

If a rider moves from a mode with lower fare to a mode with higher fare, a tap of a Hop card deducts only the difference.

In May of 2019, Hop became the first transit fare card in North America to launch in Apple Wallet. The achievement came just over a year after TriMet worked with Google to offer the first virtual transit fare card available within Google Pay globally. Hop's NFC technology accepts contactless credit cards and payments made through a mobile wallet, even without a Hop card. Users

Future of fare collection: Mobility integration

By Eric Kaled
CEO, Genfare

ELK GROVE VILLAGE, ILL. · Transit needs and capabilities are both evolving at a rapid pace and the ideal solutions are ones that not only fulfill today's demands but are also flexible and adaptable enough to handle future challenges, as well. Mobile ticketing and payment, already a big part of many agencies' systems, can play a vital role in those future solutions.

One certain component of future transit solutions is integrated mobility, the ability to access multiple modes of transportation all from one app, consolidating payment while providing an array of options for customizing a trip to suit each rider's unique needs. By its very nature, it requires a robust, comprehensive and vertically integrated mobile solution.

Why is integrated mobility vital to the future of transit? The answer lies in its inherently flexible, adaptable nature and in its ability to access and incorporate microservices, rather than relying solely on big, established public systems. A rider's ability to hop on a city bus for part of a journey and then switch to a bikeshare increases the reach of transit, reduces an agency's operating costs and gives commuters better experiences. When you factor in benefits like reduced environmental impact, it's hard to deny just how appealing mobility integration is for agencies, cities and riders.

Transportation network companies—like Uber, Lyft and bikeshares—deliver transportation on demand, reducing travel and wait time, while also conserving resources. These ad-hoc solutions, when integrated into a single transportation app, let agencies find efficiencies in their services, while still providing transportation options. It might not make sense to run a city bus to serve two riders and integrated mobility lets agencies make more cost-effective decisions without depriving city residents of vital transportation.

Getting on the right track: How mass transit operators can meet passenger expectations for convenience by implementing mobile payments

By Toby Holmes
Vice President U.S. Sales, Ground & Sea,
CellPoint Mobile

SEATTLE, WASH. • Seamless payments are both wildly popular and a fact of life for most Americans and Canadians. Think of Amazon's "one-click" purchasing, the "tap-and-go" simplicity of the Starbucks app and, of course, the real-time, mobile-integrated, location-aware payment process that Uber and Lyft (and their competitors) feature.

Mass transit payments, by contrast, are too often removed from the process of booking or boarding, rely on outmoded technology and add unnecessary complexity to riders' journeys. Mass transit providers may not be competing with Starbucks and Amazon, but they are certainly competing with rideshare companies and other digitally-enabled transportation options. And to compete effectively, they need to add convenience to their payment processes.

Unfortunately, too few North American transit agencies and operators leverage the digital and mobile channels to make payments easier. According to our recent report, Challenges Facing Municipal, Regional and National Transit Agencies in the United States, only 30 percent of providers currently collect fares through a mobile app. In fact, only 39 percent of U.S. ground transportation providers have an app at all, and only 37 percent can accept alternative payment methods (APMs).

Meeting passenger expectations for convenience

Making payments easier is a "low hanging fruit" opportunity for mass transit agencies and one that is less resource-intensive (and faster) to implement than traditional IT deployments. Importantly, this is what their riders say they want. According to another report of ours, Modernizing the Passenger Experience in U.S. Ground Transportation, convenient booking/ticketing process and in-app payments were the two top-ranked features that U.S. riders look for in transit mobile apps, highlighting areas where operators must prioritize their investment in new mobile technology solutions. New and alternative payments matter, too: The same study found that 34 percent of riders say using APMs, such as Apple Pay or Google Pay, for fares is "Very" or "Extremely" important. To enable these payment methods, it requires a deep understanding of payment control and services beyond what fare collection vendors are prepared to provide.

Meeting these expectations for convenient payments may even help mass transit providers get more riders to download transit mobile apps, which puts providers on closer to equal footing with rideshare companies and facilitates fare collection and ridership. Thirty-four percent of riders who say their top priority is making payments more easy can be incentivized to download a transit app and one-third of U.S. riders (31 percent) say reducing the need to carry cash would incentivize them to download a transit app.

> ...the same study found that 34 percent of riders say using APMs... for fares is "Very" or "Extremely" important.

With convenient, mobile and digital payment solutions, transit agencies and operators can better meet the needs of passengers. They can increase ridership by modernizing their payment processes, but many agencies will need a technology partner to get started, providing access to payment service providers, acquirers and multiple payment methods and digital wallets such as Google Pay, Apple Pay, AliPay and more.

TriMet's Hop Fastpass® continued »

simply tap their phone to a Hop reader. For Apple users, Express Transit with Apple Pay allows them to simply tap and hop onboard without unlocking the phone.

By adopting Hop, TriMet built the regional foundation for mobility as a service (MaaS). MaaS seeks the seamless integration of various transportation options into one accessible on-demand resource. Its purpose is to streamline options for the customer, optimize routes, reduce congestion and pollution and provide better value for the customer. The result is convenient, sustainable transportation, diminished reliance on personal vehicle ownership and reduced traffic congestion. The idea is that one day, Hop will be able to integrate with solutions that allow the rider to pursue all travel needs – incorporating not only transit, but transportation network companies, car-sharing services, e-scooters and future generations of on-demand mobility.

Future of fare collection continued »

Additionally, mobile ticketing and payment are more than simply a solution for fare collection. The true benefit is when a mobile application fully integrates with your full fare collection system—a single point to manage not only mobile but also cash (the largest amount of transactions), as well as point-of-sale and electronic payment transactions. Together, the technology functions as a powerful solution that allows public transit to integrate, grow and adapt to meet future needs and provide vital services to communities.

Transforming the curb – one data point at a time

By Roamy Valera
CEO, PayByPhone

VANCOUVER, B.C. • British comedian Tommy Cooper once quipped, "You know, somebody actually complimented me on my driving today. They left a little note on the windscreen, it said, 'Parking Fine.'"

It brought me back to the start of my career as a parking enforcement agent in Miami. Of course, drivers rarely joked when I issued parking citations because their coin-fed meters had run out.

Today's parking landscape is more complex than it was three decades ago because of the increasing modes of available transportation. At the same time, technological advancements that include mobile payment apps have made using the curb a more frictionless experience for motorists and municipalities alike.

By adopting mobile parking apps, for instance, smart communities have untethered motorists from constant trips to the parking meter by offering the ability to check and extend parking time – all through a mobile app. Plus, these same cities have benefited from the data collected from mobile payments apps, which can help better manage the complexities of the curb.

So, to make strides toward transforming a municipality's curbside management, use data gleaned from mobile apps to improve usage patterns and match infrastructure and traffic processes to the needs of the community, while simultaneously educating constituents on the benefits emerging technology provides for mobility.

Data delivers usage insight

In the past, data consisted of how much money was collected from a meter. Today, mobile payment apps provide cities with information to help them better manage the curb: how much people pay to park, their method of payment – whether mobile app or credit card- length of stay, which areas fill up quickly and which are underused, to name a few.

This data helps municipalities better understand parking utilization and demand to better manage parking infrastructure – and particularly curbside management, which is increasingly important as more pedestrians, cyclists, motorists and transportation purveyors share the curb. Add that to varying zone requirements and drop-off and pick-up areas, and managing the curb becomes an increasingly complex puzzle.

When parking, transportation and mobility managers have access to this substantial amount of data, they can better evaluate the information and make data-driven decisions to manage all aspects of the curb.

Education is necessary for adoption

While data is a must when tackling the different pieces of the curbside management puzzle, to fully master the curbside, cities must also educate consumers on the benefits of adopting new technology and show them how to use it. Seattle, for example, introduced a successful stakeholder engagement campaign that introduced consumers to a modern, easier way to pay for their parking.

Transportation department employees covered a car in sticky-backed pay-and-display receipts motorists were accustomed to receiving from the city's parking kiosks. They were prompted to remove a sticky note, which gave directions on how to download and use a mobile parking app to receive a parking discount. The campaign generated buzz while giving users a reason – a discount – to try the app.

Plus, these same cities have benefited from the data collected from mobile payments apps, which can help better manage the complexities of the curb.

Technology can dramatically change the curbside management landscape, but only if it's widely accepted by motorists. And with new apps and technologies popping up seemingly overnight, there can be challenges in achieving widespread adoption from constituents. By educating consumers and providing strategic marketing initiatives, transportation leaders can encourage technology adoption to provide a smarter, more streamlined mobility landscape for both motorists and the cities they inhabit.

Give parking fine a new meaning

As mobile payments become more prevalent, cities around the globe can use data from adopting these apps to improve management of the curb while educating consumers on the benefits mobile payments provide.

Doing so will help ensure that when people talk about "parking fine," they truly mean that the parking in your municipality is indeed, fine. MT

Coming in the September/October issue:

Best Practices for TNC Integration

Have you experienced success with the integration of TNC services into your network and want to share your story? Please contact Executive Editor Mischa Wanek-Libman, mwanek@masstransitmag.com.

In Focus: Fare Collection

View more of the latest fare collection products at MassTransitmag.com/technology/farecollection

Genfare Genfare Link

Genfare Link is a fully integrated, cloud-based software solution that is secure, reliable and scalable for any sized agency. Offering control over every aspect of fare collection management and reporting, Genfare Link allows agencies to manage their accounts from anywhere. Genfare Link offers tools to collect, house, access, interpret and act on the data that keeps the agency moving.

www.genfare.com

INIT Innovations in Transportation Inc. PROXmobil

INIT's passenger terminal, PROXmobil, supports riders with real-time validation of all e-fare media, including smart cards, mobile tickets, debit/credit cards and even virtual transit fare cards in Google Pay or Apple Pay. With PROXmobil, agencies can offer multiple media options depending on their structure: mobile 2D barcodes, branded regional fare media and third-party contactless ID media, like college IDs. PROXmobil's sleek design and fast processing time guarantee a flexible solution for individualized or multi-client fare systems.

www.initusa.com

Delerrok Inc. TouchPass

TouchPass is an electronic fare collection (EFC) offered as a subscription service. TouchPass offers customization through configuration and enables agencies and their passengers to use contactless smart cards, smartphones and paper tickets. It also offers an extensive sales network, including agency ticket windows, online services and a nationwide retailer network. TouchPass serves all passengers and the cloud-based, multi-agency hosted platform ensures a low lifetime cost.

www.delerrok.com

Masabi The Justride Validator

The Justride Validator is a multi-format ticket validation device designed to make account-based ticketing (ABT) affordable for transport authorities of any size. The product enables the electronic validation of all major transport ticketing formats, including contactless bank cards (cEMV), barcodes and smartcards (NFC). It provides a robust and reliable pole-mounted validation solution and has been designed to meet accessibility standards, including the Americans with Disabilities Act.

www.masabi.com/justride-validator

Moovel becoming REACH NOW Ticketing App

The Ticketing App offers a simple, reliable mobile payment option that doesn't require fumbling for cash or a paper ticket. With the Ticketing App, public transit agencies can instantly benefit from having greater intelligence and control. Modernized payment technology makes it easier and faster for users to purchase transit tickets. This affordable solution with a powerful core feature set can be implemented rapidly and has a straightforward, fee-free approach without any upfront costs.

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DISCUSSION

Tweet & Retweet

NUMO alliance
@NUMOalliance

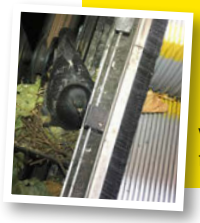
"Transit is more than just a #mobility strategy, it is a stimulant for new business creation, job generation, and economic development as well." A new study connects startup growth in cities to accessible #transit. @Richard_Florida @clairevtran @CityLab ow.ly/GbgK50v6eQn

Peter Rogoff
@SoundTransitCEO

Thank you to our @FTA_DOT partners for allocating $100M in 2019 Capital Investment Grants Program to @SoundTransit's Federal Way light rail project. We're grateful for this major commitment to support Puget Sound's investment in high-capacity rapid transit.

SFBART
@SFBART

During repairs on the 24th St Mission escalator, a pigeon set up a nest by the escalator and laid two eggs. By federal law, we can't disturb an active nest and monitored the nest every day. Last week, the two hatchlings and momma pigeon flew away and we're moving forward again.



Big Ten mascots take a train ride

PHOTO OP

CTA
@cta

▶ Nine mascots from Big Ten Universities surprised customers by taking a ride on the Red Line today. Can you name the schools? The mascots are in town to promote the Big Ten Network's Eighth Annual Big 10K race and 5K run/walk on August 11 in Grant Park!

THE VIEW

MBTA
@MBTA

With a heat advisory in effect, it's important to stay hydrated! If you're in Downtown Boston, join us at our Park Street station today until 3 pm to beat the heat with a cup of @BOSTON_WATER's award-winning H2O. #FillDrinkRepeat

Have something we shouldn't miss?
Tag us or email us at editors@masstransitmag.com.

PERSPECTIVE

HIRTA Public Transit
@rideHIRTA

▶ @rideHIRTA providing service during Ragbrai in Winterset. It was great having an overnight stop for 30,000 people in our little town of 5,000. A big thank you to all our drivers and staff that made everything run so smoothly! #ragbrai #ruraltransit #publictransit #winterset

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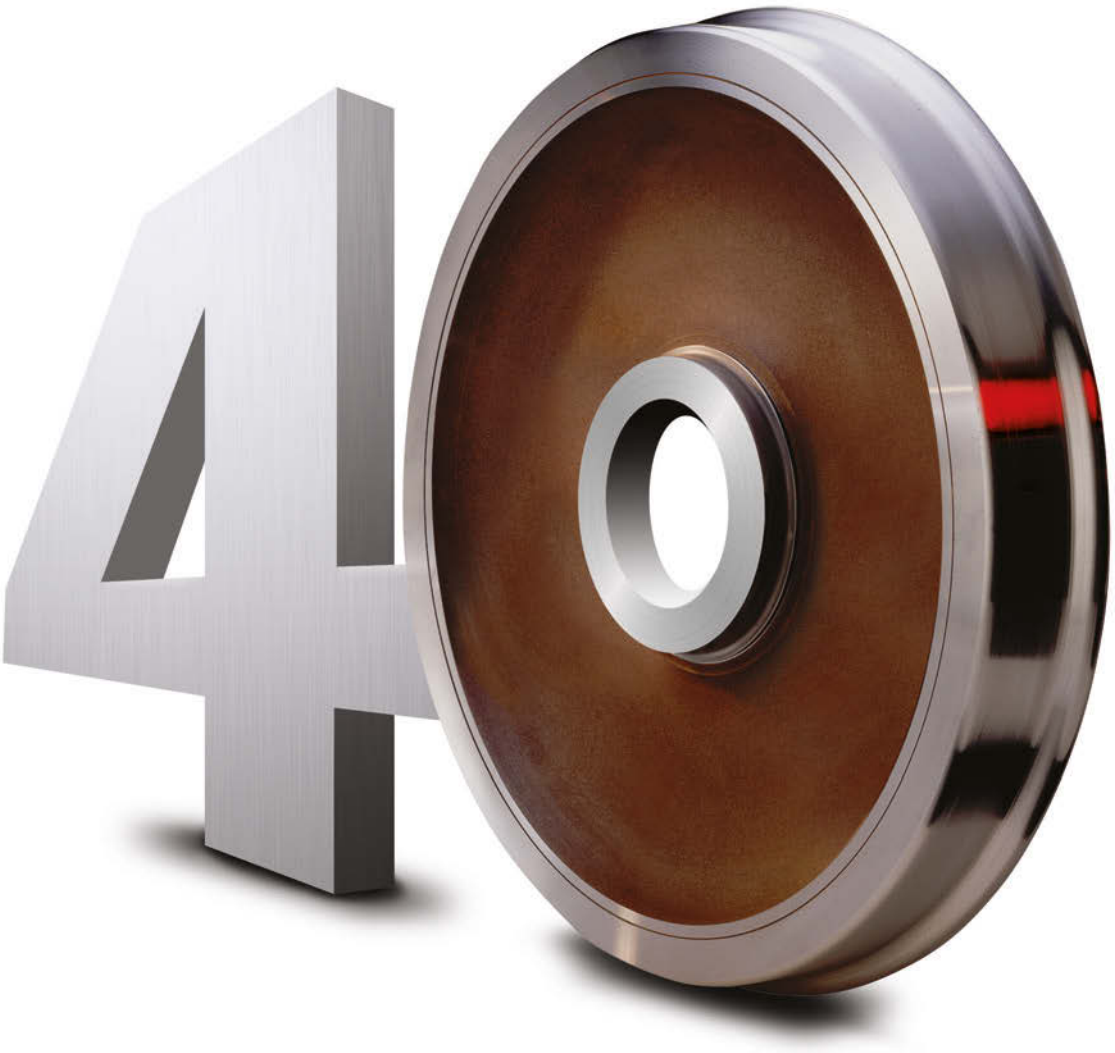

Lordy, Lordy.

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