U.S.Department of Transportation
Federal Highway Administration

July/August 2019 Volume 8, Number 2
FHWA-HEP-19-038

FHWA's Fostering Multimodal Connectivity Newsletter

In This Issue

Introduction

The Federal Highway Administration's (FHWA's) *Fostering Multimodal Connectivity Newsletter* provides transportation professionals with real-world examples of how multimodal transportation investments use accelerated project delivery, technology and design innovation, and public/private partnerships to promote economic revitalization, provide access to jobs, and achieve safer communities. The newsletter also showcases how FHWA and its partners are supporting the USDOT Strategic Plan by improving connectivity, accessibility, safety, and convenience for all transportation 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.

Reprioritizing the Curb in Fort Lauderdale Using Designated TNC (Rideshare) and Unloading Zones

Catherine Prince, Mobility Project Manager, City of Fort Lauderdale

In the past decade, technology innovations—including transportation network companies (TNCs) such as Uber and Lyft—have substantially expanded mobility options. At the same time, there has been an unprecedented increase in the number and frequency of last-mile delivery vehicles in response to rising demand for online shopping. These changing trends in on-demand services pose new challenges—but also provide opportunities for taking a comprehensive look at how communities move people and balance the needs of the different users within existing streets.

In the city of Fort Lauderdale, these on-demand changes have impacted local streets, especially during the months of November through April when the number of people in the city doubles. From retired snowbirds to young spring breakers, this transient population puts additional pressure on limited street space. The city acknowledges that the right-of-way within the urban center is limited. In many cases expanding the right-of-way is not an option when the adjacent properties are built-out. The 2013 Las Olas Boulevard Mobility Study identified Las Olas Boulevard as a constrained corridor with potential for street design improvements. Repurposing the underutilized space within the existing right-of-way using temporary materials, such as paint and delineators, is one example. The City Commission approved a six-month demonstration project between January and June 2018, funded by the Las Olas Boulevard Community Investment Project.

Las Olas Boulevard is the city's 24-hour activity center and de facto main street with retail, entertainment, offices, and mixed-use spaces. The constrained corridor consists of three blocks of an undivided four-lane street, with between 800 to 1,000 vehicles per hour. Given that Florida Department of Transportation (FDOT) standards recommend a capacity of 1,300 vehicles for two lanes, the existing cross section was underutilized. Drivers used travel lanes for loading/unloading, TNC drop-offs/pick-ups, and other activities. Such a disorganized arrangement causes stop-and-go traffic and safety concerns for people walking or biking, or those delivering or using TNCs. Furthermore, the entire curb space was allocated for on-street parking, even though the area has a number of underutilized parking garages.

The demonstration project proposed a two-lane divided section and prioritized the more vulnerable users along the curb. The project repurposed the outside travel lane to accommodate multiple activities and users by designating separate areas for each activity. To discourage unsafe practices—such as double parking or stopping in the travel lane for loading/unloading and pick-up/drop-off of passengers—the city implemented the new configuration with three pilot initiatives complementing the street design during the same six-month period. The reconfigured curb space, previously designated only for on-street parking, now has:

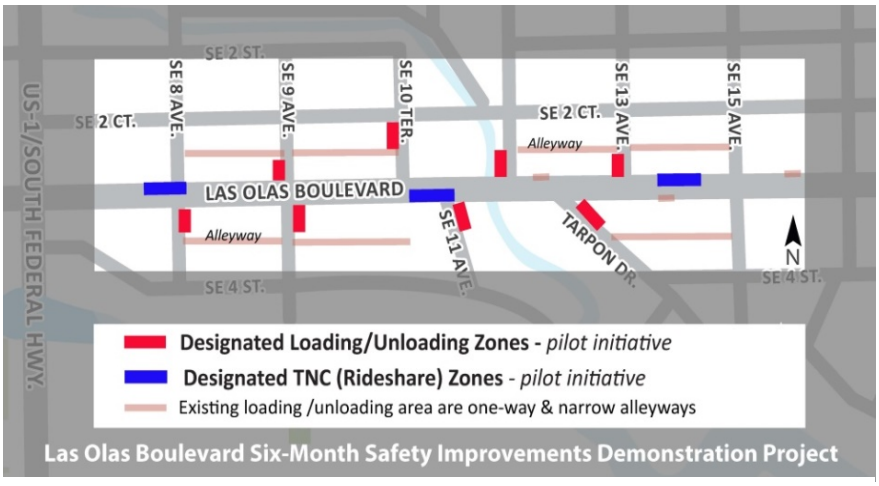

Figure 1: Map showing locations of new TNC zones on Las Olas Boulevard and loading/unloading zones for freight on the side streets (Image courtesy of City of Fort Lauderdale)

- **Parking-protected (separated) bike lanes** by repurposing one travel lane and one turn-lane for the bike lane. The parked vehicles provide people biking with a physical buffer from traffic. The project includes installing bike parking along every block to ensure easy access to adjacent retail and restaurants.
- **Designated freight loading zones** on the side streets during off-peak hours (weekday mornings) by repurposing on-street parking. The loading zones allow people to load/unload packages and deliver them to businesses at a safe distance from traffic.
- **Designated TNC zones** during peak hours (weekday mornings and all weekend) by repurposing on-street parking through a partnership with Uber, Lyft, Yellow Cab, and adjacent business associations. The three zones offer safe areas for drivers to pull in and drop off passengers, and provide a safe space on the sidewalk for those waiting to catch a ride.
- **UPS cargo e-bikes**, which replaced UPS delivery trucks. These e-bikes use the new bike lanes instead of the travel lanes, reducing congestion.

Figure 2: A delivery person using a UPS cargo e-bike in the Las Olas bike lanes rather than travel lanes for deliveries along the demonstration project. (Image courtesy of city of Fort Lauderdale).

The city supported additional efforts to increase the efficiency of vehicle movement in the adjacent corridor—SE 15th Avenue between Broward Boulevard and Las Olas Boulevard—for those traveling between downtown and the beach. The challenge of this capital project was to balance promoting safety and quality of life and preserving the neighborhood's historic identity, while still allowing large trucks to pass. To achieve this, the city:

- Installed a truck apron at the intersection of SE 15th Avenue and Broward Boulevard to widen the space for trucks to turn and avoid pedestrian conflicts;
- Added a raised intersection at SE 15th Avenue and SE 2nd Street to manage speed and support pedestrian safety;
- Adjusted signal timing to support efficiency; and
- Included additional traffic calming strategies throughout the neighborhood intersections.

The Las Olas Boulevard demonstration and SE 15th Avenue capital project met the city's goals of 1) increasing safety; 2) balancing the needs of all users; and 3) improving economic vitality. Reprioritizing the curb space for people biking, making deliveries, and using TNCs resulted in significant increases in safety and encouraged more people to bike. Comparing data collected in spring 2018 with the same time period in 2017, the six-month evaluation showed the following improvements:

- 21 percent decrease in traffic crashes and 24 percent reduction in number of traffic citations;
- 91 percent of people biking using new bike lanes;
- 4 trucks per hour using the designated loading/unloading zones;
- 19 TNC users per hour using the designated pick up/drop off zones; and a
- 41 percent increase in self-reported business sales and 38 percent increase in self-reported foot traffic to businesses.

The project team presented their evaluation report to the City Commission in August 2018. The Commission voted to retain the temporary improvements until the three-mile wide design set out in the Las Olas Boulevard Master Plan is complete.

Currently, the city is constructing Americans with Disabilities Act (ADA) ramps along the demonstration project corridor to enhance accessibility of the temporary improvements.

The project team suggests that other communities looking to implement similar projects in their communities consider:

- Stakeholder engagement throughout the project to build trust and open communication;
- User education after construction to ensure the new design is used as intended;
- Collaboration with private partners to ensure emerging technology and mobility options—such as autonomous vehicles and e-scooters—are integrated into the project design;
- Quick-build using temporary materials like paint and plastic delineators to quickly and cost-effectively implement safety improvements, evaluate the design's effectiveness, and make any adjustments; and
- Post-project evaluations as a learning tool to help communicate project successes with stakeholders.

The project team recommends the following resources:

- FHWA's Achieving Multimodal Networks: Applying Design Flexibility and Reducing Conflicts;
- Institute for Transportation Engineers' Curbside Management Practitioners Guide; and
- PeopleforBikes' Quick Builds for Better Streets: A New Project Delivery Model for U.S. Cities.

The city's website also includes general information, FAQs, an evaluation report, and user education materials, including the Las Olas Boulevard New Bike Lanes Educational Video and Rideshare Educational Video and FAQ.

TriMet Multimodal Trip Planner Provides More Informed Travel Decisions and Door-to-Door Options

Bibiana McHugh, Manager of Mobility & Location-Based Services, Tri-County Metropolitan Transportation District of Oregon

Portland, Oregon has become a popular travel destination in the Pacific Northwest for its food, natural beauty, and easy-to-use transit. According to data compiled by Oregon Metro, the metro area's population is growing by over 400 people per week. With this rapid growth comes associated transportation challenges. Fortunately, more multimodal options are becoming readily available, providing travelers with additional opportunities to get to where they need to go.

The Tri-County Metropolitan Transportation District of Oregon (TriMet) has combined information on both public transit and these emerging multimodal options into a new trip planner. The trip planner is part of TriMet's initiative to evolve from a transit agency to a transportation options agency—an agency that connects people with integrated mobility options in addition to transit—to make it easier, more efficient, and cost-effective to get around the Portland area.

Figure 3: Trip planner graphic shows multimodal connections featured in the new trip planner (Image courtesy of TriMet).

In January 2017, TriMet received a $678,000 Federal Transit Administration (FTA) Mobility on Demand (MOD) Sandbox Program grant, supported by $324,000 of in-kind contributions, to develop the multimodal trip planner. The MOD Sandbox Program is designed to provide the public transportation industry with a better understanding of how to adapt to the rapidly changing mobility marketplace. TriMet's successful proposal was to create a platform to promote door-to-door trips integrating public transit with other modes.

The funding allowed the agency to use the same open source technology it pioneered development of in 2009. TriMet collaborated with 38 partners—including researchers, private companies, other public transit agencies, and city government—to create an open platform that integrates transit and shared-use mobility options into the existing OpenTripPlanner. TriMet continually interacted with application and geocoder development teams and negotiated working agreements with transportation network companies (TNCs) to share data and develop interfaces for the final product.

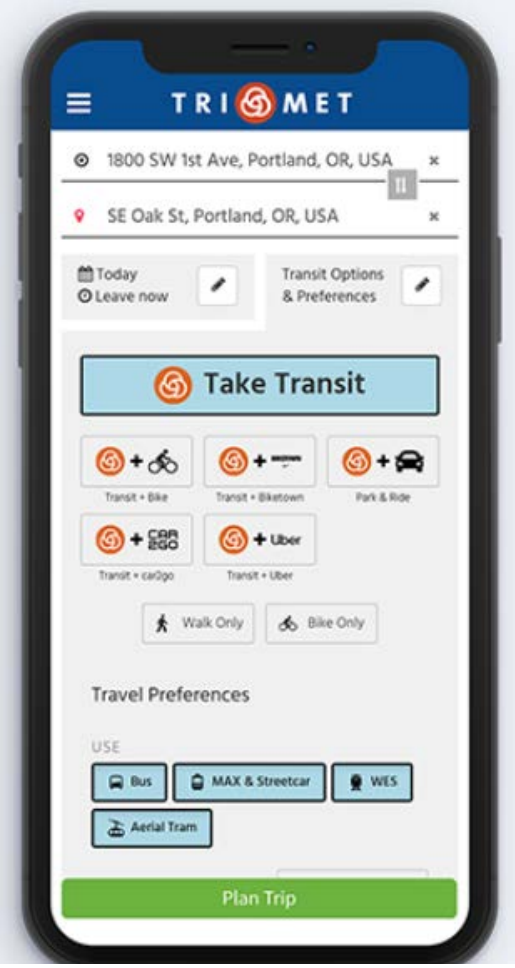

Figure 4: Sample view of TriMet's new trip planner shows how users can compare and combine different modes to optimize their trips (Image courtesy of TriMet).

TriMet is the first U.S. transit agency to release such a comprehensive multimodal trip planner—one that incorporates transit with shared-use mobility service providers. The current trip planner combines transit with walking and biking and private TNCs. Launched in March 2019, the new planner currently integrates TriMet buses and trains, Uber, SHARE NOW (formerly car2go), BIKETOWN (Portland's bike share system), Portland Streetcar, and Portland Aerial Tram, with more providers to come.

Combining these many options into one application addresses the "first mile/last mile problem" by improving customers' ability to travel door-to-door. Using the new trip planner on their desktop or mobile device, people can now plan the trip that works best for them in a variety of scenarios—whether a bus or train only gets them part of the way, they are in a hurry and transit alone may take too much time, or they are looking to save money by combining TNC services with other modes.

The tool uses real-time locations of vehicles and bikes to plan a single trip using a mix of travel options. If the trip planned includes Uber, the tool links customers to the Uber app to easily book and pay for that part of the trip. The new trip planner also lets customers search for destinations using business names and landmarks, in addition to streets and addresses. Eventually, TriMet wants to include all service providers—such as e-scooters and additional carshare options—so customers have more options and can make even more informed decisions about their trips.

Developing this open source software through collaboration with partners has resulted in a product that can easily and cost-effectively be replicated and implemented by other transit agencies. TriMet hopes to make improvements based on lessons learned from other agencies and incorporate them into the trip planner. The next step is gathering and applying stakeholder and customer feedback. TriMet anticipates adding more TNC and carsharing services, regional transit agencies, and e-scooters. The ultimate goal is to make the trip planner a one-stop-shop, combining planning, booking, and payment for all services. TriMet is offering the new trip planner on its homepage at trimet.org.

Rhode Island Launches Little Roady Autonomous Shuttle Pilot

Julia Gold, Chief of Sustainability and Innovation, Rhode Island Department of Transportation

New technologies such as autonomous vehicles (AVs) can improve safety and mobility, build the economy, reduce negative environmental impacts, and benefit the health and well-being of the traveling public. However, to achieve these benefits, nothing can take the place of real-world experience and diligent research associated with actually putting these AV technologies on the road.

In spring 2019, the Rhode Island Department of Transportation (RIDOT) launched the Little Roady Autonomous Vehicle Shuttle Pilot Project in Providence to help RIDOT and its partners better understand the opportunities and challenges of integrating new technologies into transportation planning. By doing so, RIDOT hopes to avoid unintended consequences and provide the best applications of this technology for use on public roads.

The Little Roady project uses a fleet of self-driving, electric vehicles running seven days a week from 6:30 AM to 6:30 PM, on a 5.3-mile fixed route with 12 stops between the Providence Train Station and Olneyville Square. This route currently does not have a dedicated transit service and Little Roady is helping to fill the gap. Based on RIDOT's research, it is the longest free, public, and autonomous shuttle route in the United States. Along the way, riders can connect with a variety of multimodal connections—such as Amtrak and the Massachusetts Bay Transportation Authority (MBTA) trains, Rhode Island Public Transit Authority (RIPTA) buses—and micromobility services such as electric bikes and scooters. The route connects passengers to State offices, a variety of large office and apartment complexes, community-based organizations, grocery stores and other commerce, and public health services, as well as dense residential neighborhoods. In its first month of operation, more than 3,500 rides were taken to work, school, shopping, or just to experience this exciting new technology. Wheelchair accessible rides are currently offered on the route through RIPTA; an ADA-accessible vehicle will be added to the fleet towards the end of the summer 2019.

The Little Roady shuttles are provided by May Mobility, which entered into a public-private partnership with RIDOT following a competitive request-for-proposal (RFP) process. After the initial year of service, RIDOT has the option to extend its agreement with May Mobility for up to two additional years. The company has hired more than 50 fleet attendants and site supervisors from Rhode Island and the region. Their local operations center is located in Providence on the route.

Figure 5: Little Roady with passengers on the street in Providence. (Image courtesy of RIDOT)

This carefully planned, well-executed integration of electric, autonomous, and connected technologies started two years ago, when RIDOT launched the Rhode Island Transportation Innovation Partnership (TRIP). This collaboration of State and local partners views transportation and mobility as a critical part of an integrated and comprehensive system of communities, infrastructure, land use planning, technology, and the natural environment. Complementing RIDOT's RhodeWorks asset

management program, TRIP's mission is to explore new technologies and the changing transportation system. A pilot project like Little Roady is an important milestone on that journey, and it is doing what TRIP had envisioned—engaging the community, workforce, and policy-makers in planning for the future of transportation.

Partners include RIPTA, the city of Providence, and Quonset Development Corporation. RIPTA is looking into first/last-mile electric micro-transit solutions and preparing their workforce for the future by having Amalgamated Transit Union bus drivers ride the shuttles and engage with the research team. The city of Providence is assisting with infrastructure connectivity, first-responder engagement and education, public engagement, and research for future transportation and land-use planning. The Quonset Development Corporation provided a vehicle testing location within their business park—the largest in Rhode Island—during Phase 1. RIDOT also has contracted with a research team from Brown University, 3x3 Design, Stae, and Bits and Atoms.

Pilot project costs—including the research component—are approximately $1.225 million, and include funding for an $800,000 public-private partnership with May Mobility. Funding sources include a $500,000 grant awarded by the Rhode Island Attorney General's Office as part of a settlement with Volkswagen, $580,000 in State Planning and Research Part 2 funds through the Federal Highway Administration, and $145,000 in matching State funds.

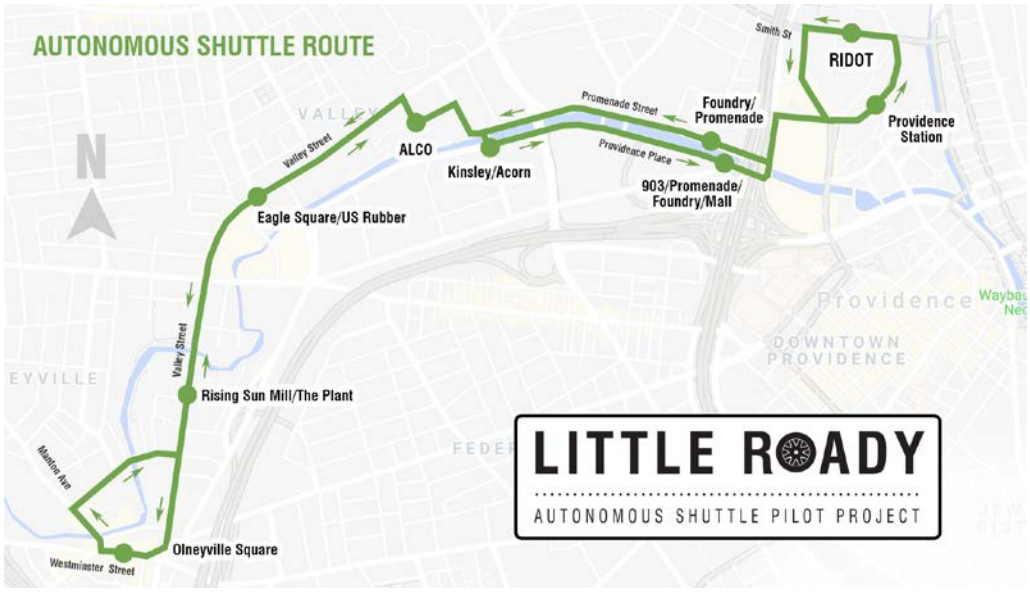

Figure 6: The Little Roady map shows the route from Providence Station to Olneyville Square. (Image courtesy of RIDOT)

During the next year, the Little Roady project will provide invaluable source data for Rhode Island's AV planning and policies and contribute to a broader discussion of how residents, businesses, the workforce, policymakers, and other stakeholders can adapt to the introduction of new transportation technologies. RIDOT and its partners will use the information collected to determine next steps and additional opportunities, as well as areas for further research. Observations from the pilot and on-the-ground surveys and interviews with bicyclists, pedestrians, and personal vehicle drivers will also provide valuable data. In the meantime, RIDOT invites everyone who is interested in AVs to hop on board a Little Roady shuttle and share their thoughts on experiencing tomorrow's technology on Rhode Island's roads today. Additional project background, FAQs, and a live route are available on the project website.

FHWA/FTA Peer Exchange Explores Use of Level of Traffic Stress Analysis to Support Bicycle Network Decisions

Jonah Chiarenza, Community Planner, U.S. Department of Transportation Volpe Center, Cambridge, Massachusetts

The Federal Highway Administration (FHWA) / Federal Transit Administration (FTA) Transportation Planning Capacity Building (TPCB) Peer Exchange Program provides Federal aid recipients with funding and planning support to collaborate with and obtain the input of State departments of transportation (DOTs), metropolitan planning organizations (MPOs), municipalities, and transit agencies on a given topic in transportation planning. Arlington County, Virginia applied to host an exchange program, bringing together peers from Oregon DOT (ODOT); the Atlanta Regional Council (ARC); Fairfax County, VA; Montgomery County, Maryland, and Washington D.C. on April 10-11, 2019. The peer exchange focused on "Building out the 2.0 Bicycle Network," a reference to the complexity of bicycle infrastructure projects that go beyond the lane narrowing, shared lane markings (sharrows), and wayfinding that these and many other communities across the country have been implementing for decades.

Figure 7: Screenshots of the bicycle LTS web map route finder show arterials with and without bicycle infrastructure improvements. The image on the lower left shows a section with a low-LTS connection, and the image on the lower right shows a high-LTS barrier. (Image courtesy of Madison Area Transportation Planning Board and the Volpe Center)

Exchange participants from the peer agencies represented planning, implementation, research, data management and analysis, and community involvement roles. To meet the challenge of building bicycle infrastructure projects that require more significant tradeoffs within the public right-of-way—protected bicycle facilities, two-way cycle tracks, bicycle-signal equipped intersections, and so on—each peer agency presented their most effective strategies for collecting, analyzing, and communicating performance-based information about the needs and benefits of such bicycle infrastructure projects.

While collecting crash, mode split, and bicyclist count data are common and useful strategies for developing bicycle facilities, they are tools that reflect and evaluate where a community is today. Arlington County was particularly interested in learning more about tools for planning future projects, and evaluating and defending decisions about what to build where. A key tool is using ridership, traffic, and infrastructure data to develop a Level of Traffic Stress (LTS) network map. An LTS analysis characterizes and maps the locations where bicyclists with varying levels of experience and confidence feel comfortable traveling—on a scale of 1 (least stressful) to 4 or 5 (very stressful). The LTS rating system allows agencies to not

only assess existing conditions, but also to propose future scenarios at a broader planning stage then at a more detailed design and implementation scale. The peers discussed how much more effective they could be at promoting the benefits of their plans and projects to leadership, advocacy and stakeholder groups, and the community at large.

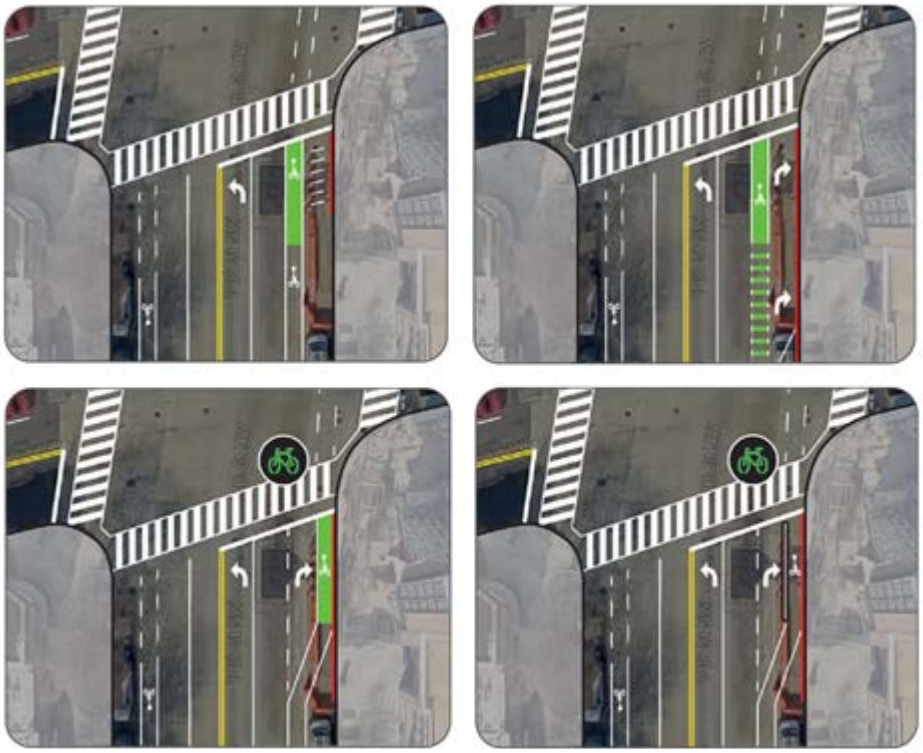

Figure 8: Images show several intersections with different treatments to separate right turning vehicles from bicycle traffic. Treatments include through bicycle and vehicle travel lanes, through intersection guidelines, phase separation, and concrete median separation. (Image courtesy of Madison Area Transportation Planning Board and the Volpe Center)

While LTS is still a relatively new technique, pioneered by Northeastern University Professor Peter Furth in 2012, many communities have applied LTS analysis in some form to better understand how well their infrastructure accommodates people riding bikes. Using LTS as a scenario planning tool is a newer innovation, and promises to better leverage this network-based approach to evaluate proposed changes in more objective, performance-based terms. For example, a roadway project that proposes implementing just one block of protected cycle track on a busy suburban arterial that bisects residential neighborhoods may not seem effective. However, an LTS analysis might be the most effective way to demonstrate that such a project could provide a low stress link between the otherwise low-stress networks within the adjacent neighborhoods, and double the potential travel reach for the 60 percent of bicyclists who are only comfortable bicycling on a relatively low stress "LTS level 2" facility.

Peer exchange participants discussed how communicating a performance-based analysis such as this would help turn a potentially subjective discussion about cost and traffic throughput into a more pragmatic debate about the merits of expanding a basic, continuous network of low-stress bicycle routes throughout a given community, and provide access to local employment centers, parks, schools, and other community destinations.

Another example in a more urban context is using LTS to evaluate infrastructure options on an element-by-element level. At many intersections along bicycle routes, the volume of motor vehicle right turns must be considered to evaluate the risk of a potential "right hook," or a vehicle turning right directly in front of a bicyclist. By using LTS as a framework for establishing a targeted level of stress for a given route, planners and engineers could more objectively determine where to invest in more costly (from a materials and signal timing perspective) interventions to separate right turning vehicles from

through moving bicycle traffic. This analysis would not only help establish consensus within the technical realm of planning and engineering departments, but it could also prove a more effective means for communicating the benefits of such proposals to decisionmakers, elected officials, stakeholders, and the community at large.

The TPCB peer exchange participants concluded the meeting with a discussion about the potential to build upon a community, regional, or even statewide LTS network analysis to assess progress toward broader goals, such as public health, happiness, and economic competitiveness. The peers agreed that a methodology to model ridership increases associated with infrastructure and other interventions that alter network LTS could be translated into figures such as per capita reduction in heart disease, obesity, and diabetes; decreases in depression and anxiety; and increases in retail sales. Additional research is needed to assess the potential of these ideas. A cursory search of the existing research literature suggests there is interest in pursuing strategies like these—applying a performance-based approach to increasingly complex bicycle facility design and implementation challenges—as communities across the country continue to explore the development of their "2.0 Bicycle Networks."

Announcements/New Resources

- The Federal Highway Administration (FHWA) published the 2019 Recreational Trails Program (RTP) Annual Report. The RTP provides States with funds to develop and maintain recreational trails and trail-related facilities for both nonmotorized and motorized recreational trail uses. The Annual Report describes RTP funding and administration and provides examples of a variety of project benefits, such as accessibility, community connections, economic development, public land stewardship, safety, and workforce development.

- The FHWA Office of Planning, Environment, and Realty and the Volpe Center hosted a webinar on Tuesday, July 30th on the recently released "Integrating Shared Mobility into Multimodal Transportation Planning: Metropolitan Area Case Studies." The webinar provided an overview of the case studies and include speakers from the case study agencies. It also featured examples of how metropolitan planning organizations (MPOs) and their partners are integrating shared mobility technologies and services into the regional multimodal transportation planning process.

- FHWA published the Fiscal Year 2018 Transportation Alternatives Annual Report. The report compiles the number and dollar value of project applications and project selections for the Transportation Alternatives program, as reported by the States. The report consists of a national summary and State project lists. In fiscal year 2018, States received 6,601 project applications for $2.75 billion in dollar value, and selected 2,789 projects for $780 million. About 82 percent of the selected projects were pedestrian and bicycle facilities (including school access), 14 percent were recreational trails (mostly through the Recreational Trails Program set-aside), and 4 percent were historic preservation or environmental and wildlife projects.