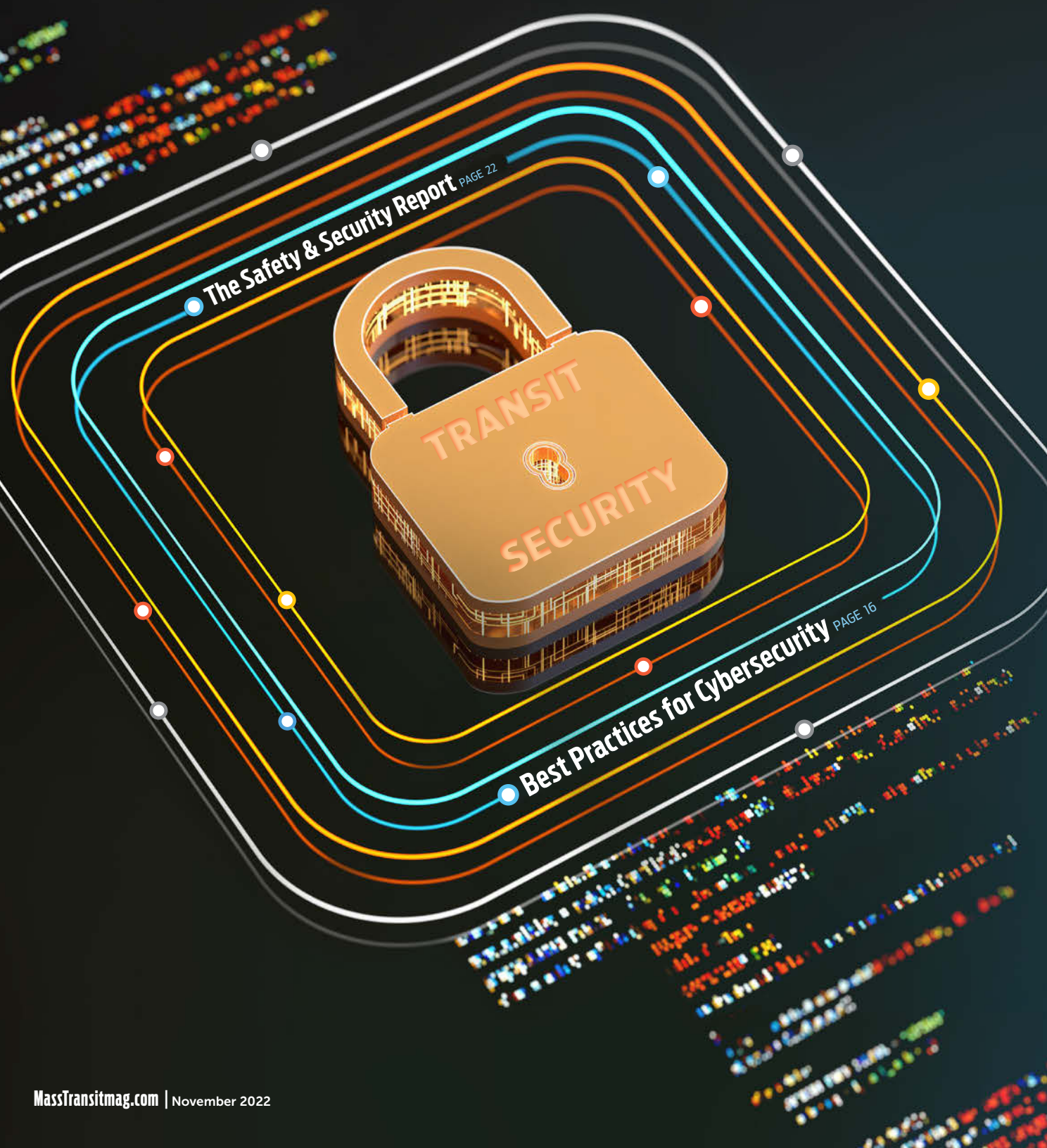# MASS TRANSIT

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▶ ONLINE EXCLUSIVES

Supplier consolidation is key to managing lingering supply chain challenges

▶ Market challenges, such as labor shortages and rising freight and materials costs, also offer an opportunity for OEMs to benefit from consolidating their supplier bases.

↪ MassTransitmag.com/21286916

Enhancing security at mass transit hubs with radio frequency technology

▶ Radio waves target objects rather than people and can alert the appropriate authorities to any potential threats, enhancing public safety without making passengers feel "watched."

↪ MassTransitmag.com/21286917

Advertiser's Index

Transit's story in communities

Of the five questions to answer in a story – who, what, where, when and why – effectively sharing "why" helps an audience understand motivation behind an action.

f you attended the American Public Transportation Association (APTA) TRANS-form Conference this past October in Seattle or have read recent communication from APTA, you are aware of the focus and encouragement from the association to tell transit's story.

APTA noted the historic investment included in the Infrastructure Investment and Jobs Act, coupled with high expectations of the industry, will require sharing transit's positive impact on communities and will be critical to the industry's future success.

The 2022 midterm election in early November is another reminder of why sharing transit's impact within communities is important.

The 2022 election was another success for transit ballot initiatives across the United States. In a round of up of results, the APTA reports voters approved 14 of the 19 transit measures put before them.

The measures passed are in addition to the 15 that have already been passed by voters in 2022, bringing the total to 29 out of 36 wins for transit, which APTA says is an 80.56 percent win rate and represents billions in transit investment.

Among the measures approved in November are a tax on high income earners in Massachusetts, with a portion of the revenues supporting transit investments, a more than $52 million bond in Arlington County, Va., where transit will benefit from the funds and various millage renewals in Michigan.

These measures could not have been successful without an effective storytelling strategy, and with final results of key U.S. House of Representatives races still being tallied as of this writing, there is yet another reminder of why it's important to share the industry's successes.

Congress currently has 69 freshman members in the House and nine in the Senate. The 118th Congress, set to commence in January 2023, is expected to have an equivalent number of new members. These elected officials will shape policies impacting transit, as well as influence how much the federal government will invest in this industry.

It's time to showcase what and how agencies deliver services and why they deliver these services.

I'm reminded of an event when I worked in the rail industry where a freshman U.S. Representative toured a facility of a manufacturer in Iowa. The U.S. Representative was touting the business diversity within his district and noted he learned about a new business nearly every day, pointing to the manufacturer's product and exclaiming, "I didn't even know this was here!"

Now is the time to let them know you are here.

It's time to showcase what and how agencies deliver services, and why they deliver these services. When it comes to communication basics of who, what, where, when and why, I would argue answering "why" is the most important to creating a meaningful connection to a message. It gives a target a chance to understand what you're doing, as well as the motivation and drive behind an action.

Mischa Wanek-Libman, editor in chief

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PEOPLE & PLACES

THE SUNRUNNER BRT started service on Oct. 21, 2022.

Strong debut for PSTA's SunRunner BRT

Pinellas Suncoast Transit Authority (PSTA) began service on its SunRunner bus rapid transit (BRT) route on Friday, Oct. 21. The 10.3-mile line is Tampa Bay's first BRT and connects St. Pete Beach to St. Petersburg, Fla. The service, which will be free for the first six months of operation, surpassed 10,000 riders in its first four days of operation. The SunRunner features semi-dedicated lanes, limited stops and safety enhancements for riders including level boarding platforms and crosswalks. The route is operated with hybrid vehicles with service every 15 minutes during the day and every 30 minutes between 8 p.m. and midnight.

➲ MassTransitmag.com/21285031

2022 election results:
Voters support 14 out of 19 transit ballot initiatives

▶ The November 2022 midterm election in the United States saw voters approve 14 of the 19 transit measures put before them in communities across the country. Among the measures approved are a tax on high income earners in Massachusetts with a portion of the revenues supporting transit investments, a more than $52-million bond in Arlington County, Va., where transit will benefit from the funds and various millage renewals in Michigan. The measures passed add to the 15 that have already been passed by voters in 2022; bringing the total to 29 out of 36 wins for transit, which is an 80.56 percent win rate and represents billions in transit investment. The results

add to a string of historic years for transit at the ballot box, with more than 85 percent of measures winning for public transit from 2017 to 2022. At a time when the federal government is more committed than ever to funding transit and infrastructure, APTA says voters agree and are putting their money where their mouth is to provide a local match.

"Voters support transit at the ballot box because it can transform a community and create pathways to a more equitable and accessible future," said Josh Cohen, executive director of APTA's Center for Transportation Excellence. "While some of the larger measures suffered a setback, the results from the 2022 elections reflect a years-long trend toward greater investment."

➲ MassTransitmag.com/21286633

CTA partners with Olive-Harvey College on free CLP course

▶ Chicago Transit Authority launched a partnership with Olive-Harvey College that will offer a free preparatory course that will help candidates in meeting the hiring requirement of obtaining a commercial learner's permit (CLP). A CLP is needed to obtain a commercial driver's license (CDL) Class "B". The two week course is available to qualified CTA applicants with the authority covering the costs of tuition, training, books, fees and other expenses associated with the program, including the cost of the permit exam, in an effort to remove financial barriers for students to pursue and complete the program.

➲ MassTransitmag.com/21283815

A CTA bus operating in Chicago's loop.

Honolulu rail project remains eligible for federal funds with FTA approval of recovery plan

▶ The Honolulu Authority for Rapid Transportation (HART) remains eligible to receive the remaining federal funds committed to its rail project under a Full Funding Grant Agreement (FFGA) with the Federal Transit Administration (FTA) following FTA's approval of its 2022 Recovery Plan. The recovery plan was required by the FTA to document how the rail project would be completed within the amount of funding that is forecast to be available. The recovery plan includes amending the FFGA to reflect a rail project that is 1.25 miles shorter than the original scope of work, which will reduce the estimated project costs from $10.46 billion to $9.93 billion. HART says the forecast funding is sufficient to cover the costs of the reduced scope. There is $744 million in federal funding that remains to be distributed to HART and, according to a letter from FTA Regional Administrator Ray Tellis, $125 million will be allotted at the conclusion of the FFGA being amended and a second release of $250 million will be contingent on awarding the City Center Guideway and Stations contract. HART projects the contract will be awarded in fiscal year 2024.

➲ MassTransitmag.com/21282574

People in the News

Metropolitan Atlanta Rapid Transit Authority (MARTA)

Greenwood

The MARTA Board of Directors voted to confirm Collie Greenwood as the authority's new general manager and chief executive officer. Greenwood had been serving in the position on an interim basis since January 2022. A former bus operator, Greenwood rose through the ranks over 30 years to serve as chief service officer with the Toronto Transit Commission and joined MARTA in July 2019 as chief of bus operations and urban planning. In January 2021, Greenwood was named deputy general manager of operations where he oversaw all bus and rail operations and helped develop and deliver major capital projects aimed at enhancing the customer experience, including the largest in MARTA's history, the procurement of new railcars and the addition of electric buses to MARTA's fleet.

MassTransitmag.com/21285363

Transit Authority of Northern Kentucky (TANK)

Douthat

The TANK Board of Directors promoted Gina Douthat to the role of general manager. Douthat has held various positions at TANK since 1997, most recently as deputy general manager and director of communications and development. She was named as interim general manager in August after Andrew Aiello resigned to join the executive team at Cincinnati Metro. During her time at TANK, Douthat has provided oversight to areas including marketing and communications, planning, IT and customer service.

"I believe in our mission to provide exceptional transit services to the people of Northern Kentucky, and I am grateful for the opportunity to build on our strong foundation and continue to serve the community," said Douthat.

MassTransitmag.com/21284802

San Mateo County Transit District (SamTrans)

Chan

April Chan, a more than 20-year employee of SamTrans, will succeed Carter Mau as SamTrans general manager/chief executive officer. Chan also will serve as executive director of the San Mateo County Transportation Authority, which administers the Measure A transportation sales tax to fund transportation projects county-wide. She also will be responsible for services provided by the district to both the Peninsula Corridor Joint Powers Authority and the San Mateo County Express Lanes Joint Powers Agency. Chan has been an employee of the district since April 2000 in positions of increasing responsibility, rising through the ranks from senior planner, capital programming and grants to chief officer, planning, grants and transportation authority and acting deputy general manager.

MassTransitmag.com/21283640
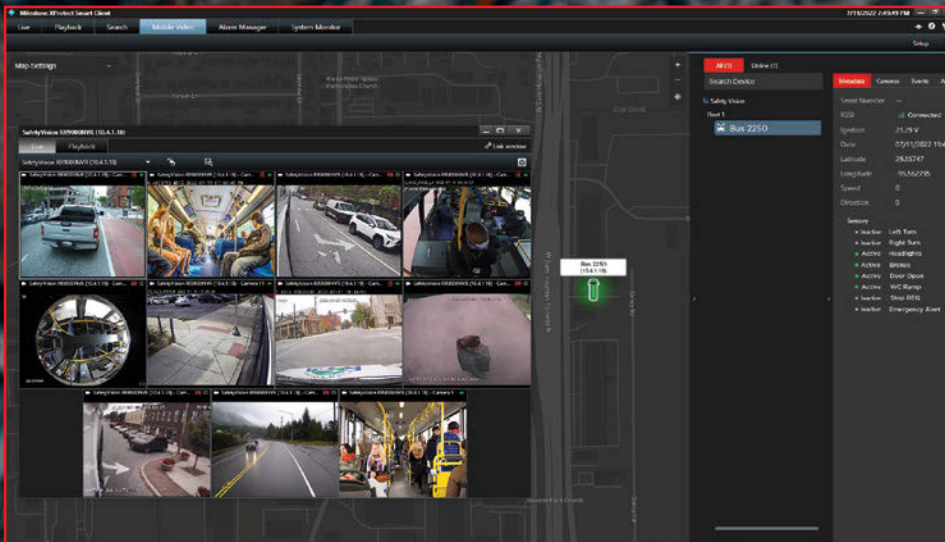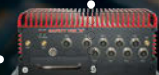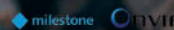
PEOPLE & PLACES

Tunnel boring begins on
Vancouver's Broadway Subway Project

▶ Two behemoths named Elsie and Phyllis are helping push the Broadway Subway Project forward in Metro Vancouver, British Columbia, in a big way. After months of prepping the launch site and assembling the tunnel boring machines (TBMs), the province of British Columbia says tunnel excavation has begun. The TBMs will launch separately from the Great Northern Way-Emily Carr Station and are expected to take about a year to tunnel five kilometers (3.1 miles) to Cypress Street. Elsie, named after Elizabeth MacGill, will begin work first. The second TBM, Phyllis, named after Phyllis Munday, is expected to begin tunnel boring this winter after assembly is complete.

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Province of British Columbia
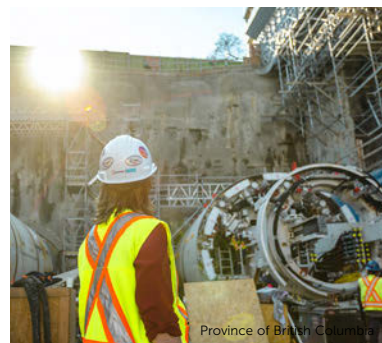
ELSIE, THE first of two tunnel boring machines for the Broadway Subway Project prepares for launch from the future Great Northern Way-Emily Carr Station, while assembly of Phyllis is underway.

Officials celebrate completion
of the Long Island Rail Road Third Track project

▶ The Long Island Rail Road (LIRR) Third Track project is complete with state and transit officials marking the milestone on Oct. 3. The project saw the construction of a new 9.8-mile section of track between Floral Park and Hicksville that will allow LIRR greater operational flexibility and support an increase of service across the system when Grand Central Madison opens later in 2022. The newly built Third Track is physically the southernmost track on the roadbed and will carry eastbound service. It opened in three sections, with the first leg opening August 15 through New Hyde Park and Merillon Avenue and the second stretch to Mineola on August 30. The Third Track project is a central element to the LIRR Main Line Expansion Project, which includes the renewal of five LIRR stations along the route, the elimination of eight at-grade railroad crossings, upgrades at seven railroad bridges, parking expansions, installation of new sound attenuation barriers and landscaping improvements. With only minor station work left to complete, the project is heading toward the finish line $100 million under budget almost four years after breaking ground.

➲ MassTransitmag.com/21282731

FTA awards $8.6 million
in grants through the Tribal Transit Program

▶ The Federal Transit Administration (FTA) has awarded $8.6 million in

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10 | **Mass Transit** | MassTransitmag.com | NOVEMBER 2022

Fiscal Year 2022 grants through the Tribal Transit Program to more than two dozen American Indian Tribes and Alaska Native communities that will use the grants to improve transit services in their communities. The competitive grants awarded by FTA are in addition to the more than $35 million in formula funding Tribal Transit programs receive from the federal government annually. Competitive funding for Tribal Transit programs will see an 83 percent increase during the next five years due to the Infrastructure Investment in Jobs Act, which includes nearly $46 million for the programs. The grants ranged between $16,000 to $1.6 million, but the impact of the funding is measured beyond dollar amounts. In a press briefing held in Seattle, Wash., a state home to more than 100,000 Native Americans, representatives from the C'oeur D'Alene Tribe and Nez Perce Tribal Committee explained without transit service, the alternative transport mode for their communities would be walking long distances or relying on friends, neighbors and relatives for rides. According to the National Transit Database, nearly 12 million vehicle miles of service are provided by Tribal Transit systems each year nationwide, providing critical access to jobs, schools, healthcare and shopping and to provide eldercare.
◆ MassTransitmag.com/21283525

MORE NEWS AT A GLANCE

▶ The California High-Speed Rail Authority's Board of Directors approved awarding the design and support services contract for the Merced, Fresno, Kings/Tulare and Bakersfield stations that will serve high-speed rail passengers on the initial 171-mile segment to Foster + Partners and Arup.
◆ MassTransitmag.com/21284809

▶ Hitachi Rail revealed the final designs and images for its new $70 million train factory and 800-yard test track, built on a 41-acre site located in Washington County, Md.
◆ MassTransitmag.com/21284123

▶ Spokane Transit Authority (STA) launched the Connect fare system, an account-based fare collection system supplied by INIT.
◆ MassTransitmag.com/21282706

▶ National Express Transit signed a three-year contract with the Regional Transportation Authority (RTA) of Pima County in Arizona. The services took effect Oct. 1, 2022, and builds on a partnership that began in 2012. The contract includes two one-year options to extend.
◆ MassTransitmag.com/21286014

▶ Skanska and its joint venture partner, New Jersey-based Railroad Construction Company was selected by the Metropolitan Transportation Authority (MTA) to make improvements on the Flushing Line in New York, N.Y., for $200 million. AECOM serves as the project's engineer.
◆ MassTransitmag.com/21285554

▶ Tolar Manufacturing Company has been selected by Tranzito-Vector to build 3,450 state-of-the-art bus shelters for the city of Los Angeles's Sidewalk and Transit Amenities Program.
◆ MassTransitmag.com/21284627

People in the News

Caltrain

The Caltrain Board of Directors unanimously appointed Michelle Bouchard to serve as the first permanent executive director of the railroad.

Bouchard

Bouchard has worked for Caltrain for more than 20 years and has been the acting executive director since April 2021. Bouchard has spent more than 25 years in the transit industry, rising through the Caltrain ranks during the 2000s to eventually become director of Rail Transportation, where she successfully managed all aspects of the procurement and transition of operations, maintenance and management services.

↪ MassTransitmag.com/21286147

Virginia Department of Rail and Public Transportation (DRPT)

Trogdon

Zach Trogdon has joined Virginia DRPT as its next chief of public transportation to provide leadership to Virginia's public transportation programs. Trogdon will lead the evaluation, assistance, and execution of a $4.7 billion portfolio of public transportation, commuter assistance and congestion management programs throughout the commonwealth. Trogdon comes to DRPT with two decades of executive experience in the public sector, most recently as the executive director of the Williamsburg Area Transit Authority.

↪ MassTransitmag.com/21285887

Des Moines Area Regional Transit Authority (DART)

Smiley

Brandon Smiley joined DART in Des Moines, Iowa, as its chief operating officer. Smiley's extensive experience includes 17 years working in operations for the Kansas City Area Transit Authority where he started as a transit bus operator and worked in several roles, including his most recent role as the director of transportation. At DART, Smiley will lead more than 200 employees in the operations, maintenance and facilities departments, overseeing vital projects supporting the delivery of current and future services.

↪ MassTransitmag.com/21284804

Chatham Area Transit Authority (CAT)

Twumasi

Chatham Area Transit Authority in Savannah, Ga., named Dr. Emmanuel Twumasi to serve as its chief operating officer, effective Oct. 6, 2022. Dr. Twumasi's previously served as the chief operating officer of Rock Region Metro in Little Rock, Ark. He worked at the Port Authority of Allegheny County (now known as Pittsburgh Regional Transit) in Pittsburgh, Pa., serving in various roles including the manager for bus and rail operations, assistant manager for bus and rail operations and the service performance manager.

↪ MassTransitmag.com/21283368

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Committee 12 - Rail Transit

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Data Management

Transit agencies can implement tools such as predictive analytics, artificial intelligence and digital twins to bring powerful decision support systems, create proactive knowledge management solutions and streamlined work practices.
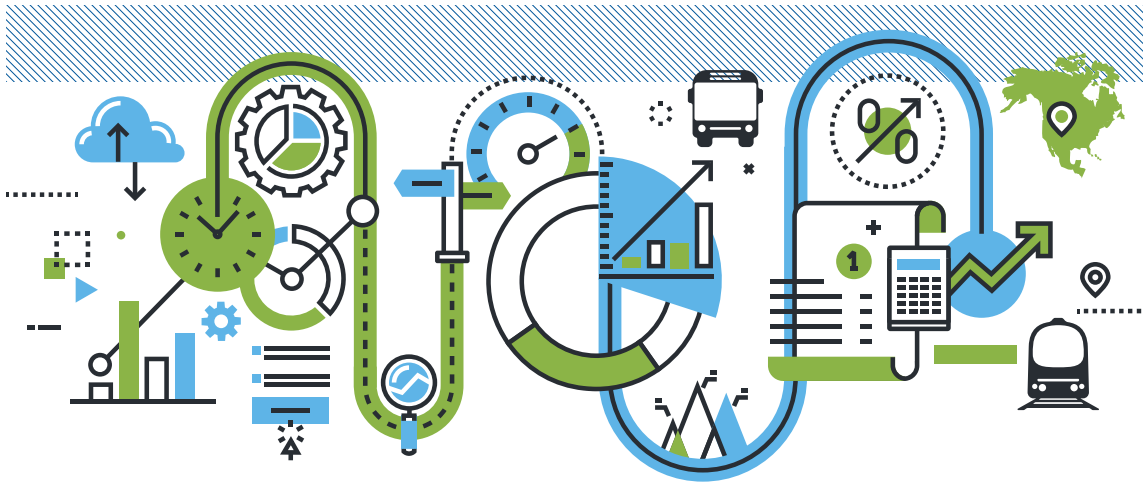
Data Management Maturity is Key to the Future of Managing Our Infrastructure

By Jeff Siegel
Director
Technology Solutions Center, HNTB

CHICAGO, IL • Public transit agencies and other infrastructure managers need a strong foundation of data governance and management to fully tap into the potential of new technologies that help automate or optimize asset management practices. The time to start is now.

The Infrastructure Investment and Jobs Act provides a generational opportunity for the United States to improve how public transit agencies serve the public and determine the best path to manage, operate and maintain those investments for the long-term.

Transit agencies can implement tools such as predictive analytics, artificial intelligence and digital twins to bring powerful decision support systems, create proactive knowledge management solutions and streamlined work practices. The promise and success stories from recent implementations are driving these technologies to become the new normal throughout transportation agencies and supporting industry partners.

Predictive analytics, for example, can be used to forecast future maintenance needs long before they become a problem. Artificial intelligence, through machine learning, can proactively identify patterns in asset operations to notify infrastructure managers of improved preventative maintenance schedules.

Digital twins will continue to have limitless possibilities, including 3D virtual environments used for operations control, workforce training/simulation and utility network traceability.

To better prepare for this technology-driven future, public agencies must create an organizational structure that supports sound data management fundamentals and an agile mindset to implementation. A mature data governance approach is essential to support agency operations and long-term asset management goals.

Enterprise digital transformation initiatives in support of asset management advancement can be a significant change in how an agency manages its assets. It is important an agency remains agile during this process by focusing on incremental change while providing staff with the training and support needed to meet its long-term goals, but it is also best supported by agencies that have invested in data governance and management strategies that support distributed data ownership, stewardship and extreme accessibility.

There are countless examples of agencies embarking on this journey. For example, the Southeastern Pennsylvania Transportation Authority (SEPTA) is implementing an enterprise asset management system through an incremental, stakeholder-intensive strategy across all its departments and building an effective network of stewards to support future implementation phases.

A grand vision of the future that embraces innovation is what drives these initiatives forward. None of it will work without the full "buy in" and encouragement of agency leadership. Focusing on establishing the fundamentals and practices that embrace change – which is sure to come – will make all the difference. **MT**

Put yourself in
the driver's seat

For more than two decades, Avail Technologies, Inc., has been committed to delivering solutions focused solely on helping make public transit operations better. We deploy innovative and forward-thinking intelligent transportation systems that empower agencies to deliver the safest, most efficient and most customer-friendly transit service. With the latest evolution of our myAvail Enterprise Transit Management Software (ETMS), agencies now have access to a full suite of tools to maximize their technology investment and increase efficiency across all departments with greater control and insight into every aspect of their operations.

What is the most important part of a deployment?

Avail recognizes the magnitude of these procurements for organizations, and the impact they have on your communities—these projects don't end at implementation. We believe the most important phase of a deployment is encouraging employees to adopt the technology and leverage it to achieve its ultimate potential. We have designed our deployment services to focus on understanding the roles, responsibilities and daily tasks of employees. This allows us to tailor our training and adoption strategy around empowering them on how best to apply our tools within their standard operating procedures (SOPs) to transform how they do business. When employees fully embrace their new ITS, they experience the benefits, such as real-time data to improve operations and simplified ADA compliance—which frees up staff, so they can focus on safety and rider satisfaction.

What is the biggest challenge for an agency looking to implement CAD/AVL or ERP systems?

Change is hard. The amount of features available through back office systems can be overwhelming to transit staff and can lead to frustration, dissatisfaction and reverting to old practices. Avail understands the challenges and the need for the staff to have an easy-to-use system and the importance of being comfortable using it. myAvail ETMS is a system that you grow into, not out of.

At the beginning of your project, it's important to identify the champions at your agency who are excited to implement and adopt this new technology. Share with them what the process entails and get them involved in the pilot. Help them see how efficiencies in their position will flow across the entire agency.

Getting employee buy-in is crucial, but you also need public investment. Promote your real-time information and let the community know they can access it on their devices. By integrating myAvail into your website and advertising our mobile app myStop® your agency will cut down on customer service calls and reduce overhead.

How can you tell if your CAD/AVL ERP systems are being used to their full potential?

Ask yourself this: Do you have processes that still use paper? Do you pull data from multiple sources then rely on Excel or another program to interpret it? Your back-office systems should eliminate the need for paper and spreadsheet calculations.

How are you informing the public about real time changes? If daily schedule changes and alerts are entered on multiple platforms rather than coming directly from your ITS real-time public information system, there are still improvements to be made.

How is your on-time performance measured, and how do you know if on-time performance has improved? An ITS system has KPIs and dashboards that track and analyze data in real time. This also means adjustments can be made more frequently to increase these metrics.

What does the post-deployment phase look like?

Once all new features have been deployed and are operating at full capacity, your agency will transition into the operational improvement phase, with continuing training assessment, technical support, ITS upgrade strategies and adoption services. During this phase, new business processes and SOPs will be developed.
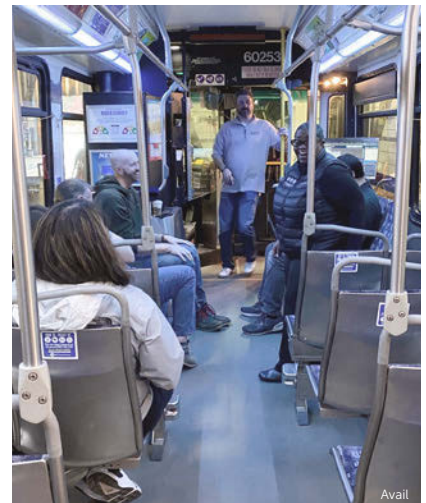
Avail

THE LATEST evolution of myAvail Enterprise Transit Management Solution (ETMS), gives agencies access to a full suite of tools to maximize their technology investment and increase efficiency across all departments with greater control and insight into every aspect of their operations.

The customer experience team will make regular on-site visits to assess operational success while the agency will have access to tools and services, such as training videos, Wayfinder quick tools, a customer support portal and our annual User's Conference. This is what makes Avail's offering unique. We will work with you to squeeze every bit of functionality from your technology. **MT**

Sigrid Sharif writes for Avail Technologies, Inc.

BEST PRACTICES FOR TRANSIT CYBERSE

APTA's Operational Technology – Cybersecurity Maturity Framework

Each agency is different in size, talent and financial resourcing, the OT-CMF attempts to help organizations move past the "one-size-fits-all" approach to security.

By **John B. Moore and Michael Echols, contributors**

The security and stability of the nation's public transportation systems are an important part of maintaining our way of life. As enterprise cyber-assurance projects proceed within U.S. transit, the hacking community chips away at protection strategies and any layer of protection that may have previously been effective. Maintaining safety
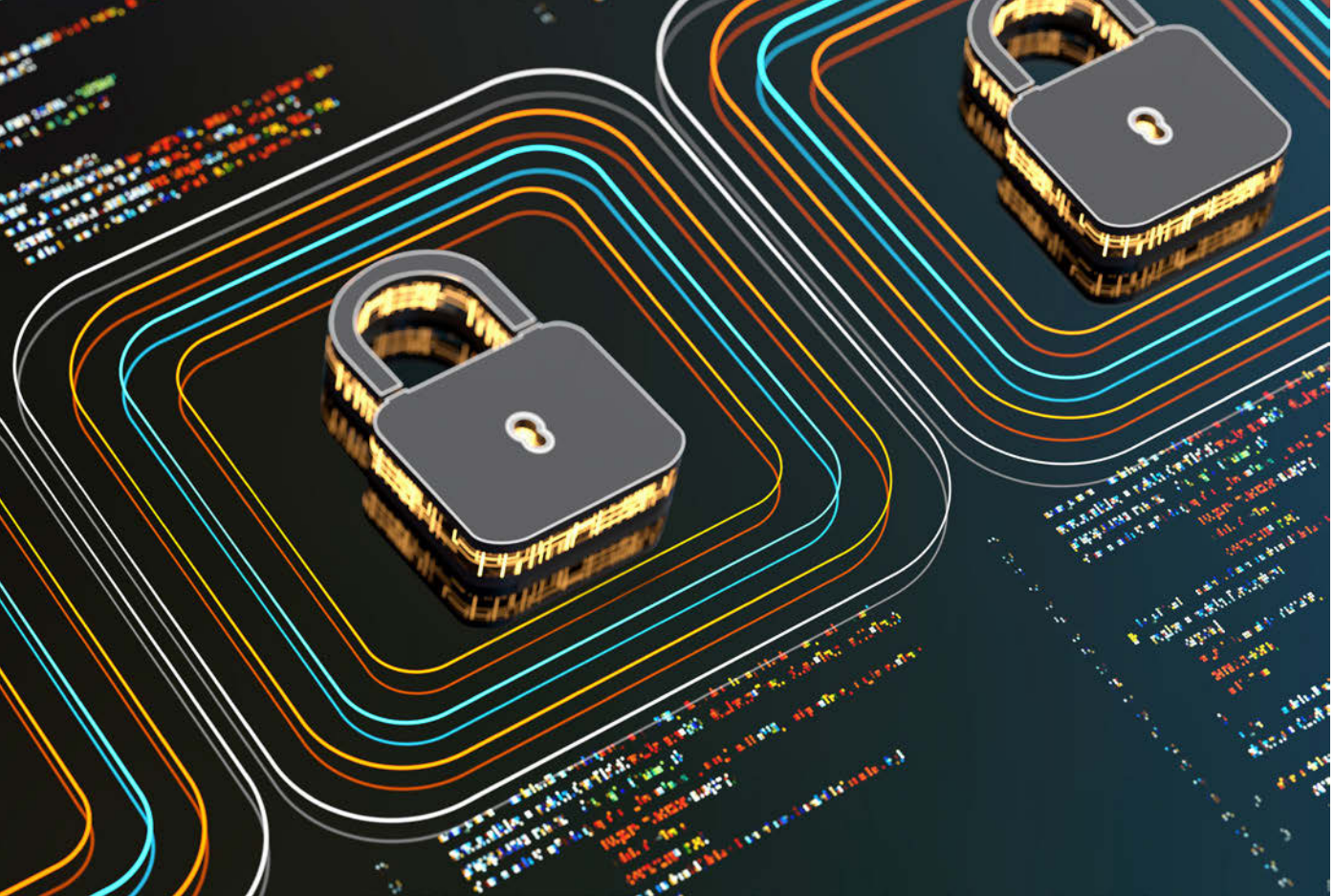
systems and digital control of transit assets is critical to maintaining public confidence and ensuring systems function as intended. Transit agencies must take a holistic approach to cyber

> **"Maintaining** safety systems and digital control of transit assets is critical to maintaining public confidence and ensuring systems function as intended."

protection to stay ahead of a digital disaster that is always waiting around the next corner.

The National Institute of Standards and Technology (NIST) is a U.S. government agency that works with industries to develop best practices.

NIST has established well-known and accepted standards produced by many experts. The security goals for Information Technology (IT) and Operations Technology (OT) have been honed by organizations like NIST for several years.

The American Public Transportation Association (APTA) uses NIST standards to better define the critical actions transit agencies should take to secure transportation networks. Im-

plementing NIST practices is a core component of a successful security program in the hacking "arms race." Most people are familiar with basic IT requirements because routers and Wi-Fi are a part of our daily lives, but transit agencies must secure their OT or industrial control systems (ICS) with a lesser-known set of system requirements to meet safety and security goals across all ICS systems.

APTA uses NIST best practices to help transit agencies build OT protection programs. The focus is on "maturing" an organization's cyber preparedness. The concept is not very different from my expectation for my daughter as she soon graduates college. We have discussions about preparedness and have found there are many things she has learned in the past four years:

- There are things that she knows she knows
- There are things that she knows she doesn't know
- There are deep things she doesn't know that she knows

• There are things she doesn't know that she doesn't know

Like cybersecurity in transit agencies, we celebrate the first, I try to help her with the second, we talk about the third, and the simple awareness of the last is a win as she works to discover the unknowns.

In much the same way that my daughter faces an ever-more-challenging world, APTA is concerned with the need for better cybersecurity preparedness in its member transit agencies, large and small. To help alleviate the problem, one of APTA's many standards working groups, the Control and Communications Security Working Group (CCSWG), has been writing recommended practices and white papers for the industry for the past 14 years. The CCSWG differentiates Control and Communications Operational Technology from IT Enterprise Technology. Cyberattacks can cause great harm in ICS areas.

Most recently, in response to requests from APTA's membership, the Transportation Security Administration (TSA) and others, the working group has developed an Operational Technology – Cybersecurity Maturity Framework (OT-CMF) overview for launching and maturing an OT program. This framework enables and empowers transit agencies to plan, implement, measure, monitor, and mature their OT cybersecurity program, so they can respond to the evolving cyber threats undermining critical service delivery and safety. Transit agencies will be able to implement the maturity framework to use what "they know they know" to work toward understanding the threats presented from the unknown and always with the goal of maturing and reaching a high state of prepared resilience.

The OT-CMF draws from existing NIST standards like NIST 800-53 (Security and Privacy Controls for Information Systems and Organizations), and its overlay,
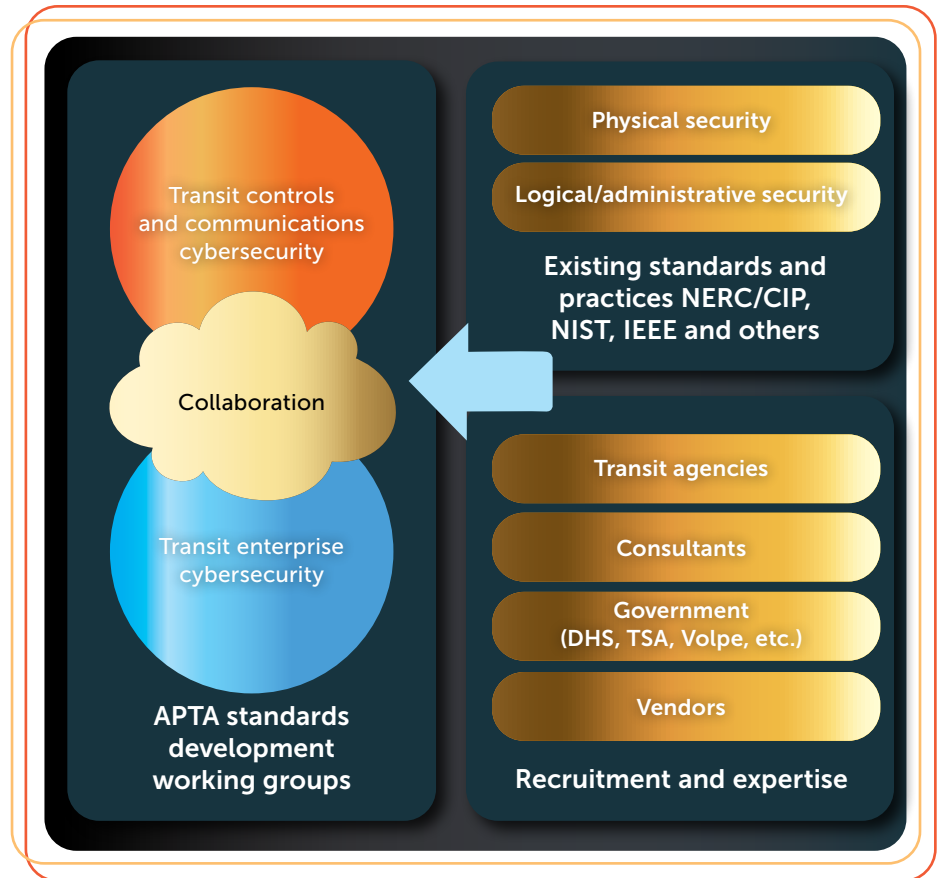
TRANSIT AGENCIES must ensure that their cybersecurity plans address both the traditional information technology (IT) systems and the operational technology (OT) or industrial control systems (ICS).

APTA Control and Communications Security Working Group

NIST 800-82 (Guide to Industrial Control Systems (ICS) Security), as well as NERC-CIP (National Electrical Reliability Council – Critical Infrastructure Protection) and various IEEE standards.

At this point, there is a need to differentiate the term requirements from controls. Whereas requirements are obligatory, controls are selected according to the organization. NIST 800-53 describes controls as:

"Controls can be viewed as descriptions of the safeguards and protection capabilities appropriate for achieving the particular security and privacy objectives of the organization and reflecting the protection needs of organizational stakeholders. Controls are selected and implemented by the organization in order to satisfy the system requirements."

The CCSWG distilled the 965 controls in NIST 800-53 and 800-82 into 134 controls for the Cybersecurity Maturity Framework. Each control is numbered according to its topic.
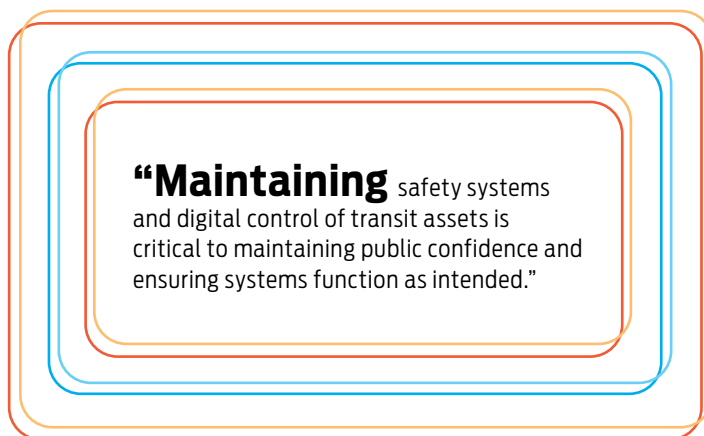
Each agency is different in size, talent and financial resourcing, so the OT-CMF attempts to help organizations move past the "one-size-fits-all" approach to security. Within these controls lies the recipe for maturing individual transit agencies.

With careful, thoughtful work to build an agency-specific OT cybersecurity program, transit agencies can move their organizations up through the maturity levels. The goal is better identification of incidents, detection of anomalies, protection of systems, faster response and an organized approach to recovery.

Transit agencies that implement the OT-CMF will realize alignment with these goals with the following five objectives:

- Establish a common cybersecurity language to enable communication between the leadership and stakeholders.
- Create a consistent approach for maturing control systems' cybersecurity programs.
- Develop a common understanding of control systems' cybersecurity best practices.
- Enable organizations to develop data-driven risk prioritization.
- Define a path to optimize cybersecurity investments and increase cyber resilience.

The CCSWG looked to industry standards and found that five levels of maturity existed. The OT-CMF isn't just a tool for large transit agencies. It was designed with the perspective that all organizations must start to develop a cyber-maturity program from where they are now, so a "0" level of maturity was created to credit organizations for what they are currently doing to meet security requirements. The CCSWG calls it the on-ramp. A description of the six maturity levels follows:

- **Level 0 Baseline (On-Ramp)** – Establish a foundation and implement minimum OT-CMF recommended controls.
- **Level 1 Initiate** – OT-CMF recommended controls are adopted without formal processes or documentation.
- **Level 2 Planned** – Establish security roles and responsibilities and a risk management program with documented policies, procedures, and processes with Key Risk Indicators (KRI) and Key Performance Indicators (KPI) aligned with the OT-CMF.
- **Level 3 Operational** - All OT-CMF recommended controls have been documented, implemented, and assessed at least annually. An improvement plan is reviewed and updated annually to enhance the efficiency and effectiveness of controls.
- **Level 4 Managed** – Continuous monitoring and improvement have been put in place to manage the controls using automated tools and technologies that respond and adapt to the changing threat landscape.
- **Level 5 Optimized** – Full automation of monitoring and response using technological advances (A.I.) that continuously increases efficiency, performance, and real-time reporting.

At this point, the reader may ask, "How many agencies are at a Level 5 or even Level 4?" And the answer is probably none. Those

are levels to strive for and can be reached with a focused effort.

The OT-CMF overview will provide guidance on:
- Must-have cybersecurity operations technology controls
- Should-have cybersecurity operations technology controls
- Implementing operations technology controls
- Measuring the success of operations technology controls
- Achieving higher operations technology controls maturity levels

Conclusion

The safety and security of transit environments are critical to maintaining commerce, and, just as important, confidence in public transit systems. The growth of digital systems has created opportunities to do things faster and more efficiently, but this increasing digitalization comes with added vulnerabilities. Leadership within agencies must have a better understanding of how to prioritize cyber-preparedness strategies across their organization. They need a harness that can be tightened and loosened based on data-driven requirements.

Just as agencies have developed a culture of safety, new approaches to managing the IT and OT environments will need to be integrated into the culture of the transit agency to ensure smart growth, and just as the sector has created consistency through the development and adoption of standards across all transit agencies, approaches must be implemented to provide a feedback loop for sharing lessons learned. The OT-CMF tool is a key tool in achieving these goals. **MT**

"**The** safety and security of transit environments are critical to maintaining commerce, and, just as important, confidence in public transit systems."

John B. Moore is the senior business development manager of U.S. Rail Infrastructure at Phoenix Contact USA.

Michael Echols is the APTA Facilitator for the CCSWG and CEO of Max CyberSecurity, LLC, located in Washington, D.C.

2022 Transit Safety & Security Report

Transit agencies and their partners are working to match customer perception with information from data to promote and deliver safer mobility options.

By **Mischa Wanek-Libman, editor in chief**

The North American transit industry continues its recovery from the disruption of the COVID-19 pandemic. Riders are slowly but steadily returning to systems in Canada and the United States with new benchmarks in ridership regularly achieved. A renewed focus on the customer experience has prompted special attention on the safety of systems, and how statistics and public perception are matched up against each other.

In August, Mineta Transportation Institute (MTI) released the findings from a global study, "Changing Patterns of Violence Pose New Challenges for Public Transport," that found countries with advanced economies account for a growing percentage of incidents worldwide, with the United States taking the lead in the total number of incidents and number of fatalities in those countries.

By analyzing data from 5,611 attacks against all public surface transport tar-

By the numbers

146.69
streetcar injuries per 10 million VRM

118.05
BRT injuries per 10 million VRM

3.83
commuter rail injuries
per 10 million VRM

NTD reports modes operating in central cities with more stops have a higher chance of injury compared to modes that travel longer distance.

*2021 National Transit Database National Transit Summaries & Trends

gets that occurred worldwide between January 1970 and July 2022, the authors observed a growing problem of violence against passengers and staff on passenger trains and at train stations, buses and bus stations, rail infrastructure and operating and security staff.

"The increase in violence at transportation venues appears to parallel a general increase in random public violence and reflects broader societal trends occurring on the streets and elsewhere. Some observers blame the behavior on the pandemic, but the trends precede COVID-19 and are contributing to a sense of insecurity," said Author Bruce R. Butterworth.

The authors of the MTI report determined most attacks appear to be random where risk reflects exposure. Passengers are more numerous than operating personnel but are exposed for shorter periods, so their risk is lower. However, well-publicized events contribute to an atmosphere of fear. There are far fewer operating personnel, but they spend longer times on the job, therefore their exposure to risk is greater.

"A public fearful of traveling adds to economic difficulties for transportation operators and reduced resources for facilities improvements, service and security. The fact there are fewer riders may contribute even further to a sense of insecurity, and it is possible that increased ridership actually contributes to security," Author Brian Michael Jenkins said.

This iteration of the Safety & Security Report spotlights how agencies are increasing the presence of staff, including law enforcement, on systems, what technology is being utilized to support safety and security efforts and how behavior-based education efforts and policies are all working to positively impact safety statistics, as well as how safe customers feel while using transit systems.

Boosting Security Presence

Agencies throughout North America have promoted increased presence of police officers, transit ambassadors and other staff trained in safety, security and outreach efforts as one method to help customers feel safer on their systems.

This summer and fall, Los Angeles County Metropolitan Transportation Authority (L.A. Metro) and Greater Cleveland Regional Transit Authority (GCRTA)

TOTAL FATALITIES AND INJURIES 2013-2021
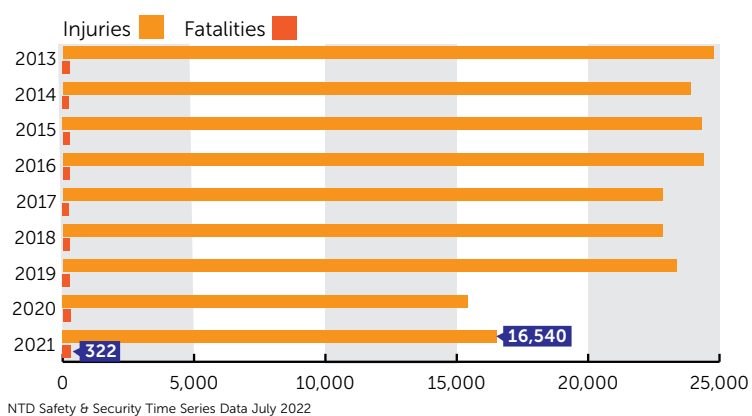
Injuries ▮ Fatalities ▮

NTD Safety & Security Time Series Data July 2022

EMPLOYEE INCIDENTS 2013-2021

Injuries ▮ Fatalities ▮

NTD Safety & Security Time Series Data July 2022

NON-EMPLOYEE INCIDENTS 2013-2021

Injuries ▮ Fatalities ▮

NTD Safety & Security Time Series Data July 2022 - passenger; people waiting or leaving

COLLISIONS 2013-2021

NTD Safety & Security Time Series Data July 2022
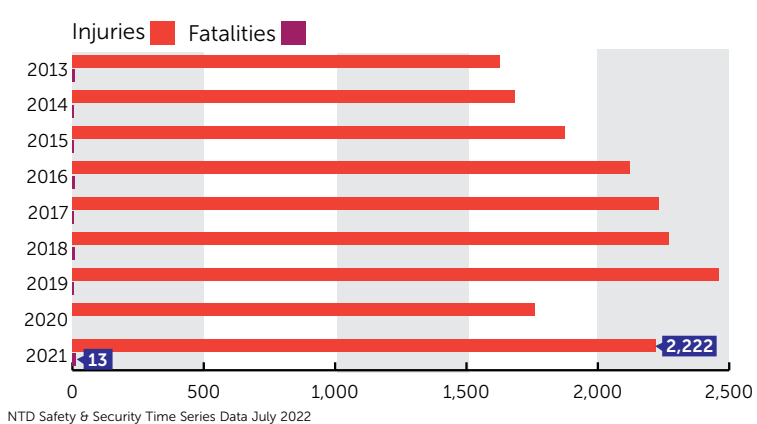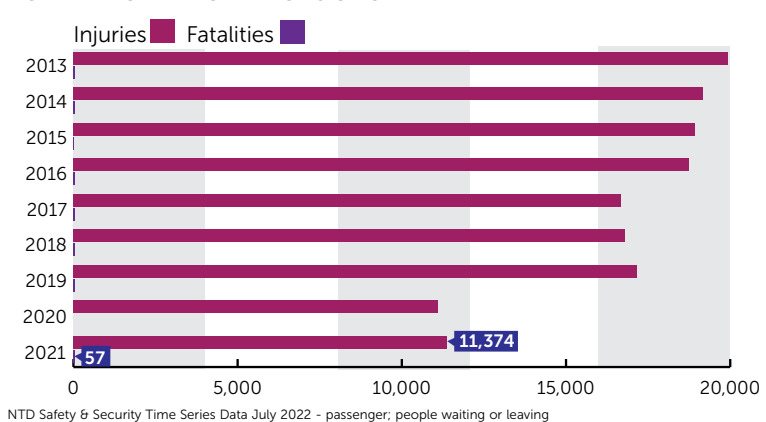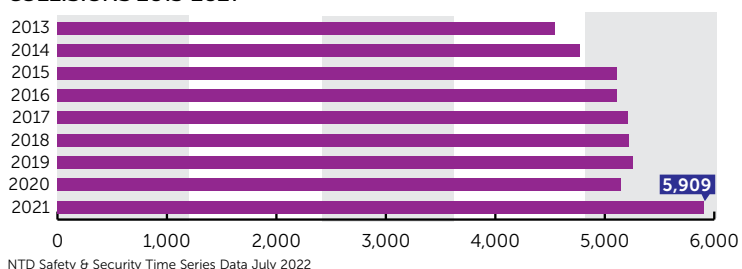
were the most recent agencies to approve ambassador programs aimed at increasing outreach and engagement of non-criminal issues.

GCRTA says both transit ambassadors and crisis intervention specialists will work in collaboration with GCRTA's Transit Police and have their own specific responsibilities.

L.A. Metro's program is modeled after successful ambassador programs at Bay Area Rapid Transit and Southeastern Pennsylvania Transportation Authority and was shown to be supported by riders who said they wanted to see more L.A. Metro staff on the system. L.A. Metro stressed the three-to-five-year pilot program has an emphasis on greeting riders and creating positive and compassionate interactions with them.

Uniformed law enforcement has also increased on systems, notably Metropolitan Transportation Authority (MTA) in New York City, which is deploying an addition 1,200 officers daily throughout its rail network with support of the state and city, and Chicago Transit Authority (CTA), which has placed safety as a cornerstone of its Meeting the Moment initiative.

CTA renewed a three-year agreement with the Chicago Police Department where CTA will be provided additional sworn police officers who volunteer to police the transit system through the police department's Voluntary Special Employment Program (VSEP). The use of VSEP officers is in addition to plans the police department has to assign additional officers to CTA trains and platforms.

CTA also deployed K-9 teams to patrol its rail system. CTA calls the use of K-9 teams through a trained contractor a supplementary security move to law enforcement patrols.

How effective this increased presence has on transit security will depend on the community and system. In St. Louis, Mo., Bi-State Development Agency, which operates St. Louis Metro services, credits a greater security presence across its system for providing a "foundation

for a more proactive approach to policing." In the agency's second quarter 2022 MetroLink Task Force Incident Report, incidents were shown to have increased. However, the agency reports 71 percent of those incidents were self-initiated.

"The effectiveness of the security measures and collaboration we have put into place over the last two-plus years is evident throughout our latest incident report. Incidents are up, but that is 100 percent attributable to the proactive work of our law enforcement partners," said Kevin Scott, general manager of security, Bi-State Development.

Bay Area Rapid Transit (BART) reports its police officers have made more felony arrest in 2022 than they have in four years. BART Police Department says the increase is because there are more officers patrolling the system.

"This increase in felony arrests is proof that our officers are making a difference in keeping our system safe," said BART Police Chief Ed Alvarez. "The increased number of felony arrests is further proof our Progressive Policing strategy is allowing sworn officers to focus on serious crimes."

Technology Support

While the BART Police Department recognizes an increased presence of officers on its system has resulted in safety improvements, it notes the efforts of officers are supported by "a robust network of more than 4,000 working cameras." BPD officers have been able to use images from these cameras to identify suspects in some of the crimes on the system.

Another agency to invest in camera systems for improved security is New York MTA, which was awarded a U.S. Department of Homeland Security Preparedness Grant in September 2022 to install cameras across its entire subway fleet. MTA has installed cameras in all of its subway stations, and the grant will extend that coverage at 130 stations, as well as allow the agency to purchase 5,400 cameras that will be

installed on 2,700 subway cars. All subway cars should be equipped with cameras sometime in 2025.

Outside of the subway system, MTA has expanded the use of automated bus lane enforcement (ABLE) cameras and expects to install the technology on an additional 300 buses by the end of 2022.

MTA calls ABLE cameras "an essential tool to keep bus lanes clear" and keeping buses on schedule. The cameras capture busway and bus lane rules violations in real-time and transmits the information to the New York City Department of Transportation (NYCDOT) for review and processing.

Cameras are also being used to improve safety around critical public/transportation interfaces, such as grade crossings. As *Mass Transit* reported in the June 2022 issue, Federal Railroad Administration-funded research, led by a team from Rutgers University, uses an AI-driven computer vision system that analyzes video and collects several key pieces of information on all trespassing events occurring at a given location. The information can then be used to evaluate what engineering, engagement and/or enforcement methods may be implemented to reduce the number of crossing violations.

Advancing technology is delivering safety and security improvements to the transit industry, but this rapid pace of development also carries a certain amount of risk when the topic of cybersecurity is considered. Check Point Research found the transportation sector saw a 38 percent increase in average weekly cyber attacks comparing Q3 2021 data to Q3 2022 data. A report from Verizon this year determined 82 percent of data breaches involved the human element, making employee education and awareness of potential threats a critical focus area for the industry.

Mineta Transportation Institute (MTI) published a paper in July urging broader collaboration when it comes to cybersecurity between the U.S. transit industry and its

SUICIDES 2013-2021
(TOTAL OF INTENTIONAL ACTS THAT RESULTED IN DEATH OR INJURY)*

Year	
2013	
2014	
2015	
2016	
2017	
2018	
2019	
2020	
2021	**75**
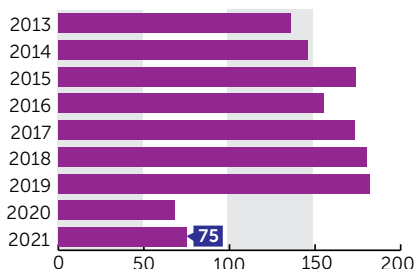
NTD Safety & Security Time Series Data July 2022

If you or someone you know is struggling with feelings of depression or suicidal thoughts, the National Suicide Prevention Lifeline offers free, round-the-clock support, information and resources for help. Reach the lifeline at 800-273-8255.

TOTAL NUMBER OF MAJOR SECURITY EVENTS REPORTED

Year	
2013	
2014	
2015	
2016	
2017	
2018	
2019	
2020	
2021	**1,654**
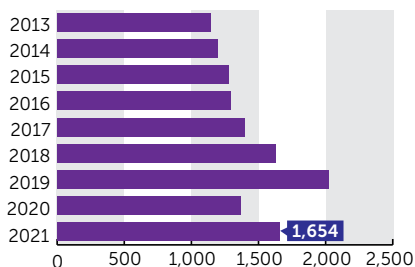
NTD Safety & Security Time Series Data July 2022

vendor community. MTI says both sides need to create a secure environment that can benefit from and augment the other.

The authors of the paper, "Aligning the Transit Industry and Their Vendors in the Face of Increasing Cyber Risk: Recommendations for Identifying and Addressing Cybersecurity Challenges," focus on three key areas: cyber literacy and procurement practices, the lifecycle of technology vis-à-vis transit hardware and the importance of embracing risk as a road to resiliency.

Measures taken to protect transit security require executive focus and investment across the transit ecosystem. MTI says transit agencies, vendors, associations, the U.S. Department of Homeland Security and U.S. Department of Transportation, as well as the Federal Transit Administration, can cooperate and collaborate to invest in risk management to ensure the safety, efficiency and reliability of the nation's critical infrastructure.

The Transportation Security Administration (TSA) took a step to limit that risk within the rail sector by issuing a security directive focused on bolstering cybersecurity of freight and passenger rail systems.

The security directive requires that TSA-specified passenger and freight railroad carriers take action to prevent disruption and degradation to their infrastructure with passenger and freight railroad carriers are required to:

- Establish and execute a TSA-approved Cybersecurity Implementation Plan that describes the specific cybersecurity measures the passenger, and freight rail carriers are utilizing to achieve the security outcomes set forth in the security directive.
- Establish a Cybersecurity Assessment Program to proactively test and regularly audit the effectiveness of cybersecurity measures and identify and resolve vulnerabilities within devices, networks and systems.

TSA says the directive strengthens cybersecurity requirements and focuses on performance-based measures to achieve critical outcomes. It was developed with extensive input from industry stakeholders and federal partners, including the Department of Homeland Security's Cybersecurity and Infrastructure Security Agency and FRA.

Behavior-Based Initiatives

To align behavior expectations of customers, agencies throughout North America have initiated various educational campaigns aimed at reducing incidents of harassment.

Most recently, King County Metro launched an anti-harassment campaign, "It's OK to Say, That's Not OK," with three suggested actions to take against potential harassment that are dependent on a person's comfort level and include notifying the driver, filling out an online comment form or calling/texting 9-1-1 in case of emergency.

Maryland Department of Transportation Maryland Transit Administration's new public service campaign is targeting sexual harassment, and how it can be stopped. An integral component of the MDOT MTA campaign focuses on data collection to better assess the extent riders in the Baltimore region that are experiencing sexual harassment, as well as to inform future decision making on outreach, campaign messaging, expectations for rider conduct and resource deployment. Rider outreach tactics include annual rider surveys, management and operator training, outreach events at frequently used tran-

DANGER

Total injuries **increased 7.2%** between 2020 and 2021 and total fatalities **increased more than 11%***

*NTD Safety & Security Time Series Data July 2022

sit stops and on-line reporting tools. This type of data collection is valuable to assessing incidents, as well as perception of a system. At BART, data collected as part of its ongoing Passenger Environment Survey shows its Not One More Girl campaign has increased awareness of sexual harassment/gender-based violence, increased awareness of how to respond to this type of incident and provided greater understanding of the impact this type of harassment has on girls, transgender and gender nonconforming people on BART.

Beyond raising awareness are efforts aimed at increasing the penalties for repeated prohibited behavior on transit systems. TriMet's Board is considering a revision to an ordinance that would impost stiffer penalties for non-fare related prohibited behavior such as vandalism, crime and drug use.

TriMet explains it aims to keep both its operators and riders moving safely, and it's important to have a means to hold people accountable for inappropriate, threatening or dangerous behavior.

On the East Coast of the U.S., a new law in the state of New York extended protections against assault to transit workers not previously covered including customer assistants, ticket or revenue collectors, maintenance workers and supervisors who work with an among the public.

New York Gov. Kathy Hochul signed the law in June. It will toughen laws by charging individuals who physically injure transit workers with second-degree assault. Officials say the law will also serve as a deterrent to those seeking to harm transit employees.

"New York's transit workers have always been there for us, and now it is our job to be there for them," said Gov. Hochul. "No one should be subjected to physical violence or harassment in the workplace, and today we are taking an important step in protecting the men and women who keep our subways and buses running." **MT**

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GCRTA's five areas of concentration for a robust DBE program

Greater Cleveland Regional Transit Authority's approach to promoting and supporting DBE firms has resulted in an increase in the number of qualified DBEs, as well as expanded areas of expertise.

By **Kay Sutula, Carl Kirkland, contributors**

There are many alarming stories about Disadvantaged Business Enterprise (DBE) firms, also known as sub-contractors, and prime contracts where the DBEs were not getting paid, being underpaid and prime contractors not performing or failing to submit proper documentation. The Office of Business Development (OBD) at the Greater Cleveland Regional Transit Authority (GCRTA) wanted to take a different approach to increase the number of qualified DBEs, expand the areas of expertise and help them be successful sub-contractors.

To do this, OBD focuses on five areas of concentration:
- Certification, eligibility and compliance
- Contract compliance and monitoring
- Goal setting
- Outreach
- Small business participation plan

Certification, Eligibility and Compliance

Once a DBE firm completes the Ohio Department of Transportation (ODOT) Uniform Certification Application submission form, and the DBE eligibility is reviewed, the Office of Business Development receives the information and plans an on-site visit. This on-site visit is conducted with the owners of the firm and completes a desk audit, including products, equipment and any machinery depending upon the type of expertise. OBD will also perform an on-site visits with current DBEs, building a good relationship with the firm and checking to see if they have expanded their expertise. While most of the application process is within ODOT, OBD staff at the authority will contact other DBE firms to provide support. This support includes education about the entire program including ownership, eligibility and the authority's process. GCRTA's process includes contract opportunities, procurement and engineering processes.

Contract Compliance and Monitoring

Once a DBE is selected for a procurement, OBD will work closely with the project manager to monitor the compliance of the prime contractor. OBD staff will travel to a job site, unannounced, at least two times per week. They will count the number of workers on the job site, compare this to the project schedule log, ask workers for a paystub or proof of income and ask the foreman for the workforce utilization. The OBD staff will review the prevailing wage

received by workers against the Department of Labor's wage schedule. If there are discrepancies, GCRTA will report this to the authority's project manager, and payments to the prime contract will cease until the workers receive the required backpay. With a staff of four, including the director, weekly meetings with staff on the progress of each project is vital.

> **"Since** 2019, GCRTA's Office of Business Development has certified 49 new DBE firms."

There have been times when a prime contractor will pay a worker the wage where the worker lives rather than where the work is being done. The authority's OBD staff need to ensure the DBE is receiving payment, and if not, hold prime contractors accountable. Once everything is verified by the prime contractor by sub-mitting certified payroll reports, invoices, compliance reports and DBE payment confirmation, the project can then continue.

Goal Setting and Changing the Culture

Procurements of $25,000 and above will be reviewed for a DBE participation goal. This goal encompasses all certified DBEs that are ready, willing and able to perform. The prime contractors will then receive the DBE goal with the project information, which is sent in a mass email to all available DBEs. A pre-bid conference is held virtually with all prime contractors and DBEs present. Once procurement and the project manager review the project, OBD asks the DBEs to address the audience on how they can perform in the contract. This encourages and assists the prime contractors to identify DBEs that are available to participate. OBD also tracks which DBEs attend and participate in these virtual pre-bid meetings.

During the procurement process, the prime contractor must identify which DBEs will be part of the project when submitting a proposal. An affidavit from the DBE, as a letter of intent, must be submitted with the project proposal, ensuring that the DBE percentage goal will be met with good faith effort. If a prime contractor is unable to find a DBE, the prime can contact the OBD staff to assist in identifying sub-contractors.

Once a prime contractor is selected, and DBEs are not identified in the proposal, OBD will send a certified letter to the prime regarding their non-compliance. The prime contractor has three

business days to comply with the DBE goal and identify certified DBEs to work on the project. If the prime replies, a letter of intent and the DBE affidavit must be received by OBD within the specified timeframe. If the prime contractor does not adhere to the timeframe, the contractor is ruled out of compliance, and the next contractor in line will be selected for the project.

When a project begins, project meetings are held monthly with the project manager, OBD staff, other staff from the authority, prime contractor and sub-contractors (DBEs). Issues and concerns are addressed, bottlenecks are identified, and if a project is off schedule, a plan is put in place to get it back on track. If a prime contractor is not paying the DBEs, payment to the prime contractor can be withheld until the problem is resolved, as specified under the Contract Compliance and Monitoring section. If the prime contractor remains non-compliant, the authority's project manager can shut the project down completely. The authority has ensured that compliance and procedures are followed as specified in CFR 49, part 26.

Outreach

The authority's procurement staff and OBD staff conduct a monthly "Learn to do Business" virtual training program for small businesses, potential DBEs and currently certified DBEs. Mass emails are sent to all certified DBEs and encourage them to bring other small businesses to these sessions. This program highlights construction, fleet purchase and professional service projects and how these small businesses can participate. The training programs highlight the certification process, procurement opportunities, contract compliance, payment policies and how to monitor project progress. GCRTA partners with various

agencies in Northeast Ohio such as the Greater Cleveland Partnership, City of Cleveland, Cuyahoga County, area universities and colleges, Jumpstart and Economic & Community Development Institute (ECDI) providing an awareness of the small businesses and DBEs to the community and networking opportunities for these businesses. This also enables the seasoned DBEs to assist the newer businesses and learn how to participate in a procurement as a prime contractor.

Small Business Participation Plan

In addition to the outreach and goal setting opportunities for DBE firms, the Office of Business Development (OBD) reaches out to all businesses that can bid on any procurement. The authority's Procurement Department and OBD conduct a "Learn to do Business" seminar for these firms. This enables the small businesses that are not part of the DBE program to learn how they can propose on the authority's procurements and network with the other firms that are attending. This has become a bit harder during the virtual meetings since the COVID-19 pandemic. Now that the economy is more relaxed on face-to-face meetings, OBD hosts these meetings twice a year and collaborates with their partners on the other two meetings.

This program gives small businesses an opportunity to gain revenue during a three-year period. To participate in this program, a small business cannot exceed three-year gross revenues of $28.48 million at

the end of Federal Fiscal Year (FY) 2021. For Federal Fiscal Year (FY) 2021, GCRTA's Office of Business Development has certified 16 new DBE businesses, completed 67 no change certifications for existing DBE businesses, conducted four on-site visits, conducted 58 goal settings, certified 62 payroll reports and either held or attended 30 outreach sessions. Since 2019, the authority's Office of Business Development has certified 49 new DBE firms. These efforts have helped to ensure that the Greater Cleveland Regional Transit Authority maintains a healthy and robust DBE program. **MT**

Carl Kirkland is the director of the Office of Business Development for GCRTA.

Kay Sutula is the director of the Office of Management and Budget for GCRTA.

Mixed Fleets

The Future of Microtransit and Paratransit

Implementing mixed fleets is integral to rebuilding ridership while keeping rider and transit agency flexibility at the forefront.

By **Kristoffer Vik Hansen, contributor**

Riders around the world change their behaviors and habits around how and when they access public transportation. Whether it's to go to the grocery store, the doctor's office or run errands, riders want to be able to book a ride that allows them the flexibility to move around rather than fit their schedule around fixed travel options.

This isn't new: Behaviors even prior to the pandemic showed that riders are opting for ride hailing alternatives for flexible travel. In 2018, the Chicago Transit Authority (CTA) reported reduced ridership partly due to competition from Transportation Network Companies (TNCs), with 106 million rides equaling 44 percent of bus ridership. TNC vehicles in San Francisco are estimated to contribute to a fifth of local driving miles per day. Research suggests ride hailing is replacing the use of public transportation, providing plenty of benefits, including low wait times and flexibility.

Many demand-responsive mobility services offered by transit

> **"Whether** it's to go to the grocery store, the doctor's office or run errands, riders want to be able to book a ride that allows them the flexibility to move around rather than fit their schedule around fixed travel options."
>
> **-KRISTOFFER VIK HANSEN**

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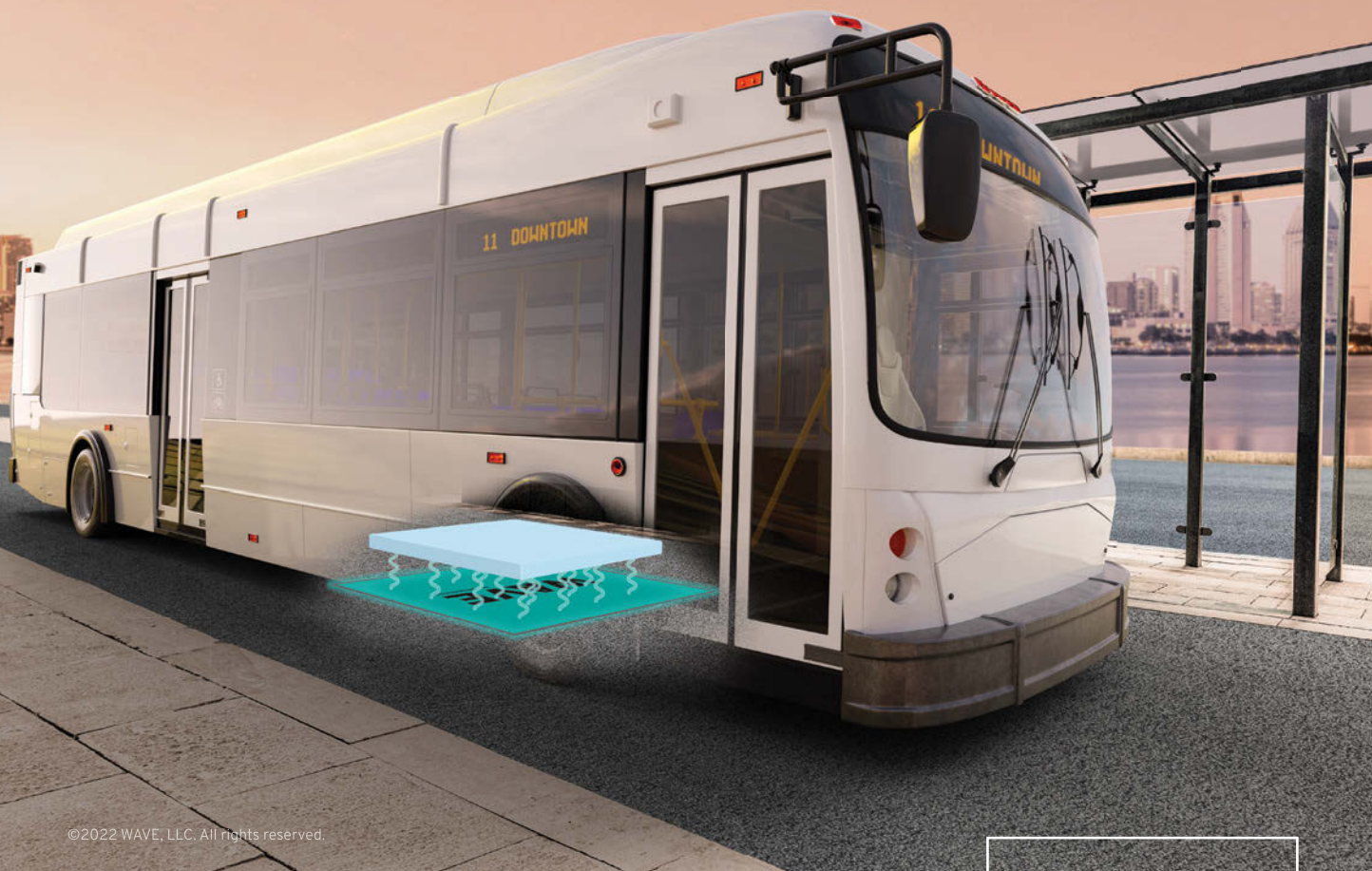
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agencies, such as ADA paratransit or dial a ride services, need to be booked a minimum of 24 hours in advance. This creates limitations for the rider, especially under unpredictable or unplanned circumstances, including delayed doctor's appointments and unanticipated line ups at the grocery store or other events with an unknown duration or end time.

The rider's need for flexibility arrives at a critical time for public transportation, especially when it comes to rebuilding ridership in a post pandemic world. Both conventional transit and ride hailing are perceived with skepticism from more than 60 percent of riders.

For transit agencies, limited fleets and driver shortages pose a restriction in providing flexibility. Investing in fleet expansions may not be feasible because vehicles may sit idle when there is low demand from riders.

How can transit agencies evolve to balance rider experience and needs with financial constraints when rebuilding ridership?

This is where mixed fleets come into play. Mixed fleets, also referred to as intelligent trip brokering, utilize non-dedicated service providers (such as TNCs and taxis) enabling transit agencies to access vehicles, which are not part of their own dedicated fleet network. Shifting to mixed fleets provides several benefits, including the flexibility to shift and allocate trips to lower cost, non-dedicated providers.

Trip brokering is directly dependent on what is the most reliable and cost-efficient way to meet rider demand. Similar to microtransit and paratransit services offered by transit agencies, pooling is also possible when appropriate. What previously was considered to be competition to conventional transit is now necessary to provide better rider experience and offer more flexibility to both the rider and the agency.

● Non-dedicated vehicles   ● Dedicated vehicles   Demand
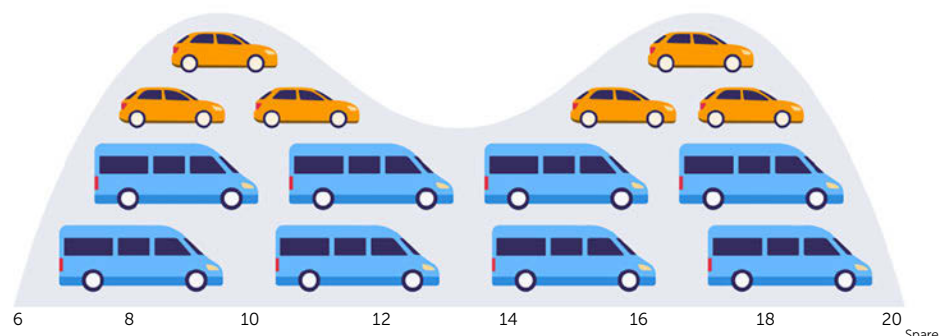
6   8   10   12   14   16   18   20
                                                    Spare

> **"What** previously was considered to be competition to conventional transit is now necessary to provide better rider experience and offer more flexibility to both the rider and the agency."
>
> **-KRISTOFFER VIK HANSEN**

McKinney, Texas, Mixed Fleet Model

A prime example of leveraging mixed fleets to evolve with rider demand is Collin County Transit, specifically its operations in McKinney, Texas.

Located roughly 45 minutes on the outskirts of Dallas, McKinney has consistently been one of the fastest growing cities in the United States. This is easily seen by the sharp increase in rider behavior in the city. Throughout 2022, the number of rides soared from approximately 200 rides per week up to between 750 and 800 rides per week. With such a significant jump in demand, Collin County Transit utilized a flexible solution that would allow it to efficiently service their ridership and their varying needs without too much upfront investment.

Collin County Transit's McKinney service originally operated with solely dedicated vehicles. One hundred percent of trips were going to dedicated providers, which meant that if there was ever a service interruption, or ridership were to surge for whatever reason, Collin County Transit riders had limited options.

To manage its mixed fleet model, Collin County Transit used transit software provided by Spare to divide rides between its two local dedicated trip providers, Irving Holdings and ECHO, and a non-dedicated fleet provider in Lyft. During the course of the first year of the brokered service, Collin County Transit reduced its share of dedicated trips to 30 percent, with 70 percent being brokered via Lyft. The agency has also benefited from large cost savings, as the introduction of Lyft as a mixed fleet provider has slashed the average cost per ride by 47 percent. The savings in cost per trip, as well as the avoidance of upfront costs when needing to expand existing fleets, demonstrates a convenient and tangible solution for both riders and transit agencies.

This is especially useful when there is a large service area: Dedicated vehicles cannot effectively cover vast geographic distances while providing riders with a good experience. Intelligent trip brokering generates more vehicle capacity, which means agencies can serve more riders without additional costs or drivers. In the long term, this also reduces the agency's vehicle requirements and promotes a resilient system that can respond to fluctuating ridership demand.

As illustrated by Collin County Transit's operations in McKinney, switching to mixed fleets helps transit agencies enhance rider experience. Low wait times, flexible bookings and the freedom to move beyond fixed route transportation provides riders with affordable and more favorable transportation options. **MT**

Kristoffer Vik Hansen is the CEO and co-founder of Spare.
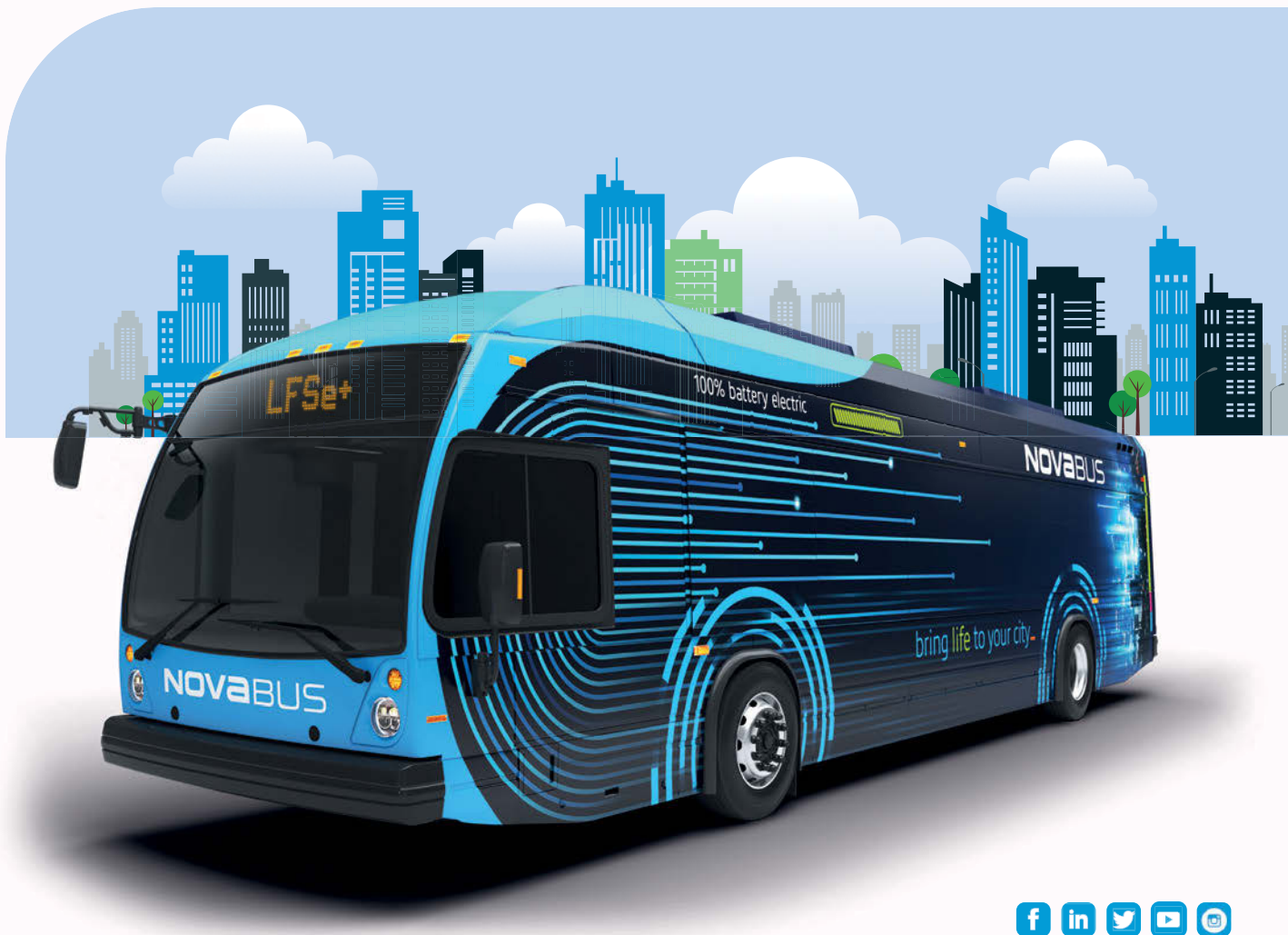
BEYOND CARBON REDUCTION

Electric buses provide resilience for climate emergencies.

When climate emergencies shut down transit service, vehicle-to-grid and vehicle-to-everything applications could allow transit agencies to use battery electric buses to keep the power on for their communities.

By **Dayna Wasley, contributor**

Transit is a critical factor in the accessibility of economic and social opportunities for people who do not have access to a personal vehicle. With these services alone, transit has earned its keep as one of the greatest equalizers in society. However, as the world continues to evolve, the transit industry has an enormous opportunity to extend its reach beyond taking people from one place to another and become a solution to one of the greatest threats to communities in today's world: resilience.

Energy is a Scarce Resource

All over the news, resilience is one of today's hottest topics. From wildfires, to hurricanes, to extreme temperatures, to floods, communities around the world have experienced situations in recent years in which their resilience has been tested.

During these events, energy becomes a scarce resource. Utility lines are ripped out by strong winds, or the grid gets overloaded by a high demand for air conditioning or heating, and thousands, sometimes millions, of people may be left without energy. In the best-case scenario, people are left without energy for a few hours, and it is an inconvenience. In the worst-case scenario, people may be left without energy for days during inclement weather, and it can be a matter of life and death.

In 2021, three severe winter storms left 4.5 million homes and businesses without power during below-freezing temperatures in Texas. At least 246 people died during the power outages, with some sources putting the number as high as 814 deaths. That same year, Hurricane Ida caused more than a million people to lose power. During the aftermath of the hurricane, an excessive heat advisory was issued. Despite efforts to evacuate residents to state shelters, 12 people died from heat-related causes from the power outage. To be truly resilient during these situations, communities need to develop decentralized energy solutions that can keep people comfortable and safe and prevent further tragedies.

This is where vehicle-to-grid (V2G) and vehicle-to-everything (V2X) come into play. When most people think about an electric vehicle, they think of a vehicle plugging into a charger and taking energy from the grid. V2G and V2X challenge this idea. With V2G and V2X, the vehicle could actually give energy to a building, another vehicle or return it to the grid. This emerging concept would allow vehicles to be a potential solution to stabilize the grid during natural disasters. On a small scale, your vehicle could be your source of energy for several hours during a power outage. On a large scale, V2G and V2X could be a game changer for an entire community.

Transit is the Resilience Solution We've Been Looking For

How does transit fit into this problem? Well, many transit agencies across the U.S. have committed to converting their vehicle fleets to fully zero-emission vehicles by 2040. Some agencies have even taken a more ambitious approach and plan to have a fully electric fleet by 2030 or sooner. This transition offers a tremendous opportunity to improve resilience around the country.

The battery-electric buses (BEBs) that transit agencies use have batteries that can store significantly more energy than a personal vehicle, which means that BEBs have more potential to deliver the larger-scale benefits of V2G and V2X. Currently, a fleet of 30 BEBs has the battery capacity to power an average hospital for a full day. BEB manufacturers are constantly working to make batteries with even more capacity, and this number is expected to grow in the future.

Many people may think about this concept and wonder if transit fleets are the right vehicles to provide this service. Many transit vehicles are in service more than 14 hours a day and do not have a lot of downtime compared to other types of fleets. School buses, for example, only run in the mornings and afternoons and even have multiple months each year where they don't run at all when school is out of session. While school buses and other fleets may be part of the solution too, transit vehicles have a special purpose in the greater V2G and V2X framework.

During natural disasters, transit agencies help people evacuate and get to a safer place. That means that transit vehicles are likely already onsite at evacuation centers, giving transit vehicles the perfect opportunity to use V2X capabilities to provide energy to the evacuation center and keep people safe and comfortable.

Even during situations that don't require a full-scale evacuation, transit buses still have the potential to provide this incredibly important service. Bus service is often used as an indicator of whether school and even work is canceled during inclement weather. If transit can't run, that's usually a good indicator the city will be shut down for the day. While buses are grounded during these events, they could be supplying energy back to the grid to help utility companies handle the influx of demand for energy.

V2G and V2X are not exclusive to BEBs or at least not for very long. The Mobility House, in partnership with New Flyer, the Center for Transportation and the Environment (CTE) and AC Transit, is already leading the charge on one of the biggest innovations in the V2G and V2X space, unlocking the potential of hydrogen fuel cell technology for V2G and V2X.

Hydrogen fuel cell technology is one of the latest innovations in the clean transportation space. It uses hydrogen and oxygen to generate energy to power vehicles. This new technology creates the potential for a continuous energy source that could

"The transition to zero-emission vehicles and emergence of V2G and V2X add yet another way transit agencies can be there for their communities when they need support the most."

-DAYNA WASLEY

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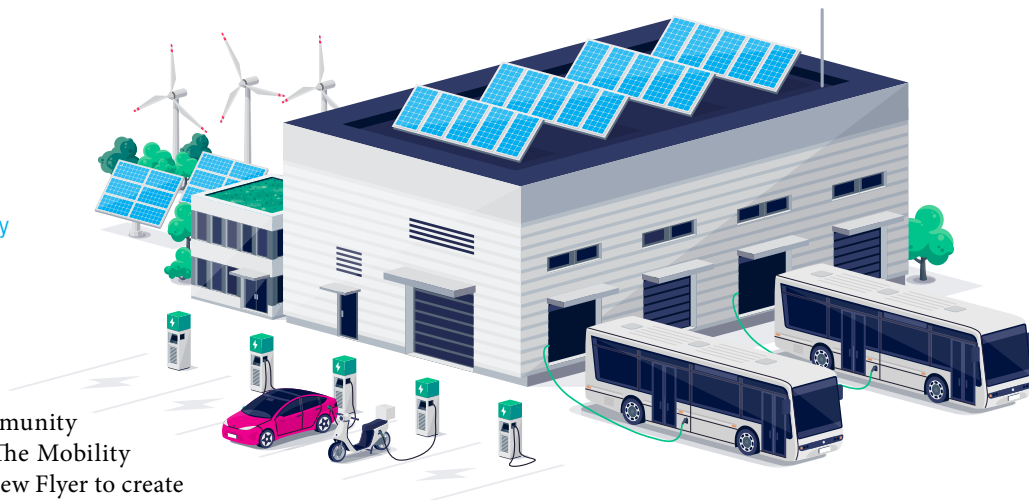
provide energy to a community during a time of need. The Mobility House is working with New Flyer to create the first ever hydrogen fuel cell transit bus that will give energy from hydrogen fuel back to a building. This will unlock the potential for transit agencies to become the resilience solution that the world has been searching for.

A Safer Future for Communities

Transit agencies have always and will always serve a critical role in their communities. The transition to zero-emission vehicles and emergence of V2G and V2X add yet another way transit agencies can be there for their communities when they need support the most. This exciting opportunity demonstrates why transit is so important to the world, as it gives us the opportunity to advance – as individuals, as a community and as a society. ⓜ

Dayna Wasley is the North American transit business development manager at The Mobility House.

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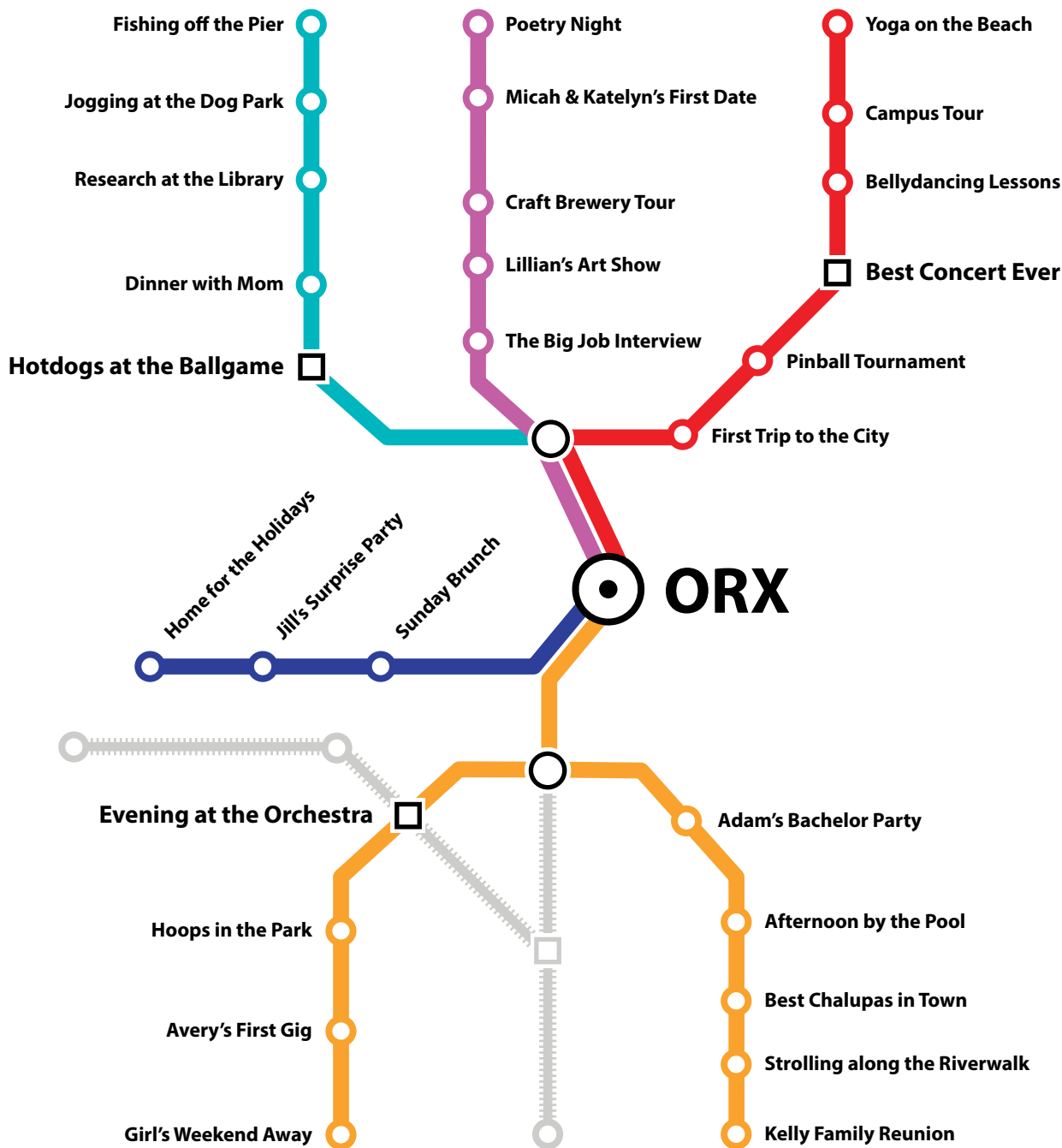**NFI** Leading the *ZE*volution™

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