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Acceleration**

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**Publisher** Emily Guill  
(847) 454-2730 | Emily.Guill@MassTransitmag.com

**Executive Editor** Mischa Wanek-Libman  
(224) 324-8532 | MWanek@MassTransitmag.com

**Assistant Editor** Megan Perrero  
(224) 252-0226 | MPerrero@MassTransitmag.com

**Contributors** Narinder Manku, Gerald Becker, Russ Turner and Ed Dornheim

**Multimedia Account Manager** Barb Szatko  
(800) 547-7377 Ext. 1344 | BSzatko@MassTransitmag.com

**Inside Sales Representative** Jesse Gonzalez  
(224) 303-0611 | jgonzalez@MassTransitmag.com

**List Rentals Representatives** InfoGroup  
Michael Costantino  
(402) 836-6266 | Michael.Costantino@infogroup.com  
Kevin Collopy  
(402) 836-6265 | Kevin.Collopy@infogroup.com

**Production Manager** LuAnn Hausz

**Art Director** Erin Brown

**Audience Development Manager** Debbie Dumke

**ENDEAVOR BUSINESS MEDIA, LLC**

**CEO** Chris Ferrell  
**CRO/CMO** June Griffin  
**CFO** William Nurthen  
**COO** Patrick Rains  
**Chief Administrative and Legal Officer** Tracy Kane  
**EVP Healthcare & City Services** Amy Mularski  
**EVP Special Projects** Kristine Russell

**SUBSCRIPTION CUSTOMER SERVICE**

877-382-9187; 847-559-7598  
Circ.MassTransit@Omeda.com  
PO Box 3257, Northbrook IL 60065-3257



**ARTICLE REPRINTS**

Brett Pettilo, Wright's Media  
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# Are the New Census Numbers Good News for Transit?

U.S. residents live in more urban areas, but as population density increases, efforts to ensure freedom of movement will increase in importance.

The U.S. Census Bureau released data in early August to help states impacted by the ebb and flow of population shifts over the past decade begin redistricting efforts. It's always interesting to see how the country's population has shifted over a 10-year period, but the more information I saw, the more I found myself thinking about the various strategic plans developed at transit agencies and municipalities throughout the U.S.

The Census Bureau highlighted Los Angeles County, which remains the largest county in the U.S. with more than 10 million people. It's also the site of my worst driving experience where it took more than four hours to travel 20 miles; an event soured further when the reverse trip the next day took 25 minutes – I have visited L.A. since, but have not driven again. Vision 2028, Los Angeles County Metropolitan Transportation Authority's long-term strategic mobility plan, is designed to help reduce the likelihood someone else will experience something similar.

Another area of the country that seems to be at the heart of the subject is Central Florida. LYNX, the topic of this issue's cover story, has a service area that covers three counties. Two of those counties are in the Census Bureau's top 10 list: Osceola County for being the tenth fastest growing county based on percent change from 2010 and 2020 and Orange County for seeing the seventh largest numeric change in population from 2010 to 2020.

**As more of us live closer together, it may be time to revisit some of those long-term plans and move to make them reality.**

LYNX has conducted several studies over the years focused on transit enhancements along key corridors to improve mobility within its service area and, with local university economists estimating Central Florida's growth will continue, those plans to enhance service now come with additional urgency.

The Census Bureau says 86 percent of the U.S. population lives in metro areas and it doesn't take an expert to understand increased population density and masses of single occupancy cars do not make a great mix. As more of us live closer together, it may be time to revisit some of those long-term plans and move to make them reality.



*Mischa Wanek-Libman*

Mischa Wanek-Libman, Editor



# The Importance of Enterprise Transit Management Software to **Take a Centralized Approach to Data Management**

**Where do you feel the North American transit industry is as far as understanding the information found within its data? Do you think this understanding will grow in the short-term?**

Our industry has seen an amazing transformation in both the availability and adoption of technology in really a short time span compared to other industries. The negative impact has been that there is so much data available that it's harder than ever to separate the signal from the noise. Fortunately, there are agencies leading the way in data-driven decision making and they are being staffed with individuals well suited to navigate this new landscape. At the same time, technology vendors are getting better at presenting answers about how an agency is performing as compared to hundreds of thousands individual pieces of data.

I do believe the understanding is growing rapidly and it will continue to grow. The most important takeaway is that all this data doesn't change the important metrics, it just makes measurement of them so much more accurate.

## **Why is it important to take a centralized approach to data?**

I think the best way to answer this question is with asking yourself these questions:

- What reports does your agency depend on per month/yearly?
- What does it take/process and compile the data?
- What is confidence level of the data you're compiling and reporting?
- Lastly, if you had to pull a comprehensive report for the board in a moment's notice and you needed ridership, revenue and employee information could you pull it off?

Many agencies live this nightmare on a regular basis. Data coming from multiple



systems and the pain staking effort it takes to compile. Because of disparate software systems, departments working in silos and not having exposure to the complete picture makes this a difficult task.

Having a centralized approach for collecting data would give many CEO's a higher level of confidence and peace of mind.


## **How can teams begin their shift to enterprise thinking?**

Easy, stop thinking about it and ask us about myAvail Enterprise Transit Management System.

This essentially means we have combined our feature rich CAD/AVL system with the industries only transit focused Enterprise Resource Planning (ERP) system, to offer the only fully integrated system available in the industry.

The industry has been rapidly adopting the MaaS model, so passengers can see how the entire transportation network works together to solve the problem of how to navigate their environment. myAvail ETMS is solving the same problem for the Transit Industry's back-office systems.

Imagine if an agency is having difficulty meeting schedule commitments and is forced to cancel trips. The transportation department may report what service has been missed, the customer service department can report on the impacts to customers, maintenance can report on equipment availability and human resources can report on staff availability. Enterprise thinking teaches us to look at the total ecosystem not at these individual parts, so all efforts can be focused on the agency's goals not the departments objectives.

With myAvail ETMS in place, you'll be able to see things like payroll and inventory, and driver start times and bus maintenance side-by-side in one system, rather than having to make multiple requests, then spend time figuring out how to reconcile the data. 



**David Mugica**, Director of Business Development, Avail Technologies, Inc.



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**DASH LAUNCHED** a redesigned bus network on Sept. 5 – the first since DASH was established in 1984.

## Alexandria Transit Company launches New Dash Network

The Alexandria Transit Company (DASH) launched its New Dash Network on Sept. 5, a complete overhaul of its bus service. DASH also began fare-free service in conjunction with the new bus network. DASH CEO and General Manager Josh Baker explained the changes enable DASH to meet current and future needs of the community, as well as offer an improved customer experience. The new network incorporates all-day, frequent service on major transit corridors and provides more frequent service to more people across Alexandria. The service and route changes are designed to meet current and future transit ridership demand and encourage more people to use transit. Nearly 60,000 additional Alexandria residents will gain access to high-frequency service, and the number of low-income residents with access to frequent transit will improve from 29 percent to more than 72 percent. The network launch is the first phase of the larger Alexandria Transit Vision Plan, which seeks to create a more inclusive, accessible and useful transit system by 2030.

➔ [MassTransitmag.com/21236281](https://www.masstransitmag.com/21236281)

### Mask mandate for public transit extended to January 2022

► The Transportation Security Administration (TSA) published an updated security directive on Aug. 20 that extends the requirement for passengers and employees on airplanes, public transportation and intercity surface transportation to wear face masks through Jan. 18, 2022. The initial requirement for

face masks went into effect Feb. 1, 2021, following President Joe Biden's Executive Order "Promoting COVID-19 Safety in Domestic and International Travel." The original directive's expiration of May 11 was extended to Sept. 13, 2021, and will now remain in place through mid-January 2022. The Federal Transit Administration updated its information page on the requirement and explained that while the date of enforcement has been extended,

all other aspects of the security directive remain in place, including exemptions and civil penalties.

➔ [MassTransitmag.com/21235375](https://www.masstransitmag.com/21235375)

### First rail installed for Southwest LRT project

► Contractors installed the first rail of the Southwest Light Rail Transit (LRT) Project that will extend Metro Transit's Green Line 14.5 miles between downtown Minneapolis to St. Louis Park, Hopkins, Minnetonka and Eden Prairie. The rail was installed Aug. 11 near the future Downtown Hopkins Station; one of 16 new stations being constructed along the extension. Employment within half a mile of the line's stations is expected to grow to 80,900 by 2035 and by 18 percent – 145,300 – in downtown Minneapolis by the same year. The Metropolitan Council estimates the population within half a mile of the stations will grow by 56 percent by 2035 and the population of downtown Minneapolis is expected to grow by 117 percent. The \$2-billion project, which broke ground in December 2018, is more than 50 percent complete with 11 of the 16 stations under construction or nearly complete.

➔ [MassTransitmag.com/21234394](https://www.masstransitmag.com/21234394)

### IndyGo secures nearly \$81 million for Purple Line BRT project

► The Indianapolis Public Transportation Corporation (IndyGo) Purple Line Bus Rapid Transit (BRT) Project to connect downtown Indianapolis to the city of Lawrence secured an \$80.975-million grant from the Federal Transit Administration (FTA) through its Capital Investment Grants (CIG) Program. The \$162-million project includes 18 new stations on its 15.2-mile route that will serve some of the highest concentrations of low-income and zero-car households in central Indiana. The Purple Line BRT will replace an existing local bus route and serve a total of 31 stations, which includes 13 existing Red Line stations. Additionally, the service will utilize 5.3 miles of the Red Line and construct 9.9 miles of exclusive bus lanes. When the project opens for service, which is expected in July 2024, riders will board 15 60-foot electric buses at enhanced stations with real-time signage and ticket vending machines. Traffic signal priority will be installed at 30 intersections along the route. Accessing the route will be improved with 355 new or upgraded curb ramps and 9.5 miles of sidewalk infrastructure.

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## PEOPLE & PLACES

### People in the News

#### Blacksburg Transit (BT)



**Booth**

**Brian Booth has been selected to be the new director of BT.** Booth, a native of Hardy, Va., started his career as a bus operator and dispatcher while in college. After leaving BT in 2011, he stayed in the transit industry, assuming various leadership roles at New River Valley Community Services before becoming the manager overseeing all aspects of the transportation department, which included the operation of Radford Transit. In 2017, Booth became the general manager of the Greater Lynchburg Transit Company in Lynchburg, Va. His first day was Aug. 30.

➔ [MassTransitmag.com/21236277](https://www.MassTransitmag.com/21236277)

#### Pierce Transit



**Griffus**

**Mike Griffus has been selected by the Pierce Transit board of commissioners to be the agency's next CEO.** Griffus has served as Pierce Transit's chief operating officer since 2016, where he oversaw and managed daily agency operations, including bus and paratransit services, system support and emergency services. He was also responsible for safety and security across the system and negotiated the contracts for Pierce Transit to operate Sound Transit's express bus service, which accounts for more than 40 percent of the agency's bus operator positions. Griffus began his new role Aug. 10.

➔ [MassTransitmag.com/21233953](https://www.MassTransitmag.com/21233953)

#### Suburban Mobility Authority for Regional Transportation (SMART)



**Ferrell**

**Dwight Ferrell has been named general manager of SMART.** Ferrell is a transit executive with nearly 40 years of experience.

He most recently served as the CEO of Go Metro in Ohio, and has been active in national transit associations. Ferrell's first day was Sept. 20, 2021.

➔ [MassTransitmag.com/21234456](https://www.MassTransitmag.com/21234456)

#### Metropolitan Transportation Authority (MTA) Bus Company



**Annicaro**

**Frank Annicaro has assumed the role of acting president of the MTA Bus Company.**

Annicaro has more than three decades of

experience. He will double as acting senior vice president of New York City Transit's Department of Buses. Annicaro has spent the past 18 years working in bus operations. Annicaro has managed multiple new bus procurement contracts and warranties. He began his new position Aug. 26.

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# Make Digitalization Part of Your Rail and Transit STRATEGY

Advances in technology are helping operators of all sizes adopt predictive maintenance strategies using linear analytics.

By **Narinder Manku, contributor**

**T**HE WORLD'S POPULATION IS expected to rise to 10 billion people by 2050. The combination of a growing population and increased urbanization is placing a considerable strain on infrastructure. Rail and transit networks, in

tandem with roads and bridges, will be most affected because they are critical to mobility in cities and across the nation.

However, the latest innovations in linear analytics can help maintain infrastructure assets and

optimize maintenance decisions. It can also accelerate the return on investment in technology by leveraging rapidly deployed analytical and decision support tools that reduce risk and improve service, safety and long-term reliability.

## The New Normal

The effect that COVID-19 has on daily life can not be ignored. However, it has also created new opportunities and can be a business driver for change for the better. For many, working from home will become part of a better work-life balance, so communication and collaboration tools like Microsoft Teams, Zoom and Bentley's ProjectWise 365 are increasingly important.

"Now is the time to start reimagining our industry and how organizations can emerge in the next normal from a position of strength," said McKinsey & Company's article *How construction can emerge stronger after coronavirus* from May 2020. The article advocates for increased digitization, remote working and a greater reliance on building information modelling (BIM)—advancing to include 4D and 5D simulation to re-plan and reoptimize project schedules. The report also identifies digital twin solutions for providing current and ongoing feedback, as well as insight into the decision processes. The article authors believe that the case for digital tools proven to increase productivity will become even stronger, including increased use of off-site construction, where working in controlled environments makes it easier to keep people safe and improve quality.

These findings mirror the belief at Bentley Systems that advanced technologies can help users deliver improved business outcomes across the lifecycle of infrastructure assets. This improvement might be through smarter decisions that help tar-

get project investment, optimize design, save money or enhance safety. The bottom line, however, is that the decisions made today will impact lives tomorrow.

## Data-driven Decisions with Digital Twins

Change is not unfamiliar to the industry having seen the evolution of servers to cloud-based storage that support digital strategy. There has also been a shift from 2D to CAD and now to 5D, where BIM standards and processes deliver productivity and quality improvements.

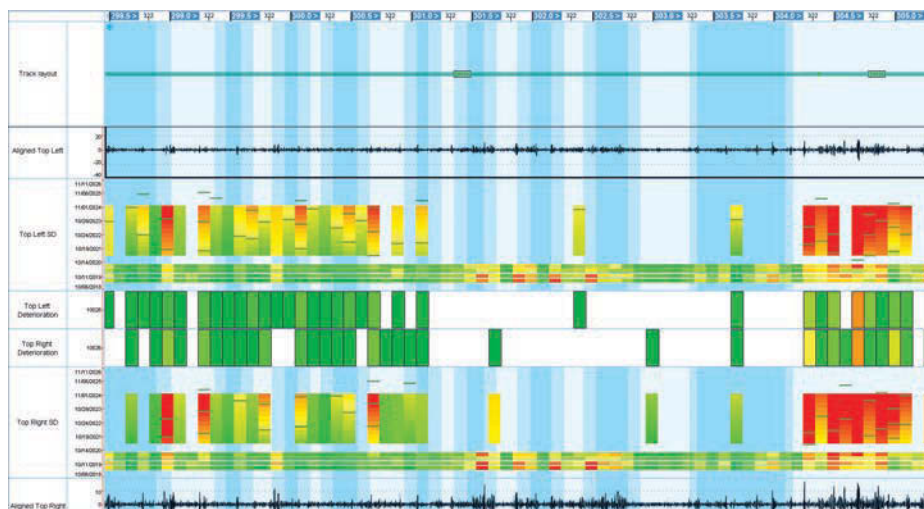
Moving beyond BIM—fueled by the increasing amounts of data that is collected, created and consumed in day-to-day tasks, and the volume of connected devices delivering so-called big data and

delivery of projects and throughout an asset's operational life.

Bentley's iTwin technology enables the federation of data and deliverables from engineering and design, with live or near real-time data streams from IoT-connected devices in operations to connect the physical asset in the real world with its digital counterpart: its digital twin.

## ASCE: America's Infrastructure Report Card

Every four years, the American Society of Civil Engineers (ASCE) publishes a report on America's infrastructure. The 2021 Report Card shows that the U.S. is not investing in "the backbone of our economy." It costs every American household US\$3,300 a year.



### RAIL CONDITION ANALYTICS:

Bentley's AssetWise rapidly deployed linear analytics solution helps to develop strategies using automated key condition score reporting and visibility into past maintenance activities.

the Internet of Things (IoT)—more decisions are made with the insight gained directly from data. It is why Bentley believes that infrastructure digital twins will be the next big digital disruption in the industry.

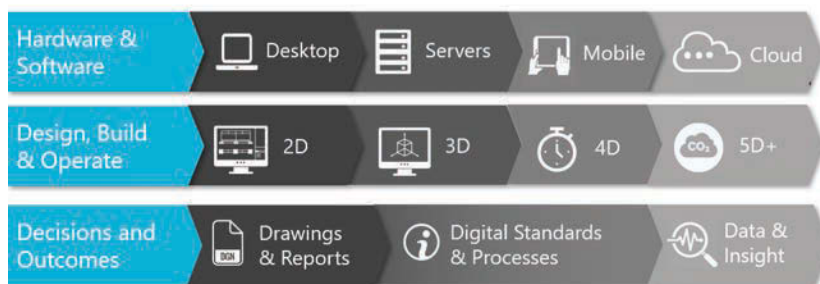
Digital twins are already enabling organizations to visually immerse their teams in the decision-making process and run advanced analytics to predict and produce different outcomes, as well as track and manage the change that can be seen across the

When multiplied by the roughly 132 million U.S. households predicted to exist at the end of 2021, it has a significant effect on the nation's economy.

The report scored rail and transit with grades B and D, respectively. The lack of federal support has led to the current rail state of good repair (SGR) backlog of US\$45.2 billion.

With transit, the situation is worse. Currently, there is a US\$176 billion transit SGR backlog, nearly four times as much as





**BENTLEY BELIEVES** Digital Twins will be the next big digital disruption in the industry.

rail, with the deficit expected to exceed US\$250 billion by 2029. Meanwhile, transit ridership is declining—a trend further compounded by COVID-19, which has seen some agencies experience a 70 percent drop in passenger numbers.

Failure to address the shortfall for passenger rail and transit only exacerbates the existing challenge of ridership decline, creating a downward spiral—unless a change is made and the future is reimaged.

## SMRT Trains: The Future of Rail and Transit

There is clear evidence within projects of Bentley users around the world that going digital, including the use of digital twins, is already enabling organizations to reimagine the future of rail and transit.

One such organization is SMRT Trains (SMRT). The first rail operator in Singapore, it operates and maintains more than 282 kilometers (175.2 miles) of track. With an average daily ridership of more than two million people in 2020, SMRT needed a method to keep the tracks in good condition to avoid delays.

System reliability is measured using mean kilometers between failure (MKBF). To improve reliability, SMRT set a target of one million MKBF for all its lines—the equivalent of traveling over the entire network thousands of times before seeing a service delay of five minutes or more. However, SMRT relied on intensive, time-consuming and manual maintenance planning using tens

of millions of data points per year across separate data silos.

To enable engineers to make optimized decisions using all relevant data, SMRT used Bentley's linear analytics as the basis of its predictive decision support system (PDSS). With the PDSS, engineers can visualize multiple datasets in one view to see different track sub-systems, enabling more in-depth engineering analysis. The system automatically pulled SMRT's existing data, allowing engineers to review the events leading to the current asset condition.

As of August 2019, SMRT achieved its one million MKBF target. Data correlation is twice as fast and with easy access to data, it has significantly streamlined multiple analyses. With prioritization implementation, SMRT cut hundreds of manual planning hours and saved about 20 maintenance train deployments annually. Engineers also have a better idea of work conditions, allowing improved preparation in advance and saving time on the site.

## Reimagine the New Normal

As the operator of a large and busy network, SMRT is using technology to work smarter and move forward to continuously improve its maintenance efficiency and effectiveness. But smaller networks—such as metros, short-lines and mass transit—face similar challenges, especially when it comes to ensuring the continued safe and reliable running of their networks. So, how can these organizations unlock the potential of their data?



**SOME AGENCIES** experienced a 70 percent drop in passenger numbers during the COVID-19 pandemic.

Historically, adopting predictive maintenance strategies using linear analytics has been out of reach due to the time and cost of deployment and configuration. However, recent advances in technology mean that owners and operators of all sizes can now improve maintenance and renewal decisions with minimal time and cost, achieving greater efficiency, easier regulatory compliance and enhanced operational performance.

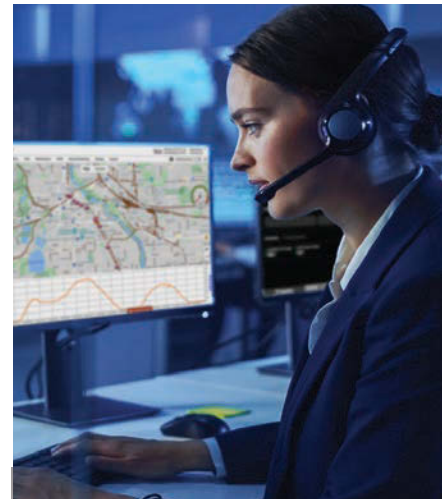
SMRT's experience serves as an example for other metros looking to a cloud-based solution that includes pre-configured data, import tools and linear analytics. Through a rapidly deployed solution, such as AssetWise Rail Condition Analytics, agencies can work smarter and develop proactive strategies using automated key condition score reporting and visibility into past maintenance activities. Engineers can predict and validate future decisions that help improve service, safety and reliability. These latest innovations in linear analytics let rail and transit owner-operators increase the value of their track maintenance activities, resources and budget by completing the right work, in the right place, at the right time to create a safer network for a better tomorrow. **MT**



**Narinder Manku** is Bentley Systems' solution marketing manager for Rail Asset Performance.

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# LYNX

## Primed for Post-Pandemic Acceleration

Central Florida's LYNX is ready to provide enhanced services to one of the fastest growing areas in the U.S. through ingenuity and coordination with its regional partners.

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

**C**ENTRAL FLORIDA CONJURES several images in the mind's eye – a family vacation, a convention, a specific mouse – but for those in the transit industry, it's the brightly colored buses, affectionately

referred to as the Skittles fleet, that may come to the forefront.

These buses represent a segment of the service options provided by the Central Florida Regional Transportation Authority



(LYNX), but they also provide a metaphor that public transport is a vibrant part of the region.

"LYNX has been a three-county agency that serves Orange, Seminole and Osceola coun-

ties since the 1970s," explained LYNX CEO Jim Harrison. "This region is one of the fastest growing areas in the nation. We're well over two million residents now and we serve a 2,500-square-mile

A LYNX bus waiting for a light at UCF's Dr. Phillips Academic Commons in downtown Orlando. Photo taken prior to COVID-19.

Photos by Ben Wade/LYNX



area. When you think about our annual visitor population, that increases the population count significantly and over 50 percent of our ridership occurs on routes serving the major tourist destinations like Disney and Universal, as well as others in the area.”

There is no hyperbole behind Harrison’s fastest growing area claim. Numbers released by the U.S. Census Bureau in August 2021 show the three-county area LYNX serves saw a population increase of more than 350,000 residents in the past decade. Seminole County’s population increased 11.4 percent, Orange County’s population increased 24.8 percent and Osceola County’s population increased 44.7 percent – making Osceola the tenth fastest growing county in the U.S.

While Central Florida’s economy is largely service based, the

University of Central Florida’s Institute for Economic Forecasting expects the sectors with the strongest average job growth between 2020-2023 to be financial activities; education and health services; trade, transportation and utilities; professional and business services; and construction.

The main takeaway: Central Florida is growing in population and adding a diverse array of jobs, which will only increase the need for reliable transit services.

Harrison explains LYNX has a long history of being an early adopter of trends in mobility, including the opening of the first bus rapid transit route in the U.S., the Lymmo Orange Line, which opened in 1997 and has since expanded to four routes. Additionally, LYNX’s NeighborLink was one of the earliest on-demand flex services de-



**LYNX OFFERS** various passes or the LYNX PawPass app to purchase fares; below, a LYNX driver behind an operator shield.



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signed to provide residents in less-populated areas access to local and regional transportation.

"What makes us stand out right now is that we're the only three-county transit agency that has experienced such unprecedented growth over the last decade and that growth, coupled with our funding challenges as a regional agency, has led us to be innovative in the way that we deliver our services," said Harrison.

The stated mission of LYNX is to provide its served community with "quality mobility options with innovation, integrity and teamwork." The third element, teamwork, is critical in execution of its mission and that extends to its regional planning and funding partners.

"Coordinated transportation planning is crucial to any successful project and certainly even

more so in a fast-growing region like this. We work very closely with our partners; we also coordinate very carefully with our regional funding partners in the cities that we serve so that we can make sure that we coordinate those services and facilities. But I think these relationships and working closely together is absolutely imperative as we navigate the fast moving, fast growing environment," said Harrison.

The Transit Development Plan, a needs-based evaluation required by the Florida Department of Transportation, is one document that offers LYNX and its regional partners a chance to coordinate on the changing mobility needs of the growing region.

"The annual update allows us an opportunity to show off all the stuff that we've done but the major update that occurs every five years

is an opportunity to take a look at how travel patterns have evolved, along with land development," explained Harrison. "We work very closely with our regional partners to see where we can make sure that we improve service and time the construction of our facilities."

LYNX will be starting the next update shortly and Harrison notes it will involve extensive outreach of the community to account for the impact of the COVID-19 pandemic.

The effects of the health crisis did not spare LYNX; ridership dropped, costs increased, but, through the challenges, service continued.

Prior to the pandemic, there was discussion of a sales tax initiative referendum to provide dedicated funding to LYNX and other transportation projects in the Orange County. The effort

## By the Numbers

Approximate service area of **2,500 square miles**

**More than 23 million** vehicle miles traveled in FY20

**17,832,104** passenger trips in FY20

Fleet size of more than **300** coaches

**Eight** battery-electric buses with **six more** slated for delivery by mid-2022


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proposed by Orange County Mayor Jerry Demings included a one-cent sales tax that would have generated an estimated \$596 million annually for transportation funding. The county suspended pursuit of the transportation sales tax referendum due to the uncertainty brought about by the pandemic. However, Mayor Demings committed to revisiting the referendum post pandemic with the possibility that it could be ready for a November 2022 vote.

“Dedicated funding would be an absolute game changer for LYNX and for transit in the Central Florida region in general,” said Harrison. “Transit is a core need for the success of the region. Not only do we serve the tourists, but we also provide essential service for the workers and LYNX provides an excellent service. I’m very proud of what we do, but, by

far, the most common concern we hear is about frequency and the only answer to that is funding.”

### Current Projects Delivered Through Partnerships

Harrison notes the financial assistance provided by the federal government through the three pandemic relief bills that included the transit industry has had a positive impact on LYNX’s ability to maintain operations through the pandemic and enhance the safety of workers and riders.

He explains LYNX created a stabilization fund with oversight of the agency’s board of directors to help stabilize and mitigate impacts of what is believed will be a prolonged economic downturn.

This has provided the budgetary balance needed to LYNX so it could continue with several long-



**TOP, SHELTER** being repainted on Link 6, below; newly renovated stop at Valencia College’s West Campus.



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**WILLIE**, A member of LYNX's facilities crew, uses a disinfectant sprayer in the LCS lobby.

planned improvements, such as its introduction of zero-emission buses and reconstruction of several superstops.

LYNX operates a mixed fleet of biodiesel, compressed natural gas (CNG) and battery-electric buses.

"Our goal is to move away from diesel to a low and no-emission fleet," said Harrison, noting LYNX began this initiative with the transition to CNG.

In April 2016, LYNX, as part of a public-private partnership with Nopetro, opened a six-acre CNG fueling facility capable of distributing 40 gallons per minute. Harrison describes the transition to CNG successful with about half of LYNX's current fleet comprised of CNG vehicles.

"We are now continuing that trend towards no-emission vehicles and converting our entire downtown circulator, the Lymmo

fleet, to electric," said Harrison. "We're working closely with the city of Orlando to utilize a public-public partnership to bring the strengths of various government agencies together."

In late October 2020, LYNX introduced the first battery-electric buses to its Lymmo routes in downtown Orlando. The goal is to transition the Lymmo service to a full zero-emission fleet by 2025.

Orlando Utility Commission (OUC), which is part of the public-public partnership, assisted in the procurement of the charging stations that were installed at LYNX's bus depot. The charging system is capable of fully charging LYNX's electric buses in three to four hours. While LYNX is gaining information about the real-world operation of electric buses, OUC says it is gaining information on battery



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## By the Numbers

**44.7%** change in population of  
Osceola County between 2010-2020\*

**More than 350,000** additional residents live in the  
three-county area served by LYNX since 2010\*

\*U.S. Census Bureau

performance, as well as how to mitigate demand charges.

Funding for the electric buses was provided through a \$1.9-million grant from the Federal Transit Administration's Low or No Emission Program, as well as \$850,000 in matching funds from the city and \$900,000 from OUC.

"We have eight electric buses running our downtown circulator right now and we have six more ordered, which will fill out our downtown Lymmo service," said Harrison. "The community has been very supportive and very accepting [of the electric vehicles] and, of great importance to me, so have our operator and maintenance team. I think that this transition has been very well received."

In addition to new vehicles, LYNX is focused on providing new and improved passenger amenities through a long-term program that includes shelter installations and superstop construction. These improvements include new benches, wayfinding signage, real-time information and other elements.

A large capital project currently underway is the rebuilding of the Rosemont Superstop, which is among the system's 10 busiest stops serving approximately 1,500 passengers each day. LYNX is partnering with the city on the project, which began in May, to improve the superstop by increasing the amount of onsite lighting, bringing the number of bus shelters with seating to 10 (up from four), improving pedestrian crossings and building larger bus bays that can accommodate LYNX's larger buses. Additionally, the superstop incorporates the city's Crime Prevention Through Environmental Design principles, which ensures a safe environment.

Harrison says construction is going well on the long-awaited project, which should take a total of four to five months to complete.

"We have a number of other significant projects out there, as well," said Harrison. "The Pine Hills Transit Center, we are in the final process of getting the permits and getting that out to bid and will probably award that project later this year."

The Pine Hills Transit Center is designed to be a new prototype for stations on LYNX's system.



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The multi-phase project will include construction of an eight-bay transfer center, real-time departure and arrival information, bicycle parking, safety and security improvements, integration with the Pine Hills Trail and a driver's lounge. The project has been under development with several community partners to ensure it promotes economic competitiveness, advances an equitable and performance-driven transit system, delivers seamless transportation services and enhances the customer experience.

Another major project, Harrison mentions, is the Florida Mall Transfer Center that is currently out to bid with a contract expected to be awarded soon. The project is another complete reconstruction of existing facilities and will include new amenities such as bus shelters and better ADA access.

"[These improvements are] certainly driven by LYNX's perception and communication with its customers and with regional partners," said Harrison. "It's a partnership."

## Looking to the Future

Future projects at LYNX will continue to be pursued and delivered using its proven strategies associated with innovation and collaboration.

One project involves coordination with the Central Florida Automated Vehicle Partnership and the city of Orlando to deploy a pilot program using automated vehicles along LYNX's Lymmo route in an area of central business district in downtown Orlando referred to as Creative Village.


"It's a pilot program to explore the use of automated shuttles and shared use ve-

hicles on kind of a limited circuit," explained Harrison. "We expect that this is going to serve as kind of a vehicle proving facility, as well as provide that important daily service."

Another project focused on improving transit service is the SR 436 Transit Corridor Study, one of several critical corridors in the region that LYNX has conducted studies to evaluate service enhancements, but movement forward for these projects hinges on funding.

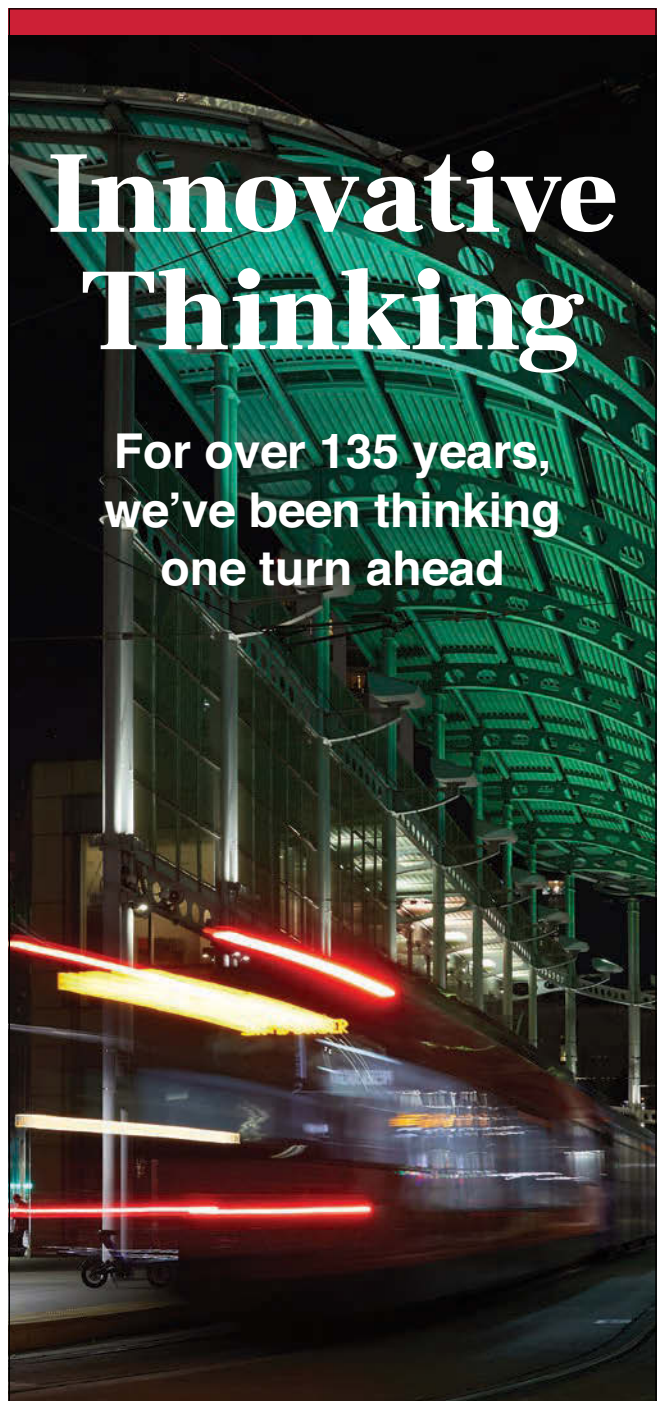
"Funding is really the key issue on the 436 study, as well as a number of other critical corners in the region, like the State Road 50 connection between our international airport and our convention center. These have been a focus for LYNX for a long time and they were part of the financial package that was proposed by Mayor Demings and his regional funding initiative. Unfortunately, the pandemic put those projects temporarily on hold and so right now, we're working to identify funding sources," said Harrison.

Through the uncertainty of the past year, LYNX has tapped into its legacy of innovation to continue to provide service within its community and find ways to enhance that service. The efforts, says Harrison, paints a future that, like the system's Skittles fleet, can be described as bright.

"As we continue to be one of the fastest growing regions in the nation, there's no question that transit in all of its forms is going to be a key component to the region's success; I think our futures is very, very bright," he said. 

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# How LiDAR is Making Roads Safer for Pedestrians and Cyclists

Smart cities are utilizing intelligent road management to make informed decisions on policies and infrastructure changes that will improve safety.

By **Gerald Becker, contributor**

**A**s populations have swelled and road traffic has increased in major metro areas throughout the world, keeping pedestrians and cyclists safe has become an increasingly important global public health concern. According to the Centers for Disease Control and Prevention, 3,700 people are fatally injured each day in traffic accidents around the world—a total of more than 1.35 million per year. More than half of these fatalities are pedestrians, motorcyclists and cyclists.

The most recent road safety report from the World Health Organization (WHO) notes that traffic injuries are now the leading cause of death globally for individuals between the ages of five and 29. The economic toll is massive. One study of 166 countries estimated that crash injuries will cost the world economy \$1.8 trillion dollars (in 2010 USD) from 2015-2030.

With more people and vehicles sharing the roads, intelligent road management and smarter traffic policies are critical to saving lives and building safer cities. To meet this growing need, smart cities around the world have begun implementing LiDAR to monitor traffic and collect critical data to inform policies and infrastructure



changes to protect pedestrian and cyclist safety.

## LiDAR-Based Traffic Intelligence: How it Works

Light Detection and Ranging (LiDAR) is a time-of-flight sensing technology that pulses low-power, eye-safe lasers and measures the time it takes for the laser to complete a round trip between the sensor and a target. The resulting data is used to generate 3D point cloud images, providing advanced 3D perception and situational awareness about the scanned area. This data is then analyzed with computer perception software to extract valuable insights and power real-time, data-driven decision-making.

Installed at roads and intersections, LiDAR sensors monitor and autonomously collect traffic data, including how and when people

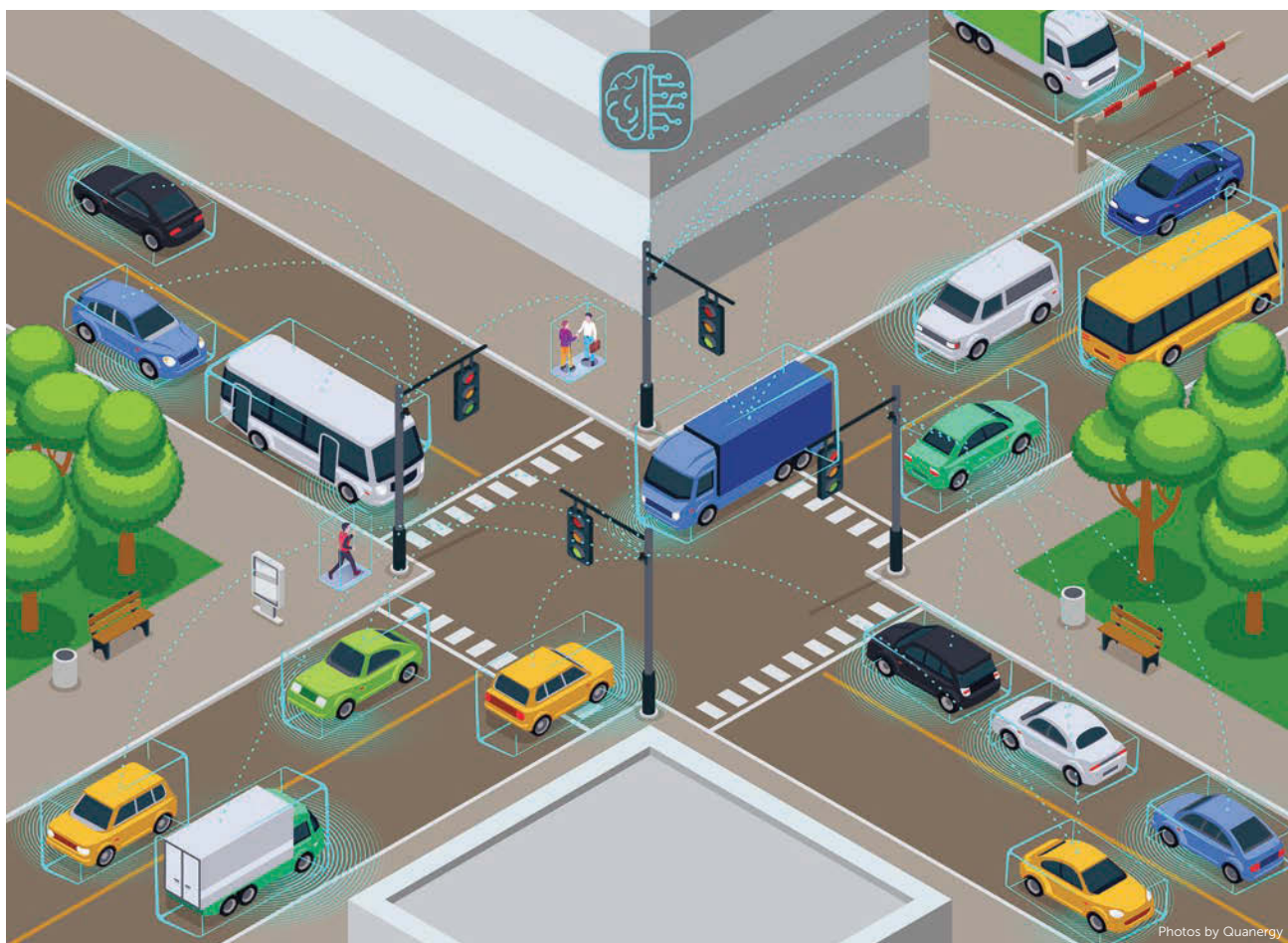
**A SIDE-BY-SIDE** of the monitoring system and the dashboard where data can be viewed.



and vehicles use this critical infrastructure. For example, the LiDAR sensors can identify and count pedestrians jaywalking, measure vehicle traffic volume, identify speeding vehicles and other hazards and much more.

This data can then be compared by time of day, day of the week, to identify patterns, predict safety hazards and ultimately inform transportation policies to improve pedestrian and cyclist safety. For example, data from LiDAR sensors is currently being used in cities to inform decisions and understand key metrics like:

- How many traffic lights should be installed, and where, to be most effective?
- How long should the pedestrian crossing time be?
- What hours and days of the week are experiencing the highest traffic and pose the highest safety risk?



• What are the most common factors that contribute to safety incidents? How can these factors be mitigated or eliminated?

In addition to driving policy and technology decisions, collected data can also be used in vehicle-to-everything (V2X) applications and delivered to both drivers and passengers to enable real-time decisions on the road.

## Five Benefits of LiDAR for Traffic Monitoring

Because LiDAR provides the most accurate and granular 3D data of any other technology, city officials can get a complete and detailed picture of what is happening on the roads—and derive actionable insights that have never been possible with cameras and other sensing technologies. The following are five advantages of LiDAR for intelligent traffic monitoring.

### 1. ACCURATE DATA IN ANY ENVIRONMENT

Accuracy is critical when lives are at stake. 3D LiDAR sensors provide greater than 95 percent detection accuracy and 24/7 reliability in all lighting and environmental conditions, including rain, snow, wind, dust, fog, bright sunlight and very low light. Because of this, LiDAR sensors are ideal for outdoor applications like monitoring traffic and cross walks.

### 2. ADVANCED 3D PERCEPTION

Some LiDAR sensors can capture hundreds of data points per second. The level of detail that LiDAR provides enables greater situational awareness than is possible with cameras or manual data collection. For example, with LiDAR, users can “see” all objects in a scanned area, identify

what it is (i.e., pedestrian, cyclist or vehicle) and precisely measure their location and the speed at which they are traveling. This makes it possible to capture a complete picture of traffic scenarios and accurately determine how to prevent safety incidents.

**INTELLIGENT ROAD** management and smarter traffic policies are critical to saving lives and building safer cities.

**With** more people and vehicles sharing the roads, intelligent road management and smarter traffic policies are critical to saving lives and building safer cities.

### 3. LOW TOTAL COST OF OWNERSHIP

LiDAR sensors provide a low total cost of ownership compared to alternative technologies. With 360-degree coverage, only a few



devices are required to monitor each traffic zone. With a few rugged devices to install and maintain, users can monitor traffic activity and collect critical data throughout the entire city for a comparably low cost.

#### 4. VERSATILE SENSING CAPABILITIES

LiDAR is a powerful and versatile technology that can handle the varied demands of traffic monitoring applications, from identifying vehicles at high speeds on the highways to visualizing people hidden in blind zones.

#### 5. ZERO PII RISK

Any application that tracks and monitors people's movement will inevitably raise privacy concerns. Fortunately, LiDAR doesn't capture or store any personally identifiable information (PII), protecting privacy and eliminating PII risk.

### Case Studies

3D LiDAR technology is already being used to protect pedestrian and cyclist safety around the world. For example, in 2012, South Korea held the second highest pedestrian death rate among OECD countries at 10.8 road fatalities per 100,000 people. Since then, the country has made considerable efforts to successfully lower these figures. After implementing these changes in 2017, South Korea recorded a lower number of pedestrian crashes than the preceding five years.

#### THE SMART CITY PROJECT - BUSAN, SOUTH KOREA

Busan, South Korea, is one of several pilot cities in South Korea's Smart City Project. The problem of road safety is a critical part of the country's larger initiative to build people- and future-oriented cities by leveraging technologies



**BUSAN, SOUTH KOREA**, one of the pilot cities in South Korea's Smarty City Project, implemented LiDAR for traffic monitoring.

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A Siemens advertisement featuring a blue and silver Amtrak train, number 605, traveling on tracks next to a body of water under a blue sky with clouds. The train is a Siemens Charger model, as indicated by the 'F ACS-44' marking on its side. The Siemens logo is in the top left corner.

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and innovations that improve citizens' safety and quality of life.

Prior to implementing LiDAR for traffic monitoring, Busan depended on manual data collection methods to understand traffic patterns and inform road policies. However, this process was prone to error and required staff

in the field to collect the information, expending valuable time for less-than-optimal results. In addition, the city had considered AI-based CCTV technology; however, CCTV could not provide the data reliability the city needed to handle such a critical application as pedestrian safety. The data city officials

were working with simply wasn't accurate enough to make informed decisions that could save lives.


The Smart City Project ultimately chose a 3D LiDAR solution to continuously monitor roads and intersections in Busan. With more accurate data, Busan was able to improve the effectiveness of its transportation policies. LiDAR also automated the data collection, eliminating the need for manual, error-prone data collection methods.

#### PEDESTRIAN CROSSING IN SCHOOL ZONES – SEOUL, SOUTH KOREA

School zones are a key area of concern in addressing the safety of a city's youngest pedestrians. In the local governmental district of Nowon-Gu in Seoul, South Korea, a LiDAR-based solution provided the data city officials needed to understand and mitigate the contributing factors in school zone accidents.

The sensors gathered extensive data about each school crossing zone, including patterns in vehicle traffic, vehicle speeds and pedestrian behavior. For example, the solution can accurately detect a person standing in a blind spot (i.e., behind a parked car), a situation that frequently contributes to pedestrian-involved accidents. The data from this deployment formed the basis for new and more effective traffic policies and helped city officials decide on the best technology to keep pedestrians and drivers safe.

#### Conclusion

The need for safer roads remains a pressing public health concern and a focal point for smart cities. By leveraging emerging IoT technologies like LiDAR, cities can better understand how to protect their citizens from harm on the road. 

Gerald Becker is vice president, market development and alliances, Quanergy Systems, Inc.

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# Get Ready for APTA's Big Event

APTA's TRANSform Conference and EXPO is proceeding as an in-person event this November in Orlando and promises to engage and inform attendees.

By **Mass Transit Staff Report**

**T**HE AMERICAN PUBLIC Transportation Association (APTA), as well as the North American transit industry, is preparing to travel to Orlando, Fla., this November to attend APTA's TRANSform Conference and EXPO.

The show, which will be held Nov. 7-10, 2021, is typically held every three years. However, the spread of the COVID-19 pandemic caused the event to be rescheduled and moved from Anaheim, Calif., to the Orange County Convention Center (OCCC) in Orlando. OCCC is the second largest convention facility in North America and has hosted more than 100 con-

ventions, trade shows, meetings and other events since the onset of the pandemic. OCCC received its Global Biorisk Advisory Council® (GBAC) STAR™ accreditation in July 2020, which is considered the gold standard of reduced biorisk situations.

When APTA announced the show's move to Orlando in April 2021, the association noted Orlando and OCCC's success in hosting large conventions and tradeshow, as well as the surrounding hotels' ability to safely handle large groups.

Safety of attendees is a focus of the show and the association recognizes the spread of the delta



**THE LAST APTA EXPO** was held in Atlanta in 2017.

variant adds a new element of concern. APTA reports it is "working diligently to provide the safest experience possible for all those participating." Its Safety First policy will include proof of vaccination from attendees or a negative COVID-19 test within 72 hours of the event start date; proper mask use; using floor decals to encourage six feet of physical distance, as well as offering contactless badge pick-up and hand sanitizing stations throughout the convention center.

Registration for the event is open and, while there is a fee to attend the TRANSform Conference, attending the exhibit is free. The show floor will feature more than 725 suppliers across three halls. The show floor will also feature



**OCCC'S WEST Building** will host APTA's TRANSform Conference and EXPO, Nov. 7-10, 2021.



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four Learning Zones. The four themed Learning Zones include:

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- **Procurement Learning Zone** will help attendees determine strategies for effective procurements.
- **Hot Topics Learning Zone** will showcase the latest developments, projects, current and emerging trends from the U.S. and around the world.

APTA TRANSform Conference attendees will have three

full days of education sessions that APTA says “will provide ideas, insights and connections” as transit professionals manage the changing environment.

The APTA TRANSform Conference will include two powerful keynote speakers meant to inspire and leave attendees empowered.

Dr. Cady Coleman will deliver the opening keynote on Monday, Nov. 8, and Jeff Henderson will deliver the general session keynote on Wednesday, Nov. 10.

Dr. Coleman is a former NASA astronaut and Air Force colonel who has spent more than 180 days in space during two shuttle missions and a six-month expedition to the International Space Station, where she acted as the lead robotics and lead science officer.

She also served in a variety of Earth-bound roles with the Astronaut Office at NASA, including chief of robotics, lead for tile repair efforts after the Columbia accident and lead astronaut for integration with NASA’s commercial partners, which includes SpaceX. Her work is credited with paving the way for commercial spaceflight collaborations.

Dr. Coleman is a vocal advocate for inclusion in STEM/STEAM fields, serves as the Global Explorer in Residence at Arizona State University and is also a research affiliate at the MIT Media Lab.


Her keynote will draw from her time at NASA and in extreme “remote work” situations to discuss team building, leadership and innovation.

Jeff Henderson is a bestselling author, philanthropist, TV personality and leader in personal and professional development. He is also an award-winning American chef, which is how many around the world know him.

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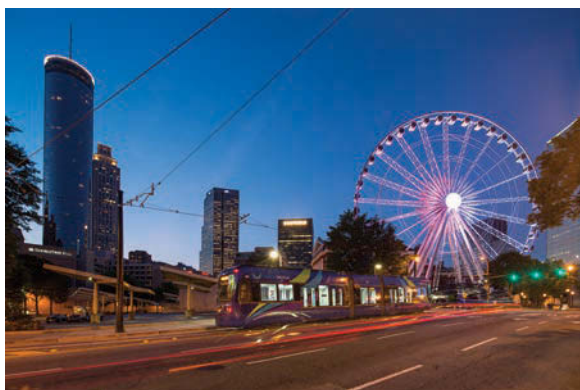
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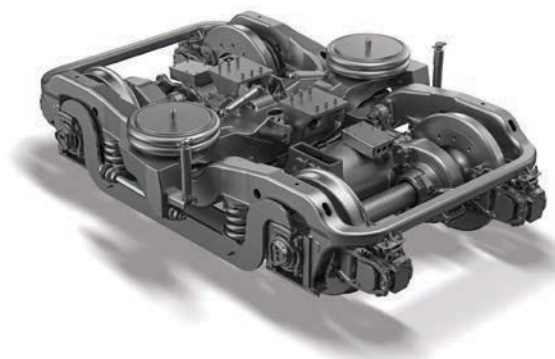
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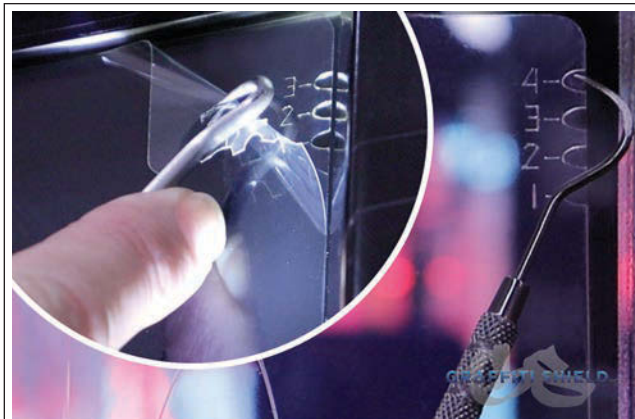


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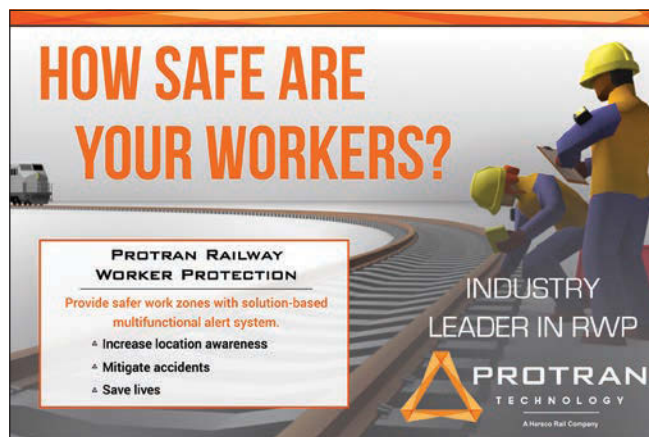
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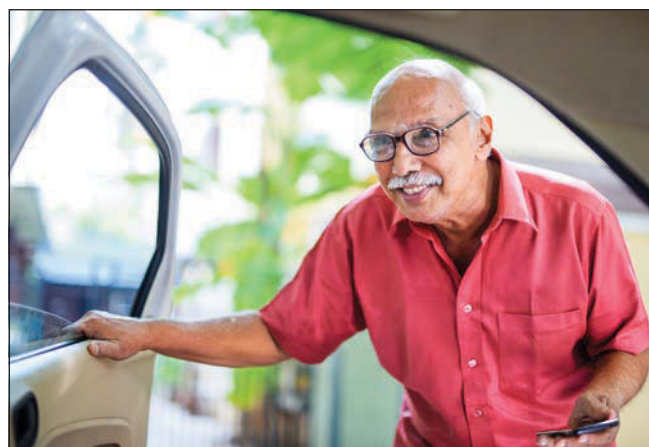
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# A 21st Century Approach to Fare Collection

Contactless fare payment technology, such as mobile ticketing, gives transit agencies a future-proof solution that provides more flexibility and a more convenient, equitable customer experience.

By **Megan Perrero**, assistant editor



**T**HE PANDEMIC HAS ALREADY highlighted how contactless fare payment technology can contribute to a cleaner and safer environment. However, the technology offers transit agencies a host of other benefits, including access to more accurate data, streamlined boardings, simplified fare structures and a more flexible and future-proof solution.

“The realization was that mobile ticketing was the technology we really needed to embrace. At the time, this is going back four or five years ago, where we thought that it was way advanced for what we needed. With every year that passed, we realized how much we needed [it]” said Cory Shrigley, customer support and engagement manager, Saskatoon Transit.

**DTS' HOLO** card can be used on the fixed-route bus system, with plans to expand the card to the paratransit service and municipal parking.

## Saskatoon Transit's TGO Creates Opportunities for New Fare Products

As Saskatoon Transit's fareboxes reached the end of their useful life, the agency was going to simultaneously think about new solutions while conducting a fare review with the public.

“COVID affected that a lot,” said Tracey Davis, Access Transit manager, Saskatoon Transit.

Since the pandemic affected public outreach for the fare review, Saskatoon Transit launched its new fare payment system in phases instead of rolling out as a complete package with new fare products. The first phase introduced the TGO mobile app, which was rolled out June 2021, a little more than a year after the agency had awarded a contract to work with Masabi on the new technology.

“The first phase was always to get that TGO mobile app up and running and get it into the hands of our riders,” Davis explained.

The app offers customers a mobile ticketing option, which was also integrated into Transit, thanks to Masabi's partnership with the app company. Also included in the first phase was integrating the local university's U-Passes as a mobile ticketing option.

The second phase will focus on expanding partnerships to businesses, high schools and a social service program to integrate their respective passes into the mobile ticketing platform as well. Riders will also be able to add transit value at partner vendor locations or via the web platform.

In addition to more partnerships, the next phase will involve launching account-based ticketing and offering a new smart card. This will be contingent on when thorough public engagement can be completed for the fare review and when the agency is able to present recommendations to the city council.

“The flexibility of contactless solutions and account-based

solutions are opportunities to inspect fare policy and fare equity decisions, especially as a way to respond to riders coming back to public transportation,” said Sara Poulton, head of services, Masabi.

While these modernized products will benefit many riders, Saskatoon Transit emphasizes it will maintain onboard cash payments. But something that could benefit everyone is the fare capping feature that could be rolled out in a later phase.

“That will be tied to the fare review, which will be about an eight-month public engagement where we’ll meet with the public and do a complete review of our fare products and pricing,” Shrigley explained. “Then that will prepare us for setting some new fare rates and open the door for fare capping.”

Along with the possibility of new fare products, the new fare payment system also provides Saskatoon Transit with more accurate, real-time data, informing the agency to make better decisions such as providing better services or offering the right fare products. Part of this means making it easier for people to access the products they need.

“We envisioned [the new fare payment system] to create new partnerships with leisure services with other city departments, where we could see perhaps a loyalty card or some sort of a package that will involve a transit pass. The door is opening for us to make a transit pass more readily available to everyone in the city,” Davis said.

## To Travel Seamlessly and Conveniently with HOLO

The Department of Transportation Services (DTS) for the city and county of Honolulu recently eliminated all paper passes as it completed its transition to the HOLO card. HOLO, a Hawaiian word meaning to travel, is an



**“Getting** key user groups involved in the transition helps build the grassroots confidence in the new [fare] solution.”

**-SARA POULTON,**  
head of services,  
Masabi

account-based ticketing system with a smart card where information is stored on a central system. For now, the card can be used on the fixed-route bus system.

“We also plan the HOLO card to be a strategic card for Honolulu. We are committed to trying to ultimately expand into parking and a few other things that are related to public transportation,” said J. Roger Morton, director, DTS.

There are also hopes to expand the system to the paratransit service, as well as the fixed guideway rail system that is expected to open in 2022, creating seamless transfers between transportation modes. The rail system will only be accessible with the HOLO card, which fueled the timeline and decision to eliminate paper passes and rollout HOLO cards to different groups of customers.

For example, DTS has been transitioning its reduced-fare

senior cards and fixed-route disability cards to HOLO cards over the past two years, and a new HOLO card will come July 1, 2022, since the city council approved a new low-income fare.

The HOLO card can also be issued as payroll deductions or subsidized cards by HR departments via a website for local government agencies and businesses.

“HR [departments] in these organizations can manage those cards themselves. We see it as another area where we can make continued inroads. We’ve got most of the major employers, the hotels, the banks, the hospitals, but we haven’t got them all,” Morton said.

More convenient fare offerings are just one benefit. DTS has also implemented fare capping for its daily and monthly passes, as well as reinstating free transfers, which had been eliminated due to complexities of paper passes.

The new HOLO system has been embraced by bus operators since it is a much simpler fare structure.

“Prior to this, we had probably about 35 different fare instruments that drivers had to keep track of. And now, they don’t have to worry about that little obscure type of fare that they only see once a year or something like that,” Morton said.

Ultimately, Morton says his goal is for the system is to go completely cashless, but he notes this is years away and would require

**PRIOR TO** eliminating paper passes, DTS displayed messages on its bus head signs and provided onboard audio announcements.





**SASKATOON TRANSIT'S** TGO mobile app offers customers a mobile ticketing option, which is also available in Transit, through a partnership with Masabi.

overcoming several barriers. For now, a more attainable expansion would be to turn on open payments. This would allow riders to tap-to-pay with contactless credit and debit cards instead of using the HOLO card.

"We're looking at doing that and particularly in our visitor markets with our tourists. If we

can figure out a way that they don't have to obtain a card and they can directly use a credit card, we'll probably make more money that way. And we'll make it more convenient for the customers as well," Morton said.

### NJ Transit Pilot Leads to Streamlined Boarding

Michael Kilcoyne, senior vice president of surface transit for New Jersey Transit (NJ Transit), says he and his team developed the idea of using off-board fare collection at the Port Authority of New York and New Jersey (Port Authority) Bus Terminal for Route No. 126 during weeknight evening peaks to help improve the customer experience by generating more consistent and timely bus service, as well as eliminating large queues of passengers.

"Because of that high volume of traffic in that very constrained environment, the ability to land a bus on a platform when you have five-to-seven-minute departures off the same platform is difficult and really can be enhanced by loading a bus quicker," Kilcoyne explained.

Right now, Kilcoyne says it typically takes more than three minutes to load a full bus of passengers. On top of that, customers may sometimes have to wait for two buses to come through before they can finally board.

"So, the concept of having customers pay their fare while they're waiting for the bus to arrive [is] certainly something that seems to make sense because our focus has been on increasing the throughput through the terminal without adding buses," Kilcoyne said.



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Instead of more buses, NJ Transit is using articulated buses for several bus routes. With this increased capacity and off-board fare collection, boarding times can be cut in half. For example, during a recent Friday there was an incident in the Lincoln Tunnel, delaying some buses' arrival. When the bus arrived, it took one minute and 15 seconds to board a full bus. Comparatively, it took two minutes and 22 seconds to do the same thing on Route 128 in the traditional boarding manner.

"One of the next phases of the pilot is to adjust the doors on the gates at the Port Authority Bus Terminal, so that customers can access both the front and rear door when they board, which will decrease that boarding time even more," Kilcoyne said.

Kilcoyne adds the agency is finding the pilot to be successful,

with the expectation to expand this to other routes that have similar constrained timeframes with large numbers of passengers.

"There are probably 10 other routes that we are interested in pursuing. A lot of the timing of that will fall on post COVID-19 ridership levels. So, it's obvious the benefit, but to really see the impact to the queues in the terminal we need to see those post pandemic numbers rise before we start to expand the project," Kilcoyne said.

### Conclusion

Whether it's a new app with mobile ticketing, account-based smart cards or a new way to collect payment, the opportunities for fare collection seem endless.

"There are so many benefits when transforming to digital experience with more ways to



provide digital ticketing, whether through an agency mobile app, through retail networks or through other applications like ride-share or trip planners. Getting key user groups involved in the transition process helps build the grass roots confidence in the new solution," concluded Poulton. **MT**

**NJ TRANSIT** staff validate bus fares prior to riders boarding the bus at the Port Authority Bus Terminal, which has cut boarding times in half.



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# How drivers can de-escalate stressful situations with passengers

The secret is engaging the neocortex, also known as our ‘thinking brain.’



**By Russ Turner**

Director,  
People Incorporated Training Institute

**EAGAN, MINN** • People are stressed; many have trauma and mental illness and some are experiencing homelessness. As these folks board your bus or train, your employees can quickly create connection and a friendly environment to keep things safe.

Our brains take in countless messages every minute throughout the day. Messages come in many forms – a funny look here,

a comment someone makes there or a request to wear a mask. Many of these messages elicit a stress response in the survival parts of our brain. Each time the stress response is turned on, stress hormones are pumped into our bloodstream preparing us for action and response to the “threat.” This puts us in a bind, because many of our physiological responses to threats – increased blood pressure and heart rate, for example – are almost certain to escalate a situation on the bus.

To keep things safe and calm, we need to get into our neo-cortex – or “thinking brain” – which works quite slowly, but is reliable; allowing us to pause, consider and figure out what to do, rather than irrationally reacting. Keeping things calm is often referred to as de-escalation and what it usually entails is connecting with the person in some way that is non-conflictual to get their thinking brain involved.

At the People Incorporated Training Institute, a leading mental health and trauma education organization where I serve as director, we offer courses that cover a variety of tools to quickly help manage stressful situations in a variety of workplaces and settings, including public transit. For example, our training project with Metro Transit in Minneapolis in 2020 and 2021 covered a variety of tools to quickly help manage a stressful situation. We teach transit drivers to respond carefully in tense situations with the following advice:

- Take a moment to do a quick assessment of your mood and sense your surroundings. If you feel some tension, **breathe** in slowly and mindfully to exhale any tightness.
- Even though you may be wearing a mask, smile and make a connection with **eye contact**.
- Although it doesn’t sound like much, a **pause** is an important tool because it gives you a chance to stop and think about the next best thing to say or do. As you pause to observe, aim to **listen** and thoughtfully respond instead of reacting with defensiveness or judgement. Listening to understand will help keep a situation calm and avoid misunderstandings. The tool of active listening helps **reflect** and validate what we’re hearing to build rapport and mutual respect. Reflecting a simple validation like, “it sounds like you’re having a rough day,” or “it’s a lot to deal with,” shows you understand what the other person is saying.
- When people are emotional, instead of telling them to “calm down,” tell them you can see they’re upset and **ask** them what they need. A little human kindness or compassion goes a long way with a simple show of concern like “how’s it going?” or “what do you need?” These connecting questions are a tool to switch on the person’s thinking brain. In a way, the content of the question is not that important, it’s just a connector.
- Using a respectful “**please**” when asking for cooperation can keep a tense situation from escalating. Modeling that common courtesy shows we are professionals and deserve respect in return.

Using tools, like those outlined above, will help reduce tension in situations and create the non-threatening environment human brains are looking for, even if they don’t know it. **MT**

Each time the stress response is turned on, stress hormones are pumped into our bloodstream preparing us for action and response to the “threat.”

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# In Focus: Maintenance

## Arva Industries 3-Ton Hybrid Railbound Crane

Arva Industries' three-ton hybrid railbound crane can travel the length of the chassis with 360-degree operation. Arva was contracted by New York City Transit to provide this product. The first delivery is expected in July 2022, after which approximately one new crane car will be delivered per month. The cars were purchased to support all critical track work in support of the Metropolitan Transportation Authority's Capital Program and maintenance throughout the subway system.

➔ [www.arvaindustries.com](http://www.arvaindustries.com)

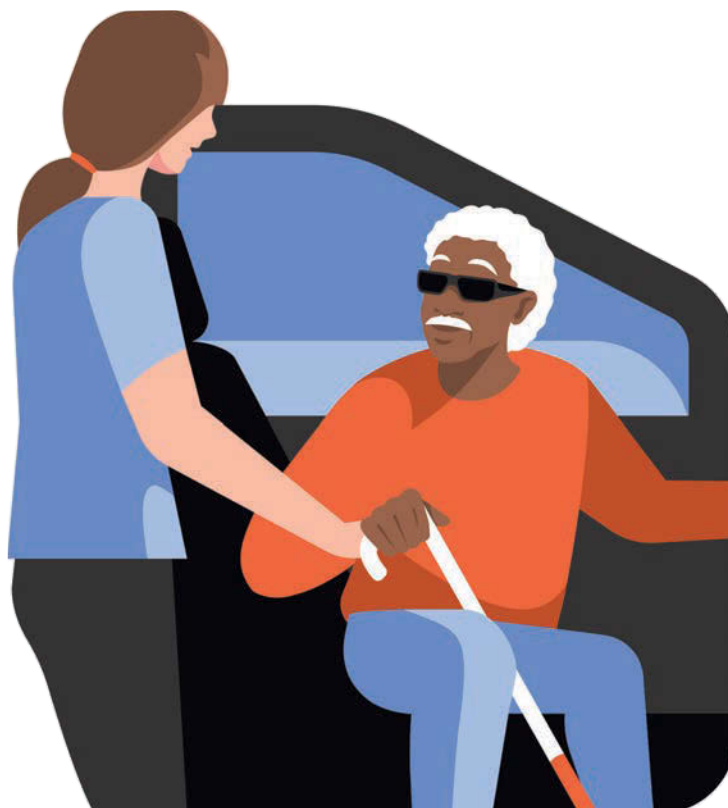


## Loram Maintenance of Way, Inc. MHC60

Loram's MHC60 material handling car is the newest addition to its line of ballast maintenance equipment. The MHC60's name comes from its 60-cubic-yard hopper capacity. The MHC60 exceeds the industry standard throughput by up to 30 percent and can discharge material up to 20 percent further to either side of the track centerline in comparison to other material handling cars in the market. The machine is designed to operate around electrified track and includes an enclosed cab for safe and comfortable control of the machine. Loram has secured multiple orders from transit customers for maintenance projects involving transferring and off-loading of ballast and spoils.

➔ [www.Loram.com](http://www.Loram.com)

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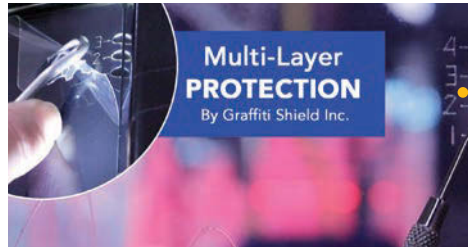
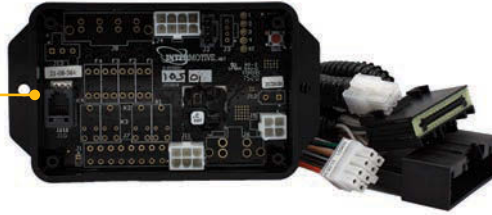


## PRODUCTS

### InterMotive Vehicle Controls Pre-Trip Module

Pre-Trip Module makes bus inspections a quick one-person job with an automatic rotating cycle of exterior lights, including brake and reverse. The repeating cycle and timer are customizable and make it easy to check if lights are working properly. The system also includes a function to provide vehicle data via Bluetooth-enabled devices, so the user can send reports on vehicle status. For added vehicle security, Pre-Trip Module includes an optional shift lock function, allowing the transmission to be locked in park while the system is engaged (available on select chassis).

➔ [www.InterMotive.net](http://www.InterMotive.net)



### Graffiti Shield Glass Shield Multi-Layer Film

The Glass Shield Multi-Layer Film provides four layers of protection against graffiti and vandalism. The peel point system allows each layer to be removed quickly and easily, removing each damaged layer to reveal a clean surface. Glass Shield Multi-Layer offers a onetime install while providing four layers of protection before another installation is required.

➔ [www.graffiti-shield.com](http://www.graffiti-shield.com)



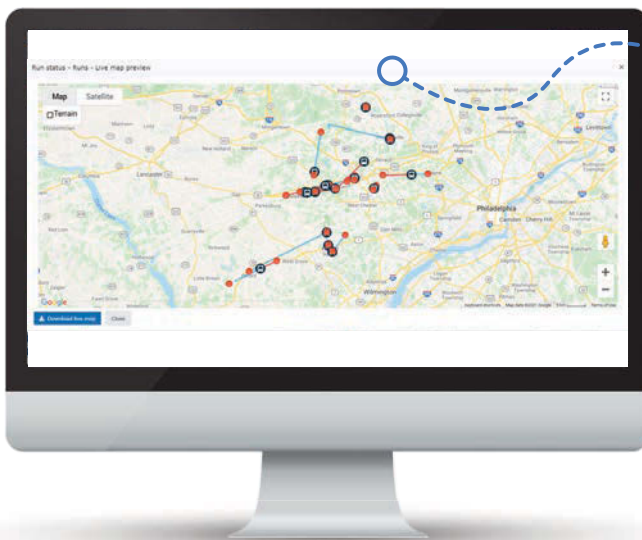
### Cortec® Corporation VpCI-330

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# Transit Schedulers - They Get No Respect

Creating a schedule will move people between two points, but the complexity occurs when balancing the need for efficiency with customer needs.



**Ed Dornheim**  
Transit Schedule Maker/  
Consultant

**RECENTLY MET WITH A FORMER COL-**league who I have not seen since the pandemic began. When we got around to discussing the *Mass Transit* scheduling articles, his quick response was, “Is it really all that complicated; how hard can it be to make a schedule?” Then a little over an hour and a half later I heard that sentiment echoed again by another colleague when she mentioned that her husband made a similar comment as she prepared a new signup. I (unintentionally) answered those questions for my wife when she joined me at the Canadian Urban Transit Association scheduling course in 2016. At the end of the course, she admittedly understood why I went crazy for a period of about a month and a half at least three times a year (the rest of the year I really can’t defend myself).

While repeating this ad nauseum; from friends and loved ones up to some top executives, transit scheduling is more complicated and misunderstood than anyone realizes. During an interview with a software company a couple of years ago, one interviewer actually asked if I was up to the challenge of working for a change. Good schedulers make it look easy by finding ways to make the schedule work no matter the assignment. In its simplest form we want to move the



A poll posted on LinkedIn by Transport Toolkit in Australia asked whether schedulers and planners would prioritize service or efficiency. The question posted was, “Schedulers often have to make a choice to reduce run times to get a trip link that saves a peak bus but cause some late running. What would you do? [sic]”

- Efficiency, save a peak bus?
- Customer, leave as is?

The survey didn’t offer any context and required a gut reaction. Of the 19 respondents, 42 percent would save a peak bus, while 58 percent favored the customer’s needs. This demonstrates how complicated this business can be with huge impacts on the agency and riders we serve. What happens if a scheduler does not fully comprehend the agency’s operating framework, and more importantly, can they create the types of schedules required?

There are consultants and schedulers who are great technicians and can save your agency money on the front end but can cost you more with customer and driver dissatisfaction on the back end. Other schedulers massage the schedule on the front end with the hope of better overall results, including bigger savings.

The larger question is, does anyone in your agency other than the scheduler really understand how they create the items that become the driving force behind your agency? My wager is that most agencies do not know or realize what the scheduler is doing until there is a problem, and even then, you might not recognize or comprehend the real root cause. Is it really all that complicated? How hard can it be? **MT**



**Craig Dunn**, director, transport integration for Transport for NSW in Sydney, Australia, co-authored this column.

**Is there anyone out there who wants to do a backflip on a balance beam because a gymnast made it look easy?**

customer between points A and B. It gets complicated when compounded with agreements, spread time, passenger and driver satisfaction, etc. Is there anyone out there who wants to do a backflip on a balance beam because a gymnast made it look easy?

In my world, scheduling the needs of the customer exceed all other concerns and should be the driving force behind any schedule. I believe if you do right by the customer, the agency will benefit, but not everyone shares my opinion as demonstrated in the following survey.



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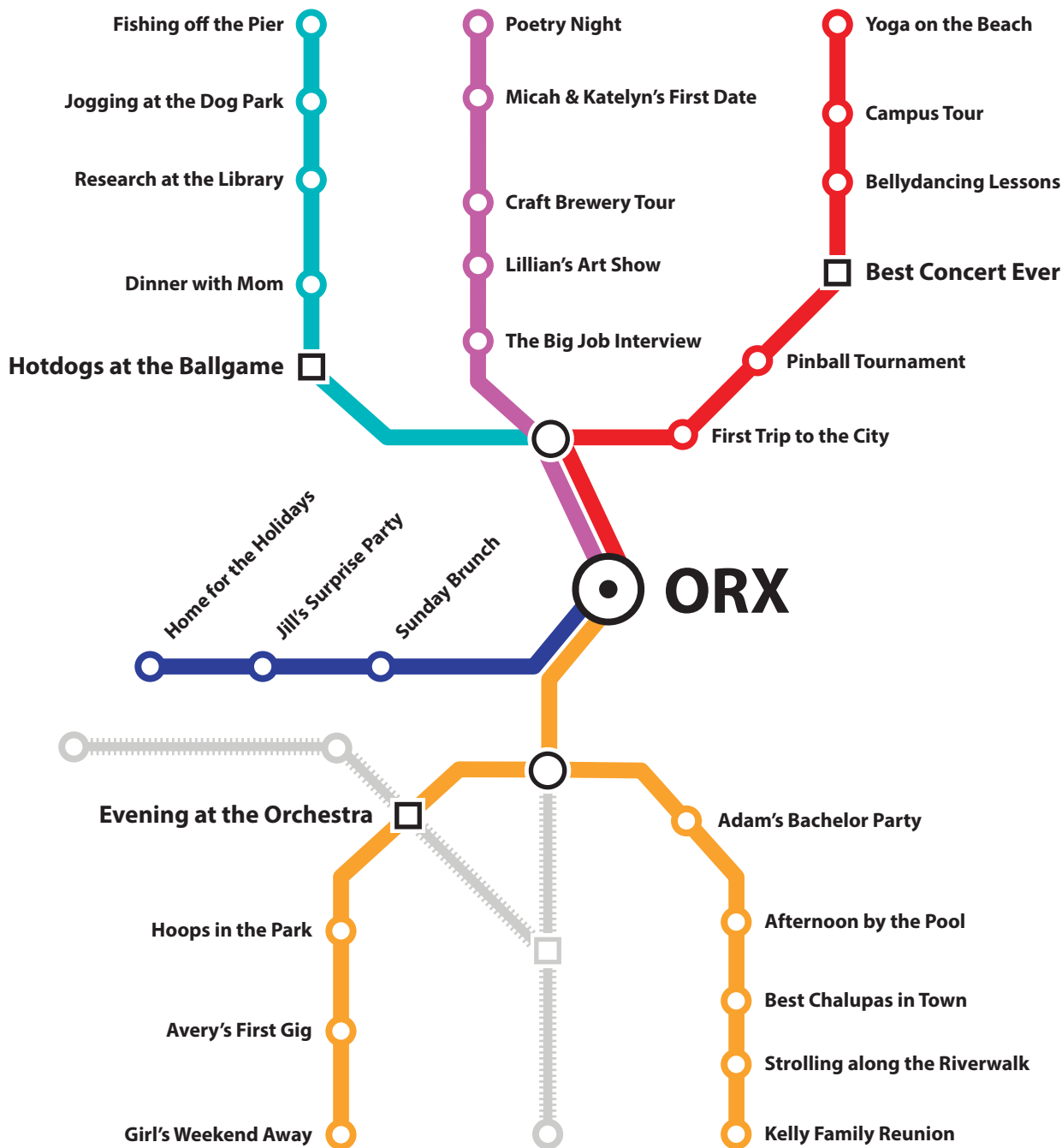


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