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SECTION II:

Training and Development

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CASE STUDY 5 –

Safety Training for Local Agencies

Problem

Local agencies find it difficult to identify and develop safety projects for Highway Safety Improvement Program (HSIP) funding since very few of their staff are trained in safety analysis.

Noteworthy Solution

State and federal entities acknowledge that some local agencies have limited staff and their responsibilities cover a broad range of work that often monopolizes their time. They frequently are unable to take the necessary training to understand or apply traffic safety methods. In response, agencies have developed tools to help guide local practitioners through the HSIP safety analysis process. Federal and state agencies have developed the following resources to provide local agencies with safety analysis training and tools:

1. U.S. Federal Highway Administration (FHWA) *Improving Safety on Rural Local and Tribal Roads – Safety Toolkit* (2014a).
2. Minnesota Department of Transportation (MnDOT) *Traffic Safety Fundamentals Handbook* (2015).
3. North Jersey Transportation Planning Authority (NJTPA) training course using the *New Jersey Highway Safety Improvement Program (HSIP) Manual* (2016).

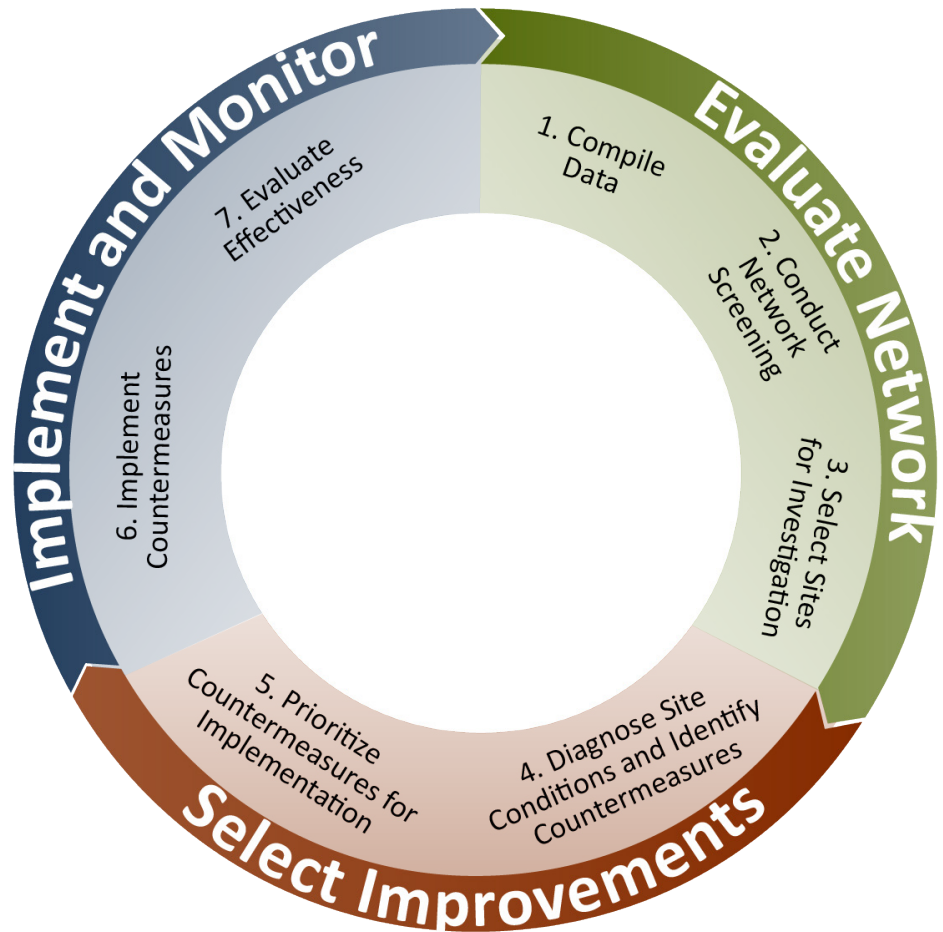
Improving Safety on Rural Local and Tribal Roads – Safety Toolkit

The *Improving Safety on Rural Local and Tribal Roads – Safety Toolkit* (FHWA, 2014a) helps rural, local, and tribal roadway safety practitioners address safety challenges and integrate road safety into their existing responsibilities.

The Toolkit provides a seven-step process to complete traffic safety analyses, identify safety issues, identify countermeasures to address the issues, and develop an implementation process. Each step contains a set of tools, examples, and links to appropriate resources to meet the needs of safety practitioners (Figure 5-1):

1. Compile data.
2. Conduct network screening.
3. Select sites for investigation.
4. Diagnose site conditions and identify countermeasures.
5. Prioritize countermeasures for implementation.
6. Implement countermeasures.
7. Evaluate effectiveness of implemented countermeasures.

Figure 5-1. FHWA Safety Analysis Process



The Safety Toolkit, in addition to other FHWA training, tools, guidance, and countermeasures for local practitioners, is online at: <https://safety.fhwa.dot.gov/> (FHWA, 2017).

Traffic Safety Fundamentals Handbook

The *Traffic Safety Fundamentals Handbook* (MnDOT, 2015) focuses on providing the information most often requested by local agencies. MnDOT published the original version in 2001, with updates in 2008 and 2015.

More than 3,500 copies have been distributed through MnDOT's outreach to government agencies and the private sector. In addition, the Handbook is used as a resource in undergraduate and graduate traffic engineering classes at the University of Minnesota and is available to professionals in other states online at: <https://www.dot.state.mn.us/trafficeng/publ/fundamentals/2015-mndot-safety-handbook-reduced.pdf>.

The Handbook is organized into three sections:

- » Crash Characteristics – National and state crash summaries, including basic characteristics as a function of roadway classification, intersection control, roadway design, and access density.
- » Safety Improvement Process – Site analysis at high-crash locations and systemic assessments.
- » Traffic Safety Tool Box – Identification of new tools (HSM and Crash Modification Factor Clearinghouse [FHWA, 2014b]) and a safety strategies update, with an emphasis on effectiveness (crash reduction).

Agency staff refer to this Handbook for guidance on safety context, analysis, comparisons, and countermeasures.

HSIP Training

The New Jersey DOT (NJDOT) requires HSIP applications to be based on the state’s HSIP Manual (NJTPA, 2016). To help local agencies comply with this requirement, the NJTPA sponsored four, free 2-day workshops on Highway Safety Manual (HSM) analytical techniques, key assumptions, and benefit/cost ratio computations. FHWA’s Resource Center, FHWA’s New Jersey Division Office, NJDOT’s Bureau of Transportation Data and Safety, and NJTPA provided the instructors. The target audience included metropolitan planning organizations and local agency engineers. The workshop included 1-hour time slots for local agencies considering submitting a project for HSIP funding to present details about their projects. Instructors provided feedback to local agency engineers about HSM assumptions and the suggested approach for analytical techniques.

To date, almost two-thirds of NJTPA’s 15 sub-regions have participated and applications for 26 safety projects have been adopted by the NJTPA Board of Trustees for funding through the Local Safety Program (NJTPA, 2016).

Local Agency Action Items

These three noteworthy resources provide local agencies with safety analysis training and tools. To ensure staff receive this training, local agencies could:

- » **Identify** document and training resources through the state DOT or other agencies.
- » **Collaborate** with local agencies to develop applicable materials or training.
- » **Request** information and training assistance from the state DOT, when needed.
- » **Incorporate** the recommendations found in the guidance documents into the local agencies’ internal processes.

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References

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CASE STUDY 6 –

Local HSIP Advisory Committee

Problem

Despite a notable percentage of fatalities occurring on local roads, there is low county, city, and local agency participation in the Highway Safety Improvement Program (HSIP).

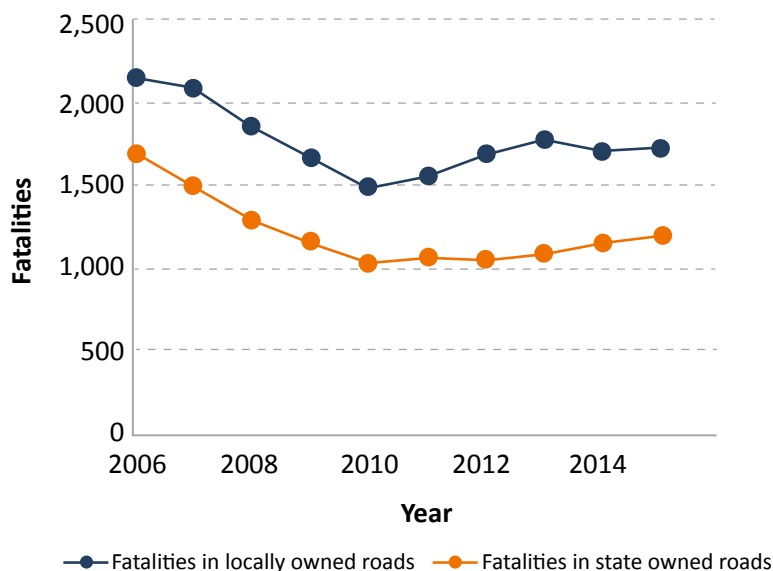
Noteworthy Solution

In 2014, California formed a local HSIP Advisory Committee to increase local agency participation in California’s HSIP and to support the state’s goal to reduce traffic fatalities (Figure 6-1) and serious injuries on California public roads. The Advisory Committee provides California’s local HSIP and other safety programs with safety guidance on California’s local roadways. Committee members include the California Department of Transportation (Caltrans) – Division of Local Assistance; U.S. Federal Highway Administration (FHWA), the Local Technical Assistance Program, and local agencies throughout California.

The Advisory Committee’s Charter (Appendix C, Desired Goals, Advisory Committee Charter, 2017) identifies six goals:

1. Ensure that California’s Local HSIP and other safety programs and efforts are consistent with California’s Strategic Highway Safety Plan (SHSP).
2. Provide vision and strategic priorities for improving local safety programs and processes.
3. Provide recommendations on California Local HSIP and processes.
4. Provide recommendations to streamline decision-making, review, and project delivery on safety projects.
5. Identify funding opportunities to meet local roadway safety needs.
6. Encourage, improve, and support traffic safety efforts at local agencies.

Figure 6-1. Local/State Fatalities Trend Line
Road Fatalities in California



Source: Fatality Analysis Reporting System (FARS), 2017; Adapted by FHWA

The Advisory Committee is co-chaired by Caltrans and a representative from a local agency, and includes 11 members representing cities, counties, and regional/metropolitan planning agencies. The goal is for committee members to represent urban and rural areas distributed geographically across the state.

The Advisory Committee (Appendix C) adopted four key initiatives:

1. Address systemic risks on local roads with low-cost safety countermeasures, including programs focused on roadway departure and high-friction surface treatments.
2. Identify funding strategies that reflect unique local needs, including webinars focused on preparing applications for safety funding.
3. Target high-risk jurisdictions for funding, training, and technical assistance. Recognize that some local systems with the highest number of fatalities and serious injuries are smaller jurisdictions without the capacity or technical ability to address safety concerns.
4. Implement an effective, consistent, and coordinated traffic incident management program at the state and local level to reduce the duration and impacts to traffic incidents and improve safety for motorists, crash victims, and emergency responders.

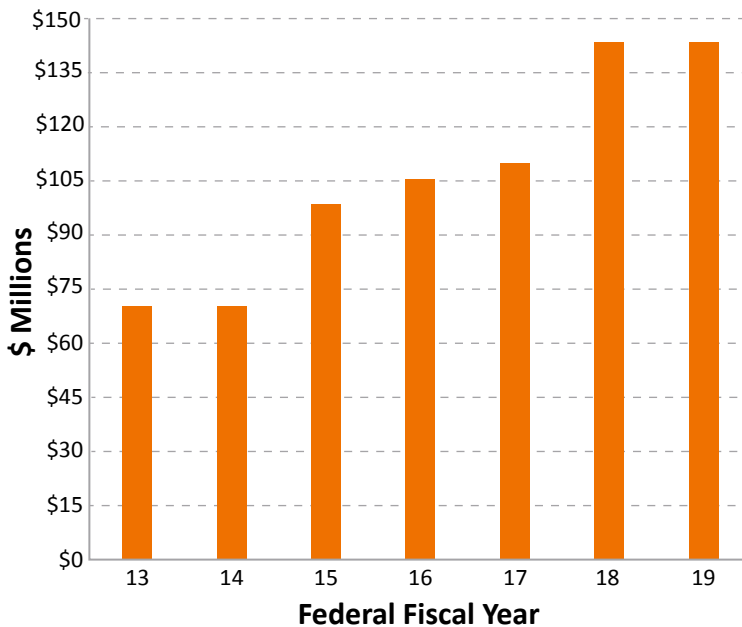
Since 2014, the outreach, training, and technical assistance provided by the Advisory Committee increased local agency participation by almost 40%. This

translates to a 70% increase in the level of safety funds dedicated to local system projects (from about \$65 million programmed for Fiscal Years 2012 and 2013 to \$100 million in 2015 and \$140 million in 2019) (Kochevar, 2017, pers. comm) (Figure 6-2).

The types of projects selected for funding as a result of the Advisory Committee initiatives are listed below and illustrated in Figures 6-3 and 6-4:

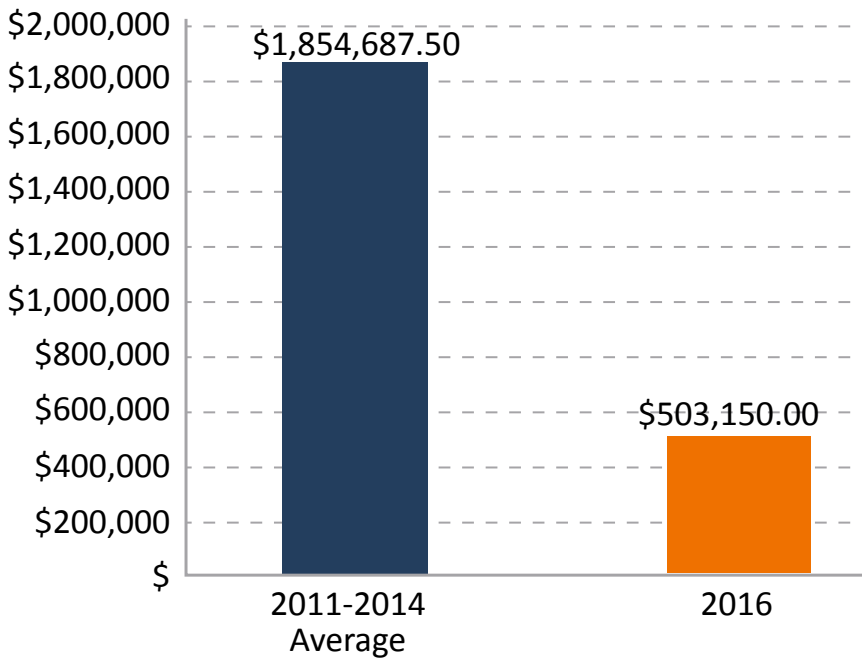
- » Pedestrian/bicycle improvements – Countdown timers, curb ramps, refuge islands, curb extensions, rapid flash beacons and signals, sidewalks, and bike lanes.
- » Access management – Raised medians and road diets.
- » Intersection improvements – Signal modifications and left-turn lanes, roundabouts, and street lights.
- » Segment improvements – Shoulder paving, pavement markings, clear zone maintenance, and guardrail upgrades.

Figure 6-2. HSIP Funding for Local Road Safety in California



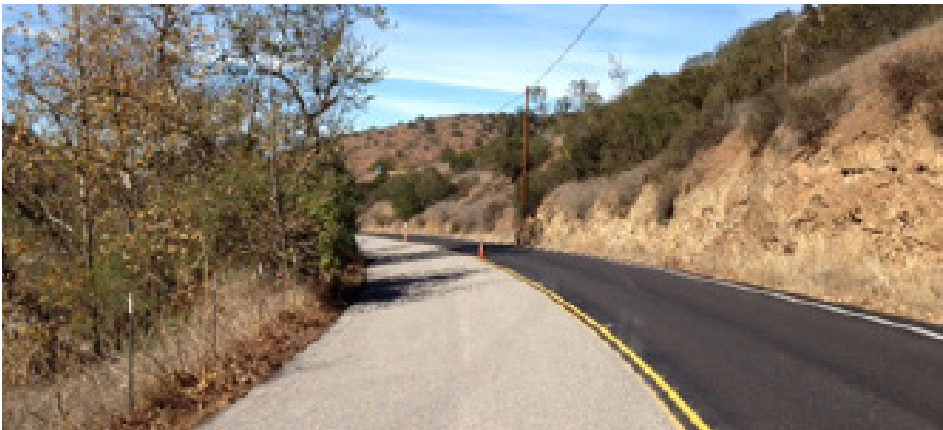
Source: Kochevar, 2017, pers. comm.; Adapted by FHWA

Figure 6-3. Injury Severity Quantified in California



Source: Mattox, 2016, pers. comm..

Figure 6-4. Rural Highway Shoulder Paving in California



Source: Kochevar, 2017, pers. comm.

Local Agency Highlights

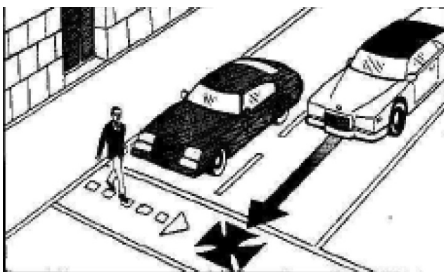
The Town of Paradise has benefited from state efforts to increase the number of cities and counties participating in the HSIP. Prior to securing HSIP funds, Paradise’s \$1 million annual capital budget focused on expanding the roadway system to accommodate growth and managing 100 miles of roads. In the past 3 years, Paradise has supplemented its capital budget with \$8 million in HSIP funds, which has supported adding a shoulder paving/bike lane project, adding a two-way left-turn lane to Clark Road, upgrading the town’s signal system by adding pedestrian countdown timers and emergency vehicle pre-emption, and implementing a road diet along Skyway Road (Mattox, 2016, pers. comm). A project along Skyway Road (Figure 6-5 and Figure 6-7) converted the four-lane undivided cross-section to a three-lane cross-section

Figure 6-5. Downtown Paradise Road Configuration Change Before



Source: Mattox, 2016, pers. comm.

Figure 6-6. Illustration of Multiple-threat Pedestrian Crash



Source: FHWA, 2005

and improved signal coordination. It also added pedestrian enhancements, including crosswalks, curb extensions, refuge islands, and activated flashing beacons. Prior to these enhancements the crash rate on Skyway Road was more than twice the statewide average for similar facilities. Pedestrian crashes were the key component, especially multi-vehicle threat crashes common to four-lane roads (Figure 6-6).

According to U.S. Federal Highway Administration (FHWA), “A multiple-threat crash involves a driver stopping in one lane of a multilane road to permit pedestrians to cross, and an oncoming vehicle (in the same direction) strikes the pedestrian who is crossing in front of the stopped vehicle. This crash type involves both the pedestrian and driver failing to see each other in time to avoid the collision” (FHWA, 2005). After completing the HSIP-funded safety improvements project, the Town of Paradise reported the following successes (Mattox, 2016, pers. comm):

Figure 6-7. Downtown Paradise Road Configuration Change After



Source: Mattox, 2016, pers. comm.

Safety and Other Outcomes

- » A 15% reduction in total collisions.
- » A 27% decrease in injury collisions.
- » A 73% decrease in injury severity.
- » Zero pedestrian-involved collisions in 2016.
- » Reduced travel time during off-peak and peak hours.
- » Drastically improved yield rates at pedestrian crossings.

Local Agency Action Items

The California Advisory Committee has successfully increased local participation in California's HSIP by developing a local HSIP Advisory Committee. To develop a similar committee, a local agency could:

- » **Communicate** with the state HSIP coordinator to obtain information on opportunities for local agency HSIP participation.
- » **Collaborate** with the state DOT to provide input on where HSIP funding is allocated.
- » **Partner** with state DOT, FHWA, Local and Tribal Technical Assistance Programs, and other local agencies to charter a similar group to encourage and increase participation in the HSIP.

References

1. California Department of Transportation (Caltrans). 2015. *California Strategic Highway Safety Plan 2015-2019*. http://www.dot.ca.gov/trafficops/shsp/docs/SHSP15_Update.pdf. Accessed September 18, 2017.
2. Fatality Analysis Reporting System (FARS). 2017. Database. <https://www.nhtsa.gov/research-data/fatality-analysis-reporting-system-fars>. Accessed September 25, 2017.
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5. U.S. Federal Highway Administration (FHWA). 2005. *Federal Highway Administration Research and Technology Coordinating, Developing, and Delivering Highway Transportation Innovations*. Chapter 3. Publication Number: FHWA-HRT-04-100. September.

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CASE STUDY 7 –

Implementing New Technology

Problem

Local agencies may have limited expertise with new/innovative safety countermeasures. This limits the agency's ability to address key crash factors.

Noteworthy Solution

In 2012, Thurston County in Washington State conducted a data-driven safety analysis to identify and prioritize potential safety projects that would be eligible for Highway Safety Improvement Program (HSIP) funds.

In late 2013, Thurston County determined that wet/icy pavement contributed to 47% of crashes and identified high friction surface treatment (HFST)—a new and innovative technology proven effective at reducing crashes, particularly on wet pavements—as a solution. However, Thurston County had no prior experience with HFST and neither the Washington State Local Technical Assistance Program (LTAP) nor the U.S. Federal Highway Administration (FHWA) could answer Thurston County's questions about local implementation (installation costs, materials, and ongoing maintenance issues). To resolve the unanswered HFST inquiries, Thurston County worked with LTAP and FHWA to coordinate a peer exchange and pilot project.

Using information received from other agencies with experience in implementing HFST Thurston County partnered with Washington State LTAP and FHWA to secure funding to cover materials and installation at two demonstration sites, selected to compare different installation methods. To share the lessons learned on HFST, the partnering agencies hosted a peer exchange, featuring an installation demonstration, and attended by 37 representatives of various local agencies, the Washington State DOT (WSDOT), FHWA, and the Western Federal Lands Division. The demonstration included an application of HFST applied by Thurston County traffic and road maintenance crews and was followed by a detailed overview of HFST by national experts.

Since the peer exchange and pilot projects, there have been at least 36 planned or installed HFST sites in the State of Washington (state and local roads). In addition, eight counties, including Thurston County, submitted HSIP funding applications to WSDOT for HFST sites in the summer of 2016. In December 2016, WSDOT awarded Thurston County more than \$2 million for HFST at 29 locations.

Local Agency Action Items

Thurston County has successfully partnered with Washington State LTAP and FHWA to implement a new and innovative, proven safety technology on local roads. To begin using a new technology on local roads, an agency could:

- » **Gauge** existing resources and interest in new technologies.
- » **Participate** in a strategic partnership or peer exchange with other agencies to share information and promote implementation of new technologies.
- » **Pilot** technologies and share information on implementation and effectiveness with a local audience.

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CASE STUDY 8 –

Local Agency Safety Program

Problem

Local agencies often do not have the resources/expertise to conduct in-depth crash analyses and/or identify traffic safety solutions.

Noteworthy Solutions

The Florida Department of Transportation (FDOT) District 7 (Tampa Bay region) has developed the Local Agency Safety Program to assist local agencies without the resources to identify, develop, and implement safety improvements on local roadways as part of their Highway Safety Improvement Program (HSIP) process.

The Local Agency Safety Program includes:

- » A yearly traffic safety summit.
- » Access to Safety Ambassadors.
- » A Local Agency Traffic Safety Academy (LATSA).
- » Project delivery assistance.

The Local Agency Safety Program provides resources to local agencies that result in improved understanding of traffic safety, project development, and the application process for project funding. In fact, *“As a result of the improved level of understanding regarding the application process, the number of project submissions made by local agencies increased from averaging 3 applications each year to 50+ applications”* (U.S. Federal Highway Administration (FHWA), 2013).

Yearly Traffic Safety Summit

FDOT District 7 hosts an annual seminar called the Local Agency Traffic Safety Summit. This seminar is geared toward local agency staff, elected officials, and independent industry consultants. The purpose of the seminar is to (FHWA, 2013):

- » Emphasize the need to improve roadway safety by drawing on case studies and local examples.
- » Describe the process to apply for HSIP funding.
- » Review the Local Agency Traffic Safety Program’s success rates.
- » Explain how FDOT District 7 can help local agencies improve safety on local roads.

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Access to Safety Ambassadors

Local agencies have access to Safety Ambassadors who have been designated by District 7 to provide guidance on navigating the HSIP funding process by linking local agencies to industry contacts, consultants, and district staff. The Ambassadors:

- » Are available year round.
- » Provide process guidance.
- » Provide access to FDOT crash maps and analyses.
- » Perform project reviews.
- » Guide local agency staff in successful project completion.

Local Agency Traffic Safety Academy

The LATSA is a webinar-based program that trains participants in best practices for successful implementation of safety projects. LATSA focuses on topics relevant to local agencies in District 7 including:

- » Securing funding for HSIP and other local safety projects/programs.
- » Local best practices on related topics including data analyses, modern infrastructure countermeasures, and project implementation.
- » New safety treatments and technologies.
- » Project delivery processes.

The webinars are free and presenters are experts in a variety of fields including consulting, government, and education and research.

LATSA began in 2013 and is online at (FDOT 2017a):

<http://www.tampabaytrafficsafety.com/LATSA/SitePages/Home.aspx>.

Project Delivery Assistance

Project Development

FDOT District 7 supports local agencies during project development by providing access to crash data and analysis, identifying high-crash locations and locations with specific crash patterns, and helping local agencies with project identification and design when resources are limited.

Project Review

FDOT District 7 provides guidance for local agencies submitting project funding requests. Since submitted projects are closely reviewed by FDOT, this guidance prompts local agencies to consider what FDOT will be looking for during its review. For instance:

- » Is the project in a high-crash location?
- » Have potential countermeasure efforts been exhausted?
- » Are cost estimates and constructability reviews complete and accurate?

Project Implementation

FDOT District 7 supports local agencies during project implementation through:

- » Material Provisions – FDOT may provide requested materials (signage, markings, and signal heads) to local agencies who are then responsible for installation and maintenance.
- » Design-Build/Push-Button (DBPB) Contracts – DBPB contracts streamline the delivery of projects considered low to medium complexity, such as:
 - Crosswalks.
 - Overhead signage (Figure 8-1).
 - Bicycle lanes.
 - Pavement markings.

DBPB projects are expedited and do not require the standard FDOT review. In fact, each task is completed in less than 1 year. According to FDOT, *“The push button framework allowed the District to reduce the time it takes to deliver simple or low-cost safety improvement from 3-5 years to 3-9 months (FDOT, 2017b).”*

According to FDOT, the DBPB has accomplished the following:

- *“Reduced the time it takes to implement a safety improvement; at the same time, reduced the potential for fatalities and serious injuries during the shortened implementation period.”*
- *Reduced overall costs of the project application process.*
- *Ensured compliance with Federal guidelines on all submitted project proposals.*
- *Promoted use of these low-cost safety improvements.”*
- » Local Agency Program support – This Program is used for more complex projects that are considered significant based on design and construction (e.g., intersection reconstruction). It permits funding of projects managed and administered by the local agency during the design and construction phases. FDOT District 7 uses a Local Agency Program expert to assist local agencies in requesting HSIP funds through the local agency safety program.

Figure 8-1. Improved Overhead Signage in District 7: Before (top) and After



Source: Florida Department of Transportation Improved overhead signage in District 7: before (top) and after.

Local Agency Action Items

Through its Local Agency Safety Program FDOT District 7 has successfully provided resources to help local agencies identify and develop traffic safety solutions as part of the HSIP process. To develop a similar program, an agency could:

- » **Identify** and **participate** in available programs offered by the state DOT or other agencies.
- » **Collaborate** with other local agencies to collectively identify and develop solutions to common needs (e.g., programs, resources, training, and funding sources).
- » **Communicate** ideas to the state DOT that improve the consistency and manageability of HSIP applications.

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