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FHWA's Fostering Multimodal Connectivity Newsletter

In This Issue

Introduction

The Federal Highway Administration's (FHWA's) Fostering Multimodal Connectivity Newsletter is intended to provide transportation professionals with real-world examples of ways that multimodal transportation investments promote economic revitalization, provide access to jobs, and achieve safer communities through support of accelerated project delivery, technology and design innovation, and public/private partnerships. This newsletter communicates FHWA and partner efforts in support of the USDOT Strategic Plan by improving connectivity, accessibility, safety, and convenience for all users.

Want to access additional tools and resources? Please visit FHWA's website. Past issues of the newsletter are also available. To subscribe to the newsletter, visit GovDelivery.

San Francisco Launches Shared Scooter Pilot Program

Ben Jose, Public Relations Officer, San Francisco Municipal Transportation Agency

At the end of March 2018, electric scooter companies unloaded hundreds of motorized scooters across San Francisco. From April 11 to May 23, San Francisco's 311 Customer Service Center received nearly 1,900 complaints regarding scooters. Complaints ranged from scooters blocking sidewalk access to unsafe riding in the public right-of-way. As a result, San Francisco Public Works impounded more than 500 scooters that were blocking sidewalks or otherwise improperly parked.

San Francisco's Board of Supervisors unanimously passed a new city law on April 24, 2018 to address the scooter issue, requiring companies that operate shared, powered scooters to obtain a permit from the San Francisco Municipal Transportation Agency (SFMTA) to park scooters on city sidewalks or other public spaces. In compliance with this law, which took effect on June 4, existing companies removed their scooters from San Francisco.

Figure 1: The City allowed electric scooters to operate in bicycle lanes in San Francisco. (Image courtesy of SFMTA).

In late May, SFMTA announced the regulatory steps the agency would take in alignment with this law. The agency created an official permitting process, pilot program, and application for all interested applicants, with a deadline for submittals of June 7.

Applicants had the opportunity to develop innovative solutions that would minimize their impact on San Francisco's sidewalks, while maximizing transparency and engagement with the public and city government.

At a minimum, SFMTA required that operators provide user education, have insurance to cover potential property damage or injury, share trip data with the city, have a privacy policy that safeguards user information, offer a plan for low-income users, and submit a proposed service area plan for city approval. SFMTA also underscored the opportunity companies had to seriously address illegal scooter riding and parking.

SFMTA did not provide a predetermined description of what the strongest application would look like, but rather the minimum standards applicants were expected to meet. Applicants had the opportunity to share innovative proposals and offer true commitments to ensure their service would be safe, equitable, and accountable. Strong applications demonstrated the highest level of commitment and ability to solve known challenges and concerns, and substantially exceeded the minimum requirements set by the city.

On August 30, 2018, SFMTA announced that after a thorough review of 12 applications and more than 800 pages of proposals, it would offer permits to Scoot and Skip. These companies demonstrated a high level of capability to operate a safe, equitable, and accountable scooter share service. They also showed the highest level of commitment to solving challenges and concerns, ranging from public safety and user education to equitable access and collaboration with the city and its diverse communities.

To provide transparency, accountability, and insight into the agency's evaluation and decisionmaking process, SFMTA made public a variety of information and materials on the SFMTA website. These include a detailed policy memo outlining the

application review process, evaluations for each separate application, a summary table showing ratings for all the applicants across key evaluation criteria, the original applications received, and the decision letters sent to the applicants.

On October 15, 2018, SFMTA issued permits to Scoot and Skip. Each permit allows a maximum of 625 scooters for each company in the first six months. Scoot and Skip may be permitted to increase the number of scooters in months seven to 12, up to a cap of 2,500 total between the two companies, at the sole discretion of the SFMTA. The cap is sufficient to allow for a thorough evaluation of the scooter-sharing operating model in San Francisco, while minimizing the potential for sidewalk crowding and safety impacts during the pilot phase.

During the 12-month pilot, SFMTA will evaluate how a shared scooter system works in San Francisco. The agency will assess the pilot's effectiveness and company compliance through field observation, counts, citations issued, data received, complaints received, and other measures. Scoot and Skip are also expected to follow community engagement guidelines, particularly in focus neighborhoods identified by SFMTA.

Recognizing both the challenges and potential benefits of scooter share for residents, San Francisco moved quickly to put in place a law, regulations, and application and permitting process, resulting in permits being issued just a few months later for a pilot program. The pilot's results will inform future policy recommendations and next steps. SFMTA's scooter permitting requirements and pilot program reflect the agency's data-driven method to better understand how new mobility services impact the city and its communities. The model is similar to approaches the agency has taken in the past, including using pilots and short-term permits to better understand the needs and impacts of new services such as dockless bike sharing, on-street car sharing, and electric moped sharing.

For more information about shared mobility, please see Federal Highway Administration resources Shared Mobility: Current Practices and Guiding Principles and Integrating Shared Mobility into Multimodal Transportation Planning.

Seattle Sidewalk Condition Assessment Project Accelerates Repair Program and Supports Pedestrian Access

Emily Burns, Asset Management Strategic Advisor, Seattle Department of Transportation

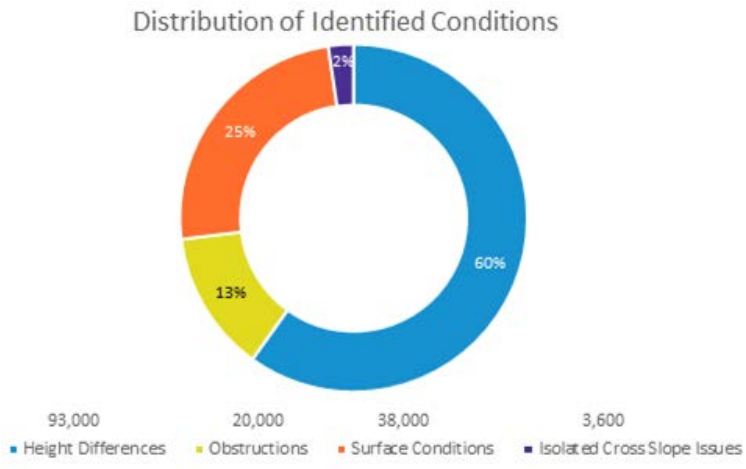

Figure 2: The chart shows that height differences are the most common sidewalk issue, followed by surface conditions. (Image courtesy of SDOT)

With an almost $5.6 billion replacement value, sidewalks are one of the Seattle's most valuable assets. Maintaining and improving sidewalks is essential for a healthy, growing city. In 2016, the Seattle Department of Transportation (SDOT) lacked condition information for 70 percent of its sidewalks. SDOT's budget included $400,000 in 2017 to perform a sidewalk assessment. The project validated sidewalk data, like material and dimensions, on over 34,000 city blocks. SDOT also identified information on conditions along city blocks, which allowed staff to assign condition ratings to 99 percent of the inventory.

SDOT started planning the first ever comprehensive survey of Seattle's sidewalks in December 2016. To inform these efforts, SDOT gleaned insights from

small, medium, and large cities including Clayton, Missouri; Bellevue, Washington; and San Diego, California. Over the following summer, 14 college interns used electronic tools to measure sidewalk surfaces and iPads equipped with Collector for ArcGIS software, and traversed the city primarily using public transit. They assessed over 2,300 miles of sidewalk looking for vertical differences, cracks, gaps, obstructions, and cross slopes. Initial sidewalk observations data was used for the AARP-sponsored "A City for All Hackathon." Winners of the hackathon created an interface for SDOT to visualize sidewalk data and prioritize repairs.

The wealth of sidewalk information is now available on SDOT's Accessible Route Planner. This tool helps people plan convenient routes that provide access to curb ramps and avoid major slopes and obstructions. Temporary and permanent obstructions, such as vegetation, perpendicular curbs, and utility poles can make it difficult for older adults and people with mobility or visual impairments to navigate the city.

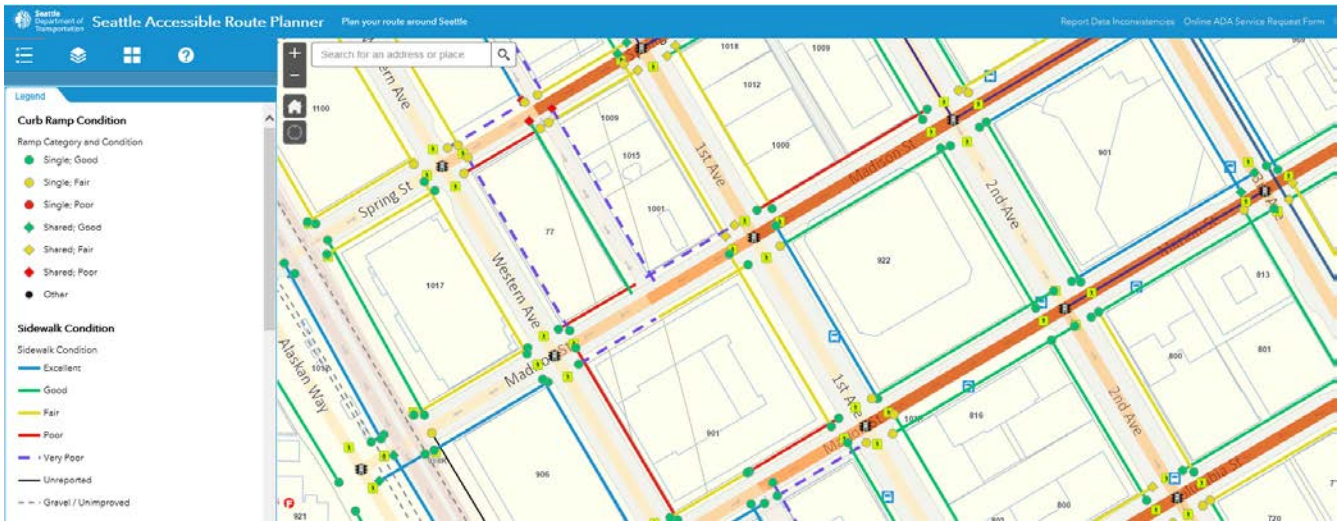

Figure 3: Screenshot of the Seattle Accessible Route Planner. (Image courtesy of SDOT)

Understanding sidewalk condition, type, and location is key in order to equitably manage and prioritize sidewalk work and inspections across the city, rather than rely solely on customer requests. SDOT's Sidewalk Repair Program is implementing a repair and mitigation prioritization approach that considers safety, mobility impacts, cost, and high usage areas like government facilities, transit, hospitals, and other key locations under the Americans with Disabilities Act. Using the data, SDOT hopes to improve accessibility for everyone, including those with mobility and vision impairments.

Through this effort, SDOT has successfully heightened awareness about sidewalk repair needs and increased funding. After analyzing the sidewalk data, SDOT executed a three-week "shim blitz," in which crews placed shims—thin strips of asphalt—over damaged sidewalks, and beveled vertical differences to mitigate trip hazards. An SDOT engineer shared, "When I started my job, I thought our sidewalk repair needs were overwhelming. Using the data, I feel like I can make a difference." SDOT crews report being invested in the outcome of an effective approach that gives them the ability to organize their work within a grid, rather than responding to single customer requests that inefficiently route them across the city. Using the previous demand-driven method in 2017, SDOT crews completed about eight shims per day, or 1,063 total shims a year. During the three-week, data-driven shim blitz, crews repaired more than double this number, a total of 2,760 shims, or about 184 per day. As of September 2018, SDOT has applied more than 9,000 shims and bevels, accelerating the delivery of these important pedestrian safety features with the new data-driven approach.

This sidewalk assessment is just one piece of the puzzle in implementing Seattle's Pedestrian Master Plan (PMP), which aims to transform Seattle into the most walkable city in the nation. The PMP intends to improve safety and make walking routes more accessible for all ages and abilities. During the PMP Implementation Plan review, the Seattle Pedestrian Advisory Board advocated for the sidewalk assessment to expand its focus beyond new sidewalk assets to documenting existing sidewalk needs.

In addition to prioritizing sidewalk mitigation and repair, the PMP supports improved property owner and occupant education on responsibilities for vegetation and damage repairs; performance measurement and targets; risk assessments and litigation response; sidewalk repair policies and legislation; and long-term capital planning that evaluates project opportunities and funding options with the goal of improving sidewalk conditions citywide. Ongoing challenges include implementing a sustainable technology solution to update collected data and interpreting intern data quality in comparison to data reported from the field.

At some point during the day, almost everyone is a pedestrian. Walking can be an efficient and interesting way to navigate Seattle. Sidewalk condition information significantly benefits the city's planning efforts for mobility studies, capital projects, maintenance programs, and key transit connections with regional partners, including the massive Sound Transit light rail system expansion. Furthermore, the assessment provides an opportunity to communicate SDOT's sidewalk story to different audiences including residents, elected officials, stakeholders and partners, engineers, crews, planners, and grantors such as the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA). Since implementing the project, SDOT has shared lessons learned and data dictionaries with small towns, medium-sized cities, and large cities. Some examples include Stevenville, Texas; Fort Worth, Texas; Tacoma, Washington; Portland, Oregon; and the University of Colorado, Denver. To learn more about the project, please see the SDOT website.

Minnesota Department of Transportation Conducts Automated Shuttle Pilot

Michael Kronzer, CAV-X Project Manager, Minnesota Department of Transportation

As automated vehicle (AV) technology rapidly evolves, it has the potential to revolutionize the transportation industry. Around the country, significant work is being done to research, test, and deploy AVs. Automated shuttle systems are expected to be among the first automated systems to be deployed in the United States. Automated shuttles are tailored to low-speed, urban environments. The Minnesota DOT (MnDOT) team observed how an automated shuttle vehicle would interact with the average daily roadway environment, which included considering potential interactions across modes.

The team sought to understand how the shuttle would operate in both clear and winter weather conditions. Many AV research efforts are taking place in States with warm weather and road conditions that are more conducive to every-day

Figure 4: EZ10 undergoing testing in controlled snow-making conditions. (Image courtesy of MnDOT)

driving. MnDOT recognized the State must tackle the challenge of winter weather in order to realize the benefits of AVs. With this in mind, MnDOT set out to be the first State in the nation to reach out to the AV industry in search of a partner to test and demonstrate AV technology in winter weather conditions, including interactions with pedestrians and bicyclists.

This outreach effort resulted in a partnership with EasyMile, an automated shuttle company, to test and demonstrate the technology in varying winter weather conditions. EasyMile worked with the National Highway Traffic Safety Administration to acquire a required exemption for testing or operating a driverless vehicle on a public roadway. EasyMile's autonomous shuttle, the EZ10, is a 12-15 passenger, level four automated shuttle. A level four AV refers to a fully autonomous vehicle that requires no driver to operate. The limitation of a level four AV is that it can only operate in a constrained environment, or in this case, a pre-programmed route. The shuttle also has a mobility ramp for wheelchair accessibility, which was a point of emphasis for MnDOT.

Winter testing took place at MnDOT's MnROAD facility, a research facility typically used for pavement research, but well suited for AV testing due to the 2.5-mile closed loop track. Testing of the automated shuttle involved running the vehicle through many different scenarios that may be encountered in real-world operations. The project team observed how the vehicle behaved while on its route as it interacted with:

- Pedestrians,
- Bicyclists,
- Other vehicles, and
- Work zone cones and barrels.

These scenarios were first observed during ideal weather (i.e., no precipitation and dry surface conditions) and then replicated in winter weather conditions to observe how these affected vehicle behavior. Winter weather conditions included falling snow, blowing snow, snow on the pavement, ice on the pavement, and salt spray on the vehicle's sensors. The project team contracted snow-making services at MnROAD to create controlled snow and ice conditions via a large pump and two ski-hill sized snow-making machines.

The MnDOT team observed the automated shuttle handling varying pavement conditions very well. The sensors used on many AVs are very sensitive and will pick up nearly everything in the vehicle's path, many times slowing the vehicle or bringing it to a complete stop. Test scenarios included detecting bicyclists and pedestrians, and identifying appropriate stopping distances for pedestrians and bicyclists traveling ahead of or behind the automated shuttle bus under various approach speeds. The vehicle even demonstrated the ability to "follow" pedestrians and bicyclists. This involved reducing its speed to match the pedestrian or bicyclist to follow at a safe distance until the path was clear and the vehicle could continue on its route at normal operating speed. In winter conditions specifically, AVs will need to learn how to distinguish between potential hazards (pedestrians, cyclists, and other vehicles), and falling and blowing snow, which is not necessarily a hazard. Currently, AV technology is highly sensitive in order to avoid collisions; ideally, future

Figure 5: MnDOT held public demonstrations of the automated shuttle in downtown Minneapolis during Super Bowl week, giving people a chance to view and comment on the technology. (Image courtesy of MnDOT)

adjustments to the technology will allow AVs to more finely distinguish between pedestrians and other moving objects like snowflakes.

MnDOT and its project partners also identified public education and outreach as a second major challenge in advancing AV technology. To address this, MnDOT conducted a series of public demonstrations, including a three-day demo in downtown Minneapolis during Super Bowl week in February, which brought in nearly 1,300 riders. The goal was to allow the public to see, touch, feel, and experience a fully automated vehicle first hand. The public was able to ask questions, voice concerns, and provide input on how the technology should be deployed in the future.

MnDOT's Automated Shuttle Pilot was a learning opportunity for all involved. It was the first step for Minnesota in what will be a series of many steps to address how AVs will operate in the State's multimodal transportation system, winter climate, and society. Moving forward, the local, State, and Federal governments will need to foster a culture of collaboration amongst levels of government, as well as with the private sector. Communities looking to implement this technology would be best suited starting in a controlled environment to learn and build comfort with the technology before deploying onto public roadways. The public should also have as many opportunities as possible to experience the technology early in the process, as public perception and education are extremely important for acceptance of these new vehicles. This technology has the potential to revolutionize how people live and travel, but it will require continued work to ensure the technology advances in a safe, efficient, and equitable way for all roadway users. To learn more about the pilot and read the final report, visit MnDOT's website. For more information on transit automation research, see the Federal Transit Administration website. For more information on the U.S. Department of Transportation's approach to automated technology, please see *Preparing for the Future of Transportation: Automated Vehicles 3.0*.

Providence Implements Strategies to Expand Pedestrian and Bicycle Network

Miranda Richard, U.S. DOT Volpe Center, Cambridge, MA & Alex Ellis, Principal Planner, City of Providence

The city of Providence Department of Planning and Development seeks to make the public right-of-way safe for all road users, regardless of their mode of travel. This involves collaboration with other agencies, including the Providence Department of Public Works, the Rhode Island Department of Transportation, and the Rhode Island Public Transit Authority. Over the past several months, Providence has implemented a number of projects to expand pedestrian and bicycle networks, including demonstration projects for shared-use paths and the launch of the city's bike-share system.

The citywide Urban Trail initiative vision seeks to connect every neighborhood to a shared-use path network that provides a safe, intuitive, and comfortable way to access employment and services; experience Providence's arts and culture; explore the city's vibrant neighborhoods; walk, run, bike, skate, and scoot to parks, schools, jobs, and other destinations; and connect the Downtown Providence Parks Network, Providence Riverwalk, City Walk, and regional trail network.

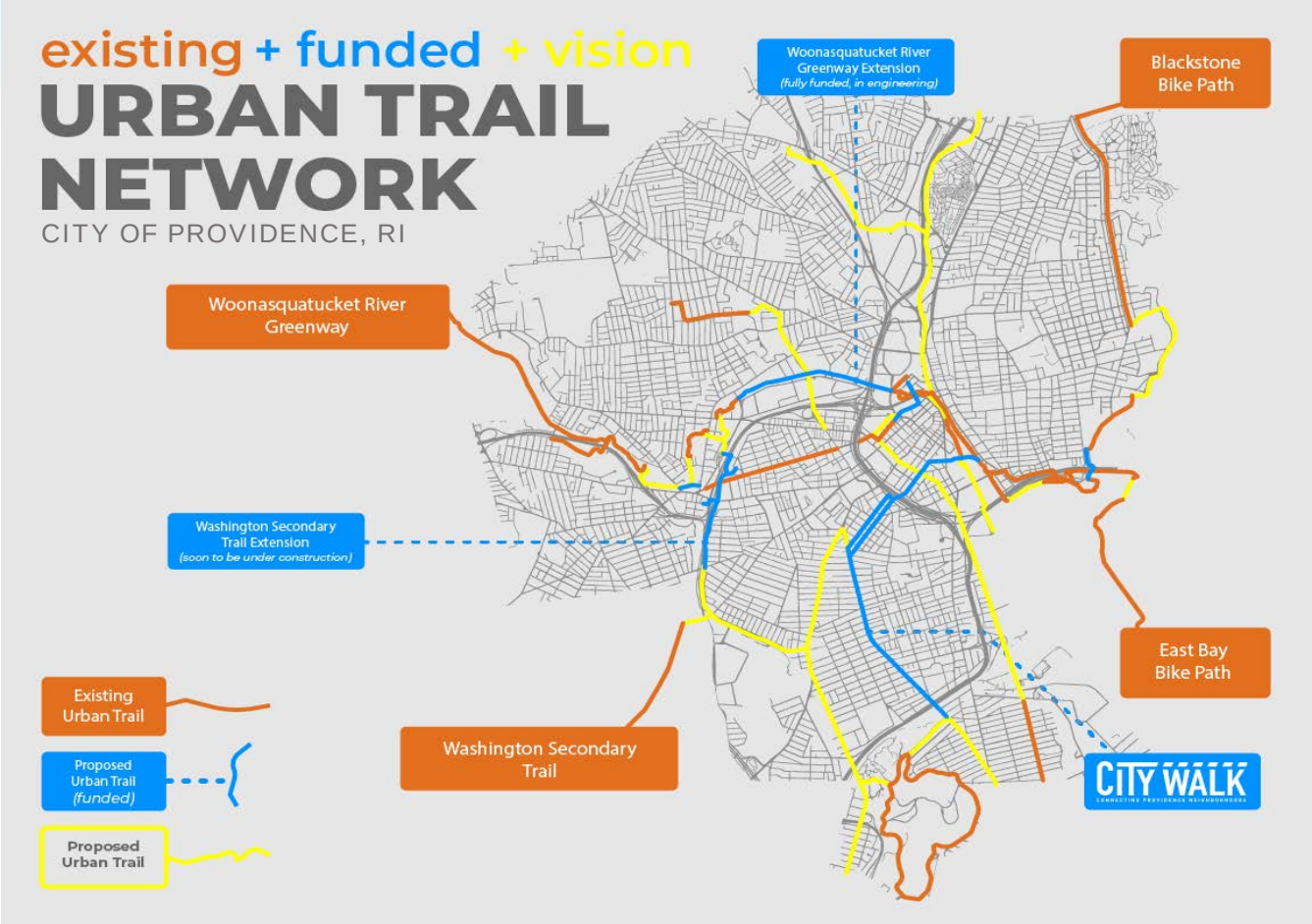

Figure 6: A map of Providence's Urban Trail Network, including existing, funded, and proposed trails. (Image courtesy of the city of Providence)

In addition to these regional trails, the city is examining small gaps in the network to improve conditions for all road users. In June 2018, Providence conducted a demonstration day of improvements along Broad Street as part of the Statewide Transportation Improvement Program (STIP) funded City Walk section of the trail network. Between 2009 and 2015, 82 bicyclists and pedestrians were involved in vehicle-related crashes along Broad Street. The neighborhoods surrounding Broad Street are majority-Hispanic with median household incomes below $30,000. Furthermore, 40 percent of the residents depend on nonmotorized transportation. For the demonstration, city officials temporarily set up several blocks of the commercial arterial corridor on Broad Street to show a two-way protected shared use path on one side of the street, as well as intersection curb bulb-outs featuring ground murals created by local artists. The team also used 6,000 square feet of pavement to create large pedestrian plazas for people to gather.

Beyond traditional outreach methods such as community meetings, project webpages, and community stakeholder advisory groups, the Providence Department of Planning and Development uses innovative outreach methods, including a street ambassador program. Piloted for the City Walk project, this program hires community residents to inform other community members about projects and collect feedback. Project team members collected feedback from passersby and connected with many more corridor users than are typically reached through traditional outreach methods. Passing residents reacted most positively to the ground murals in the painted pedestrian plazas and the separation of the bike lane. This feedback informs the design of the permanent improvements that will be installed throughout the corridor in 2019.

Figure 7: The demonstration of bi-directional, protected bike lanes on Broad Street. (Image courtesy of the city of Providence)

The city is also encouraging residents and visitors to access the network with a new citywide bike-share system. Launched in September 2018, this system is one of the first electric pedal-assisted bike-share systems in New England. The system helps residents connect their first mile and last mile to transit trips. Funding for the bike-share system came in part from a grant for Providence's Downtown Transit Connector from the U.S. Department of Transportation Investment Generating Economic Recovery (TIGER) program, which has become the Better Utilizing Investments to Leverage Development (BUILD) program. The 400-bike system is operated by JUMP Bikes and includes a service area that currently reaches 14 of the city's 25 neighborhoods. In its first few weeks of operation, Providence had the highest ridership of any JUMP system outside California, with more than 2,000 riders and 5,000 trips per week. This strong performance has led JUMP to consider expanding the system area in 2019. Current hub locations include several on City Walk and the Woonasquatucket Greenway, with the Washington Secondary Path extension likely encompassed in the service area expansion. The distribution and equitable pricing plans for the bike-share system provide access to bicycles for residents and visitors who may have limited mobility options.

These initiatives demonstrate Providence's work to organize its streets more equitably. Through the process of prioritizing safety and access for users of all modes, the city has learned several lessons:

- Agreement about the importance of this goal across all levels of government is critical to develop an appropriate infrastructure and regulatory environment.
- A favorable regulatory environment for bicyclists avoids laws that are shown to stifle ridership while doing little to improve bike safety at the population level.
- Developing regulatory policy before the launch of new technology can support adjusting to a rapidly changing transportation system.

The evolution of dockless, shared transportation options is developing faster than government is used to regulating, and Providence benefitted from writing a policy for electric scooter sharing even before those companies arrived in the city. Similarly, electric-assist bicycles require updated regulations to distinguish vehicles like JUMP bikes. With average speeds of 5 miles per hour (mph) and maximum speeds of 20 mph, the JUMP bikes are more similar to bicycles than electric bicycles with higher-powered motors or throttles that operate more like motorbikes.

While Providence faces similar challenges as many cities in aligning decisionmakers and the public around shared transportation priorities, the progress being made in Rhode Island's capital is significant, and the city has the momentum to continue improving multimodal networks and safety. These investments enhance the quality of life for all residents and visitors, while boosting the economy through equitable transportation access, business competitiveness, and tourism. All users benefit when connected multimodal networks allow people to get where they need to go safely and efficiently.

Announcements/New Resources

- The Federal Highway Administration (FHWA) published a new resource on "Strategies for Accelerating Multimodal Project Delivery." This resource focuses on specific strategies and techniques for accelerating multimodal project delivery, with a priority on opportunities to efficiently and effectively build out connected multimodal networks in concert with major highway, intersection, and bridge projects. It includes examples of standalone pedestrian and bicycle projects, retrofits in built environments, and ongoing maintenance activities. It highlights proven techniques that agencies are using to get high quality results, and opportunities to address barriers or delays in the project delivery process. FHWA and the project team hosted a webinar on the resource on October 31, 2018.
- The Federal Highway Administration (FHWA) released the **"**Community Connections Innovations Handbook**."** This publication is a handbook for States, metropolitan planning organizations (MPOs), local and tribal governments, and other transportation practitioners that includes a toolbox for advancing Community Connections considerations in the transportation planning, project development, and design processes.
- The Center for Environmental Excellence by the American Association of State Highway and Transportation Officials (AASHTO) recently released two new case studies: "Connecticut DOT Helps Towns Accommodate Walking and Bicycling through Road Safety Audits" and "PennDOT Seeks Local Input to Build Better Connections for Communities." The initiative supports streamlined project delivery by helping to identify and build community support for needed intermodal connections.
- American Trails brings agencies, trailbuilders, advocates, and volunteers the latest in state-of-the-art information on all aspects of trails and greenways through monthly webinars. Webinar topics featured in coming months include topics on public-private partnerships, e-bikes, and economic development.