



FHWA's Fostering Multimodal Connectivity Newsletter

In This Issue

Introduction	1
Walla Walla County, Washington Uses Drone to Support Design of Planned Multiuse Path.....	2
City of Durham, North Carolina Prioritizes and Accelerates Project Delivery Using Bike+Walk Implementation Plan	3
Gary, Indiana Supports Vision for Transit-Oriented Development with Investments in Bus, Rail, and Multimodal Trails.....	5
Virginia's SMART SCALE Process: Supporting Quality of Life Outcomes.....	7
Strategic Investments Support Economic Development and Transportation Improvements in Rural and Suburban Communities.....	9
Announcements/New Resources.....	11

Editor's Note: With the New Year and the release of the [U.S. Department of Transportation Strategic Plan for Fiscal Years 2018- 2022](#), we are introducing some formatting changes to this publication to highlight the development and implementation of multimodal transportation projects.

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 U.S. Department of Transportation (DOT) 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](#).



Walla Walla County, Washington Uses Drone to Support Design of Planned Multiuse Path

Seth Walker, P.E., Interim Assistant Chief of Engineering and Construction, Walla Walla County Public Works Department

Recognizing the many transportation planning-related uses for drones or unmanned aerial vehicles (UAVs), Walla Walla County, Washington purchased one in June 2017. Using the UAV, the Public Works team performed a 120-acre survey with only two 30-minute flights, an effort that would have taken weeks to accomplish using conventional surveying techniques.

Most recently, the county [used the UAV to fly a mission for the Whitman Drive West Bike Path project](#). The project area was identified as unsafe for bicyclists and pedestrians, particularly after a fatal bicycle accident involving a university student in 2015. The community, especially members of the university, wrote letters of support to secure a grant from the State of Washington's Pedestrian and Bicycle Program, which will be matched by county funds. The project will widen the road to include bike lanes and construct a separated 12-foot wide multiuse path along 2.13 miles of Whitman Drive just outside the city limits of College Place, Washington, an area that has seen an increase in walking and bicycling as the city has expanded. This project will fill a gap between College Place and a trail that connects to the Whitman Missions National Historic Site, located along the Oregon Trail.



Figure 1: Walla Walla County staff prepare the UAV for deployment. (Image courtesy of Walla Walla County Public Works Department)

The UAV is a light-weight, fixed-wing model made primarily of specialized Styrofoam. It carries a camera and has internal Global Positioning System (GPS) capabilities, as well as other sensing equipment. It is launched by hand and has a maximum flight time of 59 minutes in ideal flight conditions. The flight pattern is pre-programmed using software which is



Figure 2: Walla Walla County staff deploy the UAV. (Image courtesy of Walla Walla County Public Works Department)

transferred to the UAV via a radio modem. Agencies wishing to use UAVs must register them with the Federal Aviation Administration, and the pilot must have a remote pilot license and comply with [Part 107 of the Federal Aviation Regulations](#), which defines pilot certification and the operation requirements of UAV flights for commercial use. The planned project on Whitman Drive is near a local airport, making it necessary for the department to file notices to inform commercial pilots in the area of the UAV deployment.

The survey process uses Pix4D, an advanced photogrammetry software, to process the images taken during the flight. The photos are geotagged with GPS information, and the software identifies unique pixels within the photos and matches them to other images to stitch the imagery together. Once the processing is complete, the information can be transferred to AutoCAD Civil 3D design software and utilized for project design. For the

Whitman Drive project, the surveyor is currently completing quality control procedures to ensure accuracy of the images. For some areas, manual surveys will need to be completed where trees, buildings, and other elements block the view of the UAV. These fine-tuned images will be used to design and calculate material quantities for the multiuse path, which is expected to be completed in 2019.



The UAV is another tool for the department but does not eliminate the need for conventional survey equipment. It is an innovative technology that can be used to complement current survey practices and increase efficiency. The use of UAVs also promotes safety, as they can survey a busy road or a pit site without having a surveyor in the road or on the edge of a steep embankment.

Adding this piece of equipment to Walla Walla County's inventory will reduce the costs of acquiring survey data and aerial imagery. The county already has plans to apply for Federal Highway Administration (FHWA) funding to support future projects using the UAV and will continue to seek additional uses for this technology, especially in support of projects focused on improving multimodal connectivity and safety.

City of Durham, North Carolina Prioritizes and Accelerates Project Delivery Using Bike+Walk Implementation Plan

Bryan Poole, Bicycle and Pedestrian Transportation Planner, City of Durham Department of Transportation

In 2016, the city of Durham's Transportation Department decided to create a combined master bicycle and pedestrian plan instead of updating several outdated plans. The city knew that it did not want an overly broad plan that would potentially be left on the shelf, but rather wanted to create an implementation-focused plan that would identify a short list of priority projects, and make recommendations on expediting project delivery. Utilizing Federal Highway Administration (FHWA) resources ([Separated Bike Lane Planning and Design Guide](#) and [PedSafe/BikeSafe Safety Guides and Countermeasure Selection Systems](#)) and funding ([Surface Transportation Block Grant-Direct Attributable](#) funds), the city worked with consultants to develop the [Durham Bike+Walk Implementation Plan](#).

To begin identifying potential projects, the city drew on previous plans and used public engagement methods, such as an online mapping tool, a survey, and community meetings. Staff also demonstrated a temporary separated bike lane to enhance public engagement efforts. More than 1,000 residents provided quantitative and qualitative information on where they wanted to walk and bike, as well as existing obstacles to walking and bicycling. The team used the [ActiveTrans Priority Tool](#) to rank 420 miles of sidewalk; 453 miles of bicycle paths and lanes; and 480 intersections with improvement needs. The four prioritization categories—safety, connectivity, demand, and equity—had specific metrics to score each potential project. Metrics included the number of crashes, proximity to schools/parks/employment/transit, commercial land use, population density, percentage of families within half a mile of the project living below the poverty line, speed limit, and connections to existing bicycle/pedestrian facilities.

Projects that ranked high in the first round of prioritization were analyzed again in an attempt to balance construction feasibility, cost, and facility needs (bicycle and/or pedestrian). These efforts produced an unranked list of 8 bicycle-focused corridor projects, 17 pedestrian-focused corridor projects, 25 sidewalk gap projects, and 25 intersection projects.

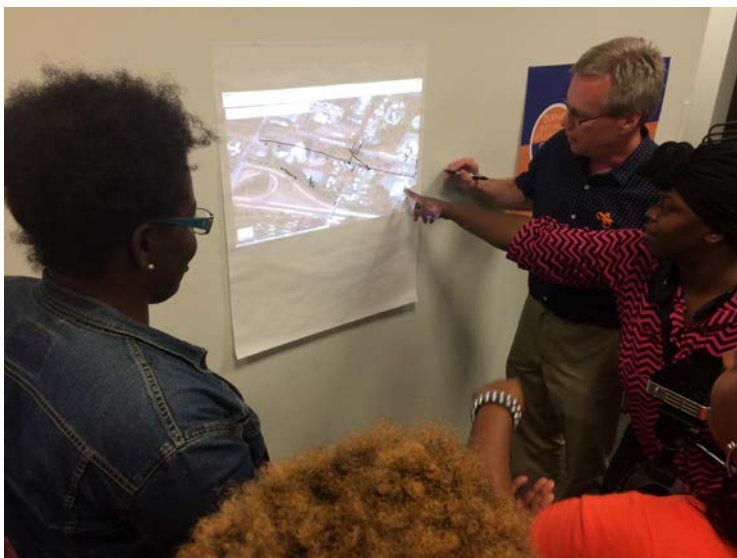


Figure 3: Citizens provide input on pedestrian and bicycle infrastructure in Durham. (Image courtesy of the city of Durham)



Staff used a second round of public engagement to solicit feedback on the type of improvements needed, and to develop detailed recommendations and cost estimates for each project. Although some residents were disappointed their street was not identified as a priority project, there was a general consensus on high-priority projects.

In addition to the project recommendations, the Bike+Walk Plan explores 11 topics related to implementation. The topics include regional connections, low-cost/temporary pilot projects, innovative facilities, and [Unified Development Ordinance](#) amendments, among others. The project team gathered best practices from peer cities related to each topic, and made recommendations on how the city could improve conditions for bicyclists and pedestrians and expedite project delivery.



Figure 4: Striping roads for road safety. (Image courtesy of the city of Durham)

Since the plan's adoption in May 2017, city staff have been identifying funding sources and a timeline for each project. Higher-cost projects were submitted to North Carolina's Department of Transportation for Federal funding consideration. Staff will use Congestion Mitigation and Air Quality Improvement Program funds for other projects in the plan, along with \$15 million the Durham City Council dedicated for sidewalk construction prior to the plan's adoption. Durham has begun construction on construction-ready sidewalk gaps, and will soon complete the design phase for five other corridors. The city aims to construct all locally funded projects by fiscal year 2022.

The Bike+Walk Implementation Plan gives Durham a clear understanding of project priorities, while maintaining flexibility. The variety of project types, lengths, and costs allow for work to be done by various teams and departments, and staggers construction so that the public can continually see improvements being made. However, narrowing the list of projects from hundreds of miles of potential projects took more time than anticipated, and there were issues with project prioritization due to

unequal lengths and methods of scaling. Others interested in developing an implementation-focused plan might consider developing a comprehensive bicycle and/or pedestrian plan first, and/or having a list or groups of projects that are of similar length. Alternatively, a comprehensive plan could dedicate a greater percentage of the scope of work to the implementation phase of a plan.

The city of Durham was able to initiate projects quickly following plan adoption as a result of the \$15 million that was dedicated for sidewalk construction. In order to accelerate project delivery, funding should be requested prior to or as part of plan adoption, in addition to the necessary support for engineering and construction. The city of Durham recognized that as more people walk and bike, residents and elected officials are less concerned with cost and more interested in project delivery. The Bike+Walk Implementation Plan gives Durham a clear framework for making significant investments in multimodal infrastructure.

For more information on the plan and the city's implementation progress, visit the [Durham Bike+Walk Implementation Plan webpage](#).



Gary, Indiana Supports Vision for Transit-Oriented Development with Investments in Bus, Rail, and Multimodal Trails

Mitch Barloga, Transportation Planning Manager, Northwestern Indiana Regional Planning Commission and David Wright, Planning and Marketing Manager, Gary Public Transportation Corporation

In recent years, Northwest Indiana has focused on transit-oriented development (TOD) as part of [a vision for more livable communities](#). The Northwestern Indiana Regional Planning Commission (NIRPC) and the Northwestern Indiana Regional Development Authority have been working directly with communities like Gary, Indiana to identify neighborhoods and development zones that are ripe for livability improvements. The city of Gary has actively worked over the past several years to improve multimodal connectivity both within the city and regionally.

Gary has developed a vision for TOD that emphasizes transit-, bicycle-, and pedestrian-friendly development, and connectivity between modes. The [South Shore rail line](#) and [GPTC's Broadway Metro Express rapid bus line](#) have been focal points for transit-related efforts, which have included neighborhood planning and targeted grant programs. The South Shore commuter rail line, operated by the Northern Indiana Commuter Transportation District (NICTD), has three stations in Gary, connecting the city with Chicago, Illinois to the west and South Bend, Indiana to the east. Federal Highway Administration (FHWA) funding will be used to realign State highways to allow NICTD to provide new tracks, expand its station, and provide opportunities for new TOD construction. The realignment of US Highway 12—combining it with nearby US Highway 20 and making available land on which its existing alignment sits—will be implemented in coming years. GPTC and NICTD are working to make sure the new station will provide maximum transit connectivity.

The Miller Beach neighborhood is an example of how targeted investments and policies are supporting TOD in Gary. Given its wealth of transportation assets and transit-friendly environment, the neighborhood has become a showcase for TOD in recent years. The city of Gary, NICTD, GPTC, and local stakeholders have created a vision for TOD in Miller Beach that includes the creation of a [tax increment finance district](#), development of transit-supportive design guidelines, and identification of new bus and transit infrastructure centered around a markedly larger and more accessible commuter rail station. Miller Beach's station on the South Shore commuter rail line is located just south of a major commercial corridor on Lake Street, and the community's bus line is one of GPTC's busiest. The city has invested in sidewalk improvements, bicycle facilities, and connections to nearby multiuse paths around the station and along its popular commercial corridor.



Figure 5: Miller Beach Station on the South Shore commuter line (Image courtesy of Wikipedia Creative Commons)



One of these multiuse paths is the [Marquette Greenway](#), an off-road trail running through Gary connecting Chicago to New Buffalo, Michigan. The route traverses 58 miles through a variety of land uses and socioeconomic areas. Nearly 200,000 residents live within a mile and half of the route, with over 60,000 people employed within the corridor. The route also connects to all areas of interest within the Indiana Dunes National Lakeshore and State Park, which is adjacent to the city of Gary.

Multiuse trails have demonstrated strong financial returns with residential desirability, and increased property values for those living near a trail. Furthermore, companies of all sizes are looking for areas that provide quality of life benefits for their employees, with trails remaining a top-ranked amenity for relocation purposes. Thus, the Marquette Greenway encourages economic development and enhances quality of life for residents and employees.



Figure 6: Overview map of the Marquette Greenway in Indiana (Image courtesy of Northwestern Indiana Regional Planning Commission)

As of early 2018, approximately 28 miles of the proposed trail are either built or funded for construction. A vast majority of these miles were constructed using FHWA funds, including Surface Transportation Block Grant Program, Congestion Mitigation and Air Quality Program, and Transportation Alternatives. In Gary, 1.5 miles have been constructed in the downtown area with TA funds, with another half-mile funded, but remaining to be built. The city is still seeking funds for the remaining four miles on the west side of the city. The National Lakeshore will build another four miles east, which includes the paving of a two-mile gravel trail.

NIRPC is actively seeking \$24.2 million in funding to build the remaining 30 miles. This 30-mile stretch includes four miles of new trail in Gary including an additional two miles of paved trail. The project involves all three States along the route, and has been supported by 72 stakeholder agencies. NIRPC has also designated the Marquette Greenway as their highest priority trail corridor, aiding with future Federal allowances.

Gary and Northwest Indiana provide an example of working closely with local, State, and regional partners to become a strong example of TOD in Indiana and the nation. By working on TOD efforts both regionally and at the neighborhood level, Gary has built momentum that will continue in the coming years.



Virginia's SMART SCALE Process: Supporting Quality of Life Outcomes

Chad Walker, Assistant Division Administrator for Performance Based and Conceptual Planning, Virginia Department of Transportation

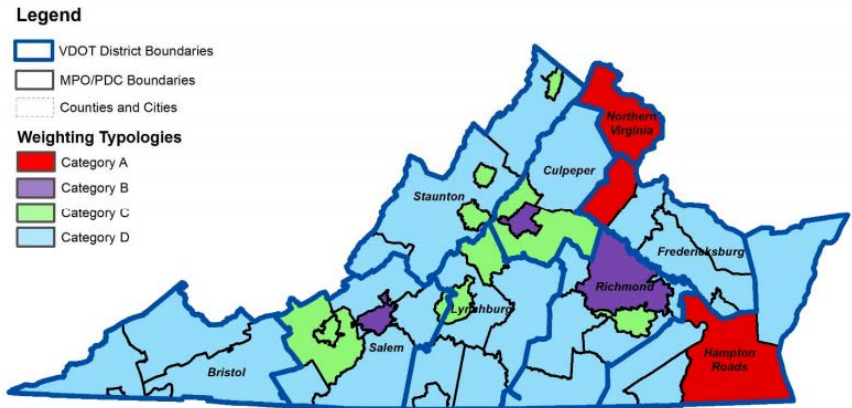
Establishing SMART SCALE

Change is never easy. Changing how transportation projects are evaluated and funded is particularly difficult. Virginia realized that change was necessary as it faced stagnant revenue sources and ever increasing transportation needs. Virginia was able to garner bipartisan support for a new project evaluation mechanism, [SMART SCALE](#), with criteria focusing on economic development and quality of life.

The Virginia General Assembly established the SMART SCALE in 2014, acknowledging that new transportation revenue in Virginia, established through action by the prior administration, needed to be tied to a transparent decision making approach. The bipartisan legislation directed the Commonwealth Transportation Board (CTB) to develop and implement an objective and quantifiable process for the allocation of State and Federal construction funds. One of the most surprising aspects of the legislation was that it did not dictate specific measures, methods, or weights—it simply stated that projects should be evaluated based on six factor areas relative to cost: congestion mitigation, economic development, accessibility, safety, environmental quality, and land use. Evaluating projects based on these factors can support the selection of transportation projects that will enhance livable communities, while providing greater accountability in the efficient use of transportation funds.

How SMART SCALE Works

SMART SCALE is the method of scoring transportation projects that are ultimately funded in [Virginia's six-year improvement program \(SYIP\)](#). Projects can be submitted by local governments, regional planning organizations, or public transit providers, thus ensuring local and regional support for the project. The Virginia Department of Transportation (VDOT) and Department of Rail and Public Transportation cannot submit projects for evaluation and scoring.



Area Type	Congestion Mitigation	Economic Development	Accessibility	Safety	Environmental Quality	Land Use
Category A	45%	5%	15%	5%	10%	20%
Category B	15%	20%	25%	20%	10%	10%
Category C	15%	25%	25%	25%	10%	
Category D	10%	35%	15%	30%	10%	

Figure 7: VDOT District Boundaries and Weighting Typologies. (Image courtesy of VDOT)



Projects are scored based on an objective, outcome-based process that is transparent to the public and allows decisionmakers to be held accountable to taxpayers. Project evaluation within SMART SCALE is based on a set of quantitative, benefit-focused measures in six factor areas, weighted uniquely to reflect the priorities of each region. Measures selected for each of the six factor areas focus on anticipated outcomes of the proposed investments as opposed to measuring the size of the problem. The tool uses non-traditional measures that have not typically been included in evaluating transportation projects, such as access to jobs and non-work destinations. These measures recognize the connection between transportation and land-use, and encourage mixed-use development and multimodal solutions. These measures recognize the connection between transportation and land use, and encourage mixed-use development and multimodal solutions.

The weighting framework is sensitive to the diverse needs of communities throughout the State. Scoring is relative as each measure is scored based on the best performing project for that measure. The highest or best project for a specific measure gets 100 points, and others are scored proportionally. The final benefit score is divided by the requested funding amount, thus encouraging cost-effective projects, development of innovative solutions, and cost sharing. After projects are scored and prioritized, Virginia’s CTB has the best information possible to select the right projects for funding.

The CTB, Virginia Secretary of Transportation’s Office, VDOT, and the Department of Rail and Public Transportation worked with the State’s 15 metropolitan planning organizations and 23 planning district commissions as well as local partners to develop and test the process. Local groups appreciate that SMART SCALE is sensitive to the unique needs and priorities of different regions of the State—with stakeholder feedback used to establish four different area types

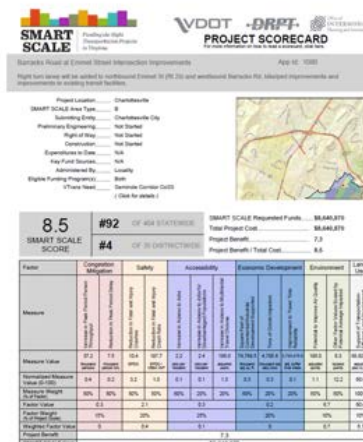


Figure 8: SMART Scale Project Scorecard and Dashboards. (Image Courtesy of VDOT)

for scoring that weighted each of the six factor areas differently. Congestion mitigation is weighted highest in highly dense urban areas, while safety and economic development drives scoring in rural areas. In general, multimodal projects have ranked well in the tool, especially given that they are relatively cost-effective.

The hallmark of SMART SCALE is the high level of transparency and accountability to decisionmakers and the public. The [SMART SCALE website](#) is a one-stop location to inform stakeholders, educate the public, and communicate the overall process and results. It includes training videos, a link to the [SMART Portal](#), project scorecards, raw scoring calculations, access to all application details, and interactive mapping. In addition, the [SMART SCALE Dashboard](#) allows decisionmakers and the public to monitor the progress of projects funded through SMART SCALE to ensure they support a safe and accessible transportation system for all users. Since developing the tool, Virginia has shared its approach with several other States through peer exchanges sponsored by the Federal Highway Administration and other organizations.



Strategic Investments Support Economic Development and Transportation Improvements in Rural and Suburban Communities

Rachel Galton, Community Planner, U.S. Department of Transportation Volpe Center, Cambridge, Massachusetts

Multimodal connectivity, livability, and economic development are closely intertwined. Communities that are walkable, bike-friendly, and have access to transit attract businesses and investment. Businesses also can contribute to quality-of-life improvements, including upgrading local infrastructure. For communities to experience the greatest economic development benefits, transportation planning and projects should be integrated with historic preservation and environmental, economic, and recreational planning. The Federal Highways Administration (FHWA) [Livability Transportation and Economic Development fact sheet](#) offers additional information on this complementary relationship.

In rural and suburban areas, the arrival of new major businesses or factories can stimulate community economic development by providing jobs. However, an increase in economic activity can also often lead to transportation-related challenges like increased congestion. Rural and suburban communities may fear that new development will disrupt the natural environment, historic character, or quality of life.

Strategic, business-minded investments in transportation can ensure that the local economy can develop in a way that preserves and enhances the livability and multimodal connectivity of rural and suburban communities. [FHWA Livability case studies](#) highlight examples of two communities in Delaware and Minnesota where business growth presented challenges and transportation concerns primarily related to congestion. The Delaware and Minnesota departments of transportation (DOTs) took two different approaches to stakeholder involvement to ensure that economic development would support communities' livability priorities.

In communities north of [Wilmington, Delaware](#), the arrival of a major pharmaceutical company threatened to compromise historic and natural sites. To address community concerns and identify a solution that addressed the needs of all stakeholders, Delaware DOT collaborated with government agencies, local businesses, preservation groups, and citizens to consider over 250 design alternatives at public workshops. Narrow lanes, grass shoulders, roundabouts, and other features



Figure 9: The red line represents the Northern Delaware Greenway Trail. (Image courtesy of Delaware Greenways)



were included in the final design to divert and separate local and regional traffic while providing bicycle and pedestrian connections. Rather than take away from existing environmental and historical resources, the final design plan expanded the Alopocas Run State Park, incorporated the historical Blue Ball Dairy Barn, and created the Northern Delaware Greenway Trail, which now spans 10.4 miles from the city of Wilmington to the Delaware River, connecting several State and local parks.

[Perham, Minnesota](#) has also responded to the transportation challenges of economic development in its small downtown. Growth in the community's manufacturing and health care sectors has resulted in congestion in its pedestrian-oriented downtown. Minnesota DOT worked with the Federal Highway Administration Minnesota Division Office and the Minnesota Department of Employment and Economic Development to establish the [Transportation Economic Development Program](#), a funding program designed to support transportation projects that advance the State's economic development goals, such as job creation or retention in manufacturing, technology, and research. This partial funding source has encouraged local Perham businesses to financially contribute to projects such as diamond interchanges to reduce traffic and a multiuse trail to increase multimodal access. Perham's diamond interchange includes four on/off ramps connecting a county highway to US Highway 10. Since its completion in 2012, it has reduced access time to the hospital, facilitating over 6,000 employee and patient trips per week. It has also supported local manufacturers and residents alike by reducing the need for freight trucks to drive on local, residential streets.

By providing funding for projects that draw on the expertise of local stakeholders, States can support local agencies wishing to leverage economic development as an opportunity to improve the transportation system. FHWA is continuing to collaborate with partners to produce additional fact sheets, case studies, and other resources on these topics. For more examples of States and local agencies supporting economic development and transportation improvements in rural areas and small towns, see the [FHWA Livability case studies](#) under the economic development and rural categories, and the FHWA [Livability and Economic Development fact sheet](#).



Announcements/New Resources

- The Federal Highway Administration (FHWA) has published a new resource on [Measuring Multimodal Network Connectivity](#). This resource provides information on incorporating pedestrian and bicycle network connectivity analysis into State, metropolitan, and local transportation planning processes. It outlines a five-step analysis process, and highlights methods and measures to support a variety of planning decisions. It includes references and illustrations of current practices, including materials from five case studies. The University of North Carolina Highway Safety Research Center's Pedestrian and Bicycle Information Center (PBIC) will host a webinar on the guidebook on Tuesday, April 24, from 1:00 to 2:00 ET.
- FHWA has released a new compiled set of [Case Studies in Realizing Co-Benefits of Multimodal Roadway Design and Gray and Green Infrastructure](#). This resource highlights case studies of projects that contribute to safe and connected pedestrian and bicycle networks in States and communities throughout the U.S., while providing green and gray infrastructure benefits that promote resiliency and relieve burdens on stormwater systems.
- PBIC conducted a webinar on [Making Signals Work for Bicyclists and Pedestrians](#), supported through cooperative agreement with FHWA.
- FHWA released [Accessible Shared Streets: Notable Practices and Considerations for Accommodating Pedestrians with Vision Disabilities](#). This document reviews notable practices and considerations for accommodating pedestrians with vision disabilities on shared streets. Shared streets are those where pedestrians, bicyclists, and motor vehicles are intended to mix in the same space.
- The FHWA Office of Planning has released a white paper on [Integrating Shared Mobility into Multimodal Transportation Planning: Improving Regional Performance to Meet Public Goals](#). This white paper provides a framework and examples to assist transportation agencies in anticipating and planning for shared mobility as part of a higher-performing regional multimodal transportation system.
- The Institute of Transportation Engineers released [Implementing Context Sensitive Design on Multimodal Thoroughfares: A Practitioner's Guide](#). This handbook, funded by FHWA, includes an expanded focus on topic areas such as freight accommodation, speed management, and context sensitive design in lower density urban and built-up suburban environments. Several real-world case studies are also included in the report, to demonstrate the medium- and long-term impacts of successful context sensitive design projects.
- In February 2018, the Institute of Transportation Engineers released a case study on "[Delivering Impactful Projects Quickly and Effectively](#)." This case study discusses strategies communities can use to accelerate project delivery, and also highlights successful examples of projects that have implemented these strategies.
- The FHWA Office of Transportation Policy Studies has released a report on "[Travel Behavior-Shared Mobility and Transportation Equity](#)." This report discusses shared use of motor vehicles, bicycles, or other low-speed transportation modes that allow users to obtain short-term access to transportation on an as-needed basis. The report includes discussion of how shared mobility can help address the myriad of transportation equity barriers facing transportation system users, including spatial, temporal, economic, physiological, and social barriers.

