Summary of Federal Highway Administration Pedestrian and Bicycle Research and Program Activities

January 2018

This document presents recent and ongoing pedestrian and bicycle research efforts and related activities, organized by four goals from the draft U.S. Department of Transportation (DOT) Strategic Plan for FY 2018-2022:

- Safety
- Infrastructure
- Innovation
- Accountability

Use these FHWA tools and resources to support multimodal transportation projects that improve connectivity, accessibility, safety, and convenience for all users.

To view a web version of this document, and to access the resources below, please visit:
https://www.fhwa.dot.gov/environment/bicycle_pedestrian

Federal-Aid Funds for Pedestrian and Bicycle Programs and Projects

- In FY 2017, States obligated $970 million in Federal-aid highway program funds for pedestrian and bicycle programs and projects, an increase from $860 million in FY 2016. FY 2017 pedestrian and bicycle funding was 2.4 percent of Federal-aid highway funding (~$40.5 billion).

- FHWA lists Pedestrian and Bicycle Funding Opportunities to indicate potential eligibility for pedestrian and bicycle activities under U.S. DOT surface transportation programs.

SAFETY: Reduce Transportation-Related Fatalities and Serious Injuries across the Transportation System

Noteworthy Local Policies that Support Safe and Complete Pedestrian and Bicycle Networks.

The FHWA Safety Office developed this guide to provide local and State agencies with tools to complement new infrastructure and program development. While much of the focus on bicycle and pedestrian travel in the United States is on building new infrastructure, policies (laws, regulations, ordinances, and procedures) also play a critical role in shaping how we use and manage our transportation systems. The guide is accompanied by case studies from across the country that support safe and complete street networks.

FHWA Pedestrian and Bicyclist Safety Information Search Tool

The Pedestrian and Bicyclist Safety Information Search Tool offers an easy way to look for key resources related to planning, designing, building, and managing safe pedestrian and bicycle networks. By typing in keywords or selecting from the Popular Topics popup, you can search for information from more than 100 reports, guidebooks, and training documents.

Interim Approval for Two-Stage Bicycle Turn Boxes

On July 13, 2017, the FHWA issued Interim Approval 20 allowing the optional use of Two-Stage Bicycle Turn Boxes under the *Manual on Uniform Traffic Control Devices*.

Multimodal Access to Transit Resources

FHWA and the Federal Transit Administration (FTA) have been coordinating on issues relating to safe multimodal access to transit, and jointly released three related resources. The resources focus on planning, designing, and implementing pedestrian and bicycle networks around transit stations and stops to enhance access, leverage investments, and improve safety. FTA's Manual on Pedestrian and Bicycle Connections to Transit provides a national level "top down" resource to help transportation professionals improve pedestrian and bicycle safety and access to transit.

FHWA's Richmond, Virginia Pedestrian and Bicycle Network Improvement Study provides a companion "bottom up" resource, demonstrating a State and locally led quick turnaround planning process. The report focuses on the process used to develop a detailed set of infrastructure improvement recommendations around seven TIGER (Transportation Investment Generating Economic Recovery) funded Bus Rapid Transit stations now under construction along a 7.6-mile corridor in Richmond, Virginia. This report was developed in partnership with the City of Richmond, the FHWA Virginia Division, and the FTA. The project team used innovative methods to gather qualitative public feedback to inform recommendations.

FHWA also published Incorporating Qualitative Data in the Planning Process: Improving Project Delivery and Outcomes, a report that highlights these and other emerging tools, techniques, and resources for gathering qualitative public and stakeholder input to inform the planning process, improve project outcomes, and contribute to accelerated project delivery.

FHWA's Work Zone Safety Grant Program

The National Work Zone Safety Information Clearinghouse is dedicated to providing the transportation construction industry and the general public with comprehensive information to improve motorist, worker, and pedestrian safety in roadway work zones. Topics of interest include:

- Applying the Americans with Disabilities Act in Work Zones: A Practitioner Guide,
- Pedestrians and Americans with Disabilities in Work Zones,
- Americans with Disabilities Act Requirements for Accessibility in Temporary Traffic Control Zones,
- Pedestrian Safety and Accessibility in Work Zones,
- Pedestrians Checklist and Considerations for Temporary Traffic Control Zones, and
- Guidance Sheet — Temporary Traffic Control Zone Pedestrian Access Considerations.

FHWA's Pedestrian Countermeasure Crash Modification Factor Study

This study identifies and promotes promising countermeasures to reduce pedestrian and bicyclist crashes. The purposes of the project are to: 1) demonstrate the effectiveness of pedestrian safety plans in reducing pedestrian fatalities, injuries, and conflicts; and 2) demonstrate the plan's portability to other jurisdictions within the United States. The two countermeasures selected to be evaluated are *Permissive to Protected Left Turn Phasing* and *Leading Pedestrian Interval*. This project is anticipated to be completed in Fall 2018.

Identification and Prioritization of Pedestrian Crash Locations and Areas

This project will improve safety and mobility for pedestrians and bicyclists. An initial step in reducing the frequency of pedestrian crashes is identifying where they occur. Once locations are identified, appropriate treatments can be selected and installed. Several techniques are used to identify high crash locations including

identifying intersections or midblock crossing with the highest number of crashes in a given time period (i.e., frequency) or the highest number of crashes after adjusting for exposure (i.e., crash rate). This project will document methods used to identify or prioritize high pedestrian crash sites or areas, including the methods' input data demands. It will develop a best practice guide to assist State and local agencies in identifying high pedestrian crash locations, corridors, and zones. The guide will demonstrate both existing tools along with potential tools being explored to identify locations that justify consideration of pedestrian treatments. This projected is anticipated to be completed in Summer 2018.

Pedestrian and Bicyclist Scalable Risk Assessment Methodology (ScRAM)

This project will build on existing resources to create a standardized approach that agencies can use to estimate pedestrian and bicyclist exposure to risk. The project will result in a Scalable Risk Assessment Methodology, making it easier for stakeholders to assess risk and inform funding decisions, which is especially important in a constrained fiscal environment. The ScRAM tool will be finalized in Summer 2018, followed by 2 years of training and technical assistance for communities interested in using it.

NCHRP 03-133 Signal Timing Strategies for Non-Motorized Users

This research will 1) identify and evaluate a broad range of current international and national practices for signal design and operational strategies for nonmotorized users; 2) identify gaps in the state of practice on signalized intersections with multimodal specific infrastructure and intersections across a broad range geometries (signalized path crossings, diverging diamond interchanges, continuous flow intersections); 3) develop guidance for traffic signal design and operations strategies that will address the needs of nonmotorized users and multimodal connectivity which includes vulnerable road users with disabilities; 4) develop a means to convey how to best incorporate findings to a wide range of stakeholders including those stakeholders with visual impairments and other disabilities; and 5) identify opportunities for future research studies. The project is expected to begin in March 2018 and continue for 2 years.

EDC-4/Safe Transportation for Every Pedestrian (STEP)

Pedestrians account for more than 16 percent of all fatalities in motor vehicle traffic crashes, and the majority of these deaths occur at uncontrolled crossing locations such as mid-block or un-signalized intersections. As part of Every Day Counts, FHWA is working with states and locals to promote five countermeasures to improve pedestrian safety at uncontrolled crossing locations. These countermeasures include: Road Diets, Pedestrian Hybrid Beacons, Pedestrian Refuge Islands, Raised Crosswalks, and Crosswalk Visibility Enhancements. These low-cost countermeasures offer proven solutions for reducing pedestrian crashes and also have health, social justice, mode choice and accessibility, economic, quality of life and environmental benefits. This EDC-4 effort will help more communities deploy these pedestrian safety improvements based on their specific roadway contexts and needs. Technical assistance and training to deploy these countermeasures is available to States and local agencies at no charge.

INFRASTRUCTURE: Invest in Infrastructure to Ensure Mobility and Accessibility and to Stimulate Economic Growth, Productivity, and Competitiveness for American Workers and Businesses.

Small Town and Rural Multimodal Networks

FHWA published the Small Town and Rural Multimodal Networks guide to help rural and small town communities plan, design, and implement safe and comfortable multimodal networks. The guide focuses on the concept of connected networks that meet the needs of everyone in a rural and small town context. The guide

helps communities visualize multimodal networks appropriate to the land use setting. It provides a toolbox of facility types that, when thoughtfully pieced together, will make up a connected network for pedestrians and bicyclists. The facilities, which are tailored to rural land use and roadway characteristics, build on existing national design guidelines, while also recognizing geographic and fiscal constraints in rural areas and the need for design flexibility. The guide will help agencies identify and implement incremental improvements, often in retrofit situations, which will enhance safety, access, and mobility.

Implementing Context Sensitive Design for Multimodal Thoroughfares: An ITE Informational Report

FHWA funded the development of the Institute of Transportation Engineers' (ITE) Implementing Context Sensitive Design for Multimodal Thoroughfares: An ITE Informational Report, released in November 2017. The resource focuses on implementing context sensitive design along multimodal corridors in urban and suburban areas. This report is tailored to State and local needs and builds on the recommended practices presented in the 2010 ITE publication, *Designing Walkable Urban Thoroughfares: A Context Sensitive Approach*, and includes an expanded focus on areas such as freight accommodations, speed management, and context sensitive design in both built out and lower density areas. Case studies highlight the medium and long-term impacts of successful context sensitive design projects.

National Park Service Active Transportation Guidebook

FHWA's Office of Federal Lands Highway is working with the National Park Service (NPS), and other FHWA offices, through the U.S. DOT Volpe Center, to develop the first *NPS Active Transportation Guidebook*. Many NPS units are experiencing increased visitation, leading to congestion and other resource impacts, while grappling with aging infrastructure. Active transportation efforts can help NPS, partners, and gateway communities accommodate growing visitation and mitigate some of the negative impacts caused by vehicles, while offering a unique experience for visitors. The guidebook will help parks and partners identify opportunities for active transportation, and introduce a variety of policies, programs, and types of infrastructure to support and promote the use of active transportation. Resources in this guide will assist those who want to implement programs and projects which support walking and bicycling. The guidebook will be available in early 2018.

Federal Land Management Agencies National Multimodal Catalog

The Office of Federal Lands Highway is working with the U.S. DOT Volpe Center and the FTA to create a National Multimodal Catalog across Federal lands. The Federal land management agencies (FLMAs), along with FHWA, State departments of transportation, and local governments require better data to make informed decisions about investments that support all modes of transportation, including transit, walking, and bicycling. This effort includes developing and implementing a data collection framework to gather comprehensive and consistent multimodal data across all FLMAs. Partner agencies include the Bureau of Land Management, National Park Service, U.S. Fish and Wildlife Service, U.S. Forest Service, and U.S. Army Corps of Engineers. The initial catalog should be available to the public online in 2018.

Bike Facility Selection Guide

This project will develop a new resource guide that will help State and local agencies identify the most appropriate types of bike facilities to use based on user and roadway characteristics. After development, FHWA will provide technical assistance to several pilot communities as they use the guide. FHWA has produced and revised several well-received tools (e.g., BIKESAFE) and documents (e.g., *Separated Bike Lane Planning and Design Guide*). However, there is a gap as to *when* to separate bicycle traffic from motor vehicle traffic and how to do it safely within an often-constrained urban right-of-way. The final guide is expected to be available in December 2018.

Every Day Counts (EDC)-4 Community Connections

Community Connections provides transportation agencies with the information, tools, and support necessary to connect communities that have been divided by past transportation plans and projects. Community Connections is built upon collaboration, innovation, and human-centered thinking. As part of an outreach effort, an EDC-4 video (Community Connections Innovation Spotlight video) highlights the Community Connections Toolkit, mobility options, and cities that are practicing community connections. A community connections handbook is now under development and will be released in Fall 2018. The handbook will provide case studies on projects in urban, rural, and rural communities where States, MPOs, local, and tribal governments, and other transportation practitioners used analytical tools, public involvement strategies, or operational improvements to advance community connections.

Top Strategies for Accelerating Multimodal Infrastructure Delivery

This project will result in a practical, action-oriented resource that highlights effective strategies for accelerating multimodal infrastructure delivery. It will highlight proven techniques that agencies are using to get high quality results, and opportunities to address barriers or delays in the project delivery process. The resource will document specific strategies from project scoping to implementation. It will address common issues relating to purpose and need statements, public involvement, and the right-of-way process. It will address issues relating to Categorical Exclusions, while also highlighting programmatic streamlining opportunities relating to permitting, project bundling, competitive selection, and Federal and State procurement requirements. It will highlight economies of scale opportunities, for example by addressing multimodal needs as a part of larger projects. The resource will help transportation agencies deliver multimodal projects effectively and efficiently, and will build on existing resources. The resource is expected in summer 2018.

INNOVATION: Lead in the Development and Deployment of Innovative Practices and Technologies that Improve the Safety and Performance of the Nation's Transportation System.

Fostering Innovation in Pedestrian and Bicycle Transportation Pooled Fund (TPF) Study

FHWA posted a Fostering Innovation in Pedestrian and Bicycle Transportation Pooled Fund Study on January 11, 2017. The TPF study will supplement existing research venues and fill an important gap by emphasizing short turnaround practical research on issues immediately relevant to practitioners. It will address national goals and priorities identified through input from local, State, and national partners in FHWA's Strategic Agenda for Pedestrian and Bicycle Transportation. The FHWA Office of Planning, Environment, and Realty will serve as the Administrator and Financial Agent. To participate in this study, contact Daniel.Goodman@dot.gov.

Shared Streets: Notable Practices and Considerations for Accommodating Pedestrians with Vision Disabilities

FHWA published Accessible Shared Streets: Notable Practices and Considerations for Accommodating Pedestrians with Vision Disabilities. This document captures the national state of the practice for accommodating pedestrians with vision disabilities on shared streets and helps State and local partners meet Americans with Disabilities Act obligations. The study process included engagement with the U.S. Access Board, State DOTs, National Association of City Transportation Officials, and FHWA headquarters and division offices, and is a model for engaging people with disabilities in the planning process.

Global Benchmarking Shared-Use Mobility Study

Following up a primer that examined domestic experience in shared-use mobility applications, Shared Mobility: Current Practices and Guiding Principles, FHWA is currently studying successful practices and policies that have

resulted in large-scale deployment of shared-use mobility services in Europe. Bike sharing is a core element of many cities in Europe and a growing tool to improve urban mobility in the United States. The report is expected in Summer 2018.

Measuring Multimodal Network Connectivity

This project will synthesize and present options available for measuring network connectivity and tracking change over time. A summary report will document the various methodologies and approaches and identifying strengths and weaknesses of each based on a real-world application in different contexts. The methodologies will range from detailed data, resource, and time heavy applications to more streamlined approaches. Methodologies will be examined for communities that have extensive data and for communities that have limited data. The project will apply a subset of these methodologies in five case study communities and will include the results in the final report, expected in January 2018.

MySidewalk

FHWA awarded a Small Business Innovation Research (SBIR) Phase II project for a mobile application facilitating the crowd-sourced collection of sidewalk inventory and condition data. MySidewalk uses advances in social networks, mobile data collection, and data mining to provide integrated sidewalk datasets. Phase I demonstrated the feasibility of the concept through a proof-of concept prototype. Phase II is improving the MySidewalk user interface and features, beta testing a pilot implementation, and preparing to take the application to market. It is expected to be complete in February 2018.

Connected Bicycle Technology

FHWA awarded a Small Business Innovation Research (SBIR) Phase II project to develop connected vehicle technology and supporting applications for bicycles. In Phase II, the project will develop and test a working system both through simulations and on-road testing. The project will include virtual reality testing of the system with a bicycle simulator at FHWA's Turner-Fairbank Highway Research Center. The project also includes partnerships with Motivate (operator of many bikeshare systems) and several bicycle hardware manufacturers. Connected vehicle technology allows direct communication of safety and mobility information between suitably equipped vehicles, as well as between vehicles and infrastructure such as traffic lights or warning beacons. The products of this research will ensure that bicycles can participate in this new information environment. The project runs through March 2019.

Smartphone Based Mid-Block Pedestrian Crossing Application

The FHWA Office of Operations Research and Development is leading a project to develop and test a smartphone based application to increase driver awareness of pedestrians using mid-block crosswalks. Drivers who have the application running on their smartphone or tablet will receive an audible and visual warning when pedestrians using the application indicates that they want to use the mid-block crosswalk. The application only works when both the pedestrians and vehicles are in the designated geofenced areas. Testing was conducted on 80 test subjects at the Turner-Fairbank Highway Research Center's mid-block crosswalk. Initial results are promising and detailed data analysis of the results is underway. The application will be available soon as an open source software product.

ACCOUNTABILITY: Serve the Nation with Reduced Regulatory Burden and Greater Efficiency, Effectiveness, and Accountability.

Traffic Monitoring Guide

The Traffic Monitoring Guide (TMG), published by the FHWA Office of Highway Policy Information, presents information on recommended data collection strategies for motorized vehicles, and for bicycles and pedestrians. The TMG also contains specifications of data structures for count locations and count data that are implemented in the Traffic Monitoring Analysis System.

Coding Nonmotorized Station Location Information in the 2016 Traffic Monitoring Guide Format

This document provides details and examples showing how to prepare nonmotorized station and count data in the Traffic Monitoring Guide format. The TMG format is required for data that is to be submitted to the Traffic Monitoring Analysis System.

Traffic Monitoring and Analysis System

The Traffic Monitoring and Analysis System (TMAS) is a national database of traffic counts, originally established to gather automated traffic counts collected by State transportation agencies. TMAS is currently being updated to receive and manage bicycle and pedestrian count data (including counts collected both manually and by machine, both from temporary and permanently installed count locations). The nonmotorized component is expected to be available to the public in early 2018. For information on contributing or review data in TMAS, contact Steven Jessberger (steven.jessberger@dot.gov) or Jeremy Raw (jeremy.raw@dot.gov).

Developing National Bicycle Facility Inventory Data

The objective of this project is to: 1) gather national geospatial data in a consistent common format to represent bicycle travel facilities such as routes, trails, and shared use roadways including both bicycle routes as part of the roadway systems and independent bicycle trails, and, 2) develop a mechanism such as crowdsourcing or other data sources where new bicycle geospatial data and other directly necessary information can be supplied by the public, agencies, and various organizations to maintain the bicycle geospatial inventory's accuracy on a timely basis. This project will develop data specifications and initial tools for incorporating bicycle facilities (both on-road and separated off-road) into the All Roads Network Of Linear-referenced Data (ARNOLD) that currently incorporates each State's network of motorized facilities to support the Highway Performance Monitoring System (HPMS). Pilot efforts to process network information will be conducted using data assembled from the case studies in the Multimodal Network Connectivity project. The project runs through February 2019.

U.S. Fish and Wildlife Service Bicycle and Pedestrian National Counting Project

FHWA's Office of Federal Lands Highway is working with the U.S. Fish and Wildlife Service (USFWS) to test and deploy pedestrian and bicycle counters at wildlife refuges across the country. USFWS has been observing increases in pedestrian and bicycle use at 28 of its stations, but has not had counters in place that accurately track the use and movements. The ability to count pedestrian and bicycle traffic will help inform USFWS where to invest, expand, and enhance multimodal access. The pilot program is testing count technology in a variety of refuge settings, while also developing a process to equitably continue to deploy this type of technology at refuges with significant, anecdotally observed levels of pedestrian and bicycle traffic. The pilot will continue through December 2018 and result in further phases to develop data collection and national reporting processes.