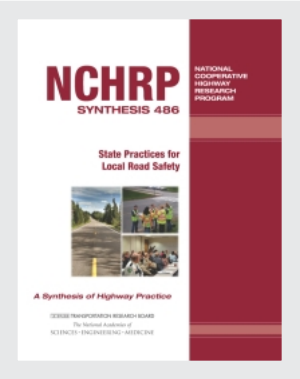

State Practices for Local Road Safety

DETAILS

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AUTHORS

Park, Seri; McTish, Patrick; Holman, Jacob; Giancola, Anthony R.; and James S.G. Davenport

NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

NCHRP SYNTHESIS 486

State Practices for Local Road Safety

A Synthesis of Highway Practice

CONSULTANTS
Seri Park, Patrick McTish, and Jacob Holman
Villanova University
Villanova, Pennsylvania

Anthony R. Giancola
Washington, D.C.
and
James S.G. Davenport
Arlington, Virginia

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NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

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Cover figure: Left corner—Centerline rumble strips of rural local road (*Credit*: Saint Louis County Public Works Department, Minnesota); **Right upper corner—**Representatives from different agencies and disciplines conducting Road Safety Audit (RSA) (*Credit*: Connecticut Technology Transfer Center); **Right lower corner—**MnDOT 4E safety workshop (*Credit*: Minnesota Department of Transportation).

FOREWORD

Highway administrators, engineers, and researchers often face problems for which information already exists, either in documented form or as undocumented experience and practice. This information may be fragmented, scattered, and unevaluated. As a consequence, full knowledge of what has been learned about a problem may not be brought to bear on its solution. Costly research findings may go unused, valuable experience may be overlooked, and due consideration may not be given to recommended practices for solving or alleviating the problem.

There is information on nearly every subject of concern to highway administrators and engineers. Much of it derives from research or from the work of practitioners faced with problems in their day-to-day work. To provide a systematic means for assembling and evaluating such useful information and to make it available to the entire highway community, the American Association of State Highway and Transportation Officials—through the mechanism of the National Cooperative Highway Research Program—authorized the Transportation Research Board to undertake a continuing study. This study, NCHRP Project 20-5, "Synthesis of Information Related to Highway Problems," searches out and synthesizes useful knowledge from all available sources and prepares concise, documented reports on specific topics. Reports from this endeavor constitute an NCHRP report series, *Synthesis of Highway Practice*.

This synthesis series reports on current knowledge and practice, in a compact format, without the detailed directions usually found in handbooks or design manuals. Each report in the series provides a compendium of the best knowledge available on those measures found to be the most successful in resolving specific problems.

PREFACE

By Jon M. Williams
Program Director
Transportation
Research Board

Three-quarters of all road miles in the United States are owned and maintained by local entities. More than half of all fatal crashes occur on rural roads, which are mostly owned by local entities. This study documents the state transportation agency programs and practices that address local agency road safety.

Findings of the study include information on state program size, funding sources, and administrative procedures; changes in local road safety programs since the legislation of Moving Ahead for Progress in the 21st Century (MAP-21); noteworthy local/state program partnerships and initiatives to improve safety; and the use of 4E (Engineering, Enforcement, Education, and Emergency Services) approaches to local road safety.

Seri Park, Patrick McTish, and Jacob Holman, Villanova University, Villanova, Pennsylvania; Anthony R. Giancola, Washington, D.C.; and James S.G. Davenport, Arlington, Virginia, collected and synthesized the information and wrote the report. The members of the topic panel are acknowledged on the preceding page. This synthesis is an immediately useful document that records the practices that were acceptable within the limitations of the knowledge available at the time of its preparation. As progress in research and practice continues, new knowledge will be added to that now at hand.

CONTENTS

Note: Photographs, figures, and tables in this report may have been converted from color to grayscale for printing. The electronic version of the report (posted on the web at www.trb.org) retains the color versions.

STATE PRACTICES FOR LOCAL ROAD SAFETY

SUMMARY

According to the U.S.DOT Bureau of Transportation Statistics for 2014, approximately 76% of all road miles in the United States is owned and maintained by local entities. In addition, NHTSA's Fatality Analysis Reporting System (FARS) for 2013 reports that approximately 54% of all fatal crashes occur on rural roads; 72% of which are owned by local entities. Hence, many states are facing challenges in addressing safety issues on locally owned roads.

This synthesis documents the state programs and practices that address local agency road safety. Of particular interest to this study has been information on state program size, funding sources, and administrative procedures; changes in local road safety programs since the legislation of Moving Ahead for Progress in the 21st Century (MAP-21); noteworthy local and state program partnerships and initiatives to improve safety; and the use of 4E (Engineering, Enforcement, Education, and Emergency Services) approaches to local road safety. The findings of this synthesis will provide state departments of transportation (DOTs) and their local agencies with useful information on successful partnerships to address the reduction of crashes on local roads.

The information for this synthesis was gathered through a comprehensive literature review, a survey of state DOTs, and subsequent interviews with a handful of state and other organizations such as local public agencies, local technical assistance programs, and metropolitan planning organizations in ten states that were selected for further study. A listing of noteworthy practices of state coordinated programs aimed at local road safety was developed from the state survey and analysis of ten states whose safety programs have achieved reductions in local road crashes. Forty-seven DOTs responded to the survey, a response rate of 94%. The following major observations were made based on the DOT survey data, detailed interviews, and literature review:

- MAP-21 has positively affected states in their ability, through significantly increased funding levels especially in the Highway Safety Improvement Program (HSIP), to address local road safety and the need for data-driven decisions that implement proven countermeasures to reduce crashes on local roads. Through the survey, federal funding was identified as the major source in many states (more than 80% of fund source) for the local road safety programs.
- Thirty-three states have experienced a reduction of fatal and serious injury crashes since the implementation of MAP-21 legislation and reported the promotion of systemic low-cost safety improvements and initiation or expansion of state coordinated local road safety programs and partnerships as key factors in crash reduction. Increased HSIP funding and improved access to crash data for local agencies were also identified as elements that contributed to crash reductions.
- States are using a variety of approaches to engage local government agencies. Many states are holding summits, conferences, workshops, and meetings to help educate and train local agencies in applying for safety funds and discussing safety requirements. In addition, many states are coordinating with their Local Technical Assistance Program (LTAP) centers to address issues with local agencies on local road safety.
- Many states have adopted and/or support the Toward Zero Deaths Initiative within its own Strategic Highway Safety Program (SHSP), in which states address reducing crashes on

all public roads by employment of a 4E approaches. Survey results revealed that most states (32) include an element in their SHSP that identifies and addresses goals and initiatives to improve the safety on local roads.
- The majority of states responded that the administration and reporting requirements for the use of federal-aid dollars have been a deterrent to the participation of local agencies. Practices identified to encourage such involvement were a year-round fund application timeframe, streamlining and consolidating the solicitation process [e.g., a universal application (one application) for federal safety funds]; lowering local match requirements (e.g., providing state funds to match federal funds so that a local match is not required); and providing training, technical assistance, and certification programs for local public agencies.
- Key challenges faced by state DOTs in addressing local safety projects were the lack of local agency resources (44 states), followed by the limit of state DOT resources (29 states). Tools identified to address these challenges were providing workshops, training, and technical assistance; enhancing communication; outreach and engagement with local agencies; procedures documented in local road manuals; and comprehensive guidance and policy for local agencies.

This synthesis identified the following future research needs to support local road safety:

- Development of a cost-effective traffic and roadway inventory database system to facilitate the implementation of a data-driven systemic safety approach. Advances in sensor technology (e.g., Utah DOT's LiDAR pilot study) and research initiatives on effective traffic counts on local roads (e.g., traffic count estimation based on small scale sample counts and land use variables) are reported as possible solutions to address the lack of a roadway inventory system. Iowa DOT's Statewide Traffic Records Coordinating Committee-supported traffic record program and Ohio's geographic information system crash analysis tool system are examples of the geographic information system applications that could contribute to the data-driven systemic safety approach.
- Development of new performance indicators for program/practice evaluation in addition to the currently used crash fatality and serious injury numbers and rates. The corresponding research results will also assist in establishing an effective methodology to document and estimate the level of safety enhancement at the project location or program level other than one based on crash numbers or rates. Research results will also assist in developing proactive safety methods for enhancing the safety on local roads. Possible future performance measures for further study have been addressed in the Minnesota SHSP entitled Minnesota's Traffic Safety Tracking Indicators by Focus Area (presented in web-only Appendix D).
- Further analysis is needed on driver's behavior on all roads to identify countermeasures and/or strategies that would have significant impacts on human behavior. For example, there is a need for detailed observations of vehicle speeds on local roads in order to establish and post realistic speeds and driver behavior changes as they transition from interstate, state, and local roads. Research results will help provide guidelines for implementing safety programs targeted at reducing human factor attributed crashes.
- The use of the *Highway Safety Manual* (*HSM*) by local agencies has been very limited. Although the state of Michigan, through the LTAP, developed and has been implementing a training program to educate local agencies in the use of the *HSM*, future efforts could be explored for ways to make this important safety tool more readily usable by local agencies.
- Investigation on the impacts of various advances in technology, such as autonomous vehicles and the use of low-cost intelligent transportation systems technology [e.g., Advanced LED Warning system for Rural intersections (ALERT) rural two-way stop control intersection warning system by the Minnesota DOT and Local Road Research Board] to improve local road safety.

CHAPTER ONE

INTRODUCTION

This chapter introduces background information and highlights the importance of coordinated safety programs by state departments of transportation (DOTs) to improve the safety of a state's local roads. The survey, interview processes, and organization of the report will also be presented.

BACKGROUND

According to U.S.DOT Bureau of Transportation Statistics, approximately 76% of all road miles in the United States are owned and maintained by local entities, such as towns, counties, and other municipalities (*State Transportation Statistics* 2014). Based on the review of the Fatality Analysis Reporting System (FARS) for 2013, rural roads, of which is 72% are owned by local entities, contribute to approximately 54% of all fatal crashes on the U.S. highways ("Traffic Safety Facts" 2015). These data accentuate the need to systematically improve road safety on local roads.

The current federal transportation law, Moving Ahead for Progress in the 21st Century (MAP-21), includes a number of safety provisions designed to achieve a significant reduction in traffic fatalities and serious injuries on all public roads (Public Law 112-141 2012). MAP-21 defines a Highway Safety Improvement Program (HSIP) project as "strategies, activities, and projects on a public road that are consistent with a state strategic highway safety plan and correct or improve a hazardous road location or feature or addresses a highway safety problem." It also confirmed the importance of highway safety by continuing the HSIP as a core federal-aid program. One of the requirements of the HSIP is for states to prepare a Strategic Highway Safety Plan (SHSP) that addresses the safety needs of all public roads and is developed in consultation with various stakeholders throughout their state.

All states have a comprehensive SHSP that provides a framework for reducing highway fatalities and serious injuries on public roads. Several reports have been completed in recent years on the importance of addressing local road safety. Such reports include FHWA's 2013 *Assessment of Local Road Safety Funding, Training, and Technical Assistance.* That report reviewed department of transportation (DOT) practices associated with local safety projects from four different topical areas: resources and information; training and development; technical assistance; and project implementation (Gaines et al. 2013). The report also provided model local road safety practices that can be adapted to enhance existing local road safety efforts. FHWA's domestic scan document, *Noteworthy Practices: Addressing Safety on Locally-Owned and Maintained Roads*, presented the practices of state DOTs in the planning, programming, and implementation efforts to improve local road safety (Anderson et al. 2010). There is a need to synthesize these efforts and provide examples of effective state and local agency partnership practices to help other states. This study will provide state DOTs and their local agencies with useful information on successful partnerships to address the reduction of crashes on local roads.

SYNTHESIS OBJECTIVE

The objective of this synthesis is to document state programs and practices that address local road safety. These programs and practices may include those that are using data-driven approaches to addressing local road safety. The project gathered information from states and a sample of local agencies involved in finding new or innovative ways to address local road safety. This synthesis will help identify local and state agencies that have a track record of working together to successfully deliver projects, and will reveal programs and practices that benefit both state DOTs and local agencies.

This synthesis was preceded by NCHRP 20-24, Task 87: *State DOT Administration of Local Road Safety Aid*, which was oriented to chief executive officers of state DOTs, and which studied how state DOTs organize themselves to administer safety programs on local roads (Preston et al. 2014). This synthesis study built on NCHRP 20-24, Task 87 and delved more deeply into current practice. Information gathered on state's local road programs included:

- Size of state program, funding, and staff.
- HSIP split and other funding sources.
- Administrative procedures:
  - Process for applying for funds;
  - Competitive or not;
  - Audit procedure;
  - Bidding procedures; and
  - Use of consultants, Local Technical Assistance Program (LTAP) centers, and metropolitan planning organizations (MPOs).
- Data used to identify recipient agencies and projects.

- Since the legislation of MAP-21, the change in the number of local agencies participating in state coordinated local safety programs and the extent of state outreach to local agencies.
- Recent obstacles to implementation and strategies for overcoming these obstacles.
- Use of 4E (Engineering, Enforcement, Education, and Emergency Response) approaches to safety.
- Noteworthy local and state program partnerships.
- Recent local road safety program initiatives that have or will result in tangible safety benefits.
- Status of local agencies' local road safety plans and corresponding funding sources.

The synthesis also includes suggestions for future research based on existing gaps identified through the literature review, survey, and agency interviews. It provides a reference for transportation agencies regarding existing practices, funding approaches, and noteworthy partnerships that address local road safety issues.

STUDY APPROACH

A multifaceted approach was taken to document the various efforts that have been made in recent years by some states working with local public agencies to implement safety programs that reduce fatalities and injuries on local roads. The approach to this study included a literature review, survey of state transportation agencies, and interviews with state and local transportation agencies in states identified as having practices that are effective in reducing crashes on local roads. The following sections provide more detail on each step in the approach.

Literature Review

A comprehensive literature review of federal and state sources established background information on the programs and practices that focus on the safety of local roads. A number of available resources were used, including the Transport Research International Documentation (TRID) database, Internet, and Web searches; FHWA and DOT published reports; journal publications; conference proceedings; other published media including newspaper and magazine articles; and resources of professional associations. Results of the literature review will be reflected throughout the synthesis report, primarily in chapter two. Particular attention was paid to references suggested in the Project Scope and other related resources. Some of these resources were guidance manuals and toolkits drafted by a number of federal agencies to address local roads safety.

Survey of State Transportation Agencies

The survey consisted of 73 questions and was sent to each state DOT safety engineer with a recommendation to distribute portions of the survey, if needed, to other members of their organizations in the Local Programs Office and the Chief Engineer, or other state agencies such as Office of Motor Carrier Services, Director of Department of Public Safety, and Department of Motor Vehicles, for completion and to encourage a comprehensive and collective response to the survey. The survey was sent to contacts in each of the 50 state DOTs; Washington, D.C., and Puerto Rico. Forty-seven agencies (94%) of all state DOTs responded to this synthesis survey. The survey questions and results are included in Appendix A of this report.

Interviews with Transportation Practitioners in Ten States

Based on the results of the survey and literature review, ten states were selected for additional information on practices used related to partnering with local agencies in enhancing the safety of local roads. There were a number of criteria considered in the selection. The list of examples was reviewed and approved by the topic panel before detailed interviews were conducted. The first criterion was different local road ownership levels. During the survey, each state was asked to select from seven predefined ownership level categories. The organization of a local road safety program (centralized vs. decentralized) and the levels of communication among different divisions at the state DOT were other criteria considered. The final criterion was the extent of crash reduction on local roads. As a result, DOT offices, local agencies, and LTAPs in the states of Connecticut, Florida, Iowa, Louisiana, Michigan, Minnesota, Ohio, Oregon, Utah, and Washington were selected for interviews. More than 50 representatives from several agencies or organizations involved at various levels with the local roads safety enhancement contributed to this synthesis. Multiple representatives from the organizations listed in Appendix B were interviewed in person, by telephone, or through e-mail to gather input on issues and practices in their state related to addressing the reduction of crashes on local roads. A listing and sampling of documents obtained as examples of current practice are included in web-only Appendix D. Figure 1 is a map of the specific states reviewed and the types and locations of interviewees.

ORGANIZATION OF REPORT

This synthesis report is organized into five chapters. The balance of chapter one presents the report's background, objectives, and organization, and also defines key terms. The report structure is summarized with brief explanations of each chapter's content.

Chapter two describes and highlights the literature review of state safety programs and practices addressing local roads in the United States as documented in published literature and online state and local resources.

Chapter three presents the results of the detailed questions posed in the survey as reported by the DOTs in their survey

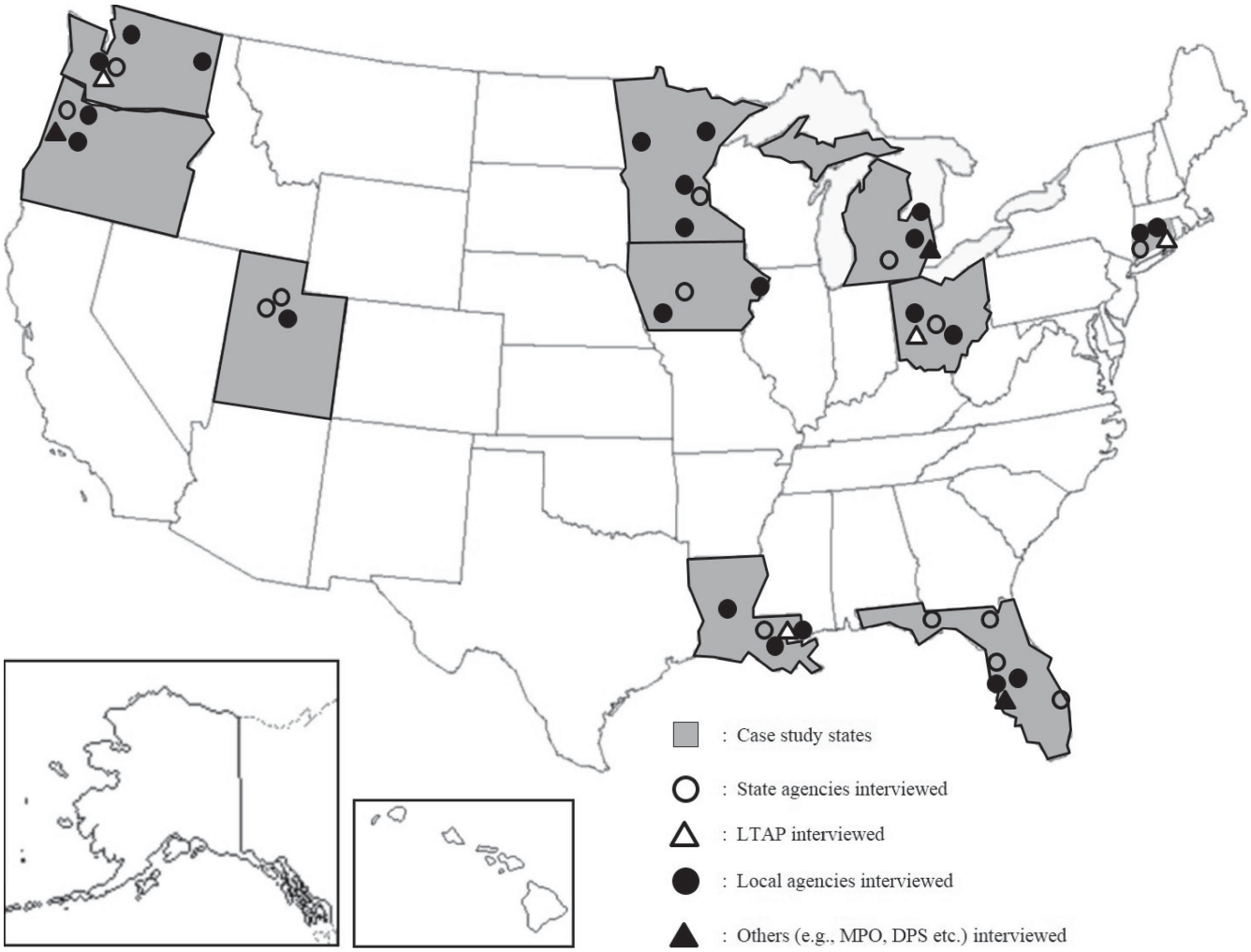

FIGURE 1 Types of survey respondents and the location and type of interviewees.

responses. The survey results provide the state of the practice on the extent to which state programs are addressing safety on local roads. This chapter also provides an overview of the various state and local programs and partnerships that demonstrate successful state coordination of safety programs with their local jurisdictions.

Chapter four reviews the specific noteworthy practices of the ten states selected for further study. This information was collected through published literature, survey responses, and a series of detailed interviews with those individuals listed in Appendix B. The chapter is organized into five topic areas of practices: (1) project development and funding; (2) project delivery and operations; (3) data support; (4) education, outreach, and technical assistance; and (5) Toward Zero Deaths (TZD).

Chapter five concludes the synthesis with a summary of findings, knowledge gaps, and suggestions for further research.

Also included are a glossary, references, bibliography, and five appendices. Appendix A is a copy of the survey questions and results and Appendix B lists agency or organization representatives that contributed to the corresponding synthesis development. Appendix C offers more details on the ten states selected for their noteworthy examples of state and local agency partnerships, including the administration, implementation and oversight of innovative and/or successful safety programs, practices and projects, performance measures, published results, challenges faced at the state and local levels, and the lessons learned on establishing successful partnerships. Web-only Appendix D presents several sample documents that were shared by agencies as a result of the interviews, and Appendix E includes links to resources identified through the literature review or by the agencies interviewed.

DEFINITIONS

Some key terms are defined here that pertain to the synthesis scope based on FHWA and published synthesis reports. Additional terms are defined within the context of their relevant sections. A glossary is also included in the report that further defines acronyms and organizations discussed in the report.

Fatality Analysis Reporting System (*FARS*) was created in the United States by the NHTSA to provide an overall measure of highway safety, help suggest solutions, and provide an objective basis to evaluate the effectiveness of motor vehicle safety standards and highway safety programs. FARS contains data on a census of fatal traffic crashes within the 50 states, the District of Columbia, and Puerto Rico.

Federal-aid projects: Projects funded with federal funds both on and off the federal-aid system, on and off the National Highway System (NHS), and off right-of-way; all phases of project delivery (planning through project close-out and reimbursement).

FHWA's Systemic Safety Project Selection Tool: The systemic approach to safety involves widely implemented improvements based on high-risk roadway features correlated with specific severe crash types. The approach provides a more comprehensive method for safety planning and implementation that supplements and compliments traditional site analysis. It assists agencies in broadening their traffic safety efforts and considers risk as well as crash history when identifying where to make low-cost safety improvement locations.

Highway Safety Improvement Program (*HSIP*) is a core federal-aid program and its goal is to achieve a significant reduction in traffic fatalities and serious injuries on all public roads, including non-state-owned public roads and roads on tribal lands. The HSIP requires a data-driven, strategic approach to improving highway safety on all public roads that focuses on performance.

Local road: For purposes of this synthesis, local is used to describe roads by the type of agency—or jurisdiction—that owns and operates the facility. Therefore, local roads refer to roads and highways that are non-state owned, such as a county, city, or township agency.

Local public agency (*LPA*): Any organization or instrumentality that is directly or indirectly affiliated with a government body under federal, state, or local jurisdiction. Such entities will be administrative and/or have functional responsibilities including the authority to finance, build, operate, or maintain public infrastructure facilities. Although such entities are most often associated with county, municipal, town, and township jurisdictions, and their related public works authorities, the term LPA covers a broader context to include quasi-governmental entities such as port authorities, water districts, public utilities, and other agency representatives of governmental entities associated with all levels of government including tribal sovereignties.

Local Road Safety Plan (*LRSP*) is a locally focused plan that builds on a state's SHSP, as well as provides a framework for local practitioners to identify factors that contribute to crashes. The LRSP identifies data-driven strategies to improve the safety of all local road users incorporating all 4Es of safety

Local Technical Assistance Program/Tribal Technical Assistance Program (*LTAP/TTAP*): LTAP and TTAP are composed of a network of 58 centers—one in every state and Puerto Rico, and regional centers serving tribal governments, with LTAP composed of a network of 51 centers—one in every state and Puerto Rico and TTAP consisting of seven regional centers serving tribal governments.

Metropolitan planning organization (*MPO*) is a federally mandated and federally funded transportation policy-making organization that is made up of representatives from local government and governmental transportation authorities. The U.S. Congress passed the Federal-Aid Highway Act of 1962, which required the formation of an MPO for any urbanized area with a population of greater than 50,000. Federal funding for transportation projects and programs is channeled through this planning process. Congress created MPOs to ensure that existing and future expenditures of governmental funds for transportation projects, and programs are based on a continuing, cooperative, and comprehensive planning process.

Moving Ahead for Progress in the 21st Century (*MAP-21*): Public Law (P.L.) 112-141, the Moving Ahead for Progress in the 21st Century Act (MAP-21) was signed into law on July 6, 2012. MAP-21 funded surface transportation programs at more than $105 billion for fiscal years 2013 and 2014.

Strategic Highway Safety Plan (*SHSP*): The SHSP is a data-driven plan that establishes statewide goals, objectives, and key emphasis areas that integrate the 4 Es of safety—engineering, education, enforcement, and emergency services.

Regional planning organization (*RPO*): An organization that performs planning for multi-jurisdictional areas. MPOs, regional councils, economic development associations, and rural transportation associations are examples of RPOs. These organizations are also sometimes referred to as a regional transportation planning authority, Regional Planning Affiliation, or other similar designations.

Road safety audit (*RSA*) is the formal safety performance examination of an existing or future road or intersection by an independent, multidisciplinary team. It qualitatively estimates and reports on potential road safety issues and identifies opportunities for improvements in safety for all road users.

CHAPTER TWO

STATE COORDINATED PROGRAMS ADDRESSING LOCAL ROAD SAFETY IN THE UNITED STATES

This chapter provides an overview and key findings of the state safety efforts throughout the United States. This information will assist in establishing a baseline of the current extent of state safety programs that address local road safety and in defining context to the noteworthy state-coordinated safety practices. An overview of the resources associated with local road safety is presented, followed by a report on each state's safety programs and practices.

OVERVIEW

Many states are facing challenges to address safety issues on locally owned roads, primarily as a result of a lack of resources and/or communication between local agencies and state DOTs. Especially with MAP-21's emphasis on public roads' safety, many resources have been published that present tools and strategies to overcome these challenges.

In 2013, FHWA produced *Assessment of Local Road Safety, Funding, Training, and Technical Assistance*, which summarizes the findings of a study on how the state DOTs allocate funds and resources for safety projects on a local level, with specific successful examples of state–local partnerships (Gaines et al. 2013). A checklist with a list of questions that would be helpful in identifying opportunities to enhance or initiate a local road safety program targeted to state DOTs and LTAP centers was also provided (Gaines et al. 2013). The domestic scan report *Noteworthy Practices: Addressing Safety on Locally-Owned and Maintained Roads* provided details of successful practices performed by scanned states in six areas: data collection and analysis; local project identification; local project administration; funding; training and technical assistance; and partnership and outreach (Anderson et al. 2010).

A FHWA safety toolkit *Improving Safety on Rural, Local, and Tribal Roads* provides the following seven-step analysis process in assessing the safety of rural local and tribal roads (Wemple and Colling 2014):

1. Compiling the available data.
2. Network screening, where agencies develop lists of candidate sites for safety improvements.
3. Selecting sites for investigation.
4. Diagnosing site crash conditions and identifying countermeasures. After the sites have been narrowed down, all data can be studied to identify the factors contributing to the crashes.
5. Prioritizing countermeasures for implementation, where a treatment is selected to address crash concerns at a site.
6. Implementing the countermeasures.
7. Evaluating the effectiveness of the countermeasures.

In summary, the safety toolkit provides a step-by-step process to assist local agency and Tribal practitioners in completing traffic safety analyses, identifying safety issues, providing countermeasures to address them, and a designing an implementation process. The goal of this toolkit is to assist local agencies in completing the entire safety project from identification of road safety issues to project implementation process.

FHWA's *Systemic Safety Project Selection Tool* presents a process for the incorporation of systemic safety planning into pre-existing traditional safety processes (Preston et al. 2013). By providing a step-by-step process for conducting systemic safety analysis, their report makes it easier for local agencies to understand what needs to be done to implement such programs. Included are suggestions for deciding when and where to use spot safety enhancements and where a full systemic safety improvement may be more efficient. This tool enables county and local government agencies to plan, implement, and evaluate systemic safety improvement programs. The report works in direct correlation with the MAP-21, which calls for data-driven decisions that reduce crash occurrences and fatalities. In addition, there is a call for more systemic safety programs to be incorporated into the traditional ideas and programs for roadway safety.

Developing Safety Plans: A Manual for Local Rural Road Owners demonstrates five critical elements in developing a Local Road Safety Plan (LRSP): having an advocate champion, developing a clear vision and mission, assembling collaborative partners to implement the plan, allocating appropriate resources, and establishing open communication with stakeholders (Ceifetz et al. 2012). The manual also highlights the importance of LRSP as it forms the foundation of the safety consensus and focuses among various stakeholders, which ultimately leads to a proactive approach in addressing safety issues.

The *Safety Circuit Rider Programs Best Practices Guide* provided state DOTs and LTAP centers with a guide for

implementing a Safety Circuit Rider (SCR) program (Gross et al. 2009) The report included characteristics of existing SCR programs, information on the services provided by SCR programs, and lessons learned by the existing programs. The guide shows the effectiveness of the existing SCR programs by highlighting the program's practices of using existing crash data to identify high-priority sites and finding low-cost safety improvements.

In addition to the aforementioned literature, FHWA sponsors a Peer Exchange series about local and rural road safety, which includes topics such as systemic safety implementation and other safety practices. In 2013, a Peer Exchange focusing on LRSP was held. An LRSP, according to FHWA (2013), is a locally focused plan that builds upon a state's SHSP as well as provides a framework for local practitioners to identify factors that contribute to crashes. Providing the basis for the systemic implementation of safety countermeasures, the LRSP identifies data-driven strategies to improve the safety of all local road users incorporating all 4Es of safety.

The *FHWA Road Safety Audit Guidelines* provide a foundation for local agencies to use when developing their RSA procedures and presents basic principles to encourage development of RSAs (Ward 2006). The steps for the RSA process begin with identifying a project or road in service and selecting a RSA team. Next, a pre-audit meeting would be conducted to review the project information and field observations performed under various conditions. An audit analysis is followed and the findings are presented to the design team, which prepares a response and incorporates the findings into the project. A RSA provides the opportunity to proactively address safety, which can potentially lead to fewer crashes.

The *Low Cost Local Road Safety Solutions* is a publication issued by a partnership between the American Traffic Safety Services Association (ATSSA) and the National Association of County Engineers (NACE) to assist local agencies in identifying proven low-cost safety solutions for local roads, both rural and urban (ATSSA 2008). The solutions outlined in the publication cover everything from signage and pavement marking to median barriers and rumble strips. A more recent publication of this partnership entitled *Cost Effective Local Road Safety Planning and Implementation* details topics such as conducting a crash study, crash data and its uses, county-wide systemic safety plans, using the *Highway Safety Manual* (*HSM*) to improve local road safety, and project and corridor road safety audits (ATSSA 2011). It provides examples of ten specific applications of safety countermeasures and details state DOT and local partnerships in the states of Illinois, Minnesota, Utah, and Washington.

NCHRP Topic 20-24(87): *State DOT Administration of Local Road Safety Aid* (Preston et al. 2014) examined the organizations of state DOTs that administer programs to enhance safety on local roads and assessed the performance of alternative organizational strategies. This study provided the opportunity for understanding how state DOTs engage the local agencies and organizations in the safety process and how they determine factors that influence the DOTs in local road safety. Study results show that to lay the groundwork for successful communication between DOTs and local agencies a number of characteristics such as designated staff working as liaisons to local agencies, partnerships with MPOs, LTAPs, adequate safety funds, and a systemic safety program need to be in place.

NCHRP Report 788: Guide for Effective Tribal Crash Reporting (Noyce et al. 2014) noted that many DOTs, MPOs, and local agencies are relying on data-driven crash reporting to determine the focus areas for road improvements. This report offers a map for tribal programs for implementing crash data collection systems and improving the safety of their roadways. Insufficient crash data are a major issue in many tribal communities. Underreporting, and often times no reporting at all, is an obvious barrier for tribal communities developing and implementing safety programs. To implement the most effective safety programs, it is important that the tribes have an accurate crash database that can identify the critical areas of traffic safety in their respective tribal safety programs.

NCHRP Synthesis 460: Sharing Operations Data Among Agencies (Pack and Ivanov 2014) discovered there is little documentation that quantifies the direct value of sharing interagency transportation operations data. It showed that the majority of DOTs are sharing some form of operations data with local agencies. However, most of the data being shared are basic, such as vehicle speed and crash type. State DOTs and local agencies may improve information flow and coordination between all agencies involved by collaborating and sharing data, and thereby can enhance the understanding of priorities and restrictions by all agencies. Based on the interviews with the DOTs and local agencies, there are still concerns about liability with respect to sharing information and open data initiatives.

NCHRP Synthesis 458: Roadway Safety Data Interoperability Between Local and State Agencies (Lefler 2014) found that, in terms of interoperability between state and local agencies, both have more crash data than roadway or traffic data. In addition, it was discovered that states are striving to obtain, maintain, and use safety data for local roadways to meet the federal mandate to incorporate local roadway data into a statewide base map and support analysis of that data. Local agencies are collecting some of the roadway data elements that states are most in need of and most interested in collecting, including information regarding intersections and curves. Collaboration with local agencies presents a greater opportunity to populate the states' inventories for these elements. It is also essential that support of data improvement efforts come from both the state DOT and the local agency leadership.

NCHRP Synthesis 321: Roadway Safety Tools for Local Agencies (Wilson 2003) reported that there are no uniform

safety solutions, and safety practices must be tailored to the local agencies. Reducing the local crash rate requires an increased effort by both experienced and inexperienced professionals who manage local transportation agencies. The goal is to help local agencies implement safety improvements through better organization and apply the most appropriate countermeasure to reduce crashes. The synthesis concluded that a documented local roadway safety program is the most effective safety tool.

STATE OVERVIEW

Based on the previous information, there were four topic areas of successful practices in which state coordinated programs have been identified as improving local road safety: (1) program development and funding, (2) project delivery and operations, (3) data support, and (4) education, outreach, and technical assistance. Table 1 presents highlights of specific programs and practices by state that address the challenges that were found on FHWA and state DOT websites as well as published resources. In reviewing each state's SHSP, it was also found that many states (39) have adopted and/or support the Toward Zero Deaths (TZD) initiative within its own SHSP. Based on the survey results and the interviews with ten selected states, the TZD initiative was later added as a fifth topic area. Safety programs and practices of ten selected states (Connecticut, Florida, Iowa, Louisiana, Michigan, Minnesota, Ohio, Oregon, Utah, and Washington) will be summarized in chapter four and detailed in Appendix C.

TABLE 1
SUMMARY OF STATE PROGRAMS FOCUSED ON LOCAL ROAD SAFETY

State	Practices	Description
Alabama	Education, outreach, and technical assistance	ALSAFE, an Alabama-specific planning level safety tool, is an initiative conducted by the University of Alabama in Huntsville. Its purpose is the development of a specific planning safety tool for local agencies. It is anticipated that MPOs and states can apply the corresponding tool to address safety in the planning process. Estimated completion date is March 31, 2015 (Alabama Department of Transportation 2015).
	Data support	A pilot project to evaluate the potential use of the United States Road Assessment Program (usRAP) in Madison and Mobile counties is underway. The output from usRAP will allow the Alabama Department of Transportation (ALDOT) to benchmark the safety of roads using crash history data and roadway inventory data. These efforts are designed to complement and supplement other highway safety management practices and assist ALDOT and local jurisdictions to provide information on performance measures. The software will enable ALDOT and local agencies to generate a program of road infrastructure improvements to enhance safety for a road network without the need for detailed site-specific crash data (Alabama Department of Transportation 2015).
	Data support	ALDOT utilizes the University of Alabama–Critical Analysis Reporting Environment (CARE) data analysis software program, which identifies problem locations, searches for countermeasures, and is able to analyze data and generate crash diagrams (Anderson et al. 2010).
Arizona	Education, outreach, and technical assistance	The Arizona LTAP worked with FHWA to develop a local agency grant program to provide Safety Edge equipment and training to local agencies. Safety Edge changes the shape of the pavement edge from a vertical drop-off to 30 degrees, enhancing the ability of a driver to return safely to the paved surface in run off the road situations. Most local agencies in Arizona do not have the experience or equipment to handle Safety Edge on roadway projects. LTAP promoted Safety Edge implementation at both industry and MPO meetings throughout Arizona ("FHWA Arizona Division Office . . ." 2013).
California	Education, outreach, and technical assistance	California DOT (Caltrans) developed a *Local Road Safety Manual* to improve the data-driven approach to statewide safety project selections and identify locations with roadway safety issues. This manual improved the ability of local agencies to perform benefit/cost (B/C) ratio calculations for project applications. The *Local Roadway Safety: A Manual for California's Local Road Owners* (Caltrans 2013) provides an outline and the tools necessary to recognize local road safety issues, as well as solutions to these problems.
Georgia	Program development and funding	The Georgia Department of Transportation (GDOT) developed the Off-System Safety Program (OSS) in 2005 to enhance off-system safety using a data-driven approach. OSS focuses on low-cost safety improvements that can be designed within the existing rights-of-way that are likely to reduce both the severity and frequency of crashes. Administered by the Local Grants Office, GDOT provides each of the seven districts with $1 million per year dedicated to off-system safety projects. Each of the districts hired an off-system coordinator to manage the program. These coordinators provide technical assistance and expertise to local governments in identifying projects and providing cost estimates (GDOT 2005).

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Idaho	Program development and funding	Idaho's LTAP, the Local Highway Technical Assistance Council (LHTAC), is assisting all safety-related programs for local agencies. The Local Highway Safety Improvement Program (LHSIP) is administered by LHTAC for funding projects based on the number of fatal and serious injury crashes per jurisdiction using five years of crash data, where the highest risk areas are identified ("Programs," Local Highway Technical Assistance Council 2015)
	Project delivery and operations	Another program administered by LHTAC is the Local Highway Rural Investment Program (LRHIP), which aids small local agencies with roadway construction and signage projects (Local Highway Technical Assistance Council 2015)
Illinois	Education, outreach, and technical assistance	The Illinois Department of Transportation (IDOT) Bureau of Safety Engineering created a strong partnership with law enforcement to improve local road safety. Law enforcement officers conducted safety training within IDOT and provided detailed crash report data. This partnership resulted in an increased understanding of how their safety roles complement each other (FHWA 2010).
	Data support	IDOT also assists local public agencies (LPAs) on the use of the safety data. IDOT's Bureaus of Safety Engineering and Local Roads and Streets offers safety analysis tools, safety data, and *Highway Safety Manual* training. They also provided LPAs with technical assistance in accessing safety data to identify roadway projects (*State Safety Data and Analysis Systems: Noteworthy Practice* 2004).
Indiana	Program development and funding	The Hazard Elimination Project for Existing Roads and Streets (HELPERS) is a program created through Indiana's Department of Transportation (INDOT) and the local LTAP center. Provided funding by these two entities, the goal of this program is reducing the number of and severity of crashes in Indiana by identifying local road safety issues and providing low-cost solutions to addressing these problems. Counties and towns, and cities with populations of less than 50,000 are eligible for the HELPERS program. The program provides technical assistance in areas such as crash analysis, RSAs, traffic volume counts, signal warrant analysis, ball bank studies, and low-cost improvement ideas. HELPERS is able to provide assistance to agencies not eligible or those that do not wish to apply for federal funds by providing a list of countermeasures that can be implemented ("HELPERS," Indiana LTAP 2013).
Kansas	Program development and funding Education, outreach, and technical assistance	According to the Kansas Department of Transportation (KDOT), 92.5% of Kansas roadways are owned by cities, counties, and townships. Hence, the DOT developed a strategic highway safety plan specifically for local roads. A Local Roads Support Team (LRST) was formed to identify and coordinate strategies with the goal of reducing fatal crashes on local roads. The overall trend of crashes and general roadway safety on Kansas roadways is improving, but when local road safety is looked at specifically, the crash data have remained unchanged in recent years. Proposed strategies to improve local road safety in Kansas include making federal and state funds more accessible to local agencies, maximizing benefit of said funding by utilizing crash data and distributing the funds on a need basis, improving LPA access to crash data, collaborating between local and regional safety agencies, LPA training and assistance with developing safety programs and cost-effective strategies, and emphasizing law enforcement and its importance in terms of local road safety (Kansas DOT 2014).
	Program development and funding	In 2010, KDOT developed a voluntary exchange program, the Federal Fund Exchange Program, to assist local agencies in streamlining the project implementation process on local roadways. Through this program, local agencies were able to trade all or a portion of their federal Surface Transportation Program funds with state funds or with another LPA in exchange for their local funds. This program allowed LPAs far greater flexibility in selecting local projects. Figure 2 details the corresponding fund exchange program (Kansas DOT 2014).

TABLE 1
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		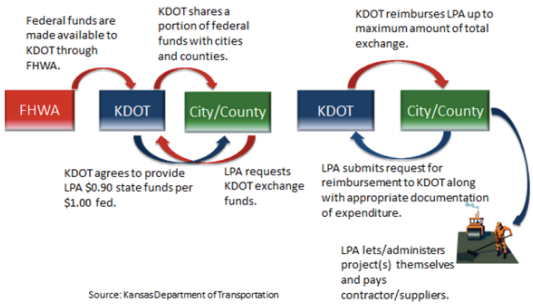 FIGURE 2 Kansas DOT's Federal Fund Exchange Program.
Kentucky	Education, outreach, and technical assistance	The Kentucky Transportation Cabinet (KYTC) uses the Safety Circuit Rider (SCR) Program to provide technical assistance and present safety information to local agencies. The Kentucky LTAP offers technical assistance and training on low-cost safety improvements to local agencies through the Safety Circuit Rider Program (Kentucky Transportation Center 2010).
	Program development and funding	The High Risk Rural Road (HRRR) funds are used in conjunction with the program to fund improvements on horizontal curve realignments and training (FHWA 2015).
	Data support	KYTC used the Systemic Safety Project Selection Tool on the local road system to analyze county roadway corridors (FHWA 2013).
Maine	Education, outreach, and technical assistance	The Maine Transportation Safety Coalition (MTSC) was founded by transportation safety advocates and professionals for the sole purpose of improving the safety of Maine's roads. This coalition offers opportunities for local agencies to learn and share information at monthly meetings and through quarterly newsletters. The website promotes special events and educational materials ("About the MTSC" Maine Transportation Safety Coalition 2014).
Maryland	Program development and funding	A leadership summit was conducted by the Maryland Management Team to address the SHSP requirements that are applied to all local roads. Data were provided on the most serious roadway safety problems in Maryland, and participants viewed the data and identified the emphasis areas. The Regional Traffic Safety Program (RTSP) is responsible for marketing programs and campaigns to local agencies, as well as providing funding. This program is comprised of ten program managers in eight regions and ensures coordination and cooperation with traditional highway safety partners. The RTSP program managers build multi-jurisdictional task forces and manage grants for the Maryland Highway Safety Office (MHSO) ("Regional Traffic Safety Programs" Maryland DOT 2015).
Massa-chusetts	Program development and funding	The Massachusetts Department of Transportation (MassDOT) distributes two-thirds of its HSIP funding to local communities through MPOs. An RSA must be performed on the site for a project to be eligible for HSIP funding, and countermeasures identified in the RSA must be included in the project. RSAs have helped locals to identify low-cost improvements and helped improve relationships between local safety agencies and MassDOT (FHWA 2015).
Nebraska	Program development and funding Education, outreach, and technical assistance	A systemic county sign installation program was developed between the Nebraska Department of Roads (NDOR) Local Projects Division and the Nebraska LTAP Center. The NDOR identifies high risk sites for safety improvements, while the LTAP center provides the crash data and assists in the project application process (Gaines et al. 2013).

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Nevada	Education, outreach, and technical assistance	The Nevada Departments of Transportation and Public Safety conducted road show meetings to educate stakeholders about the SHSP process. Participants were briefed on the zero fatality goal and the *Nevada Big Book of Safety*, which is a searchable list for local agencies to use for research and contact information on the traffic safety initiatives ("SHSP Stakeholder Involvement" 2011).
New Jersey	Data support Program development and funding	The New Jersey Department of Transportation (NJDOT) partnered with the Transportation Safety Resource Center (TSRC) at Rutgers University to develop Plan4Safety, which is a web-based software tool used to analyze crash data. All local agencies have access to this software tool, and crash data can be filtered to allow for a greater in-depth analysis. Plan4Safety integrates the statewide crash data and roadway characteristic data, and provides GIS location data. Also included is a module to give local agencies access to safety grants through the Governor's Office of Highway Safety. The Local Safety Program is an MPO administered program to support construction of safety improvements on local roads. The projects supported by this program include new traffic signals and signage, as well as pavement markings and curb ramps. For this program, projects must be quick-fixed and supported with detailed crash data analyses (Anderson et al. 2010).
North Dakota	Program development and funding	The North Dakota Department of Transportation (NDDOT) has a Local Road Safety Program (LRSP) that is divided into four phases, including a tribal phase. Each phase focuses on a certain region of the state. An LRSP manual is created for each county, with all the manuals containing consistent goals, which are to reduce the number of severe crashes by identifying high-risk areas, promoting effective low-cost treatment options, and assisting local agencies in competing for safety funding. Each portion of the state is analyzed, and treatment options are provided based on the work that needs to be done, as well as the funds available for each area. A manual is developed for each tribal area, with a focus on describing the emphasis areas, identification of a list of high-priority/low-cost safety strategies, documentation of at-risk locations that are candidates for safety investment, and development of $1 million of suggested safety projects across the reservations. The manuals for each of the regions and counties contain the same information as the tribal manuals, with the exception of the funding development for the suggested safety projects. In North Dakota, the state DOT funds the development of LRSPs for each county and dedicates 50% of their HSIP funding to local agencies (*North Dakota Local Road Safety Program* 2013).
South Carolina	Project delivery and operations	The South Carolina Department of Transportation (SCDOT) is an example of a state that effectively used data-driven methods to implement new safety measures. By doing this, the reduction in overall crashes at 458 analyzed intersections decreased by 22%. SCDOT chose to hire a private company to install the safety devices. The installation was another step in the process that could take some time and going through a private company may have been an added expense, but ultimately allowed the safety precautions to be implemented sooner (Bergal 2014).
South Dakota	Program development and funding	South Dakota Department of Transportation has a county wide highway signing program to identify, design, and upgrade existing signs on a system wide basis. The signs eligible for replacement include all regulatory, warning, and guide signs. Under this program, the funding is covered entirely by federal safety funds at no cost to local governments. Upon completion of the projects, the local agency is responsible for maintenance ("Countywide Highway Signing Frequently Asked Questions" SDDOT 2010).
Tennessee	Education, outreach, and technical assistance	The Tennessee Department of Transportation (TDOT) Project Safety Office sponsors road safety audits to identify and study safety improvements at locations identified through the analysis of crash data. Safety programs used to plan and fund improvements to local roads include the HRRR program, the Local Roads Safety Initiative, and the Roadway Departure Action Plan. The Project Safety Office simplified the process so that construction contracts can be approved within a year after the problem has been identified. The Local Roads Safety Initiative assists with improving safety on local roads by creating a partnership between the SHSP and safety projects coordinator (FHWA 2015).

TABLE 1
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Wisconsin	Data support Program development and funding	The Wisconsin Information System for Local Roads (WISLR) assists local governments and the Wisconsin Department of Transportation (WisDOT) to manage local road data to improve decision making, and to meet state statute requirements. WISLR combines local road data with interactive mapping functionality that provides users with the ability to display data in a tabular format, on a map, or both. WISLR allows local governments to report local road information, such as width, surface type, surface year, shoulder, curb, road category, functional classification, and pavement condition ratings to WisDOT. Local governments use WISLR's querying, analytical, and spreadsheet tools to organize and analyze data. As a safety and asset management system, WISLR was designed to meet the needs of local agencies in integrating data, which produced consistent data throughout the state. The Local Roads Improvement Program assists local governments in improving local roads and acts as a reimbursement program, paying up to 50% of the total eligible costs with local governments providing the rest ("Wisconsin Information System . . ." FHWA-SA-14-037 2014).
Wyoming	Program development and funding	The Wyoming Rural Road Safety Program (WRRSP), funded by the Mountain–Plains Consortium (MPC) and the Wyoming Department of Transportation (WDOT), is the entity that oversees the identification of high-risk rural roadways and development of strategies to obtain funding on the riskiest segments (Ksaibati et al. 2011). As a part of the WRRSP, a statewide sign program is being implemented for local governments, where half of the counties have submitted sign requests at high-risk locations. As a part of this program, WDOT will purchase and distribute more than 1,200 signs for installation by the counties. The Wyoming LTAP center will then conduct a study to examine the effectiveness of these new signs.
	Program development and funding Education, outreach, and technical assistance	The Cheyenne MPO is heavily involved in planning traffic safety in Wyoming, completing a Transportation Safety Management Plan (TSMP), which is similar to a SHSP at the MPO level, and developing funding grants. Meetings were arranged to review the strategies set forth in the TSMP, and action plans are updated frequently. Through the MPO, safety stakeholder engagement was built and sustained, engaged in the process of identifying, and coming up with solutions for safety issues on local roads. This plan resulted in implementing major safety projects from new local agencies, and engaged local agencies in law enforcement summits and legislative briefings. The Cheyenne MPO set up the first safety summit in the region, focusing on law enforcement personnel. The legislative briefing focused on addressing a safety belt law and a medical advisory board ("SHSP Stakeholder Involvement" FHWA-SA-11-02 2011).

CHAPTER THREE

SURVEY ON STATE PRACTICES FOR LOCAL ROAD SAFETY

INTRODUCTION

A survey was distributed to the state Safety Engineer (or equivalent position) at the 50 state DOTs, the District of Columbia, and Puerto Rico. Forty-seven of the state DOTs responded (a survey response rate of 94%) and provided input on state practices in local road safety. The DOT survey questions and a summary of the results are presented in Appendix A, along with a complete set of survey responses. This section is organized into the following four sub-sections: (1) Organization Structure and Local Road Programs; (2) Local Road Safety Information, Resources, and Funding; (3) Project Development, Implementation, and Administration; and (4) Noteworthy State Coordinated Local Agency Safety Program Partnerships and Challenges.

ORGANIZATION STRUCTURE AND LOCAL ROAD PROGRAMS

The majority of the states (27 of 47; 58%) reported that the local road programs and/or projects are implemented by the state DOTs through both central offices and district office staff. Fifteen state DOTs (32%) noted that only central office staff is involved in implement local road programs and/or projects. When asked whether the local road programs and safety programs that include local roads reside under the same state organization, 41 state DOTs (87%) stated that both programs reside under the same state organization. Table 2 presents six state DOTs that reported different state organizational structures in handling the local road programs and safety programs.

The survey asked the extent of each state DOT's responsibility for local roads and the road mile ownership by local agencies. Table 3 and Figure 3 summarize collected survey information.

Six DOTs (Iowa, Kansas, Michigan, Minnesota, North Dakota, and Washington) responded that more than 90% of total lane miles are locally owned and maintained. Road lane mile ownership was one of the criteria used to select states for further interviews in chapter four (Case Examples) and Appendix C.

Forty-one of 47 of the responding state DOTs (87%) reported that they have a dedicated local road program. Appendix A contains Table A1, which lists the website and local program information for each state DOT and Table 4 presents the state's local road program staff size distribution.

Table 5 summarizes the organization of the local road programs of the six state DOTs that indicated more than 90% of locally owned and maintained roads (Figure 3). Six state DOTs responded that they did not have a dedicated local roads program; of those six, Delaware and Rhode Island noted that their respective state DOTs will be developing a local road program in the future.

LOCAL ROAD SAFETY INFORMATION, RESOURCES, AND FUNDING

Providing technical assistance and support to local agencies when needed is a key element in a project's success. To gather information regarding the entities that provide technical assistance and support at each different project stage, survey respondents were allowed to select multiple agencies, which included the state DOT, LTAP, MPO, and other (e.g., consultant or university). As shown in Figures 4 and 5, states' involvement was observed at every project stage. Among the remaining entities, MPOs were identified most frequently in providing assistance during project stages pertaining to information resources, local project application process, and project planning stages, followed by the LTAP centers. During the environmental assessment, project design and utilities, and project procurement and contracting phases, the role of other entities such as a consultant is noted. For the post-project evaluation, post-project audit of compliance with guidelines, and regulations, states are identified as the foremost involved entity. States and LTAP centers were the prominent entities for the assistance and technical support associated with the training on federal-aid procedures and reporting requirements.

When asked whether state DOTs have a crash data collection system for state and non-state-owned roads, all 47 states responded that they had such systems. Figure 6 depicts DOT reported agencies responsible for collecting and maintaining non-state owned road crash data systems.

When asked about crash data accessibility for local agencies, the majority of DOTs (31) stated that local agencies can access and effectively use the crash data that are maintained at the state level. Figure 7 presents the distribution of the information available to local agencies.

TABLE 2
REPORTED LOCAL PROGRAM AND SAFETY PROGRAM ORGANIZATION

State	Description
Connecticut	Safety-related local road programs are run by the Safety Engineering Unit in Traffic Engineering. All other local road programs are run by the State Design Unit.
Indiana	The INDOT Office of Traffic Safety establishes requirements for LPA application for HSIP and HRRRP project eligibility. The INDOT Division of LPA Assistance and Grants has authority to determine project funding approval and administers project development phases.
Kentucky	HSIP is administered by the Division of Traffic Operations. Safety programs are administered by the Office of Highway Safety. Local roads programs are administered by the Office of Local Programs.
Massachusetts	The local roads safety program is part of the overall safety program (specific projects are data-driven regardless of jurisdiction).
New York	Local Program Bureau in the Planning and Policy Division and the Safety Program Management & Coordination Bureau in the Operating Division.
Utah	The safety programs reside in the the Operations Department, Traffic & Safety Division.

TABLE 3
REPORTED EXTENT OF STATE DOT'S RESPONSIBILITY FOR LOCAL ROAD

Response Type	Response Rate
Local jurisdictions own and maintain their own roads	38 DOTs (81%)
State oversees capital improvement projects of local roads, while the local jurisdictions maintain their own roads	5 DOTs (11%)
State owns and maintains unincorporated roads, while the local jurisdictions own and maintain their own roads	1 DOT (2%)
Other	3 DOTs (6%) • Alaska: Some locals own and maintain their roads, while others may enter into maintenance agreements with the state • Delaware: State owns and maintains most of the roads • Rhode Island: Local jurisdictions own and maintain their own roads. However, state is responsible for safety on all public roads

47 responses.

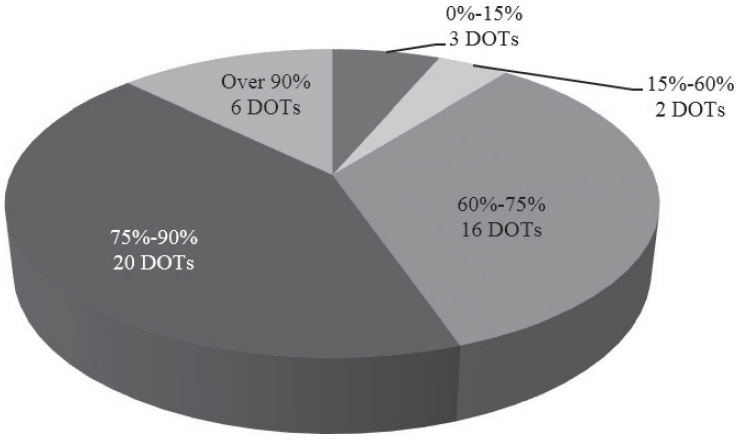

FIGURE 3 Reported road lane miles ownership by local agencies (47 responses).

TABLE 4
REPORTED STATE LOCAL ROAD PROGRAM STAFF SIZE

Response Type	Response Rate
Less than 5	12 DOTs (30%)
5–10	11 DOTs (28%)
10–15	5 DOTs (12%)
Over 15	12 DOTs (30%)

40 responses.

TABLE 5
ORGANIZATION AND STAFF SIZE OF STATE DOT'S LOCAL ROAD (AND SAFETY) PROGRAMS WITH MORE THAN 90% OF LOCALLY OWNED ROADS

State	Program	Local Road Program Staff Size	Safety Program Staff Size
Iowa	Office of Local Systems	9	1
Kansas	Bureau of Local Projects	20	1
Michigan	Local Agency Program (LAP) and Local Safety Initiative (LSI)	19	1 (LAP) and 4 (LSI)
Minnesota	State Aid for Local Transportation	67	1
North Dakota	Local Road Safety Program	10	3
Washington	Local Programs	63	2

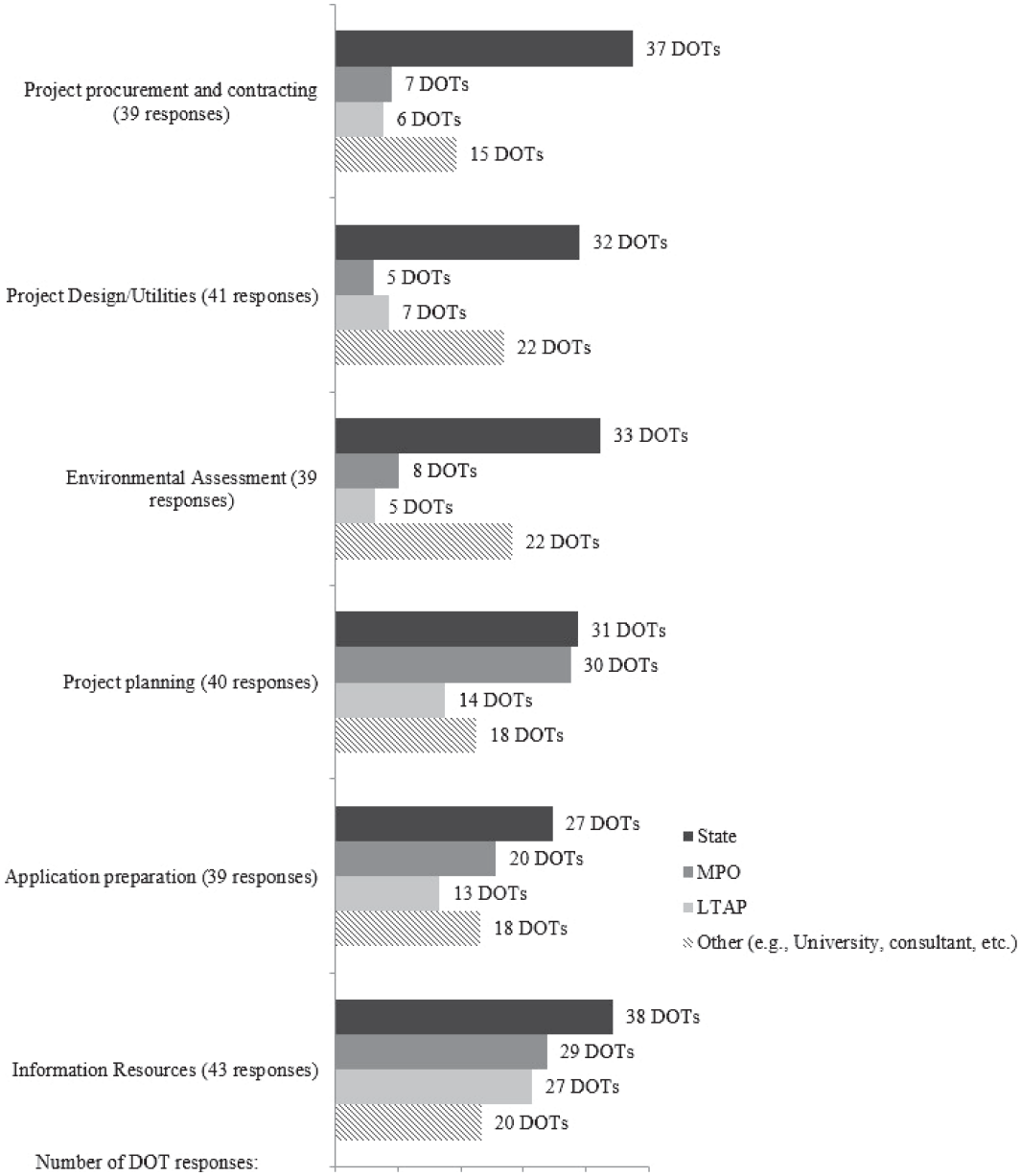

FIGURE 4 Entities that provide assistance to local agencies on project elements. Survey respondents were allowed to select multiple answers.

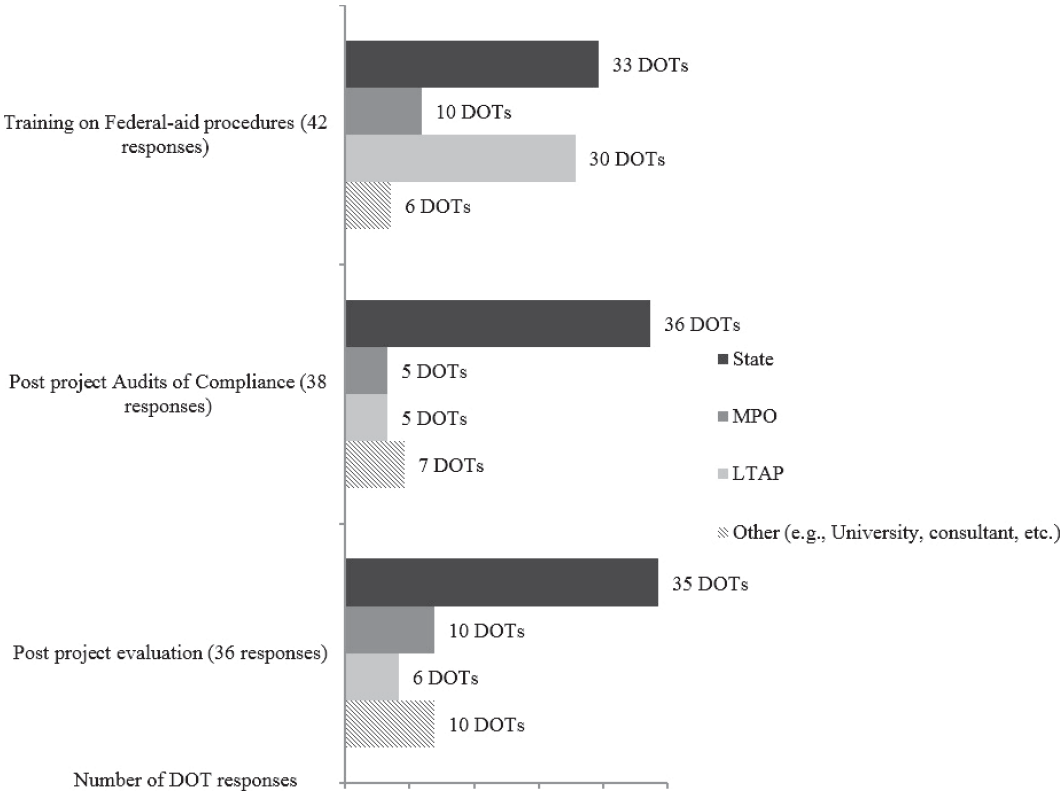

FIGURE 5 Entities that provide assistance to local agencies on post-project and federal-aid procedures. Survey respondents were allowed to select multiple answers.

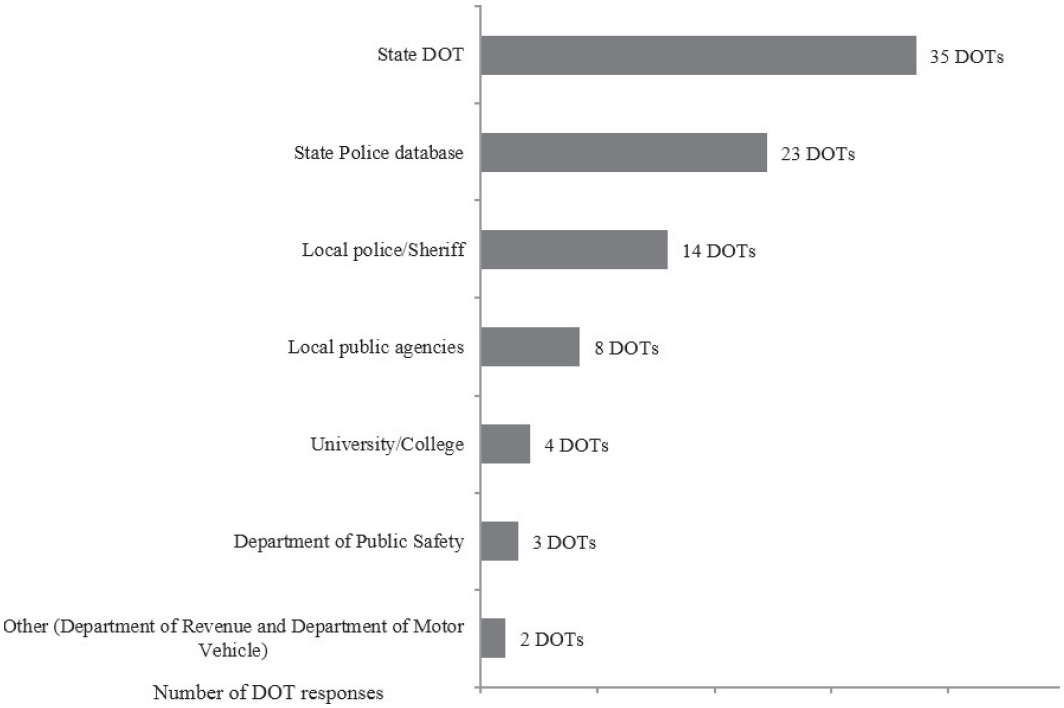

FIGURE 6 Reported agencies through which non-state-owned road crash data are collected and maintained (47 responses). Survey respondents were allowed to select multiple answers.

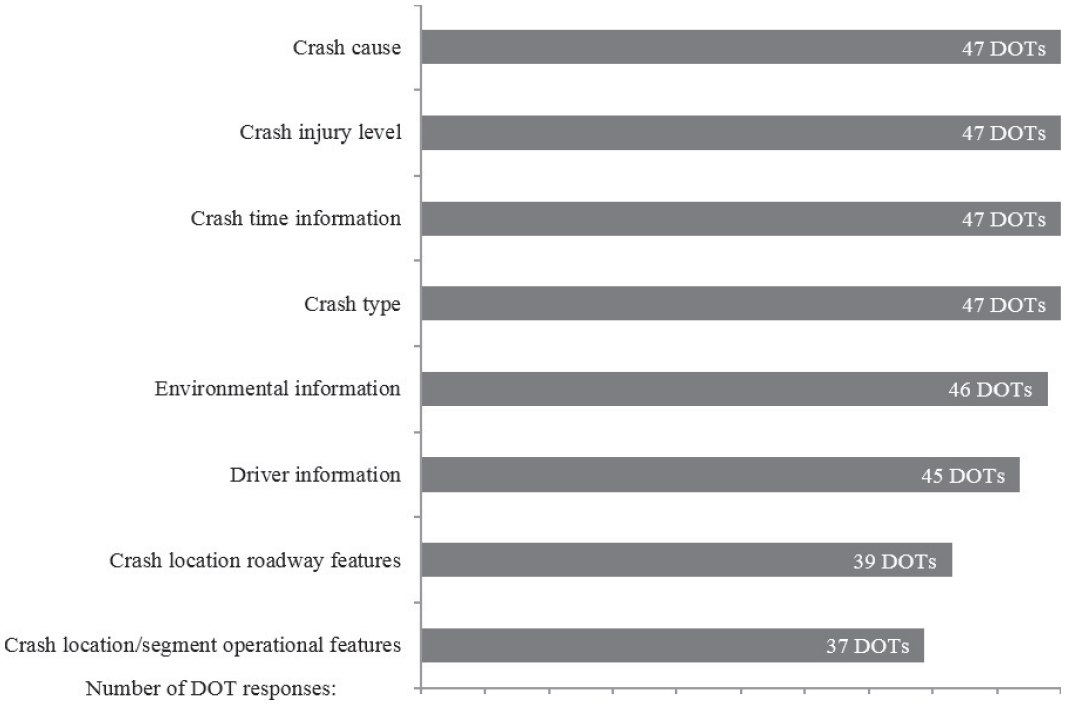

FIGURE 7 Crash information available to local agencies (47 responses). Survey respondents were allowed to select multiple answers.

The safety of tribal land roads is an important issue in many state's overall safety efforts. Nine state DOTs reported that the state DOT has safety programs on tribal lands. Table 6 summarizes details of safety tribal land programs provided by eight states.

There are 11 federally recognized Native American tribal governments in Minnesota. MnDOT also has a coordinator for the tribal governments and the tribes are involved with TZD activities. As an example, St. Louis County interacts with the two tribal governments, Fond du Lac Reservation of Chippewa and the Bois Forte Band of Chippewa. The safety coordinator for Fond du Lac is actively involved in the TZD regional coalition.

Washington State Department of Transportation (WSDOT) held a Tribal Traffic Safety Summit in May 2009 to discuss traffic fatality reductions on tribal roads. The 4Es of traffic safety were the focus of this summit and recommendations were made to increase Native American priorities in the Target Zero process (FHWA-SA-11-02). The 29 federally recognized tribes within Washington State are sovereign nations. Each tribe has its set of codified laws, including those addressing traffic safety. In the early 2000s, the traffic fatality rate was

TABLE 6
REPORTED SAFETY PROGRAMS ON TRIBAL LANDS

State	Comment
Idaho	Only the statewide behavior highway safety program such as public service announcements, billboards, etc., is related to tribal lands. There are no other formal programs that relate to infrastructure.
Minnesota	Minnesota does have a safety program that impacts tribal lands, but it's not specific to tribal lands. These roads would be identified through regular risk assessment; i.e., Minnesota DOT (MnDOT) District Safety Plans.
Montana	Part of Montana's SHSP, VisionZeroMT http://www.mdt.mt.gov/visionzero/plans/soar.shtml
Nevada	Working with tribal partners with Road Safety Assessments and low-cost safety improvements through Intergovernmental Agreements.
New York	New York DOT treats tribal lands just like state highways—incorporating all standard safety treatments on roadways maintained by the state.
North Dakota	Local Road Safety Programs for each of the four tribal nations are currently in development.
Oregon	Tribal lands are eligible for federal funding and many of the roads in tribal lands are under the jurisdiction of different counties.
Wyoming	Part of the Wyoming Rural Road Safety Program (WRRSP)

2.4 times higher than for non-Native Americas. In the 2010 Target Zero Plan, the rate had risen to 3.3 times higher and in the 2013 Target Zero Plan the rate continued to climb to the current level of 3.9 times higher. The link of the criteria for tribal governments to access FHWA discretionary safety funds is presented in Appendix E. A key issue faced by Washington State is a lack of data making it difficult to analyze information specific to reservations. Data serve as the critical link in identifying safety problems, selecting appropriate countermeasures, and evaluating performance. As a result of limited data, analysis is challenging and tribes have difficulty justifying their needs and competing for safety funding. To address some of the tribal traffic safety issues, the Washington Transportation Safety Commission (WTSC) entered into a "Centennial Accord Agreement 2014 Plan" with Washington State and the Tribes of Washington State. The purpose of this initiative is to enhance traffic safety, thereby saving lives, preventing injuries, and averting the loss of property on Washington's tribal lands. A copy of the agreement and the ten action items are presented in web-only Appendix D.

Thurston County, Washington, partners with three tribes and provides technical assistance on projects (e.g., a traffic study affecting state, local, and tribal roads; an intersection alternatives analysis; and two roundabouts) valued at $5 million. The partnership is accomplished through an intergovernmental agreement, which is presented in web-only Appendix D, and the corresponding project description link is provided in Appendix E. The link to the 2012 video report of Colville's reservation's efforts, "Traffic Safety Successes on the Colville Reservation," is also included in Appendix E.

Safety Program Funding and Priority Setting

Twenty-eight states provided detailed answers to a question regarding the funding sources for local safety programs, and the distribution of funding sources varied from state to state. In most cases, federal funding was noted as the major funding source (more than 80% of funds) except for the states of Alabama, Illinois, Iowa, Minnesota, and Ohio. Table 7 presents collected survey information regarding the funding sources for the local safety programs.

Survey results noted that state DOTs employ multiple criteria in determining the funding allocation for local safety programs. Twenty-seven DOTs listed crash data as one of the primary factors that determines funding allocation for local safety programs, whereas 19 use risk analysis. Figure 8 displays various funding allocation methods for local safety programs.

Thirty-five state DOTs reported that SHSP emphasis areas are used when selecting which local safety programs are funded. A competitive application process was indicated by 28 state DOTs as another factor in determining local safety project funding. Twenty-three state DOTs stated that technical criteria was one of the factors for funding where a large number of those states indicated benefit/cost (B/C) ratios as the main technical criteria. In addition to the B/C ratio, the Ohio DOT responded that crash analyses and a priority level in terms of statewide, regional, or local, and matching funds are considered. Illinois DOT requires the projects to be linked to SHSP and address fatalities and serious injuries. Utah DOT responded that projects must potentially reduce serious injuries and fatalities using a proven low-cost safety countermeasure. Figure 9

TABLE 7
REPORTED FUNDING SOURCES FOR THE LOCAL SAFETY PROGRAMS

Fund Source Description	States
100% Federal Funding Sources	Hawaii, Idaho, Nevada, Rhode Island, South Dakota, Utah, and Virginia
90% Federal and 10% Local Funding Sources	Indiana, Kansas, North Dakota, Texas, Washington, Wisconsin, and Wyoming
90% Federal and 10% State Funding Sources	Massachusetts, Montana, and New Hampshire
80% Federal and 20% State Funding sources	Delaware and Georgia
Other	• Alabama: 50% federal, 30% state, and 20% local funding sources • Colorado: approximately 90% from federal funding sources • Illinois: 20% federal funding sources • Iowa: approximately 8% federal and 80% from state funding sources • Louisiana: 95% federal and 5% local funding sources • Nebraska: 84% federal, 1% state, and 15% local funding sources • New Mexico: approximately 93% federal and 7% state funding sources • Minnesota: 50% federal funding sources • Ohio: 65% federal, 23% state, and 12% local funding sources

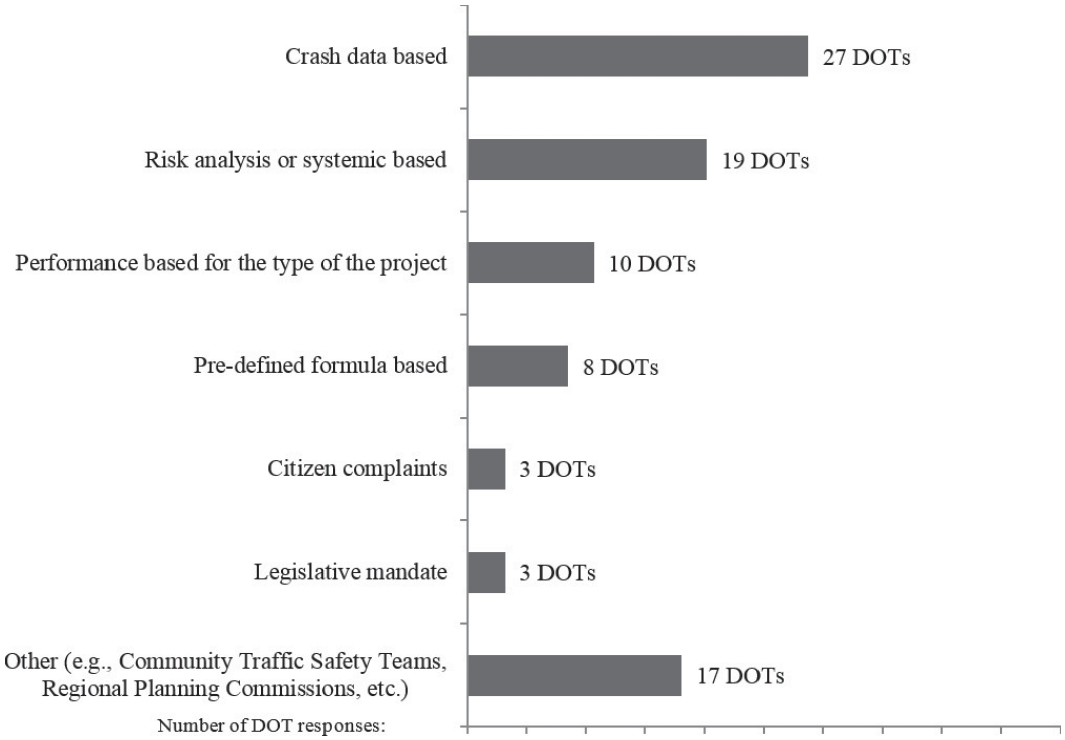

FIGURE 8 Reported state funding allocation for local safety programs (47 responses). Survey respondents were allowed to select multiple answers.

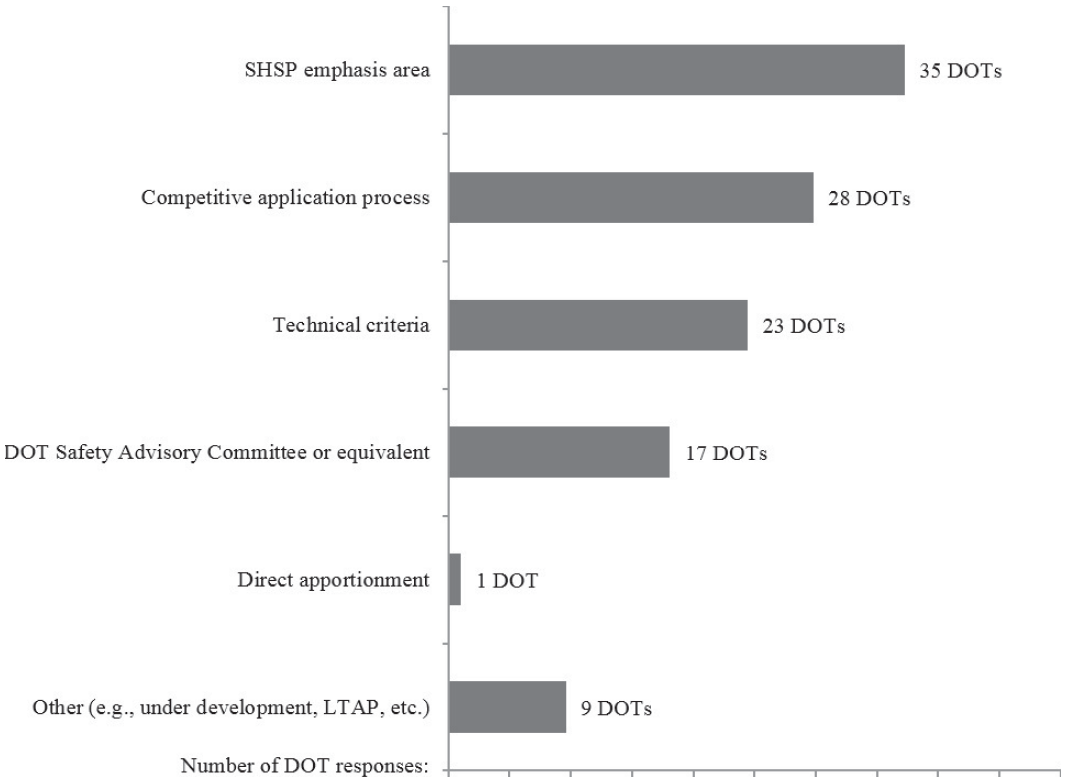

FIGURE 9 Reported funding selection process for local safety projects (47 responses). Survey respondents were allowed to select multiple answers.

describes the collected information associated with funding selection for local safety projects.

Some state DOTs identified alternative funding techniques for local road program safety projects. Eleven state DOTs responded that a set percentage of funds is taken off the top of federal funds provided to the state. Ten state DOTs indicated that the funding allocation technique chosen is dependent on the type of project, whereas five reported that a set percentage of funds is taken off the top of state transportation funds. Idaho has a specific formula that factors inputs such as fatalities and serious injuries, roadway mileage, and vehicle miles traveled. Figure 10 summarizes the alternative funding allocation techniques. Funding allocation for local road safety projects occurs at the state level for 35 state DOTs. For 14 state DOTs, it was at the MPO/RPO level that funding is allocated for local road safety projects.

Local Road Safety Plan

Thirty-four state DOTs reported that their local agencies have local road safety (or equivalent) plans. When asked about the state DOT's financial assistance, 27 states specified that their respective state DOT does assist in financing local road safety plans through either federal or state funds. Eight DOTs (Alabama, Arkansas, Colorado, Florida, Kentucky, Maine, Ohio, and Pennsylvania) reported that funding assistance will be considered for local road safety plans in the future. Figure 11 provides the financing assistance sources of local road safety (or equivalent) plans.

PROJECT DEVELOPMENT, IMPLEMENTATION, AND ADMINISTRATION

Use of Engineering, Education, Enforcement, and Emergency Response Approaches to Safety

As part of the MAP-21 legislation, the federal government requires all state DOTs to develop and maintain a SHSP. Thirty-two states indicated that their SHSP includes an element that identifies and addresses goals and initiatives to improve the safety on local roads. Many DOTs have local road programs spelled out within their respective SHSPs. The focus of the approaches of state DOTs' 4E for local roads include road safety audits, local and tribal technical assistance programs, improvement of communication and data collection between state and local governments, low-cost safety countermeasures such as safety edge and rumble strips, high risk rural road programs, and safety programs specifically for pedestrians, bicycles, motorcycles, intersections, and roadway departures. Some state DOTs are taking part in new and innovative strategies involving local road programs.

When describing the extent of the safety goals on local roads, all responding states indicated the reduction of fatalities and serious injuries on local roads with various target values. For instance, the goal of the South Dakota DOT is to reduce the number of fatal and serious injury crashes by 15% on all public roads by the year 2020, while the goal of MnDOT is to have fewer than 300 roadway fatalities by the year 2020. Another common theme among state responses was the focus on intersection safety. For example, in Louisiana, the goal for

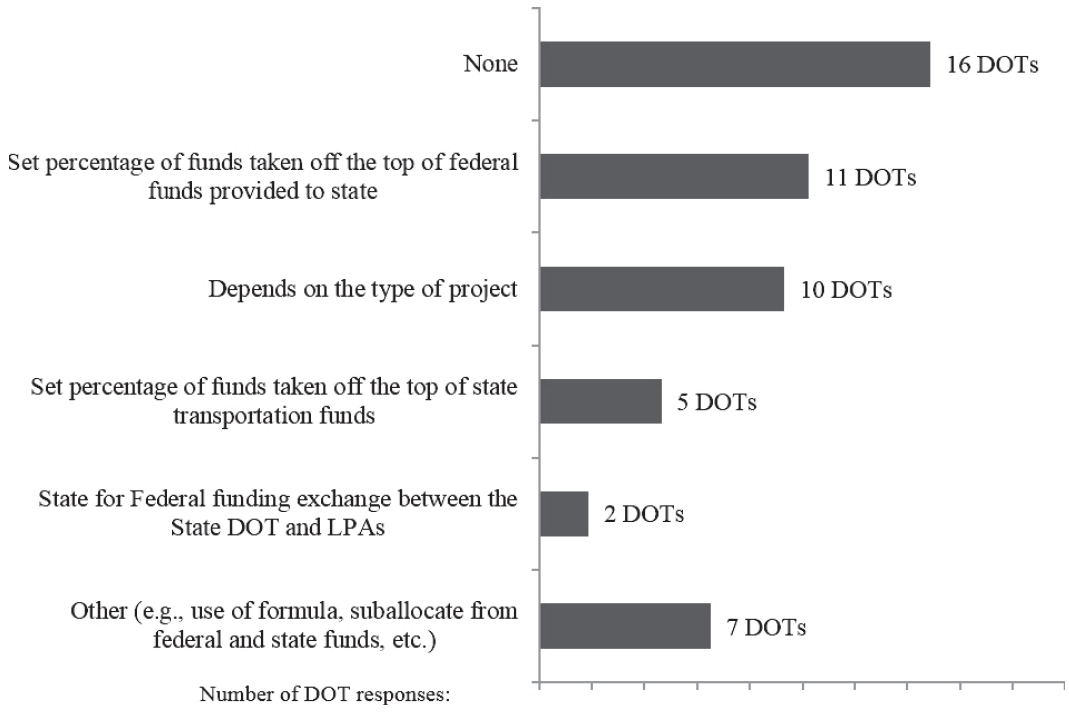

FIGURE 10 Reported alternative funding allocation techniques for local road safety program safety projects (43 responses). Survey respondents were allowed to select multiple answers.

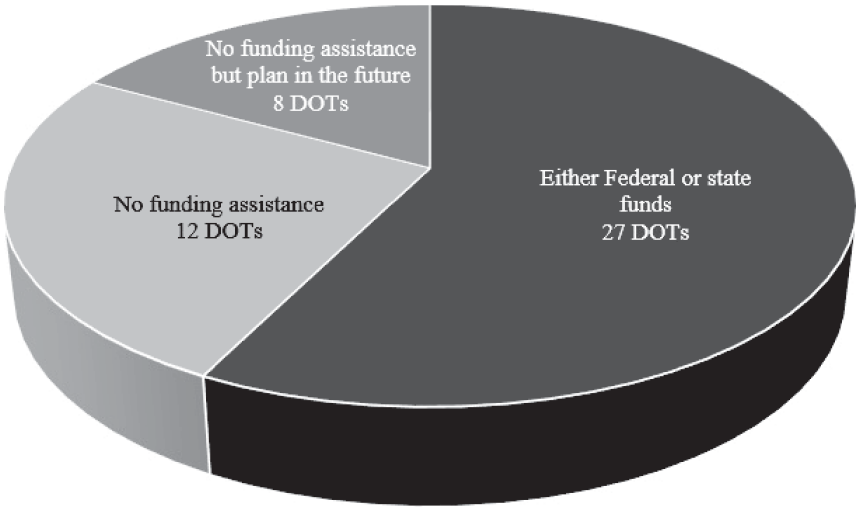

FIGURE 11 Financing sources of local road safety (or equivalent) plans (47 responses).

the Infrastructure and Operations Emphasis Area is to reduce roadway departures and intersection fatalities and injuries by 50% by 2030. Rhode Island DOT (RI DOT) also has a focus on reducing intersection fatalities by coordinating with local jurisdictions and conducting workshops to teach the agencies, whereas MassDOT incorporates the 4Es into intersection design to reduce intersection fatalities and serious injuries.

Information about the 4E approach to safety collected from the survey questions indicated a multitude of projects and programs.

- Engineering: Many of the engineering approaches focused on systemic approaches to improving signage and adding rumble strips. Nine states identified signage upgrading as an engineering design for local road safety improvements. For example, Illinois DOT performed a system wide rural sign upgrade for regulatory and warning signs for all 102 counties, while the Idaho Local Highway Technical Assistance Council uses a systematic approach to sign upgrades through a competitive application process. Delaware LTAP provides student interns with instructions for managing sign inventory programs and Mississippi DOT supplies signs at no cost to local governments in locations determined by crash data. Ina addition, four states identified rumble strips as an engineering design. Iowa DOT, MassDOT, and Louisiana DOT all have horizontal curve programs to reduce run-off-the-road crashes. Vermont DOT has a School Zone Safety Initiative that helped upgrade school zones and achieve a uniform application of traffic control devices within Vermont's local school zones. In Kansas, upon the request of local agencies, the state may provide 100% of project engineering costs.
- Education: Twenty-three states noted that local agencies receive education on local road safety through the state LTAP center or other DOT programs. South Dakota is developing applications to be used on mobile devices to improve education on local road safety. In Texas, the Lone Star LTAP offers training on safety, infrastructure, and work force development. In addition to educating local agencies, some states reported on education programs for residents of the surrounding communities. In Illinois, the DOT has Traffic Safety days, a week-long safety education course, for high school students focusing on safety topics. MassDOT is beginning to work on a statewide awareness campaign for bicycle and pedestrian safety that started with 12 local communities throughout the state. In Rhode Island, the Attorney General's Office, RI State Police, RIDOT, and AT&T are involved in the *It Can Wait* campaign through which 41 schools have been visited to educate high school students on the dangers of texting and using a cell phone while driving. Vermont holds regional safety forums where state and local officials come together with law enforcement, advocacy groups, and private sector leaders to discuss innovative approaches to improving highway safety.
- Enforcement: Survey results indicated that a key partnership for the DOTs in promoting safety on local and state roads is with the state law enforcement or public safety office. Most states enforce distracted and drunk driving and seat-belt use. Of note is Georgia's Thunder Task Force, an enforcement technique that is centered on areas of unusually high incidences of traffic fatalities and serious injuries. In Idaho, all of the enforcement programs are funded and managed by the Idaho Transportation Department, Office of Highway Safety. The Indiana Criminal Justice Institute houses the Governor's Council and has responsibility for all behavioral traffic safety programs, including seat-belt use, impaired driving, and law enforcement programs.

MassDOT is funding enhanced enforcement for local police departments to target interactions between bicycles, pedestrians, and motorists. Massachusetts's Traffic Records Coordinating Committee funded crash data systems of local police departments using federal funds.

- Emergencies Services: Georgia DOT reported a task team that develops specific implementation plans and solutions to enhance response time, whereas Michigan noted that its Highway Safety Program includes a Traffic Incident Management Component. The Minnesota Statewide Trauma System is integrated into the Minnesota Toward Zero Deaths program. The Minnesota Department of Health (MDH) oversees the statewide trauma system, which consists of the State Trauma Advisory Council (STAC) and Regional Trauma Advisory Committees (RTAC). The WTSC, which chairs the state's Traffic Records Committee, focuses efforts on improving access to and the quality of emergency services data, whereas the state's Department of Health supports Emergency Services efforts. Iowa, New Jersey, and Rhode Island mentioned the application of emergency vehicle signal preemption at intersections.

Use of Other Tools in Local Road Safety

Table 8 describes other tools and approaches applied in assessing and evaluating local road safety.

Project Development and Implementation

When asked about their current problem identification processes on local roads, the most frequent response from state DOTs was a combination of both reactive and proactive methods. Figure 12 and Table 9 summarize the problem identification process each responding state has implemented for local roads.

The survey indicated cost–benefit analyses as the most frequently applied criterion for prioritizing local safety projects (28 states) followed by crash history (26 states) and available funding (25 states). Thirty-three state DOTs responded that their state has performance measures for evaluating the impact of safety projects. Six states (Connecticut, Mississippi, Minnesota, New Jersey, Ohio, and Virginia) indicated that those performance measures were used to direct the amount of funding that is allocated to local agency applicants. Fatal and serious injury crash numbers and crash rates are identified as major performance measures, which is also described in the next section, *Noteworthy State Coordinated Local Agency Safety Program Partnerships and Challenges.*

Project Administration

Project Application and Competitiveness

For the project application submittal process, 29 state DOTs responded that each jurisdiction submits its own local road safety projects to the state. Twenty-three state DOTs reported that MPOs and RPOs submit local road safety projects. Figure 13 summarizes survey information collected about agencies that submit local road safety projects to the state DOT.

While the majority of the states responded that a similar funding application process is used for both state and local projects, many states recommend that local agencies contact regional and district offices or safety committees prior to the

TABLE 8
REPORTED OTHER TOOLS AND APPROACHES APPLIED IN ASSESSING AND EVALUATING LOCAL ROAD SAFETY

Tools	Response Option	Response Results
FHWA Systemic Safety Project Selection Tool (46 responses)	Currently use	16 DOTs
	Not yet but plan to use in the future	15 DOTs
	No, but other equivalent tool	15 DOTs. The states of Indiana, South Dakota, and Wyoming have developed software to identify routes for safety improvements (including shoulder widening, inslope flattening, reconstruction, approach flattening, lighting, and turn lanes).
State DOT's assistance in conducting Road Safety Audits/Assessments for local agencies (47 responses)	Currently use	36 DOTs
Use a coordinated team approach across state DOT divisions to coordinate the local road safety program (47 responses)*	1 (Not effective)	0
	2 (Somewhat effective)	1 DOT
	3 (Effective)	10 DOTs
	4 (Mostly effective)	12 DOTs
	5 (Very effective)	4 DOTs (Illinois, New Hampshire, North Dakota, and Tennessee)

*5 being very effective and 1 being least effective.

FIGURE 12 Reported problem identification methods.

TABLE 9
PROBLEM IDENTIFICATION METHODS

Problem Identification Process	Method*	States and Description
A combination of both reactive and proactive methods (25 responses)	Crash data analysis (reactive) and systemic approach to determine high risk roadway (proactive)	Reported examples include: • Florida: Florida DOT has initiated efforts to combine its identification methods through the District 7 Local Agency Project Funding Program and Intersection Safety implementation in Districts 2 and 3. • Indiana: DOT conducts an annual screening of state and local roadway networks for apparent safety risks. All intersections, road segments, and interchange ramps undergo a comparison of multi-year crash frequency data to nominal risk calculated for two indices. The Index of Crash Frequency (ICF) measures relative risk of all crashes, while the Index of Crash Cost (ICC) measures relative risk of severe crashes. The results can be used to conduct RSAs for both reactive spot safety improvement projects and for planning proactive systemic safety projects. • Oregon: The DOT reported that it uses crash-based analysis for network screening purposes for both state highways and local roads using the Safety Priority Index System (SPIS), a numerical value based on the combination of crash rate, crash frequency, and crashes severities. Oregon DOT has launched a newly developed All Roads Transportation Safety (ARTS) program and plan to apply *Highway Safety Manual* Safety Performance Functions for some areas. Details of the ARTS program are presented in chapter four and Appendix C. • Washington: Spot locations are primarily addressed through the City Safety Program (reactive), while risk locations over widespread areas (systemic safety) are addressed in both the City Safety Program and the County Safety Program (proactive).
Reactive method (14 responses)	Crash frequency analysis	11 DOTs
	Crash rate analysis	8 DOTs
	Surrogate analysis	2 DOTs
	Other	• Arkansas: Arkansas State Highway and Transportation Department uses a reactive method based on complaints from the people they serve. • California: California identifies projects on local roads in a reactive manner through a benefit–cost analysis. • Wisconsin: Wisconsin uses the input of DOT staff, local officials, and the public to identify problems on local roads.
Proactive method (3 responses)	Road safety audit	3 DOTs (Nevada, New Hampshire, and North Dakota)
	Risk factor analysis	2 DOTs (Nevada and North Dakota)

*Survey respondents were allowed to select multiple answers.

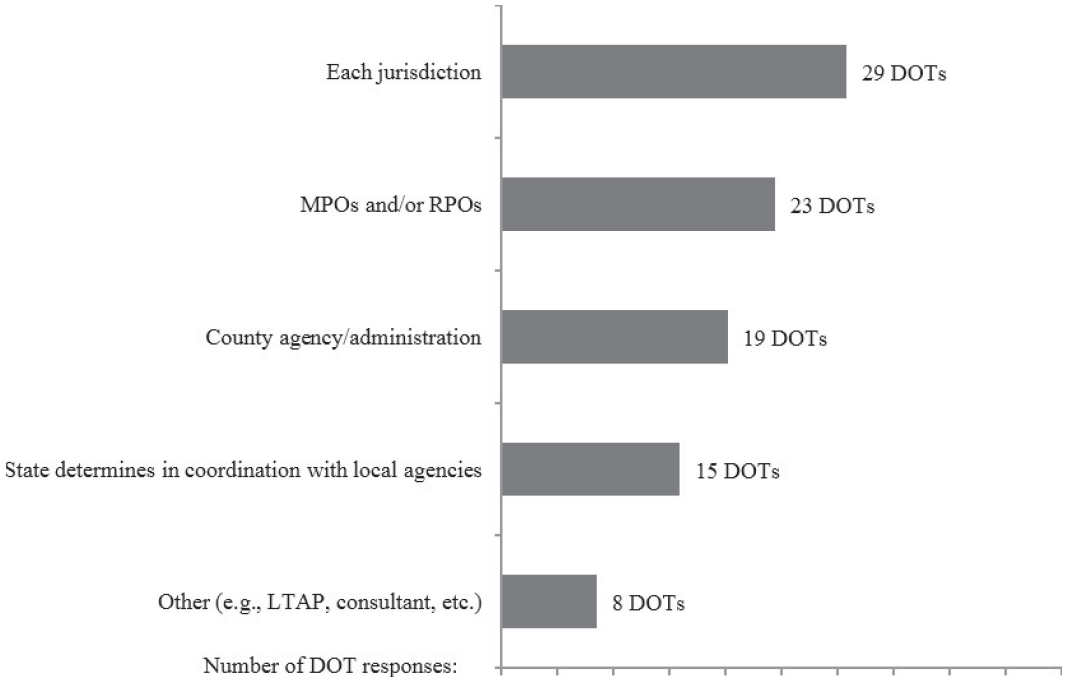

FIGURE 13 Reported entities that submit local safety projects to the state DOT (46 responses). Survey respondents were allowed to select multiple answers.

application to assess funding eligibility and project feasibility. Table 10 presents some of the details provided regarding the application process.

Twenty-eight state DOTs reported that local safety projects are competitive with state road safety projects based on the project prioritization and submittal process. Table 11 summarizes survey responses pertaining to the local project competitiveness level with state safety projects.

Procurement and Contracting

Survey results associated with the entities that administer contracts for local safety projects are presented in Figure 14. It is noted that 15 states indicated that a combination of methods (state, local agency, and consultant) is used for administering contracts for local safety projects.

Thirty-four state DOTs reported that the state assists local agencies in the procurement and contracting of local road safety projects. When asked to provide details, 23 states indicated that assistance is accomplished through an established LPA program. Table 12 presents survey information of the states where the assistance for the procurement and contracting of local road safety projects is not associated with an LPA program.

Bidding and Auditing Procedures

For smaller dollar value local federal-aid projects, nine of 47 state DOTs (19%) offer a different bidding process to facilitate the project. The alternative bidding processes are summarized in Table 13.

Thirty state DOTs indicated that the comprehensive review, oversight, and auditing requirements for the use of federal-aid

TABLE 10
SAMPLE APPLICATION PROCESS

State	Description
Illinois	Illinois DOT's annual solicitation letter that goes out to local agencies to apply for funding. Candidate applications are submitted to the Illinois DOT district offices for initial review and comment followed by the Central Office for review by the safety committee.
New Jersey	MPOs solicit the projects from locals followed by a screening and submittal to NJDOT. A technical review committee evaluates the application, gives comments and recommends the projects for construction.
New York	A periodic project solicitation is done through the MPOs and Regional Planning and Program Managers to local agencies.
Oregon	The Oregon DOT delivers safety projects on local roads based on a ranked list prepared by a consultant.
Vermont	In Vermont, there is currently no application process for HSIP projects but rather HSIP locations are ranked and reviewed by the state and project sites are selected by the regional planning commissions (RPCs) based on crashes.
Wyoming	The Wyoming WRRSP works with counties to develop applications and a Committee of Wyoming DOT Engineers reviews and recommends projects to the State Highway Commission for approval.

TABLE 11
REPORTED REASONS FOR LACK OF COMPETITION BETWEEN LOCAL AND STATE SAFETY PROJECTS

States	Reason for Lack of Competitiveness
Alabama, Alaska, Arkansas, Iowa, Illinois, Kentucky, and New York	Lack of supporting data (e.g., crash and volume) or resources (e.g., funds and technical staff) for project identification and justification
Delaware, South Carolina, Indiana, and Virginia	State road safety projects have priority over local safety projects
California and Minnesota	Different prioritization methods used for state and local projects
Kansas, Georgia, Louisiana, and Idaho	Local projects only compete with other local projects

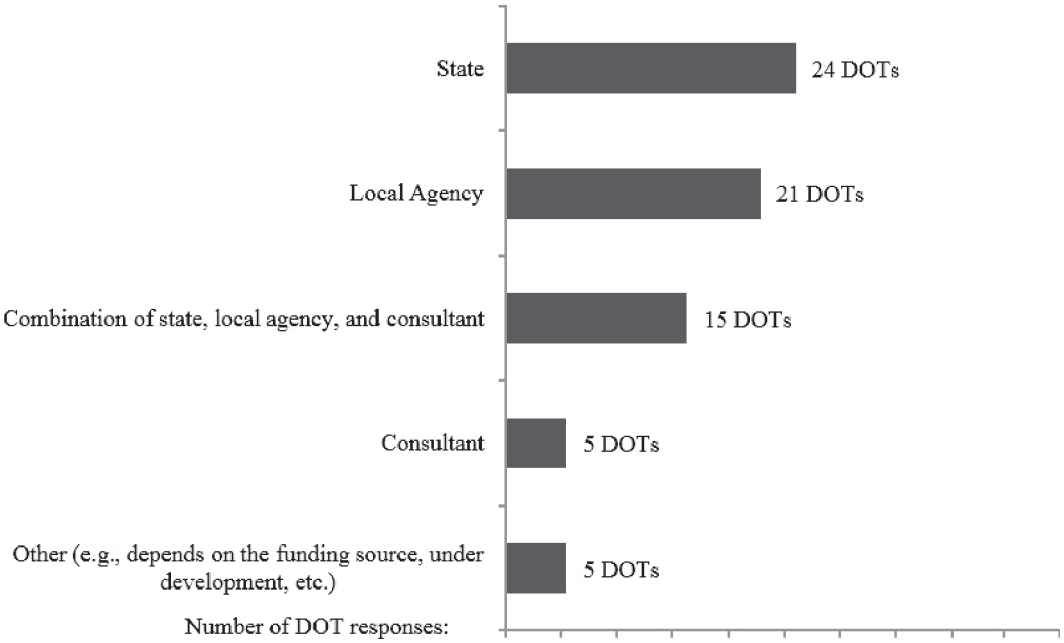

FIGURE 14 Reported entities that administer local safety projects (46 responses). Survey respondents were allowed to select multiple answers.

TABLE 12
REPORTED REASONS FOR LACK OF COMPETITION BETWEEN LOCAL AND STATE SAFETY PROJECT

State	Description
Massachusetts	MassDOT noted that all state and local projects in the State Transportation Improvement Program (STIP) get advertised and awarded the same.
Texas	The procurement and contracting process requires all HSIP projects to go through the Texas DOT procurement process.
Utah	Utah DOT has the same advertising process established for the state DOT in place for local projects.
Vermont	Vermont DOT combines all low-cost sign projects into one large statewide project, while individual HSIP projects are contracted by the state. In both cases, Vermont DOT designs and awards the projects in direct consultation with the towns.
Washington	The majority of large cities and all counties are certified to administer their own federal projects.

TABLE 13
REPORTED ALTERNATIVE BIDDING PROCESSES FOR SMALLER DOLLAR VALUE LOCAL FEDERAL-AID PROJECTS

State(s)	Description
Alabama, Kansas, Michigan, and Oregon	The use of Force Account is authorized.
Illinois	Projects can be done through either a local or state letting process. As an option the locals may use a master contract to procure items.
North Dakota	The Small Scale Safety Program is used when safety project estimates fall under $20,000. The NDDOT administers the program, the locals find three suitable bids, and the project is awarded based on environmental clearances and approval by the state FHWA division office.
New York	Local sponsors can bid their own projects via state and local agreements.
Ohio	Coop purchasing program is available to local governments.
Tennessee	Bundle several low-cost projects together for a better bid.

dollars has been a deterrent to local agencies participating in safety programs. To encourage local agency participation in the use of federal-aid dollars, 12 state DOTs reported that they have considered multiple options including allowing more work phases in funding and lowering the local match when possible. Five state DOTs (19%) allow local agencies to submit applications for funding at any time of the year. Iowa DOT provides state funding that matches the federal funding so that the only contribution required by local agencies is staff time. MnDOT reported streamlining and consolidating the solicitation process through various practices such as a universal application (one application) for federal safety funds, a one-page project memo for projects with minor impacts, and encouraging local agencies to bundle similar type of projects. In New Mexico, a quarterly application process is used. Oregon and Washington State DOTs reported providing training and technical assistance as major factors to encourage local agency participation. Washington DOT also noted setting minimum funding levels for most safety projects as another factor.

To assist local agencies, 29 state DOTs indicated that they conduct post-project audits in compliance with federal regulations on those projects funded with federal-aid dollars. The use of Generally Accepted Accounting Principles, as stipulated by the federal or state agency providing the funding for the project, was most commonly reported by most DOTs. Missouri DOT conducts standard audits unless the LPA expends more than $500,000 in federal funds where an independent audit by the State Office of Management and Budget is necessary. In Michigan, the Office of Commission Audit is charged with the overall responsibility to supervise and conduct auditing activities for Michigan DOT. In Washington, the state DOT assists with the assurance of compliance with federal rules and requirements including audits of completed projects.

NOTEWORTHY STATE COORDINATED LOCAL AGENCY SAFETY PROGRAM PARTNERSHIPS AND CHALLENGES

Figure 15 introduces the challenges reported by DOTs and shows that the limitation of local agency resources was the most highly ranked challenge, followed by state DOT resource limitations. Figure 16 shows the tools that state DOTs use to address these challenges. Ten states reported providing workshops, training, and technical assistance as one of the primary tools to address challenges. Specifically associated with project delivery, Washington State DOT noted an approach of requesting fewer matching funds if projects are awarded by a certain date, whereas Oregon DOT has local roads project delivery by the state agency.

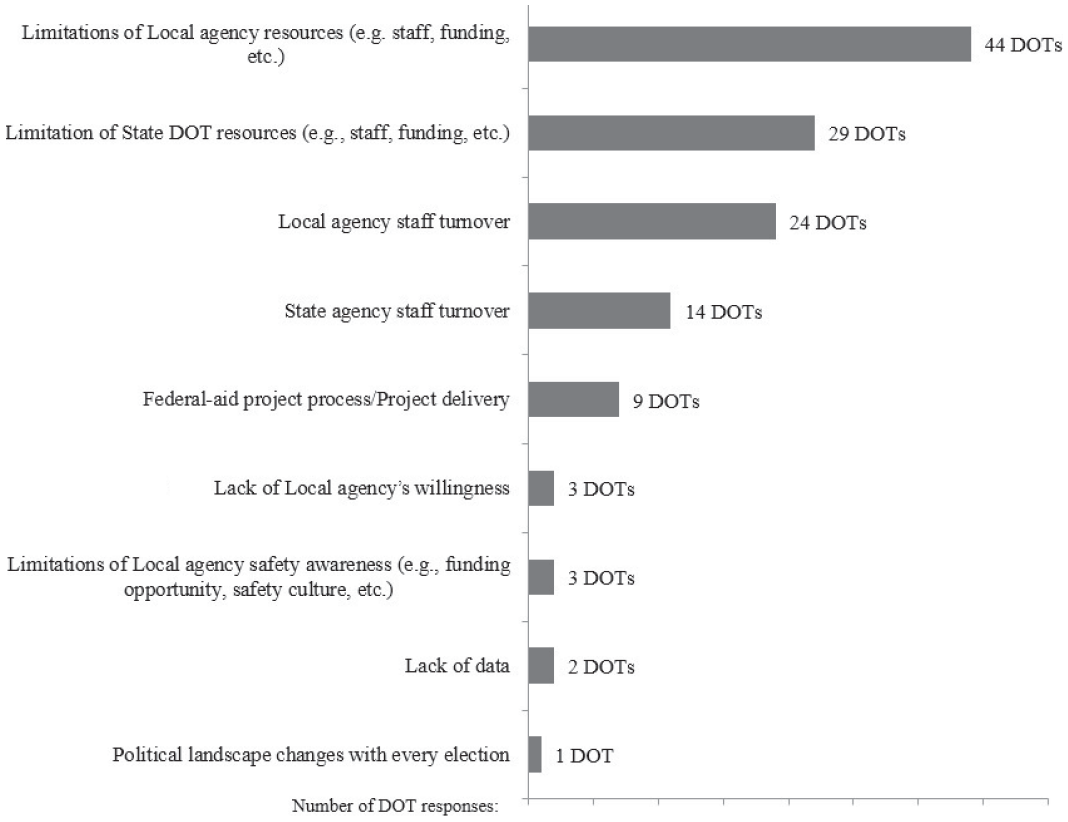

FIGURE 15 Identified challenges related to local roads safety (45 responses). Survey respondents were allowed to select multiple answers.

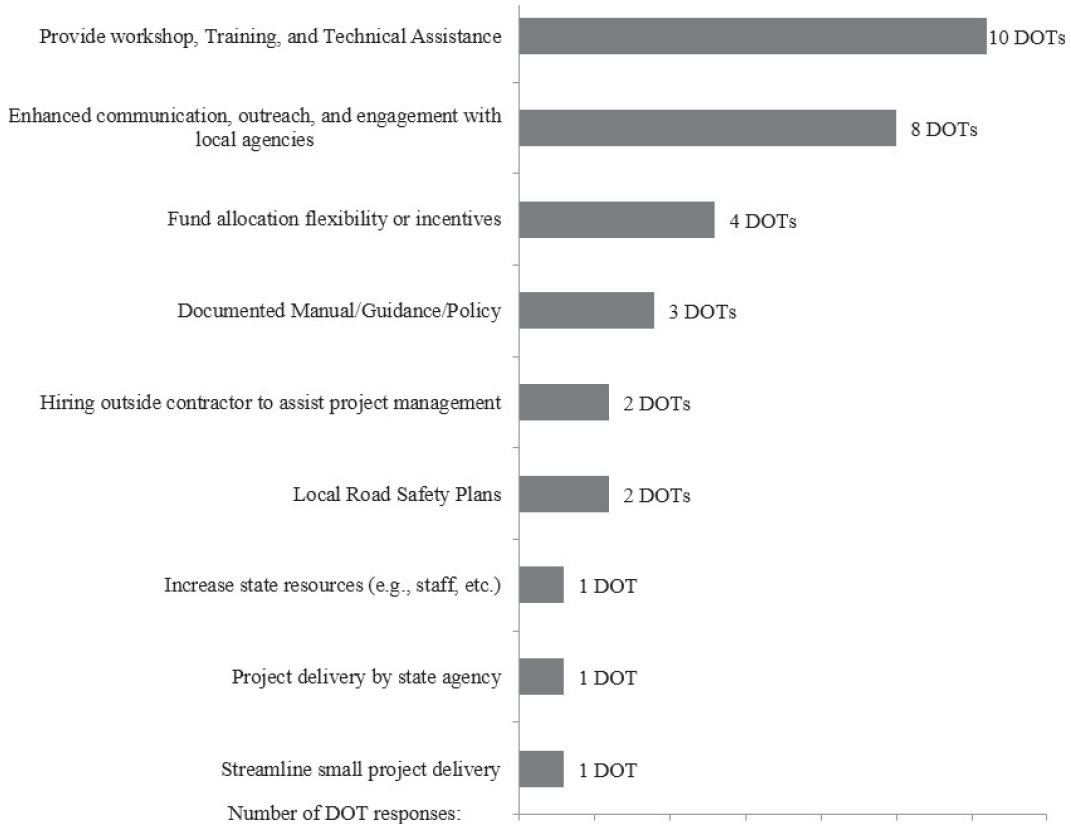

FIGURE 16 Tools used to address challenges as reported by agencies (23 responses). Survey respondents were allowed to select multiple answers.

Since the MAP-21 legislation, 19 state DOTs have noticed an increase in the number of local agencies taking part in state coordinated local safety programs. Figure 17 summarizes the main factors that contribute to this increase as identified by the 19 responding states.

Performance measures were reviewed as part of the survey. Thirty-three states responded that they have instituted performance measures to quantify the effectiveness of safety programs. The survey responses reported that fatal and serious injury crash numbers and crash rates are applied as performance measures across all responding states. The aforementioned performance measures are used by the state DOTs to determine whether or not the implemented safety programs and specific projects in each state produce a measureable positive result on improving the safety of local roads. Thirteen states responded that their safety programs have produced measureable positive results. Twenty-one states indicated that the performance of their safety programs and projects was still under evaluation at the time of the survey completion. Most states noted their states' before and after analysis of crash data, specifically the number of fatal and/or severe injury crashes, when asked to provide details of performance measures. Thirty-three state DOTs have seen a reduction in fatal and/or severe injury crashes over the past three years on local roads within their respective state. Figure 18 shows a more detailed response as to which factors were critical in this reduction.

As indicated in Figure 18, 22 state DOTs identified the promotion of systemic low-cost safety improvements as a main factor in reducing fatal and/or severe injury crashes, whereas 18 listed the initiation or expansion of state coordinated local road safety programs. Two states (Iowa and Michigan) reported that a combination of efforts among all state agencies produced the largest impact on their crash reduction on local roads, whereas four states (Minnesota, New Mexico, Washington, and Wisconsin) reported the emphasis on 4Es attributed to the reduction.

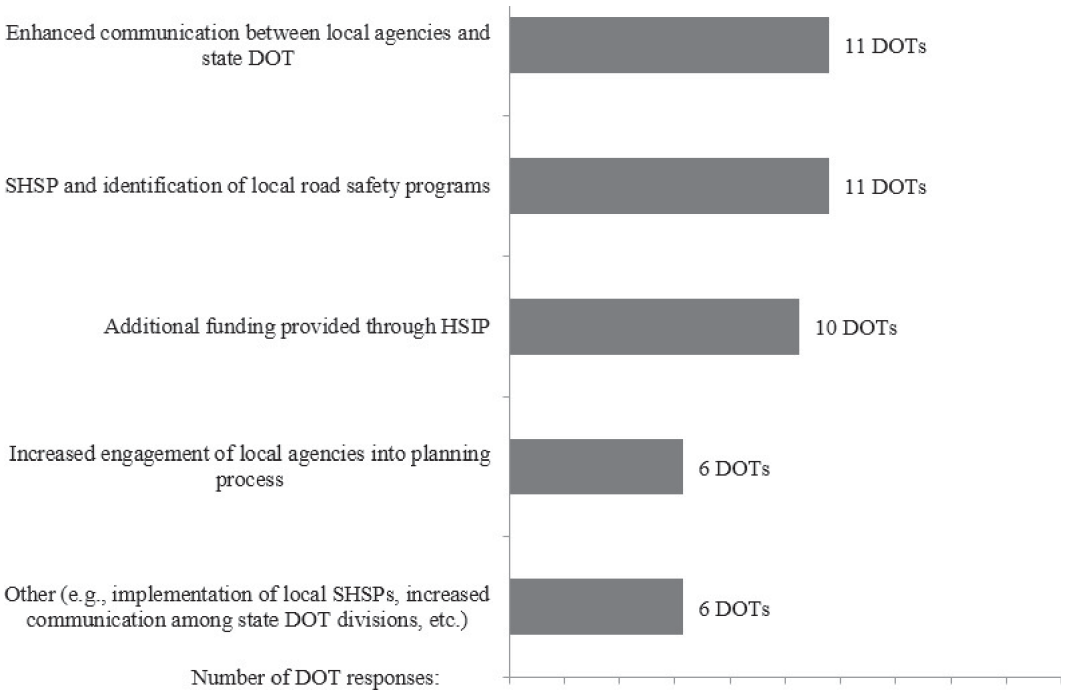

FIGURE 17 Identified main factors that attribute to the increase in the number of local agencies participating in state-coordinated local safety programs (19 responses). Survey respondents were allowed to select multiple answers.

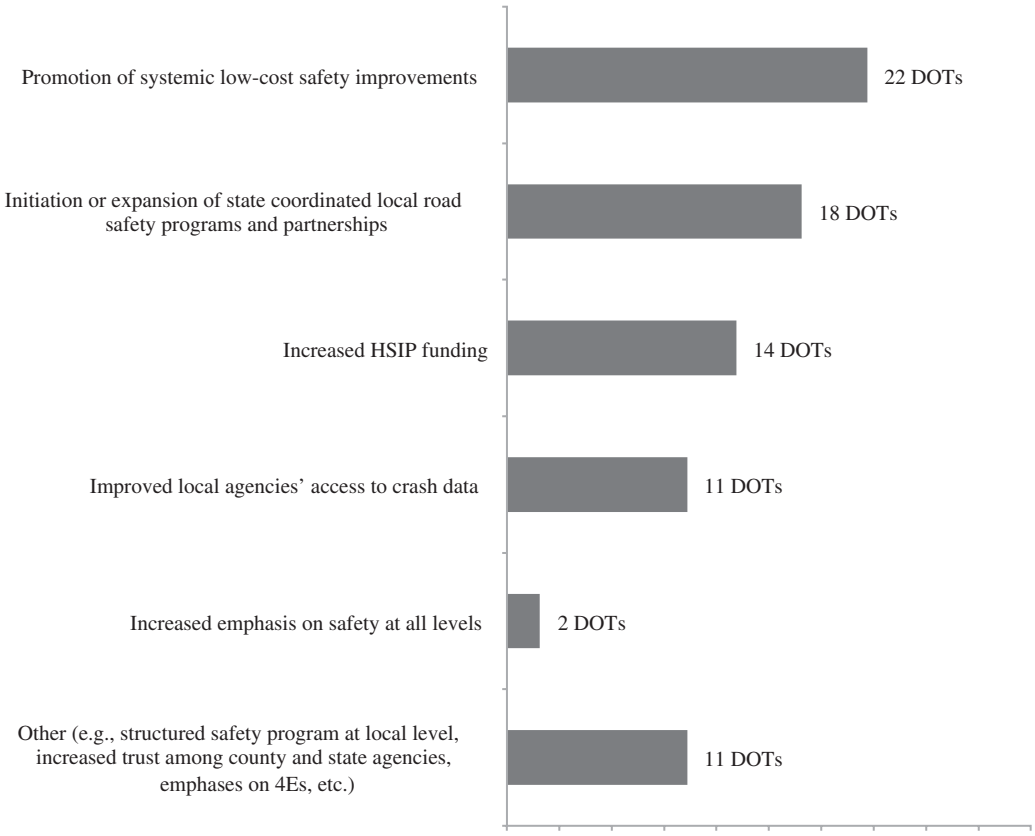

FIGURE 18 Reported main factors that attribute to the fatal and/or severe injury reduction (32 responses). Survey respondents were allowed to select multiple answers.

CHAPTER FOUR

CASE EXAMPLES OF STATE COORDINATED SAFETY PROGRAMS ADDRESSING LOCAL ROADS

INTRODUCTION

Connecticut, Florida, Iowa, Louisiana, Michigan, Minnesota, Ohio, Oregon, Utah, and Washington were the ten states selected for a more detailed investigation into their local road safety programs and practices. Appendix C provides the detailed results of these ten state case examples. There were a number of reasons why these states were selected to be case examples. One reason is that they represent a fair distribution of differing organizational approaches of delivering safety projects. Michigan represents the central office structure to implement local road programs and/or projects, whereas Connecticut, Louisiana, and Ohio reported the involvement of LTAPs. In all ten states, the local road ownership was more than 70% of the total lane miles, with Iowa, Michigan, Minnesota, and Washington having more than 90% local ownership. All ten states reported a fatal and serious injury crash reduction on state and local roads, although only Connecticut, Minnesota, Utah, and Washington had detailed information on the reduction of crashes on their local roads. Table 14 summarizes each state's response along with its corresponding feature of key criterion used.

TOPIC AREA DESCRIPTION

This chapter is organized into five topic areas of practices: (1) program development and funding; (2) project delivery and operations; (3) data support; (4) education, outreach, and technical assistance; and (5) Toward Zero Deaths (TZD). The detailed findings of each topic area, as well as program and project results are summarized by state in Appendix C.

Program Development and Funding

Many factors contribute to successful programs to enhance local road safety. Interviews with ten states showed that program support to local agencies generally comes in the form of an established state program, which focuses on local road safety including the planning and development phases, and often the provision of dedicated funding. Table 15 summarizes information gathered on successful program development and funding practices.

Project Delivery and Operations

As noted in previous chapters, the administration and detailed documentation needed to utilize federal funds on projects were major challenges for local agencies. Interviews with ten states revealed that some state DOTs are providing project delivery on behalf of local agencies (e.g., engineering services to include environmental reviews, design, and construction). In some cases, the consultants are employed by the state or LPAs to provide environmental reviews, design, and construction. Additionally, there was one successful operational practice that was brought up during the interviews (Minnesota) and hence it is included in this section. Table 16 provides a summary of project delivery and operations practices.

Data Support

Many state DOTs provide data support and coordination for LPAs to access local road crash data. To this end, many state DOTs have developed tools to assist in data analysis. In most cases, local agencies can directly retrieve data by registering online or through the data request to state DOTs. Many states already provide or plan to integrate geographic information system (GIS) mapping attributes to better represent crash features on state and local roads. All are important factors in moving toward a data-driven and informed decision for safety problem identification and project selection and prioritization. Table 17 outlines a summary of data support practices.

Education, Outreach, and Technical Assistance

To assist local agencies in the planning, development, design, and construction of local road safety projects or in the procurement of safety equipment, state DOTs provide education, outreach, and technical assistance to LPAs. This practice comes in the form of either in-house or contract staff; agreements with the LTAP offices located at universities, if not already housed within the DOT, and other agencies; and through consultant contracts. Table 18 provides a summary description of education, outreach, and technical assistance practices.

Toward Zero Deaths

Toward Zero Deaths (TZD) uses a data-driven, interdisciplinary approach targeting areas for reducing crashes, injuries, and deaths on public roads. TZD employs proven countermeasures that integrate application of education, enforcement, engineering, and emergency services (the 4Es). Although individual disciplines have a long history of successful traffic safety programs TZD aims to tie these together, usually in concert with the state's SHSP with a common vision and mission for even greater success. A TZD program team works in partnership with community and corridor or regional groups, which include LPAs, to improve the traffic safety of a designated area. This section includes state programs of successful TZD practices as provided in Table 19.

TABLE 14
SUMMARY OF TEN SELECTED STATES

States	Local Road Ownership*	Organization	Fatal and/or Severe Injury Crash Reduction**	Percentage of HSIP Fund Allocated to Local Road Safety Projects***
Connecticut	82%	Central Office staff and assistance from LTAP	Yes	15%–16%
Florida	88%	Both Central Office (planning and programming) and District Office staff (Implementation)	Yes	20%
Iowa	92%	Both Central Office (planning and programming) and District Office staff (Implementation)	Yes	7%–8%
Louisiana	72%	Central Office staff, District Office staff, and assistance from LTAP	Yes	5%–8%
Michigan	91%	Central Office staff	Yes	25%
Minnesota	90%	Both Central and District Office staff. At the same time, varies by program and funding.	Yes	50%
Ohio	84%	Combination of Central Office, District, and LTAP staff	Yes	30%
Oregon	63%	Both Central Office (planning and programming) and District Office staff (Implementation)	Yes	30%
Utah	78%	Both Central Office (planning and programming) and District Office staff (Implementation)	Yes	6%
Washington	81%	Both Central Office (planning and programming) and District Office staff (Implementation)	Yes	70%

*_Source_: *Highway Statistics* (2013) (http://www.fhwa.dot.gov/policyinformation/statistics/2013/hm10.cfm). Numbers represent centerline miles.
**With exception of Connecticut, Minnesota, Utah, and Washington, which have local road crash reduction details, the response from other states reflect the reduction of fatalities/injuries on all state and local roads.
***_Source_: Interview with state DOT Safety Engineer.

TABLE 15
SUMMARY OF PROGRAM DEVELOPMENT AND FUNDING PRACTICES

State	Program/Initiatives/Practices	Description
FL	District 7 Local Agency Safety Program	A comprehensive safety program applied in District 7 to address local road safety issues. Under this program, District 7 applied a five-layered approach to access and used federal funds for local roads safety. • The first layer focuses on the use of HSIP funds for low-cost safety improvements on local roads where neither additional funding from local agencies nor a formal contracting process is required. Through an informal solicitation process, local agencies submit an online application (www.d7safeetysummit.org/hsip). An annual budget of $350,000 is allotted to District 7 for such improvements. Local agencies install and maintain purchased safety equipment through this first layer approach. • The second layer provides technical assistance for local agencies (Table 18). • The third layer introduces a contract template that covers the project process from design to construction, design-build push button (Table 16). • Local agency program (LAP) procurement process for the local agencies and local force account agreement are the fourth and fifth layers main elements, respectively. With this layered approach, a LAP agreement is waived for the first three layers, which allowed many local agencies' safety project participation.
IA	Traffic Safety Improvement Program (TSIP) www.iowadot.gov/tsip.htm	Program provides funding for traffic safety improvements or studies on public roads under state, county, or city jurisdiction. The fund source of this program is ½ percent of Iowa's Road Use Tax Fund, which provides approximately $6 million/year to safety improvements. A maximum of $500,000 per project is set aside.

TABLE 15
(*continued*)

State	Program/Initiatives/Practices	Description
	HSIP–Secondary Program www.iowadot.gov/traffic/sections/HSIP.html	Iowa DOT initiated the HSIP–Secondary Program to continue supporting safety enhancement in rural roadways. Program focuses on Secondary Road System projects by investigating applicable low-cost, systemic safety improvements. Approved projects are 90% funded from federal funds, while a 10% local match is required. Iowa DOT then contributes 10% required local match from TSIP funds leaving local agencies with no cost obligation, but only their own staff time for project delivery and completion.
	Horizontal Curve Sign Program www.iowadot.gov/traffic/horizontalcurve.html	This program, which is a sub-program of the TSIP program, provides funding to counties for the purchase of curve warning and chevron signs. Funds can be used to reimburse counties for purchases of advance warning signs, advisory speed plaques, chevrons, and arrows. Beginning January 2013, posts and hardware are eligible to be reimbursed. Maximum $10,000 per applicant, per year is provided.
	Sign Replacement Program www.iowadot.gov/traffic/signreplacementprogram.htm	Started around year 2000, a sub-program of TSIP, the primary purposes included updating regulatory/warning signs to current retroreflectivity requirements and establishing a sign inventory program for the city to manage their signs. Program fund source is TSIP. Approximate total of $120,000/year is granted. On average, around 50 cities receive grants each year.
	Local Road Safety Plan Initiative	Iowa is piloting local road safety plan development in 12 counties starting in 2015. The pilot study begins with developing crash maps and crash trees to identify crash patterns using analysis tools developed by Iowa DOT and Institute for Transportation at Iowa State University. A total of $600,000 of safety funds (90% federal and 10% state) is assigned for this initiative. The purpose of this initiative is to offer local safety plan development to all 99 counties in Iowa over the next six years. Further details are provided in Appendix C.
LA	Local Road Safety Program (LRSP) http://www.ltrc.lsu.edu/ltap/lrsp.html	Initiated in 2006, LRSP aims to improve highway safety for Louisiana's local road system. Parish or municipal jurisdictions may apply for funding. Individual projects are limited to $500,000.
MI	Local Agency Program (LAP) http://michigan.gov/mdot/0,1607,7-151-9625_25885---,00.html	LAP administers the safety program for the local agencies allocating HSIP funds through a competitive grants process. MDOT dedicates approximately $15 million of HSIP funds annually for safety improvements on the locally-controlled roadways, and all local roads being eligible for the federal funding. Projects call for a 10% or 20% local match.
	Local Road Safety Plan http://loggedin.semcog.org/iMIS_SEMCOG/Events/Events/Event_Display.aspx?EventKey=RSTF080415&WebsiteKey=346ba721-3255-4fb4-9ea6-899d0eb35a62 http://www.michigan.gov/documents/mdot/What_are_Local_Road_Safety_Plans_473532_7.pdf	The state is in the process of developing local regional road safety plans at the State Planning and Development region level. These safety plans address emphasis areas specific to their region, such as lane departure, intersections, pedestrians, young drivers, and older drivers. The first two pilot plans should be completed by early 2016. The strategies from these plans will include both infrastructure- and behavior-based strategies. By the end of 2017, it is anticipated that all the State Planning and Development regions will have local road safety action plans in place. The plans will help address MAP-21 performance measure driven safety requirements.
MN	County Roadway Safety Plans (CRSPs) http://www.dot.state.mn.us/stateaid/county-roadway-safety-plans.html	Provides the basis for systematic implementation of safety measures across the entire jurisdiction by developing a comprehensive list of proactive measures and prioritized safety improvements, based on current crash trends. A Local Road Safety Plan (LRSP) Peer Exchange, sponsored by FHWA and hosted by MnDOT, was held in 2013 on the development of LRSP with representatives from all levels of government in Minnesota, Colorado, Iowa, Kansas, Michigan, and Missouri (http://safety.fhwa.dot.gov/p2p/mn/).
	Township Sign Program http://www.dot.state.mn.us/stateaid/township-sign-program.html	Aims to develop and upgrade the requirements for sign removal and reduction that would assist local agencies' conformity with the *Manual on Uniform Traffic Control Devices* (*MUTCD*) retroreflectivity standards.

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TABLE 15
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State	Program/Initiatives/Practices	Description
OH	MPO Priority Lists http://www.dot.state.oh.us/Divisions/Planning/ProgramManagement/HighwaySafety/HSIP/Documents/Other%20Safety%20Programs.pdf	Under Ohio DOT (ODOT) guidance, MPOs identify safety priorities and work with local agencies to plan and implement safety improvements to address those priorities. The MPOs also assist the local agencies by helping them apply for federal and state safety funding.
	County Engineers Association of Ohio	Annually, ODOT allocates $12 million to the County.
	Safety Set Aside http://www.dot.state.oh.us/Divisions/Planning/ProgramManagement/HighwaySafety/HSIP/Documents/Other%20Safety%20Programs.pdf	Engineers Association of Ohio. The funding allows the Association to help counties make safety improvements on the county road network across the state. These projects usually include guardrail, pavement marking, and sign improvements.
	Mid-Ohio Regional Planning Commission Pilot Program (MORPC) http://www.morpc.org/transportation/safety/index www.morpc.org/Assets/MORPC/files/2014JuneSafety.pdf	In 2013, ODOT and the Mid-Ohio Regional Planning Commission (MORPC) launched an MPO-led pilot program to advance low-cost systemic safety improvements on locally maintained roads. The two-year, $2 million program is being funded by HSIP and Regional Surface Transportation Program, and will be used to develop a template for other MPO regions across the state.
	Ohio Township Sign Safety Program http://www.dot.state.oh.us/Divisions/Planning/LocalPrograms/Pages/Township_Sign_Safety_Grant_Program.aspx	Ohio LTAP, as part of ODOT, allocates $1 million of HSIP funds every year for the program. Through this program, townships can upgrade existing or install additional safety signage by applying a systemic approach throughout the township's roadway system. In three years, 152 townships have received $3 million to install about 48,000 new safety signs on locally maintained rural roads.
OR	Transitional period to the All Roads Transportation Safety (ARTS) program http://www.oregon.gov/ODOT/HWY/TRAFFIC-ROADWAY/Pages/ARTS.aspx	Currently (2014–2016), Oregon DOT is delivering safety projects on local roads based on a ranked list prepared by a consultant. A draft list of potential hotspot projects for all roads in each region that will identify locations and the appropriate countermeasures. Locations are prioritized using a benefit/cost ratio analysis. The safety funds are split to each region based on the amount of fatalities and serious injuries occurring in the region on all public roads. Regions will be required to spend a minimum of 50% of their funding on systemic projects. Under the transition program to ARTS, Oregon DOT allocated $16 million for the local roads and no local match was required.
	Memorandum of Understanding between Oregon DOT, the League of Oregon Cities, and the Association of Oregon Counties (AOC) http://www.oregon.gov/ODOT/HWY/TRAFFIC ROADWAY/docs/pdf/MOU_HSIP_Transition.pdf	The MOU documents the understanding between Oregon DOT and the two local government organizations on the allocation of funding from the federal safety program. The MOU focuses on funding only for roads managed by counties and cities across the state of Oregon. Oregon DOT conducted a series of meetings with AOC and representatives from the counties where they discussed details of the ARTS safety program including its contents, funding structure, and project selection process.
WA	City Safety Program http://www.wsdot.wa.gov/LocalPrograms/Traffic/FedSafety.htm	Started in 2012, this program funds the design/preliminary engineering, right-of-way, and construction phases of projects that apply engineering countermeasures to reduce fatal and serious injury crashes. The eligible project sites include streets in cities of any population and state highways that serve as arterials for cities.
	County Safety Program http://www.wsdot.wa.gov/LocalPrograms/Traffic/FedSafety.htm	Initiated in 2009, similar to the City Safety Program, the County Safety Program funds the design/preliminary engineering, right-of-way, and construction phases of projects that will use engineering countermeasures to reduce fatal and serious injury crashes. Project sites are selected from county roads in counties with a prioritized local road safety plan.
	Quick Response Safety Program http://www.wsdot.wa.gov/LocalPrograms/Traffic/FedSafety.htm	One-time program focused on construction phase safety projects.

TABLE 16
SUMMARY OF PROJECT DELIVERY AND OPERATIONS PRACTICES

State	Program/Initiatives/Practices	Description
FL	District 7 Design-build push button http://www.tampabaytrafficsafety.com/DBPB/SitePages/Home.aspx	First executed in 2009, design-build push button is a contract template that allows state DOT to implement safety projects in a more streamlined process for state or local roads using federal safety funds. Design-build push button addresses urgent safety issues more expediently than the traditional design-bid-build process. Safety projects to be considered through the design-build push button process should not require additional or new right-of-way acquisition with minimal impacts to utility systems or environmental impacts.
	District 7 Off-system Safety Project Design Contract	One of District 7 Local Agency Safety Program elements is providing the engineering service for the off-system safety project. Under this off-system safety project design contract, District 7 offers design service, while local agencies are in charge of project construction and maintenance.
	Local Agency Safety Funding Guide for Off-System Roadways manual www.tampabaytrafficsafety.com/SafetySummit/2015%20Resources/D7%20Local%20Agency%20Safety%20Funding%20Guide%20for%20Off-System%20Roadways%202015-04-08.pdf	Developed in 2012 by District 7, *Local Agency Safety Funding Guide for Off-System Roadways* provides a detailed explanation of the HSIP process and guides local agencies through the application process. The manual has been updated annually to reflect all rules and policy changes. The most recent version was published in April 2015.
MN	**A**dvanced **LE**D Warning System for **R**ural In**t**ersections (ALERT) http://www.lrrb.org/media/reports/201410.pdf	ALERT is a rural, two-way stop control intersection warning system. Uses four basic Intelligent Transportation System (ITS) technologies: LED-based signs, renewable energy, non-intrusive sensors, and wireless communications. It is a jointly sponsored program by the MnDOT and the Local Road Research Board aimed at rural road intersections.
UT	Federal-aid project through DOT	To encourage local governments' active participation, Utah DOT handles all project delivery activities to ensure all federal requirements are met.

TABLE 17
SUMMARY OF DATA SUPPORT PRACTICES

State	Program/Initiatives/Practices	Description
CT	Crash Data Repository http://www.ctcrash.uconn.edu/	Based on the crash information collected by state and local police, the CT crash data depository (CDR) is a web tool designed to provide access to crash database. With this data repository, users are able to query, analyze, and print/export the data for research and informational purposes. The purpose of the CT CDR is to provide members of the traffic safety community, which includes LPAs, with timely, accurate, complete, and uniform crash data. Users can assign complex queries of datasets such as, by route, route class, collision type, and injury severity.
FL	Signal Four Analytics https://s4.geoplan.ufl.edu/	Signal Four Analytics is a statewide, interactive, web-based geospatial crash analytical tool that allows visualization and analysis of crash information. The system hosts a crash database that is daily updated and contains over 4 million crash records from all state and local roads since year 2006. Open to any state of Florida's public agencies, the system is designed to support the crash mapping and analysis needs of law enforcement, traffic engineering, and transportation planning agencies. Local agencies have direct access to the system after registering online.

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TABLE 17
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State	Program/Initiatives/Practices	Description
IA	Statewide Traffic Records Coordinating Committee and Crash Mapping Analysis Tool http://www.iowadot.gov/crashanalysis/data.htm	The Statewide Traffic Records Coordinating Committee (STRCC) is a multidisciplinary team whose responsibility is to promote and maintain a complete, accurate traffic records program. To assist local agencies in analyzing crash histories, Iowa DOT provides a computer-aided crash mapping analysis tool (CMAT) that offers crash location and severity information. Crash maps are also provided in the form of hard copy or electronic files (pdf format) to local agencies at a Local Road Safety Workshop or via e-mail as requested. Iowa DOT is currently working to develop a web-based analysis tool that would include GIS compatibility and be directly accessible to local agencies as well as many other safety partners
MI	RoadSoft Program http://www.roadsoft.org/ http://rspcb.safety.fhwa.dot.gov/noteworthy/html/datacollect_mi.aspx?id=125	RoadSoft is an asset management software package with a Safety Module that provides 10 years of crash data and crash reports to local agencies. The Michigan RoadSoft program is a data analysis tool used for data sharing among all agencies, and improving the location references for local road crashes through a GIS-based roadway management system. As part of the Local Safety Initiative (LSI; Table 18), RoadSoft program is used to provide a review of crash data, identification of locations of concern, field visits, suggested countermeasures, and follow-up reviews.
MN	Minnesota Crash Mapping Analysis Tool (MnCMAT) http://www.dot.state.mn.us/stateaid/crashmapping.html	MnCMAT was developed to assist cities and counties in gaining a better understanding of crash characteristics. A cooperative effort from MnDOT, the Minnesota Local Road Research Board, and the Minnesota County Engineers Association developed an online tool, MnCMAT, which is a map-based computer application that provides 10 years of crash data for all public roads in Minnesota. Up to 67 pieces of information are provided for each road including route, location, date/day/time, severity, vehicle actions, crash causation, weather, road characteristics, and driver condition.
OH	GIS Crash Analysis Tool (GCAT) http://www.dot.state.oh.us/Divisions/Planning/ProgramManagement/HighwaySafety/HSIP/Pages/GCAT.aspx	ODOT developed a user-friendly tool that allows organizations, such as ODOT, MPOs, and county engineers to retrieve and analyze crash data. GCAT is a GIS crash analysis system in which a user can obtain maps of certain road sections or intersections that show crash attributes for the particular roadway section of interests to the user. The data are available in a formatted Excel spreadsheet that automatically analyzes all crash data information. GCAT crash data are not official data available for the general public. The data can be obtained from the law enforcement handling the accident or Ohio's Public Safety Traffic Safety Office Crash Data Site.
UT	Data analysis for local agencies http://www.udot.utah.gov/main/uconowner.gf?n=3562132679126905 *Section 4.4*	To encourage local governments' active participation, after Utah DOT completes its crash analysis and identifies potential projects, it approaches each local government regarding their participation.

TABLE 18
SUMMARY OF EDUCATION, OUTREACH, AND TECHNICAL ASSISTANCE PRACTICES

State	Program/Initiatives/Practices	Description
CT	Safety Circuit Rider Program http://www.t2center.uconn.edu/circuitrider.php	The Safety Circuit Rider (SCR) program, funded through HSIP, aims to provide safety information, training, and field technical assistance for local governments that was previously lacking. The services of the SCR program, including technical assistance and training through the new Safety Academy program, are provided at no cost to local agencies. Program goals include, but are not limited to, coordination of RSAs, identification of low-cost safety improvements, and assistance to local agencies in the development of local road safety plans.
	Traffic Signal Systems Circuit Rider Program http://www.t2center.uconn.edu/signalcircuitrider.php	In November 2014, the CT LTAP implemented CT's first Traffic Signal Systems Circuit Rider (using a model based on the Safety Circuit Rider program). Funds from CT DOT's Congestion Mitigation and Air Quality (CMAQ) were used for the program development. This program provides no-cost technical assistance and training to local agency representatives responsible for municipal traffic signals.
FL	Community Traffic Safety Team http://www.dot.state.fl.us/safety/7B-YourCommunity/YourCommunity.shtm	Community Traffic Safety Teams (CTST) Program is a multi-disciplined federal, state, and local government program established to enhance roadway safety funded through Section 402 Highway Safety Grants. Each district differs in number of CTSTs and has a full-time CTST coordinator who interacts closely with the Central FDOT Safety Office.
	District 7 Safety Summit www.tampabaytrafficsafety.com/SafetySummit/SitePages/Home.aspx	Established in year 2010, the District 7 annual Safety Summit is a fully funded (federal and/or state) forum where all the parties involved in local roads safety exchange information to address local roads safety concerns. Topics from a federal safety fund application process to implemented project evaluation are covered during the Safety Summit.
	District 7 Local Agency Traffic Safety Academy (LATSA) www.tampabaytrafficsafety.com/LATSA/SitePages/Home.aspx	First offered in October 2013, Local Agency Traffic Safety Academy (LATSA) is a free webinar series focused on information regarding safety-related issues. Open to the public interested in promoting local roads safety, LATSA is funded by HSIP to support and enhance local agency safety programs.
IA	Traffic Engineering Assistance Program www.iowadot.gov/traffic/teap.html	Program aims to provide traffic engineering expertise to local governments without the resources of a staff traffic engineer. Typically serves cities with populations less than 35,000. With the program fund level of $125,000, a maximum of 100 consulting hours are allotted per applicant. TEAP is funded by a combination of a Federal NHTSA grant and state funds.
	Local Road Safety Workshop http://www.intrans.iastate.edu/events/local-road-safety-workshops	An annual Local Road Safety Workshop is the venue where a multidisciplinary team consisting of staff from Iowa DOT, Iowa Department of Public Safety, FHWA, and LTAP discuss traffic safety issues with local agencies. Iowa DOT staff from Traffic & Safety, Local Systems, Traffic Operations, Systems Planning, Motor Vehicle Enforcement, and each of the six district offices traditionally participates. Presentations cover various topics including engineering, enforcement, and education to appeal to traffic safety professionals from across disciplines.
MI	Local Safety Initiative (LSI) www.michigan.gov/mdot/0,4616,7-151-9615_11261_45212-161513--,00.html	The LSI is a voluntary program that emphasizes low-cost fixes to improve the safety of local roads. Through the LSI, Michigan DOT (MDOT) reaches out to local agencies (cities or counties) to help them analyze their crash data and recommend countermeasures to support the SHSP. The LSI also works with LTAP to deliver a software program, RoadSoft (Table 17).
	Local Agency Safety Peer Exchange http://www.ctt.mtu.edu/sites/ctt/files/resources/LocalRoadSafety2014Agenda.pdf	In 2014, MDOT and LTAP and the Michigan Division of the FHWA hosted a Local Agency Safety Peer Exchange. The exchange allowed MDOT to gather information on specific needs of local agencies related to the delivery of safety programs and the opportunity for local agencies to discuss their programs' successes and challenges with other local agencies. The peer exchange in 2014 consisted of discussion items such as quick systemic fixes, case studies, funding, lesser known fixes, and the overall change of the safety culture.

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TABLE 18
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State	Program/Initiatives/Practices	Description
MN	Sign Maintenance and Management for Local Agencies (online) http://www.mnltap.umn.edu/training/topic/traffic/onlinesign/index.html	This online distance learning course was created to provide a concise, cohesive set of sign maintenance and management materials to employees of cities, counties, and municipalities. In addition, students will learn how to use and navigate the Minnesota *Manual of Uniform Traffic Control Devices* and understand the new federal sign maintenance regulations.
UT	United States Road Assessment Program (usRAP) https://www.aaafoundation.org/sites/default/files/usRAPIIIUtah.pdf http://www.udot.utah.gov/main/uconowner.gf?n=3562132679126905	Being the first state to apply usRAP statewide, Utah DOT is planning to initiate pilot projects to apply the usRAP safety protocol to local roads in a few counties in 2015. It is envisioned that usRAP will be used to develop a Safer Roads Investment Plan.
	LiDAR data inventory http://www.udot.utah.gov/main/uconowner.gf?n=6581026708572391	In 2012, Utah DOT established a roadway asset collection program with a comprehensive LiDAR mobile survey of the entire state system of roadways. The data collected are integral to the usRAP safety model as LiDAR mobile survey allows for a more systemic safety analysis. The LiDAR system is currently focused on the state highway system with plans to expand to local roads as the program develops.
WA	City/County Corridor Safety Program http://www.wsdot.wa.gov/LocalPrograms/Traffic/FedSafety.htm	Initiated in 2000, the program aims to reduce fatal and serious injury collisions in local communities in Washington State.

TABLE 19
SUMMARY OF TOWARD ZERO DEATHS PRACTICES

State	Program/Initiatives/Practices	Description
IA	High Five Rural Traffic Safety Project Initiative www.dps.state.ia.us/commis/pib/Releases/2014/04-01-2014_GTSB_HighFive.htm Zero Fatalities Program http://ia.zerofatalities.com/	Established through Governor's Traffic Safety Bureau, this initiative aims to increase seatbelt use on state and local rural roads and reduce the occurrence/severity of state and local rural road crashes. This initiative is in line with Iowa's Zero Fatalities program that also aims to enhance traffic safety through driver behavior change.
LA	Regional Coalitions: Destination Zero Deaths http://www.destinationzerodeaths.com/	Led by the DOTD, LSP, and LHSC, the state of Louisiana seeks zero deaths on its roads and highways through its Destination Zero Deaths (DZD) initiative and SHSP, which includes coordination and collaboration with LPAs.
MI	Toward Zero Deaths (TZD) http://michigan.gov/mdot/0,4616,7-151-9615_11261_45350_66595---,00.html	MDOT has listed the TZD name on its safety program and is moving toward a goal of "Zero Deaths." MDOT is currently developing partnerships in the state through presentations, communication efforts, and visuals such as a video, brochure, flyer, poster, and presentation. As part of its outreach, MDOT has presented the National Strategy to safety stakeholders to encourage their participation.
MN	Toward Zero Deaths (TZD) http://www.minnesotatzd.org/	The TZD mission is to create a culture for which traffic fatalities and serious injuries are no longer acceptable through the integrated application of education, engineering, enforcement, and emergency medical and trauma services. These efforts are driven by data, best practices, and research. This philosophy is an integral part of the SHSP and includes multiple initiatives.

TABLE 19
(*continued*)

State	Program/Initiatives/Practices	Description
UT	Zero Fatalities Program http://ut.zerofatalities.com/	Initiated in 2006, Utah's Zero Fatalities Program is an education campaign focused on changing driver behavior.
	Zero Fatalities Safety Summit http://ut.zerofatalities.com/summit/	Starting in 2007, the state of Utah launched the Zero Fatalities Safety Summit. The Zero Fatalities Safety Summit is an opportunity for law enforcement personnel; city, county, and state government officials; educators and counselors; traffic safety engineers; child passenger safety technicians; emergency responders; and all other traffic safety advocates to share and gain ideas, experiences, opportunities, and successes to improve traffic safety in Utah. The Summit is designed to foster discussion and interaction between presenters and participants on a variety of topics, including the state's comprehensive safety plan, crash data usage, safety education programs, impaired driving, teen driving, engineering, safety restraint systems, and enforcement opportunities, among others.
WA	Target Zero Program http://www.targetzero.com/	In Washington the HSIP program requires that the state program and spend safety funds according to the WSDOT Strategic Highway Safety Plan. Washington State's plan is called Target Zero. Target Zero presents strategies to reduce fatal and serious injury collisions to zero by the year 2030.Target Zero prime partners include the WSDOT, Washington Traffic Safety Commission, and the Washington State Patrol.

CHAPTER FIVE

CONCLUSIONS AND KNOWLEDGE GAPS

The responses supplied by 47 departments of transportation (DOTs) provided valuable insight into how state coordinated safety programs impact local road safety. Detailed interviews were conducted with DOTs and local agencies in ten states. The information obtained in the interview sessions was used to acquire a more precise idea of the concerns and effective practices for addressing local road safety. Based on the literature review, state survey, and detailed in-depth interview and study of ten states, the following conclusions and observations can be made.

LITERATURE REVIEW SUMMARY AND CONCLUSIONS

- MAP-21 has positively affected states in their ability to, through significantly increased funding levels, address local road safety and the need for data-driven decisions that implement proven countermeasures to reduce crashes on local roads.
- States are using a variety of approaches to engage local government agencies. Many states are holding summits, conferences, workshops, and meetings to help educate and train local agencies in applying for safety funds and discussing safety requirements. For example, the Ohio DOT held a series of Safety Conscious Planning forums for metropolitan planning organizations (MPOs) to help them identify safety needs.
- State DOTs are coordinating with their Local Technical Assistance Program (LTAP) centers to address issues with local agencies on local road safety. The Michigan LTAP developed a GIS-based integrated roadway management system to analyze and report on local roadway safety, while most LTAP centers assist local government agencies in managing and maintaining safe local roads by providing training and technical assistance. In addition, the Safety Circuit Rider (SCR) program is being implemented by LTAP centers in many states.
- Owing to limited funds for local road safety, many states have developed low-cost treatment options that improve the safety on local roads.
- Many states are assisting local agencies in developing Local Road Safety Plans, locally focused plans that both build on a state's Strategic Highway Safety Plan (SHSP) and provide a framework for local practitioners to identify factors that contribute to crashes and proposes countermeasures to eliminate crashes.
- Local agencies rely on a crash database to determine safety improvement focus areas. The Louisiana Department of Transportation and Development brought in a law enforcement expert to improve crash data collection through the training of law enforcement agencies on data collection, which resulted in improved accuracy and completeness in statewide crash data reporting.
- Many states have adopted and/or support the Toward Zero Deaths initiative or an equivalent within its own SHSP, in which states address reducing crashes on all public roads by employment of 4E (Engineering, Education, Enforcement, and Emergency Services) approaches.
- Local agencies frequently lack the resources (e.g., staff and funds) to plan and implement road safety projects and programs. Nationwide, the LTAP programs have developed, with their respective DOTs, training programs to overcome both education and knowledge limitations of local government agencies. Examples include the SCR program and Road Safety Audits (RSAs).
- Local agencies vary greatly in population and organization. As such, a one-size-fits-all situation does not exist and it is important that safety programs be tailored to the needs of that agency.

SURVEY SUMMARY AND CONCLUSIONS

- Most states (27) reported that local road programs and/or projects are implemented by the state DOT through both central offices and district office staff. Fifteen state DOTs indicated that only central office staff is involved in implementing local road programs and/or projects. Forty-one state DOTs reported that the local road programs and safety programs that include local roads fall under the same state organization. Many states are making local road safety improvements a priority through increased funding and resource allocation.
- State DOTs were the agency most frequently cited for providing technical assistance and support to local agencies at all project stages. MPOs provide assistance to local agencies, most notably during project planning and application preparation stages, and share a similar assistance level with LTAP centers in providing information resources. For local agency training on federal-aid procedures, the LTAP program was identified as the foremost agency providing assistance to local agencies.
- Federal funding was identified as the major source of support in most states (more than 80%) for the local safety programs. In Alabama, Illinois, Iowa, Minnesota, and Ohio local funding was more than 10% of the funding source for the local safety programs.

- Survey results indicated that state DOTs employ multiple criteria in determining the funding allocation for local safety programs. Crash data and risk analysis were identified as the most commonly applied criteria.
- For program fund selection, SHSP emphasis area (35 states) and a competitive application process (28 states) were identified, followed by technical criteria (23 states) that were mostly represented by benefit/cost analysis.
- Thirty-four states reported that 25% or fewer of their local agencies participate in developing local road safety (or equivalent) plans. In terms of a funding source for local road safety (or equivalent) plans, federal or state funds were used by 27 states.
- Most states (32) include an element in their SHSP that identifies and addresses goals and initiatives to improve the safety on local roads. Regarding the 4E approach in local safety, many of the engineering approaches focused on systemic approaches to improving signage and rumble strips. Thirty-three states reported that local agencies receive education and training on local road safety through the state LTAP or other DOT programs. In the enforcement area, a key partnership for the DOTs in promoting safety on local and state roads is with the state law enforcement or public safety office.
- For safety analysis, 16 states reported using the application of the FHWA systemic safety project selection tool, whereas many states are assisting local agencies in conducting RSAs. The majority of the responding states reported using a combination of reactive and proactive practices, mostly crash data analysis and risk analysis, to identify local road safety problems. Cost-benefit analysis and the fatal/serious crash reduction rate were the most frequently identified factors in local safety projects prioritization and evaluation, respectively.
- In many cases, for local safety project submittals, each local jurisdiction and MPO/regional planning organization processes the submittal to the state and the application process follows a similar procedure to that of the state. Twenty-eight states noted that local safety projects are not competitive with state road safety projects.
- Thirty-four states reported that the state assists local agencies in the procurement and contracting of local road safety projects, and 23 states indicated that the assistance is provided through an established local public agency (LPA) program. Most states (38) have similar bidding processes for local federal-aid projects of smaller dollar value.
- To assist local agencies, 29 states reported that their DOT conducts post-project audits in compliance with federal regulations on those projects funded with federal-aid dollars. Generally Accepted Accounting Principles, as stipulated by the federal or state agency providing the funding for the project, was the most commonly used audit procedure as reported by the majority of DOTs.
- Many states (30) responded that the administration and reporting requirements for the use of federal-aid dollars have been a deterrent to the participation of local agencies. Practices identified to encourage local agencies' involvement were a year-round fund application timeframe, streamlining and consolidating the solicitation process [e.g., a universal application (one application) for federal safety funds], lowering local match requirement (e.g., providing a state fund to match federal funds so that a local match is not required), and providing training, technical assistance, and certification programs for LPAs.
- Several states provide an incentive for the LPA's participation in state safety programs by either reducing the local funding match on safety projects or by creating state programs that completely fund local safety projects without the use of federal dollars.
- Several states have improved state and local collaboration through partnership agreements [e.g., the County Engineers Association of Ohio (CEAO) and Minnesota Association of Townships (MAT)], along with the LTAP centers (e.g., Connecticut, Louisiana, and Ohio), in the planning and implementing of statewide safety initiatives.
- Key challenges for many state DOTs in addressing local safety projects were the lack of local agency resources (44 states), followed by the limit of state DOT resources (29 states). Tools identified to address these challenges were providing workshops, training and technical assistance, enhancing communication, outreach and engagement with local agencies, procedures documented in local road manuals, and comprehensive guidance and policy for local agencies.
- Since the implementation of the MAP-21 legislation, 19 states have observed an increase in the number of local agencies taking part in state coordinated local safety programs. Most states attributed additional funding through the Highway Safety Improvement Program (HSIP), the implementation of SHSPs, and the establishment of dedicated local road safety programs as primary contributing factors for this increase.
- Thirty-three states experienced a reduction of fatal and serious injury crashes since the implementation of MAP-21, and reported the promotion of systemic low-cost safety improvements, the initiation or expansion of state coordinated local road safety programs, and partnerships as key factors in crash reduction. Increased HSIP funding and improved access to crash data for local agencies were also identified as elements that contributed to crash reductions.

KNOWLEDGE GAPS AND FUTURE RESEARCH

The following section outlines knowledge gaps that stemmed from the DOT survey and agency interviews. The responses indicated a need for future research in the following areas:

- Development of a cost-effective traffic and roadway inventory database system to facilitate the implementation of a data-driven systemic safety approach. Advances in sensor technology (e.g., Utah DOT's LiDAR pilot

study) and research initiatives on effective traffic counts on local roads (e.g., traffic count estimation based on small-scale sample counts and land-use variables) are reported as possible solutions to address the lack of a roadway inventory system. Iowa DOT's Statewide Traffic Records Coordinating Committee-supported traffic record program and Ohio's Geographic Information System Crash Analysis Tool are examples of GIS applications that could contribute to the data-driven systemic safety approach.

- Development of new performance indicators for program and practice evaluation, in addition to the currently used crash fatality and serious injury numbers and rates. The corresponding research results will also assist in establishing an effective methodology to document and estimate the level of safety enhancement at the project location or program level other than one based on crash numbers or rates. Research results will also provide a guide toward proactive safety methods for enhancing safety on local roads. Possible future performance measures for further study have been addressed in the Minnesota SHSP entitled "Minnesota's Traffic Safety Tracking Indicators by Focus Area" (presented in web-only Appendix D).
- Further analysis is needed on driver behavior on all roads to identify countermeasures and/or strategies that would have significant impacts on human behavior. For example, there is a need for detailed observations of vehicle speeds on local roads in order to establish and post realistic speeds and driver behavior changes as they transition from interstate, state, and local roads. Research results will help provide guidelines for implementing safety programs targeted at reducing human factor attributed crashes.
- The use of the *Highway Safety Manual* (*HSM*) by local agencies has been limited. Although Michigan, through the LTAP, developed and has been implementing a training program to educate local agencies in the use of the *HSM*, future efforts could be explored to determine ways of making this important safety tool more readily usable by local agencies.
- Investigation on the impacts of various advances in technology, such as autonomous vehicles and the use of low-cost intelligent transportation system technology [e.g., Advanced LED Warning system for Rural intersections (ALERT) rural two-way stop control intersection warning system by the Minnesota DOT and Local Road Research Board] to improve local road safety.

GLOSSARY

4E	Engineering, Education, Enforcement, and Emergency Services
ADT	Average daily traffic
AOC	Association of Oregon Counties
ARTS	All Roads Transportation Safety Program
ATSSA	American Traffic Safety Services Association
B/C	Benefit/Cost
CCTRP	Connecticut Cooperative Transportation Research Program
CEAO	County Engineers Association of Ohio
CMAQ	Congestion Mitigation and Air Quality
CRAB	County Road Administration Board
CRSP	County Roadway Safety Plan
CTST	Community Traffic Safety Team
CT T2	Connecticut Technology Transfer Center
DOT	State department of transportation (state highway agency)
DOTD	Louisiana State Department of Transportation and Development
DPS	Department of Public Safety
DZD	Destination Zero Deaths
EMS	Emergency Medical Service
FARS	Fatality Analysis Reporting System
FDE	Fundamental Data Elements
GCAT	Geographic Information System Crash Analysis Tool
GIS	Geographic Information System
GTSAC	Governor's Traffic Safety Advisory Commission
GTSB	Governor's Traffic Safety Bureau
HELPERS	Hazard Elimination Project for Existing Roads and Streets
HRRR	High Risk Rural Road
HSIP	Highway Safety Improvement Program
HSM	*Highway Safety Manual*
LAL	Local Agency Liaison
LAP	Local Agency Program
LED	Light-emitting diode
LEE	Law Enforcement Expert
LHSC	Louisiana Highway Safety Commission
LHSIP	Local Highway Safety Improvement Program
LHSRG	Louisiana Highway Safety Research Group
LHTAC	Local Highway Technical Assistance Council
LLRB	Local Road Research Board
LOC	League of Oregon Cities
LPA	Local public agency (borough, city, county, town, township, village, etc.)
LRARP	Local Road Accident Reduction Program
LRHIP	Local Rural Highway Investment Program
LRIP	Local Road Improvement Program
LRS	Linear Referencing System
LRSP	Local Road Safety Plan
LRST	Local Roads Support Team
LSI	Local Safety Initiative
LSP	Louisiana State Police
LSU	Louisiana State University
LTAP	Local Technical Assistance Program
LTRC	Louisiana Transportation Research Center
MAP-21	Moving Ahead for Progress in the 21st Century
MAT	Minnesota Association of Townships
MnCMAT	Minnesota Crash Mapping Analysis Tool
MORPC	Mid-Ohio Regional Planning Commission
MOU	Memorandum of Understanding
MPO	Metropolitan planning organization
MTSC	Maine Transportation Safety Coalition
MUTCD	*Manual on Uniform Traffic Control Devices*
NACE	National Association of County Engineers
NACo	National Association of Counties
ORIL	Ohio Research Initiatives for Locals
OSS	Off-System Safety Program
RPA	Regional Planning Affiliation
RPO	Regional planning organization
RRFB	Rectangular rapid flashing beacon
RSA	Road Safety Audit
RTPA	Regional Transportation Planning Authority
RTSP	Regional Traffic Safety Program
SALT	State Aid for Local Transportation
SCR	Safety Circuit Rider Program
SCRTSP	South Central Regional Transportation Safety Plan
SHSP	Strategic Highway Safety Plan
SPIS	Safety Priority Index System
STIP	State Transportation Improvement Program
STP	Surface Transportation Program
STRCC	Statewide Traffic Records Coordinating Committee
TRID	Transport Research International Documentation

TSAP	Transportation Safety Action Plan
TSIP	Traffic Safety Improvement Program
TSMP	Transportation Safety Management Plan
TSRC	Transportation Safety Resource Center
TTAP	Tribal Technical Assistance Program
TZD	Toward Zero Deaths
USLEC	Utah Safety Leadership Executive Committee
usRAP	United States Road Assessment Program
VMT	Vehicle miles traveled
WRRSP	Wyoming Rural Road Safety Program
WTSC	Washington Traffic Safety Commission

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APPENDIX A

Survey Questions and Results

NCHRP Synthesis Topic 46-07: State Practices for Local Road Safety

INTRODUCTION/BACKGROUND

The purpose of this appendix is to present the survey questions distributed to all fifty states, the District of Columbia, and Puerto Rico through Survey Gizmo® and to present a summary of the results from all 47 respondents.

Organization Structure and Local Road Programs

Question 1: "How is your state DOT structured to implement local road programs and/or projects?"

TABLE A1
SURVEY RESPONSE TO QUESTION 1: "HOW IS YOUR STATE DOT STRUCTURED TO IMPLEMENT LOCAL ROAD PROGRAMS AND/OR PROJECTS?"

Response Type	Response Rate
Both Central Office (planning and programming) and District Office staff	58% (27 DOTs)
Central Office staff only	32% (15 DOTs)
Central Office, District Office, and LTAP staff	4% (2 DOTs)
District Office staff	2% (1 DOT)
Other	4% (2 DOTs)

Question 2: "Are your local road programs and safety programs that include local roads under the same state organization?"

TABLE A2
SURVEY RESPONSE TO QUESTION 2: "ARE YOUR LOCAL ROAD PROGRAMS AND SAFETY PROGRAMS THAT INCLUDE LOCAL ROADS UNDER THE SAME STATE ORGANIZATION?"

Response Type	Response Rate
Yes	87% (41 DOTs)
No	13% (6 DOTs)

Question 3: "If your safety program for local agencies is separate, how is it organized and staffed?"

TABLE A3
SURVEY RESPONSE TO QUESTION 3: "IF YOUR SAFETY PROGRAM FOR LOCAL AGENCIES IS SEPARATE, HOW IS IT ORGANIZED AND STAFFED?"

Count	Response
1	Local Program Bureau Safety Program Management Bureau
1	Our local roads safety program is just part of the overall safety program (specific projects are data driven regardless of jurisdiction). There are 7 people in the MassDOT Safety Section.
1	Safety-related local road programs are run by the Safety Engineering Unit in Traffic Engineering. All other local road programs are run by the State Design Unit.
1	The INDOT Office of Traffic Safety establishes requirements for LPA application for HSIP and HRRRP project eligibility. The INDOT Division of LPA Assistance and Grants has authority to determine project funding approval and administers project development phases.
1	HSIP is administered by Division of Traffic Operations; "NHTSSA" safety is administered by Office of Highway Safety; local roads is administered by Office of Local Programs
1	Our safety programs reside in the Traffic & Safety Division, which is part of Operations. I am the manager and I have several staff members that work to prepare and analyze the crash data.

Question 4: "Other than interstate and state highways, to what extent does your state DOT have responsibility for local roads?"

TABLE A4
SURVEY RESPONSE TO QUESTION 4: "OTHER THAN INTERSTATE AND STATE HIGHWAYS, TO WHAT EXTENT DOES YOUR STATE DOT HAVE RESPONSIBILITY FOR LOCAL ROADS?"

Response Type	Response Rate
Local jurisdictions own and maintain their own roads	81% (38 DOTs)
State oversees capital improvement projects of local roads while the local jurisdictions maintain their own roads	11% (5 DOTs)
State owns and maintains un-incorporated roads while the local jurisdictions own and maintain their own roads	2% (1 DOT)
Other	6% (3 DOTs)

Question 5: "Approximately what percentage of all lane miles are locally owned and maintained?"

TABLE A5
SURVEY RESPONSE TO QUESTION 5: "APPROXIMATELY WHAT PERCENTAGE OF ALL LANE MILES ARE LOCALLY OWNED AND MAINTAINED?"

Response Type	Response Rate
0%–15%	6% (3 DOTs)
15%–30%	2% (1 DOT)
30%–45%	0% (0 DOTs)
45%–60%	2% (1 DOT)
60%–75%	34% (16 DOTs)
75%–90%	43% (20 DOTs)
Over 90%	13% (6 DOTs)

Question 6: "Please also provide the mileage value of all locally owned and maintained lane miles."

TABLE A6
SURVEY RESPONSE TO QUESTION 6: "PLEASE ALSO PROVIDE THE MILEAGE VALUE OF ALL LOCALLY OWNED AND MAINTAINED LANE MILES."

Count	Response
1	100,000 miles
1	109,679 center lane miles
1	110,780
1	129,347.73
1	131,130
1	14,000 miles
1	177,333 lane miles
1	199,744 lane miles
1	20,000 ±
1	216,086 lane miles
1	24,000
1	3,211 miles
1	35,820 miles
1	40,000
1	5,378 locally owned and maintained lane miles.
1	55,911.35 lane miles NOT centerline miles
1	6,767 owned; 6,770 maintained
1	60,000
1	61,990
1	64,218
1	74,750
1	78,500
1	79,641 centerline miles
1	808 miles of locally owned roadways.
1	84,112
1	86,181 miles of local roads
1	95,000
1	97,000
1	All mileage reported is centerline miles, not lane miles. 50,498.259

TABLE A6
(*continued*)

Count	Response
1	Approximately 10,000 miles
1	Approximately 200,000 lane miles
1	Don't know at this time. Will have to insert later when the answer is available.
1	Indiana has approximately 85,000 miles of locally owned and maintained roads.
1	Local road mileage—44,828 (centerline miles)
1	Roughly 75,000 centerline miles
1	State-owned miles = 2,700 total miles = 14,400
1	There are approximately 17,240 miles of locally owned and maintained roads in CT.
1	County system = 18,698 miles; Other rural roads = 56,867 miles; City streets = 3,907 miles; Trails = 19,823 miles
1	Data on lane miles are not available for locally owned roads. We have 140,000 centerline miles of public roads in Kansas. About 10,000 miles are owned by the state, while the rest is owned by locals.
1	Q5 & Q6 answers reflect lane mile ownership only. Maintenance responsibility is variable; 19,455 lane miles locally owned.
1	7,400 miles of locally owned "classified" roads; do not have a number for all local roads that are not classified
1	127,400 lane miles (63,000 centerline miles). In Oregon, about 67,000 centerline miles are considered public roads (open to the public) for purposes of federal funding.
1	County roads: 39,466 centerline miles; City roads; 4,878 centerline miles; Tribal 5,025 centerline road
1	211,446 centerline miles of local roads; 80,268 centerline miles of state maintained roads (2013 data)
1	~105,000 miles

Question 7: "Does your state DOT have a dedicated local road program?"

TABLE A7
SURVEY RESPONSE TO QUESTION 7: "DOES YOUR STATE DOT HAVE A DEDICATED LOCAL ROAD PROGRAM?"

Response Type	Response Rate
Yes	87% (41 DOTs)
No	13% (6 DOTs)

Question 8: "What is the title of this program? Please provide website link if available."

TABLE A8
SURVEY RESPONSE TO QUESTION 8: "WHAT IS THE TITLE OF THIS PROGRAM? PLEASE PROVIDE WEBSITE LINK IF AVAILABLE."

State	Program Title	Program Website
AL	County Transportation Bureau	http://www.dot.state.al.us/ctweb/index.html
AK	Local Federal-aid Project Administration	http://www.arkansashighways.com/program_mgmt/program_contracts.aspx
CA	Local Assistance Program	http://www.dot.ca.gov/hq/LocalPrograms/
CO	Local Agency Training and Safety Plans	https://www.codot.gov/business/localagency
CT	Highway Design—Local Roads	http://www.ct.gov/dot/cwp/view.asp?a=2302&q=300830
FL	Florida Local Technical Assistance Program	http://www.t2ctt.ce.ufl.edu/t2ctt/ltap.asp
GA	Off System Safety	http://www.dot.ga.gov/localgovernment/Documents/OSS/OSS-ProceduresManual.pdf
HI	Local Public Agency	http://hidot.hawaii.gov/highways/files/2015/02/20150203-LPA-Manual-Sent.pdf
ID	Local Highway Technical Assistance Council (LHTAC)	http://www.lhtac.org
IL	Bureau of Local Roads and Streets	http://www.idot.illinois.gov/Assets/uploads/files/Doing-Business/Manuals-Guides-&-Handbooks/Highways/Local-Roads-and-Streets/Local%20Roads%20and%20Streets%20Manual.pdf
IN	Local Public Agency	http://www.in.gov/indot/2390.htm
IA	Office of Local Systems	http://www.iowadot.gov/local_systems/index.htm
KS	Bureau of Local Projects	http://www.ksdot.org/bureaus/burlocalproj/default.asp
KY	Department of Rural & Municipal Aid	http://transportation.ky.gov/Local-Programs/Pages/default.aspx
LA	Local Public Agency Program	http://wwwsp.dotd.la.gov/Inside_LaDOTD/Divisions/Administration/LPA/Pages/default.aspx
MA	Maine Local Roads Center	http://www.maine.gov/mdot/csd/mlrc/

(*continued on next page*)

TABLE A8
(*continued*)

State	Program Title	Program Website
MA	Local Aid Program	http://www.massdot.state.ma.us/highway/DoingBusinessWithUs/LocalAidPrograms.aspx
MI	Local Agency Programs	http://www.michigan.gov/mdot/0,4616,7-151-9625_25885---,00.html
MS	Circuit Rider State Aid LPA	http://mdot.ms.gov/portal/ltap.aspx
MN	State Aid for Local Transportation	http://www.dot.state.mn.us/stateaid/
MO	Local Programs / Local Public Agency Group	http://epg.modot.mo.gov/index.php?title=Category:136_Local_Public_Agency_(LPA)_Policy
NE	Local Projects Program	http://www.transportation.nebraska.gov/gov-aff/
NV	Local Public Agency program	https://nevadadot.com/uploadedFiles/NDOT/About_NDOT/NDOT_Divisions/Engineering/Design/2010_04_April_LPA_Manual.pdf
NH	Local Public Agency	http://www.nh.gov/dot/org/projectdevelopment/planning/documents/LPAManual.pdf
NJ	Local Safety Program- High Risk Rural Road Program	http://www.njtpa.org/Project-Programs/Project-Development/Local-Safety.aspx
NM	Local Public Agency projects	http://dot.state.nm.us/content/dam/nmdot/Local_Government_Agreement_Unit/TLGA_HANDBOOK.pdf
ND	Local Road Safety Program	https://www.dot.nd.gov/divisions/safety/docs/LSRP/LSRP_PhaseI_NE_Region.pdf
NY	Local Programs Bureau	https://www.dot.ny.gov/divisions/operating/opdm/local-programs-bureau
OH	Ohio Local Technical Assistance Program	http://www.dot.state.oh.us/Divisions/Planning/LocalPrograms/LTAP/Pages/default.aspx
OR	Local Agency Program.	http://www.oregon.gov/ODOT/TD/AT/Pages/Local-Program.aspx
PA	Local Technical Assistance Program	https://www.dot7.state.pa.us/LTAP/default.aspx
SD	Local Government Assistance Office	http://www.sddot.com/business/local/
TN	Local Roads Safety Initiative and Road Safety Audit process	http://www.tdot.state.tn.us/STI/safetyoffice.shtml
TX	Local Technical Assistance Program	https://teex.org/Pages/services/ltap.aspx
UT	Local Government Assistance	http://www.udot.utah.gov/main/f?p=100:pg:0:::1:T,V:84,
VT	Municipal Assistance Bureau	http://vtransengineering.vermont.gov/bureaus/mab
VA	Local Technical Assistance Center	http://www.virginiadot.org/business/local-assistance-lpt.asp
WA	Local Programs	http://www.wsdot.wa.gov/localprograms/
WI	Local Roads and Finance Unit	http://www.dot.wisconsin.gov/localgov/highways/index.htm
WY	Rural Road Safety Program	http://www.dot.state.wy.us/files/live/sites/wydot/files/shared/Planning/Research/RS01207%200906F%20WRRSP%20%20Wyoming%20Rural%20Road%20Safety%20Program.pdf

Question 9: "Organizationally, where does this office report to in the state organization?"

TABLE A9
SURVEY RESPONSE TO QUESTION 9: "ORGANIZATIONALLY, WHERE DOES THIS OFFICE REPORT TO IN THE STATE ORGANIZATION?"

Response Type	Response Rate
Planning Division	20% (8 DOTs)
Operations Division	12% (5 DOTs)
Highway Division	12% (5 DOTs)
Chief Engineer	7% (3 DOTs)
Separate Bureau/Division under Secretary/Commissioner	7% (3 DOTs)
Design Division	5% (2 DOTs)
Other (e.g., Traffic Engineering Division Deputy Secretary, Deputy Director of Planning and Modal Programs, etc.)	37% (15 DOTs)

Question 10: "What is the DOT staff size of such program?"

TABLE A10
SURVEY RESPONSE TO QUESTION 10: "WHAT IS THE DOT STAFF SIZE OF SUCH PROGRAM?"

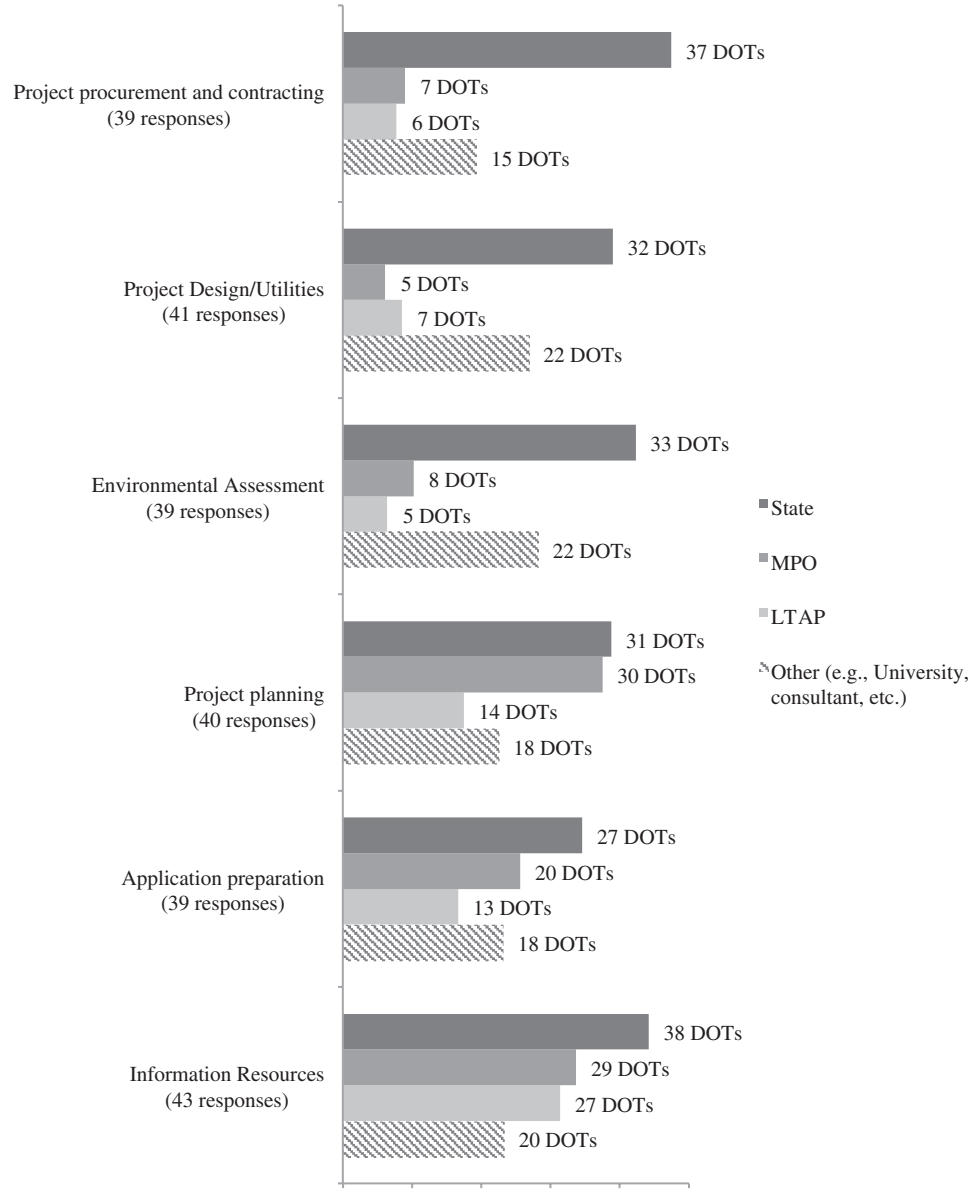
Response Type	Response Rate
Less than 5	30% (12 DOTs)
5–10	28% (11 DOTs)
10–15	12% (5 DOTs)
Over 15	30% (12 DOTs)

Question 11: "Is your state DOT developing a local road program in the future?"

TABLE A11
SURVEY RESPONSE TO QUESTION 11: "IS YOUR STATE DOT DEVELOPING A LOCAL ROAD PROGRAM IN THE FUTURE?"

Response Type	Response Rate
Yes	33% (2 DOTs)
No	67% (4 DOTs)

Question 12: "Which entities provide assistance and technical support to local agencies for local road projects?"



FIGURES A1 and A2 survey response to Question 12: "Which entities provide assistance and technical support to local agencies for local road projects?"

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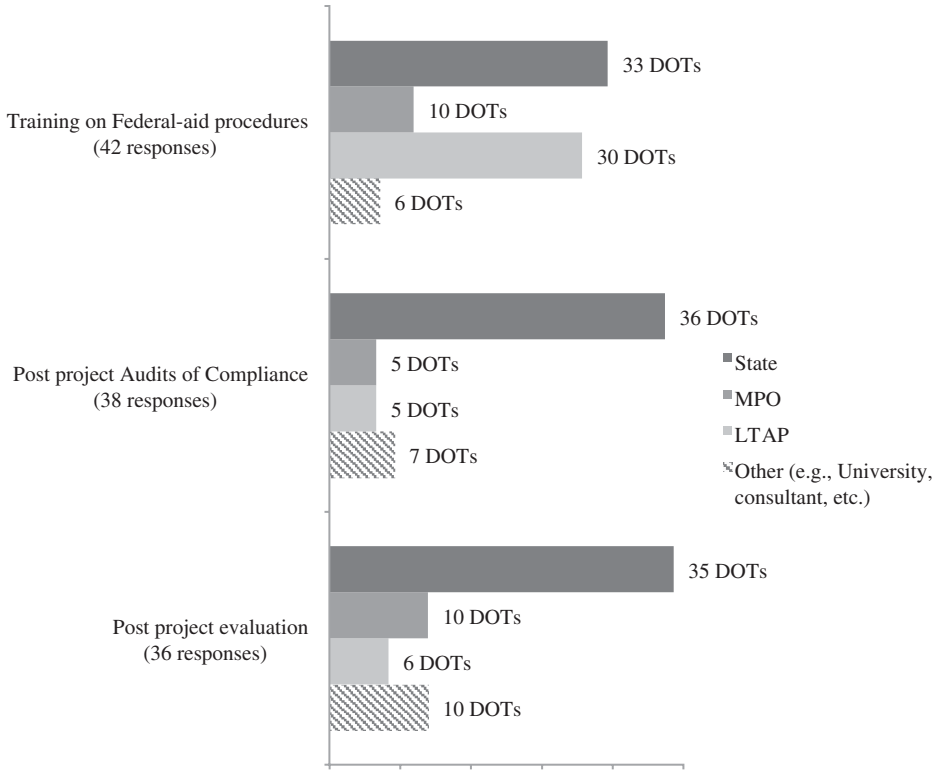


FIGURES A1 and A2 (*continued*)

Question 13: "Does your state DOT have a crash data collection system for state and non-state owned roads?"

TABLE A12
SURVEY RESPONSE TO QUESTION 13: "DOES YOUR STATE DOT HAVE A CRASH DATA COLLECTION SYSTEM FOR STATE AND NON-STATE OWNED ROADS?"

Response Type	Response Rate
Yes	100% (47 DOTs)
No	0% (No DOT)

Question 14: "Through which agency (or agencies) is this non-state-owned road crash data system collected and maintained? Check all that apply."

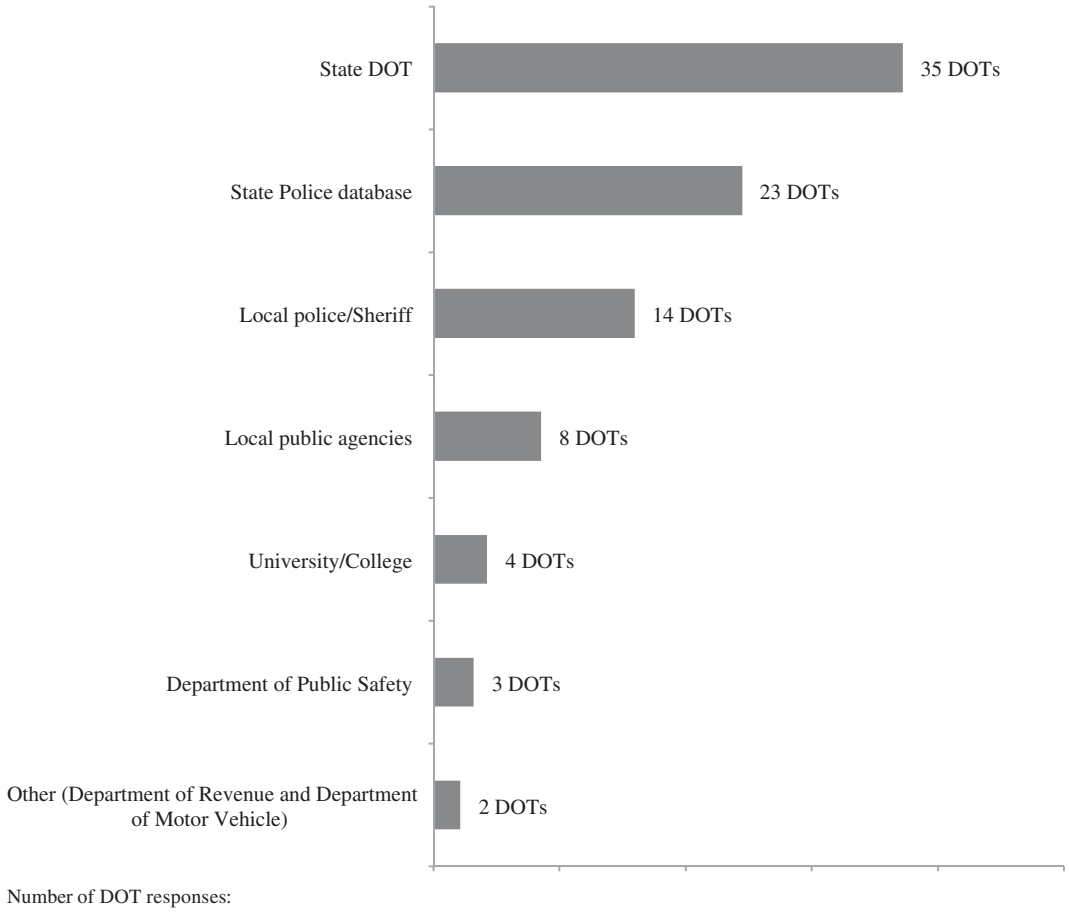


FIGURE A3 Survey response to Question 14: "Through which agency (or agencies) is this non-state-owned road crash data system collected and maintained? Check all that apply."

Question 15: "If the crash data system is maintained at the state level, can local agencies access and effectively use this data?"

TABLE A13
SURVEY RESPONSE TO QUESTION 15: "IF THE CRASH DATA SYSTEM IS MAINTAINED AT THE STATE LEVEL, CAN LOCAL AGENCIES ACCESS AND EFFECTIVELY USE THIS DATA?"

Response Type	Response Rate
Yes	73.8% (31 DOTs)
No	7.1% (3 DOTs)
Not sure	19.1% (8 DOTs)

Question 16: “What information is available? Check all that apply.”

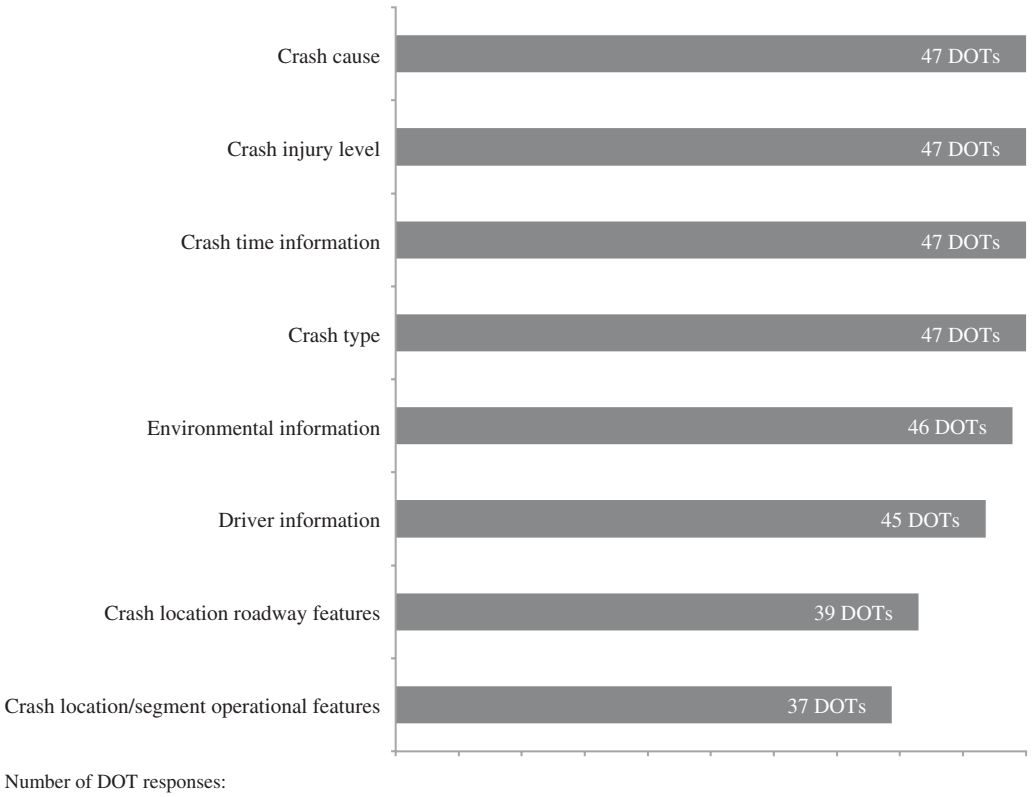


FIGURE A4 Survey response to Question 16: “What information is available? Check all that apply.”

Question 17: “Please check all the reasons why your state DOT does not collect and maintain crash data on non-state-owned roads.”

TABLE A14
SURVEY RESPONSE TO QUESTION 17: “PLEASE CHECK ALL THE REASONS WHY YOUR STATE DOT DOES NOT COLLECT AND MAINTAIN CRASH DATA ON NON-STATE OWNED ROADS.”

Response Type	Response Rate
—	—

Question 18: “Does your state DOT have safety programs on tribal lands?”

TABLE A15
SURVEY RESPONSE TO QUESTION 18: “DOES YOUR STATE DOT HAVE SAFETY PROGRAMS ON TRIBAL LANDS?”

Response Type	Response Rate
Yes	19% (9 DOTs)
No	81% (38 DOTs)

Question 19: "Please provide details of these programs and website link if available."

TABLE A16
SURVEY RESPONSE TO QUESTION 19: "PLEASE PROVIDE DETAILS OF THESE PROGRAMS AND WEBSITE LINK IF AVAILABLE."

State	Comment
Idaho	Only the statewide behavior highway safety programs such as public service announcements, billboards, etc. There are no other formal programs that relate to infrastructure. Working with the tribes in Idaho has been a challenge.
Minnesota	Our state DOT does have a safety program that impacts tribal lands, but it's not specific to tribal lands. These roads would be identified through our regular risk assessment; i.e., MnDOT District Safety Plans
Montana	http://www.mdt.mt.gov/visionzero/plans/ http://www.mdt.mt.gov/visionzero/plans/soar.shtml
Nevada	Working with Tribal partners with Road Safety Assessments and low-cost safety improvements via "inter-local Agreements"
New York	We treat tribal lands just like state highways—incorporating all standard safety treatments on roadways maintained by the state.
North Dakota	Local Road Safety Programs for each of the four tribal nations are currently in development.
Oregon	Tribal lands are eligible for federal funding and many of the roads in tribal lands are under the jurisdiction of different counties.
Wyoming	Part of the Wyoming Rural Road Safety Program (WRRSP)

Question 20: "What are the funding sources for the local safety programs in your state for the last two fiscal years (FYs)? Please provide an average % of each fund source. For information not available, please leave the box blank."

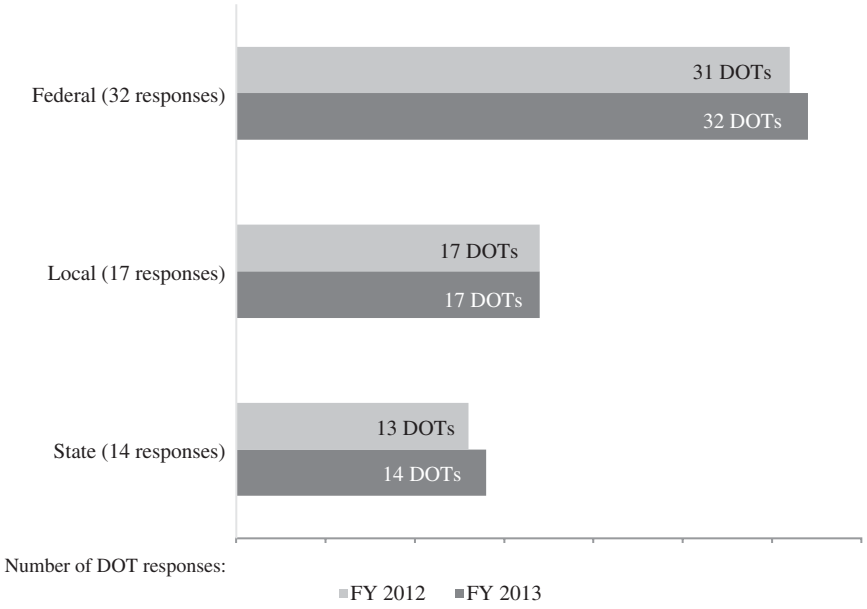


FIGURE A5 Survey response to Question 20: "What are the funding sources for the local safety programs in your state for the last two fiscal years (FYs)? Please provide an average % of each fund source. For information not available, please leave the box blank."

Question 21: "How does your state DOT determine the funding allocation for local safety programs? Check all that apply."

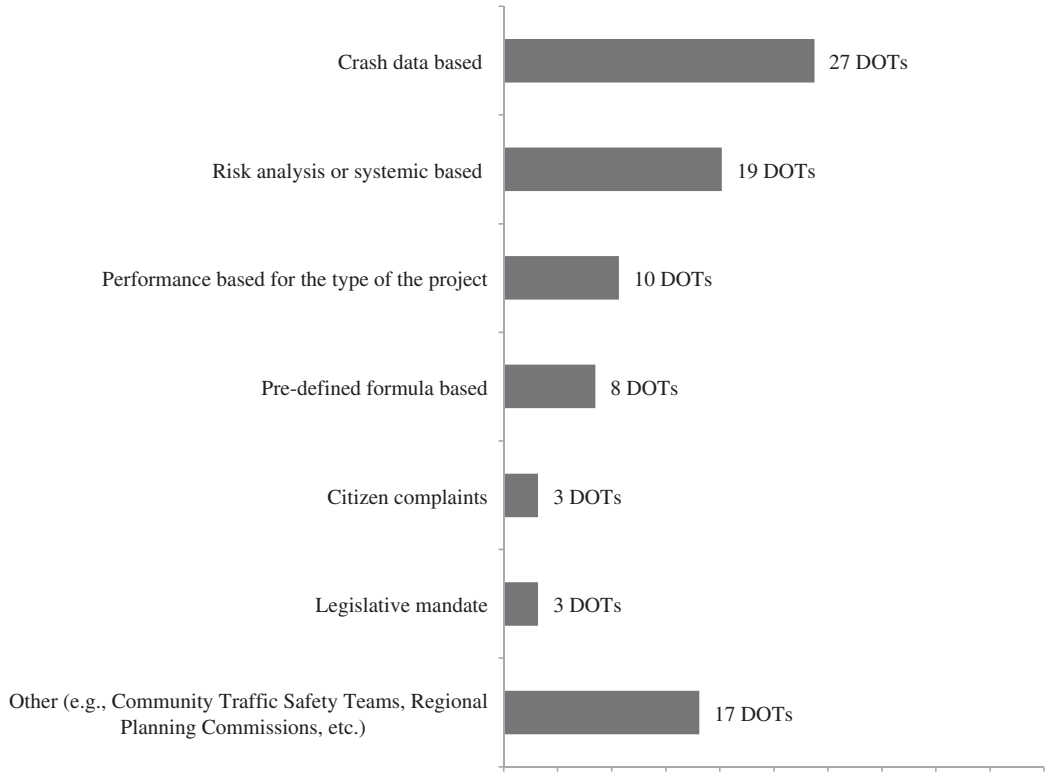


FIGURE A6 Survey response to Question 21: "How does your state DOT determine the funding allocation for local safety programs? Check all that apply."

Question 22: "Please provide the corresponding formula or the website link where the formula is documented."

TABLE A17
SURVEY RESPONSE TO QUESTION 22: "PLEASE PROVIDE THE CORRESPONDING FORMULA OR THE WEBSITE LINK WHERE THE FORMULA IS DOCUMENTED."

State	Comment
Arizona	http://azdot.gov/docs/default-source/traffic-library/azhsip2010.pdf?sfvrsn=2
Indiana	25% of all federal aid is allocated for local road programs. The share of HSIP funding allocated for local roadway safety programs is 33% of the state's total annual HSIP apportionment.
Minnesota	Funding is based on percentage of fatal and serious injury crashes for state and local system.
New Mexico	Lane miles and population are factors used to determine local road safety funding.
North Dakota	Local Road Safety Funds = (Total Safety $) x (% of fatal/serious injury crashes on local roads) x (Proportion of counties with LRSP)

Question 23: “How are local safety projects selected for funding? Check all that apply.”

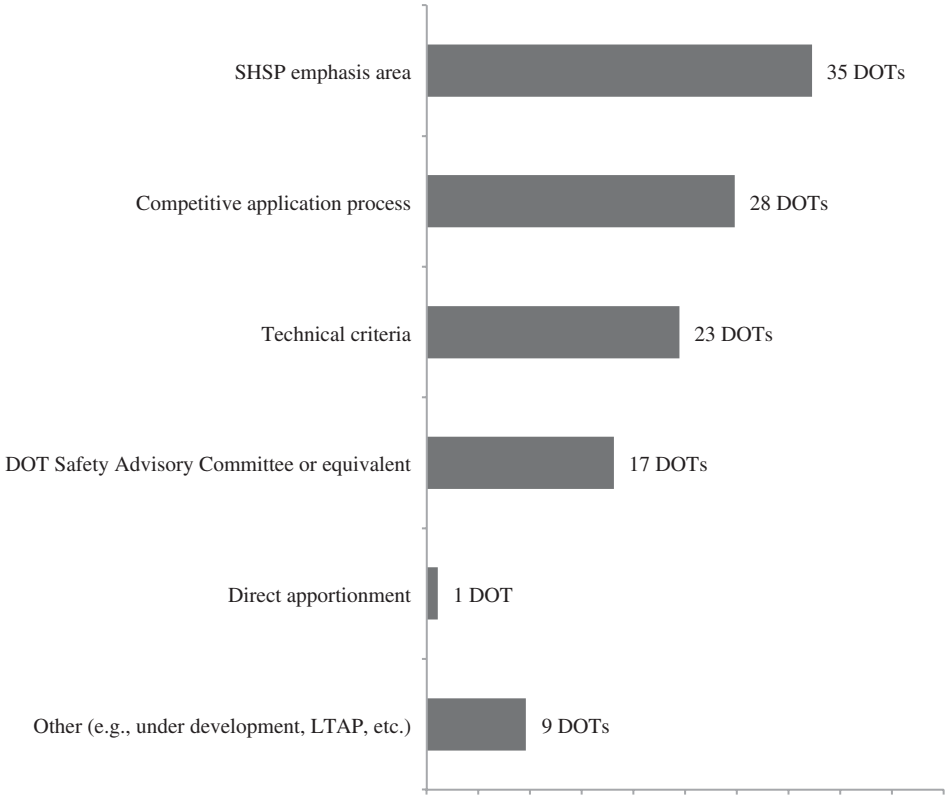


FIGURE A7 Survey response to Question 23: “How are local safety projects selected for funding? Check all that apply.”

Question 24: “Please describe the applied technical criteria or provide a reference or a website link to the state website.”

TABLE A18
SURVEY RESPONSE TO QUESTION 24: “PLEASE DESCRIBE THE APPLIED TECHNICAL CRITERIA OR PROVIDE A REFERENCE OR A WEBSITE LINK TO THE STATE WEBSITE.”

Count	Response
1	B/C greater than 1
1	Benefit cost calculation
1	Benefit to cost ranked
1	Crash trends and cost-effectiveness (b/c) evaluation
1	D7—http://www.tampabaytrafficsafety.com/HSIP/_layouts/15/start.aspx#/
1	The current local HSIP project selection criteria is on line at: http://www.in.gov/indot/2357.htm
1	benefit/cost www.dot.ca.gov/hq/LocalPrograms/HSIP/prepare_now.htm www.tims.berkeley.edu/
1	http://azdot.gov/docs/default-source/traffic-library/azhsip2010.pdf?sfvrsn=2
1	http://lhtac.org/programs/lhsip/
1	http://www.oregon.gov/ODOT/HWY/TRAFFIC-ROADWAY/Pages/ARTS.aspx
1	Projects submitted under the Local Road Accident Reduction Program are selected based on an economic analysis using a benefit-cost ratio. This ratio relates the cost of the project to the estimated crash reduction benefits. This only applies to projects with an estimated cost >$50,000.
1	As defined in the county road safety plans: http://www.dot.state.mn.us/stateaid/county-roadway-safety-plans.html
1	Technical criteria apply to the systemic safety projects for cities. To rank the projects, they were evaluated using a formula based on % of fatal/serious crashes addressed by that type of improvement, the number of locations being improved, the associated crash reduction factor of the countermeasure(s) being used, and the cost of the project.
1	Depending on the project, we might consider shoulder width, number of curves, crash data, or segment length.
1	http://www.iowadot.gov/tsip.htm (scroll to the bottom of this web page for the TSIP application instructions and worksheet.)
1	Here is a guide to assist municipals: http://www.mma.org/resources-mainmenu-182/doc_view/694-municipal-project-guide-for-road-and-bridge-projects. We also have guidance on when a project is HSIP eligible (regardless of roadway ownership). It is not posted on our website, but I can provide a file on our HSIP guidelines upon request.
1	Information on the application and evaluation process for proposed safety projects can be found at the following website: http://www.dot.wisconsin.gov/localgov/highways/hsip.htm.
1	The following methodology to prioritize hazard locations and corridors on local roads is to be used by all RPCs to achieve consistency in the prioritization approach by all regions. (1) The latest five years of VAOT crash data for non-state roads functionally classified as rural major and minor collectors and rural local roads will be used. In addition, non-state roads in urban areas that display the characteristics of rural roads will also be considered. (2) The RPCs will analyze the data to identify (i) three high hazard locations (hot spots and segments up to 1 mile long) on local roads and (ii) three programmatic corridors—road segments more than 1 mile long that exhibit safety issues throughout the segment. (3) The RPCs will consider crash severity by computing the Equivalent Property Damage Only Number as defined in Equation 1. Prioritization of site using the Equivalent Property Damage Only Number should be done using the following methodology: Use Equation I to Prioritize High Hazard Locations and Programmatic Corridors UNLESS the difference between two locations is less than 70. If the difference is less than 70, use Equation II to prioritize those locations. I.) 70 x (# of fatal crashes + # of injury crashes) + 1 x (# of property damage only crashes); II.) [70 x (# of fatal crashes + # of injury crashes) + 1 x (# of property damage only crashes)]/Total # of Crashes. In addition, the RPCs will consider exposure by computing the Equivalent Property Damage Only Number per mile of roadway as calculated by equation III; III.) [70 x (# of fatal crashes + # of injury crashes) + 1 x (# of property damage only crashes)]/Total # of Miles for a Road. A location that ranks high under both prioritization approaches is a site that is likely to pose safety issues.
1	Safety can be addressed through various funding avenues and efforts. We (IDOT) may perform Road Safety Assessments (RSA) or Road Safety Reviews (RSR) upon request or upon IDOT’s suggestion. Local agencies may do safety projects with their own forces and funding. One option is to apply for HSIP funding. In this case, there is an open solicitation—there is no funding cap, although projects over $1M typically would require an RSA to ensure that the use of the funds is maximized and low cost safety strategies have been pursued. The HSIP application is at the following link: http://www.idot.illinois.gov/transportation-system/local-transportation-partners/county-engineers-and-local-public-agencies/funding-opportunities/highway-safety-improvement-program. We require the HSIP project to be linked to the SHSP, to be addressing fatalities and serious injuries, and to have a B/C greater than 1. The safety problem must be documented and the appropriate strategy for the problem should be selected and supported based on data. An RSA performed previously should be included in the application to support the project. District offices or Central Bureau of Safety Engineering will assist with applications upon request.
1	Project must have the potential to reduce serious injuries and fatalities using a proven low-cost safety countermeasure; see https://www.dropbox.com/s/opx0t27af8a863k/140305_HSIP%20Manual.pdf?dl=0.
1	http://www.dot.state.oh.us/Divisions/Planning/ProgramManagement/HighwaySafety/HSIP/Pages/Funding-Application- Process.aspx.

Question 25: "What are some alternative funding allocation techniques your state DOT has implemented for local road program safety projects? Check all that apply."

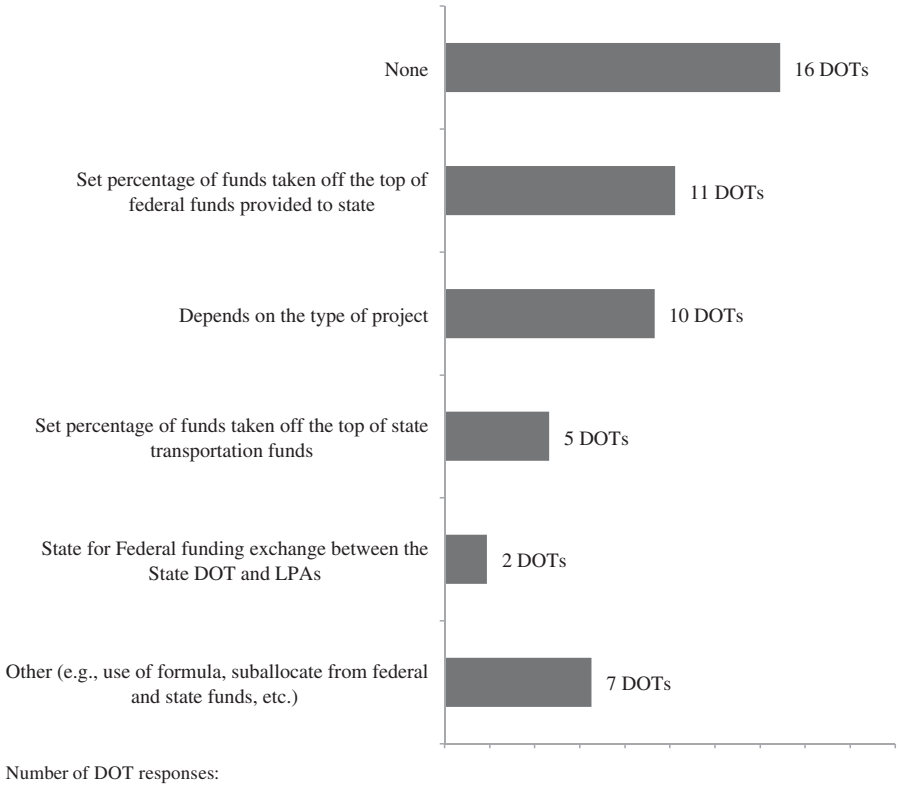


FIGURE A8 Survey response to Question 25: "What are some alternative funding allocation techniques your state DOT has implemented for local road program safety projects? Check all that apply."

Question 26: "At what level is the funding allocation done for local road program safety projects? Check all that apply."

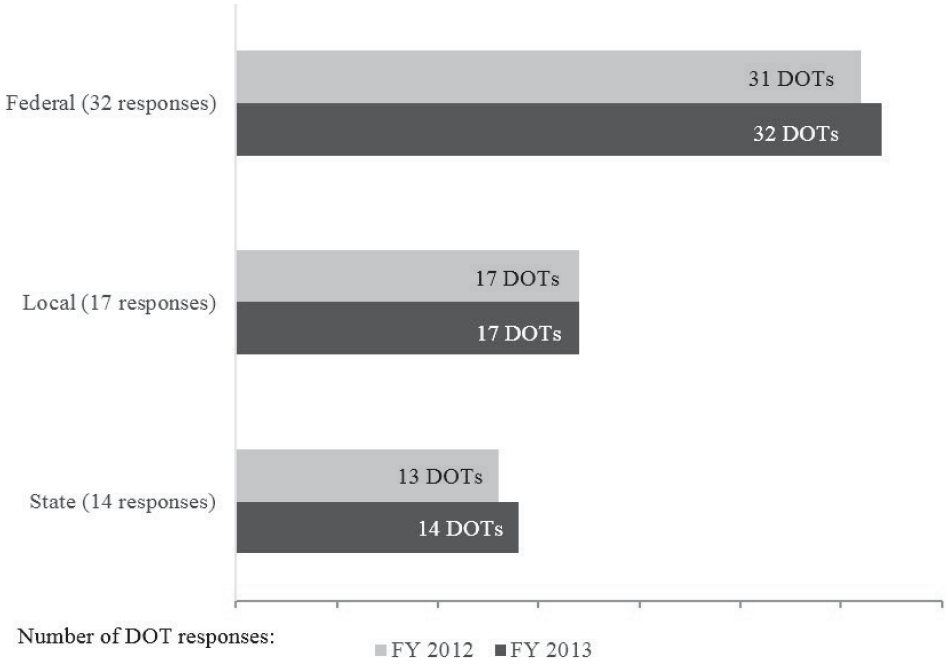


FIGURE A9 Survey response to Question 26: "At what level is the funding allocation done for local road program safety projects? Check all that apply."

Question 27: "What's the estimated percentage of local agencies that have local road safety plans or equivalent plans in your state?"

TABLE A19
SURVEY RESPONSE TO QUESTION 27: "WHAT'S THE ESTIMATED PERCENTAGE OF LOCAL AGENCIES THAT HAVE LOCAL ROAD SAFETY PLANS OR EQUIVALENT PLANS IN YOUR STATE?"

Response Type	Response Rate
None	31% (13 DOTs)
10% or less	40% (17 DOTs)
25% or less	10% (4 DOTs)
50% or less	12% (5 DOTs)
75% or less	2% (1 DOT)
100% or less	5% 2 DOTs)

Question 28: "Does you state DOT assist in financing through either federal or state funds the local road safety plans or their equivalent?"

TABLE A20
SURVEY RESPONSE TO QUESTION 28: "DOES YOU STATE DOT ASSIST IN FINANCING THROUGH EITHER FEDERAL OR STATE FUNDS THE LOCAL ROAD SAFETY PLANS OR THEIR EQUIVALENT?"

Response Type	Response Rate
Yes	57% (27 DOTs)
No	43% (20 DOTs)

Question 29: "Is your state DOT considering funding assistance of local road safety plans or their equivalent in the future?"

TABLE A21
SURVEY RESPONSE TO QUESTION 29: "IS YOUR STATE DOT CONSIDERING FUNDING ASSISTANCE OF LOCAL ROAD SAFETY PLANS OR THEIR EQUIVALENT IN THE FUTURE?"

Response Type	Response Rate
Yes	44% (8 DOTs)
No	56% (10 DOTs)

Question 30: "Does your state's SHSP include an element which identifies and addresses goals and initiatives to improve the safety on local roads?"

TABLE A22
SURVEY RESPONSE TO QUESTION 30: "DOES YOUR STATE'S SHSP INCLUDE AN ELEMENT WHICH IDENTIFIES AND ADDRESSES GOALS AND INITIATIVES TO IMPROVE THE SAFETY ON LOCAL ROADS?"

Response Type	Response Rate
Yes	68% (32 DOTs)
No	32% (15 DOTs)

Question 31: "Describe the extent of safety goals on local roads and provide the website link if available."

TABLE A23
SURVEY RESPONSE TO QUESTION 31: "DESCRIBE THE EXTENT OF SAFETY GOALS ON LOCAL ROADS AND PROVIDE THE WEBSITE LINK IF AVAILABLE."

Count	Response
1	Goal is to reduce fatal and serious injury crashes by 15% on ALL public roads by year 2020.
1	We have identified various local road safety initiatives as part of our SHSP Action Plans.
1	Federal highway safety links are available on the LTAP website: http://www.ltap.org.
1	http://azdot.gov/about/transportation-safety/arizona-strategic-highway-safety-plan
1	http://www.dot.state.mn.us/trafficeng/safety/shsp/Minnesota_SHSP_2014.pdf
1	http://www.justdrivepa.org/Resources/Strategic%20Highway%20Safety%20Plan.pdf (p. 26)
1	http://www.maine.gov/mdot/safety/documents/2014/2014SHSP102314_75a.pdf
1	Local roads are included when safety projects are evaluated.
1	You can view the SHSP through the weblink at zerofatalitiesnv.com.
1	Emphasis Area: Intersection and Run-Off-The-Road. Strategy: Continue education and outreach to local jurisdictions to improve safety. Action Steps: (1) Coordinate with local jurisdictions to improve intersection and roadway safety; (2) Conduct workshops to teach local jurisdictions about proven countermeasures, low-cost safety improvements, *MUTCD*, etc. http://www.dot.ri.gov/community/safety/reports/strategicplan.php

TABLE A23
(*continued*)

Count	Response
1	The component for local is not a set aside but a part of our plan based on data: http://www.massdot.state.ma.us/Portals/8/docs/traffic/shsp/shspSeptember2013.pdf. As an example, for Intersections it has the following strategies regardless of roadway ownership so that any of this is covered: Identify intersection crash locations and causes; educate safety practitioners on best practices for design; incorporate safety elements into intersection design and maintenance; enhance enforcement of intersections.
1	http://www.safehomealabama.gov/Portals/0/PDF/11-SAS-009.FullVersionFINALLowRes.pdf. High Risk Rural Roads Program (HRRRP)—This program provides safety improvements on local roads by using procedures developed by ALDOT and consistent with FHWA criteria. ALDOT accepts proposals from counties and provides funding based on estimated reductions of fatal and injury crashes through system-wide programs that address common crash patterns. Emphasis areas in this effort are horizontal curves, treatment of bridge ends, and guardrails.
1	Here is a link to the state's strategic highway safety plan. This SHSP does not have a section dedicated solely to local agencies, but rather is meant to be applied statewide regardless of jurisdiction. There is a new/updated SHSP near completion that will take effect this year. https://www.codot.gov/library/traffic/traffic-manuals-guidelines/safety-crash-data/problem-id-annual-reports/FY2007_SPIRS_20061001.pdf
1	Our goal for the Illinois SHSP is for all public roads. We break out the local roadways to determine the safety performance of local roads in relation to the total fatalities and serious injuries and those that occur on state routes. This is found in our SHSP. With the last two years showing an increase in fatalities from the 2011 low, we have implemented several safety initiatives directed at local roadways. They include local safety plans, local safety workshops, heat maps for all emphasis areas for each of the 102 counties, data trees for all 102 counties, "top 5% roadways and intersections" for local roadways, district lead joint jurisdiction safety projects, system-wide safety analysis, etc. We meet regularly with the Illinois Association of County Engineers and have been holding Safety Performance Measures meetings with the MPOs to begin target setting process.
1	SHSP strategies and specific actions focused on local roadway safety: www.dot.ca.gov/hq/traffops/shsp/
1	The Local Roads Safety Plan is part of our SHSP and can be found at the following link: http://www.ksdot.org/Assets/wwwksdotorg/bureaus/burTrafficSaf/reports/LocalRoadsSHSP.pdf
1	Cities and counties face diverse transportation safety issues. It is important to note that some rural communities may encounter issues related to speeding while urban areas may encounter other safety problems such as pedestrian and vehicular conflicts at intersections and school safety zones. Despite the differences, local safety efforts should address the goals and objectives of the SHSP. Local governments are encouraged to identify high priority transportation safety issues by analyzing crash numbers, types, and severity of crashes, and develop countermeasures to address them.
1	http://www.njtpa.org/Project-Programs/Project-Development/Local-Safety.aspx http://www.dvrpc.org/Transportation/Safety/ http://www.sjtpo.org/HSIP.html
1	The goal for the Infrastructure and Operations Emphasis Area is to reduce roadway departure and intersection fatalities and injuries by 50 percent by 2030. Figures 3.12 through 3.15 show the benchmarks to achieve these goals. Strategies can be found at: http://www.destinationzerodeaths.com/Updated%202011%20SHSP.pdf
1	Oregon focuses on all aspects of safety on local roads. Oregon applies the 4 "Es" to Transportation Safety (Education, Enforcement, Engineering, and EMS) approach where possible and where the safety culture exists: http://www.oregon.gov/ODOT/TS/docs/tsap_revised_03-20-12.pdf
1	http://www.iowadot.gov/traffic/shsp/pdf/SHSP.pdf Iowa is piloting local road safety plan development in 12 counties in 2015 and working to increase HSIP spending on lane departure strategies on secondary roads.
1	See pp. 7–9: http://highwaysafety.vermont.gov/sites/vhsa/files/SHSP%20Supplement_2013-07-23.pdf
1	Continue the reduction trend; we view all roads in Tennessee the same when it comes to the number and severity of crashes.
1	Reduce fatal crashes to zero on all public roads according to NDDOT Strategic Highway Safety Plan. Link: https://www.dot.nd.gov/divisions/safety/docs/ND_SHSP_final_2013-09-09.pdf
1	Local agencies are represented on the Governor's Traffic Safety Advisory Commission, which is charged with implementing the SHSP. http://www.michigan.gov/documents/msp/SHSP_2013_08_web_412992_7.pdf
1	http://www.targetzero.com/. While local roads are specifically discussed in the SHSP, it is primarily through the overall emphasis areas and data that local roads are represented. Local roads make up 70% of all fatal/serious crashes in the state and the emphasis areas are based on that data. So local roads are well-represented. In addition, the strategies listed in each emphasis area include those that are focused on local agencies (i.e., some do not apply to state roads but are still included in the list of strategies).
1	Rural local roads are not only a specific element our SHSP, but all the other emphasis areas are applicable to all public roads throughout the state. The Utah SHSP is posted here: http://ut.zerofatalities.com/safety_plan.php
1	Overall, we are currently defining and updating our goals for reducing fatalities and serious injury. Currently our goal is to reduce fatalities 9% and the fatality rate by 4.8% over a three-year period.
1	http://www.txdot.gov/business/signs/traffic-planning.html: Texas Strategic Highway Plan strategies include local roads as well as on-system highways.
1	Generally included in the strategies to mitigate road departure and intersection crashes: http://www.mdt.mt.gov/visionzero/plans/chsp.shtml

For Questions 32–35: Does your state DOT or do other state agencies (Office of Motor Carrier Services, Director of Department of Public Safety, Governor's Highway Safety and Department of Motor Vehicles) have any **noteworthy initiatives or practices** in promoting safety on the local road system in the 4E areas? Provide examples of these initiatives or practices.

Question 32: "Engineering (e.g., sign upgrading, comment or provide link to program)."

TABLE A24
SURVEY RESPONSE TO QUESTION 32: "ENGINEERING (E.G., SIGN UPGRADING, COMMENT OR PROVIDE LINK TO PROGRAM)."

Count	Response
1	County signing projects
1	High risk rural sign improvements and rumble strip program
1	LTAP provides student interns for sign inventory programs.
1	Multi-way stop sign improvements, school sign improvements, centerline rumble strips
1	Not aware of specific local road program.
1	Safety Circuit Rider http://www.kyt2.com/training/program/safety-circuit-rider-program
1	Sign and marking upgrade, rumble strips
1	Through the RSA process
1	We may fund PE 100% upon request.
1	Federal highway safety links are available on the LTAP website.
1	Go to: http://www.zerofatalitiesnv.com/ and visit the SHSP document
1	http://azdot.gov/about/transportation-safety/arizona-strategic-highway-safety-plan
1	We have two task teams that address serious crash types; Roadway Departure and Intersection
1	Currently investigating process to distribute federal and state funds to local municipalities for implementation of low-cost systemic safety improvements.
1	Currently ODOT is delivering projects on local roads for systemic improvement that includes sign upgrade, rumble strips, pavement markings and other low-cost countermeasures. From year 2017, project selection will be statewide: http://www.oregon.gov/ODOT/HWY/TRAFFIC-ROADWAY/Pages/ARTS.aspx.
1	FDOT D7 Local Agency Project Funding Program: http://www.tampabaytrafficsafety.com/HSIP/_layouts/15/start.aspx#/SitePages/Home.aspx
1	County Safety Program, City Safety Program, Corridor Safety Program (4 Es): http://www.wsdot.wa.gov/LocalPrograms/Traffic/FedSafety.htm. The local safety efforts (shown above) are funded with 70% of the HSIP funds that come to the state (funds split according to fatal/serious crash data for state/local roads).
1	We have performed: (1) system-wide rural sign upgrades for regulatory and warning signs for all 102 counties; (2) statewide safety analysis to identify the top 5% local roadway intersections and segments that have high potential for safety improvement. This is done according to peer groups (rural two-lane, urban multi-lane, etc.); (3) heat maps for Emphasis Areas that can help local agencies screen for areas to focus efforts, perform additional analysis, and prioritize safety efforts; (4) pedestrian safety enhancements: System-wide pedestrian countdown signals, signal timing upgrades, crosswalk and signing upgrades/enhancements; (5) spreadsheets to assist MPOs in safety performance target setting (these are provided directly to MPOs and not put on public website); and (6) Guidelines for Systemic Analysis and improvements.
1	The Texas Highway Safety Improvement Program has an off-system category that allows off-system categories to compete against other off-system projects for funding.
1	http://www.iowadot.gov/traffic/sections/safety.htm. See the links to the Horizontal Curve Sign Program, Overhead Flashing Beacon Replacement Program, Traffic Engineering Assistance Program. Traffic Safety Improvement Program Highway Safety Improvement Program-Secondary
1	LHTAC uses a systematic approach to sign upgrades through a competitive application process. Also pavement markings and intersection improvements are a program that is developed at the local level. Refer to: lhtac.org for details.
1	This is part of the state HSIP initiatives. It was a unique program when High Risk Rural Roads funding was a dedicated set aside.
1	Initiatives still being developed with local SHSP development. Desire is for agencies to use systemic safety approach in regards to low-cost engineering initiatives that will be identified.
1	http://www.minnesotatzd.org/whatistzd/foures/engineering/ http://www.dot.state.mn.us/stateaid/trafficsafety.html
1	Developed a Vulnerable User Safety Action plan for one local municipality with the goal of developing a Statewide Vulnerable User Safety Action plan that all local agencies can apply to their roadways.
1	Sign upgrades on the local road system; systemic curve ID and treatment project; Intersection and Roadway Departure ID and treatment; collection of roadway data on the local road system; location of crashes on the local road system Regional Safety Coalitions
1	There is no weblink for this, but we implemented a systemic local roads curve program to reduce run off road crashes. This involves hundreds of curves across the state with sign upgrades and pavement marking plans.
1	Roadway design can influence the occurrence of motor vehicle crashes. Modification of the roadway, in many cases, offers a long-term solution to crash problems in a given location. Safety design can often reduce human error and the severity of crashes.
1	http://www.safehomealabama.gov/Portals/0/PDF/11-SAS-009.FullVersionFINALLowRes.pdf pp. 25-36): Implementing the Roadway Departure Program that will involve the resigning of all horizontal curves on the state maintained system. Developing a methodology to implement a similar program on the local rural routes. Implementing the use of several safety analysis tools, along with a Speed Management Manual, Road Safety Assessment Manual, and other resources.

TABLE A24
(*continued*)

1	Strategic Highway Safety Program: https://www.dot.nd.gov/divisions/safety/docs/ND_SHSP_final_2013-09-09.pdf
1	INODT has published a list of 18 systemic safety project work types that only require an LPA to fill out a short application form for HSIP funding eligibility. A very popular example allows local agencies to utilize HSIP funds for systemic inventory and upgrade of regulatory and warning retro-reflectivity. See Local Safety on the INDOT web page: http://www.in.gov/indot/2357.htm.
1	We promote the use of systematic and systemic safety through LTAP-led training offered for free to local governments. We also use LTAP to train local governments on how to use our GIS-based Crash Analysis Tool to identify problem locations and develop countermeasures. ODOT provides LTAP with up to $1M annually to offer townships assistance in upgrading their safety-related signage (with a focus on HRRR and priority crash corridors).
1	State DOT—Local Safety Initiative: http://www.michigan.gov/mdot/0,1607,7-151-9615_11261_45212---,00.html
1	Free signs provided to local governments in locations as determined by crash data, safety projects designed to improve striping, signing, and other roadway safety items through low-cost countermeasures.
1	School Zone Safety Initiative offered by VTrans to upgrade your school zone. This School Zone Safety Initiative has been created to help achieve uniform applications of traffic control devices within Vermont's local school zones for the purpose of enhancing the safety of road users through these school zones. These projects will be 100% federally funded using allocated Highway Safety Funds through MAP-21.
1	SHSP strategies and specific actions focused on engineering solutions: www.dot.ca.gov/hq/traffops/shsp/

Question 33: "Education [e.g., traffic safety culture, LTAP safety training, comment or provide link to program(s)]."

TABLE A25
SURVEY RESPONSE TO QUESTION 33: "EDUCATION [E.G., TRAFFIC SAFETY CULTURE, LTAP SAFETY TRAINING, COMMENT OR PROVIDE LINK TO PROGRAM(S)]."

Count	Response
1	LHTAC does perform some safety training. Refer to ihtac.org.
1	LTAP safety training courses
1	LTAP and GHSO
1	LTAP provides education and training
2	LTAP safety training
1	Local road safety training course provided for all local counties and municipalities.
1	Technology Transfer/LTAP: http://kyt2.com/training
1	Various safety outreaches are available. Working on a low-cost Safety Improvement program.
1	Committee meets monthly or quarterly; also there is LTAP training.
1	http://azdot.gov/about/transportation-safety/arizona-strategic-highway-safety-plan
1	http://www.minnesotatzd.org/whatistzd/foures/education/
1	http://www.oregon.gov/ODOT/TS/docs/tsap_revised_03-20-12.pdf
1	Traffic safety culture
1	Lone Star Local Technical Assistance Program offers training on safety, infrastructure, and work force development.
1	Traffic Safety Days—Week long safety education for high school students focusing on multiple safety topics. These are held all over the state and may bring in 500–1,000 students at one week's event. ISP also have Safety Education Officers that go into schools to discuss pertinent safety topics. We provide LTAP safety training on a variety of safety topics: *MUTCD*, low-cost safety improvements, RSAs. Outreach is also done through safety grants. This website provides a brief description of several initiatives: http://www.idot.illinois.gov/transportation-system/safety/roadway/index.
1	http://www.safehomealabama.gov/Portals/0/PDF/11-SAS-009.FullVersionFINALLowRes.pdf (pp. 53–60). LTAP offers a multitude of roadway safety courses at the request of the DOT and local agencies. Alabama held its first annual Rural Road Safety Workshop and Conference last September, with 135 attendees.
1	Indiana LTAP conducts LPA training on safety subjects such as crash data analysis and RSA Process under a program sponsored by INDOT, called the Hazard Elimination Program for Local Roads and Streets (HELPERS). See the Indiana LTAP website: http://rebar.ecn.purdue.edu/LTAP1/Home/.
1	This fiscal year the Bureau of Local Projects will initiate a Safety Circuit Rider Program. Our GHSO, through their education contractor Kansas Traffic Safety Resource Office, manages the SAFE Program. SAFE stands for Seatbelts Are For Everyone and promotes seatbelt use to high school students: http://www.ktsro.org/safe. This also includes an enforcement component.
1	Federal highway safety links are available on the LTAP website. Education during road safety training, like work zone/flagger, confined space and have competent person.
1	SHSP strategies and specific actions focused on education solutions: www.dot.ca.gov/hq/traffops/shsp/
1	LTAP Highway Safety Manual Training and Traffic Safety for Elected/Appointed Officials: http://www.michiganltap.org/

(*continued on next page*)

TABLE A25
(*continued*)

Count	Response
1	Education is needed at all levels of safety planning. Information and resources must be provided to citizens and Colorado's safety stakeholders about traffic safety and the long-term health of the people of Colorado. Education programs must be provided to all people in a community with culturally significant and effective messages.
1	Attorney General's Office, RI State Police, RIDOT, and AT&T involved in "It Can Wait" campaign where 41 schools have been visited to educate high school children on the dangers of texting and using a cell phone while driving.
1	LPA Training LTAP conducts safety training for LPAs Regional Safety Coalitions Impaired Driver Training for Law Enforcement LTAP participation in TRCC: http://www.ltrc.lsu.edu/ltap/lrsp.html
1	LTAP provides training and outreach for safety related training, *MUTCD*, and other similar type training.
1	Ditto, but also visit the Office of Traffic Safety http://ots.nv.gov/uploadedFiles/otsnvgov/content/home/Features/2015_Highway_Safety_Performance_Plan.pdf
1	FDOT State Safety Office NHTSA Grants: http://www.dot.state.fl.us/safety/3-Grants/Grants-Home.shtm LTAP Bike Ped Resource Center http://www.pedbikesrc.ce.ufl.edu/pedbike/default.asp
1	We are just beginning work on a major statewide awareness campaign for bicycle and pedestrian safety. This program started with 12 local communities across the state.
1	http://ia.zerofatalities.com/ Zero Fatalities education program http://www.iowaltap.iastate.edu/ Iowa's LTAP Multi-Disciplinary Team Development
1	We are working with our LTAP Coordinator to develop a local version of the "Alternative Intersections" training. This is designed more for generalist and young engineers.
1	Strategic Highway Safety Program: https://www.dot.nd.gov/divisions/safety/docs/ND_SHSP_final_2013-09-09.pdf
1	The Washington Traffic Safety Commission (the state's Governor's Highway Safety Office is a separate agency) conducts outreach for local agencies: http://wtsc.wa.gov/. In addition, there are occasional safety classes offered through the LTAP center (based within our Local Programs division of the DOT). http://www.wsdot.wa.gov/LocalPrograms/Training/
1	Utah Zero Fatalities campaign: http://ut.zerofatalities.com/Utah Highway Safety Office: http://publicsafety.utah.gov/highwaysafety/
1	Regional Safety Forums: State and local officials will come together with law enforcement, advocacy groups, and private sector leaders to discuss innovative approaches to improving highway safety in Vermont. From statewide initiatives to highly localized approaches, a range of topics and methods will be explored.
1	LTAP has provided safety training on *Traffic Practices Guidebook* that includes an effort to educate on the *Highway Safety Manual* practices. Also, Missouri has seven Regional Coalitions that focus safety efforts on education and enforcement (http://www.savemolives.com/).

Question 34: “Enforcement (e.g., seat-belt enforcement, comment or provide link to program).”

TABLE A26
SURVEY RESPONSE TO QUESTION 34: “ENFORCEMENT (E.G., SEAT-BELT ENFORCEMENT, COMMENT OR PROVIDE LINK TO PROGRAM).”

Count	Response
1	DUI enforcement, distracted driving enforcement
1	Department of Safety has targeted enforcement efforts funded by NHTSA.
1	Division of Highway Traffic and Safety has existing programs for local roads as well.
1	During defense driving training
1	Enforcement grants are provided to local agencies.
1	GR’s office conducting night-time seat belt enforcement.
1	Highway Safety Office Programs: http://michigan.gov/msp/0,4643,7-123-64773---,00.html
1	Not aware of specific local road program
1	Passed Primary Seatbelt Law. Seat belt use increased from 80% in 2011 to 87% in 2014.
1	Utah Highway Safety Office: http://publicsafety.utah.gov/highwaysafety/
1	Various NHTSA grants: http://transportation.ky.gov/Highway-Safety/Pages/Grants.aspx
1	Various funding available for focused enforcement efforts like seatbelts and alcohol
1	Ditto
1	http://azdot.gov/about/transportation-safety/arizona-strategic-highway-safety-plan
1	http://www.minnesotatzd.org/whatistzd/foures/enforcement/
1	http://www.oregon.gov/ODOT/TS/docs/tsap_revised_03-20-12.pdf
1	http://www.safehomealabama.gov/Portals/0/PDF/11-SAS-009.FullVersionFINALLowRes.pdf (pp. 23–24)
1	School zone law enforcement
1	Through communication of data driven finds
1	Office of Highway Safety provides funding to various locals for speed, pedestrian, DUI, and seatbelt enforcement.
1	The Highway Safety Division has many STEP grants specific to local law enforcement. MassDOT is also funding (through HSIP) enhanced enforcement for local police departments to target interactions between bicycles, pedestrians, and motorists. The state’s Traffic Records Coordinating Committee has funded local police departments’ crash data systems using 405c Federal funds.
1	SHSP strategies and specific actions focused on enforcement solutions: www.dot.ca.gov/hq/traffops/shsp/
1	http://www.dps.state.ia.us/commis/pib/Releases/2014/04-01-2014_GTSB_HighFive.htm Iowa GTSB High Five Program to increase seat belt use in rural counties with low compliance.
1	Provide speed trailers to local municipalities to inform public when exceeding the speed limit on roads with speeding issues/crash history
1	FDOT State Safety Office NHTSA Grants: http://www.dot.state.fl.us/safety/3-Grants/Grants-Home.shtm
1	The Washington Traffic Safety Commission funds many local agency enforcement programs: http://wtsc.wa.gov/
1	We have three task force teams that focus on occupant protection, aggressive driving, and impaired driving. These teams develop implementation plans designed to reduce fatalities and serious injuries. Enforcement is a key player and grant funds are provided to support the effort.
1	Missouri has seven regional coalitions that focus safety efforts on education and enforcement: http://www.savemolives.com/
1	Strategic Highway Safety Program: https://www.dot.nd.gov/divisions/safety/docs/ND_SHSP_final_2013-09-09.pdf
1	The Indiana Criminal Justice Institute (CJI) houses the Governor’s Council and has primary responsibility for all behavioral traffic safety programs including seat-belt use, impaired driving, and targeted local traffic law enforcement programs.
1	Enforcement of Colorado’s driving laws is an effective method in the prevention of traffic crashes. A police officer stopping a vehicle for a violation could mean the difference between an everyday drive and a traffic crash.
1	All the behavior/enforcement programs are funded and managed by the Idaho Transportation Department Office of Highway Safety. LHTAC does not administer any behavior or enforcement type of highway safety behavior programs.

Question 35: "Emergency Services (e.g., enhance E911 wireless service, emergency vehicle signal preemption, comment or provide link to program)."

TABLE A27
SURVEY RESPONSE TO QUESTION 35: "EMERGENCY SERVICES (E.G., ENHANCE E911 WIRELESS SERVICE, EMERGENCY VEHICLE SIGNAL PREEMPTION, COMMENT OR PROVIDE LINK TO PROGRAM)."

Count	Response
1	—
1	511 call
1	Has been a partner, but no specific initiatives to highlight.
1	N/A
1	None
1	Not aware of specific local road program
1	Various NHTSA grants: http://transportation.ky.gov/Highway-Safety/Pages/Grants.aspx
1	Ditto
1	Enhanced E911, emergency signal preemption
1	http://azdot.gov/about/transportation-safety/arizona-strategic-highway-safety-plan
1	http://www.minnesotatzd.org/whatistzd/foures/emergency/
1	http://www.oregon.gov/ODOT/TS/docs/tsap_revised_03-20-12.pdf
1	http://www.safehomealabama.gov/Portals/0/PDF/11-SAS-009.FullVersionFINALLowRes.pdf (pp. 64–66)
1	Emergency Service vehicle preparedness can, many times, mean the difference between life and death for people involved in traffic crashes. Each day, Emergency Service workers work in collaboration with traffic safety educators, law enforcement, traffic data experts, and traffic engineers to ensure a safe and efficient roadway system.
1	We have a task team that develops specific implementation plans and solutions to enhance our response times.
1	The local road program does not have any EMS type of projects they administer. Any EMS programs are administered by ITD.
1	EMS safety efforts are also a focus of the state SHSP. See http://www.savemolives.com/ for more detail.
1	We have developed training for Emergency responders to ensure that all can safety perform their job when responding to a crash.
1	SHSP Includes a Traffic Incident Management Component: http://www.michigan.gov/documents/msp/SHSP_2013_08_web_412992_7.pdf
1	SHSP strategies and specific actions focused on emergency services solutions: www.dot.ca.gov/hq/traffops/shsp/
1	Deploy emergency vehicle signal preemption at intersections where local agency/fire department agree to maintain hardware.
1	Strategic Highway Safety Program: https://www.dot.nd.gov/divisions/safety/docs/ND_SHSP_final_2013-09-09.pdf
1	The Washington Traffic Safety Commission, which chairs the state's Traffic Records Committee, also focuses efforts on improving emergency services data: http://wtsc.wa.gov. The Department of Health would also support Emergency Services efforts: http://www.doh.wa.gov/.
1	The state's Traffic Records Coordinating Committee has funded local EMS departments to improve their data collection systems using 405c Federal funds.
1	E911 wireless service was achieved in the state's first published SHSP. This goal has been met and is therefore no longer included. Emergency Vehicle Traffic Signal Preemption Systems may be found eligible on a case-by-case basis.

Question 36: "Does your state DOT use the Systemic Safety Project Selection Tool in selecting safety projects?"

TABLE A28
SURVEY RESPONSE TO QUESTION 36: "DOES YOUR STATE DOT USE THE SYSTEMIC SAFETY PROJECT SELECTION TOOL IN SELECTING SAFETY PROJECTS?"

Response Type	Response Rate
Yes	34% (16 DOTs)
No	33% (15 DOTs)
Not yet but plan to use	33% (15 DOTs)

Question 37: "Does your state DOT assist local agencies by conducting Road Safety Audits (Assessments)?"

TABLE A29
SURVEY RESPONSE TO QUESTION 37: "DOES YOUR STATE DOT ASSIST LOCAL AGENCIES BY CONDUCTING ROAD SAFETY AUDITS (ASSESSMENTS)?"

Response Type	Response Rate
Yes	77% (36 DOTs)
No	23% (11 DOTs)

Question 38: "Does your state DOT use a coordinated team approach across state DOT divisions to coordinate the local road safety program?"

TABLE A30
SURVEY RESPONSE TO QUESTION 38: "DOES YOUR STATE DOT USE A COORDINATED TEAM APPROACH ACROSS STATE DOT DIVISIONS TO COORDINATE THE LOCAL ROAD SAFETY PROGRAM?"

Response Type	Response Rate
Yes	57% (27 DOTs)
No	43% (20 DOTs)

Question 39: "From a scale 1 to 5 (1 being least effective to 5 being very effective), rate your experience in handling local road safety program coordination."

TABLE A31
SURVEY RESPONSE TO QUESTION 39: "FROM A SCALE 1 TO 5 (1 BEING LEAST EFFECTIVE TO 5 BEING VERY EFFECTIVE), RATE YOUR EXPERIENCE IN HANDLING LOCAL ROAD SAFETY PROGRAM COORDINATION."

Response Type	Response Rate
1	0% (0 DOTs)
2	3.7% (1 DOT)
3	37.0% (10 DOTs)
4	44.4% (12 DOTs)
5	14.8% (4 DOTs)

Question 40: "Which best describes your state's current problem identification process on local roads?"

TABLE A32
SURVEY RESPONSE TO QUESTION 40: "WHICH BEST DESCRIBES YOUR STATE'S CURRENT PROBLEM IDENTIFICATION PROCESS ON LOCAL ROADS?"

Response Type	Response Rate
Combination of both methods	53.2% (25 DOTs)
Reactive method	29.8% (14 DOTs)
Proactive method	6.4% (3 DOTs)
Other (e.g., no process, under the process of development, etc.)	10.6% (5 DOTs)

Question 41: "Please describe your reactive method of your state's current problem identification process on local roads. Check all that apply."

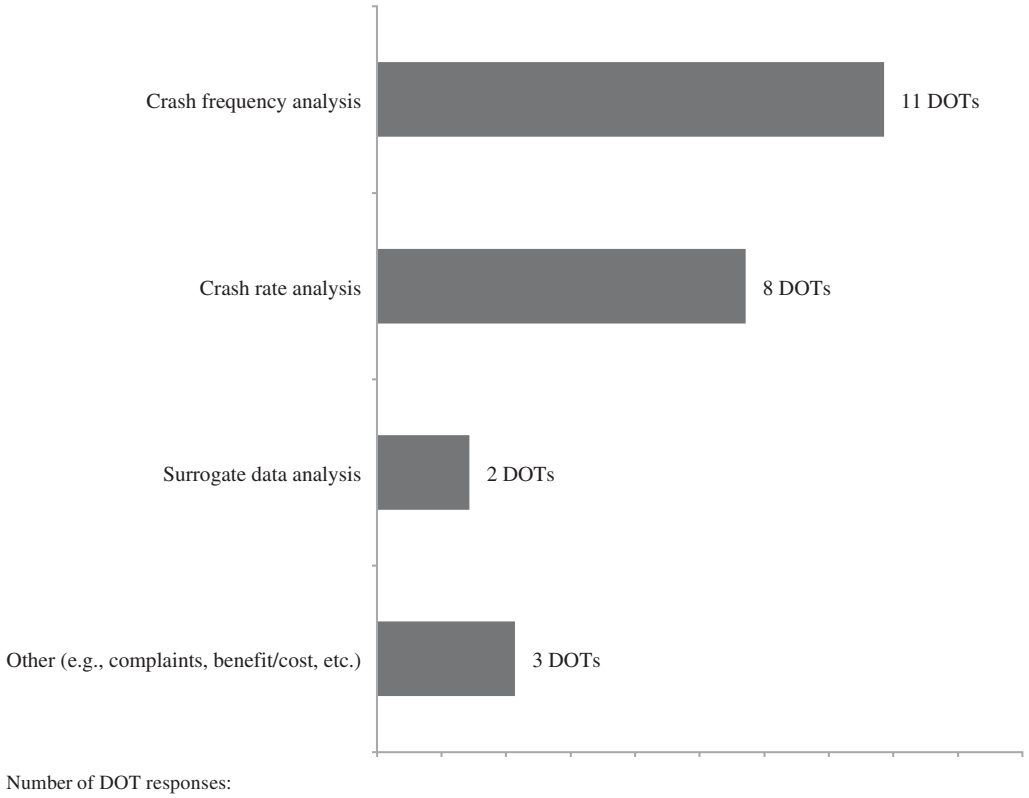


FIGURE A10 Survey response to Question 41: "Please describe your reactive method of your state's current problem identification process on local roads. Check all that apply."

Question 42: "Please describe your proactive method of your state's current problem identification process on local roads. Check all that apply."

TABLE A33
SURVEY RESPONSE TO QUESTION 42: "PLEASE DESCRIBE YOUR PROACTIVE METHOD OF YOUR STATE'S CURRENT PROBLEM IDENTIFICATION PROCESS ON LOCAL ROADS. CHECK ALL THAT APPLY."

Response Type	Response Rate
Risk factor analysis	67% (2 DOTs)
Road Safety Audit (RSA)	100.0% (3 DOTs)
Safety performance function	0% (0 DOTs)

Question 43: "Please describe your combination of both reactive and proactive methods of your state's current problem identification process on local roads."

TABLE A34
SURVEY RESPONSE TO QUESTION 43: "PLEASE DESCRIBE YOUR COMBINATION OF BOTH REACTIVE AND PROACTIVE METHOD OF YOUR STATE'S CURRENT PROBLEM IDENTIFICATION PROCESS ON LOCAL ROADS."

Count	Response
1	Crash data and roadway evaluation are combined to rate roadway segments for consideration.
1	Identify high crash locations and also conduct systemic approach for locations.
1	Look at both accident numbers and characteristics of roadways
1	Network screening, site-specific analysis, crash data, RSAs
1	Provide accident data and also encourage use of proactive low-cost safety countermeasures
1	Refer to: http://lhtac.org/programs/lhsip/
1	We address both hot spot project (reactive) and systemic approaches (proactive) for local roads.
1	We're still defining it.
1	Spot locations are primarily addressed through the City Safety Program (reactive). Risk locations over widespread areas (systemic safety) are addressed both through the City Safety Program and the County Safety Program (proactive). The County Safety Program is entirely focused in this manner.
1	Program systemic intersection and curve signage projects as a proactive method. Program safety projects based on crash data analysis.
1	INDOT conducts annual screening of roadway networks for (both state and local) for apparent safety risks. All intersections, road segments, and interchange ramps undergo a comparison of multiyear crash frequency data to nominal risk calculated for two indexes. The Index of Crash Frequency measures relative risk of all crashes and the Index of Crash Cost measures relative risk of severe crashes. The results can be used to conduct RSAs for both reactive "spot" safety improvement projects and for planning proactive systemic safety projects.
1	http://www.dot.state.mn.us/stateaid/trafficsafety/hsip/2013announcement.pdf http://www.dot.state.mn.us/stateaid/trafficsafety/hsip/2013application.pdf
1	We invest in safety treatments at prioritized locations (using SafetyAnalyst methods) and we make proactive safety investments in low-cost systematic safety treatments.
1	Reactive: ODOT uses crash-based analysis for network screening purposes for both state highways and local roads. We use Safety Priority Index System (SPIS) for this purpose. SPIS is a numerical value based on the combination of crash rate, crash frequency, and crash severities. http://www.oregon.gov/ODOT/HWY/TRAFFIC-ROADWAY/pages/spis.aspx Proactive: For some areas ODOT uses risk factor-based analysis (http://www.oregon.gov/ODOT/HWY/TS/Pages/Bicycle_Pedestrian_Safety.aspx). We also conduct Road Safety Audits. For newly developed All Roads Transportation Safety, we will use *Highway Safety Manual* Safety Performance Functions for some areas. http://www.oregon.gov/ODOT/HWY/TRAFFIC-ROADWAY/Pages/ARTS.aspx
1	FDOT has initiated efforts to combine reactive and proactive methods thru D7's Local Agency project Funding Program and Intersection Safety Implementation efforts in D2 and D3.
1	(1) We identify crash hot spots that may be eligible for funding. (2) We will do a systemic inventory of the road network of a rural county and recommend low-cost safety improvements (usually signing and delineation).
1	Low-cost sign and markings projects. Roads are selected based on crashes (EPDO number). But then the entire corridor is reviewed and signs upgraded or new signs added regardless of the locations of the crashes.
1	Through an application process, locals submit locations for funding based presumably on crash experience. Our HRRRP also includes systemic improvements such as signing, tree removal, and headwall removal that are based on aggregate crash data but not specific crash data.
1	We have been utilizing system-wide improvements for several years. Local agencies are more used to having projects that are site-specific. We have been working with them to implement system-wide improvements. We are working to provide locations with severe crashes (both specific routes/corridors as well as multiple locations based on similar roadway features contributing to the severe crashes) that locals can target improvements
1	Proactively identify safety concerns through data analysis, while still addressing other safety concerns as they are identified by local and state agencies.
1	RIDOT is in the process of developing a pilot project with several local communities for them to request locations on their local road network in need of safety improvements. Some locations are based on crash history, while others may be systemic in nature (i.e. curve signage, enhanced roadway striping, etc.).

Question 44: "Please describe your other method of your state's current problem identification process on local roads."

TABLE A35
SURVEY RESPONSE TO QUESTION 44: "PLEASE DESCRIBE YOUR OTHER METHOD OF YOUR STATE'S CURRENT PROBLEM IDENTIFICATION PROCESS ON LOCAL ROADS."

State	Comment
Delaware	No current process for identifying safety issues on local roads
Georgia	We examine crash data to identify "hot spots," but we also work with local agencies to identify locations where their insights provide opportunities that should be addressed.
Kentucky	We don't have a defined local road safety program; all local projects compete equally.
Missouri	With completion of local SHSPs, we are trying to identify systemic safety countermeasures. This is also a proactive approach.

Question 45: "What are the main criteria used in prioritizing local safety projects?"

TABLE A36
SURVEY RESPONSE TO QUESTION 45: "WHAT ARE THE MAIN CRITERIA USED IN PRIORITIZING LOCAL SAFETY PROJECTS?"

Response Type	Response Rate
Cost/benefit analysis	59.6% (28 DOTs)
Crash history (e.g., crash rate, crash severity level, etc.)	55.3% (26 DOTs)
Available funding	51.1% (24 DOTs)
Combination of criteria or formula	8.5% (4 DOTs)
Other (e.g., under development, none, etc.)	14.9% (9 DOTs)

Question 46: "Please provide details of the combination of criteria or formula or provide reference/website link."

TABLE A37
SURVEY RESPONSE TO QUESTION 46: "PLEASE PROVIDE DETAILS OF THE COMBINATION OF CRITERIA OR FORMULA OR PROVIDE REFERENCE/WEBSITE LINK."

Count	Response
1	Criteria such as number of crashes, average daily traffic, geometric features, etc. are used.
1	Refer to: http://lhtac.org/programs/lhsip/
1	WRRSP at: http://www.uwyo.edu/wyt2/safety%20program/
1	http://azdot.gov/about/transportation-safety/arizona-strategic-highway-safety-plan

Question 47: "What agency submits local road safety projects to the state DOT? Check all that apply."

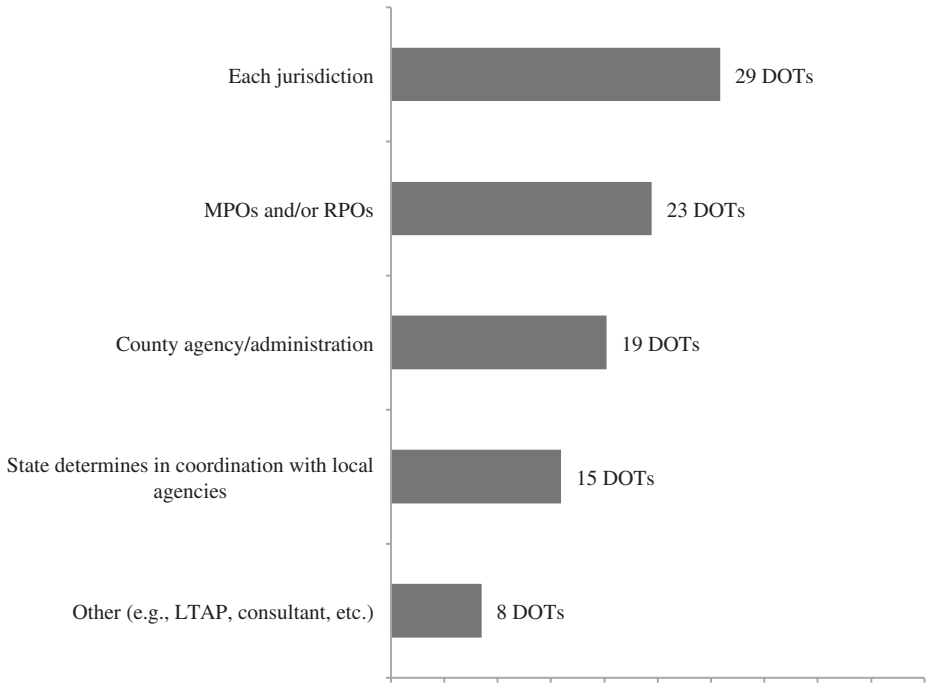


FIGURE A11 Survey response to Question 47: "What agency submits local road safety projects to the state DOT? Check all that apply."

Question 48: "Based on the process as described in previous questions associated with project prioritization and the safety projects submittal processes, do you think local safety projects are competitive with state road safety projects?"

TABLE A38
SURVEY RESPONSE TO QUESTION 48: "BASED ON THE PROCESS AS DESCRIBED IN PREVIOUS QUESTIONS ASSOCIATED WITH PROJECT PRIORITIZATION AND THE SAFETY PROJECTS SUBMITTAL PROCESSES, DO YOU THINK LOCAL SAFETY PROJECTS ARE COMPETITIVE WITH STATE ROAD SAFETY PROJECTS?"

Response Type	Response Rate
Yes	60% (28 DOTs)
No	40% (19 DOTs)

Question 49: "Why do you think local safety projects are not competitive with state safety projects?"

TABLE A39
SURVEY RESPONSE TO QUESTION 49: "WHY DO YOU THINK LOCAL SAFETY PROJECTS ARE NOT COMPETITIVE WITH STATE SAFETY PROJECTS?"

Count	Response
1	Fewer fatal and serious injury crashes, so lower B/C
1	Lack of funding at local level
1	Lack of linear referencing system
1	They don't compete with the state safety projects at the project level.
1	Different prioritization process
1	Provide more priority to state to maintain road safety improvement
1	Because the local road safety program funding comes off the top, these projects don't compete with state projects for funding.
1	There is funding set aside for local projects so they only compete against one another and not against state projects.
1	At this point we suspect that they are not competitive, but we still have a lot of roadway data to collect and analyze on the local system.
1	LHTAC is given an allocation of funding (block of funds) from the HSIP program and they break it down further into a specific local program with their own set of project application and selection processes. Please refer to: http://lhtac.org/programs/lhsip/
1	South Carolina is a state where the majority of roads (66%) are state-maintained and account for nearly 95% of fatalities. Therefore, there are no local road programs that would compete with the needs of the state system
1	We do not yet have an equivalent method for network screening of high crash locations. However, we are currently undertaking a project to enable screening across all jurisdictions.
1	Local projects are generally on lower volume roads than state projects. This makes it harder for them to compute funds.
1	We don't do local safety projects as we maintain the majority of the roads in the state. Only 11% of crashes occur on the locally maintained system. There is no data driven reason to have a local road safety program.
1	In Minnesota, it depends on the method of evaluation and the location within the state; i.e., cities and counties within the seven county metro areas compete well with B/C (reactive) project selections, but the cities and counties outside the metro area have little chance. Different risk factors and/or values for associating risk (e.g., average daily traffic) were chosen for the state and local systems as they have different makeups. This continues to support the importance of having two "pots" of money one state and one local for the safety program.
1	There is no specific local safety program. All local projects compete in the same manner. In general, 85% of our fatal crashes occur on the State System (~35%). So the remaining 15% is spread across the Local System (~65%).
1	I think that the local agency projects have not been as strong overall. I think educating the locals on the goal of a safety project is critical....that safety is about reducing fatalities and serious injuries and not just total crashes or operational needs. We have had local agencies want to use safety funds for projects to address geometric improvements when a new school is being built. Also, because of the various levels of technical expertise and staffing at the local level, identifying locations where severe crashes are occurring may be difficult. This is why we have developed the 5% lists and the heat maps. Local agencies have competing needs and priorities. We have a person in each IDOT district that handles safety. This aids in project development at state level. We are having districts reach out to local agencies to assist.

Question 50: "Does your state have performance measures for evaluating the impact of safety projects?"

TABLE A40
SURVEY RESPONSE TO QUESTION 50: "DOES YOUR STATE HAVE PERFORMANCE MEASURES FOR EVALUATING THE IMPACT OF SAFETY PROJECTS?"

Response Type	Response Rate
Yes	70% (33 DOTs)
No	30% (14 DOTs)

Question 51: "Are these performance measures used to direct the amount of funding (more funds, less funds) that is allocated to a certain local agency applicant?"

TABLE A41
SURVEY RESPONSE TO QUESTION 51: "ARE THESE PERFORMANCE MEASURES USED TO DIRECT THE AMOUNT OF FUNDING (MORE FUNDS, LESS FUNDS) THAT IS ALLOCATED TO A CERTAIN LOCAL AGENCY APPLICANT?"

Response Type	Response Rate
Yes	18% (6 DOTs)
No	82% (27 DOTs)

Question 52: "Please describe your state DOT's local road safety project funding application process. Provide a link to your website if available."

TABLE A42
SURVEY RESPONSE TO QUESTION 52: "PLEASE DESCRIBE YOUR STATE DOT'S LOCAL ROAD SAFETY PROJECT FUNDING APPLICATION PROCESS. PROVIDE A LINK TO YOUR WEBSITE IF AVAILABLE."

Count	Response
1	A draft the HSIP manual will be provided under separate e-mail.
1	HSIP Handbook: http://www.dot.state.ak.us/stwddes/dcstraffic/hsip.shtml#
1	Local entities can apply for safety funds through RTPOs and MPOs
1	Most roads in West Virginia are maintained by the DOT.
1	Mostly within HSIP on Benefit to Cost basis
1	N/A
1	N/A
1	None
1	Refer to: http://lhtac.org/programs/lhsip/
1	Still being developed
1	We have a call for projects and provide an application for the county to fill out.
1	Application with crash data and traffic counts are provided.
1	http://azdot.gov/docs/default-source/traffic-library/azhsip2010.pdf?sfvrsn=2
1	http://www.iowadot.gov/tsip.htm. Scroll to bottom of TSIP page for TSIP application process.
1	http://www.ltrc.lsu.edu/ltap/lrsp.html
1	http://www.mdt.mt.gov/publications/docs/forms/hsip_application.pdf
1	We have one application process for all project submissions through the DOT. http://www.dot.state.oh.us/Divisions/Planning/ProgramManagement/HighwaySafety/HSIP/Pages/Funding-Application-Process.aspx. We have a separate application process offered through the County Engineers Association: http://www.dot.state.oh.us/Divisions/Planning/ProgramManagement/HighwaySafety/HSIP/Pages/Funding-Application-Process.aspx
1	There is currently no application process for HSIP projects. HSIP locations are ranked and reviewed by the states. Low-cost sign projects. The sites are selected by the RPCs based on crashes. The RPCs select six locations per region and the state picks two sites for each region.
1	Division of Local Assistance issues calls for HSIP projects: www.dot.ca.gov/hq/LocalPrograms/HSIP/prepare_now.htm
1	Candidate projects are submitted to Hawaii DOT for STIP consideration. All projects, including safety projects, are subject to a cap for each county.
1	Suggested safety projects across the local systems include filled out forms suitable for direct submittal to the NDDOT for consideration for safety funding.
1	The funding application process for local road safety projects is the same as it is for state road safety projects. Information on the application and evaluation process for proposed safety projects can be found at the following website: http://www.dot.wisconsin.gov/localgov/highways/hsip.htm
1	WRRSP works with counties to develop applications. A committee of WYDOT engineers reviews and recommends projects to the State Highway Commission for approval.
1	Currently, the only available option is the ARLE funding: http://www.dot.state.pa.us/Portal%20Information/Traffic%20Signal%20Portal/FUNDARLE.html

TABLE A42
(*continued*)

Count	Response
1	See earlier question regarding the policy and application. We have a solicitation letter that goes out to local agencies for them to apply for funding. Candidate applications are submitted to the district offices for initial review and comment and then submitted to the Central Office for review by the safety committee.
1	Local agency submits project and the project is subjected to a cost-benefit analysis. Here is the link to the HSIP Manual: http://www.txdot.gov/business/resources/signage/traffic-planning.html
1	Local agencies are encouraged to directly contact the District Safety Engineer to participate on Community Traffic Safety Teams.
1	For hot spot projects that are funded on the Statewide Transportation Improvement Program (STIP), it is like any other project to be funded on the STIP. However, locals could use their own Chapter 90 funds or other sources as well. http://www.massdot.state.ma.us/Portals/8/docs/designGuide/CH_2_a.pdf. Here is the link to the Municipal Guide: http://www.mma.org/resources-mainmenu-182/doc_view/694-municipal-project-guide-for-road-and-bridge-projects
1	http://www.dot.state.mn.us/stateaid/trafficsafety/hsip/2013announcement.pdf
	http://www.dot.state.mn.us/stateaid/trafficsafety/hsip/2013application.pdf http://www.dot.state.mn.us/stateaid/lrip.html
1	Periodic project solicitation is done through the MPOs and Regional Planning and Program Managers to local agencies. This program is funded through HSIP funds.
1	A formal application is available, if requested, but we encourage the local jurisdictions to work with our region staff to determine project eligibility before making a funding request. We find that the local jurisdictions often have an unrealistic idea of what is “not safe” in their community compared to other areas of the state.
1	There is no specific local safety program. All local projects compete in the same manner. http://transportation.ky.gov/Local-Programs/Pages/default.aspx
1	See the Indiana Highway Safety Improvement Program Local Project Selection Guidance document at: http://www.in.gov/indot/2357.htm Applications for eligibility of “Spot” improvements require the submission of a complete RSA report and attendant benefit/cost analysis of the proposed project. Applications for pre-eligible systemic safety improvement projects may use a short form to define the project work type and application area.
1	The application process is detailed out in the annual call for Local Safety Projects letter: http://michigan.gov/mdot/0,4616,7-151- 9625_25885_40552---,00.html
1	Projects are completed as they are identified and funded the same way. The DOT qualifies, creates, and lets each project to a construction contract.
1	Local agencies that have an idea for a specific project can apply directly to the Department of Roads. This can be done by any agency, but is especially used by the larger cities, Lincoln and Omaha. Their proposals must be approved by one of our safety committees (depending on the type and cost of the proposed project) and, if approved, they must work with our Local Projects Section to get the project programmed. On systemic High Risk Rural Roads-type projects, we make a proposal and then send it out to the appropriate agencies (usually counties) to see if there is any interest in it. LTAP often takes charge of advertising the project, but if they want to take part, a county must work with Local Projects, who will guide them through the process.
1	ODOT has five regions. Currently (2014–2016) ODOT is delivering safety projects on local roads based on a ranked list prepared by a consultant. From 2017, safety projects on all roads including local roads will be delivered under All Roads Transportation Safety (ARTS) program, which has two components—hot spot and systemic. Systemic component of the program is application based. In each ODOT region, local jurisdictions within the region and ODOT region will compete with each other for project funding in three focus areas: roadway departure, intersection, and pedestrian/bicycle. http://www.oregon.gov/ODOT/HWY/TRAFFIC-ROADWAY/Pages/ARTS.aspx#Systemic_Approach
1	We use a benefit/cost to determine the eligibility of safety funds on the local system. We have a county-wide signing project that we have a set dollar amount and prioritize counties by crash rates.
1	MPOs solicits the projects from locals, screens them, and submits them to NJDOT. Technical review committee scores it and gives comments and recommends the projects for construction. FHWA approves the projects.
1	An application is available for each call for projects that goes out to local agencies. While the applications typically require mostly the same information, they have evolved over the years (not identical call to call). In most cases, local agencies must identify a location(s), the type of improvement(s) being made, and the associated costs/schedule for the project. For the most recent County Safety Program, counties were also required to submit a local road safety plan defining their process, how they set priorities for locations and countermeasures, etc. Counties were provided a crash data summary for the past 5 years to help them identify and set priorities to be addressed. Website information for calls for projects is not available online once the call is completed, but the application materials/information is available (just not online).
1	Municipalities may request improvements on non-state-owned roads. RIDOT allocates $1,000,000 annually for safety projects on non-state-owned roads. Municipalities may submit a HSIP proposal on any facility they wish; however, it must meet the HSIP eligibility requirements to be considered. There is no link to the proposal at this time. This effort is still under review and a pilot project is just starting to take place with 3 local municipalities.

Question 53: "Which agencies administer contracts for local safety projects? Check all that apply."

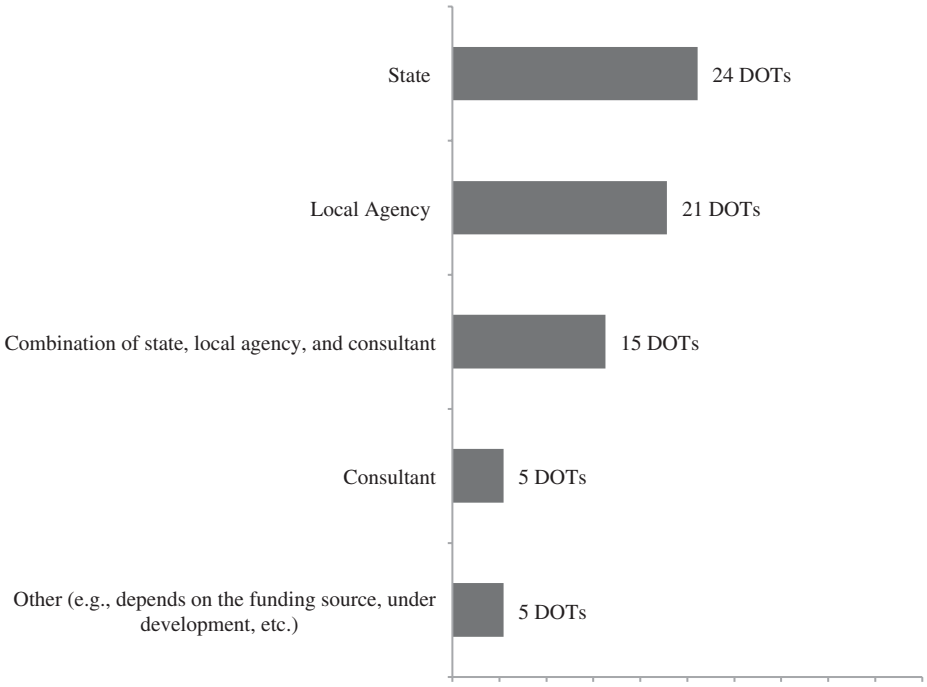


FIGURE A12 Survey response to Question 53: "Which agencies administer contracts for local safety projects? Check all that apply."

Question 54: "Does the state assist local agencies in procurement and contracting of local road safety projects?"

TABLE A43
SURVEY RESPONSE TO QUESTION 54: "DOES THE STATE ASSIST LOCAL AGENCIES IN PROCUREMENT AND CONTRACTING OF LOCAL ROAD SAFETY PROJECTS?"

Response Type	Response Rate
Yes	72% (34 DOTs)
No	28% (13 DOTs)

Question 55: "You indicated that the state does assist local agencies in procurement and contracting of local road safety projects. Is this done through the established LPA program?"

TABLE A44
SURVEY RESPONSE TO QUESTION 55: "YOU INDICATED THAT THE STATE DOES ASSIST LOCAL AGENCIES IN PROCUREMENT AND CONTRACTING OF LOCAL ROAD SAFETY PROJECTS. IS THIS DONE THROUGH THE ESTABLISHED LPA PROGRAM?"

Response Type	Response Rate
Yes	79% (23 DOTs)
No	21% (6 DOTs)

Question 56: "Please describe the procurement and contracting process. Provide a link to your website, if available."

TABLE A45
SURVEY RESPONSE TO QUESTION 56: "PLEASE DESCRIBE THE PROCUREMENT AND CONTRACTING PROCESS. PROVIDE A LINK TO YOUR WEBSITE, IF AVAILABLE."

State	Comment
Massachusetts	If it is a project on the STIP, it gets advertised and let the same as other projects.
Texas	All HSIP projects must go through the TxDOT letting process.
Utah	It is the same advertising process that is established for the state DOT.
Vermont	For our low-cost sign projects, the state combines them all into one large statewide projects. For the HSIP projects, the state contracts the projects individually. In both cases, the state designs the projects in consultation with the towns and advertises them according to our design process.

Question 57: "Does your state DOT offer any different bidding processes for smaller dollar value local federal-aid projects to facilitate the project?"

TABLE A46
SURVEY RESPONSE TO QUESTION 57: "DOES YOUR STATE DOT OFFER ANY DIFFERENT BIDDING PROCESSES FOR SMALLER DOLLAR VALUE LOCAL FEDERAL-AID PROJECTS TO FACILITATE THE PROJECT?"

Response Type	Response Rate
Yes	19% (9 DOTs)
No	81% (38 DOTs)

Question 58: "Please describe your state DOT's different bidding processes for smaller dollar value local federal-aid projects to facilitate the project."

TABLE A47
SURVEY RESPONSE TO QUESTION 58: "PLEASE DESCRIBE YOUR STATE DOT'S DIFFERENT BIDDING PROCESSES FOR SMALLER DOLLAR VALUE LOCAL FEDERAL-AID PROJECTS TO FACILITATE THE PROJECT."

State	Comment
Alabama	Force account work is permitted.
Illinois	Projects can be done through a local letting process or a state letting. The locals may use our master contract to procure items (such as signing) if they choose.
Kansas	Smaller projects can be constructed by force account where the work is done by the county and they are reimbursed.
Michigan	Force account
North Dakota	The Small Scale Safety Program is used when safety project estimates fall under $20,000. The NDDOT administrates the program, the locals find three suitable bids, and the project is awarded based on environmental clearances and approval from FHWA.
New York	Local sponsors can bid their own projects via state and local agreements (SLAs).
Ohio	We also provide a co-op purchasing program that is available to local governments.
Oregon	We currently don't have a different bidding process, but ODOT is working with FHWA for a force account method for public works to do curve warning sign upgrades.
Tennessee	We bracket several low-cost projects together for a better bid.

Question 59: "Projects involving the use of federal-aid dollars require comprehensive review, oversight, and auditing. Has this been a deterrent to local agencies participating in safety programs?"

TABLE A48
SURVEY RESPONSE TO QUESTION 59: "PROJECTS INVOLVING THE USE OF FEDERAL-AID DOLLARS REQUIRE COMPREHENSIVE REVIEW, OVERSIGHT, AND AUDITING. HAS THIS BEEN A DETERRENT TO LOCAL AGENCIES PARTICIPATING IN SAFETY PROGRAMS?"

Response Type	Response Rate
Yes	64% (30 DOTs)
No	36% (17 DOTs)

Question 60: "You indicated that comprehensive review, oversight, and auditing has been a deterrent to local agencies participating in safety programs. What procedures, if any, has your state instituted to encourage local agency participation in the use of federal aid dollars? Check all that apply."

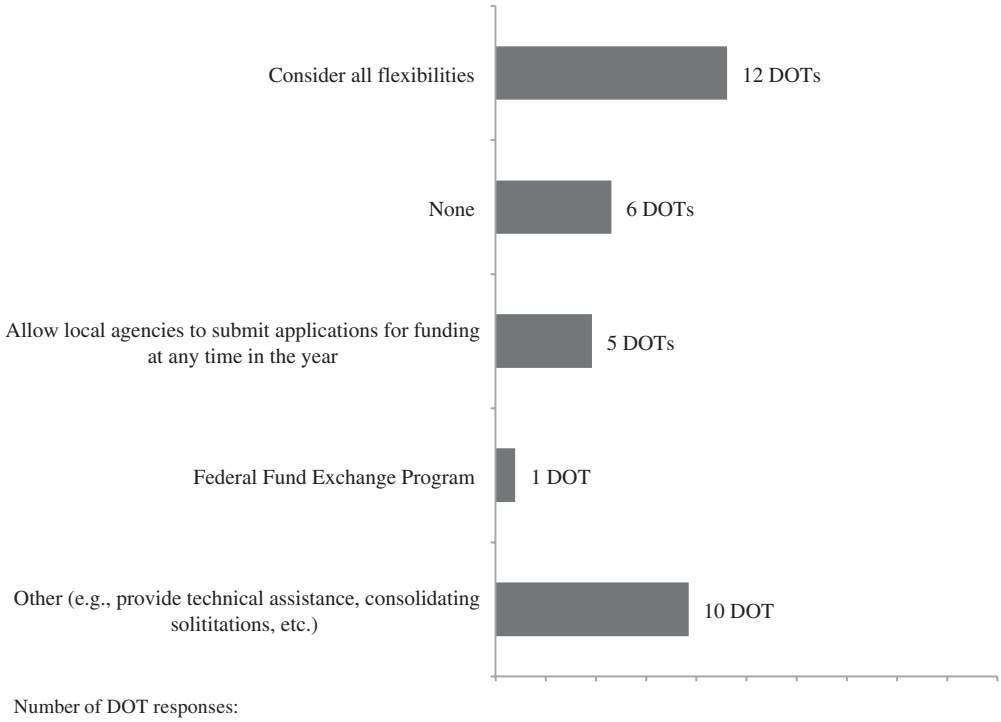


FIGURE A13 Survey response to Question 60: "You indicated that comprehensive review, oversight, and auditing has been a deterrent to local agencies participating in safety programs. What procedures, if any, has your state instituted to encourage local agency participation in the use of federal aid dollars? Check all that apply."

Question 61: "To assist local agencies, does your state DOT conduct post-project audits of compliance with federal regulations on those projects funded with Federal-aid dollars?"

TABLE A49
SURVEY RESPONSE TO QUESTION 61: "TO ASSIST LOCAL AGENCIES, DOES YOUR STATE DOT CONDUCT POST-PROJECT AUDITS OF COMPLIANCE WITH FEDERAL REGULATIONS ON THOSE PROJECTS FUNDED WITH FEDERAL-AID DOLLARS?"

Response Type	Response Rate
Yes	62% (29 DOTs)
No	38% (18 DOTs)

Question 62: "You have indicated that your state DOT conducts post-project audits of compliance with federal regulations on those projects funded with Federal-aid dollars. Please describe and/or provide reference or weblink to state website."

TABLE A50
SURVEY RESPONSE TO QUESTION 62: "YOU HAVE INDICATED THAT STATE DOTS CONDUCT POST-PROJECT AUDITS OF COMPLIANCE WITH FEDERAL REGULATIONS ON THOSE PROJECTS FUNDED WITH FEDERAL-AID DOLLARS. PLEASE DESCRIBE AND/OR PROVIDE REFERENCE OR WEBSITE TO STATE WEBSITE."

Count	Response
1	http://azdot.gov/docs/default-source/traffic-library/azhsip2010.pdf?sfvrsn=2
1	All projects receive some level of audit.
1	Local projects follow the DOTD standard procedures for audits.
1	MDOT Commission Audit 517.373.1500
1	The state DOT area offices do construction engineering on Federal-aid dollar safety projects.
1	Track all projects through the letting and construction process.
1	http://epg.modot.mo.gov/index.php?title=Category:136_Local_Public_Agency_(LPA)_Policy
1	http://lhtac.org/programs/lhsip/
1	http://transportation.ky.gov/Local-Programs/Pages/default.aspx
1	http://www.dot.state.al.us/ctweb/Documentation.html
1	http://www.dot.state.fl.us/specificationsoffice/LAP/Default.shtm
1	http://www.dot.state.mn.us/policy/financial/fm009.html#5
1	http://www.iowadot.gov/local_systems/publications/im/3910.pdf
1	http://www.virginiadot.org/business/ted_app_pro.asp
1	We ensure that the safety improvements worked to improve the severity.
1	www.dot.ca.gov/hq/LocalPrograms/lam/lapm.htm www.dot.ca.gov/hq/LocalPrograms/lpp/lpp1r1.htm
1	http://www.dot.state.oh.us/Divisions/Planning/LocalPrograms/Pages/default.aspx http://www.dot.state.oh.us/Divisions/Planning/LocalPrograms/Pages/LPA-Qualification-Process.aspx
1	The majority of large cities and all counties are certified to administer their own federal projects. However, state DOT staff assist the FHWA division in ensuring compliance with federal rules/requirements, auditing work completed on projects, etc.
1	Every federal-aid project is audited by our Bureau of Fiscal Services. Other audits are conducted on a random basis.
1	I would have to look this up... It is not my area of work, but the state does comply with all federal regulations.
1	ODOT Audit Division conducts periodic, random audits on federally funded projects, both local agency and ODOT projects: http://www.oregon.gov/ODOT/CS/EXTERNALAUDITS/Pages/about_us.aspx
1	The DOT conducts post-construction audits for contract compliance and closeout (for all contracts). I am not aware of any websites with this information.
1	IDOT performs audits. Further discussion would need to be held with our Bureau of Local Roads. Their role is to aid the locals through the federal-aid process.
1	The state DOT administers local government projects very similar to state road federal-aid eligible projects.

Question 63: "What are some of the challenges the state faces in addressing local road safety with local agencies? Check all that apply."

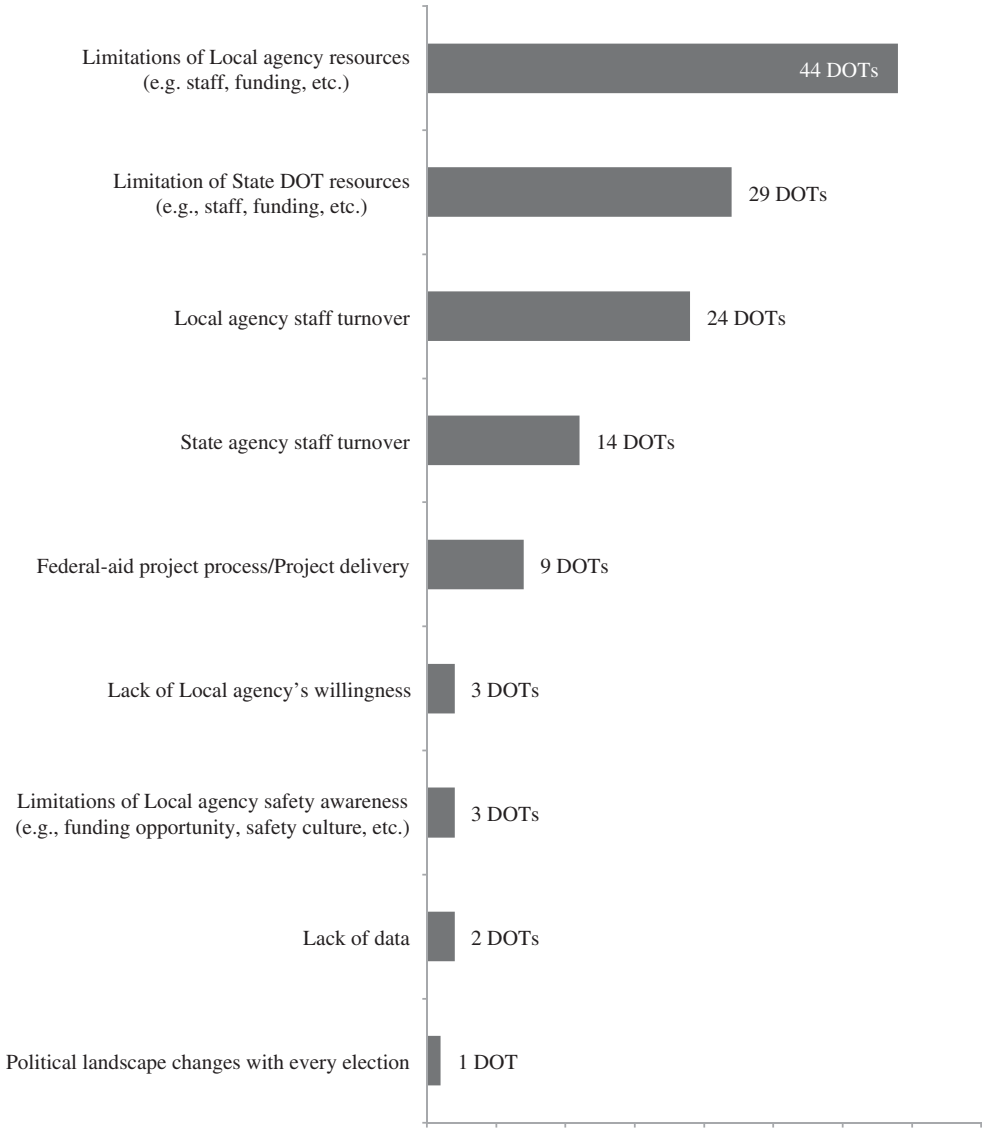


FIGURE A14 Survey response to Question 63: "What are some of the challenges the state faces in addressing local road safety with local agencies? Check all that apply."

Question 64: "What plans or initiative does your state DOT have to address these challenges?"

TABLE A51
SURVEY RESPONSE TO QUESTION 64: "WHAT PLANS OR INITIATIVE DOES YOUR STATE DOT HAVE TO ADDRESS THESE CHALLENGES?"

State	Comments
Alabama	Developing guidance on the Highway Safety Improvement Program, to include step-by-step procedures for conducting a safety analysis and applying for the funds.
Arkansas	Engineering Education Enforcement Emergency Services Public Policy
Florida	Training staff on the process of addressing safety on local roads
Georgia	We have documented our process and provide training through LTAP.
Idaho	No initiative has been developed on the ITD level. Additional staff continues to be hired and trained at the local level.
Illinois	We have a process review for local HSIP with the focus on improving the number and quality of local HSIP projects as well as improve the implementation of HSIP including the obligation of funds.
Indiana	INDOT and LTAP offer safety program training to LPAs. The FHWA division office plans to engage the MPO/RPO community to encourage self-monitoring of safety performance data.
Kansas	Conduct webinars through Kansas LTAP that are afterwards available for download.
Louisiana	The hiring of contract employees to assist in project management and technical assistance.
Maine	Nothing specific. We are aware of the needs; we keep communications open and see what opportunities we can create with available people and funding resources.
Massachusetts	The state and FHWA has allowed for use of HSIP funds for design in some cases.
Michigan	Local Road Safety Plans—plan to streamline small project delivery Biennial Local Road Safety Peer Exchange Promoting Toward Zero Deaths at the Local Level.
Minnesota	Risk assessment for the state aid cities; updating the County Roadway Safety Plans.
Missouri	Having documented policy can help reduce issues: http://epg.modot.mo.gov/index.php?title=Category:136_Local_Public_Agency_(LPA)_Policy
Nevada	We coordinate with our partners to do the necessary outreach to these new participants.
New Hampshire	DOT cannot impact/improve local agency resources.
New Jersey	State attempted to hire more staff.
Oregon	Coordination with local agencies on safety project selection and delivery. Delivery of projects by the state agency on local roads.
Pennsylvania	Currently investigating process to provide funding to local agencies to utilize federal and state funding to implement low-cost systemic improvements
Rhode Island	RIDOT is currently implementing a pilot project to work with three local agencies with the goal to expand this effort to all of the 39 municipalities within Rhode Island. This would include workshops to describe the HSIP program and educate local officials on the various types of safety improvements, proven countermeasures, funding process, etc.
Tennessee	Creation of the Project Safety Office and communication with FHWA—Tennessee Division
Texas	Speak at MPO meetings across the state to promote the off system projects and HSIP.
Utah	Lots of communication and building positive working relationships with local officials.
Vermont	We have the regional forums to educate towns about our different safety programs. We also meet with town officials and road foremen when we conduct reviews for low-cost safety projects. Our LTAP is now part of the state DOT. We have more road circuit riders than under the previous college arrangement. More resources to have classes and educate. Considering on-call contractor for timeliness.
Washington	The state has set funding incentives to address project delivery (less matching funds required if projects are awarded by a certain date). Training and technical support are provided to agencies as staff turnover continues. Unfortunately, no great solutions to limitations of local agency resources (although local agencies are welcome to contract as much of the work as they desire).

Question 65: "Since the legislation of MAP-21, has your state DOT noticed an increase in the number of local agencies participating in state coordinated local safety programs?"

TABLE A52
SURVEY RESPONSE TO QUESTION 65: "SINCE THE LEGISLATION OF MAP-21, HAS YOUR STATE DOT NOTICED AN INCREASE IN THE NUMBER OF LOCAL AGENCIES PARTICIPATING IN STATE COORDINATED LOCAL SAFETY PROGRAMS?"

Response Type	Response Rate
Yes	40% (19 DOTs)
No	60% (28 DOTs)

Question 66: "You indicated that your state DOT has noticed an increase in the number of local agencies participating in state coordinated local safety programs since MAP-21 was legislated. What are the main factors that attribute to this increase? Check all that apply."

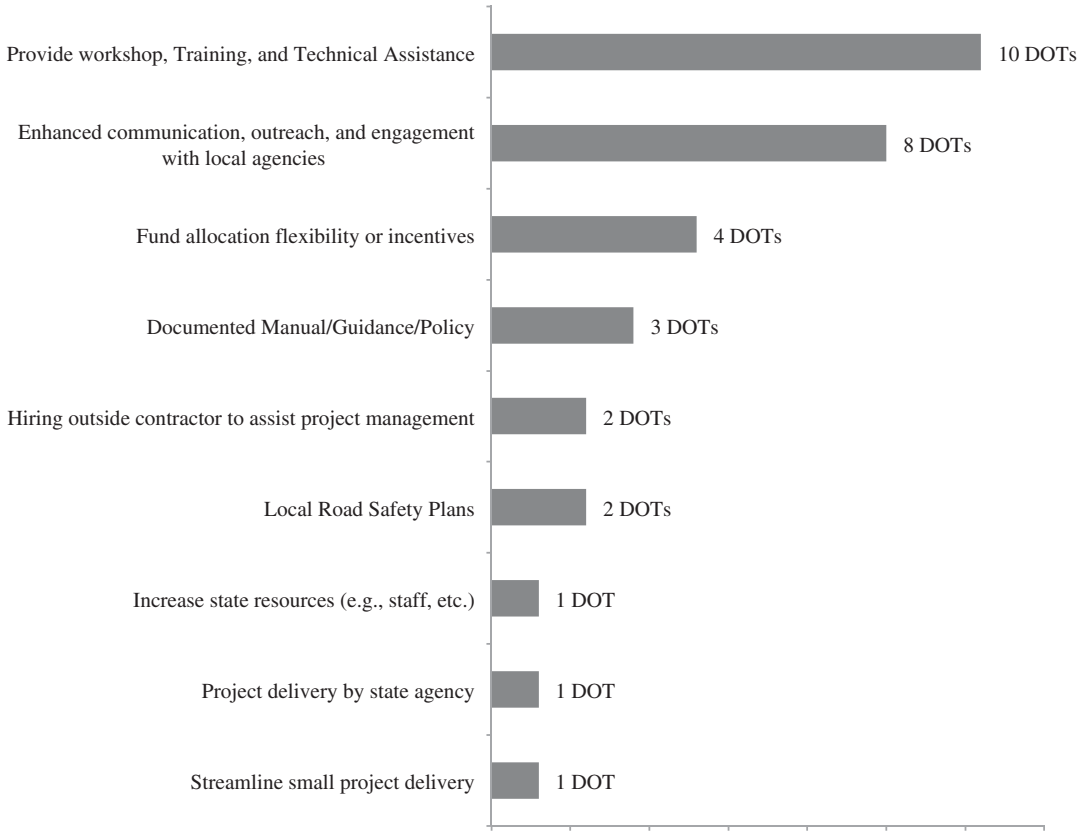


FIGURE A15 Survey response to Question 66: "You indicated that your State DOT has noticed an increase in the number of local agencies participating in state coordinated local safety programs since MAP-21 was legislated. What are the main factors that attribute to this increase? Check all that apply."

Question 67: "Has your state instituted performance measures to measure the performance of safety programs?"

TABLE A53
SURVEY RESPONSE TO QUESTION 67: "HAS YOUR STATE INSTITUTED PERFORMANCE MEASURES TO MEASURE THE PERFORMANCE OF SAFETY PROGRAMS?"

Response Type	Response Rate
Yes	70% (33 DOTs)
No	30% (14 DOTs)

Question 68: “Please describe performance measures of your state’s safety programs.”

TABLE A54
SURVEY RESPONSE TO QUESTION 68: “PLEASE DESCRIBE PERFORMANCE MEASURES OF YOUR STATE’S SAFETY PROGRAMS.”

Count	Response
1	5% reduction in the ongoing 5 year average
1	Fatal and serious injuries and their rates
1	Fatalities Serious Injuries Fatality Rate Injury Rate
1	NHTSA Core Performance Measures
1	Reduce fatal crashes by 5% per year.
1	Simple before and after crash data, crash rates.
1	Tennessee has just started the process; too early to identify the direction.
1	We have adopted a 2% annual reduction goal in fatalities, serious injuries, and their rates.
1	We have used high level performance measures as well as those identified for HSIP reporting.
1	Before and after comparison
1	http://azdot.gov/about/transportation-safety/arizona-strategic-highway-safety-plan
1	Track off system or local fatalities and serious injuries
1	All safety projects funded through the state DOT involve HSIP funds. Those projects are evaluated as required by that program. In addition, overall progress is measured through the state SHSP, monitoring overall trends in fatalities and serious injuries. If local agencies (cities or counties) start to differ from the overall state trend, additional analysis will be done to identify successes or failures.
1	Dollar amount of HSIP funds obligated; dollar amount of HSIP funds expended; percentage of yearly HSIP funds obligated; number of new HSIP locations identified; number of RSAs performed; number of systemic improvement contracts advertised; number of HSIP projects (locations) advertised; number of HSIP-related work orders prepared; number of HSIP-related work orders completed; number of safety effectiveness evaluations performed.
1	Safety performance measures are described in the Indiana SHSP at: http://www.in.gov/indot/2357.htm
1	See CA SHSP and CA HSP: www.dot.ca.gov/hq/traffops/shsp/docs.html www.ots.ca.gov/Media_and_Research/Publications_and_Reports/default.asp
1	(a) Serious Injury Crashes on Nebraska Roadways, (b) Fatalities on Nebraska Roadways, (c) Motor Vehicle Crashes on Nebraska Roadways.
1	All HSIP projects are subjected to a benefit-cost ratio safety performance functions have been developed to determine the expected crash frequencies.
1	(1) Reduce the number of traffic fatalities from 353 in CY2011 to 352* in CY2013 (FARS data). *Preliminary state data show that there were 380 traffic fatalities in CY2012. (2) Reduce fatalities per 100M VMT from 1.39 in CY2011 to 1.38* in CY2013 (FARS data). *Preliminary state data show that the overall traffic fatality rate was 1.50 in CY2012. (3) Reduce the number of serious injuries in traffic crashes from 1,711 in CY2011 to 1,710 in CY2013 (state crash files). (4) Reduce the number of speeding-related fatalities from 147 in CY2011 to 140 in CY2013 (FARS data).
1	CHSP is currently being updated. Performance measures are included in the CHSP. http://www.mdt.mt.gov/visionzero/plans/chsp.shtml
1	Statewide SHSP goals established. See SHSP pp.10–11. http://www.maine.gov/mdot/safety/documents/2014/2014SHSP102314_75a.pdf MPO/RPO Benchmarks have just been developed by MaineDOT.
1	We of course track the numbers of fatalities, serious injury, and the rates of both. We conduct before and after studies on projects after three years.
1	Performance measures are described in the State Strategic Highway Safety Plan and other plans and documents, primarily detailing the planned reductions of Fatal and Serious Injury “A” (F & A). Also reduction in Roadway Departure F & A, Intersection F & A, and Pedestrian/Bicycle F & A. http://www.oregon.gov/ODOT/TS/docs/!FINAL%20(without%20405%20app)%202014%20Federal%20Version.pdf
1	(1) Site-specific before/after crash analysis. (2) Annual reporting of fatalities and serious injuries for all our SHSP emphasis areas. (3) Continual monitoring and reporting of statewide fatalities and serious injuries.
1	Reduction in injuries and fatalities. However, there is a lag in our crash data so that even 2008 HSIP projects cannot yet be evaluated using the minimum requirement of 3 years of crash data for pre- and post-improvements.
1	Two main: Number and percentage of fatalities; number and percentage of serious injuries. Complete list: http://www.dot.state.mn.us/trafficeng/safety/shsp/Minnesota_SHSP_2014.pdf (p. 35).
1	Traffic fatalities; serious injuries; rural and urban fatality rates; unrestrained passenger vehicle occupant fatalities; fatalities involving operator with BAC > 0.08; speeding-related fatalities; motorcyclist fatalities; unhelmeted motorcyclist fatalities; pedestrian fatalities; observed seat belt use; seat belt citations issued during grant funded enforcement activities; impaired driving arrests made during grant funded enforcement activities; speeding citations issued during grant funded enforcement activities.
1	See website below for additional info.: http://www.dot.wisconsin.gov/about/performance/goalsafety.htm
1	Reduction of fatal and serious injury crashes, reduction of fatalities and serious injuries, increase in public awareness of traffic safety, increase in use of traffic safety strategies.
1	Fatal and serious injury crashes and crash rate % reduction in crashes where safety improvements have been implemented.

Question 69: "Have your safety programs and their specific projects produced measureable positive results on improving the safety of local roads?"

TABLE A55
SURVEY RESPONSE TO QUESTION 69: "HAVE YOUR SAFETY PROGRAMS AND THEIR SPECIFIC PROJECTS PRODUCED MEASUREABLE POSITIVE RESULTS ON IMPROVING THE SAFETY OF LOCAL ROADS?"

Response Type	Response Rate
Yes	28% (13 DOTs)
No	28% (13 DOTs)
Under evaluation	44% (21 DOTs)

Question 70: "Please describe these state coordinated programs and their results (or results under evaluation), and provide website links which detail them (e.g., see examples in the Background section)."

TABLE A56
SURVEY RESPONSE TO QUESTION 70: "PLEASE DESCRIBE THESE STATE COORDINATED PROGRAMS AND THEIR RESULTS (OR RESULTS UNDER EVALUATION), AND PROVIDE WEBSITE LINKS WHICH DETAIL THEM (E.G., SEE EXAMPLES IN BACKGROUND SECTION)."

Count	Response
1	Before and after crash analysis
1	Fatalities and serious injuries on decline
1	Many programs under development, but not yet implemented.
1	N/A
1	pp. 38–93: http://www.dot.state.mn.us/trafficeng/safety/shsp/Minnesota_SHSP_2014.pdf
1	Tennessee continues to see a reduction in local/rural road crashes
1	FDOT State Safety Office NHTSA Grants (http://www.dot.state.fl.us/safety/3-Grants/Grants-Home.shtm) and the FDOT HSIP.
1	RIDOT constructed a systemic improvement project for High Risk Rural Roads that included signing and striping improvements to local road corridors and intersections. 1-year and 3-year after studies will be performed at improvement locations.
1	See CA SHSP and CA HSP www.dot.ca.gov/hq/traffops/shsp/docs.html www.ots.ca.gov/Media_and_Research/Publications_and_Reports/default.asp
1	HSIP funded projects have performed well; however, very few HSIP projects have been on local roads.
1	We have evaluated many completed projects over the years that resulted in statistically significant reductions in crashes. Some of these are local projects. None of our evaluations are on the web.
1	There are currently no performance measures that are tied to local road projects only. The existing performance measures are across all systems in the state.
1	See the SHSP and the SHP from the Office of Traffic Safety, as there are numerous programs that have been positive.
1	http://safety.fhwa.dot.gov/hsip/reports/pdf/2014/or.pdf. When ODOT has delivered a significant number of roadway departure projects on local roads, we will evaluate them.
1	Measurement has occurred at the statewide level, during the most recent update to the SHSP. The state evaluates trends and changes for different emphasis areas between state roads and local roads. However, the majority of systemic safety projects have occurred too recently to measure results yet.
1	We look at the overall numbers to measure effectiveness. This has been a good way to track progress.
1	The program is currently based on black spot analysis and reactive projects. MDOT completes before after studies for all federally funded safety projects. Collectively, the program shows a reduction in crashes and crash severity.
1	I already explained that we have performance measures but we cannot yet use them to measure, because we need 3 years of pre-construction crash data and 3 years of post-construction crash data; however, our crash data are lagging so 2012 data was just finalized. Therefore, I cannot yet measure.
1	Low-cost sign and marking projects (high risk rural roads) (see pp. 57–59): http://safety.fhwa.dot.gov/hsip/reports/pdf/2014/vt.pdf High Risk Rural Roads Program (HRRR)—The HRRR program was initiated in 2008. The purpose of the program is to partner with the Regional Planning Commissions (RPCs), FHWA, and the towns to implement low-cost safety improvements on all of Vermont's public highways. Based on crash data and local input, sites are identified, selected, and prioritized by the RPCs, towns, and VTrans. Each summer, VTrans works closely with the towns in determining the appropriate safety solutions at each site. There were 27 sites selected this year. VTrans contracted these projects and oversaw the construction operations for the participating municipalities in order to simplify the process for them. Work was started in the spring of 2013 and was completed in the fall 2013. Four regional umbrella projects were contracted, implementing low-cost safety improvements such as new and upgraded signs and lines, and new guardrails. The four regional construction projects each totaled approximately $500,000 this year (see p. 83): http://vtrans.vermont.gov/sites/aot/files/VTrans-HighwaySafetyDesign-AR2014.pdf
1	For our local rural roads, we have tracked before/after fatalities and serious injuries on the local county road systems where we have done projects. Please note, crash frequencies are often small enough that it is not possible to draw any meaningful conclusions from these results.

Question 71: "Has there been a reduction of fatal and/or severe injury crashes over the past three years on your state's local roads?"

TABLE A57
SURVEY RESPONSE TO QUESTION 71: "HAS THERE BEEN A REDUCTION OF FATAL AND/OR SEVERE INJURY CRASHES OVER THE PAST THREE YEARS ON YOUR STATE'S LOCAL ROADS?"

Response Type	Response Rate
Yes	70% (33 DOTs)
No	30% (14 DOTs)

Question 72: "You indicated that there has been a reduction of fatal and/or severe injury crashes over the past three years on your state's local roads. What are the main factors that attribute to this reduction? Check all that apply."

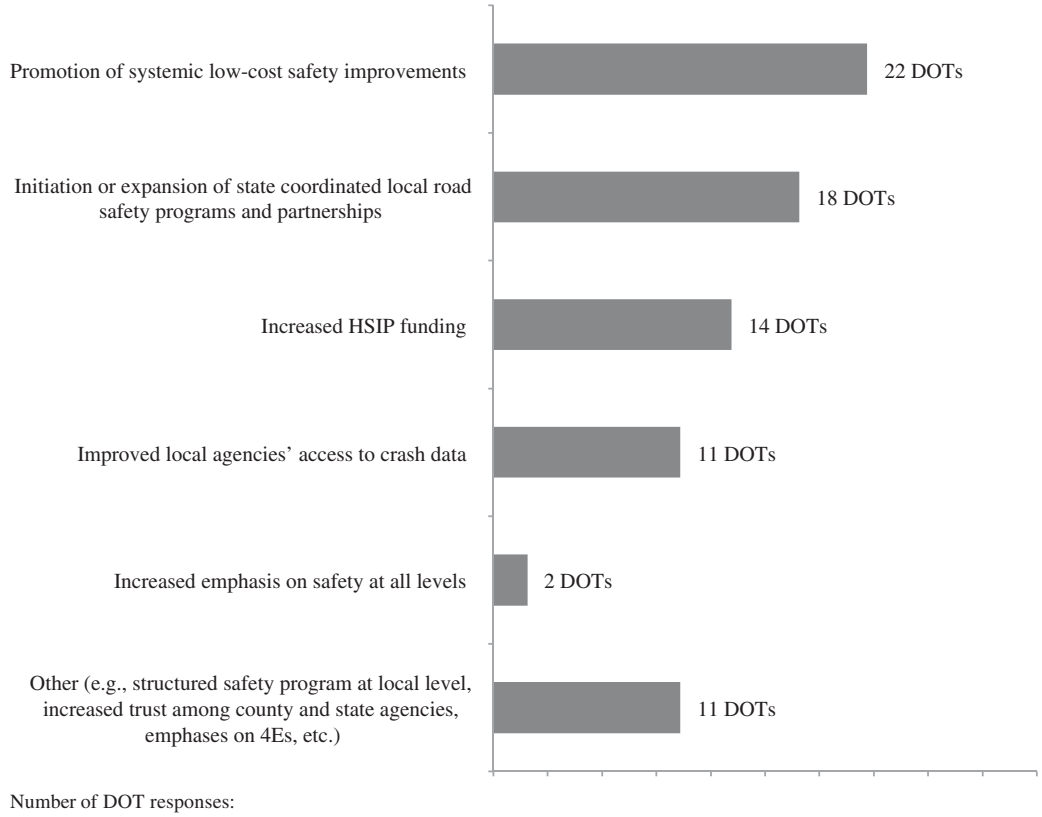


FIGURE A16 Survey response to Question 72: "You indicated that there has been a reduction of fatal and/or severe injury crashes over the past three years on your state's local roads. What are the main factors that attribute to this reduction? Check all that apply."

APPENDIX B

List of Interviewees

Connecticut

Joseph P. Ouellette
State Safety Engineer
Transportation Supervising Engineer
Bureau of Engineering and Construction
Connecticut Department of Transportation
860-594-2721
joseph.ouellette@ct.gov

Ryan J. Pothering, E.I.T.
Transportation Engineer 2
Connecticut Department of Transportation
860-594-2779
ryan.pothering@ct.gov

Donna Shea
LTAP Director
Technology Transfer Center
Connecticut Transportation Institute
860-486-0377
shea@engr.uconn.edu

Anthony A. Lorenzetti, P.E.
LTAP, Safety Circuit Rider
Technology Transfer Center
Connecticut Transportation Institute
860-486-5847
Lorenzetti@engr.uconn.edu

Michael J. Gantick
Director of Public Works
Town of South Windsor
860-644-2511, ext. 242
michael.gantick@southwindsor.org

Sally A. Katz
Director of Physical Services
Town of Wethersfield
860-721-2845
sally.katz@wethersfieldct.com

John Ivan, Ph.D., P.E.
University of Connecticut, Civil and Environmental Engineering
860-486-0352
johnivan@engr.uconn.edu

Florida

Joseph B. Santos, P.E.
State Safety Engineer
State Safety Office, Florida Department of Transportation
850-414-4097
Joseph.Santos@dot.state.fl.us

Peter Hsu, P.E.
District 7 Safety & Special Projects Engineer
Florida Department of Transportation
813-975-6251
Ping.Hsu@dot.state.fl.us

Rodney H. Cooper, P.E.
District 2 Traffic Safety Program Engineer
Florida Department of Transportation
904-360-5629
Rodney.Cooper@dot.state.fl.us

Yujing (Tracey) Xie, P.E.
District 4 Traffic Safety Program Engineer
Florida Department of Transportation
954-777-4355
Yujing.Xie@dot.state.fl.us

Mahshid Arasteh
District 7 Safety Ambassador
Florida Department of Transportation
727-543-1458
americanqualityconsultants@gmail.com

Ramon D. Gavarrete, P.E.
NACE President
County Engineer
Highlands County Board of County Commissioners
863-402-6877
rgavarre@hcbcc.org

Robert Campbell
County Engineer
Hillsborough County
813-272-5170
CampbellR@HillsboroughCounty.ORG

William Moore, Safety Engineer
Milton Martinez, Chief Engineer
Jean Duncan, Director
Transportation and Stormwater Services
City of Tampa
813-274-8045
Jean.Duncan@tampagov.net

Iowa

Jan Lasser-Webb
Safety Engineer
Office of Traffic & Safety, Iowa Department of Transportation
515-239-1349
jan.laaser-webb@dot.iowa.gov

Chris Poole, P.E.
Safety Programs Engineer
Office of Traffic & Safety, Iowa Department of Transportation
515 239-1267
chris.poole@dot.iowa.gov

Steven Schroder, P.E.
Safety Programs Engineer
Office of Traffic & Safety, Iowa Department of Transportation
515 239-1623
Steven.Schroder@dot.iowa.gov

John E. Sebastian, P.E.
In charge of sign Replacement Program
Office of Traffic & Safety, Iowa Department of Transportation
515-239-1176
john.sebastian@dot.iowa.gov

Todd Kinney, P.E.
Clinton County Engineer
563-244-0564
tkinney@clintoncounty-ia.gov

Bradley J. Skinner, P.E. & PLS
Montgomery County Engineer
712-623-5197
bskinner@montgomerycoia.us

Louisiana

Dan Magri, P.E.
Highway Safety Administrator
Louisiana Department of Transportation and Development
225-379-1871
Dan.Magri@LA.GOV

Marie B. Walsh, PhD
Director, LA Local Technical Assistance Program
Louisiana Transportation Research Center
225-767-9184
mbwalsh@ltrc.lsu.edu

David Barrow
Chief Administrative Officer, City of Center
225-261-5255
David.Barrow@central-la.gov

Maurice Jordan
Parish Engineer, Tangipahoa Parish
985-748-3211
tpcroad@tangipahoa.org

Dennis Woodward, P.E.
Public Works Director/Parish Engineer Rapides Parish
318-473-6603

Michigan

Lynnette Firman
LAP-Safety Engineer
Michigan Department of Transportation
517-335-2224
FirmanL@michigan.gov

Tracie Leix
State Safety Engineer
Michigan Department of Transportation
517-373-8950
LeixT@michigan.gov

Gary Osminski
County Highway Engineer
Huron County
989-269-6404
gmohcrc@yahoo.com

Ryan Doyle
County Highway Engineer
Lapeer County
810-664-6272
RDoyle@LCRCOnline.com

Kajal Patel
Transportation Safety Engineer, Plan Implementation Group
Southeast Michigan Council of Governments
313-961-4266
patel@semcog.org

Tom Bruff
Manager, Plan and Policy Development Group
Southeast Michigan Council of Governments
313-324-3340
bruff@semcog.org

Minnesota

Mark Vizecky
State Aid for Local Transportation Program Support Engineer
Minnesota Department of Transportation
651-366-3839
mark.vizecky@state.mn.us

Victor Lund, P.E.
Traffic Engineer St. Louis County
218-625-3873
lundv@stlouiscountymn.gov

Rick West, P.E.
Public Works Director Otter Tail County
218-998-8470
rwest@co.ottertail.mn.us

Susan G. Miller, P.E.
County Engineer Freeborn County
507-379-2981
Sue.Miller@co.freeborn.mn.us

Wayne H. Sandberg, P.E.
Deputy Director Public Works/County Engineer Washington County
651-430-4300
wayne.sandberg@co.washington.mn.us

Ohio

Michelle May
Highway Safety Program Manager
Ohio Department of Transportation
614-644-8309
Michelle.May@dot.state.oh.us

Cory Hopwood
Data Analyst
Ohio Department of Transportation
Cory.Hopwood@dot.state.oh.us

Victoria Beale
Director
Ohio LTAP Center
614-466-3129
Victoria.Beale@dot.state.oh.us

David Brand
Madison County Engineer and Co-Chair Safety Committee of NACE–
Madison County
740-852-9404
dbrand@co.madison.oh.us

Greg Butcher
Engineer, Roads, and Bridges
Violet Township
614-382-5973
Engineer@violet.oh.us

Jordan Whistler
Associate Planner
Mid-Ohio Regional Planning Commission
614-233-4148
jwhisler@morpc.org

Oregon

Zahidul Siddique
Highway Safety Engineer
Oregon Department of Transportation
503-986-3573
Zahidul.Q.Siddique@odot.state.or.us

Doug Bish
Safety Program Manager
Traffic Engineering Unit Manager
Oregon Department of Transportation
503-986-3594
Douglas.W.Bish@odot.state.or.us

Joseph F. Marek, PE, PTOE
Traffic Engineering Supervisor & Director, Clackamas County Safe Communities
Clackamas County Department of Transportation and Development
503-742-4705
JoeM@co.clackamas.or.us

Emily Ackland, County Road Manager
Oregon Association of Counties
503-585-8351
eackland@aocweb.org

Robin Lewis, Transportation Engineer
City of Bend
Growth Management Department
541-330-4025
rlewis@bendoregon.gov

Utah

W. Scott Jones, P.E., PTOE
Safety Programs Engineer
Utah Department of Transportation
801-965-4285
wsjones@utah.gov

Robert E. Hull, P.E.
Cambridge Systematics, Inc.
Former Engineer for Traffic & Safety
Utah Department of Transportation
801-633-6400
rhull@camsys.com

Brian Torgersen
Traffic Engineer
Department of Public Works
Provo City
801-852-6745
btorgersen@provo.org

Shane Winters
Principal Engineer
Department of Public Works
Provo City
801-852-6742
swinters@provo.org

Carrie Silcox
Deputy Director
Utah Department of Public Safety
801-386-1888
csilcox@utah.gov

Washington

Matthew Enders, P.E.
WSDOT Local Programs
360-705-6907
Matthew.Enders@wsdot.wa.gov

Scott Davis, P.E.
Traffic Engineering & Operations Manager
Thurston County Public Works
360-867-2345
davissa@co.thurston.wa.us

Forrest Jones
Transportation Programs Manager
Skagit County
360-419-3423
forrestj@co.skagit.wa.us

Inga Note
Senior Traffic Planning Engineer
City of Spokane
590-232-8813
inote@spokanecity.org

Bob Turner, P.E., MBA
Traffic Operations Engineer—Street Department
City of Spokane
509-232-8800
bturner@spokanecity.org

APPENDIX C

REPORTED SAFETY PROGRAMS AND PRACTICES AIMED AT LOCAL ROAD SAFETY OF TEN SELECTED STATES

Each of the ten states interviewed as part of this synthesis, along with a number of local agency or other organizational counterparts within that state, described state-coordinated safety programs and/or initiatives aimed at improving local road safety. Specific local road safety programs and practices that address challenges in reducing fatal and injury crashes are included within each of the sections listed in this Appendix C.

CONNECTICUT STATE SAFETY PROGRAMS AIMED AT LOCAL AGENCIES

Background

The state of Connecticut has approximately 21,470 miles of roadway of which 17,700 miles are maintained by local agencies. In Connecticut, there is no county government system but rather 169 municipalities. Local road programs and projects are handled by the central office, Highway Design-Local Roads that oversees various programs, including small safety projects, for local road improvement with a current staff of nine to handle a variety of consultant designed improvements. Safety-related local road programs are run by the Safety Engineering Unit in Traffic Engineering with a staff size of five. The Connecticut Department of Transportation (CT DOT) has the responsibility to oversee capital improvement projects of local roads, while the local jurisdictions maintain their own roads. As traffic volume and roadway inventory data for the majority of local roads are not available, CT DOT annually solicits the Rural Planning Organization (RPO) for inputs on potential improvements on behalf of their member towns to address local roads safety concerns. According to 2014 Highway Safety Improvement Program (HISP) report, approximately $1.8 million is programmed from HSIP Section 148 and Section 154 funds, of which approximately $1.5 million is programmed to local safety projects.

In 1985, to address local roads safety issues, CT DOT established the Local Road Accident Reduction Program (LRARP) in accordance with revisions made to the Hazard Elimination Program in the 1982 Surface Transportation Assistance Act 49 U.S.C. § 31105. With MAP-21, CT DOT is currently updating its Strategic Highway Safety Plan (SHSP) by involving various stakeholders [e.g., RPO representatives, municipal police office, and members from the Connecticut Technology Transfer Center (CT T2 Center, Connecticut's Local Technical Assistance Program, LTAP)]. As a result, roadway departure crashes will likely continue to be an emphasis area and local roads will be a target area for crash reductions. Information gathered from an interview with CT DOT indicated that with the Moving Ahead for Progress in the 21st Century Act (MAP-21), CT DOT has begun spending safety funds on its local roads. With this change, CT DOT is collaborating on three initiatives with the University of Connecticut and the CT T2 Center to develop a comprehensive safety analysis strategic plan and to promote local roads safety.

Safety Program/Initiative

Safety Circuit Rider Program

The Safety Circuit Rider (SCR) program aims to provide safety information, training, and field technical assistance for local governments that was previously lacking. According to the interview with the CT T2 Center Director, the LTAP identified the need for the SCR program 15 years ago. In 2013, funding approval was received through the HSIP, which formed the establishment of SCR program in March 2014. The annual cost of the program is $200,000, which includes one full-time Safety Circuit Rider. The services of the SRC program, including technical assistance and training through the new Safety Academy program, are provided at no cost to local agencies. The close teamwork between the CT DOT Safety Engineer and Safety Circuit Rider has advanced a statewide safety program that covers 169 municipalities. At the time of this synthesis, the SCR program was in the second year of the initial two-year program. Program goals include, but are not limited to, coordination of Road Safety Audits (RSAs), identification of low-cost safety improvements, and assistance to local agencies in the development of local road safety plans.

Traffic Signal Systems Circuit Rider Program

There are approximately 3,200 traffic signal systems in Connecticut of which 80% are owned and maintained by state DOT. A FHWA program review, conducted in 2011 (FHWA 2012), addressed the challenges that municipal agencies face in effectively managing their traffic signal systems. In November 2014, the CT T2 Center, through program funding from CT DOT [Congestion Mitigation and Air Quality (CMAQ) fund], implemented Connecticut's first Traffic Signal Systems Circuit Rider. Using a model based on the SCR program, the Traffic Signal Systems Circuit Rider program provides no-cost technical assistance and training to local agency representative's responsible for municipal traffic signals. Similar to the SCR program, one full-time Traffic Signal Systems Circuit Rider delivers services associated with traffic signals from field assistance with traffic signal system retiming projects to working with Connecticut regional planning agencies to promote opportunities for municipalities to consider federal-aid funding for traffic signal operations.

Crash Data Repository System

Data-driven approaches to safety analysis provided support for the development of Connecticut's first Crash Data Repository (CT CDR; www.ctcrash.uconn.edu). Based on the crash information collected by state and local polices, the CT CDR is a web-based tool designed to provide access to the crash database. With these data repository, users are able to query, analyze and print/export the data for research and informational purposes. The purpose of the CT CDR is to provide members of the traffic-safety community with timely, accurate, complete and uniform crash data. Users can assign complex queries of datasets such as, by route, route class, collision type, and injury severity. An interview with CT T2 Center indicated that this centralized crash data repository will help access to local roads data and make informed safety decisions. Figures C1 and C2 present sample query options of CT CDR.

Local Road System Safety and Performance

CT DOT applies a combined reactive and proactive method in identifying and prioritizing local road projects. Based on

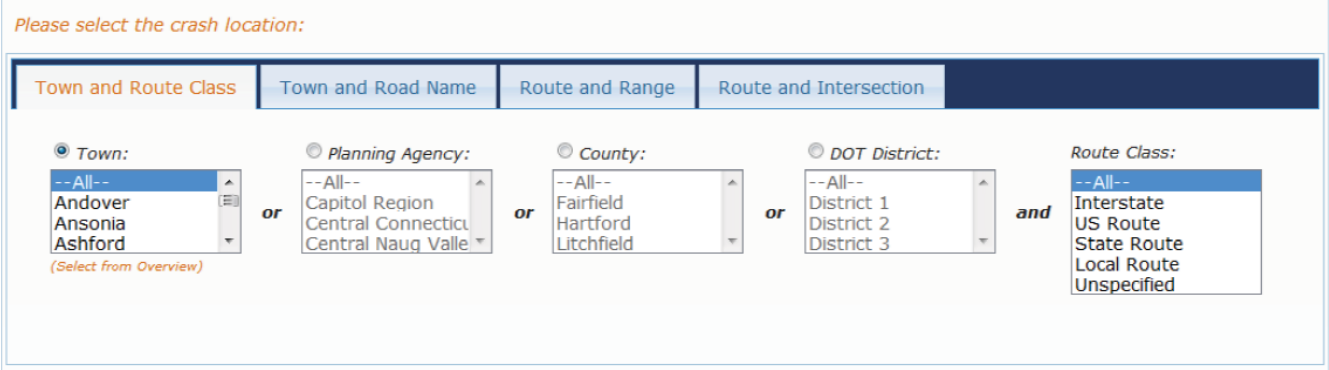


FIGURE C1 Sample CT CDR town and route class query.

the latest crash data repository system, the four-year-moving average of serious injury and fatal crashes shows a consistent decrease for both state and local roadway systems (Figure C3).

Town of South Windsor

The Town of South Windsor has a population of 25,700 with 140 roadway miles and is participating in the SCR program. An interview with the Town of South Windsor reported that the CT DOT staffs' effort to connect and partner with the municipalities has helped identify its local roads safety issues. As a result of the partnership between the state and town, an RSA was performed for a couple of problem areas and an example is presented in web-only Appendix D. The Safety Circuit Rider's outreach brought many municipalities' awareness of the corresponding program. For specific impacts of the SCR program, the town reported that it has been placing the reflective inserts in the poles on various stop, curve, and island signs with very positive feedback from residents. The Town of South Windsor is also working on updating its sign inventory, street tree clearing, and sign replacement program.

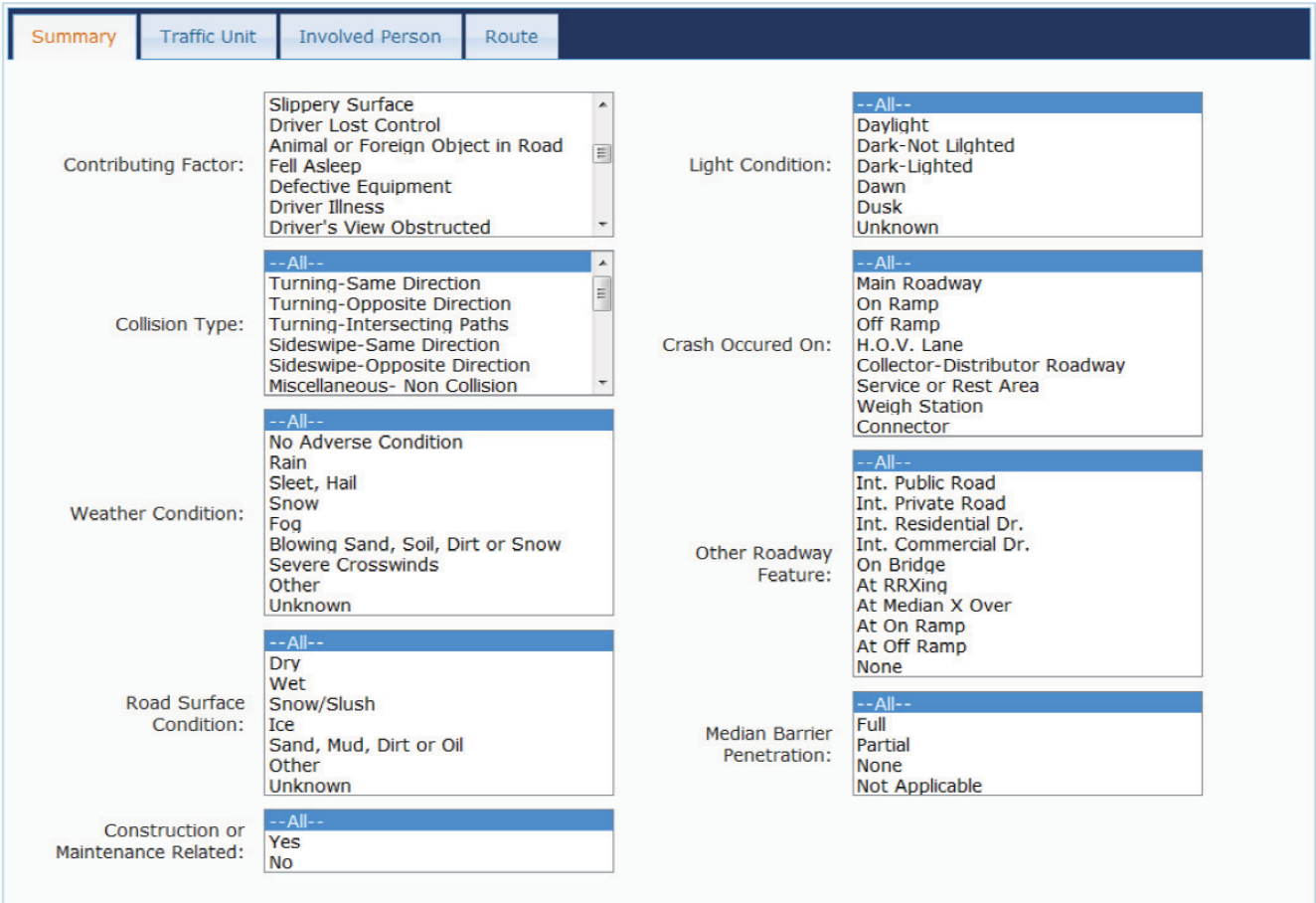


FIGURE C2 Sample CT CDR advanced summary query.

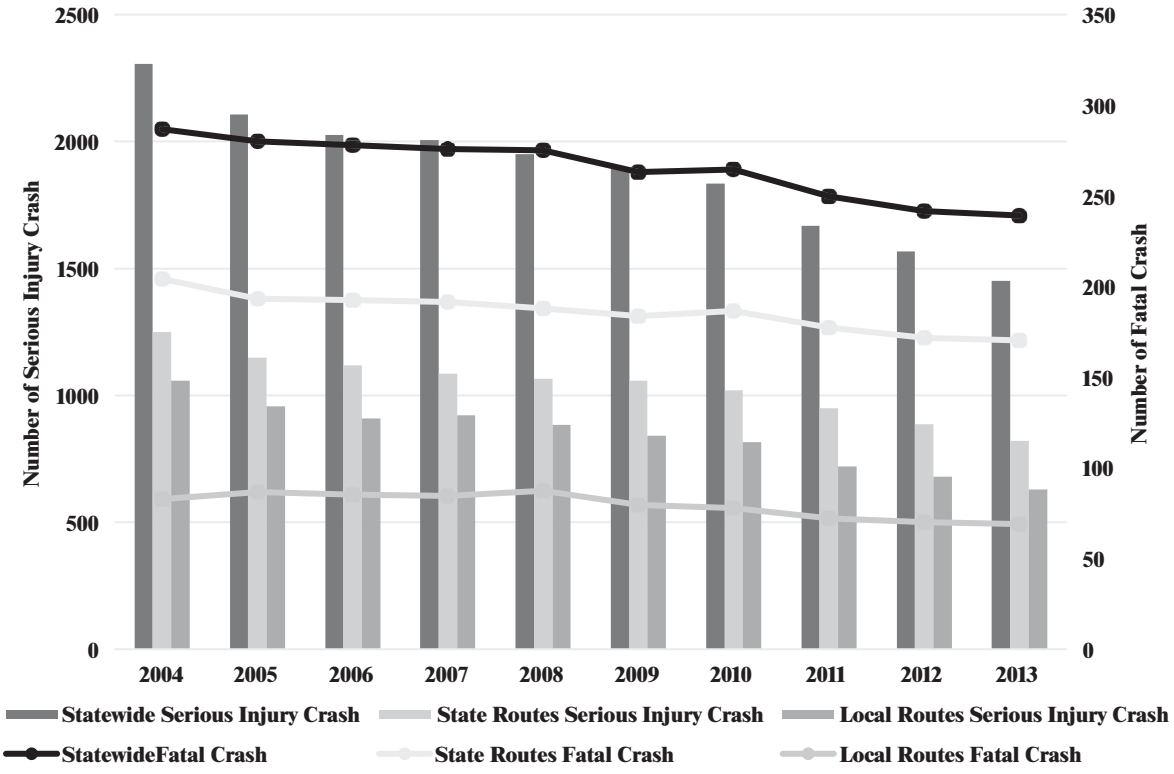


FIGURE C3 Yearly number of fatal and serious injury (*Source*: CT DOT Crash Data Repository System).

After experiencing the benefits from the SCR Program, the town has established its own Local Road Safety Committee in January 2015 as presented in web-only Appendix D. Though early to present the SCR program's effectiveness, information collected from the interview pointed a positive impact of CT T2 Center and CT DOT's continuous outreach effort. The Town of South Windsor also reported that CT T2 Center built bridges between all the transportation stakeholders in Connecticut with noticeable positive attitudes on how local roads safety projects are conducted.

Town of Wethersfield

The Town of Wethersfield, an urban town, has a population of approximately 26,670. The town reported that the no-cost initial consultation through the SCR program was one of the incentives to contact Safety Circuit Rider. The interview with the Town of Wethersfield indicated that the SCR program was exceptionally helpful as it offered various "out-of-the-box" problem solving aspects by a safety professional who was not from the same town. When asked about the main barriers in developing local road safety plan, the town noted lack of resources and an incomprehensive traffic data that did not show roads that are safety hazards.

Addressing Challenges

Both the SCR Program and Traffic Signal Systems Circuit Rider Program are at an initial phase of program full development. Interviews with Safety Circuit Rider, state DOT, CT T2 Center, and local agencies reported that identifying the right contact person, getting all the stakeholders in one table, and limitation of local agency resources are major challenges in enhancing local roads safety. To address these challenges, a majority of interviewees identified integration of field personnel and CT T2 Center members into different CT DOT safety committees to keep involved with current policies and issues and continuous outreach to disseminate and raise programs awareness to local agencies. Also mentioned is the importance of the collaboration between the LTAP, the Safety Engineer at CT DOT, and the Safety Engineer at the Connecticut FHWA Division office.

To address issues with limited roadway data inventory on local roads, particularly traffic counts, the *Connecticut Cooperative Transportation Research Program* (CCTRP) is sponsoring a research effort developing local road crash prediction models that do not require traffic counts. The approach is to apply already-available planning level data (e.g., population, employment, land use, etc.) in evaluating local road safety issues where a local roadway traffic and physical inventory database is not available or limited.

Summary

The state of Connecticut showed a good example of a well-coordinated effort between its DOT, LTAP, and local agencies to improve local road safety. With the MAP-21 requirement that led to the SHSP update, CT DOT has actively launched two major safety initiatives: Safety Circuit Rider Program and Traffic Signal Systems Circuit Program. The interviews with various parties showed positive feedback of both initiatives though they are still in an early stage. Limitations of local agency resources, bringing together various stakeholders, and identifying correct contact persons at both local and state levels remain primary challenges. To address these challenges, a majority of the interviewees identified integration of field personnel and CT T2 Center members into different CT DOT safety committees to keep involved with current policies and issues. This collaboration would provide

continuous outreach to disseminate and raise program awareness to local agencies. The interview with CT DOT and LTAP staffs also reported the importance of the collaboration between the LTAP, the Safety Engineer at CT DOT, and the Safety Engineer at the Connecticut FHWA Division office.

FLORIDA STATE SAFETY PROGRAMS AIMED AT LOCAL AGENCIES

Background

In the state of Florida, 107,760 miles of roadway, 88% of all public roads, are locally owned and maintained. Florida Department of Transportation (FDOT) is decentralized in accordance with legislative mandates and, therefore, each of the districts is managed by a District Secretary. Local road programs and projects are handled by both the central (planning and programming) and district offices (implementation) with a staff of about five to ten persons at district level. FDOT reported that in the past five years, out of an approximate annual $100 million HSIP fund, an annual average of $20 million is allocated to local road projects. The Community Traffic Safety Team (CTST) program and District 7 Local Agency Safety Program that integrates various strategies are noteworthy practices in the state of Florida.

Safety Program/Initiative

Community Traffic Safety Team

Created in response to the Intermodal Surface Transportation Efficiency Act of 1990, the CTST Program is a multi-disciplined Federal, State and Local Government program established to enhance roadway safety funded through Section 402 Highway Safety Grants. Each district differs in number of CTSTs and has a full-time CTST coordinator who interacts closely with Central FDOT Safety Office. An interview with a county engineer identified that in District 1, the CTST is the main channel for the state DOT to work with local agencies for RSAs and other safety concerns. Though not formally assessed, a reduction in crashes or "near misses" is observed in locations where roadside safety audits have occurred. Another interview with a local agency in District 7 also identified CTST regular meetings as an avenue for local agencies to share safety information where district DOT staffs invite local agencies to learn about available safety programs, ultimately resulting in local safety projects funding. Additionally, in District 7, as part of the application process for funding through FDOT District 7 and the HSIP, applicants are required to attend four CTST meetings per year and, at one of those meeting, the applicant is required to present their organization's safety project.

District 7 Local Agency Safety Program

District 7 has proven success in streamlining federal funds to support local road safety and in bringing efficient communication with local agencies through a Local Agency Project Safety Program and the dedicated efforts of district safety engineers. District 7 includes five counties (Citrus, Hernando, Hillsborough, Pasco and Pinellas) in the Tampa Bay area and has shown higher fatalities and serious injuries compared with other districts. The interview with the District Safety Engineer showed that the use of a layered approach to access and use federal funds for local roads safety has not only resulted in positive impacts such as crash reduction, but also provided an awareness of local funding opportunities.

Figure C4 describes a five-layered approach with each layer's key components. Each layer can be applied individually or com-

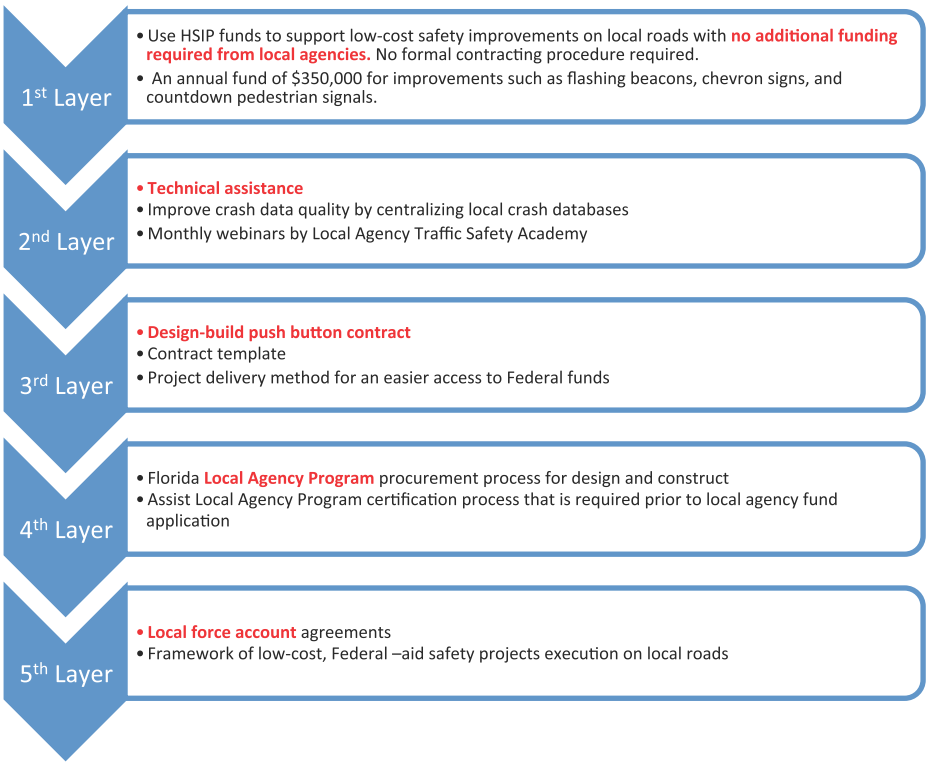


FIGURE C4 FDOT District 7 five-layered approach.

bined, depending on the local agency's needs. The first layer focuses on the use of HSIP funds for low-cost safety improvements on local roads where neither additional funding from local agencies nor a formal contracting process is required. Through an informal solicitation process, local agencies submit an online application. An annual budget of $350,000 is allotted to District 7 for such improvements. Local agencies install and maintain purchased safety equipment through this process. While the second layer provides technical assistance for local agencies, the third layer introduces a contract template that covers the project process from design to construction, named design-build push button. The design-build push button is a project delivery method developed from a 2007 pilot program and details of the design-build push button are presented on the link provided in Appendix E. The local agency program (LAP) procurement process for local agencies and local force account agreement are fourth and fifth layers main elements respectively (Merrefield et al. 2015). The LAP agreement is waived for the first three layers, which also allowed many local agencies' safety project participation. The following elements are the initiatives the District 7 uses to achieve the five-layered approach.

Design-Build Push Button

First executed in 2009, the design-build push button is a contract template that allows state DOT to implement safety projects in a more streamlined process for state or local roads using federal safety fund. This process addresses urgent safety issues more expediently than the traditional design-bid-build process. By pre-selecting and pre-qualifying contract teams with already-negotiated project item prices, the design-build push button ultimately saves time and money. Safety projects to be considered through the design-build push button process should not require additional or new right-of-way acquisition with minimal impacts to utility systems. The primary benefits of design-build push button contracts are: reduced project schedule and fund; creation of construction jobs; and primarily, fast safety improvements through a streamlined process that ultimately save lives. FDOT District 7 reported that as of November 2014, more than 150 miles of roadway were equipped with audible vibratory pavement markings and approximately 550 intersections designed with high-emphasis crossing markings. Over the past four years (2011–2014), a total of $4.8 million has been awarded through design-build push button contracts. Details of the design-build push button are provided on the link in Appendix E.

Safety Summit and Local Agency Traffic Safety Academy

Established in 2010, the District 7 annual Safety Summit is a fully-funded (federal and/or state) forum where all parties involved in local road safety exchange information to address local roads safety concerns. The most recent summit was held in January 2015. A range of topics, from a federal safety fund application process to implemented project evaluation, are covered during the Safety Summit. Safety ambassadors, usually selected from professionals who worked in public and private sectors, are also introduced during the summit to assist local agencies in answering every aspect of local road safety project. Interviews with local agencies in District 7 reported that through the Safety Summit, the presentation of an overall HSIP fund application process with specific timeline tables led their agencies to engage in applying HSIP funds. First offered in October 2013, the Local Agency Traffic Safety Academy (LATSA) is a free webinar series focused on information regarding safety-related issues. Open to the public interested in promoting local roads safety, LATSA is funded by HSIP to support and enhance local agency safety programs.

Local Agency Safety Funding Guide for Off-System Roadways Manual and Design Contract

Developed in 2012, the *Local Agency Safety Funding Guide for Off-System Roadways* provides a detailed explanation of the HSIP process and guides local agencies through the application process. The manual has been updated annually to reflect all rules and policy changes. The most recent version was published in April 2015 and the website link is provided in Appendix E. There is also a dedicated districtwide design contract for off-system safety projects. Approximately a $500,000 annual fund is assigned and while FDOT District 7 provides design service, local agencies are in charge of construction and maintenance.

Signal Four Analytics

Signal Four Analytics is a statewide interactive, web-based geospatial crash analytical tool that allows visualization and analysis of crash information. Funded by the Florida Traffic Records Coordinating Committee to improve accessibility and utilization of traffic records in the state, Signal Four Analytics presents a new concept for crash intersection diagrams that integrates GIS maps, crash features (e.g., crash injury level, crash type, driver's behavioral information etc.), and two-dimensional bubble charts that can be interactively explored. The system hosts a crash database that is updated daily and contains more than four million crash records from all state and local roads since the year 2006. Open to any state of Florida's public agencies, the system is designed to support the crash mapping and analysis needs of law enforcement, traffic engineering, and transportation planning agencies. Local agencies have direct access to the system after registering online. Currently more than 2,000 users across 300 state, regional, and local agencies are using this system. Figure C5 presents a screen shot of Signal Four Analytics that displays detailed crash information together with the corresponding roadway map and summary charts.

Local Road System Safety and Performance

FDOT has initiated efforts to combine reactive and proactive methods in identifying and prioritizing local road projects through District 7's Local Agency Safety Program and Intersection Safety Implementation efforts in Districts 2 and 3. As presented during *Strategic Highway Safety Plan Performance Review Summary* meeting in November 2014, a consistent decreasing pattern of five-year average fatalities and serious injuries was observed across all the districts. Figure C6 illustrates average count of serious injuries and fatalities associated with lane departure and young driver crashes, FDOT's SHSP focus areas. Compared to other districts, District 7 showed a significant decrease in serious injuries and fatalities number and exceeded its target. In Figure C7, the number of fatalities and serious injuries related to lane departure crash is presented per road ownership.

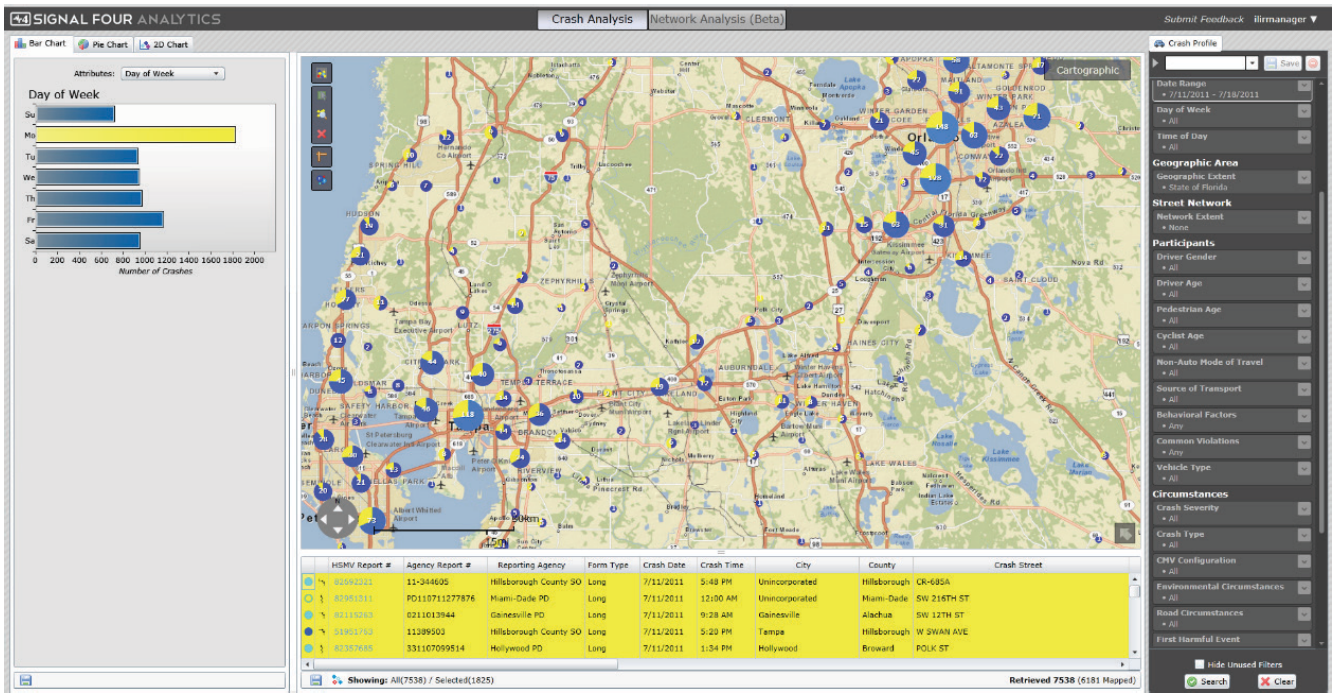


FIGURE C5 Screenshot of the Signal Four Analytics.

District 7 also noticed an increase in the application number of local agencies for HSIP safety funds as well as the awarded HSIP fund amount. For example, in 2012 and 2013, there were $13–16 million project fund requests from six to ten local agencies, resulting in an annual average of total $4.5 million approved project fund. In 2014, there was an increase to more than 25 local agencies, requesting a total of $11.3 million in project funds. A total of 55 projects valuing at $8.5 million have been awarded—almost double the awards from the previous years. Applications submitted in years 2013 and 2014 for local corridor signal timing projects have all been approved for HSIP funding amounting to approximately $1 million. According to the recent FDOT District 7's safety fund summary, a total of 118 projects totaling to approximately $23 million were funded through HISP over the past four years (2011–2014). District 7 also focused on educational program, especially for high school students in its five counties that demonstrated positive results as presented in Figure C7.

Pasco County

Pasco County, one of District 7's counties, has a population of more than 475,200 and includes five major cities and one town. Pasco County participated in the safety equipment purchase program, part of the D7 Local Agency Safety Program, for more than four years from year 2010. Details of safety equipment program are presented in Appendix D, District 7 Local Agency Safety Program slides. Britesticks, retroreflective strips on the sign support posts, were installed at several locations on

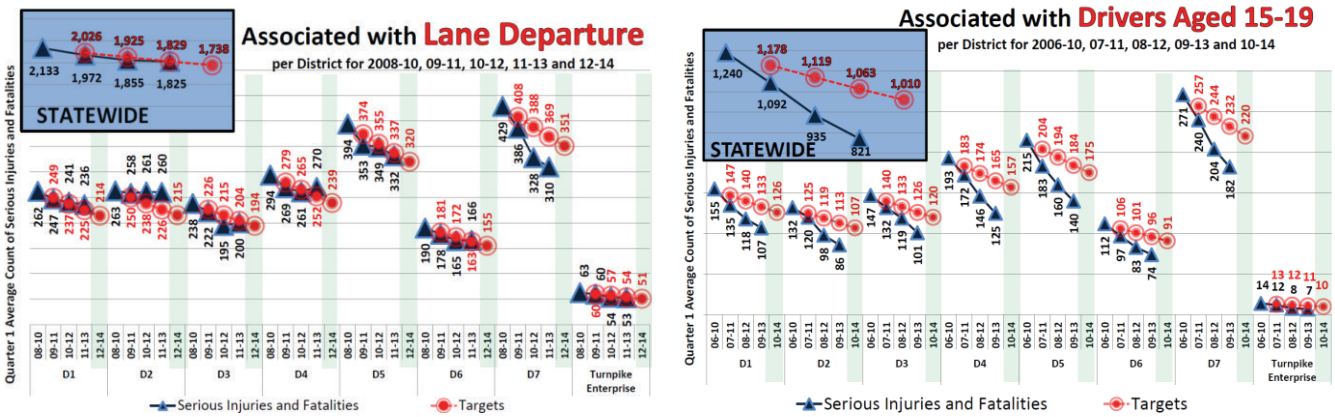


FIGURE C6 FDOT lane departure and young driver crash statistics (*Source*: Strategic Highway Safety Plan Performance Review Summary meeting, Nov. 2014).

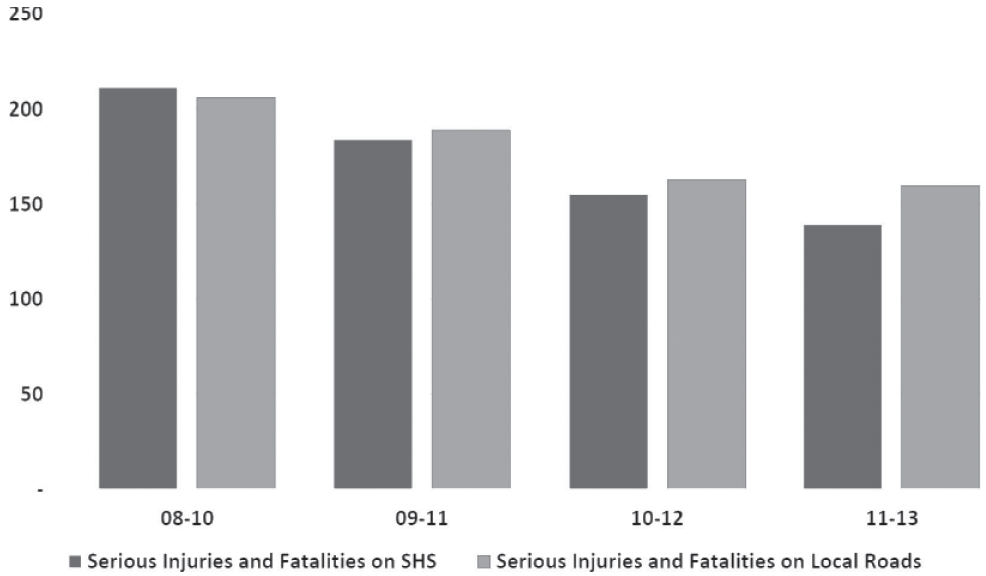


FIGURE C7 FDOT state highway system and local roads crash statistics (*Source*: Strategic Highway Safety Plan Performance Review Summary meeting, Nov. 2014).

the curved roadway to enhance the visibility of traffic control signs. A before/after study showed approximately a 41% reduction in departure curve lane crashes, which is more than double the national average crash modification factor of 20%. Details of the corresponding project and a before/after study are presented as part of web-only Appendix D. In June 2013, Pasco County was awarded with a $1.9 million construction fund to correct a substandard horizontal curve that had critical run-off-the-road crash problems. The design was provided by a FDOT safety consultant and is currently under construction through LAP approach.

Hillsborough County

Hillsborough County is the fourth largest county in the state of Florida with a population more than 1.2 million. Information from interviews indicated that Hillsborough County had a long and high level partnership with District 7 in conducting various successful local roads safety projects. District 7's leadership in notification of local agencies regarding funding programs and providing assistance to prepare the necessary applications and agreements has significantly benefited Hillsborough County.

Started in 2012 and recently completed in 2014, the Fletcher Avenue Complete Streets project aims to address a high number of pedestrian crashes. The $5 million project was partially funded with $3 million from federal funding. FDOT decided to adopt few of the innovation used in this local road safety project—as one of the statewide pedestrian/bike safety engineering tools. The 1.5-mile segment involved the installation of additional mid-crossings with Rectangular Rapid Flashing Beacons (RRFBs) and a full pedestrian signal at one location in addition to existing signal at intersection. The project also included pedestrian mid-block crossing at installed median islands with light-emitting diode (LED) lighting which activated simultaneously with the pushing of the button for the RRFBs. The speed limit was lowered from 45 miles per hour (mph) to 35 mph. Though still under evaluation, an early crash analysis shows a clear decrease in the number of pedestrian and vehicle crashes (e.g., drop from an annual average 6 crashes to 1 crash in the case of pedestrian related crash). Appendix E provides link to the corresponding project.

Local Curve Safety Improvement for Various Counties

During the FDOT fiscal year 2013–2014, approximately $2.7 million was awarded to address 230 rural and suburban local highway curve segments to three counties (Citrus, Hernando, and Pinellas) in District 7. This award was accomplished through design-build push button with the agreement of local being in charge of maintenance.

Addressing Challenges

In the synthesis survey, limitations of local agency and FDOT resources as well as local and state agency turnoff were stated as major challenges in addressing local roads safety. When asked about the replication of District 7's various strategies at other districts, the interview with District 2 and 4 Safety Engineers reported that the main barriers were the overall geographic and district level safety interests differences. Different districts have different structures in managing project fund aiming at different objectives.

Information gathered from an interview with FDOT District 2 indicated that District 2 is planning to implement the Safety Summit after attending District 7's annual Safety Summit in early 2014. There are a total of 18 counties in District 2, which include approximately 65 different local governments. District 2, therefore, presents a significantly larger scale than District 7. The main challenge for District 2 is distributing funds throughout its high number of local agencies. The question posed is whether there is a mechanism to fairly distribute limited funds to local agencies which lack resources. With a large number of local groups, it is difficult to provide funding for all of them which ultimately may discourage local agencies from

attending yearly safety summit and applying for funding. Dividing up District 2 and focusing on certain sections each year is one method that District 2 is trying to address this challenge. District 2 has adopted the design-build push button approach but not directed to local road system at the moment of this synthesis.

Interviews with District 7 reported that official face-to-face meetings with local agencies to go through the HSIP application process and numerous unofficial meetings between safety ambassadors and local agencies helped increase local agencies' participation in overall safety projects. This approach is also aimed to bring all FDOT District 7 offices (e.g., Design, Utilities, Operation, etc.) on board to understand local roads system.

Summary

The state of Florida demonstrated the importance of a safety champion who brought a great success in enhancing local road safety with a structured layer approach that could be implemented tailored to local agency's needs. Crash statistics on Florida's latest SHSP present a continuous crash reduction in the majority of emphasis areas. District 7's innovative layered approach in addressing local roads safety issues have proven to be successful. In Florida, CTST's major role in coordinating the safety efforts of the local agencies and the state was instrumental in crash reductions. An interview with a county engineer in District 1 revealed that the biggest challenge local agencies face is the administration and delivery of federal-aid projects. Interviews with District 7's local agencies attributed District 7's outreach and training in resolving these issues. Continuous outreach efforts by DOTs and smart use of resources (e.g., safety ambassadors) coupled with streamlined project delivery method (e.g., design-build push button) are reported as major factors of achieving successful local roads safety projects.

IOWA STATE SAFETY PROGRAMS AIMED AT LOCAL AGENCIES

Background

The state of Iowa has approximately 105,500 miles of roadway (92% of all public roads) that are locally-owned and maintained. Local road programs and projects are handled by both the central (planning and programming) and district offices (implementation) of the Iowa Department of Transportation (Iowa DOT). Many of these projects are coordinated by the Office of Local Systems, which has a staff of nine persons. Safety programs and safety-funded projects are coordinated by the five-person Safety Section in the Office of Traffic & Safety. According to the 2014 HSIP annual report, HSIP funds are primarily allocated to the state-owned and primary road systems, while a portion of state funds are available to the secondary-road and local road systems via the state's Traffic Safety Improvement Program (TSIP).

Per the Governor's Traffic Safety Bureau (GTSB) Iowa Highway Safety Plan, local roads are identified as one of ten emphasis areas for traffic safety based on crash data analysis (Iowa DPS 2015). The state of Iowa has embraced a vision of zero traffic fatalities and launched its *Zero Fatalities* Campaign in 2013. The Zero Fatalities Program is a partnership with Iowa DOT, Iowa Department of Public Health and Iowa DPS. Iowa DOT's Office of Traffic and Safety administers several programs that encompass a wide range of safety topic areas. Table C1 outlines safety programs associated with local agencies.

Safety Program/Initiative

Based on interviews with Iowa DOT staff and County Engineers, there are three safety programs and two initiatives that the state of Iowa is most actively pursuing regarding local roads safety.

Traffic Safety Improvement Program

As defined in Iowa Administrative Code, Section § 761, Chapter 164, presented in web-only Appendix D, the Traffic Safety Improvement Program (TSIP, also known as Traffic Safety Fund) has three project categories for funding eligibility: (1) a site-specific safety project, (2) traffic control devices installation-related project, and (3) research, studies, and public information-associated project. An applicant's maximum fund level depends on the project types. The program fund is from the Iowa Road User's Tax and is therefore a solely state-funded program. Interviews with county engineers reported that easy access to TSIP funds without undergoing federal fund documentation process facilitates and encourages many local agencies' participation.

Also noted is the unique relationship between Traffic Engineering Assistance Program (TEAP) and TSIP. Information gathered from the Iowa DOT interview showed several TEAP studies led to local agency's application of TSIP and ultimately resulted in funded projects. The following three projects present an example of TEAP studies resulting in funded TSIP projects. As many local agencies are facing limited staff resources, Iowa DOT's engineering service through TEAP is identified as a way to enhance local roads safety of these agencies.

- City of Ankeny: Intersection of 1st Street and State Street; TEAP study completed on May 2013; Funded with TSIP for Fiscal Year 2015 (widen pavement to provide a dedicated left turning lane and improve traffic signals, $500,000).
- City of Carroll: Intersection of U.S. 30 and Grant Road; TEAP study completed on May 2013; Funded with TSIP for Fiscal Year 2015 (improve intersection radii and provide left turning lanes, replace traffic signal installation, $500,000).
- City of Bondurant: Intersection of U.S. 65 and 32nd Street; TEAP study completed on September 2012; Funded with TSIP for Fiscal Year 2014 (install traffic signals, install offset left turns on U.S. 65, add left turn lanes on 32nd Street SW, $500,000).

HSIP-Secondary Program

Iowa DOT initiated the HSIP-Secondary Program to replace the High Risk Rural Road program and to continue supporting safety enhancement in rural roadways. Collaboration with the Iowa County Engineers Association was noted as a key element in initiating this program. A total of $2 million from the HSIP fund is set aside specifically for this program. Approved projects are funded 90% from federal funds while a 10% local match is required, which Iowa DOT then contributes from TSIP fund. Local agencies are responsible for project delivery and completion. Local agencies submit the Letter of Interest as presented in web-only Appendix D and the Iowa DOT HSIP-Secondary Team will review and analyze crash data with the County Engi-

TABLE C1
IOWA DOT'S SAFETY PROGRAMS

Safety Program	Description	Program Fund Level	Applicant Fund Level
Traffic Engineering Assistance Program (TEAP)	Program aims to provide traffic engineering expertise to local governments without the resources of a staff traffic engineer. Typically serves cities with populations less than 35,000.	$125,000.00 TEAP is funded by a combination of a Federal NHTSA grant and state funds.	Maximum of 100 consulting hours per applicant
Traffic Safety Improvement Program (TSIP)	Program provides funding for traffic safety improvements or studies on public roads under state, county or city jurisdiction.	½% of Iowa's Road Use Tax Fund which is approximately $6 million/year	Maximum of $500,000 per project
Highway Safety Improvement Program (HSIP) – Secondary Program	Program focuses on Secondary Road System projects by investigating applicable **low cost, systemic safety improvements**	HSIP set aside amount of $2 million	90% federal reimbursement and 10% required local match
Horizontal Curve Sign Program	This program, which is a sub-program under TSIP, provides funding to counties for the purchase of curve warning and chevron signs. Funds can be used to reimburse counties for purchases of advance warning signs, advisory speed plaques, chevrons and arrows. Beginning January 2013, posts and hardware are eligible to be reimbursed.	Program funded from TSIP	Maximum $10,000 per applicant, per year.
Sign Replacement Program	Started around year 2000, a sub-program under TSIP, the primary purposes included updating regulatory/warning signs to current retroreflectivity requirements and establishing a sign inventory program for the city to manage their signs.	Program funded from TSIP	Approximately total of $120,000/year. Approximately 50 cities receive grants each year.
Overhead Flashing Beacon Replacement Program	This program, which is a sub-program under TSIP, replaces overhead flashing beacons at intersections with a two-way stop condition with post mounted flashing beacons.	Program funded from TSIP	Funds material costs only. Labor for removal and installation is applicants' responsibility.

Source: Adapted from Iowa DOT's Office of Traffic and Safety (http://www.iowadot.gov/traffic/index.htm).

neer and other stakeholders to identify potential projects. Low-cost systemic implementation of safety measures is a focal point of this program. At the time of this synthesis, applications are accepted on a first-come, first-awarded basis without a specific deadline for applications.

Horizontal Curve Sign Program

Through interviews with county engineers, the horizontal curve sign program, a sub-program of TSIP, was also identified as one of the safety programs where local agencies' participation was high. With no specific program application deadline, local agencies have a year-round application time window. The only restriction to a local agency is that an applicant must not have applied for funding under this program in the prior 12 months. The program application/agreement form is presented in web-only Appendix D. A link to an excel spreadsheet that assist local agencies to determine appropriate sign type based on the curve features is also provided in Appendix E.

Figure C8 describes the overall fund flow between safety programs.

Workshop and Database

An annual Local Road Safety Workshop is the venue where a multidisciplinary team consisting of staff from Iowa DOT, Iowa Department of Public Safety, FHWA, and LTAP discuss traffic safety issues with local agencies. Iowa DOT staff from Traffic & Safety, Local Systems, Traffic Operations, Systems Planning, Motor Vehicle Enforcement, and each of the six District Offices traditionally participates. Iowa DPS staff from the Governor's Traffic Safety Bureau (GTSB) and Iowa State Patrol has also traditionally participated. Six workshops are arranged across the state to provide local agencies with the opportunity to attend without having to spend an overnight away from their busy workplaces. Presentations cover various topics including engineering, enforcement, and education to appeal to traffic safety professionals from across disciplines. An interview with the Iowa DOT staff reported that this workshop is where many connections and communications among various parties are made, which ultimately builds trust. The Iowa County Engineer's Meeting is also another venue where DOT staff attends to gather local agencies' issues related to local roads safety.

The Statewide Traffic Records Coordinating Committee (STRCC) is a multidisciplinary team whose responsibility is to

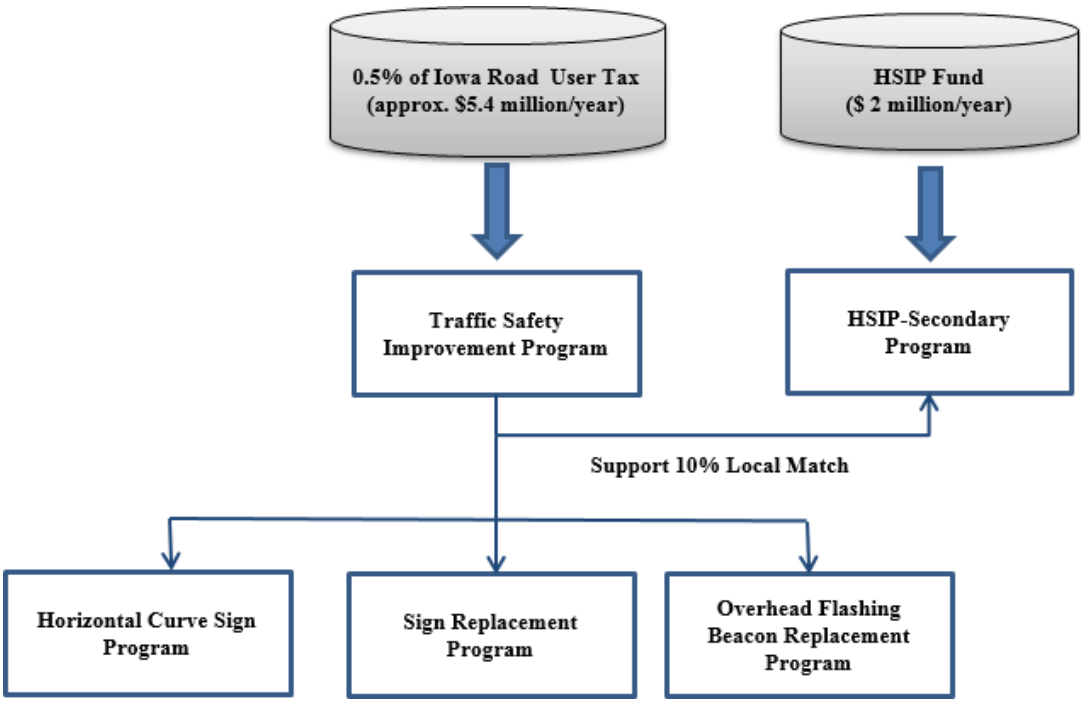


FIGURE C8 State of Iowa's safety programs fund flow.

promote and maintain a complete, accurate traffic records program. Based on federal funding from Section § 408 of SAFETEA-LU and Section § 405 of MAP-21, STRCC supports the development of data programs applied for traffic safety analysis and special projects. For example, to assist local agencies in analyzing crash histories, Iowa DOT provides a computer-aided crash mapping analysis tool (CMAT) that offers crash location and severity information. Crash maps are also provided in the form of hard copy or electronic files (pdf format) to local agencies at Local Road Safety Workshop or via email as requested. Iowa DOT is currently working to develop a web-based analysis tool that would include GIS compatibility and be directly accessible to local agencies as well as many other safety partners. Figure C9 depicts a sample CMAT screenshot.

Initiatives

The GTSB's *High Five Rural Traffic Safety Project* Initiative, initiated on April 1, 2014, aims to increase seatbelt use on rural roads and reduce the occurrence/severity of rural road crashes. Five counties (Allamakee, Marion, Webster, Fremont, and Palo Alto) are currently participating. The proposed initiative encompasses a three-tier approach to include enforcement, engineering, and education with the ultimate goal of building a safer community. Identification of low-cost safety improvements across the county is an example of an engineering focus area. The initiative will continue with a new set of five additional counties in 2015. This initiative is in line with Iowa's Zero Fatalities program that also aims at enhancing traffic safety through the behavior change of drivers.

Another initiative the state of Iowa has launched is the *Local Road Safety Plan* Initiative. Iowa is piloting local road safety plan development in 12 counties starting in 2015. The pilot study begins with developing crash maps and crash trees to identify crash patterns using analysis tools developed by Iowa DOT and the Institute for Transportation at Iowa State University. A survey questionnaire has been sent to the participating 12 counties to further explore safety countermeasures. Specifically, identification of countermeasures the county leadership has tried or may be interested in is a focal point of the survey. Starting in June 2015, a meeting with stakeholders in each county is planned. The intention of this initiative is to offer local safety plan development to all 99 counties in Iowa over the next six years. This initiative has been influenced by Iowa's neighboring state, Minnesota. It is anticipated that this initiative will identify projects

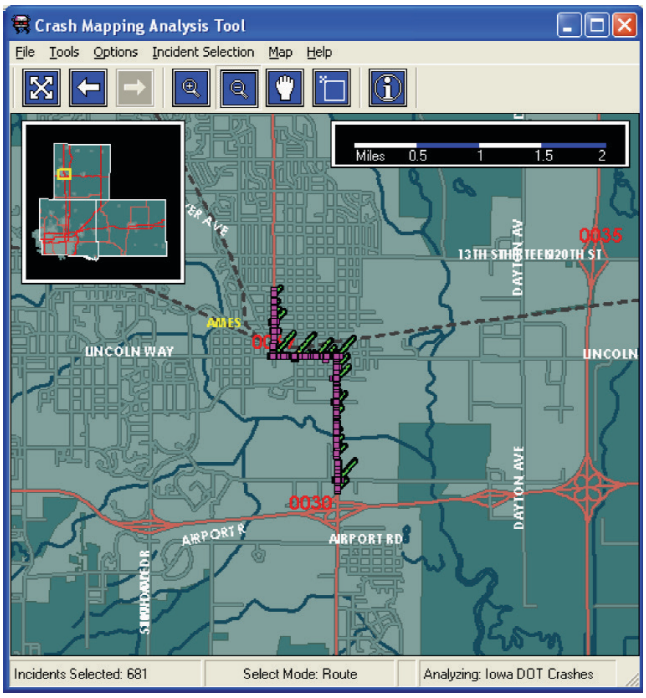


FIGURE C9 State of Iowa's CMAT sample screen shot.

which would address existing safety-related needs (e.g., signing, pavement section, localized geometric or road characteristics, clear zones issues, etc. A total of $600,000 of safety funds (90% federal and 10% state) is assigned for this initiative. Both Clinton and Montgomery Counties are participating in Iowa DOT's Local Roads Safety Program (LRSP) pilot study. Interviews with county engineers indicated positive expectations from the corresponding pilot study. More specifically, expectations include having a list of projects beyond what counties might have initially envisioned, evaluating project effectiveness based on local resources, and facilitating local agencies' outreach programs like HSIP and TSIP to supplement efforts and work toward the safest possible road system.

Local Road System Safety and Performance

Iowa DOT applies proactive and reactive approaches in problem identification on the local roads system. Iowa's crash trend as described in the SHSP and HSIP reports indicate a consistent decrease of the five-year average of fatalities and major injuries (Figure C10). Iowa's SHSP and GTSB's Highway Safety Plan also project a 15% reduction in fatalities and major injuries by year 2020 across the state highways with a long term vision of the zero deaths.

Clinton County

Clinton County is comprised of 18 townships and 14 cities with a population more than 48,000. The secondary road department of Clinton County maintains 200 miles of paved roads and 800 miles of gravel roads. An interview with the Clinton County engineer reported that the use of state fund through TSIP is the Iowa DOT's notable practice in bringing local agencies' participation to improve safety issues on roadways. Local agencies are using exclusively state funds and they are not required to go through the federal-aid process. In 2006, the county implemented a 1,000-foot curve realignment project using TSIP funds. No fatal or major injury crashes were observed since the project's completion. A sample project fund request document is presented in web-only Appendix D. At the time of this synthesis interview, the county completed a $70,000 intersection realignment project from the fiscal year 2012 TSIP. Furthermore, in the past four years, the County also received funding to correct horizontal alignment sign issues through the Horizontal Curve Sign Program.

Montgomery County

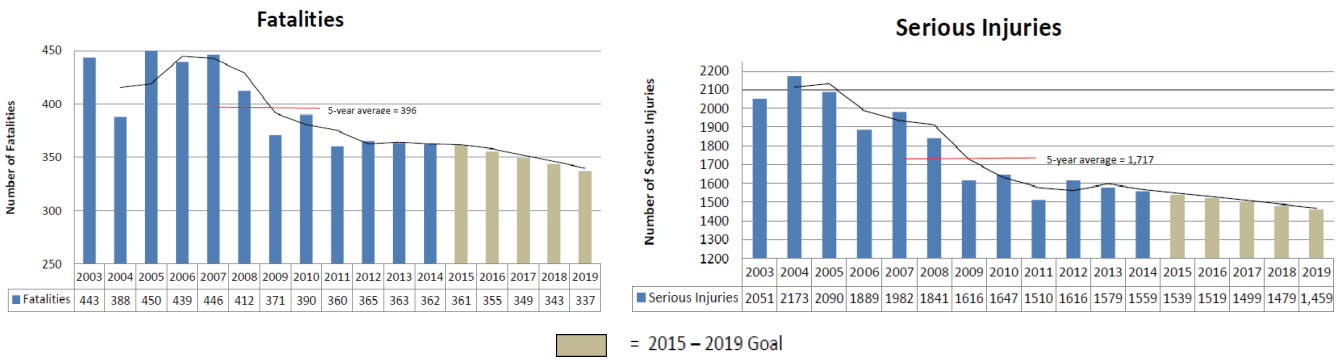
Montgomery County has a population of more than 10,740 and includes six cities and 12 townships. Recently awarded projects include: (1) a $500,000 TSIP funded project on County Road H34 that covers various tasks such as adding pavement and rumble strips as well as widening painted edges and (2) a HSIP-secondary program funded project that covers milling in traffic markings for more than 25% of paved system, which will lead to significant cost savings (more than $50,000 per year). An interview with the county engineer reported that Iowa DOT's currently providing up to 100% of costs on many safety studies and improvement projects is a unique feature that helps local agencies' involvement in safety projects. The County Engineer also noted Iowa DOT hosting of the workshop is significantly informative and allows the chance to learn about various programs and funding opportunities. One problem the local agency is facing is related to the difficulty in capturing local roadway crash statistics due to low traffic volume.

Addressing Challenges

In the synthesis survey, Iowa DOT stated resource limitations of local agencies and state DOT staffing as a primary challenge in addressing local road safety with local agencies. To encourage local agency participation, the Iowa DOT provides state funds to match federal funds that alleviates the burden of federal-aid project requirements for local agencies and currently allows a year-round funding application submission. Interviews with county engineers reported that the increased outreach by DOT safety staff and coordination between state DOT safety and local systems staff to connect with more county engineers helped local agencies identify available safety programs. The importance of a multi-disciplinary collaboration approach is emphasized in Iowa's Highway Safety Plan and its SHSP, which would contribute significantly to strengthen its state-coordinated safety programs.

Summary

In Iowa, the state fund, as described in Iowa Administrative Code, Section § 761, Chapter 164, supports all of the local road safety programs so that local agencies only need to contribute their own staffing to complete the projects. Based on interviews with Iowa DOT and County Engineers, there are two safety programs (Traffic Safety Improvement Program that includes Horizontal Curve Sign Program and HSIP-Secondary Program) providing local road safety funding and two relatively new initiatives (High Five Rural Traffic Safety Project and Local Road Safety Plan) that the state of Iowa is actively pursuing regarding local roads safety.



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Fatalities	443	388	450	439	446	412	371	390	360	365	363	362	361	355	349	343	337
Serious Injuries	2051	2173	2090	1889	1982	1841	1616	1647	1510	1616	1579	1559	1539	1519	1499	1479	1,459

FIGURE C10 Crash trend of fatalities and serious injuries (*Source*: Iowa Highway Safety Plan 2014).

LOUISIANA STATE SAFETY PROGRAMS AIMED AT LOCAL AGENCIES

The state of Louisiana has 16,698 miles of state highways and 44,691 miles of locally owned roads. Louisiana's state system carries 83% of the traffic volume where 72% of the public roads are owned by local agencies. Overall, about $60 million is allotted to highway safety, with $3–5 million of the HSIP program budgeted for local roads. Safety projects are funded from Section §154 (Open Container laws), Section § 164 (Repeat Intoxicated Driver laws), HSIP and high risk rural road program (HRRRP) and funding levels are projected to increase as the capacity to implement projects by local jurisdictions increase. The Department of Transportation and Development (DOTD) has two successful programs addressing safety on local roads in Louisiana: (1) LRSP and (2) the Regional Safety Coalitions, which are focused on implementing the Destination Zero Deaths vision of the State's SHSP.

Safety Program/Initiative

Local Road Safety Program

In 2006, the DOTD initiated a LRSP to improve highway safety for Louisiana's local road system. Eligible projects include those for roadways and transportation systems owned and operated by parish and/or municipal road agencies. Parish or municipal jurisdictions may apply for funding and projects are limited to $500,000 per project. For 8 years, the Louisiana LTAP, sponsored by the DOTD and Louisiana State University (LSU's) Louisiana Transportation Research Center (LTRC), administered the LRSP in cooperation with the DOTD. Within DOTD, no unit or department is responsible for administering local public road safety projects, which is one of the main reasons for the partnership with LTAP and the new Louisiana Center for Transportation Safety (LCTS). When the LRSP was moved by the DOTD to the LCTS in January 2015, the program manager also transferred to this office. The DOTD Office of Safety pays a portion of the LTAP director's salary, the LCTS Director's and LRSP Manager's salaries, and a portion of administrative costs. LTAP has been working with the Louisiana Highway Safety Research Group (LHSRG) which is a separate entity at LSU to access more crash data assistance. The LHSRG has been working on crash data locations on the local roads as well as developing analytical tools for use by LTAP and the locals in the future. Prior to LRSP's transfer to LCTS, LTAP administered the local road safety improvement projects through an annual solicitation process as well as a statewide analysis to identify locations for improvement as part of the State's SHSP Intersection and Roadway Departure Action Plans. Now, solicitation of projects is year-round but proposals are evaluated on a quarterly basis with cutoff dates. The LRSP utilizes a Technical Review and Selection committee to assist in selecting projects for funding. DOTD safety staff, FHWA, and local representatives are active participants. The LRSP is a cost disbursement program that allows local governments to apply federal-aid funds for safety enhancement of locally-owned and maintained roads. Since its inception, more than 120 projects such as curve delineation and intersection improvements have been funded. For funding eligibility, LRSP requires Local Public Agency program training. Complete information for the application process and application form can be reviewed in web-only Appendix D.

According to the DOTD, 17% of fatal crashes and 36% of serious injuries occurred on city and parish roads. Table C2 summarizes Louisiana's progress in implementing a reduction in fatalities and serious injuries on state and local roads. Since the program's inception, there has been a reduction in fatalities and injuries. However, over the last few years the number of crashes has leveled off with no further reductions. As a result, the program administrators have begun to evaluate further steps necessary to expand the LRSP and safety-related programs.

The LCTS is separate from the LTAP but still organized under the LTRC of LSU. Both LTAP and LCTS continue to collaborate in reviewing LRSP projects submittals and providing assistance for SHSP activities. DOTD/LTRC is funding a full time program manager and center director, one part time staff, 20 hour a week, on data analysis and planning and technical assistance. Previously, there were not enough resources in staff to get all of the work done. Besides a more coordinated organizational structure, two additional staff members are being hired by LCTS: one will concentrate on highway safety workforce development and assist LTAP and LCTS program efforts; the other one will manage contracts and research. It is planned by the DOTD to contract out the development of parish level safety plans for the top 20 parishes with the highest number of crashes. With the completion of these local safety plans, the local public agency can then focus on submitting identified projects for funding and implementation. Local Public Assistance (LPA) programs are the responsibility of one office within the DOTD. Extensive training has been provided across the state to local agencies who wish to participate in the LPA program including safety. A noteworthy practice from DOTD was to bring in a Law Enforcement Expert to improve crash data collection. Being able to train law enforcement agencies on data collection has allowed for better accuracy and completeness in

TABLE C2
TOTAL STATE AND LOCAL ROAD CRASHES IN LOUISIANA

Year	State Fatalities	All Local Road Fatalities	State Road Injuries	All Local Road Injuries	All Fatalities	All Injuries
2005	753	205	55,780	26,709	958	82,489
2006	801	184	54,198	25,777	985	79,975
2007	807	186	54,094	24,808	993	78,900
2008	748	164	52,332	23,551	912	75,883
2009	663	162	50,420	23,436	824	73,856
2010	608	112	48,405	20,342	720	68,747
2011	533	143	49,190	21,054	676	70,244
2012	605	117	49,917	22,533	722	72,450
2013	562	141	49,189	21,456	703	70,645
2014	563	163	49,775	22,771	726	72,546

Source: Louisiana DOTD Highway Safety Administrator.

statewide crash data, which in turn resulted in informed decision-making and an overall improvement in safety. Finally, Louisiana was noted for their participation in the Distracted Task Force and the Aggressive Driving Task Force. The intent of the task forces was to analyze the data to identify the problem and then enact effective countermeasures to correct the problem.

The DOTD is also exploring systemic safety analysis for local roads as a new focus. In the past, the DOTD did not have specific location information for local crash data. A project has been completed to locate all local crash data from 2010 to the present. A three-year project is currently underway to gather the Fundamental Data Elements (FDE) on the local network with its goal to establish a foundation for better data analysis in crashes and traffic volume. A new initiative is underway to identify high risk horizontal curves on the local road system and program low-cost projects to improve safety at these locations. In 2010, FHWA highlighted the Louisiana LRSP as a noteworthy practice (FHWA 2010). The DOTD/LTAP and newly added LTRC/LCTS partnership continues to be a successful endeavor in implementing the LRSP. Its initial success in reducing crashes continues to evolve, expand, and be enhanced in an effort to empower local agencies to improve the safety on local roads in Louisiana.

Destination Zero Deaths (DZD) Initiative of the SHSP and Regional Safety Coalitions

The state of Louisiana seeks zero deaths on its roads and highways through its DZD initiative and SHSP. The DOTD, the Louisiana State Police (LSP) and the Louisiana Highway Safety Commission (LHSC) jointly lead this effort. Its strategies include, discouraging impaired driving, encouraging seatbelt use and educating young and new drivers. The program also aims to improve road safety through improved roadway infrastructure and operations that can be implemented at the state, regional and local level. The 2011 SHSP is currently being updated and the 2015 DZD highway safety summit is scheduled for the fall. To accomplish the DZD goals and strategies, in 2011, the DOTD divided the state into nine regions and required that each develop a regional safety coalition and safety plan to assist with the implementation of the Louisiana SHSP. As of 2015, as reported by the DOTD, eight active coalitions have been established. Each coalition reviews regional crash data to identify projects to reduce fatalities and serious injuries for impaired drivers, unsecured and young drivers and crashes due to infrastructure safety issues. Several regional coalitions have also identified bicycles and pedestrians as an additional emphasis area.

To identify and implement local infrastructure improvements, the LRSP team works with regional safety coalitions in coordination with those activities being accomplished on the state system. To assist, the LRSP Technical Assistance Engineer analyzes the available crash data on the local system to help coalition members identify and prioritize road segments and intersections for future analysis. Once priorities are agreed upon, RSAs are conducted and solutions are developed. The regional coalitions are then able to apply for LRSP funding for improvements. Typical projects include sign improvements, minor geometric improvements, and other low-cost safety improvements. A sample SHSP funding application form is presented in web-only Appendix D.

An example of a regional SHSP is the South Central Regional Transportation Safety Plan (SCRTSP), the recipient of the FHWA 2013 National Roadway Safety Award (FHWA 2013). As the first regional, data-driven action plan developed in Louisiana as part of the State's efforts to implement its SHSP, SCRTSP showed a strong partnership among Federal, State and local agencies from six parishes in the region—including the South Central Planning & Development Commission), the Louisiana DOTD and the Houma-Thibodaux Metropolitan Planning Organization (MPO).

Included in the SCRTSP are action plans regarding four emphasis areas (occupant protection, alcohol-related driving, crashes involving young drivers, and infrastructure) by integrating the approaches of safety 4Es. As of August 2013, 70 % of the plans have been implemented with the fund sources from HSIP, the Louisiana Highway Safety Commission and the DOTD. According to the South Central Safe Community Partnership coalition's, there has been a decline in the South Central Region's 3-year-average of fatalities and serious injuries where lack of seatbelt use or driving under the influence of alcohol are causal factors. The ultimate goal of SCRTSP is to have 50% fatality reduction by 2030.

Moving forward, the LTAP and DOTD are partnering on a three-year program to collect and compile roadway and traffic data on the local road systems. This program will collect roadway characteristic and traffic data on all public roads. The program will continue to enhance LTAP's capability to work with the local agencies, share data and collaborate on infrastructure improvements. The LTAP is facilitating the development of a research project to develop better estimates of local road Average Annual Daily Traffic (AADT) that is necessary for many of the safety analytical tools currently being used.

Local Road System Safety and Performance

Both reactive and proactive methods are used to identify and prioritize local roads projects. Since 2006, with the initiation of DOTD's local road safety program, approximately 25% of the state fatalities occur on locally-owned roadways each year. For local road safety projects, parishes must submit a minimal match in funds—typically 0–10%. Some local agencies accomplish their own project design by using local funds, which can count as a match. To supplement the local road data collection, an Interagency Agreement with the LHSRG, a separate entity at LSU, has been executed to provide more historical crash data. The group is currently using geo-coding to identify local road crashes. This geo-coding system allows the DOTD and local agencies to query the local road system and identify both spot and systemic improvements projects.

Interviews with the Chief Administrative Officer, city of Central, the Parish Engineer of Tangipahoa Parish and the Public Works Director/Engineer of Rapides Parish reported on specific safety projects where positive safety improvements were noted with reductions in crashes.

City of Central

With a population of about 27,000, the city of Central, the second largest city in East Baton Rouge Parish, has approximately 160 miles of road under their jurisdiction. Central City had a project that addressed four local roads with high numbers of head-on and run off the road crashes by installing centerline rumble strips, chevrons, and advance curve warning signs. An improvement in traffic safety occurred on these roads with a 50% reduction of crashes and roadway departures. In 2012, another project for signage produced similar reductions in crashes. The city did not keep crash data records. The Chief Administrative Officer coordinates all safety projects while the DOTD prepares, funds, and manages the contracts. A sample funding commitment letter on the projects is presented in web-only Appendix D.

The success of centerline rumble strips as a countermeasure resulted in a DOTD specification for use in state highway projects. The city of Central has been a member of the Capital Region Transportation Safety Coalition for the past two years. The coalition is currently working on establishing performance goals, objectives and identifying the types of projects such as those which reduce pedestrian crashes and the collection of crash data. The biggest challenge is driver distraction including the use of cell phones and radios and speeding.

Tangipahoa Parish

One noteworthy example of emphasizing safety programs, identified by the DOTD/LA LTAP, is Tangipahoa Parish. The Parish Engineer, a former DOTD District Engineer, is a champion in enhancing local roads safety. Tangipahoa Parish has participated in several LSRP projects. In 2003, ten intersections were identified as high crash locations and an initial pilot project installing stop bars at intersections, new stop signs, and about 46 advance warning flashing beacons was completed in 2004. As a result, a reduction in crashes was witnessed at those intersections. One area, with a 5,500 Average Daily Traffic (ADT) and with two 10-foot lanes without shoulders, had a previous accident rate of 12 crashes at four intersections per year. After the completion of the project, only two crashes per year have been recorded. In 2013, Tangipahoa Parish instituted another project incorporating advance flashing beacons at 15 intersections. While the data are still being evaluated over a three-year period, there has been a reduction in crashes. Another project, completed in 2012, with a double reverse horizontal curve on an access road, had one to two crashes a week on the road prior to the project's completion. It currently averages one crash a year. Another project, valued at $350,000, installed in 2006, included centerline marking and raised pavement markings, striping and rumble strips at critical locations at intersections. The result was improved visibility and a reduction of crashes.

Tangipahoa Parish has one of the highest crashes on railroad crossings in the state. A major railroad-crossing project addressing 25 unsignalized rail crossings is now underway and expected to improve crossing safety with new signs, advance warning and pavement markings. This project was 90% funded by the state with 10% of local government share.

The Parish Engineer noted the total crash numbers remained the same even though the parish did see an increase in population from 96,000 to 120,000. In areas where safety improvements have been made, the parish has witnessed a significant reduction in crashes. An interview with the Parish Engineer indicated that while the Parish does not keep crash records, the sheriff's office has detailed GIS records of crash locations. The Parish Engineer participates in the regional safety coalition meetings, which meets monthly, when infrastructure issues are raised. Besides the infrastructure needs of Tangipahoa Parish, there is a considerable need to focus on seat belt use, distracted and inattentive driving, speeding and other behavior issues.

Rapides Parish

The Rapides Parish Public Works Director reported two LRSP projects, fully funded by the DOTD, completed in the 2012-2013 period yielding a reduction in crashes on these routes. Similar to the Tangipahoa Parish case, the Parish Engineer does not monitor total crashes on Rapides Parish roads but crash information is available through Sheriff's office. In an interview with the Parish Engineer he reported that the biggest challenge is addressing distracted driving. The Parish does participate in the regional Toward Zero Deaths (TZD) safety coalition.

Addressing Safety Challenges

The DOTD and LA LTAP reported that communications with the local agencies on safety programs is a continuing challenge primarily due to differing priorities, in understanding available traffic data and in submitting projects to install countermeasures. Of the 64 parishes, approximately 25% have an engineer overseeing the road system. To improve the effectiveness in communications and coordination of the DZD regional coalitions, the DOTD has hired full-time coordinators in most of its regions. A key goal is to create a traffic safety culture among local government agencies, which in turn, can address driver behavior in outreach programs. One key element in the success of promoting an improved safety culture is the identification of safety champions in every agency. While the availability of funding safety projects is not a current concern, project delivery is an issue. The DOTD districts do not have assigned safety engineers to coordinate and monitor safety projects and, as a result, the state's LTAP provides technical engineering support through the central DOTD office. Behavior issues, such as driver distraction, remain the biggest challenge. Additionally, alcohol-impaired driving factored into 30% to 40% of crashes. While slowly improving each year, the state has a low seat belt compliance rate of about 79.3% in 2012 (DOTD reports improved to 82.5% in 2013) (U.S. DOT Bureau of Transportation statistics 2014).

Additionally, the DOTD Highway Safety Administrator summarized that challenges in implementing programs include: local agency resource limitations including funding and staff; local agency staff turnover; and slow project delivery. Accordingly, the DOTD has emphasized in the LRSP a need for increased technical assistance, data analysis and project delivery training to local agencies.

According to the Highway Safety Administrator the reduction of fatalities and serious injuries over the initial years of these programs can be attributed to the initiation and expansion of state-coordinated programs and partnerships, the increase in HSIP funding, the promotion of systemic low cost safety improvements and other non-State DOT programs. However, in recent years the number of crashes on local and state roads has remained the same and, as a result, an evaluation of the current programs is underway. One action, in early 2015, was the reorganization and establishment of the LCTS at LSU, which expands the staffing to assist local agencies in identifying and submitting safety projects for funding. In interviews with the DOTD Highway Safety Administrator, the LTAP Director, two Parish Engineers, and a City Chief Administrative Officer, behavior issues, such as distracted driving, alcohol use and speeding remain key challenges in reducing crashes on Louisiana's state and local roads. The DOTD Highway Safety Administrator is optimistic that the Regional Safety Coalitions will begin addressing both behavior and infrastructure issues proactively as it continues to expand and improve.

Summary

The Louisiana DOTD has two noteworthy programs aimed at reducing crashes on local roads: the LRSP and DZD initiative.

- Since 2006 the LRSP has improved local road safety by reducing crashes at those sites where projects have been completed. The DOTD has partnered with the Louisiana

State University's LTRC through their LTAP to administer the LRSP. The LRSP has been transferred to the Louisiana Center for Transportation Safety (LCTS) in January 2015 with additional resources and now works in collaboration with the LTAP Center.
- Initiated in 2011 the Regional Safety Coalitions are beginning to address the goals of the Destination Zero Deaths (DZD) initiative of the SHSP and as they expand and mature, according to the Highway Safety Administrator, will have a positive effect on the reduction of local road crashes and in improving the safety culture in local agencies as they address local road safety.

The availability and analysis of local road inventory and crash data remains a challenge. It is being addressed in ongoing programs to collect the FDE on all public roads and improvements to the collection and compilation of crash data through the LHSRG and the recently established LCTS. The Louisiana DOTD and local agencies report that behavior issues such as distracted driving, alcohol use and speeding are key challenges in reducing crashes.

MICHIGAN STATE SAFETY PROGRAMS AIMED AT LOCAL AGENCIES

Background

The state of Michigan's safety efforts start with the Governor's Traffic Safety Advisory Commission (GTSAC). The GTSAC is in charge of implementing Michigan's Strategic Highway Safety Plan (SHSP) and it is the SHSP that drives Michigan's safety program. The Michigan Department of Transportation (MDOT) has two different groups in its safety program. MDOT administers Local Agency Programs (LAP) which is under its Development Services Division. Traffic and Safety administers the Local Safety Initiative (LSI) and is under the Design Division. Both the Development Services Division and the Design Division are under the Bureau of Development. The LAP administers the safety program for the local agencies, while the LSI provides technical assistance. LAP administers federal safety funds from the HSIP through a competitive grants program. A key part of the MDOT's safety program effort is the GTSAC, which is charged with implementing Michigan's SHSP. Three of the eleven representatives on the GTSAC, which consists of the representatives of key state agencies and the Governor's office, are from local government. In 2002, the Governor of Michigan formed the GTSAC to be Michigan's major program to identify key traffic safety challenges and create approaches to resolve these challenges. Statewide statistics from the *State of Michigan Strategic Highway Safety Plan 2013–2016* published in December 2012 showed significant progress toward the reduction of annual traffic fatalities from 1,084 to 889 and serious injuries from 7,485 to 5,706 over a period from 2007 through 2011.

Safety Program/Initiative

Local Safety Initiative and Local Agency Program

Through partnerships and years of working with local agencies, MDOT has built a solid foundation of trust with the local agencies. With its LSI program, MDOT helps local agencies analyze their crash data and suggests countermeasures to support the SHSP. The LSI works with local agencies on a first-come, first-served basis to identify locations of concern. LSI is a voluntary program that emphasizes low-cost fixes to improve the safety of local roads. The LSI is staffed by three full-time engineers and a data analyst and is managed by the Safety Programs Units Manager, and LAP is staffed on the safety side by one individual. Once the local agency is enrolled in the program, MDOT periodically works through its LSI program to assist them with a complete crash analysis of their local road system, using tools such as RoadSoft a graphically designed, integrated roadway management system developed for Michigan's local agency engineers and managers to use in the analysis and reporting of roadway inventory, safety, and conditional data. Upon completion of crash data review, the LSI program will conduct site visits and review with local agencies at key intersections or roadway segments. Finally, the LSI will conduct an appropriate engineering analysis and make suggestions for low-cost solutions. After the local agencies identify proper countermeasures, they can submit an application for funding based on the LSI review or can submit their own project application directly to the LAP office. LAP is divided into five program areas, which includes a safety programs. MDOT issued the call for local safety projects for the fiscal year 2017 in May 2015 as presented in web-only Appendix D.

MDOT dedicates approximately $15 million of HSIP annually for safety improvements on the local roadway system and all locally-controlled roadways are eligible for the federal funding. Projects are funded 80% federal/20% local funding unless the project scope fixes a roadway deficiency related to a fatality (K) or incapacitating injury (A) within the limits of proposed work or is an improved systemic project (that supports the state's SHSP) where the 90% federal/10% local funding. Federal safety funds cannot exceed $600,000 per project or a maximum of $2,000,000 per local agency per fiscal year. When calculating time of return for the project application, a time of return and/or a Highway Safety Manual (HSM) is a required part of the application. A HSM spreadsheet is provided to the local agency. A sample LAP safety project submittal form is attached in web-only Appendix D.

Local Agency Safety Peer Exchange

In 2014, MDOT and LTAP and the Michigan Division of the FHWA hosted a successful Local Agency Safety Peer Exchange, which nearly 50 people attended. The peer exchange agenda is presented in web-only Appendix D. The exchange allowed MDOT to gather information on specific needs of local agencies related to the delivery of safety program sand the opportunity for local agencies to discuss their programs' successes and challenges with other local agencies. Based on positive feedback, MDOT decided to host a similar peer exchange every other year. This peer exchange was successful because this was offered to all local agencies' representatives in the state of Michigan. The peer exchange in 2014 consisted of discussion items such as quick systemic fixes, case studies, funding, lesser known fixes, and the overall change of the safety culture. Participants included representatives from cities, counties and towns, MPOs, tribes in Michigan and the Michigan Division of FHWA, and private consultants.

Toward Zero Deaths

In Michigan, Toward Zero Deaths (TZD) "Effectively Engaging Locals Toward Zero Deaths on Michigan Roadways" is a communication effort to reduce roadway fatalities. MDOT has now listed the TZD name on its safety program and is moving toward a goal of "Zero Deaths." MDOT is currently seeking partners in the state

of Michigan to participate on the TZD program and sign a national partnership agreement. MDOT has created its own website for TZD and has established these partnerships through a number of presentations and have developed promotional visuals such as videos, posters, brochures, and flyers. MDOT has been presenting the national strategy to safety stakeholders, including the County Road Association Council consisting of local elected officials, across the state to encourage their participation. Sample presentation is provided in web-only Appendix D.

Local Road System Safety and Performance

Michigan's safety program stands out due to the hands-on assistance it provides to the local agencies through the LSI. In addition to LSI's partnering with LAP to deliver and fund safety projects, the partnership provides safety training and software development. MDOT has accomplished a lot in the past few years to build a trust with local agencies. LSI is a voluntary program in which local agencies decide the level of assistance they receive from the program.

Huron County

Through the LSI program, Huron County installed reflective sheeting on stop and stop ahead signs across the county. MDOT LAP administered funding for this project, implemented from 2008 to 2009. The county road commission and MDOT identified key intersections to add reflective strips to stop and stop ahead signs. The interview with the County engineer reported that the public response to the projects was overwhelmingly positive. Additionally, the project was relatively inexpensive and the subsequent public relations were successful, resulting in a win-win situation.

Another successful project with assistance from the MDOT LSI and LAP programs included improvements to an intersection consisting of a throughway road and another road with a stop sign. At the project site, motorists were required to stop at the stop sign and then pull into traffic on the through roadway which had a guardrail running along the road for a significant stretch. The guardrail also had vegetation growing in it which blocked the motorist's vision to see oncoming cars. The County worked with MDOT LSI to identify the project as a priority and utilized the LAP program to obtain a grant for the project. Simultaneously, the County secured some right-of-way and created a clear zone by using fill material to construct a gradual slope from the road and then removed the guardrail. The crash rate has decreased at the intersection and maintenance is much easier since the County does not have to negotiate the guardrail when mowing.

Lapeer County

Lapeer County participates in the LSI program through which it has completed a number of safety projects. The County was selected through LAP a series of roadway and intersection improvement projects (three intersection projects and one road segment project) in 2009 where a number of cross-over and road departure crashes occurred. The County decided to use centerline rumble strips to help reduce centerline cross-over especially with a road contain rolling hills. Since the project sites were on the low-volume roadways, the County Engineer investigated crash rates over a ten-year period, five years before the safety projects were implemented and five years after that.

The road segment project involved a half-mile section with a few horizontal and reverse curves. The county road commission cleared trees, installed guardrails, and installed centerline rumble strips. The County had 14 crashes over the five-year period before the improvements. These crashes included 12 fixed-object crashes, one vehicle over-turn and one side swipe). One crash resulted in a fatality and one motorist was injured. Five years after the project, from 2010 to 2014, the County had two fixed object crashes with no resulting injuries at the corresponding site.

The three intersection projects were different sites and varied somewhat in the treatment. The treatments for the intersections, implemented in 2009, included the installation of rumble strips, a flashing beacon and a "cross traffic does not stop" signs. For the first intersection there were 14 crashes with seven injuries before the improvements and 14 crashes with eight injuries afterwards. Unfortunately, statistics showed limited success in the first intersection. However, at another intersection, the number of crashes dropped from 11 to eight, and crash-related injuries dropped from six to three though using the same approaches. A third intersection was designed as a T-intersection after a horizontal curve where the County installed signage and rumble strips. There were four crashes with one fatality and one injury prior to the project while there were two crashes with no injuries after the project implementation. For all the projects, MDOT assisted the county in identifying the priority areas for safety improvement and assisted the county in identifying the appropriate countermeasures.

At the end of 2013, the County had one road segment that consisted of a 90 degree, tree-lined curve adjacent to a ditch containing a number of car parts from past crashes. The County cleared the trees, fixed elevations and installed shoulder rumble strips. Results from these improvements have yet to be measured but the improvements are evident in that there has been no damage to the current infrastructure, (signage) since the improvements were implemented. The improvements are further evident in the before and after pictures presented in web-only Appendix D. Future safety projects will involve adding pavement to sharp horizontal curves such that shoulder and centerline rumble strips can be installed.

South-Eastern Michigan Council of Governments

South-Eastern Michigan Council of Governments (SEMCOG) supports local planning for the seven counties in the region and the city of Detroit. Half of the state's population and jobs are in this seven county region. With 4.7 million people living in the region, the highest regional population in the state, approximately 45% of the crashes in the state occur in the region, mostly in the Tri-county area surrounding the city of Detroit. SEMCOG coordinates the development of the region's long range plan (2040), the Transportation Improvements Program (TIP) and the Transportation Alternative Program. The MPO has one full time person (Transportation Safety Engineer) who works exclusively on safety. Through the strong partnership with MDOT, SEMCOG provides data analysis for the local agencies, conducts road safety audits with the local agencies, and provides direct technical assistance. SEMCOG's safety program addresses several prominent issues including, safe routes to schools, bicycle and pedestrian safety, red-light-running, lane departure, etc.

SEMCOG works with MDOT and conducts in-house trainings and regional peer exchange forums. Through these forums, representatives from the cities and counties in the area share their experiences and approaches to improve safety. Usually, SEMCOG hold these sessions once a year and it usually follows the annual release of the state's crash data. The state is in the process of devel-

oping regional road safety plans, at the county and/or MPO level. SEMCOG was selected as one of the MPOs to develop two plans as pilot projects; one for rural areas and one for urban areas.

The state is in the process of developing local regional road safety plans at the State Planning and Development region level. SEMCOG was selected as one of the MPOs to develop two plans as pilot projects; one for rural areas and one for urban areas. These safety plans address emphasis areas specific to the region, such as lane departure, intersections, pedestrian, young drivers and older drivers. The first two pilot plans should be completed by early 2016. The strategies from these plans will include both infrastructure and behavior based strategies. By the end of 2017, it is anticipated that all the State Planning and Development Regions will have local road safety action plans in place. The plans will help address MAP-21 performance measure driven safety requirements.

Addressing Challenges

It is important for state DOTs and local and regional agencies to be able to justify the allocation of funds to safety projects and programs. For federally funded projects, it important that the DOTs are able to provide hard evidence to FHWA, as well as the general public, the benefit and success of safety projects. To address this issue, MDOT conducts before and after studies on federally-funded local safety projects every year. MDOT categorizes the projects and evaluates the results for each of the project categories. MDOT conducted an analysis in 2014 for the 2010 safety program and the full report link is provided in Appendix E. The 2010 report showed an overall reduction in fatalities and incapacitating injuries (MDOT 2010). Projects that involved guardrail installation, tree and object removal in the right-of-way, and surface treatments were grouped under roadway departure and clear-zone improvements. Twenty-eight projects from the 2010 Safety Program and HRRR funding programs included these approaches. Results from the before and after study showed a 36.9% reduction of roadway departure crashes and a 51.5% reduction of fatalities and injury target crashes. Safety projects that are targeted to specific high-risk/priority areas have shown positive results also. Results show a 42% reduction of injuries and a 65% reduction in fatalities, at improved high-risk sites. Many of these sites were urban projects focusing on signals and roundabouts as counter-measures.

There are many challenges in moving safety programs forward, the major one being the ability to request funding to support local safety programs. Barriers to this goal may include meeting the funding application requirements and addressing the lead time for project delivery. Michigan has built strong partnerships both internally within departments and externally with LTAP, the MPOs and local agencies. The communication and coordination between MDOT and its partners goes a long way in addressing these barriers whether through the peer exchange program or working directly with the local agencies.

SEMCOG participated in the 2014 Local Agency Safety Peer Exchange referenced earlier. They indicated that the discussions centered on what was working, how to strengthen partnerships and evaluate various treatments that apply more for rural or urban areas. Local and regional transportation professionals came together to share their experiences. The peer exchange along with the action teams is a way for the state to engage the MPOs and local agencies in establishing safety priorities across the state.

Additionally, Michigan has important goals for TZD regarding its research programs. MDOT will be conducting research to improve its safety program as a way to implement TZD and accelerate the reduction in fatalities. It is one of many initiatives to implement TZD.

Summary

Michigan's safety program is oriented toward a close working relationship with the local and regional transportation agencies. MDOT provides technical and financial assistance and the agencies decide the level of assistance they receive. The examples displayed a partnership between the MDOT and the agencies in which MDOT provided funding and recommendations in identifying priority areas for safety countermeasures while the agencies planned and implemented the safety projects. MDOT is also making a concerted effort to engage local and regional agencies to participate in the TZD initiative.

MINNESOTA STATE SAFETY PROGRAMS AIMED AT LOCAL AGENCIES

Background

The Minnesota State Department of Transportation (MnDOT) administers local agency programs under the State Aid for Local Transportation (SALT) Division. One program in the SALT Division is a traffic safety program called the "Local Highway Safety Improvement Program." Under this umbrella, several initiatives addressing local road safety include the County Road Safety Plans (CRSP); Road Safety Audits (RSA); Township Sign Inventory and Replacement Program, Community Toward Zero Deaths Safety Meetings; and simplified financial application procedures to apply for specific projects. The success of these programs has been noteworthy as seen in the summary of fatal crashes shown in Table C3.

TABLE C3
MINNESOTA FATALITIES ON MINNESOTA ROADS 2004–2014 (PRELIMINARY)

Year	Statewide	State Roads	County Roads	City, Township, Other
2004	567	292	207	68
2005	559	294	186	79
2006	494	239	185	70
2007	498	253	182	63
2008	455	238	154	63
2009	421	192	165	64
2010	411	190	162	59
2011	368	173	144	51
2012	395	168	160	67
2013	387	193	151	43
2014	361	196	127	38

Safety Program/Initiative

Local Road Improvement Program

Created in 2002, the Local Road Improvement Program (LRIP) provides funding assistance to local agencies for constructing or reconstructing local roads. Initially, it began with two types of funding: Truck Highway Corridor Account and Routes of Regional Significance Account. In 2005, a fund from the Rural Road Safety Account was added. Counties, townships and cities are eligible for funding, except for cities with a population less than 5,000. Additionally, for the townships, the county's sponsorship must be obtained for the application eligibility.

County Roadway Safety Plans

With the main objective to establish a specific set of low-cost systematic safety projects, CRSP were built on the foundation established by Minnesota's SHSP. MnDOT completed CRSPs for all eight MnDOT districts and 87 counties. Each CRSP provides the basis for systemic implementation of safety measures across the entire jurisdiction by developing a comprehensive list of proactive measures and prioritized safety improvements, based on current crash trends. The link to a sample CRSP for Otter Tail County can be reviewed in Appendix E. The primary objectives of CRSP are to:

- Develop a document, which will list safety projects in a prioritized manner by route and location(s).
- Analyze the jurisdictions crash data to determine patterns by location, type of crash, and any circumstance of the crash, which would lead to effective countermeasures.
- Develop projects by a consensus building exercise with key stakeholders of each jurisdiction. These should include but not be limited to representatives of the 4 Es services. Consideration should be given to representation from different modes of transportation—bike, pedestrian, commercial vehicles, motorcycles, etc.
- Educate stakeholders on the magnitude of the issues and the effectiveness of possible solutions.

Township Sign Inventory and Replacement Program

In 2011, the Minnesota Association of Townships (MAT) established the Township Sign Inventory and Replacement pilot program, a pilot version of the current Township Sign Program, with the assistance of MnDOT. Funded by Federal HSIP and State funds, the Township Sign Program is administered by the SALT division of MnDOT in coordination with MAT. The primary goal of the program is to develop and upgrade the requirements for sign removal and reduction that would assist local agencies' conformity with the Manual Uniform Traffic Control Devices retroreflectivity standards. The completed pilot program, which began with townships located within six counties, was divided into two phases: (1) the inventory and design and (2) construction phases. The pilot program upgraded old signage and reduced signage clutter on roadway segments while MnDOT developed a Sign Reduction Manual to help local agencies comply with the *MUTCD* guidelines. A summary of a completed pilot program is presented in web-only Appendix D. MnDOT is conducting a second round of the program with Steven and Wright counties. During this second round, a study on estimating accurate traffic volumes on low-volume roads was conducted. Results of accurate volume estimation are expected to assist sign installation and removal activities where reliable traffic counts are limited.

The township sign replacement program is considered very successful. Since MnDOT funded up to 95% of the project costs, the townships believed more signs was an improvement and therefore, installed more signs than necessary. There is a federal match requirement, which the state primarily covered with bonds and funds from the state general obligation fund. Minnesota therefore, reduced its local match to an estimated 5%. MnDOT spent considerable time from 2013–2014 working with the state association of townships in developing materials to educate local officials that fewer signs properly placed, the right sign in the right place, was more effective. As a result, crashes on the local system were reduced by 28%. The first round of the program also produced a significant backlog of projects, which will be considered in the next round. This program is being continued statewide although not as robust with funding limitations due to other safety priorities. Additionally, in early 2015, MnDOT developed an on-line, ten-module sign maintenance and management training courses for local agencies administered by the LTAP center. The link to these modules is provided in Appendix E.

Toward Zero Deaths Initiative

In 2015, the Minnesota TZD is in its 12th year as the state's cornerstone traffic safety program. It employs an interdisciplinary approach to reducing traffic crashes, injuries and deaths on Minnesota roads. TZD aims to unite separate interdisciplinary visions toward a greater success. The TZD program looks at target areas for improvement, evaluates data and utilizes proven countermeasures. The TZD philosophy is an integral part of the SHSP and includes several initiatives, such as TZD Regional Partnerships, TZD Safe Roads Grant Program, TZD Enforcement Grant Program, Statewide Trauma System, Minnesota SHSP, County and District Safety Plans, Crash Records System, Crash Help Demonstration and Highway Enforcement of Aggressive Traffic (HEAT). Along with the statewide TZD effort, partnerships have been formed in eight geographic areas of Minnesota for a coordinated regional effort. The eight regions, divided geographically, are tasked to investigate crash data and identify factors leading to fatal and serious injury crashes and ultimately to implement proven countermeasures. A local steering committee, led by MnDOT and the State Patrol, is comprised of local traffic safety stakeholders. The TZD program team works in partnership with community and corridor groups to improve the traffic safety of a designated area. The team provides technical assistance, materials and guidance to local groups that are committed to reducing crashes and the fatalities and severe injuries. The TZD program co-chairs are the Director of the Office of Traffic Safety, Minnesota Department of Public Safety and the Director of the Office of Traffic, Safety, and Technology, MnDOT.

Over the years MnDOT has been fortunate to have safety champions in leadership roles in the organization. The importance of these champions at each level is critically important to ensure a consistent priority on transportation safety. Over time, as witnessed in MnDOT, the institutionalizing of a safety philosophy has resulted in a continuance of both state and local road safety programs as well as the fostering of the TZD philosophy.

TZD coalitions exist in each of the eight regions, which correspond to the MnDOT district boundaries, and are focused on driver behavior issues. TZD coordinators, which are assigned to each coalition, facilitate and provide focus for the coalition stakeholders, which may include fatality review committees, education

campaigns, and public safety enforcement grants. MnDOT and local agencies use a crash mapping analysis tool of the crashes collected by the Department of Public Safety. Tribes are often reluctant to use this tool due to privacy concerns. MnDOT funds TZD coordinators in the state and seat belt surveys that are completed every spring. The state had a 94.7% compliance in seat belt use in 2014, up from 87.8% in 2007, but regions in the state do differ in accordance with local culture (U.S. DOT 2015).

Local Road System Safety and Performance

MnDOT's Principal Engineer oversees local roads safety programs at the MnDOT SALT Division office. The TZD serves as the umbrella for other programs such as the CRSP. MnDOT allocates HSIP funds according to the number of crashes on specific roads. This amounts to about 60% of HSIP funds for local roads. The latest 2014–2019 SHSP outlines the success of these programs as demonstrated by the steady reduction of fatal and serious injury crashes since 2004. In Minnesota, traffic fatalities and serious injuries are the prime performance measures. While developing performance measures for plans are difficult, MnDOT is considering other unique measures, entitled Minnesota's Traffic Safety Tracking Indicators by Focus Area—discussed in the SHSP and presented in web-only Appendix D. Additionally, the Minnesota Crash Mapping Analysis Tool (MnCMAT) was developed to assist local agencies in analyzing crash data. The Minnesota Local Road Research Board and Minnesota County Engineers Association have made the MnCMAT tool available for use to all counties. It is a map-based computer application that provides ten years of crash data for every roadway in Minnesota. Analysts can select specific intersections or roadway segments for study.

St. Louis County

St. Louis County has a population of more than 200,000 and maintains 3,000 miles of roadway. The annual capital budget averages $40–$50 million per year. The St. Louis County Engineer reported reductions in crashes since the inception of TZD. Between 2000 and 2007, the County averaged nine fatal crashes per year, while from 2008 to 2014 its average was five fatal crashes per year, close to a 50% reduction. The biggest improvement was the reduction in serious injury crashes. From 2000 to 2007, 28 serious injuries per year were recorded, while from 2008 to 2012, 12 serious crashes per year were observed. From 2008 to 2012, the county safety program improved significantly following MnDOT recommendations to focus on wider edge lines and rumble strips countermeasures.

The CRSP was developed in 2012 and the county continued those programs but expanded to intersection improvement strategies, which were identified as high risk, and primary road dynamic warning systems. The ALERT system was sponsored and piloted in St. Louis County as a research project, funded by the Minnesota Local Road Research Board (LRRB). A summary of this research project is attached in web-only Appendix D. The second phase of the county's project is the development of a less-expensive intersection conflict warning system for use by local agencies. http://www.lrrb.org/media/reports/201410.pdf The three challenges of these advance-warning systems are the capability to operate and maintain these systems, the power cost for operation, and the general installation costs. The goal in this ongoing research is to develop an alternate, non-competing system with the state, which the county can afford to build, operate and maintain. A comparison of the ALERT systems before and after data showed positive results. The county used a surrogate measure, the reduction in speed on the primary (main) road. On the minor roads, the use of two metrics: roll through incidents and time waiting at stop signs, were employed. The reduction in speed observed on the primary road was 3.5 mph. On the minor road, roll through were reduced from 25% to zero and the time waiting at stop signs increased by 2 seconds. The drivers knew there was an upcoming conflict and more than likely waited to make their movements at the intersection. MnDOT, the LRRB and the local agency jointly funded this pilot program. A follow on project is planned in late 2015, to conduct a primary road dynamic warning system. The County Engineer estimates about one-third of the County's intersections will employ this feature. St. Louis County participates in the Area Transportation Partnership, which reviews, coordinates and approves projects and then, determines priorities for the distribution and programming of federal funding.

In St. Louis County, the TZD coalition operates as the umbrella organization for the district and over sees and coordinates all safety activities incorporating the 4Es. The Driving for Safety Coalition in St. Louis County, funded by the Department of Public Safety, is a subset of TZD. One of its accomplishments is the development of the Drive to Survive education program, which educates companies and agencies about safe driving techniques. The program incorporates all 4Es. Another area addressed is a seat belt survey which arranges competitions among schools for safe driving awards. Performance measurement is difficult, but surveys and quizzes are administered to determine the knowledge retained after training. The direct impact on crash reduction is unknown; however, these safety-directed programs do enhance awareness of safe driving.

Otter Tail County

Otter Tail County has a population of more than 57,000 and 1,060 road miles, all of which are paved. The Otter Tail County Engineer and Public Works Director reported that they have seen a reduction in crashes on local roads where fatalities were reduced from 15 per year in 2008 to eight per year in 2014, close to a 50% reduction. The interview discussed two safety improvements helped to reduce fatalities. A six-inch wide pavement edge line countywide was installed starting in 2009. The second project was installing intersection lighting at 21 intersections in 2015, totaling 60 intersections since inception of the program. This project will complete one of Otter Tail County's safety plan goals. Citizens responded favorably, four to one, on this improvement.

Additionally, a new project has just been awarded to improve 180 curves with treatments, which pave the inside and outside shoulders, and add rumble strips. The County's next steps are to address townships roads where one half of the fatal crashes occur. Each township has its own funding determined through distribution formulas based on mileage. Townships work with Otter Tail County for technical assistance and the county performs the work on township roads on a reimbursable basis. Receiving public support of the safety plan is a continuing effort and very important to maintain public funding.

The Otter Tail county safety plan was enacted in 2011, but the county had already been pursuing safety improvements through proven countermeasures. The dollar value of its safety plan is about $7.2 million in construction dollars. Through HSIP, the county is applying for about $500,000 in new projects in 2015 and hopes to complete the 2011 projects identified in the safety

plan by 2018. The next step is updating the CRSP and pursuing other initiatives.

Prior to the TZD initiative, there existed the Otter Tail Safe Communities Association—now called Otter Tail County Safe Roads—which addresses 4E projects and programs. Portions of its funding are from public safety grants with a focus on enforcement. With the establishment of regional TZD coalitions by MnDOT in 2013 Otter Tail County is within the West Central TZD area, which includes 20 counties. There is an annual regional TZD conference to receive briefings including a review of fatal and serious injury crashes. Members include public safety, emergency management services, and Sheriff's departments. Otter Tail recently participated in a LRRB project doing digital imaging to record the road edge lines in a GIS format. Otter Tail participates in LTAP training and includes the sign technician program.

Washington County

Washington County has a population of 250,000 and 2,046 miles of state, county, and local roads, of which the county maintains 303 centerline miles. The Washington County Engineer/Deputy Public Works Director reported major improvements, which resulted in the reduction of crashes on county roads. Specifically the CRSP and MnCMAT have identified local cost safety projects in the form of horizontal curve enhancements, paved shoulders, edge line rumble stripes, intersection signing enhancement, rural intersection lighting and enhanced pavement markings. The strong and positive relationship with the State Safety Engineer and SALT Division, the TZD statewide focus, dedicated local funding and the development of a safety culture have proved critical in the success of the safety programs. Web-only Appendix D provides a power point summary of the success of the CRSP program. The Washington County Engineer presented the report on April 22, 2015 at the NACE annual conference.

Addressing Safety Challenges

While challenges remain to sustain the many programs and to foster a continuing safety focus, the reduction of fatalities and serious injuries over the years of these focused programs can be attributed to the initiation and expansion of state-coordinated programs and partnerships; the increase in HSIP funding; the promotion of systemic low cost safety improvements; and other non-state DOT programs.

Summary

MnDOT has actively pursued safety programs on state and local roads since the early 2000s and currently has multiple programs addressing the 4E's. Under the SHSP framework its TZD initiative is comprehensive in its approach and involves state and local agencies in several noteworthy programs aimed at reducing crashes on local roads. Over the years MnDOT has been fortunate to have safety champions in leadership roles in the organization. The importance of these champions at each level is critically important to ensure a consistent priority placed on transportation safety. Over time, as witnessed in MnDOT, the institutionalizing of a safety philosophy has resulted in a continuance of both state and local road safety programs and the fostering of the TZD philosophy.

In Minnesota the Toward Zero Deaths safety focus, County Road Safety Plans, the Minnesota Crash Mapping Analysis Tool (MnCMAT), and the Township Sign Inventory and Replacement program provide noteworthy examples for use by other states and local agencies. Additionally the Minnesota LRRB has focused safety funding toward innovative technologies such as the ALERT pilot, which can improve safety on the state's local roads.

OHIO STATE SAFETY PROGRAMS AIMED AT LOCAL AGENCIES

Background

The Ohio State Department of Transportation (ODOT) administers a Highway Safety Program that consists of coordination with various local, regional and state agencies to establish safety priorities across the state of Ohio. ODOT dedicates about $102 million annually, one of the largest state investments in the United States, for engineering improvements at high-crash and severe-crash locations. This funding is available to ODOT District Offices and local governments and can be used on any public roadway. The structure of the safety office is a combination of Central Office, District and LTAP Staff. The LTAP and Highway Safety Program are in a separate office, but are under ODOT's Division of Planning. The Highway Safety Program consists of a staff of six, which includes the Highway Safety Program Manager and a number of data analysts, three of whom are engineers. Additionally, there are safety coordinators in each of the 12 Safety District Offices who oversee a multi-disciplinary team called the District Safety Review Team. They review safety locations and work with local governments to make recommendations relative to safety approaches in key areas. ODOT has a relatively large staff related to safety infrastructure and planning.

Safety Program/Initiative

A key and innovative part of ODOT's safety program is the strong partnership established with important stakeholders within the state. This collaboration provides technical and financial assistance to local agencies for the following complementary programs:

ODOT and MPO Priority Lists

Ohio's Highway Safety Program encourages the state to work with many of the local, regional and state agencies to define and address areas for safety improvements throughout the state of Ohio. In addition to ODOT's 12 district offices that identify and address priority locations on the state highway system, ODOT commissions many MPOs to develop a safety project list, to work with local agencies to plan and implement safety improvements, and to apply for federal and state safety funding on the behalf of local agencies

County Engineers Association Safety Set Aside

Annually ODOT allocates $12 million to the County Engineers Association of Ohio to make safety improvements on the county road network. Additionally, ODOT and the LTAP work with Ohio county engineers to perform roadway safety audits on corridors with serious injury and fatality rates that exceed Ohio's statewide

average. Recommendations are funded through ODOT's Highway Safety Improvement Program.

Ohio LTAP Program

More than 70% of the LTAP training is safety focused and specifically oriented to more than 2,300 local and regional agencies in Ohio. The primary reason for its success is the LTAP being part of ODOT through which it can easily facilitate training and technical assistance to local and regional agencies. ODOT leadership recognized an opportunity to coordinate provisions of technical and financial assistance to regional and local agencies across the state of Ohio. The direct coordination of the LTAP and ODOT is a benefit to the state in providing assistance to local safety programs.

Township Sign Safety Program

In 2013, ODOT launched its Township Sign Safety Program, which is administered through Ohio LTAP using $1 million annually from HSIP program. This funding is allocated based on two criteria: (1) the township's ranking based on the previous five years' crash history, and (2) its previous year's program grant status. Through this program, townships can upgrade existing or install additional safety signage by applying a systemic approach throughout the township's roadway system. In three years, 152 townships have received $3 million to install about 48,000 new safety signs on locally–maintained rural roads. Web-only Appendix D presents sample roadway enhancement through this program.

ODOT Research Initiatives for Locals

The Ohio Department of Transportation's (ODOT) Research Initiatives for Locals (ORIL) was established to develop a structure to allow for a funding match, create a self-sustaining local research program, and a permanent funding stream outside of ODOT. The initiative will help assist local agencies with research, as well as answer questions about the funding process. The Board will select and recommend projects for funding, as well as assign liaisons to projects. Safety Conscious Planning forums are available for MPOs to identify safety needs.

Mid-Ohio Regional Planning Commission Pilot Program

In 2013, ODOT and the Mid-Ohio Regional Planning Commission (MORPC) launched an MPO-led pilot program to advance low-cost systemic, safety improvements on locally-maintained roads. The two-year, $2 million program will be funded with HSIP and Regional Surface Transportation Program funds, and will be used to develop a template for other MPO regions across the state. Because local roadway inventory data are incomplete, ODOT and MORPC are using a modified, systemic safety process that identifies serious crash types and high-risk roadway features; selects low-cost safety improvements; then screens and prioritizes locations for improvements.

In Phase 1 of the pilot program, MORPC and 11 member governments (municipal and county) are focusing on intersection angle crashes. Many of the intersections will be upgraded with reflective signalized back plates, LED bulbs and battery backups. Other locations will receive LED-enhanced stop signs or new signage templates to improve signage visibility at intersections. MORPC selected final project locations and allocated funding for improvements based on safety need (crash severity) and geographic equity, which allocated a minimum amount of funding to each jurisdiction. As of the spring 2015, contractors are scheduled to install safety improvements at 67 locations across Central Ohio. Phase 2 of the pilot program will focus on pedestrian crashes. Currently, MORPC is in its planning phase and working with local jurisdictions to find high-risk locations for pedestrian incidents. MORPC's goal is to implement countermeasures including, high-visibility crosswalk markings, pedestrian countdown timers, signalized intersections and rectangular rapid flashing beacons. The MPO serves as the project manager, working with local jurisdictions to identify areas to remediate and research, while ODOT assists by providing financial and labor resources, as well as drafting the required contracts with local jurisdictions. ODOT also contracted a consultant to assist local jurisdictions to conduct signal evaluations. ODOT's involvement alleviated local jurisdictions' concerns over these projects, specifically regarding the project completion. ODOT recognized that the serious crashes were occurring on the local roads where jurisdiction had minimal resources for maintenance over these roads. As a result, ODOT partnered with local agencies and MPOs for a coordinated effort.

Geographic Information Systems Crash Analysis Tool

ODOT has also developed a user-friendly tool that allows organizations, such as ODOT, MPOs, and county engineers, to retrieve and analyze crash data, GIS Crash Analysis Tool (GCAT). GCAT is a GIS crash analysis system in which a user can obtain maps of certain road sections or intersections, which ultimately allows the user to download the crash attributes for the particular section of interest to that user. Also, the data are available in a formatted Excel spreadsheet that automatically analyzes all crash data information. Appendix E provides website link to GCAT.

Local Road System Safety and Performance

Since 2003, ODOT has been working with the LTAP and the MORPC on pilot programs that educate and coach local governments through the systematic safety process. These organizations are helping ODOT analyze the crash data, identify appropriate counter measures and help with the administering the safety funding and project implementation.

Violet Township, Fairfield County

One of the earliest participants in the township sign safety program was Violet Township located in Fairfield County, Ohio. According to the Township Engineer, when ODOT established Township Sign Safety Program in 2013, ODOT identified Violet Township in the top one-third of the townships requiring assistance based on the traffic crash rates which was the basis of the township signage program implementation. ODOT established the process to help townships and local governments meet regulatory requirements on warning signs assisting in installation of new signs that meet the new reflectivity standard. The program was capped at $50,000 per jurisdictions and to streamline the process, the state processed all of the purchase orders once the township identified the number of signs by type to be replaced. Sign installation was done by the township.

The township used social media and twice held public meetings to explain the need for the infrastructure improvements and the merits of the program. The Township Engineer reported that the public response was positive since the program allowed the township to touch a majority of the residents. Moreover, given that many jurisdictions across the state of Ohio are contending with budget cuts, the program was viewed as timely. Since the government process can be difficult and arduous, ODOT streamlining the process made the program more efficient and results oriented. The Township Engineer also noted that, LTAP and ODOT plan to randomly select townships for a future field review to ensure that signs are being installed properly.

Madison County

Madison County participated in an early phase of Township Sign Safety Program The program started with counties and MPOs, but has now expanded to include townships and smaller municipalities. The County Engineer reported that Madison County was one of the first counties to participate in a sign safety program at the county level. Similar to the townships, the county was not required to perform any paperwork but submitted to ODOT the number of signs needed. Sign were provided by ODOT and in some cases, ODOT assisted with a safety study which identified how many signs replacements were needed and the necessary locations. Typically in the first half of the program, ODOT works with the locals to determine what the safety needs are. This is accomplished either through existing signage inventory or through a safety signage upgrade/evaluation. In the second half of the program ODOT provides the materials and the jurisdiction install the signs.

The County Engineer also reported that since LTAP became a part of the ODOT, it functionally became the local projects' champion for the past 4 to 5 years. As a result, LTAP has established a number of programs which are better suited for outreach programs to the local agencies, especially townships, villages and small municipalities. Though LTAP provided support to the counties in the past, now LTAP's focus is now primarily on the townships. The key advantage to the program is that ODOT provides the materials and the locals install them. Since ODOT works directly with the Federal Highway Administration to administer the grant program, local agencies are alleviated of such responsibility, which encourages more local agencies to participate in the sign safety program.

Addressing Challenges

Since local governments have limited resources, they look to low-cost safety improvements to enhance safety on all roads. Though the one million dollars in the township sign safety program is 1% of ODOT's entire budget, this allows ODOT to assist at least 10% of Ohio's townships and in the last three years (2011–2014), at least 48,000 signs have been installed in the local system. Furthermore, funds spent on local roads and the benefits from these local road safety programs go a long way improving safety in comparison to state road improvements.

Related to the MORPC pilot program, ODOT is one of the state agencies that are allocating significant resources toward advancing systemic safety education and improvements on local road systems in comparison to other states across the country. To date, Ohio has invested $5 million in HSIP funds to support locally-focused, systemic safety programs and is partnering with MPOs and LTAP to implement the program. Both partners are investing significant time to educate and train local governments on the importance of systemic and low-cost safety improvements. These efforts help ODOT to develop a safety culture throughout the state

Summary

ODOT seeks to continue the process of funding local safety programs in Ohio. MAP-21 encouraged ODOT to place greater emphasis on multi-agency collaboration. It encouraged the state to further look to local and regional agencies to direct technical and financial assistance. Approximately 54% of the crashes occur on local roads in Ohio. In 2014, approximately half of Ohio's distribution funding was allocated to local governments or other DOTs looking to advance their safety priorities, ODOT suggests there is no need to implement multiple plans at once, but rather establish pilot programs to help get safety programs started and after implementation, encourage participants to record results in certain areas. ODOT demonstrated that investments in local programs does not equate to a large financial commitment. For instance, its own township sign safety program, one of the most successful safety programs in the state, required only 1% of total safety enhancement budget. As of 2015, ODOT is in its third year of its township sign safety program and is proceeding to review the program's success. ODOT plans to conduct and evaluate a before/after crash analysis at a much larger scale as part of the next phase of the township sign safety project.

OREGON STATE SAFETY PROGRAMS AIMED AT LOCAL AGENCIES

Background

The state of Oregon has 44,550 miles of roadway that are owned and maintained by local jurisdictions. The Oregon Department of Transportation (Oregon DOT) administers local agency programs. Oregon DOT's Local Agency Program (LAP) provides federally-supported assistance to the local agency delivery of its federally-aided transportation projects. LAP consists of several positions that include a central Local Program Coordinator, a Certification Program Manager, and Regional Local Agency Liaisons (LALs) oversee five regional Local Program Units for the five geographical areas in Oregon. LAP oversees adherence with state and federal requirements related to successfully accomplishing and documenting local agencies' project work involving federal funds. The LALs serve as the local agencies' primary Oregon DOT contact for processing projects, providing assistance for local project delivery and answering questions.

Oregon DOT has five regions and, for the short-term (2014–2016), Oregon DOT is delivering safety projects on local roads based on a priority–ranked list prepared by a consultant. From 2017, safety projects on all roads including local roads will be delivered under newly launched (in 2012) All Roads Transportation Safety (ARTS) program, which has two components–hot spot and systemic. During the transitional period to the ARTS program, Oregon DOT hired a consultant to create a draft list of potential hotspot projects for all roads in each region. The list will include locations, recommend appropriate countermeasures and then prioritize the locations based on cost/benefit analysis. Each region is required to spend a minimum of 50% of their funding on systemic approaches to safety.

Each year, Oregon DOT prepares performance plans and annual evaluation reports that summarize one-year safety pro-

gram outcomes (link provided in Appendix E). The performance plan report of 2014 statewide data (Oregon Department of Transportation 2014) showed that annual fatalities on Oregon roads dropped from 106 fatalities in 2007 to 79 fatalities in 2011, while serious traffic crashes over the same period dropped from 1,889 crashes to 1,541. MAP21 also requires states to prepare a SHSP that provides a comprehensive framework for reducing highway fatalities and serious injuries on all public roads. In Oregon, the Transportation Safety Action Plan (TSAP, link provided in Appendix E) serves as the state's SHSP and according to the latest TSAP, a total of seven HSIP local and regional based projects were completed between 2010 and 2011 resulting in a 60% decrease in fatal crashes, a 7% increase in injury crashes and a 8% decrease in property-damage-only crashes from 2007 to 2014.

Safety Program/Initiative

Oregon DOT's ARTS program is an innovative program in many ways. Supported by a signed Memorandum of Understanding (MOU) between Oregon DOT and the local government organizations in 2012, the objective is to improve safety approaches on all public roads regardless of specific jurisdictional boundaries. The MOU is presented in web-only Appendix D. This MOU helped pave the way for funding to be allocated to safety projects on locally owned roads, not solely state highways. As a result, local agencies are included in the implementation of the ARTS program. The key part about the ARTS program is that its objective is selecting the most effective projects to reduce fatalities and serious injuries on all public roads and does not use a pre-set allocation of funds to every jurisdiction within the state of Oregon. Oregon DOT's Safe Communities program is another holistic and process based system to address traffic safety problems through a continuous loop of data gathering, planning, activity/projects, and evaluation. Through this program, Oregon DOT aims to focus not only on engineering improvements related to safety, but also address problems with driver operation and use of the vehicle and infrastructure. Link to the Safe Communities program is presented in Appendix E.

The state of Oregon combines systemic and hot spot approaches to safety. It has been developing the systemic program for about five years to address roadway departure crashes as part of the state highway strategic safety plan. Currently, state of Oregon has three emphasis areas: roadway departure, intersections, and bike/pedestrian. Oregon DOT indicated that the systemic approach is beginning to be more defined by risk factors than crash history, which is how Oregon DOT is currently operating with a mix of hot spot and systemic/approaches. The systemic approach is recommended when using low-cost countermeasures and applying them to target crashes resulting in a high benefit/cost ratio. The program requires a reactionary approach, which is why it is sensible not to allocate all safety funding in systemic approach. A reactive approach is important to have so that when serious crashes occur, a well-established program can respond.

Oregon DOT found that it has been more difficult to engage local agencies in Oregon's rural areas. This upcoming round of the ARTS program will select priority safety projects for the years 2017 thru 2021. With the data-driven approach of the ARTS program, it is Oregon DOT's intention that the ARTS program will better serve rural areas of the state.

The process for hot spot and systemic projects consists of developing a draft "300%" list of potential projects for all highways, both state and non-state highways, for each Oregon DOT region. The 300% list is a list of projects in case new funds are made available, similar to an unconstrained projects list. An Oregon DOT consultant developed the hot spot project list, while an application process was used for the systemic project. The project lists were shared with local agencies for feedback regarding missing potential projects. The agencies have the opportunity to provide comments on the proposed countermeasures and submit additional projects that did not make the draft list, with justification that it meets the program purpose. The agencies must use the same criteria and analysis method that the consultant used for preparing the draft lists. The consultant will refine the list based on feedback and ultimately develop a finalized 300% list for prioritizing. Oregon DOT regions are responsible for screening applications and developing a potential list of systemic projects. The intent of this approach is to allow Oregon DOT regions to refine the list of submitted projects and scope out a 150% list. The Oregon DOT regions will prioritize the project list based on program purpose of reducing fatal and serious injuries and benefit cost/cost-effectiveness index, in order to finalize a draft list Once the refined lists are completed, all projects, both hot spot and systemic, will go through a multi-discipline assessment to verify a solution. A multi-disciplinary team, including the owner of the roadway facility, will assure the best countermeasure is chosen to mitigate fatal and serious injury crashes and at the best cost. Once the list is prioritized and a final 100% list is produced, Oregon DOT regions will work with jurisdictions to determine the delivery methods, delivering agency and timelines (applicable funding year). For projects involving local agencies, the Oregon DOT regions will work with jurisdictions to develop an Intergovernmental Agreement. The delivering agency is accountable for timely and fiscally responsible delivery. Starting in 2017, project selection will be statewide. The earliest quantifiable results for the ARTS program would be for roadway departure. Oregon DOT is currently focusing on the project delivery process to get projects into its current Statewide Transportation Improvement Program (STIP).

Local Road System Safety and Performance

For the project delivery, some projects are implemented by Oregon DOT staff while others are implemented by the local agencies. The decision is collaboratively made based on which agency has the capacity and resources to deliver on the projects and meet the particular federal requirements. With a mix of systemic and hot spot approaches to safety, the ARTS program is changing the philosophy of safety by focusing more on the prevention of crashes since the human element is the major cause of crashes, in addition to the engineering causes such as tight curves and minimal signage. It is apparent that the local transportation agencies are accepting this new philosophy as demonstrated in the examples below.

Clackamas County

Clackamas County has been taking a different approach when instituting engineering practices for safety improvements. As a result, Clackamas County believes ODOT's ARTS program parallels its own its safety initiatives. The County has been invoking systemic approaches for a while now. This is evident in the conducting of RSAs to identify areas in need of signing and stripping. In 2012, Clackamas County developed its Transportation Safety Action Plan with assistance from Oregon DOT's Safe Communities program. The County was successful in getting the Board to adopt the action plan in that same year. The County will incorporate the principles of the ARTS program as part of its

action plan which has the same data-driven/systemic approach to safety projects. The action plan has helped the County take a much broader approach to safety. In addition to the standard engineering approaches, the County has incorporated new performance standards that include personal health, when evaluating safety needs through the regular RSA process. An example of this approach is presented in web-only Appendix D. With an ultimate goal of zero crashes, the plan sets a goal to reduce fatal and serious injury crashes by 50% by 2022. Additionally, the ARTS program significantly benefits the County and its citizens in rural areas because 70% of fatalities in the County take place on roads in the rural system. With its data-driven approach, ARTS will assist the county in focusing on some of the high-priority roads in rural areas. With its limited budget, the County focuses on small expenditures, low-cost approaches to improve safety on county-owned roads.

Clackamas County used such a data-driven approach for a project on Wilsonville Road, a long and winding road running between Interstate 5 and Highway 219 in Newberg, Oregon. With Oregon DOT assistance, the County conducted a corridor-based RSA and implemented countermeasures focusing on signing and striping. Oregon DOT also provided financial assistance through HSIP funds. Since then, the County has periodically conducted RSAs and made additional safety improvements along the corridor which include changes to signage, improved guardrails, and striping. The RSA is presented in web-only Appendix D in poster format. According to the County Engineer, the County observed a significant reduction in crashes and considers the project a good example of how the ARTS approach can successfully work statewide. Oregon DOT has also funded many of the County's projects and initiatives and continues to support the County with grants for their Safe Communities program, much of the funding allocated to education and public outreach in the Oregon's schools. The program coordinates with a number of non-profit organizations to broaden the outreach to a greater audience.

City of Bend

The city of Bend started its safety improvement efforts in 2012 in parallel with the start of the ARTS program. The City Engineer reported that because of the ARTS program, the City is examining the behavior of those injured in crashes, especially those involving cyclists and pedestrians. With the help of ODOT, The city of Bend developed a Road Safety Task Force, which developed campaigns and promotional materials focusing on pedestrians and cyclists safety, especially at night. This approach has also changed how the city of Bend addresses roadway departures. In addition to completing two projects focused on improving guardrail placement, the City Engineers looked to preventing accidents by implementing standards and specifications recommended by ODOT related to corridor curves and their relationship to other curves, including the addition of appropriate signage and striping necessary to minimize crashes. This is an important approach because the city has a number of long roads that consist of very tight curves.

Before the ARTS program, Oregon DOT never worked with its cities to address safety and the city of Bend did not have a safety program in place. With the implementation of the ARTS program, however, the city of Bend has held a series of meetings focused on safety with Oregon DOT, leading to safety improvements at its key intersections. Currently, Oregon DOT works closely with the city of Bend on safety issues and the city now has a dedicated funding source for safety.

Addressing Challenges

The ARTS program has been fully operational since 2012. According to Oregon DOT, in addition to peer exchange forum discussions and an abundance of research, an impetus for Oregon DOT moving to the ARTS approach for safety was MAP-21, the reauthorization that changed the priority of spending resources on state highway system to a more "all roads data-driven process." One noted challenge in addressing local roads safety is engaging local agencies in the development and implementation of the ARTS program. One particular innovation of the ARTS program is its 2012 inception of an MOU between Oregon DOT, the League of Oregon Cities (LOC) and the Association of Oregon Counties (AOC). The MOU documents the understanding between these three entities related to the allocation of funding from the federal safety program. The MOU focuses on funding only for roads managed by counties and cities across the state of Oregon. Interviews with Oregon DOT and AOC indicated that Oregon DOT has worked closely with the AOC and Oregon DOT developed the MOU with input from AOC and county members. Additionally, Oregon DOT conducted a series of meetings with AOC and county representatives in which they discussed details of the ARTS safety program including its contents, funding structure, and project selection process. Since the MOU was signed, Oregon DOT officials periodically update AOC about the ARTS program's progress including its new funding opportunities and initiatives.

Summary

Through the upcoming round of the ARTS program, Oregon DOT will select priority safety projects for the years 2017 through 2021. With the data-driven approach of the ARTS program, it is Oregon DOT's intention to better serve local and regional agencies by selecting priority projects in key areas rather than simply allocating a pre-set distribution of funds to every jurisdiction within the state of Oregon. The state of Oregon combines systemic and hot spot approaches to safety. The process for hot spot and systemic projects consists of developing a draft 300% list of potential projects for all highways, both state and non-state highways, for each Oregon DOT region. An Oregon DOT consultant developed the hot spot project list, while an application process was used for the systemic projects.

Currently, Oregon DOT is delivering projects on local roads for systemic improvement including sign upgrades, rumble strips, pavement markings and other low-cost countermeasures. Starting in 2017, project selection will be statewide. The earliest quantifiable results for the ARTS program would be for roadway departure. Oregon DOT is currently focusing on the project delivery process to get projects into its STIP. Past evaluations have been done through the evaluation report and NHTSA yearly performance plan. For evaluating specific road improvement types generated through the data-driven/systemic process, Oregon DOT will need to collect further data for a complete assessment. Oregon DOT plans to provide technical assistance related to the ARTS program by teaming up with the LTAP. Currently, LTAP is developing a full-time position to assist and work extensively with local agencies in obtaining and analyzing crash data and help them implement data-driven approaches to identify safety needs on locally owned roads.

In addition to the implementation of engineering safety improvements, Oregon DOT expects its ARTS program to help change the overall safety culture with a major emphasis on education. Oregon DOT already has a history of success with its campaign on seat belt usage; the state of Oregon has one of the

highest usages of seat belts in the country. However, improvements in driver behavior would not continue unless the education and the campaigns evolve as driver behavior change and technologies change, whether in the automobile itself or with mobile devices that cause driver distractions. The ARTS program will provide an avenue for the state, regional and local agencies, to address safety through a broader perspective.

UTAH STATE SAFETY PROGRAMS AIMED AT LOCAL AGENCIES

Background

There are approximately 46,250 miles of roadway of which 35,850 miles are non-state owned and maintained. In the state of Utah, local road programs are managed differently than safety programs that include local roads. Local road programs and projects are managed by both the Central (planning and programming) and Region offices (implementation) with a staff of about five under a Local Government Assistance program. Safety programs reside in the Central Traffic & Safety Division, part of the Operations group. With MAP-21, the fund level of the HSIP has doubled to approximately $28.5 million compared to when SAFETEA-LU was in effect. According to the 2014 HSIP annual report, approximately $1.7 million is programmed to local safety projects. Additional funding will be allocated on educational and behavioral programs such as the Zero Fatalities Program. An interview with the Utah DOT indicated that with MAP-21, the overall emphasis on the systemic safety approach, comprehensive crash data collection, and coordination with local agencies has increased.

In Utah, an overall concerted effort to reach out to local governments and focus on low cost safety enhancements exists among various agencies. The formation of the Utah Safety Leadership Executive Committee (USLEC) in 2003 increased support for local road safety projects that had been an important focus even before SAFETEA-LU instituted the High Risk Rural Roads program. The Utah DOT and Utah Department of Public Safety (DPS) are two major partners in developing and managing comprehensive multi-disciplined safety programs. A consistent coordination of all engineering, education, and enforcement activities related to highway safety between agencies (Utah DOT, DPS, and Utah highway Patrol) is one of the success factors in Utah's local roads safety. Proven low-cost safety countermeasures with the SHSP emphasis areas are the selection criteria of local safety projects.

Safety Program/Initiative

Zero Fatalities Program

Utah's Zero Fatalities program, an education campaign focused on changing driver behavior, began in 2006 and is marking its 9th year. SAFETEA-LU allowed federal safety funds (10% flex fund) to be spent on education and enforcement activities, which was the impetus for Utah to begin the program. Funding for the program has increased since MAP-21 with a current annual expense of $2.5 million. Mainly administered through a central contract with a consultant marketing firm, Utah DOT members in the Central Traffic & Safety Division allocate their time working on the Zero Fatalities-related tasks. The Zero Fatalities program emphasis areas are impaired, drowsy, distracted and aggressive driving as well as use of safety restraints, all of which are also noted as emphasis areas in Utah's SHSP. Utah's SHSP report stated that survey results to capture Zero Fatalities program awareness showed a continuous increase of program awareness rate resulting in 72% of survey respondents in 2011 compared with 35% of survey respondents in year 2006. Survey results also indicated that 56% of people attributed the Zero Fatalities campaign to "definitely" or "probably" having an impact in avoiding behaviors causing fatal crashes. A recent change in Utah's seat belt law becoming a primary law effective May 12th, 2015 is associated with one of the emphasis areas in the Zero Fatalities program.

An interview with DPS revealed the department's ongoing effort with seat belt and drunk driving-related safety enhancements, which are all related to driver's behavior emphasized in the Zero Fatalities program and SHSP emphasis areas. Working together with MPOs and the Utah DOT, the DPS Highway Safety division also focuses on educating local government officers about law enforcement regarding seat belts, drunk driving, and pedestrian/bicycle safety.

Sponsored by the Utah DOT and DPS, starting 2007, the state of Utah launched the Zero Fatalities Safety Summit. The Zero Fatalities Safety Summit is an opportunity for law enforcement personnel, city, county and state government officials, educators and counselors, traffic safety engineers, child passenger safety technicians, emergency responders, and all other traffic safety advocates to share and gain ideas, experiences, opportunities, and successes to improve traffic safety in Utah. The summit is designed to foster discussion and interaction between presenters and participants on a variety of topics, including the state's comprehensive safety plan, crash data usage, safety education programs, impaired driving, teen driving, engineering, safety restraint systems and enforcement opportunities, among others.

Federal-Aid Projects and Utah DOT

Interviews with the Utah DOT reported that the state DOT coordinates with local governments the most through the HSIP. To encourage local governments' active participation, after Utah DOT completes their crash analysis and identifies potential projects, they approach each local government regarding their participation. Utah DOT then handles all project delivery activities to ensure all Federal requirements are met. One challenge the Utah DOT noted is making sure that the local government is actually ready to participate in the project as indicated by their willingness to contribute the 6.7% local match that is required per the Federal-aid process. Another challenge is the local governments' willingness to acquire necessary right-of-way.

Data Collection and Analysis Initiative

Interviews with the Utah DOT reported that it has been working continuously for many years to improve crash data availability and accessibility. Historically, crashes on state and Federal-aid eligible roads have been located by a linear referencing system (LRS). Since 2012, all crashes on every public road are being geospatially identified and located. This facilitates hot spot analysis on both the local and state highway systems. Furthermore, this comprehensive crash mapping system will support the more structured systemic approach that was adopted in 2012. The importance of a comprehensive database was also discussed during the *Systemic Safety Implementation Peer Exchange* held in September 2014 (FHWA 2014).

In the context of a data collection and analysis system, the Utah DOT has two initiatives: the usRAP and the LiDAR asset management approach. usRAP is a software tool that does not

require detailed, site-specific crash data. Especially suitable for agencies lacking a rich crash database or that have low-volume road networks with sparse crash data, usRAP applies a risk based approach that relies on roadway design features and traffic control characteristics. usRAP generates maps with features representing roadway risk and safety level. The Utah DOT is at a pilot study stage with implementing usRAP to systemically identify safety improvements across the State. This pilot study is focused on identifying a range of safety problems on the state roadway system. The Utah DOT is planning to initiate pilot projects to apply the usRAP safety protocol to local roads in a few counties in 2015. It is envisioned that usRAP would assist in developing a Safer Roads Investment Plan and in prioritizing safety projects that will utilize HSIP funds. Some of the noteworthy points of the usRAP initiative are (1) data for usRAP can be collected on local roads using available tools such as Google Street View without a large financial investment on the part of the local governments and (2) the Safer Roads Investment Plan created through usRAP can be a very useful safety prioritization tool for the locals to use.

In 2012, the Utah DOT established a roadway asset collection program with a comprehensive LiDAR mobile survey of the entire state system of roadways. With an approximate $2.5 million biannual budget, the Utah DOT is the first state to implement a statewide LiDAR data inventory. The second comprehensive round of data was collected in 2014. The data collected is integral to the usRAP safety model as LiDAR mobile survey allows for a more systemic safety analysis based on roadway attributes. The LiDAR system is currently focused on the state highway system with plans to expand to local roads as the program develops. Utah's LiDAR data collection project expands Utah DOT's asset and roadway feature inventory, allows for better planning and budgeting, improves coordination among divisions, and greatly improves the Traffic and Safety Division's data analysis capabilities. Utah's LiDAR project was featured in the *FHWA-SA-14-078 Case Study: Collection and Use of Roadway Asset Data in Utah Roadway Safety Data and Analysis* (website link provided in Appendix E.)

Local Road System Safety and Performance

The Utah DOT applies both proactive and reactive approaches in problem identification on local roads systems. More specifically, identification of crash hot spots and systemic inventory of rural county road networks to recommend low-cost safety improvements are applied in problem identification. Regarding the overall safety aspect, Utah statewide crash statistics show an overall decrease in fatalities despite increases in population and vehicle miles traveled (VMT) as shown in Figure C11.

Figure C12 presents the latest four-year moving average crash statistics on Utah's state and local roadway systems for fatalities and serious injuries that demonstrate a steady decreasing pattern. Before/after crash statistics showed that the counties with HRRR projects experienced an average 38% reduction in fatal and serious injury crashes with a maximum reduction of 70% in one county while all of Utah's counties had an average of 34% reduction. When considering all types of injury levels (e.g., property damage only and non-incapacitating injury) and fatalities, counties with HRRR projects reported a higher reduction rate (7%) compared with all counties (5%). While the before/after crash statistics show the HRRR project effectiveness, the interview with the Utah DOT indicated LTAP's important role in conducting HRRR projects with local governments. LTAP provided a suite of software tools to inventory signing and create a sign management system, attended the field reviews and helped with ball bank analysis to determine whether curve signage was warranted.

City of Provo

The city of Provo, Utah, has a population of more than 116,290 and is the third largest city in the state of Utah. The interviews with the city of Provo reported that Utah DOT's assistance with conducting crash analysis and identifying problematic sites and corridors helped the city, which has limited skills and resources in such analyses. Because the Utah DOT personnel have undertaken some of this burden, the city has shown increased involvement in many safety projects. Recently, the city received HSIP funds to upgrade signal timing to enhance corridor safety, including pedestrian and bike safety. The corresponding corridor safety issues were assessed and identified by Utah DOT personnel who then reported to the city with specific HSIP funding opportunities. The city of Provo plans to apply for additional HSIP funds to address different safety issues, including angled crashes, in the same corridor.

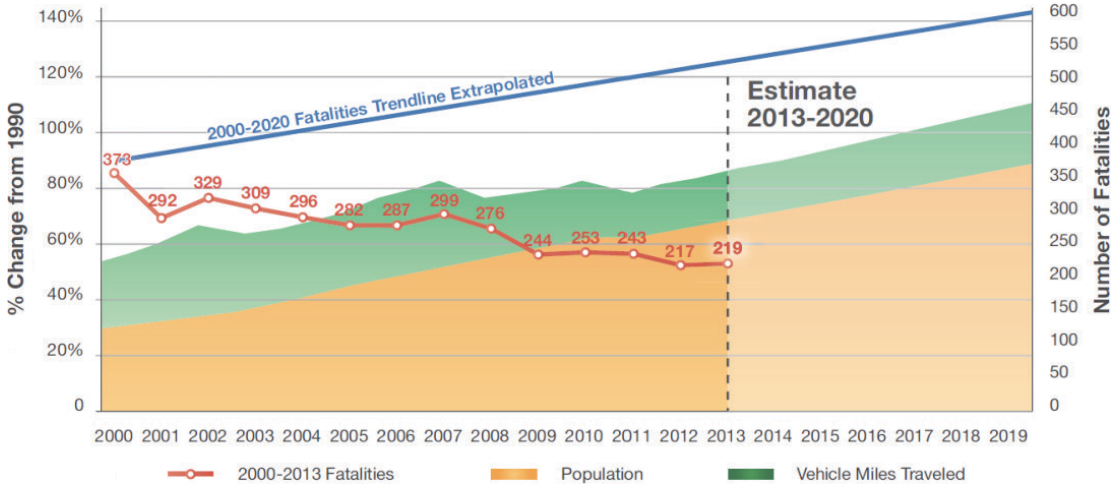


FIGURE C11 Statistics of fatalities, population and vehicle miles traveled (*Source*: 2014 Strategic Direction and Performance Measures).

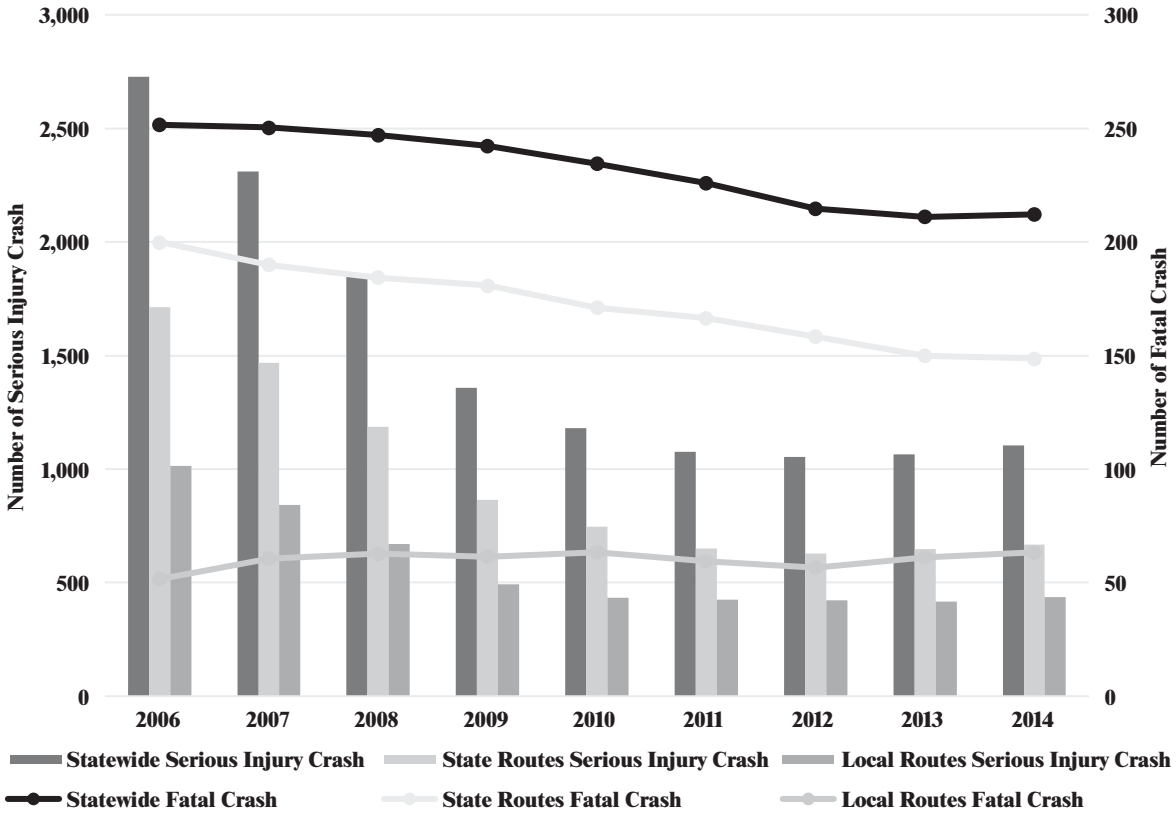


FIGURE C12 Four-year moving average crash statistics on Utah's state and local roadway systems.

Addressing Challenges

In the synthesis survey, the Utah DOT noted limitations of local government resources as well as local governments' willingness to accept direction from state and federal agencies as major challenges in a state-local partnership. To address these issues, the Utah DOT is continuing its efforts to foster communication and build a positive-working relationship with local governments.

Summary

In Utah, there were two noteworthy practices/initiatives: Zero Fatalities Program and innovative initiatives in data collection and analysis (the usRAP and the LiDAR asset management approach). An interview with the Utah DOT indicated that with MAP-21, the overall emphasis on the systemic safety approach, comprehensive crash data collection, and coordination with local agencies has increased. In the synthesis survey, the Utah DOT noted limitations of local government resources as well as local governments' willingness to accept direction from state and federal agencies as major challenges in a state-local partnership. To address these issues, the Utah DOT is continuing its efforts to foster communication and build a positive-working relationship with local governments.

WASHINGTON STATE SAFETY PROGRAMS AIMED AT LOCAL AGENCIES

Background

The Washington State Department of Transportation (WSDOT) administers local agency programs. WSDOT Local Programs Division provides federal safety funds from the HSIP to jurisdictions in Washington State to use engineering countermeasures to reduce fatal and serious injury collisions. Fatal and serious injury collision data are analyzed and jurisdictions apply for funding that meet specific crash criteria. The HSIP program requires that state programs and spends safety funds according to the SHSP. Washington State's SHSP plan is called Target Zero. Target Zero presents strategies to reduce fatal and serious injury collisions to zero by the year 2030. Local road programs and projects are handled by both the central (planning and programming) and district offices (implementation) employing a staff of about 50. More than 80% of the public roads in Washington are owned by local agencies.

Safety Program/Initiative

Four Safety Programs under Local Programs Division

The Local Programs Division has four funding programs: (1) City Safety Program, (2) County Safety Program, (3) Quick Response Safety Program, and (4) City/County Corridor Program. According to the Washington State 2014 HSIP report, oversight for the 70% of the HSIP funds that are directed to local agencies is assigned to the Local Programs Division for management (e.g., identifying local agency priorities, distribution of funds to counties and cities, individual project selection, federal oversight, project delivery, etc.). The following section provides information about the scope and number of projects that were funded in 2014.

- City Safety Program: This program, started in 2012, funds the design/preliminary engineering, right-of-way and construction phases of projects that apply engineering

countermeasures to reduce fatal and serious injury collisions. The eligible project sites include streets in cities of any population and state highways that serve as arterials for cities with population above 25,000. In 2014, 29 projects in 17 cities, totaling $23.1 million were funded.

- County Safety Program: Initiated in 2009, similar to the City Safety Program, County Safety Program fund the design/preliminary engineering, right-of-way and construction phases of projects that will use engineering countermeasures to reduce fatal and serious injury collisions. Project sites are selected from county roads in counties with a prioritized local road safety plan. In 2014, 87 projects in 29 counties totaling $25.8 million were funded.
- Quick Response Safety Program: Focusing on construction phase projects, the goal of this one time program was to fund projects that met two criteria: (1) using engineering countermeasures, reduce fatal and serious collisions on local roads and streets and state highways that serve as city arterials within any local jurisdiction; and (2) get safety projects on the ground quickly. WSDOT and the FHWA were required to obligate construction funds by a certain date. In 2013, 54 projects in 25 cities and 14 counties totaling $26.7 million were funded. It was a short-term program to expend available safety funds.
- City/County Corridor Safety Program: Initiated in 2000, the program aims to reduce fatal and serious injury collisions in local communities in Washington State. The program uses low-cost, near term solutions to improve traffic safety through engineering, enforcement, education, and emergency services approaches. Local Programs provides funding for engineering solutions while the Washington Traffic Safety Commission (WTSC) and Local Programs Division administer the program by providing grants and resources for: enforcement, education, and emergency services solutions.

According to the 2013 Washington State Annual Collision Summary, 54% of the fatal crashes and 59% of the serious injuries occurred on city and county roads (WTSC 2014). Table C4 shows the progress Washington State is achieving in the reduction of fatalities and serious injury crashes, and in meeting safety performance targets.

Washington Traffic Safety Commission

The Washington Traffic Safety Commission (WTSC) is the state's designated highway safety office and shares a vision with numerous other state and local agencies, which is reducing traffic fatalities and serious injuries to zero by 2030. The WTSC Director serves as the Governor's Highway Safety Representative, which is a designated position each state is required to have in order to qualify for federal traffic safety funding. In its 2014 Annual Report, the WTSC reported the Rural Road Traffic Fatalities from 2004 to 2014 decreased from 355 to 226 (WTSC 2014).

Local Road System Safety and Performance

Both reactive and proactive methods are used in identifying and prioritizing local roads projects. Spot locations are primarily addressed through the City Safety Program (reactive approach), while risk locations over widespread areas (systemic safety) are reviewed by both the City and County Safety programs (proactive approach). A benefit-cost analysis is used for high-cost and spot location projects in the City Safety Program. A ranking using a technical formula is used to prioritize low-cost systematic safety projects in the City Safety Program. Crash history is the basis for the County Safety Program but this program is implemented using the systemic safety approach. Crash history defines funding levels among the counties. Overall trends in fatalities and serious injuries in emphasis areas are used in evaluating performance of both state and local road safety. However, the systemic safety projects are too recent to measure performance.

Washington State DOT

The WSDOT Local Programs Division reported that the County Safety Program started in 2009, the City Safety Program in 2012, and the Quick Response Safety Program in 2013, although it was intended to be a one-time program to spend available safety funds. The Corridor Safety Program was initiated in 1990 for state routes and local routes were added into the program in 2000. County or city safety plans do not have to be voluminous documents. For the most recent round of safety funding, counties were required to submit safety plans drafted from a WSDOT-structured template. Thirty-one of 39 counties submitted plans in 2013. Each safety plan was different with some ranging from five to 15 pages, while others up to 100 pages. Plans were to outline a process, taking a risk base approach, using basic crash data and roadway factors and produce a list of projects and locations. Specific projects did not have to be supported by data, but were based on crash history of the types of crashes on certain types of roads. A sample plan for Cowlitz County Strategic Risk-Based Assessment using the Systemic Safety Project Selection Tool, Grant County WA Local Road Safety Plan, and a template "Any County Public Works Safety Local Road Safety Plan" for use by other counties are presented in web-only Appendix D.

Most of the local road safety programs were in place prior to MAP 21 and the only change was the funding levels, which were doubled. The WTSC receives NHTSA funds. They partner with WSDOT in meeting the goals of the SHSP and the Target Zero program. The corridor safety program is a coordinated joint program, which addresses all the 4E elements to roadway safety. One product of the WTSC is the Traffic Collision Report. The WTSC is currently completing the 2014 traffic collision report. The primary performance measure in all programs is the reduction of crashes. There is no specific performance measure on individual programs since many are inter-related. Projects funded by the City Safety

TABLE C4
OVERVIEW OF GENERAL SAFETY TRENDS

Performance Measures*	2008	2009	2010	2011	2012
No. Fatalities	588.2	573.2	535.4	499.6	474.2
No. Serious injuries	2,779.2	2,747.6	2,670	2,504	2,400.2
Fatality rate (per HMVMT)	1.05	1.02	0.946	0.882	0.838
Serious injury rate (per HMVMT)	4.962	4.89	4.724	4.426	4.25

*Performance measure data are presented using a five-year rolling average.

Program are normally higher-cost ones and allow the WSDOT to measure the reduction of crashes of specific projects. The County Safety Program is all risk based with no specific pre-project data and WSDOT will not be able to evaluate impacts for a number of years. The City/County Corridor Safety Program does measure before and after project data, which is trending very positively in the reduction of crashes. Of the 35 corridor projects completed, results show an average 8% decrease in total collisions and a 13% decrease in total injuries. More specifically, alcohol-related collisions and fatal and serious injuries collisions showed an average of 13% and 29% reduction respectively. The reported benefit-cost ratio was 34. The Cape Horn Corridor project, a 15.3-mile stretch of State Route 14 in southwest Washington State, is profiled in web-only Appendix D. The project involved a comprehensive 4E approach, including both state and local agencies, and produced a significant reduction in traffic crashes.

WSDOT project planning, coordination and funding are accomplished in the central office, while the district offices oversee project construction. The LTAP is a part of the local programs office. WSDOT has limited interaction with the state MPO's in the safety area and the MPOs defer to WSDOT to implement safety projects.

Thurston County

Thurston County has a population of 216,000 with approximately 1,040 miles of county roads. The Traffic Engineering & Operations Manager of the Public Works Department reported that the prime safety office contact is always looking for ways to improve the system. The interview also revealed that since MAP-21, project fund level from the WSDOT has almost doubled. The major challenges to Thurston County are related to project execution, the use of federal dollars and it's reporting. In 2012, projects were geared toward systemic applications, or a risk-based approach. Since 44%–46% of fatal and serious crashes (177 over a five-year period) occurred on horizontal curves the county's focus has been on horizontal curves. Due to the recent completion of these projects, an analysis of the impact on safety and the reduction of crashes is not currently available. The county has not seen a county-wide reduction in crashes, although in 2014 it had the lowest number of fatalities (4). The county's safety plan is the systemic safety study on horizontal curves and the follow on county safety plan, which will be funded with HSIP funds, will be more robust.

The county has access of the statewide traffic database, called "Mobility," which is maintained by the County Road Administration Board (CRAB). Each county has been able to access five years of crash data, which has proved useful in evaluating and proposing projects. The CRAB is currently developing a systemic safety module for counties. In Washington the challenge is not a lack of data, but a lack of staff to analyze the data. A Run-Off-Road and Intersection Safety Project, which involves improvements to traffic signs, pavement markings, guardrails and traffic signals has been instituted in Thurston County and is outlined on its website in Appendix E. Data has not yet been evaluated from the project and thus, it is too early to ascertain its impacts. Generally, however, individual projects are reducing fatalities. Safety projects generally have received 100% funding from the state. In 2015, Thurston County has been required to participate with a 10% match on safety projects. However, WSDOT has an incentive program to accelerate projects in which they forgo the match if the project can be completed within a certain timeframe.

In 2014, a unique safety initiative was held where the County hosted a peer-to-peer exchange on high friction pavements, in which the County partnered with the WSDOT, LTAP and the FHWA. The county staff was trained to install a high friction pavement, which was demonstrated at the peer-to-peer exchange. It was highlighted in the WSDOT LTAP Newsletter 3rd Quarter and its link is provided in Appendix E. Thurston County also has had success using the FHWA Systemic Safety Selection Tool which was featured in FHWA's success story as presented in web-only Appendix D (FHWA 2013). Challenges to the county include the federal reporting requirements when using federal-aid funds. A streamlining of the process, particularly environmental reviews, would be helpful to local governments. Most counties in the state are certified to complete contracting using federal funds. Training is available through LTAP.

City of Spokane

The city of Spokane has a population of almost 211,000. During the interview, the Senior Traffic Planning Engineer and Traffic Operations Engineer—Streets Department, city of Spokane, outlined the WSDOT City Safety Program. Their focus is on high-cost spot location and low-cost widespread projects. While the Senior Traffic Planning Engineer oversees the grants process, the Traffic and Operations Engineer accomplishes the work. Since it is only a 2012 initiative, they have not evaluated post-project completion statistics. They do, however, have before statistics for ten years and plan to evaluate project effectiveness. Other safety projects include conversion of a wide two-lane roadway into a three-lane road with a center lane for turning movements. According to the interview, crashes such as sideswipes and rear end collisions have been reduced.

Prior to the City Safety Program, the city completed other successful projects. One project installed a roundabout, which reduced fatalities from one and a high number of crashes to three crashes and no fatalities over a five-year period. The city also has been active in the Safe Routes to Schools Program and has installed 86 flashing beacons with currently on-going analysis on the impacts of the corresponding project. MAP-21 has resulted in additional safety funds. Under the City Safety Program it submitted five projects in 2014, two for lane conversions, which were valued at $500,000–750,000 each; a downtown curb extension and lighting project, valued at $2 million; a five to three lane reduction project, valued at $4 million; and the Avenue four to three lane project, valued at $2 million. All the projects were funded except the downtown curb extension and lighting project. The city also is involved with the Target Zero Program and is a member of the Spokane County Safety Commission, which is addressing Target Zero issues. It has also received staffing funds for the "*Click It or Ticket*" program and funds for several projects under the Safe Routes to Schools program.

Challenges for the city include its political leadership and neighborhood organization involvement. Additionally, the city faces challenges of education, resource needs, such as staffing and funding and timely project delivery. Currently, pedestrian and bicycle safety and distracted driving are its primary focus areas.

Skagit County

The Skagit County's Transportation Programs Manager reported progress on several projects. Skagit County is a rural county of about 120,000 population and approximately 800 miles of county-owned roads. The critical type of safety project for its rural county's needs is intersections. The county's successes have been the completion of 2 roundabout projects which received

County Safety Program funds in 2009. One roundabout, with a 3,000 ADT, replaced a four-way intersection which resulted in a crash reduction. Prior to the roundabout's construction, there were eight deaths whereas statistics shows zero fatalities for seven years after its installation.

The county does not trend crashes for the entire county. It can, however, access "Mobility," the statewide traffic database, which is maintained by the CRAB. Yearly, it meets with the Sheriff's department to identify hot spots from the Mobility database. Signal improvements were made on several local roads, which resulted in a reduction of crashes. A second roundabout project using the Quick Response Safety Program funds installed a roundabout consolidating a five-road intersection at which there was an annual average of 16 crashes. The construction was valued at $2 million and was completed in 2014. There have been no crashes since its installation. The County completed a priority assessment safety report, which addressed ADT, collisions, road geometry, and assigned a priority to that segment of a roadway. The County also identified future projects and set project priorities.

Annual reports are created from the road inventory on crash rates by intersections and road segments. Skagit County Public Works meets with the Sheriff's department and Emergency Management quarterly to review its roadway safety concerns. A major effort is underway to address railroad-crossing safety. In Skagit County the corridor program was a combination of two different projects. One project involved State Highway 20, and other, in 2012, involved county roads. The results are still being evaluated. Skagit County challenges in implementing safety projects are staffing limitations and providing the county fund match on large-scale safety projects. The funding matches are 13.5% of WSDOT Surface Transportation Program projects, 10% for safety projects and 20% for the federal bridge preservation program.

Addressing Safety Challenges

According to WSDOT Local Programs, three challenges exist in implementing programs. They include local agency resource limitations such as funding and staff; staff turnover; and slow delivery of projects. WSDOT has instituted funding incentives to address project delivery—a decreased matching fund requirements for projects awarded by a certain date. Training and technical support is provided to address staff turnover. However, local funding priorities are required to address resource limitations. The reduction of fatalities and serious injuries during the past two years can be attributed to the initiation and expansion of state-coordinated programs and partnerships; the increase in HSIP funding, the promotion of systemic, low-cost safety improvements; and other non-state DOT programs.

Summary

WSDOT has several noteworthy programs, which collectively provide a comprehensive approach in addressing safety and in reducing crashes on local roads. In the 2013 Annual Collision Report, rural road traffic fatalities from 2004 to 2013, decreased from 355 to 226, a 36% decrease in 10 years (WSDOT 2013). These programs include:

- The City/County Corridor Safety Program, initiated in 2000, has yielded a reduction of fatal and serious injury collisions by 29%.
- The County Safety Program, initiated in 2009, has invested $25.8 million on 87 projects in 29 counties.
- The Quick Response Safety Program, initiated in 2011, while aimed at a one-time effort to expend available safety dollars, provided a template of future efforts by focusing on identified priority safety projects through the development of simplified road safety plans. In 2013, 54 projects in 25 cities and 14 counties totaling $26.7 million were funded.
- The City Safety Program, initiated in 2012, invested $23.1 million in 2014 on 29 projects for 17 cities.

The WSDOT and WTSC, along with other state and local agencies, share a vision to reduce traffic fatalities and serious injuries to zero by 2030. The *Target Zero: SHSP* addresses all 4E elements. Available state-provided crash data for local roads, the use of a risk-based approach using the crash history of the types of crashes associated with certain roadway features, and the development and use of a simplified jurisdictional road safety plan have resulted in the development of an effective method to determine the priority for project funding to improve local road safety. In Washington, County Road Safety Plans, a generic Road Safety Plan, and specific uses of the FHWA Systemic Safety Selection Tool provide noteworthy examples for use by other states and local agencies.

APPENDIX D (web-only)

Sample Documents of Practices Related to Local Road Safety

Connecticut

Report of findings from the Road Safety Assessment
Town of South Windsor Local Road Safety Committee Agenda

Florida

Local Agency Safety Program
Pasco County, Florida Interoffice Memorandum Effectiveness of Britesticks for Enhancement of Traffic Control Signs

Iowa

Chapter 164 Traffic Safety Improvement Program
HSIP – Secondary Program Letter of Interest
Application/Agreement for Horizontal Curve Sign Program
Request for Traffic Safety Funds Project

Louisiana

Louisiana Local Road Safety Program Guidelines & Policies 2015
Application for Funding Louisiana Strategic Highway Safety Plan Projects Implemented Through the SHSP Regional Safety Coalitions
Funding Commitment Letter

Michigan

Fiscal Year 2017 Federal Local Safety Program
Local Agency Programs Safety Project Submittal Form
Local Road Safety Peer Exchange Agenda
Effectively Engaging Locals Toward Zero Deaths on Michigan Roadways
Lapeer County Chevron and Shoulder Improvements Before and After Pictures

Minnesota

Pilot Program Summary: Township Sign Replacement and Inventory Program
Minnesota's Traffic Safety Tracking Indicators by Focus Area
Evaluation of the ALERT System, A Rural Intersection Conflict Warning System
Implementing County Roadway Safety Plans

Ohio

Township Sign Safety Program: Before and After Pictures

Oregon

Memorandum of Understanding between State of Oregon Department of Transportation and Association of Oregon Counties and League of Oregon Cities
The Changing Lens of Transportation Safety: Combining Road Safety Audits & Health Impact Assessments

Washington

Centennial Accord Agreement 2014 Plan
Contract to Perform Governmental Activities Between Thurston County and The Nisqually Indian Tribe
Cowlitz County Strategic Risk-Based Assessment
Grant County Local Road Safety Plan
Any County Public Works Safety Local Road Safety Plan
Cape Horn Corridor Project Presentation Profile
Thurston County, Washington, Public Works Department Applies Systemic Safety Project Selection Tool

CTI Technology Transfer Center

EVERY LIFE COUNTS CONNECTICUT

Mr. Michael J. Gantick P.E.
Director of Public Works
Town of South Windsor
1540 Sullivan Avenue
South Windsor, CT. 06074

Report of findings from the Road Safety Assessment (RSA):

For the Intersection of Graham Road and Nevers Road

July, 2014

Graham Road northerly with RSA team members

Background:

The Town of South Windsor Public Works Director Michael J. Gantick P.E. requested input on the proposed Intersection improvement project for the intersection of Graham Road and Nevers Road. Graham Road and Nevers Road are both paved roads. Both roads are collector type roads. The widths of Graham Road and Nevers Road's vary from 26 to 28 feet and from 20 to 22 feet wide respectively. Both roads are uncurbed, with the exception of a portion on the west side of Graham Road just prior to the intersection of Nevers Road. The area services two public schools, one on Graham Road and one on Nevers Road. We observed moderate traffic during our tour of the road. Graham Road is a north/south road and Nevers Road also runs generally north/south and terminates on Graham Road at a skewed angle. Nevers Road intersects Graham road from the east. Nevers Road traffic is controlled by a stop sign and stop bar. The road centerline is striped with double yellow lines on both roads. The state approved speed limits are 35 mph on Nevers Road and 25 on Graham Road North of Nevers Road and by the school, and 30 mph south of Nevers Road. No traffic data was available for volume, speed and vehicle composition. There are sidewalks on the eastern side of Graham and Nevers Roads north of the intersection. Several driveways intersect Graham Road in this area. Nevers Road is curved as it approaches Graham Road. Nevers Road intersects with Graham Road in the middle of a horizontal and vertical curve. There is a 6 percent downgrade on Graham Road northbound approaching Nevers Road and the Nevers Road intersection is located at the bottom of the slope. The Connecticut DOT traffic volume map has the Average Daily Traffic (ADT) listed for Graham Road and Nevers Road shown as 1700 to 4000 on Graham Road and 1100 on Nevers Road.

Crash Data:

The CT Crash data website at The University of Connecticut provided crash history for the intersection of Graham and Nevers Roads from 2007 to 2012. Nine crashes occurred between 1995 and 2012, within 300 feet of the intersection of the two roads. One crash was on Nevers road and the remaining eight crashes were on Graham Road. The crashes included various types including turning, rear-end, sideswipes, backing and hitting a fixed object. There were three turning and three rear end type crashes. The crash data indicates that these crashes were non roadway departure types.

Observations:

The road safety assessment (RSA) team of Michael J. Gantick P.E., Jeffrey Doolittle P.E., Traffic Sergeant Glenn Buonanducci, and Anthony A. Lorenzetti P.E. toured the intersection on Friday July 25, 2014. The intersection of Graham Road and Nevers Road has been identified by

the town as being geometrically deficient because of acute angle that Nevers Road intersects with Graham Road, which restricts the sightline for vehicles entering Graham Road from Nevers Road. The town is proposing to realign the Nevers Road intersection with Graham Road, by shifting Nevers road southerly, and making Nevers Road perpendicular to Graham Road. There are no "No Parking" signs on either street. The speed limit is posted at 35 mph on Nevers Road southbound and 25 on Graham Road North of Nevers Road. The 25 mph sign has a school advisory plaque on top of it. There is a double arrow W1-7 sign located southbound at the intersection of Graham and Nevers Road. Blind Driveway signs are located on both Nevers Road and Graham Road south of the intersection. An advanced warning pedestrian sign is located north of Nevers Road on graham Road in addition to a warning sign at a Midblock crosswalk for Eli Terry School. There are trees located on the east side of Graham Road south of the intersection of Nevers Road, and these trees restrict the intersectional sightline, to further complicate matters, Graham Road widens to the right as the road curves and slopes downward, this combination can act to obscure vehicles from following traffic northbound on Graham Road as they turn right on to Nevers Road. There is also overgrowth on the west side of Graham Road directly opposite Nevers Road, and in the center of a horizontal curve, that restricts sightline to the north. There are utility poles, trees and shrubs in various locations within the clear zones. The proper clear zone is to be determined based upon ADT's and travel speeds. The Green Book also provides additional guidance on clear zone based upon side slope grade. Tree branches overhang the roadway, which may not allow for the full use of the road width on Graham Road due to vehicles shying away from the branches. The road should be clear vertically to allow Public Works, utility, Fire and Refuse vehicles to pass without hindering the vehicles. The town owned road right of way is marked in some locations by monuments or other means of identification, this will allow the town to accomplish some roadside grading and brush and tree removal.

Suggestions:

1) Replace any faded and damaged signs, and confirm their sizing meets MUTCD standards.
2) Clear sightlines of trees, branches and brush within the right of way, and grade the side slopes to allow for clear zones, snow shelves and pedestrian sanctuary.
3) Install advanced warning signing for the intersection of Nevers Road (W1-10(L), and W1-10)
4) Enforce the speed limit.
5) Install no parking signs in areas of restricted sightline.
6) Consider using the Safety Edge on the non-curbed roadway sections if additional paving is done, to eliminate the potential for drop off.
7) Install additional speed limit signs as needed.

8) Remove and or trim trees and brush to clear the area above the pavement to a minimum height of 14 feet, and or any height approved by local or other laws, or what is necessary to pass town emergency apparatus.
9) Add shoulder lines to Graham Road
10) Consider running dashed centerline through the curve on Graham Road at the intersection of Nevers Road.
11) Collect traffic data to develop the appropriate design.
12) Verify that sightlines will be in conformance with AASHTO Standards.
13) Determine the pedestrian flow generated by the nearby schools, and incorporate modifications to the design for their use as warranted.
14) Consider placing chevrons on the horizontal curve

Other considerations:

We can assist South Windsor with traffic counting.

References:

References are made to The Manual on Uniform Traffic Control Devices for Streets and Highways 2009 edition (MUTCD) by The Federal Highway Administration (FHWA) and A Policy on Geometric Design of Highways and Streets 2011 sixth edition by American Association of State and Highway Officials (AASHTO), also referred to as the Green Book.

http://mutcd.fhwa.dot.gov/
https://bookstore.transportation.org/collection_detail.aspx?ID=110

Also refer to other references as required:

AASHTO Roadside Design Guide
https://bookstore.transportation.org/collection_detail.aspx?ID=105

Connecticut Department of Transportation Highway Design Manual
http://www.ct.gov/dot/cwp/view.asp?a=3609&q=430362

Funding Opportunities:

Town Aid to Roads (TAR)

Highway Safety Improvement Program (HSIP)

Surface Transportation Program (STP)

Local Capital Improvement Program (LOCIP)

Local Transportation Capital Improvement Program (LOTCIP)

Please contact me if I can be of further assistance.

Anthony A. Lorenzetti P.E.

Safety Circuit Rider
Connecticut Technology Transfer Center
270 Middle Turnpike
Unit 5202
Storrs, Ct. 06269-5202
Email: Lorenzetti@engr.uconn.edu
O) (860) 486-5847
C) (860) 940-9776

Town of South Windsor
Agenda
Local Road Safety
April 15, 2015

Members: Michael Gantick, Director of Public Works; Michele Lipe, Director of Planning; Sgt. Glenn Buonanducci, Police Traffic Division; Pat Hankard, Board of Education; Chief Kevin Cooney, Fire Department; Jeff Doolittle, Town Engineer; mark Owens, Street Manager, Scott Yeomans, Associate Manager-Streets

Items for Discussion:

1. Current Programs/Projects
    a. Sign Inventory Update(Scott)
    b. CT Crash data
    c. Road projects Update(Jeff/Michele)
        i. Avery Street
        ii. Nevers Road
        iii. Bond resurfacing roads
        iv. Wapping Center Sidewalks
        v. Complete Streets
        vi. Other
    d. Safety Circuit Rider Program-Outreach(Mike)

2. Areas of Opportunity(All)
    a. LED Stop Signs

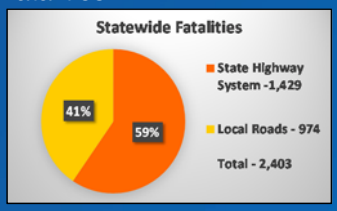
3. Future Activities Updates
    a. Street Light Project(Mike)
    b. Conn DOT(Mike)
        i. Centerline rumble strips application update
        ii. Local road Signs Program

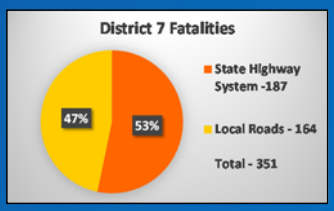
4. Comments/Questions

Why Off-System Road Safety?

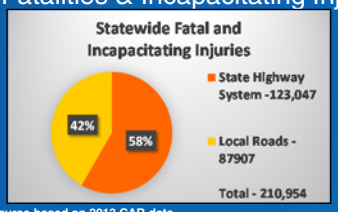
Reduce Fatal and Incapacitating (Severe Injuries)

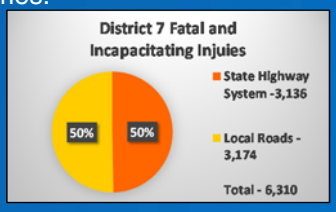
- Fatalities:



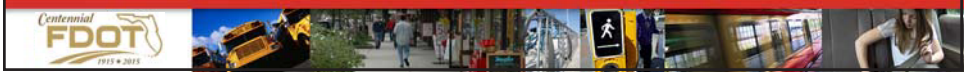


- Fatalities & Incapacitating Injuries:





*Figures based on 2013 CAR data.

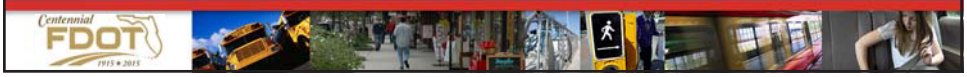


Accomplishments in the Past 5 Years

HSIP projects over the past 4 years 2011- 2014:

Requested by locals
- 242 Applications
- $58 Million

Awarded to locals
- 118 Projects
- $23+ Million



Step 1- Safety Equipment Purchase

Years 2011 to 2014 -- $2.1M total

Safety equipment purchases for:

- Systemic applications
  - Bright sticks
  - R10-15 signs
- Spot Applications
  - Location specific thermoplastic
  - RRFB
  - Beacons
  - Other Signage
  - Signal signage
  - Back plates

Step 2- Technical Assistance

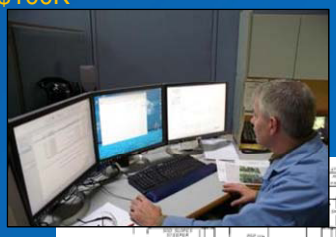
Years 2011 to 2014 -- $4 M total

Provided staff in local agency offices to assist with day-to-day safety related issues (2012-2014): -- $100K

- Citrus County,
- Hernando County,
- Pasco County

In addition, $1 M/Year for:

- Safety Studies & RSA Support;
- Safety Design Support;
- Safety Ambassadors;
- Safety Academy training;
- Safety Summit support and
- LAP & WP Administration



Step 3 – Design Build Push Button (DBPB)

Years 2012 to 2014 -- $4.8M total

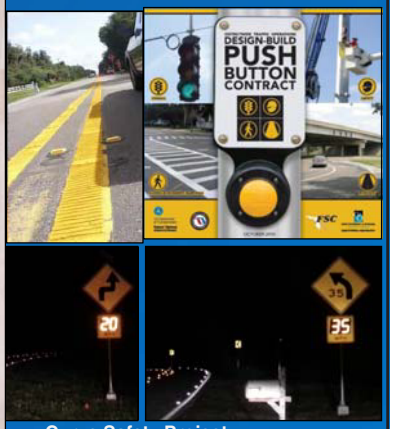

NEWS BRIEFS

CR man killed in motorcycle crash

Scott visits California seeking jobs

Flashing signs designed to slow traffic

Last year, Citrus qualified for $1.5M from FDOT to improve road safety



Curve Safety Project

Step 4 – Local Agency Program (LAP)

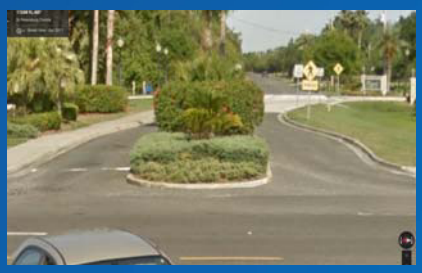
Years 2011 to 2014 -- $12+M total

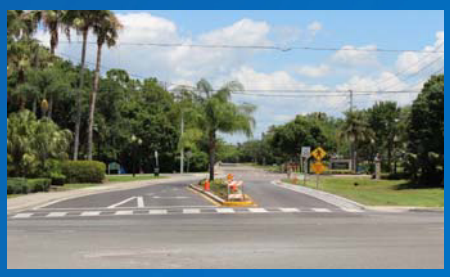
- Hillsborough County
  - Fletcher Ave Complete Street
  - Harney Road
  - Valrico Road
  - Gunn Highway
- Pasco County
  - Shady Hills Road curve
  - Lake Iola Road
- City of St Petersburg
  - 38th / 40th Avenue
  - 54th Avenue

FDOT Local Agency Program

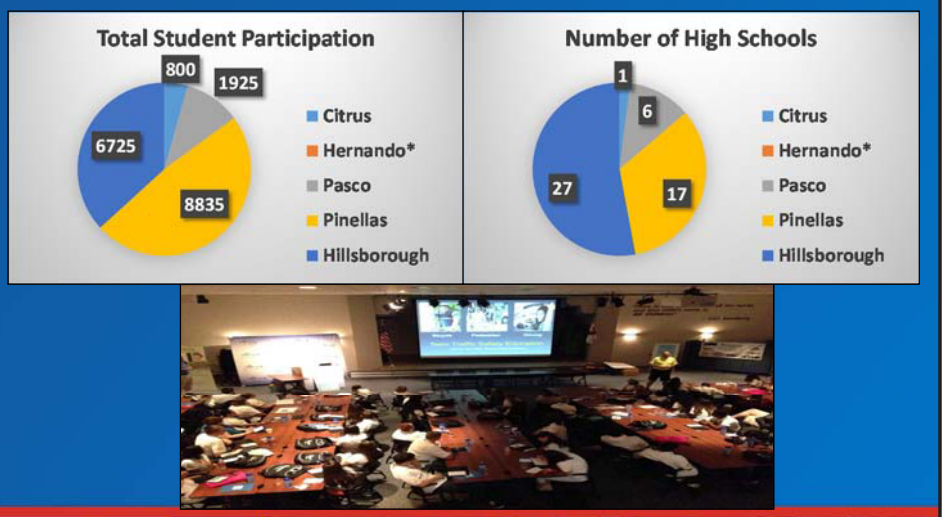
Step 5 - Force Account Program
Year 2014 only -- $130K

New approach to use local forces – 112th Avenue at Ingress/Egress Median in St Pete.. Cost saving of $50+K vs. traditional LAP process.

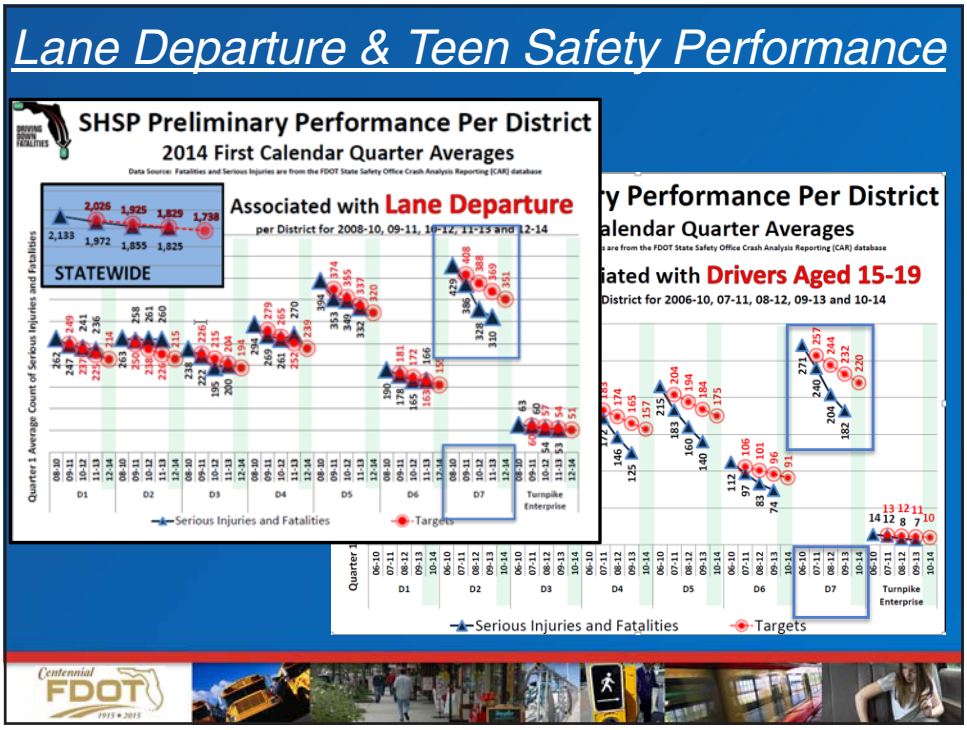




Teen Traffic Safety Program
2012-2015 for High School Teens in 5 Counties -- $120K



Lane Departure & Teen Safety Performance



PASCO COUNTY, FLORIDA
INTEROFFICE MEMORANDUM

TO: Bipin Parikh, P.E.
Assistant County Administrator
(Development Services)

DATE: 2/21/13 FILE: TR13-0428

THRU: James C. Widman, P.E.
Engineering Services Director/
County Engineer

SUBJECT: Effectiveness of Britesticks for Enhancement of Traffic Control Signs

FROM: Robert W. Reck
Traffic Operations Manager

STAFF: Michael S. Bunk
Traffic Engineering Supervisor

REFERENCES: Florida Strategic Highway Safety Plan
All Commission Districts

As requested, the Traffic Operations Division has analyzed crash data for the roadways where britesticks have been installed to enhance the visibility of traffic control signs.

Annually more than 3,500 incapacitating crashes and 370 fatalities occur on state and local (city and county) streets, roads, and highways in the Tampa Bay District of the Florida Department of Transportation (FDOT). The annual, estimated economic cost of these severe crashes is more than $960 million dollars.

In support of the Florida Strategic Highway Safety Plan signed by Governor Bush, and as part of the Tampa Bay District of FDOT District 7's comprehensive highway safety program to reduce the number of these incapacitating crashes and deaths, a vast array of coordinated, low cost crash countermeasures are being installed. Among these low cost countermeasures is the installation of a retroreflective strip (Britesticks) on the sign support posts to enhance the signs conspicuity and increase roadway delineation.

The Tampa Bay District of FDOT and Pasco County was among the first in the nation and the State of Florida to begin the use of retroreflective strips following the inclusion of these strips in the 2009 *Manual on Uniform Traffic Control Devices* (MUTCD). The 2009 MUTCD is the national standard for all traffic control devices used in the USA and Florida.

The FDOT states that a super conservative estimate of the contribution of the retroreflective strips is 0.1 percent or $170,000 annually for an economic cost saving from crash reduction. The cost to install a strip is about $50 per sign. Initial cost (6500 + 2000) signs x $50 = $425,000. **Service life is ten years**. Thus, the cost is about $42,500 per year at an economic benefit of $170,000. It is the best low cost and innovative safety improvement approach used in Tampa Bay to reduce crashes under the current budget constraint environment. These costs include the purchase of the britesticks; the cost of a britestick is approximately $22.00. To date, all britesticks used in Pasco County have been provided at no cost to the county by the FDOT. Our only costs have been the labor and, in some cases, separating Chevron panels mounted on one post onto separate posts.

It is not the intent of the Traffic Operations Division to install britesticks on all signs. We will only use them where crash statistics support their use to reduce crashes and enhance the signs conspicuity and increased roadway delineation.

There are presently 234 additional britesticks in stock that have not been installed due to Public Works concern of future maintenance costs. Below is the list of high crash locations where they were to be installed. Some of these areas are locations where Public Works is continually repairing guardrail and signs that continually get struck by vehicles running off the roadway. On some of the areas where britesticks have been installed, Public Works' own records will support the fact that their maintenance costs have been reduced as fewer signs and/or guardrails are being struck in these areas. The only alternative to the installation of britesticks is to add additional warning signs and increasing the size of exiting signs. The installation costs and future maintenance of these alternate improvements is much higher than the cost of britesticks.

Road	Locations	Number of Crashes	Britestick Quantity
Perrine Ranch/Sunray	Curves between Darlington and 2,500 ft west of Grand	12	50
Perrine Ranch	Meadowood Dr	13	14
Seven Springs Blvd	Curves between Daggett Terr and Ivory Terr	14	20
Peace Blvd	Between Hays Rd @ Tiger Trail	6	12
Parkway Blvd	Collier Parkway to Shinning Star (See RSA)	20	12
Hale Rd	S Curve just east of U.S. 41	3	12
Hale Rd	S Curve just west of Deerhound Dr	5	20
		Total	**140**

Road	Locations	Number of Crashes	Britestick Quantity
Parkway Blvd	Collier Parkway to Shinning Star (See RSA)	See above	30
Lake Iola Rd	at Blanton Rd	6	18
C.R. 575	Harris Hill Rd	2	4
C.R. 575	High Country Ln	2	16
C.R. 575	Olana Ct	2	16
C.R. 575	S Curve just north of Blanton Rd	2	4
C.R. 575	S Curve just east of Hunter Hill Dr	4	20
		Total	**78**

C.R. 575	Harris Hill Rd	See above	8
C.R. 575	S Curve just north of Blanton Rd	See above	8
		Total	**16**

Grand Total	**234**

The following is the analyses performed by Traffic Operation on some areas where britesticks have been used. At some locations additional improvements were also made.

In 2010, a series of 10 locations were chosen in Pasco County as part of FDOT's District-Wide Road Safety Audit Study. This audit is also known as the High Risk Rural Road Program (HRRRP). The Federal Highway Administration (FHWA) reports that nearly 60% of all highway fatalities nationwide occur on rural roadways. Of the 10, 6 locations received recommendation for reflective brightsticks to be added to existing signage as a countermeasure to reduce lane departure crashes. Lane departure crashes are one of the four emphasis areas for crash reduction in the FDOT Strategic Highway Safety Plan (SHSP). The use of britesticks is one of the lowest cost and most effective means of reducing lane departure crashes.

The Pasco County Crash Data Management System (CDMS) was used to compare crashes occurring in the six locations from 2007 through 2012. Crash frequency for 2007, 2008, and 2009 was used to identify before brightstick install average. Years 2010, 2011, and 2012 were used to identify post brightstick install crash frequency average. The data represented includes filtering for lane departure crashes only.

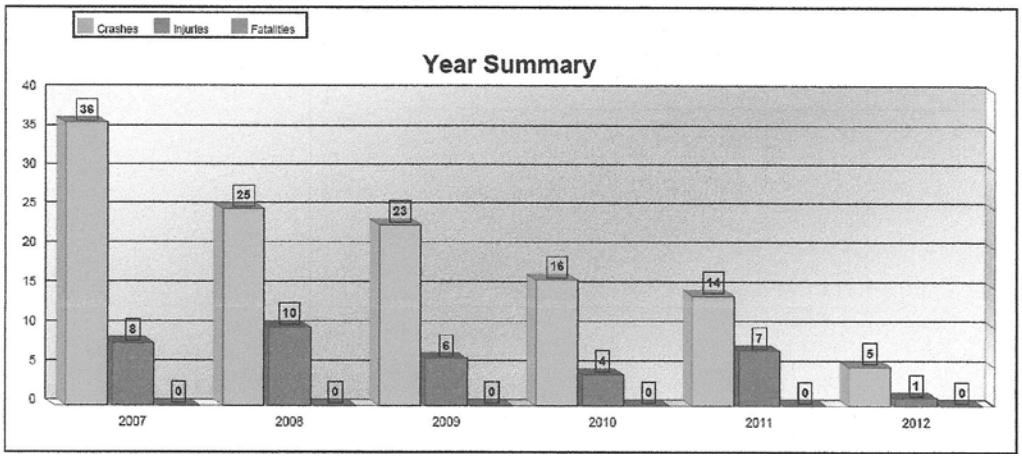
Study Locations

Shady Hills Road
Segment 14-2, 14-3 and 14-4
From S.R. 52 to Mile Post 2.2

This is a two-lane, undivided rural collector posted at 45 MPH with a speed limit advisory of 35 MPH posted at all curves. This segment of road involves a high percentage of single vehicles run off the road and lane departure crashes. From 2007 through to 2009, this segment of roadway averaged 28 lane departure crashes and eight injuries per year. From 2010 through 2012, after the installation of brightsticks, the roadway averaged 11.6 lane departure crashes and four injuries per year. This is a crash reduction of 58% and injury reduction of 50% in this segment.

Shady Hills Rd WebCDMS

Requested Date Range: 1/1/2007 to 12/31/2012	Crashes	Fatalities	Injuries	Peds	Bike	Motorcycle	Angles	Head On	Intoxication	Speeding	Run Control	Vul. Users	Agr. Driving	Lane Depart	At Int.
Records Date Range: 01/11/2007 to 09/26/2012	119	0	36	0	0	0	3	3	2	13	0	0	15	119	3

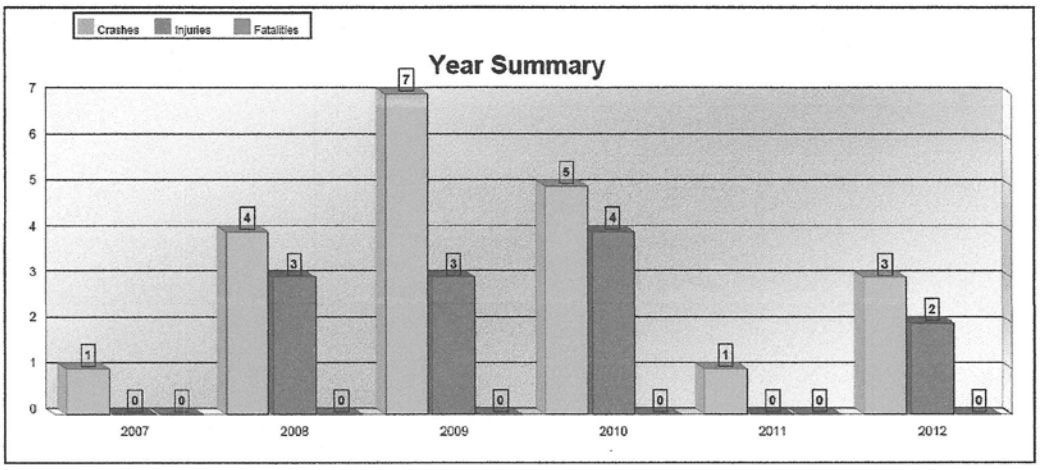


Bellamy Brothers Blvd
Segment 14-7
From Mile Post 3.2 to 4.0

This is a two-lane, undivided rural collector posted at 45 MPH that includes two 90 degree reverse turns with a speed limit advisory of 20 MPH posted at all curves. This segment of road involves a high percentage of single vehicles run off the road and lane departure crashes. From 2007 through to 2009, this segment of roadway averaged four lane departure crashes and two injuries per year. From 2010 through 2012 after the installation of brightsticks the roadway averaged three lane departure crashes and two injuries per year. This is a crash reduction of 50% and injury reduction of 0% in this segment.

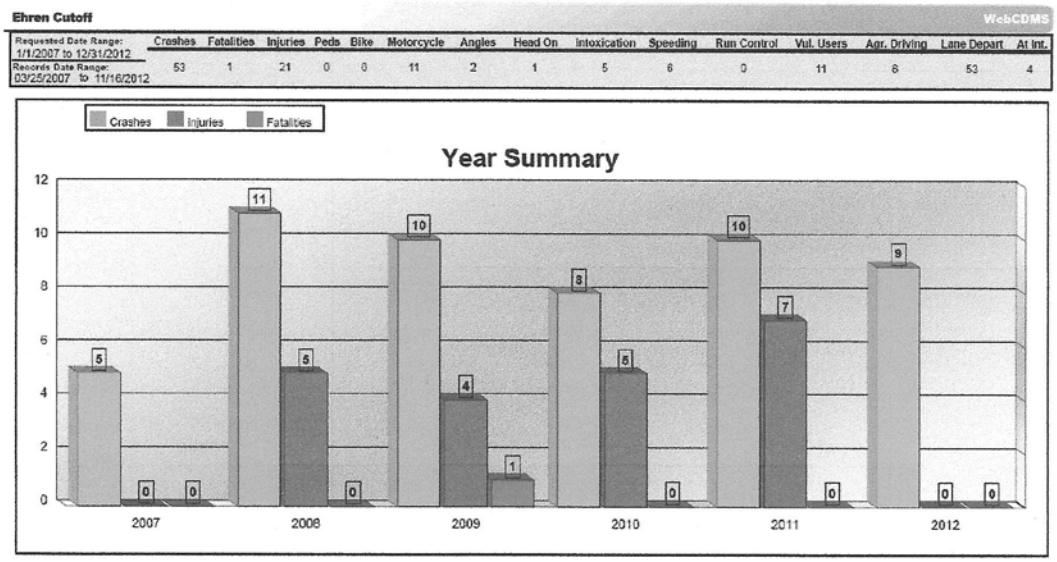
Bellamy Brothers Bl @ Bent Fork Rd WebCDMS

Requested Date Range: 1/1/2007 to 12/31/2012	Crashes	Fatalities	Injuries	Peds	Bike	Motorcycle	Angles	Head On	Intoxication	Speeding	Run Control	Vul. Users	Agr. Driving	Lane Depart	At Int.
Records Date Range: 06/06/2007 to 09/13/2012	21	0	12	0	0	7	0	0	0	4	1	6	6	21	7



Ehren Cutoff
Segment 14-8
All curves from S.R. 52 to U.S. 41

This is a two-lane, undivided rural collector posted at 45 MPH with a speed limit advisory of 35 MPH posted at all curves. This segment of road involves a high percentage of single vehicles run off the road and lane departure crashes. From 2007 through to 2009, this segment of roadway averaged 8.6 lane departure crashes and 3.3 injuries per year. There was one fatality during the 2007 – 2009 time period. From 2010 through 2012, after the installation of brightsticks, the roadway averaged nine lane departure crashes and four injuries per year. This is a crash increase of 4.6% and injury increase of 21% in this segment.



Summary of Results

The closest device for comparison to brightsticks listed in the FHWA crash reduction factor table is post mounted delineators. The expected Crash Reduction Factor (CRF) for the installation of post mounted delineators on curves is approximately 20%. For all of our studied locations crashes reduced by 41% and injuries reduced 28% with no fatalities from the average of the three previous years when compared to the average of the three years after installation of the brightsticks

Conclusion

Brightsticks have been installed in several locations throughout the County. We have issued work orders for their placement at 455 locations:

- to reduce lane departure crashes
- to reduce crashes at intersections
- to bring driver attention upon entering a school zone
- to reduce pedestrian crashes at all school crosswalks

There has not been enough time to determine if the brightsticks installed in other locations in the County will provide a similar (CRF) of 28% as observed in the study. Other benefits to brightstick installation worth considering beyond crash reduction include the cost savings for ongoing maintenance to roadway infrastructure (roadway signs, guardrails, etc.) and the reduction in possible liability claims.

The Traffic Operations Division strongly supports the continued use of britesticks as a low cost effective countermeasure for lane departure crash reduction.

CHAPTER 164
TRAFFIC SAFETY IMPROVEMENT PROGRAM

761—164.1(312) Definitions.

"Jurisdiction" means the department, or the county or city having responsibility for and control over a road or street.

"Traffic safety fund" means the fund created for traffic safety improvement projects pursuant to Iowa Code section 312.2.

761—164.2(312) Information and forms. Information, instructions and application forms may be obtained from the Office of Traffic and Safety, Iowa Department of Transportation, 800 Lincoln Way, Ames, Iowa 50010; telephone (515)239-1557.

761—164.3(312) Program administration.

164.3(1) *Purpose.* The traffic safety fund provides supplemental funding for traffic safety improvements or studies on public roads under county, city or state jurisdiction.

164.3(2) *Local participation.* The department shall administer the traffic safety fund as a statewide program and will encourage local participation in the review and evaluation of applications for funding.

164.3(3) *Funding.*

a. The commission shall review all applications and be responsible to program selected projects, subject to the availability of funds. The commission may fund all or part of a project and may make funding dependent upon adherence to a time schedule or fulfillment of specified conditions.

b. The commission need not commit all funds available during a fiscal year. Unexpended funds shall be retained for subsequent programming cycles.

c. The maximum traffic safety funding for a site-specific project shall generally not exceed $500,000. Total funding allotted for the traffic control device materials category shall not exceed $500,000 annually. Total funding allotted for all research, studies and public information initiatives shall not exceed $500,000 annually. All project costs exceeding the commitment of traffic safety funds shall be the responsibility of the applicant.

761—164.4(312) Applicant eligibility. The department, a county or an incorporated city in the state of Iowa is eligible to apply for traffic safety funds. Joint applications are encouraged when applicable, but the applicants shall designate one jurisdiction as the principal contact.

761—164.5(312) Project eligibility.

164.5(1) *Types of projects.* Eligible applications shall address needs in one of three categories: construction or improvement of traffic operations at a specific site; purchase of materials for initial installation or replacement of obsolete traffic control signs; or transportation safety research, studies or public safety information initiatives.

164.5(2) *Public roads.* Only applications involving a primary road, secondary road, or city street presently open to public use shall be considered. A project for a private purpose or road is not eligible.

761—164.6(312) Eligible project costs.

164.6(1) *Site-specific improvements.* The costs of construction or improvements eligible for traffic safety fund reimbursement include, but are not limited to, the following:

a. Road modernization, upgrading or reconstruction.

b. Bridge and culvert modernization, replacement or removal.

c. Road intersection and interchange improvement including channelization, traffic control devices or lighting.

d. Right-of-way required for a traffic safety project.

e. Drainage and erosion measures which are an integral part of the project.

f. Traffic control devices required by the project.

g. Guardrail.

h. Tree removal.

i. Other construction activities directly related to or required by the safety project.

164.6(2) *Traffic control devices.* The cost of materials purchased for initial installation of traffic control devices or replacement of obsolete traffic control devices to comply with the applicable warrants in the Manual on Uniform Traffic Control Devices (MUTCD) adopted in rule 761—130.1(321), Iowa Administrative Code, shall be eligible for funding.

164.6(3) *Research, studies and public information initiatives.* Funding shall be available for research, studies or public information initiatives related to traffic operations safety.

a. Research shall address statewide traffic safety concerns.

b. A study shall address remedies for traffic operations safety at a specific location. Study funds may be used to supplement federal Traffic Engineering Assistance Program (TEAP) funding.

c. A public information initiative shall emphasize traffic safety techniques or policies, and should be of statewide interest. An initiative of local scope may also be considered.

761—164.7(312) Ineligible project costs.

164.7(1) Any and all costs incurred prior to commission approval of funding for a project are ineligible.

164.7(2) Activities and costs not eligible for traffic safety funding as a portion of a site-specific improvement include, but are not limited to:

a. Routine maintenance of a road, street, bridge, culvert or traffic control device.

b. Safety-related activities associated with projects initiated for purposes other than traffic safety.

c. Contract administration costs.

d. Design and construction engineering and inspection.

e. Utility construction, reconstruction or adjustment, except as an integral part of a project.

f. Sidewalks, bicycle paths, or railroad-highway crossings, except as an integral part of a project.

g. Maintenance or energy costs for traffic control devices or lighting.

h. Expenditures for items not related to the roadway.

164.7(3) Activities and costs not eligible for traffic safety funding as a part of an application for traffic control device materials include, but may not be limited to:

a. Maintenance or energy costs for traffic control devices or lighting.

b. Installation costs.

761—164.8(312) Applications. Application procedures for each funding category will be distinct.

164.8(1) An application by a city or county for funding site-specific construction must be submitted on a departmental form specifically used for the traffic safety fund. Comparable information will be provided by the department for state-initiated projects. Required information shall include:

a. The applicant's name, mailing address, telephone number, and a designated contact person for the project.

b. A preliminary project concept statement, including a location map and a sketch plan. The concept must be reasonable from a traffic engineering standpoint and detailed enough to generate project cost estimates.

c. The justification for the proposed construction project. Justification may be based on a location's inclusion in the department's list of high accident locations, a TEAP-type study recommendation or a similar study generating a positive benefit/cost analysis for the proposed improvement.

d. Data showing the anticipated effect of the project on traffic safety. Data shall include accident history from the department's Accident Location Analysis System (ALAS) and the anticipated accident reduction, both in number and type, expected as a result of the project.

e. An itemized cost estimate for the project including a list of the sources and amounts of supplementary funds for the project.

f. A time schedule for the project.

g. The jurisdiction's official endorsement of the project and written assurance that the improved site will be adequately maintained.

164.8(2) An application for funding to pay the cost of materials for traffic control device installation shall be submitted in writing and shall include:

a. The applicant's name, mailing address, telephone number, and a designated contact person.

b. A list of the number and types of devices requested, and whether each is for initial placement or a replacement.

c. An inventory or similar documentation providing justification for the requested device.

d. A cost estimate and time schedule for installation after delivery.

e. The jurisdiction's official endorsement of the traffic control device project and written assurance that the traffic control device will be adequately maintained.

164.8(3) Research, a study or a public information initiative shall be proposed in writing and shall include:

a. The applicant's name, mailing address, telephone number and a designated contact person.

b. A description of the proposed subject matter and the goals or expected results of the effort.

c. A cost estimate.

761—164.9(312) Processing the application.

164.9(1) *Submission.*

a. The jurisdiction shall submit an original and three copies of the complete application to the office of traffic and safety. An application may be submitted at any time and shall be dated when received by the office of traffic and safety.

b. All complete applications received before August 15 of each year shall be evaluated for funding.

c. If an application is incomplete, the department shall return the application to the applicant to be resubmitted when complete. A resubmitted application shall be dated when received by the office of traffic and safety.

d. An unfunded application may be resubmitted for consideration during a subsequent funding period.

e. An application may be withdrawn at any time.

164.9(2) *Approval of projects.* Department staff shall prepare, with input from city and county officials, a proposed program of projects for each funding category and submit the programs to the commission for approval. The criterion for determining funding priorities in each category is the demonstrated relationship of the project to traffic safety.

[**ARC 7618B**, IAB 3/11/09, effective 4/15/09; **ARC 0033C**, IAB 3/7/12, effective 4/11/12]

761—164.10(312) Project agreement.

164.10(1) After the commission has approved funding for a county or city project, a project agreement shall be negotiated and executed between the department and the local jurisdiction. The agreement shall specify the conditions for project funding, which may include such items as the responsibility for planning, design, right-of-way, contracting, construction, materials inspection, documentation and the criteria for each. The agreement shall also specify the funding level for the eligible work items.

164.10(2) The department shall reimburse the county or city for actual eligible project costs not to exceed the amounts authorized by the project agreement.

164.10(3) Rescinded IAB 10/30/02, effective 12/4/02.

These rules are intended to implement Iowa Code section 312.2.

[Filed emergency 9/22/88 after Notice 8/10/88—published 10/19/88, effective 9/30/88]
[Filed 1/15/92, Notice 12/11/91—published 2/5/92, effective 3/11/92]
[Filed emergency 11/17/98—published 12/16/98, effective 11/19/98]
[Filed 10/10/02, Notice 8/7/02—published 10/30/02, effective 12/4/02]
[Filed ARC 7618B (Notice ARC 7482B, IAB 1/14/09), IAB 3/11/09, effective 4/15/09]
[Filed ARC 0033C (Notice ARC 9968B, IAB 1/11/12), IAB 3/7/12, effective 4/11/12]

SMARTER | SIMPLER | CUSTOMER DRIVEN

HSIP – Secondary Program
Letter of Interest

General Information:

County:
Contact Person:
Phone Number:
Email Address:

Please Complete the Following Project Information:

Project Types: (check all that apply)

Lane Departure
- ☐ Centerline Rumbles
- ☐ Edgeline Rumbles
- ☐ Shoulder Rumbles
- ☐ Milled-in Edgeline Paint
- ☐ Sign Upgrades
- ☐ Guardrail Upgrades
- ☐ Other:

Intersection
- ☐ Transverse Rumbles
- ☐ Destination Lighting
- ☐ Sign Upgrades
- ☐ Other:

This letter expresses our county's interest in meeting with the HSIP-Secondary team to review crash data, assess roadway conditions, and identify potential projects in order to utilize HSIP-Secondary funds. We understand that this letter of interest does not obligate our county to utilize HSIP-Secondary funds on any project identified.

HSIP-Secondary Team:

Terry Ostendorf
Terry.ostendorf@dot.iowa.gov
(515) 239-1077

Nicole Fox
Nicole.fox@dot.iowa.gov
(515) 239-1506

Jan Laaser-Webb
Jan.laaser-webb@dot.iowa.gov
(515) 239-1349

Bob Sperry
rsperry@iastate.edu
(515) 294-7311

Please submit application to Terry Ostendorf.

Iowa Department of Transportation

APPLICATION/AGREEMENT FOR HORIZONTAL CURVE SIGN PROGRAM

Applicant: County of _____

Contact Person: _____

Mailing Address: _____
(Street Address and/or Box Number)

_____
(City) (Zip)

Daytime Phone: _____ Email: _____
(Area Code)

PROGRAM GUIDELINES:

The signs that are eligible with this program include: W1-1 (Turn), W1-2 (Curve), W1-3, (Reverse Turn), W1-4 (Reverse Curve), W1-5 (Winding Road), W13-1P (Advisory Speed), W1-6 (Arrow), and W1-8 (Chevron). Counties are responsible for purchasing the signs and the Iowa DOT will reimburse the county for sign costs upon installation. Reimbursable costs include the signs only.

Participation in the program will be on a first come, first served basis. Counties are limited to a maximum of $10,000 per year with this program. Reimbursement will not be given for signs ordered prior to DOT authorization.

INSTALLATION GUIDELINES:

Signs will need to be installed before reimbursement will be issued. Signs shall be installed within 12 months of authorization. Signs are to be installed in compliance with the current *Manual on Uniform Traffic Control Devices*, Federal Highway Administration, U.S. Department of Transportation. Tables 2C-5 and 2C-6 from the MUTCD have been included below.

Once the signs are installed, notify the program coordinator within 30 days. Notification should include the completed spreadsheet and, if possible, a photo of the installed signs. The preferred method of notification is by email to Steven.Schroder@dot.iowa.gov.

SHEETING MATERIAL AND SIGN SIZE:

Sheeting material for the signs is to be ASTM Type IV (High Intensity Prismatic) or greater and either yellow or fluorescent yellow in color. Signs that are on riskier curves should be a larger size and fluorescent yellow in color. See Table 1 below for the minimum sizes and larger sizes of signs that are to be installed.

Table 1: Sizes of horizontal curve signs

Sign Number	Sign Description	Minimum Size	Larger Size
W1-1	Turn	30 x 30	36 x 36
W1-2	Curve	30 x 30	36 x 36
W1-3	Reverse Turn	30 x 30	36 x 36
W1-4	Reverse Curve	30 x 30	36 x 36
W1-5	Winding Road	30 x 30	36 x 36
W13-1P	Advisory Speed	18 x 18	24 x 24
W1-6	Arrow	48 x 24	48 x 24
W1-8	Chevron	18 x 24	30 x 36

Table 2C-5. Horizontal Alignment Sign Selection

Type of Horizontal Alignment Sign	Difference Between Speed Limit and Advisory Speed				
	5 mph	10 mph	15 mph	20 mph	25 mph or more
Turn (W1-1), Curve (W1-2), Reverse Turn (W1-3), Reverse Curve (W1-4), Winding Road (W1-5), and Combination Horizontal Alignment/Intersection (W10-1) (see Section 2C.07 to determine which sign to use)	Recommended	Required	Required	Required	Required
Advisory Speed Plaque (W13-1P)	Recommended	Required	Required	Required	Required
Chevrons (W1-8) and/or One Direction Large Arrow (W1-6)	Optional	Recommended	Required	Required	Required
Exit Speed (W13-2) and Ramp Speed (W13-3) on exit ramp	Optional	Optional	Recommended	Required	Required

Note: Required means that the sign and/or plaque shall be used, recommended means that the sign and/or plaque should be used, and optional means that the sign and/or plaque may be used.

See Section 2C.06 for roadways with less than 1,000 ADT.

Table 2C-6. Typical Spacing of Chevron Alignment Signs on Horizontal Curves

Advisory Speed	Curve Radius	Sign Spacing
15 mph or less	Less than 200 feet	40 feet
20 to 30 mph	200 to 400 feet	80 feet
35 to 45 mph	401 to 700 feet	120 feet
50 to 60 mph	701 to 1,250 feet	160 feet
More than 60 mph	More than 1,250 feet	200 feet

Note: The relationship between the curve radius and the advisory speed shown in this table should not be used to determine the advisory speed.

Signatures:

County Engineer: _____ _____
(Signature) (Date)

_____
(Printed)

County Board of Supervisors Chair: _____ _____
(Signature) (Date)

_____
(Printed)

DOT Approval: _____ _____
(Signature) (Date)

_____
(Printed)

Application is not approved until DOT Approval is given.

REQUEST FOR TRAFFIC SAFETY FUNDS
PROJECT NARRATIVE

Location: The project is located on Clinton County Road Z2E (302nd Avenue) in Washington Township, Section 4 at the approaches to FHWA bridge number 123720 (County Bridge #L-0431).

Existing Conditions: The existing approach roadway sections to Bridge L-0431 have 12-degree horizontal curves within 150 feet of each end of the bridge. The existing road section has a 22 feet wide paved driving surface consisting of 6-inches of ACC on a 6-inch rolled stone base with 4-feet wide aggregate shoulders. The existing bridge is 26 feet wide with guardrail at all four corners and white curve delineators along the approaches. The location has curve ahead warning signs and a recommended speed posting of 35mph for each approach direction. The curves are also marked with Chevron alignment signs from both approach directions. Z2E has several curves along its alignment but this project location is the only area with a major drainage structure between two of the more severe changes in horizontal alignment on the roadway. This section has a long history of accidents dating back more than twenty years including fatality and injury accidents occurring prior to the last 5-years of accident data submitted with this application. The existing bridge has a Sufficiency Rating of 52 and is nearing inclusion to the 5-year Construction Program.

Proposed Improvements: The major improvement proposed for this location is to remove the two 12-degree curves and realign approximately 2000 feet of the roadway to allow a single 6-degree, 950 feet radius horizontal curve to be constructed on the new alignment. The existing roadbed material will be used to construct the new alignment roadbed. As part of this proposed project the bridge would be relocated and constructed to current standards with a minimum width of 30 feet and constructed to the required clear zone, bridge rail and guardrail standards. HBRR and local funds would be used to construct the bridge portion of the project. Traffic Safety Improvement Program funds would be used to construct the alignment change portion of the project. The Motor Vehicle Accident Reports indicate that the general cause of the accidents is the failure of the drivers to negotiate the curves at the approaches to the bridge and the subsequent loss of control of the vehicles. Constructing the proposed alignment change to Z2E in accordance with current Farm-to-Market Road Design Guidelines for New or Reconstructed Collector Roads will reduce the hazards to the driving public negotiating the two existing 12-degree curves. Additional ROW will be acquired to meet clear zone requirements. A 50-feet wide strip of ROW will be acquired to allow construction of the new alignment; approximately 1 acre of agricultural land will be acquired for permanent roadway easement. The new alignment will be signed in accordance with the MUTCD. All existing access drives will be extended to provide access to property owners within the project limits.

LOUISIANA LOCAL ROAD SAFETY PROGRAM

Local Road Safety Improvement Projects

Louisiana Local Road Safety Program Guidelines & Policies 2015

LOCAL ROAD SAFETY IMPROVEMENT PROJECTS

Program Guidelines & Policies

2015

Louisiana Technical Assistance Program
Louisiana Transportation Research Center
BATON ROUGE, LA

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

Table of Contents

What is the Louisiana Local Road Safety Program?

Funding for Local Road Safety Improvement Projects is available through the Louisiana Local Road Safety Program (LRSP). Eligible safety projects include those for roadways and transportation systems **owned and operated by parish and municipal road agencies. Projects involving state roads are not eligible under this program.** Specific funds are available for these projects, and additional funding sources or resources may be available depending on the type of project. The Local Technical Assistance Program (LTAP) administers the Local Road Safety Program in coordination with the LADOTD. LTAP also facilitates submittal and review of applications for the Local Road Safety Program.

Intent of the Program

The program is intended to increase local community participation in roadway safety and to develop and implement road safety improvements to reduce fatalities and injuries on local public roads. This program is part of the implementation of the LA Strategic Highway Safety plan as required by SAFETEA-LU which was signed into law on August 10, 2005. The annual funding level is anticipated between $3 and $5 million per year.

Funding Sources and Should We Do Our Own Engineering?

LRSP funds are reimbursable federal-aid monies, not up-front grants, subject to all the requirements of Title 23, United States Code. **The Entity must have the financial resources to carry project expenditures until reimbursed and statutory authority to charge on a reimbursable basis. Due to the following stipulations, all construction projects are asked to budget for a 90% match initially. The match will then be adjusted accordingly.**

The LRSP will be funded with Transfer and/or FHWA funds. When Transfer funds are used, the U.S. Department of Transportation (USDOT) will reimburse the Entity through LADOTD 90% of the total eligible cost for construction projects and 95% of the total eligible costs for purchase only projects. When FHWA funds are used, the Federal Highway Administration will reimburse the Entity 95% of the total eligible costs for High Risk Rural Road construction safety projects and 90% of the total eligible costs for all other projects. If LADOTD advertises and chooses the consultant for the Entity, potential items that may be included in the total eligible project costs are: design, construction, engineering/testing/inspection, materials, services, and real property (if purchased for the project). The Entity's share shall be a cash match. If the Entity chooses their own consultant to perform engineering and/or contract administration, LADOTD will not reimburse the Entity for these services. This means the Entity must pay all design and/or contract administration costs for the project. The Entity will be allowed to choose the consultant and negotiate the fees without LADOTD, FHWA, or USDOT oversight. LADOTD **will** accept these costs as in-kind services and contribute toward the match source of the project. The Entity may start design (not construction) before project authorization. Entities are encouraged (if possible) to do their own engineering as this speeds up project implementation considerably.

Who is Eligible to Request Funding?

Louisiana Parish or municipal jurisdictions with direct authority over impacted roadways

Maximum Funding and Local Match Per Project

State funding cannot exceed $500,000 per project (or Entity). A local match of 10% on construction projects and 5% for other projects is usually required. See the above section regarding the use of in-kind matches for engineering and design work.

Entity/State Agreements

All entities whose projects have been approved must sign an Entity/State Agreement prior to project initiation. The agreement is a legally-binding contract between the Entity and LADOTD. **Project funding is cost reimbursement as specified in the Entity/State Agreement.**

Application Required

A downloadable application form is available at LTAP's website (www.ltrc.lsu.edu/ltap)

Open Application Schedule

As of August 2014, completed applications may be **submitted anytime throughout the year.** Project selection and award will be made **quarterly.**

Types of Projects Eligible for Funding

Eligible projects will fall into one of the following categories:

1. Construction that will **improve traffic safety** and operations at a specific site with a documented crash history, such as:
   - Parish-wide Horizontal Curve Treatments
   - Intersection signing
   - Roadside Hazard Removal
   - Guardrails
   - Rumble Strips
   - Culvert Safety End Treatments
   - Flashing Warning Devices
   - Line-of-sight Improvements
   - Roundabouts
   - Other

2. Transportation and roadway safety initiatives such as:
   - Signage Replacement and Improvements at specific sites
   - Crash and Location Data Development and Analysis
   - Work zone Safety Improvements
   - Data management systems or GIS
   - Public Information and Education

Standards Compliance

Please note that all projects (purchases and construction) must conform to recognized engineering standards (AASHTO Roadway Design Guide, MUTCD, etc.), and construction practices, as well as the LADOTD Engineering Directives and Standards (EDSM) and LADOTD's policies and procedures.

- Only regulatory and warning signs will be funded.

- Signing and pavement marking projects must have an engineering study to determine proper size, location, and placement included in the itemized cost. Pavement markings must comply with the LRSP Pavement Marking Policy found on page 11.

- All sign and pavement markings and their installation must be certified by a Louisiana Registered Professional Engineer, and the cost can be included as part of your project.

Eligible Reimbursable Work Categories

Engineering

This includes the cost to provide all engineering services necessary for the preparation of complete plans, specifications and estimates for the proposed project. Engineering will only be reimbursed for projects where LADOTD selects the consultant to performing engineering for the Entity. If the Entity chooses to use their engineer, engineering will not be reimbursed. The cost, however, will count toward the Entity's match.

Contract Administration

This includes the cost to provide construction administration and inspection and testing services during the project construction. Contract Administration will only be reimbursed for projects where LADOTD selects the consultant to perform contract administration for the Entity. If the Entity chooses to use their engineer, contract administration will not be reimbursed. The cost, however, will count toward the Entity's match.

Right-of-Way (ROW) Acquisition

This includes the cost of buying property plus right-of-way support services such as appraisals. **Whenever federal funds are used in any phase of a project, acquisition of real property for the project becomes subject to the provisions of the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, no matter if carried out by federal, state, local agencies, or by private parties.** An LADOTD certified appraiser must perform right-of-way appraisals to determine property value even if ROW is not used as part of the match or Federal funds are not used for property acquisition. Work done prior to selection and written approval by LADOTD will not be eligible for reimbursement. For additional information concerning ROW procedures, go to www.dotd.louisiana.gov/highways/project_devel/realestate/realestate.asp?page=manual on the LADOTD website to consult the LPA Real Estate Manual.

Real Property Match

ROW matches have certain stipulations. The real property must be specifically used for the project and cannot be already-owned public land. If the Entity proposes to acquire ROW with LRSP funds, then the request **must be shown in the application**. If the Entity intends to use ROW as match and pay for it themselves, then that **must be reflected in the application**. Regardless of which route is taken, the appraisal and acquisition procedures must meet federal and state guidelines. The LADOTD Real Estate Section will ultimately review for concurrence with value and thus determine the actual value of the match. Before obtaining ROW acquisition an LADOTD-certified appraiser must perform the appraisal. The Entity may obtain a list of LADOTD-certified appraisers in his area from the LADOTD Real Estate Section listed above.

Construction

This is the major category of work for eligible LRSP activities involving the actual construction of the project.

Ineligible Items for Reimbursement

Though not a comprehensive list, there are some activities that **will not be funded** through the LRSP:

1. Administrative costs are **not** compensable. The Entity is responsible for these costs. Some examples of actions considered to be administrative are application preparation, invoice checking, certification and transmittal, consultant selection and management, coordination with LADOTD, fundraising, etc.

2. Reconstruction/rehabilitation projects are not eligible for funding through the program. These projects are considered maintenance projects and should be part of an Entity's normal maintenance program.

3. Local Road Safety Program funds cannot be used for utility relocation. LRSP funds will only pay for adjustment of utilities (such as manholes or water meter that need to be raised due to sidewalk construction).

4. Actions (or work) taken prior to USDOT/FHWA project authorization are not eligible for compensation. This **does not** mean the portion of the action done before authorization is ineligible and the portion done after authorization is eligible. **None of the action is eligible.** For example, if the Entity intends to be compensated for their right-of-way acquisition, and if they inadvertently begin work before authorization, none of the right-of-way acquisition is eligible for reimbursement. The Entity will be notified **in writing** when expenditures are authorized and can be incurred.

Items that **are ineligible** for funding by the Local Road Safety Program **can be included** in the construction contract as **nonparticipating** items with the funding to be provided by the Entity or others. Costs that are ineligible for compensation are **not eligible** for match credit.

Project Selection and Approval

All project funding is provided through the Louisiana Department of Transportation and Development.

The Louisiana Local Road Safety Program utilizes a Review and Selection Committee composed of representatives from local government, LADOTD, FHWA, the Louisiana Highway Safety Commission, and the Local Technical Assistance Program (LTAP). The Committee recommends a priority ranking of projects to the LADOTD Safety Section, which then approves funding of specific projects:

- **LOW COST PROJECTS ARE ENCOURAGED.**

- Funding for selected projects is approved considering the safety benefits of eligible applications, the annual funding level and other criteria.

- DOTD will select consultants (as necessary) and contractors as specified in the Entity/State Agreements. **Approved project costs will be reimbursed per specifications in the Entity/State Agreement.**

- All purchases must be made according to state contract regulations as specified by the LA Division of Administration.

Implementation of Purchase-Only Projects after Selection and Approval

Entities of the approved projects will need to sign and return the Entity/State Agreement to LADOTD. Purchases cannot be made until LADOTD executes the Entity/State Agreement and a Notice to Proceed is issued. **Any purchases bought before the Notice to Proceed is issued will not be reimbursed.** After the Notice to Proceed is issued, the sponsor has one (1) calendar year to purchase and submit invoices to LTAP for reimbursement. Failure to file the invoices within the one year period will result in the project funds being closed as detailed in the Entity/State Agreement.

Implementation for Construction Projects after Selection and Approval

Approved projects will be implemented in two phases: (1) Engineering and Design, followed by (2) Construction. Before these phases can be implemented, the development and signature of Entity/State Agreement is required. **In order to expedite initiation of the process, the Entity/State Agreement should be signed within 60 days of receipt.** These agreements will specify that the local Entity and LADOTD will perform the following:

Engineering and Design Phase:

- LADOTD will conduct the consultant selection process on behalf of the local Entity. The Entity also has the option to hire their own consultant to perform engineering. Entity will not be reimbursed for these engineering costs; however, the cost will be used towards the Entity's local match.

- LADOTD will select consultants (depending on the option taken above) to conduct appropriate engineering studies, project designs, plan preparation, prepare estimates and construction bid proposals. They will also be responsible for construction administration and inspection.

- The local Entity will sign the contract with the consultant to perform the work required by the project application.

- The local Entity will issue task orders to the consultant to begin work.

- The consultant will perform the required work and prepare all necessary plans, specifications, and estimates to implement the installation or construction of the safety improvement project.

- The Entity will appoint a project manager who will have responsible charge of the project during the construction and design phases.

- The consultant will schedule a Plan-in-Hand meeting with the local entity and LADOTD to review the project and provide the necessary deliverables for the installation and/or construction phase.

- The consultant will invoice the local entity who will pay the consultant. The local Entity will apply for reimbursement following LADOTD's reimbursement procedures.

Construction Phase:

- The consultant will prepare construction proposals. LADOTD will advertise for and receive bids for the work on behalf of the local Entity. The bids will be tabulated, extended and summarized to determine the official low bidder. LADOTD will then submit to the local sponsor copies of the official bid tabulations. The award of contract will be made by LADOTD on behalf of the local Entity following concurrence by the Federal Highway Administration and the local Entity.

- Construction contracts will be prepared and processed by LADOTD for the loca Entity. The local Entity will sign the contract with the Contractor and will be responsible for construction contract recordation. **The contract must be signed within 60 days for the project to remain eligible.** LADOTD will inform the local Entity in writing when they can issue to the Contractor an official **"Notice to Proceed"** with construction.

- The contractor will perform the work and invoice the local Entity who will pay the contractor. The local Entity will apply for reimbursement from LADOTD.

- Standardized forms may be provided by LADOTD for consultant and contractor invoices; issuance of task orders by local Entity to consultant and/or contractors; and reimbursement requests.

- The Entity/state agreement will include a requirement to describe how safety improvement projects will be monitored and maintained at the expense of the local Entity.

Cost Increases

Funding for project costs in excess of those awarded initially will not be provided. Therefore, obtaining realistic cost estimates for the services to be performed are extremely important to insure that adequate funding is provided. Funding requests should take into account that the project will not be under construction until the third (3rd) year in the program. It is recommended that the services of a professional engineer, architect, or contractor familiar with LADOTD procedures be obtained to assist in the development of the required project services and cost estimates compliance to LADOTD standards. Costs for professional services associated with preparation of the application are not eligible for reimbursement.

The Entity will be responsible for any cost in excess of that awarded initially. Entities should carefully control increases and overruns as they may jeopardize completion of the entire project. If the Entity decides not to complete a project, the applicant will reimburse all federal expenditures to the LADOTD.

Local Road Safety Program
Pavement Marking Policy

A number of applications have been submitted that call for centerline markings on local roads. There is a concern that some of the applicants have not carefully considered the implications of their request for centerline marking of roadways within their jurisdiction. Specifically, not all roadways require centerlines.

Centerlines are traffic control devices that regulate, warn and guide traffic over your local road. As such, the Manual on Uniform Traffic Control Devices (MUTCD) is the national standard for how centerlines installed on your roadway. Chapter 3 of the MUTCD addresses centerline markings directly (available online at http://www.mutcd.fhwa.dot.gov/pdfs/2003r1/Ch3.pdf).

In accordance with the standards, guidance, and options published within Chapter 3 of the MUTCD, the roadways you submit for centerline markings should:

- Be 18 feet or more in width; and,
- For urban areas, have an average daily traffic count of at least 1000 vehicles per day (or 100 vehicles in one hour).
- For rural areas, have an average daily traffic count of at least 400 vehicles per day (or 40 vehicles in one hour).

If your roadway meets these minimum requirements, the application to fund centerline striping for that specific roadway will be approved provided funding is available. If your roadway does not meet these requirements, it should be removed from your application unless you can provide the following information:

- The roadway has more than two lanes of traffic.
- The roadway has a history of crashes where vehicles have left the roadway.
- The roadway has a history of crashes where vehicles have collided with fixed objects.
- The roadway has a railroad crossing that requires pavement markings (see Chapter 8 of MUTCD, available online at http://mutcd.fhwa.dot.gov/pdfs/2009/part8.pdf
- The roadway has a history of crashes that occur during low light or darkness.
- The roadway has a history of crashes where vehicles have collided with parked vehicles or other vehicles engaged in parking maneuvers.
- A letter from a registered professional engineer which bears the engineer's stamp. The letter should affirm that the engineer has personally examined the roadway and determined that on the basis of their engineering judgment, crashes along the roadway could be significantly reduced by the application of pavement markings as proposed within your application.

Pavement Marking Policy continued…

You should indicate within your application your willingness and ability to maintain the markings that are applied if your application is approved. That is why it is so important that you limit your pavement marking requests to a roadway(s) or a segment of a roadway that can be made safer with the application of pavement markings.

Pavement markings: Standard centerline markings shall consist of a thermoplastic (40 mil) 4 inch wide stripe installed on a 40' pattern (10' stripe and a 30' gap). The centerline will be supplemented with a raised pavement marker placed in the center of each gap.

Local Road Safety Program
Portable Changeable Message Sign Policies

Temporary Traffic Control Applications

Adapted from 2003 MUTCD Section 6F.55 Portable Changeable Message Signs

Standard:

Portable Changeable Message signs shall be TTC (temporary traffic control) devices with the flexibility to display a variety of messages. Each message shall consist of either one or two phases. A phase shall consist of up to three lines of eight characters per line. Each character module shall use at least a five wide and seven high pixel matrix.

Support:

Portable Changeable Message signs are used most frequently on high-density urban freeways, but have applications on all types of highways where highway alignment, road user routing problems, or other pertinent conditions require advance warning and information.

Portable Changeable Message signs have a wide variety of applications in TTC zones including: roadway, lane, or ramp closures, crash or emergency incident management, width restriction information, speed control or reductions, advisories on work scheduling, road user management and diversion, warning of adverse conditions or special events, and other operational control.

The primary purpose of Portable Changeable Message signs in TTC zones is to advise the road user of unexpected situations. Some typical applications include the following:

A. Where the speed of vehicular traffic is expected to drop substantially;
B. Where significant queuing and delays are expected;
C. Where adverse environmental conditions are present;
D. Where there are changes in alignment or surface conditions;
E. Where advance notice of ramp, lane, or roadway closures is needed;
F. Where crash or incident management is needed; and/or
G. Where changes in the road user pattern occur.

Guidance:

The components of a Portable Changeable Message sign should include: a message sign panel, control systems, a power source, and mounting and transporting equipment.

Portable Changeable Message signs should subscribe to the principles established in Section 2A.07 and other sections of this Manual and, to the extent practical, with the design (that is, color, letter size and shape, and borders) and applications prescribed in this Manual, except that no reverse colors for the letters and the background are considered acceptable.

The front face of the sign should be covered with a protective material. The color of the elements should be yellow or orange on a black background.

Portable Changeable Message signs should be visible from 800 m (0.5 mi) under both day and night conditions. For a trailer or large truck mounted sign, the letter height should be a minimum of 450 mm (18 in). For Changeable Message signs mounted on service patrol trucks, the letter height should be a minimum of 250 mm (10 in).

The message panel should have adjustable display rates (minimum of 3 seconds per phase), so that the entire message can be read at least twice at the posted speed, the off-peak 85^{th}-percentile speed prior to work starting, or the anticipated operating speed.

Messages should be designed taking into account the following factors:

A. Each phase should convey a single thought.
B. If the message can be displayed in one phase, the top line should present the problem, the center line should present the location or distance ahead, and the bottom line should present the recommended driver action.
C. The message should be as brief as possible.
D. When a message is longer than two phases, additional Portable Changeable Message signs should be used.
E. When abbreviations are used, they should be easily understood (see Section 1A.14).

Option:

The message sign panel may vary in size.

Smaller letter sizes may be used on a Portable Changeable Message sign mounted on a trailer or large truck provided that the message is legible from at least 200 m (650 ft), or mounted on a service patrol truck provided that the message is legible from at least 100 m (330 ft).

Two Portable Changeable Message signs may be used for the purpose of allowing the entire message to be read twice at the posted speed.

Standard:

Portable Changeable Message signs shall automatically adjust their brightness under varying light conditions, to maintain legibility.

The control system shall include a display screen upon which messages can be reviewed before being displayed on the message sign. The control system shall be capable of maintaining memory when power is unavailable.

Portable Changeable Message signs shall be equipped with a power source and a battery back-up to provide continuous operation when failure of the primary power source occurs.

The mounting of Portable Changeable Message signs on a trailer, large truck, or a service patrol truck shall be such that the bottom of the message sign panel shall be a minimum of 2.1 m (7 ft.) above the roadway in urban areas and 1.5 m (5 ft) above the roadway in rural areas when it is in the operating mode.

The text of the messages shall not scroll or travel horizontally or vertically across the face of the sign.

Guidance:

Portable Changeable Message signs should be used to supplement to and not as a substitute for conventional signs and pavement markings.

When Portable Changeable Message signs are used for route diversion, they should be placed far enough in advance of the diversion to allow road users ample opportunity to perform necessary lane changes, to adjust their speed, or to exit the affected highway.

The Portable Changeable Message sign should be sited and aligned to provide maximum legibility. Multiple Portable Changeable Message signs should be placed on the same side of the roadway, separated from each other at distances based on Table 6C-1.

Portable Changeable Message signs should be placed on the shoulder of the roadway or, if practical, further from the traveled lane. They should be delineated with retroreflective TTC devices. When Portable Changeable Message signs are not being used, they should be removed; if not removed, they should be shielded; or if the previous two options are not feasible, they should be delineated with retroreflective TTC devices.

Portable Changeable Message sign trailers should be delineated on a permanent basis by affixing retroreflective material, known as conspicuity material, in a continuous line on the face of the trailer as seen by oncoming road users.

The following section was adopted from the 2009 Edition of the MUTCD, Chapter 2L, Section 2L.02, Paragraph 03 and 06 and provisionally approved by the Local Road Safety Program until official adoption of the 2009 Edition MUTCD by the State of Louisiana.

Option:

Portable Changeable Message signs may be used by State and local highway agencies to display safety messages, transportation-related messages, emergency homeland security messages, and America's Missing Broadcast Emergency Response (AMBER) alert messages.

Standard:

When a Portable Changeable Message sign is used to display a safety, transportation-related, emergency homeland security, or AMBER alert message, the display format shall not be of a type that could be considered similar to advertising displays.

The following requirements were approved by the Local Road Safety Program committee on August 17, 2010 and are in effect for Portable Changeable Message signs requested in 2011.

An Entity requesting the purchase of a (or multiple) Portable Changeable Message signs **must send a representative to participate in the Entity's local Safe Community or Transportation Safety Coalition meetings**, provided that the Portable Changeable Message signs were approved for funding.

Camera Feature Is Ineligible for Funding Inclusion:

The following addendum was approved by the Local Road Safety Program committee on December 10, 2014 and is in effect immediately.

Portable message boards are intended to function as traffic control devices that provide information to motorists. Cameras and other real time monitoring devices that are attached to the message boards to monitor traffic are considered ITS equipment. The rules for the use of State and Federal funding for ITS equipment mandate that the device deployment be part of a Regional ITS Architecture and a Systems Engineering Study. Because of this added complexity, traffic monitoring with cameras will be considered to be outside the scope of typical traffic control function provided by message boards and will not be considered as an option.

DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT OFFICE OF HIGHWAYS			**EDSM No: VI.1.1.5**
ENGINEERING DIRECTIVES AND STANDARDS			
VOLUME	**VI**	**Effective Date:**	**April 8, 2008**
CHAPTER	**1**	**Subject:** **ROUNDABOUT STUDY AND APPROVAL**	
SECTION	**1**		
DIRECTIVE	**5**		

1. PURPOSE:
This directive sets forth the Department of Transportation and Development's (DOTD) policy for the justification and approval for installing roundabouts.

2. SCOPE:
This policy applies to the State highway system and to local roads where state or federal funds will be used as well as to any improvements to the State highway system funded by a private entity, Parish or local governments that are constructed by permit. Refer to EDSM VI.1.1.6 on Roundabout Design for the design details of a roundabout.

3. POLICY:

A. A comprehensive investigation and report of traffic conditions and physical characteristics shall be made of the location. This report shall be recommended by the District and approved by the Chief Engineer. This report shall include;

1. Crash history of the site for the past 3 years with a chart listing the number of correctable crashes
2. Traffic Volumes
    a. 7 day 24 hour approach counts with hourly subtotals including classification counts identifying truck volumes
    b. Manual counts for peak hour AM and PM (also noon and weekend if applicable)
    c. Projected peak hour counts for a 20 year design life (Traffic Engineering Division Administrator to approve waivers to design year)
    d. Pedestrian Volumes
3. Speed study for each approach
4. Analysis of roundabout operation
    a. ***Sidra Intersection*** [computer software] (Akcelik & Associates) software must be run to compare the level of service and the v/c ratio between roundabouts, signals and stop controlled intersections
    b. ***VisSim™*** [computer software] (Visual Solutions, Inc.) model
5. Identify any safety concerns
6. Perform a systems analysis on adjacent intersections and commercial driveways that the roundabout may affect

7. Nearby land use
    a. Right of Way Issues
    b. Access Issues
    c. Operational issues
8. Conceptual drawing of proposed roundabout
    a. Assure appropriate geometry can be obtained for entry and exit using a WB-67 (or larger) design vehicle. (Waivers to be approved by the Traffic Engineering Division Administrator.)
    b. Horizontal and vertical geometry must be clearly identified
    c. Approximate Right of way
    d. Nearby driveways
    e. Utilities
    f. Sidewalk location

B. Locations where a roundabout may be justified;
1. Intersections with poor visibility as long as stopping sight distance to the roundabout will be provided.
2. Intersections with 5 or more reported crashes, of types susceptible to correction by a roundabout, have occurred within a 12 month period, each crash involving personal injury or property damage apparently exceeding the applicable requirements for a reportable crash.
3. Increases capacity of an intersection.
4. Intersections with limited space for queuing.
5. Intersections with difficult skew angles, significant offsets, odd number of approaches or close spacing to other intersections.
6. Intersections where U turns need to be accommodated.

C. Reasons why a roundabout may not be justified;
1. Should not be installed strictly for access to private development using state or federal funds. May be installed under permit.
2. Should not be planned to include metering or signalization

4. WAIVERS:

Deviations from this policy must be requested in writing along with engineering justification for the variation from policy. The request shall be submitted to the Traffic Engineering Division Administrator who may approve a waiver in policy.

5. APPLICATION OF STANDARDS:

These standards shall apply immediately to all new installations.

6. OTHER ISSUANCES AFFECTED:

All directives, memoranda or instructions issued heretofore in conflict with this directive are hereby rescinded.

7. IMPLEMENTATION:

This directive will become effective immediately upon issuance.

DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT OFFICE OF HIGHWAYS			**EDSM No: VI.1.1.6**
ENGINEERING DIRECTIVES AND STANDARDS			
VOLUME	**VI**	**Effective Date:**	**April 8, 2008**
CHAPTER	**1**	**Subject:**	
SECTION	**1**	**ROUNDABOUT DESIGN**	
DIRECTIVE	**6**		

1. PURPOSE:

This directive sets forth the Department of Transportation and Development's (DOTD) policy for the design of roundabouts.

2. SCOPE:

This policy applies to the State highway system and to local roads where state or federal funds will be used as well as to any improvements to the State highway system funded by a private entity, Parish or local governments that are constructed by permit. Roundabouts must be approved according to EDSM VI.1.1.5 Roundabout Study and Approval prior to beginning design.

3. POLICY:

A. General
   1. All movements should be accounted for in the design.
   2. A roundabout should be designed for current peak hour traffic at time of construction.
   3. The roundabout should be planned for a 20 year design life such that no right of way would have to be purchased to increase capacity once the roundabout is constructed. A waiver may be approved by the Traffic Engineering Division Administrator.

B. Operational
   1. If the roundabout is installed under permit a city/state agreement must exist such that if the roundabout fails within the first three years then the state is not responsible for any construction or reengineering costs.
   2. Driveways should not be allowed within 100' away of the splitter island. (Waivers are to be approved by the Traffic Engineering Division Administrator.)

C. Geometry
   1. All Roundabouts
      A. All speed control shall take place prior to the yield point on entry. The recommended design speed for all vehicles entering the roundabout is 15 mph. Remove any reverse curvature between the entrance and exit radii and join with straight curb sections.

B. The offset left alignment is preferred, the center alignment is acceptable and the offset right alignment requires a waiver to be made by the Traffic Engineering Division Administrator.
C. Approach legs should be designed as perpendicular to each other as possible.
D. Entry width should be 18' for a single lane roundabout unless a wider entry is needed due to a larger design vehicle. Entry widths for dual movements are to be designed using Auto TURN.
E. Circulatory roadway width should accommodate buses and fire trucks.
F. Exit radius should be between 400' – 800'.
G. Use a WB-67 for the design vehicle. (Waivers are to be approved by the Traffic Engineering Division Administrator.)
H. Truck Aprons
    1) Range from 3 ft to 13 ft wide with a cross slope 3-5 percent away from the central island. Exact width of truck apron should be determined from Auto TURN.
    2) See Figure 1.1 for more detail.
I. Length of splitter island measured along the approach should be at least 50' long. Longer islands or extended raised medians should be used in areas with high approach speeds.
J. Vertical face curbs are required in the area of the splitter island on both sides of the roadway and on the splitter island. The approach nose of the splitter island should be tapered down to a sloped curve. Vertical face curb should begin at the edge of the finished shoulder on the approach roadway, then taper inward using a shifting taper to the edge of the travel way. Continue the curb on the edge of the travel way through the roundabout entrance and along the outside diameter to the various exits.

2. Single Lane Roundabouts
    A. The inscribed circle shall be at least 110' diameter.
    B. The circulatory width shall be wide enough so that a bus will not have to use the truck apron.
3. Multi-Lane Roundabouts
    A. The recommended size for the inscribed circle shall be at least 175' diameter.
    B. Gore striping shall be used between entry lanes to keep 12' lane widths for passenger vehicles.
    C. Design for minimum lanes.
    D. If inner lane can exit, outer lane must be an exit only.
    E. Path overlap
        1) Striping cannot be used to mitigate path overlap.
        2) A diagram should be furnished illustrating that path overlap does not exist: Designers should determine the natural path overlap by assuming the vehicles stay within

their lanes up to the yield point. At the yield point the vehicle maintains its natural trajectory into the circulatory roadway. The vehicle will then continue into the circulatory roadway and exit with no sudden changes in curvatures or speed

D. Pedestrians
   1. Any pedestrian crosswalk must be justified by the District Traffic Operations Engineer (DTOE) before including pedestrians in the design of the roundabout.
   2. Stopping sight distance to the crosswalk shall be provided.
   3. The pedestrian crossing is to be located at least 20 feet from the yield line to the center of the crosswalk.
   4. Sidewalk, ramp and crosswalk shall meet current DOTD standards.

E. Bicycles
   1. End all shoulders and bike lanes 100’ in advance of the yield line.
   2. Curb ramps should be placed where the shoulder/bike lane terminates to allow cyclists to access the mix use path

F. Transit
   1. Bus pullouts shall not be located on the circulatory roadway.
   2. A bus stop is best situated:
      1. On an exit lane in a pull out just past the crosswalk.
      2. On an approach leg 60’ upstream from the crosswalk, in a pullout.

G. Signing
   1. See Figures 1.4 and 1.5 for signing layouts.
   2. Junction assemblies should be placed in advance of a roundabout.
   3. Confirmation assemblies should be placed no more than 500’ beyond the intersection.
   4. Signs placed in center island shall be 24” from bottom of sign to ground.
   5. Fishhook arrows shall be used on signs.

H. Pavement Markings
   1. See Figures 1.6, 1.7, 1.8, 1.9 for marking layout.
   2. Single lane roundabouts do not need lane arrows or circulatory roadway pavement markings except for edge line markings.
   3. Fishhook pavement markings shall be used. See Figure 1.10.
   4. Bike lane markings are not permitted within the circulatory roadway.
   5. No yield lines (shark teeth) shall be used.

I. Landscaping
   1. DOTD will not be responsible for the upkeep of the landscaping. A permit/agreement will need to be signed with the community to upkeep the landscaping.
   2. Provide two conduits to the central island, 1 for water and 1 for electrical.
   3. No hard wall, fountains or any object that would encourage pedestrians shall be allowed in the center island.
   4. Select plantings to ensure adequate sight distance and to minimize maintenance for the life of the project.
   5. Use a 6:1 slope on the central island.

6. Keep at least the outside 6’ of central island clear.
7. Splitter islands must not contain trees, planters or light poles.
8. Do not obstruct the sight triangle.
9. Avoid landscaping within 50’ in advance of the yield point.
10. Use low profile landscaping in the corner radii if a crosswalk is provided.

J. Illumination

1. Roundabouts shall be illuminated such that at a minimum should be located in advance of the crosswalk. Make sure pedestrians are not “back lit”.
2. See chart below:

Recommended Illuminance for Intersections				
Roadway Classfication (Street A/Street B)	Average Maintained Illuminance at Pavement Pedestrian/Area Classification[1]			Uniformity Ratio (Eavg/ Emin)[2]
	High Lux (fc)	Medium Lux (fc)	Low Lux (fc)	
Major/Major	34.0 (3.2)	26.0 (2.4)	18.0 (1.7)	3.0
Major/Collector	29.0 (2.7)	22.0 (2.1)	15.0 (1.4)	3.0
Major/Local	26.0 (2.4)	20.0 (1.9)	13.0 (1.2)	3.0
Collector/Collector	24.0 (2.2)	18.0 (1.7)	12.0 (1.1)	4.0
Collector/Local	21.0 (2.0)	16.0 (1.5)	10.0 (0.9)	4.0
Local/Local	18.0 (1.7)	14.0 (1.3)	8.0 (0.7)	6.0

[1] fc=foot candles (conversion factor from lux to foot candles is 10.67
(fc has been rounded to nearest tenth)

[2] Eavg = Horizontal Illuminance, Emin = Vertical Illuminance

Source ANSI/IESNA RP-8-00 Table 9

Lighting Level Chart

Roadway Classification	Description	Existing Daily Vehicular Traffic Volumes
Major	That part of the roadway system that serves as the principal network for through traffic flow. The routes connect areas of principal traffic generation and important rural roadways leaving the city. Also often known as “arterials,” “thoroughfares,” or “preferential.”	Over 3,500 ADT
Collector	Roadways servicing traffic between major and local street. These are street used mainly for traffic movements within residential, commercial, and industrial areas. They do not handle long, through trips.	1,500 to 3,500 ADT
Local	Local streets are used primarily for direct access to residential, commercial, industrial, or other abutting property.	100 to 1,500 ADT
Pedestrian Conflict Area Classification	**Description**	**Guidance on Existing Pedestrian Traffic Volumes**
High	Areas with significant numbers of pedestrians expected to be on the sidewalks or crossing the streets during darkness. Examples are downtown retail areas, near theaters, concert halls, stadiums and transit terminals	Over 100 pedestrians/hour
Medium	Areas where lesser numbers of pedestrians use the streets at night. Typical are downtown office area blocks with libraries, apartments, neighborhood shopping, industrial, older city areas, and streets with transit lanes	11 to 100 pedestrians/hour
Low	Areas with very low volumes of night pedestrian usage. These can occur in any of the cited roadway classifications but may be typified by suburban single-family streets, very low-density residential developments and rural or semi-rural areas.	10 or fewer pedestrians/hour

Notes:

1. Existing Daily Vehicular Traffic Volumes are for purposes of intersection lighting levels only.
2. Pedestrian volumes during the average annual first hour of darkness (typically 6:00 pm – 7:00 pm) representing the total number of pedestrians walking on both sides of the street plus those crossing the street at non-intersection locations in a typical block or 656 ft section. These volumes are for purposes of intersection lighting levels only and should not be construed as a warrant.

4. WAIVERS:

Deviations from this policy must be requested in writing along with engineering justification for the variation from policy. The request shall be submitted to the Traffic Engineering Division Administrator who may approve a waiver in policy.

5. APPLICATION OF STANDARDS:

These standards shall apply immediately to all new installations.

6. OTHER ISSUANCES AFFECTED:

All directives, memoranda or instructions issued heretofore in conflict with this directive are hereby rescinded.

7. IMPLEMENTATION:

This directive will become effective immediately upon issuance.

How to Submit the Application

Mail Delivery

To save time in processing your application, please follow directions and provide all requested application documentation. Please provide 3 copies of the application form. Paperclip your application together, no other binding is necessary.

List of Documentation

- Completed Application which includes:
  - Project Concept description
  - Project Information including:
    - One or more sources of data
    - Pictures of site (attach to application)
    - Detailed map of site (including route numbers and street names). Projects without detailed maps will be eliminated.
  - Detailed cost estimate
  - Signed Certification by legal authority
  - Responsible Charge Form

After submitting your application, you will receive a confirmation e-mail which may also contain information on how to proceed. You will be contacted if additional information is necessary.

Send Applications to:

Rudynah Capone, LRSP Manager
Louisiana Center for Transportation Safety

Louisiana Transportation Research Center
4101 Gourrier Avenue
Baton Rouge, LA 70808
Phone: (225) 767-9718
Email: Rudynah.Capone@la.gov

APPLICATION FOR FUNDING
LOUISIANA STRATEGIC HIGHWAY SAFETY PLAN PROJECTS
IMPLEMENTED THROUGH THE SHSP REGIONAL SAFETY COALITIONS

Regional Coalition/Statewide Emphasis Area Team (check one):

- ☐ Acadiana Transportation Safety Coalition
- ☐ Capital Region Transportation Safety Coalition
- ☐ New Orleans Regional Traffic Safety Coalition
- ☐ North Shore Regional Safety Coalition
- ☐ South Central Regional Safety Coalition
- ☐ Other (specify): _____

This document constitutes an application and scope of work for Louisiana Strategic Highway Safety Plan (SHSP) projects implemented through regional traffic safety coalitions and Statewide Emphasis Area Teams. Selected projects will be funded and administered by the Louisiana Department of Transportation and Development (LA DOTD) in coordination with the Louisiana Highway Safety Commission (LHSC) and Louisiana State Police (LSP). Applications for infrastructure improvements will be considered as part of the overall HSIP program and projects not currently part of an infrastructure safety-related improvement (i.e. enforcement, education) will be considered for other funding. Non-infrastructure applications will be reviewed by the SHSP Implementation Team, which will decide on final SHSP projects. Successful applicants will be notified via email and instructions provided on entering into an agreement with the LA DOTD.

Selection Criteria:

Projects will be evaluated based on the following criteria:

- Relevance to LA Strategic Highway Safety Plan Emphasis Areas
- Level of effectiveness of proposed project/countermeasure or presence of an evaluation plan
- Availability of match funds

PROJECT APPLICATION	
1. Project Title:	**2. Applicant Contact :**
3. Applicant Agency:	**4. Applicant Address:**
5. Applicant Contact Email :	**6. Applicant Phone Number(s):**

7. Estimated Duration of Project

From (Month/Year): **To (Month/Year):**

8. Budget Request (Provide itemization in Schedule B)

Total Cost of Project:

Internal use only: HSIP Non-infrastructure Funds _____ HSIPPEN Funds _____Other Funding _____

9. Acceptance of Conditions

Agencies awarded funding will be subject to Federal, state, and administrative regulations governing grants. If selected, the applicant agrees to submit monthly progress reports to the Louisiana DOTD in the manner prescribed outlining progress on achieving milestones and a final report detailing the outcomes and effectiveness of the project. These awards are for reimbursable grant funding only.

10. Approving Signatures

Authorizing Official

Name: _____ Title: _____

Email : _____ Phone: _____

Signature: Date:

Regional Safety Coalition Chairperson/Statewide Emphasis Area Team Leader

My signature below confirms this project addresses at least one strategy identified in our regional coalition safety plan.

Name: _____ Title: _____

Email : _____ Phone: _____

Signature: Date:

SHSP Emphasis Area

- ☐ **Impaired Driving**
- ☐ **Occupant Protection**
- ☐ **Other (specify):** _____
- ☐ **Crashes Involving Young Driver**
- ☐ **Infrastructure and Operations**

List the SHSP strategy and/or action step that relates to the project.

Problem Identification *(Provide data to define the problem the project is designed to address)*

Project Description *(Provide a brief description of the project including how it will support the attainment of SHSP goals)*

Countermeasure Effectiveness *(Provide information on what the research indicates about the effectiveness of the proposed project's approach. Provide an evaluation design/plan for project approaches not supported by research)*

Tasks *(Provide a description of each task and sub task to be conducted as part of this project)*

Milestones *(Provide a list of milestones for each task)*

Performance Measures *(Describe the process and outcome measures that will determine the effectiveness of the project.)*

PROJECT BUDGET **Provide a detailed budget including a narrative for the following line items. Budget line item details should include number of personnel, their hourly rate and number of hours for each; number of travelers, individual costs per traveler per trip, destinations, purpose of trip, etc.**	
1. Personnel Services	
2. Contractual Services	
3. Operating/Supplies	
4. Other Direct Costs	
5. Equipment	
Total	**$**

Submit the completed application online at www.destinationzerodeaths.com
by clicking the contact button.

LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

Office of the Secretary
PO Box 94245 | Baton Rouge, LA 70804-9245
ph: 225-379-1232 | fx: 225-379-1863

Bobby Jindal, Governor
Sherri H. LeBas, P.E., Secretary

City of Kenner
1610 Reverend Richard Wilson Drive
Kenner, LA 70062

RE: Funding Commitment Letter
H.0xxxxx
Road Striping Project in Kenner
Jefferson Parish

The Commitment letter is to be approved by the Entity's budget authority. The initial amounts are set by the applications. If funding amounts change, the revised document will be sent to the Entity's Person in Responsible Charge for processing.

Phase	Local Match Percentage	Federal Percentage	Total
Conceptual Plans and Environmental Decision	0%	0%	0%
Preconstruction Engineering	0%	0%	0%
Right-of-Way Acquisition and Relocation	0%	0%	0%
Utility Relocation	0%	0%	0%
Non-infrastructure	0%	0%	0%
Miscellaneous	0%	0%	0%
Construction Engineering & Inspection	0%	0%	0%
Construction	0%	100%	100% - $75,000
Total			

Program Manager – DOTD ate

Responsible Person In-Charge Approval ate

Cc: Consultant Contract Services

May 8, 2015

Ms. Denise Donohue, Director
County Road Association of Michigan
417 Seymour, Suite 1
Lansing, Michigan 48933

Mr. John LaMacchia II, Legislative Associate
Michigan Municipal League
208 North Capitol Avenue, 1st Floor
Lansing, Michigan 48933-1354

Dear Ms. Donohue and Mr. LaMacchia:

Fiscal Year 2017 Federal Local Safety Program

The Michigan Department of Transportation (MDOT) is pleased to announce the solicitation of new applications for the fiscal year (FY) 2017 Local Safety Program. Federal funds for the Local Safety Program are to be used for highway safety improvements on the local roadway system. All locally controlled roadways, regardless of National Functional Classification, are eligible for the Local Safety Program. The FY 2017 federal budget for this program is estimated at $15,000,000. This amount may be subject to revisions based on approval of the future federal highway bill. We are asking the County Road Association of Michigan and the Michigan Municipal League to distribute this notice to their member agencies.

Local Agencies may submit more than one project application for consideration. Federal safety funds shall not exceed $600,000 per project or a maximum amount of $2,000,000 per Local Agency for the fiscal year. FY 2017 projects are to be developed and obligated between October 1, 2016 and August 25, 2017.

FY 2017, Selected Safety Projects General Information:

Funded at 80 percent federal funds/20 percent local funds, unless the project scope fixes the roadway deficiency related to a fatality (K) and/or an incapacitating (A) injury within the limits of proposed work or is an approved systemic project (that supports the State Strategic Highway Safety Plan), then funded at 90 percent federal funds/10 percent local funds.

- Portion eligible for federal aid:
  - Project's Construction Phase ('A' Phase.)
  - Preliminary Engineering, **ONLY** if criteria of Preliminary Engineering Section outlined below is met.

- Portion not eligible for federal aid:
  - Right-of-way costs.
  - Preliminary engineering, unless criteria of Preliminary Engineering Section outlined below is met.
  - Construction engineering.
  - Decorative items, not safety related in nature.

- 'Lump Summed' at the lesser of the original estimate plus $20,000, or the original estimate plus 20 percent. Projects may, at MDOT's discretion, be funded by a "Pro-Rata" method.

- Let by MDOT or performed by Local Force Account, as approved by MDOT's Local Agency Program (LAP) office: information found at www.michigan.gov/mdot ~ Doing Business ~ Local Agency Program ~ Force Account and Local Agency Reimbursement System (LARS) Information.

- All social, economic and environmental impacts within the project limits impacts must be mitigated before federal funds can be appropriated and obligated. Project applications which are expected to have significant public controversy and/or require an environmental assessment will not be considered until these outstanding issues have been resolved.

- Local Agencies within Metropolitan Planning Organization (MPO) areas must coordinate with their MPO to ensure inclusion of their project in the area's Transportation Improvement Program for the fiscal year for which the project was selected. LAP will supply a list of selected projects to the MDOT Planning group, but it is the local agency's responsibility to ensure these projects are included in the State Transportation Improvement Program.

FY 2017, Selected Safety Project Design Requirements:

- Meet current standards and warrants, current Americans with Disabilities Act and Buy America requirements.

- Designed in accordance with 3R, 4R, American Association of State Highway and Transportation Officials (AASHTO) Geometric Design of Highways and Streets, or the AASHTO Guidelines for Geometric Design of Very Low-Volume Local Roads Standards. Use of the Capital Preventative Maintenance guidelines and fixes will not be permitted.

- Traffic signal upgrade projects shall include the installation of signal back plates with reflectorized strips.

- High friction surface projects shall use or follow the intent/material requirements of the most current MDOT Special Provision.

- Corridor (or local agency-wide) permanent signing or pavement marking projects must be of a higher standard than the minimums required by the Michigan Manual of Uniform Traffic Control Devices and/or standards. These type projects shall include additional signing improvements beyond upgrading sign reflectivity requirements; i.e., adding reflective sheeting to sign posts, larger signs, etc., and permanent pavement markings shall include improvements such as being recessed or high quality 'durable' markings.

Refer to Attachment A for information regarding submitting candidate Safety Project Applications.

Applications are to be electronically submitted or postmarked by Friday August 14, 2015.

FY 2017, Safety Program Financial Goals*:

Project Type	Total Program
Road Safety Audits (RSA)	$50,000
Non-motorized facility/Pedestrian improvements	$100,000
High Friction Surface	$100,000
Centerline and Shoulder Rumble Strip	$200,000
Guardrail Upgrades and Clear Zone Improvements	$1,500,000
Projects with scopes that directly correct areas with a concentration of Types "A" and "K" crashes	$9,500,000
Safety Funds per MDOT Region	$350,000

*The Safety Program Financial Goals allow for the submittal of systemic projects. Systemic safety projects involve the use of countermeasures that are widely implemented (corridor or area wide) based on similar roadway or intersection features that correlate with particular K/A crash types.

Preliminary Engineering

Preliminary engineering for selected safety projects may be programmed for one or more of the following:

- Design (up to 10 percent of the estimated eligible construction costs)
  - Transparency (5 percent) location - funded at 80 percent federal funds/20 percent local funds, unless project scope fixes roadway deficiency related to a fatality (K) within the limits of proposed work, then funded at 90 percent federal funds/10 percent local funds).
    - Identified in the 2009 through 2013 Transparency (5%) Reports.
    - Proposed scope of work must address the noted location deficiencies.
    - Projects that are on the Transparency (5%) Report must be clearly identified.

- MDOT Local Safety Initiative (LSI) identified location (funded at 50 percent federal funds/50 percent local funds)
  - Proposed scope of work must address the noted location deficiencies reviewed and identified by the LSI Program.
  - Copy of MDOT LSI written suggestion list must be included with application.

- Traffic Signal Optimization
  - Funded at 80 percent federal funds/20 percent local funds.
  - Must complete and implement traffic signal optimization study to analyze and adjust timing of signal controllers.
  - Signals should be studied to allow for a minimum of one second all red phase, and the yellow change interval phase evaluated to meet current guidelines.
  - Maximum of $5,000 total cost will be allowed per signal location for the analysis and adjustment of signal controllers.
  - Signal component upgrades are not permitted under this category.
  - It is anticipated that this work would be done via force account work by the local agency. Physical adjustments of timing will be programmed under an ‘A’ Phase.

- Road Safety Audits (RSAs)
  - A RSA proposal may be submitted without an associated construction phase. It is anticipated that the construction phase would be submitted in the next call for projects
  - A maximum of $10,000 in total project costs will be set up for an RSA, with the federal portion being at the same rate as the construction phase of the project, or 80% federal funds/20% local funds, if proposed as an independent RSA (not associated with a construction phase).
  - Must be conducted at a time no later than 30 percent design completion.
  - RSA Final Report/Findings must be submitted to the Safety Program Administrator for reimbursement.
  - It is anticipated that this work will be completed by a consultant or another agency other than the road owner.

Our goal is to maintain a fiscally constrained program while maximizing the use of available federal funds. If you have any questions, please feel free to contact Lynnette Firman at (517) 335-2224 or at firmanl@michigan.gov.

Sincerely,

Larry Doyle, P.E.
Local Agency Programs Engineer

Enclosure

May 8, 2015

Attachment A - Submitting Candidate Safety Project Applications

Applications submitted electronically must be received no later than **Friday, August 14, 2015.**

- The Local Safety Program Call for Applications Funding Year 2017 Electronic Submittal Form located at www.michigan.gov/mdot ~ Doing Business ~ Local Agency Program ~ Safety Program ~ FY 2017 Call for Safety Electronic Submittal.
- Electronic submittals are limited to 15MB.

Applications sent hardcopy must be postmarked no later than **Friday, August 14, 2015**.

- Projects postmarked after Friday, August 14, 2015, at MDOT's discretion, may or may not be reviewed for selection.
- It is recommended that your application be submitted by certified mail or other traceable delivery service.

Applications are reviewed by a committee and selected based on criteria which include:

1. Cover Letter
   - Provide a brief overview discussion as to the proposed project, crash pattern that has been experienced and how the proposed scope of work will remedy the past crash history.

2. MDOT Form 1627
   - Located at www.michigan.gov/mdot ~ Doing Business ~ Forms. At drop-down menu, select Local Government ~ 1627 - Safety Project Submittal Form.

3. MDOT Time of Return (TOR) Analysis*
   - Only the MDOT TOR spreadsheet will be accepted*. A copy of the data input page and results page must be included in the application submittal.
   - Guardrail oriented projects and independent RSA submittals do not require a TOR analysis.
   - Crash Reduction factors are listed in the TOR Spreadsheet located at: www.michigan.gov/mdot ~ Doing Business ~ Local Agency Program ~ Safety Program ~ Time of Return (TOR) Calculation Spreadsheet.

4. UD-10s
   - Include for all crashes that are used to compile the TOR or Highway Safety Manual analysis/computation. Note: The HSM requires all crashes to be input, including animal crashes. Animal crashes are NOT to be submitted with the application.
   - Use most current 3 to 5 year period of available data (2010-2012 through current availability).
   - Include only those UD-10 crash reports that relate to the proposed scope of work.

5. Detailed cost estimate or Michigan Engineers Resource Library estimate.
6. Map showing project location(s).

Applications, to provide additional support, may also include:

- Crash analysis to determine the proposed project's scope.
- Crash concentration maps in the proposed project's limits.
- MDOT LSI written suggestion list (required if requesting participation for Preliminary Engineering)
- Photos of existing project site conditions.
- Preliminary proposed plan view, cross-sections, and/or profiles.
- Ability to deliver a construction package for obligation within this fiscal year.
- Project coordination with other construction projects.
- Highway Safety Manual Analysis*

*Highway Safety Manual Analysis

A Highway Safety Analysis may replace or supplement the TOR Analysis. Guardrail oriented projects or independently submitted RSA locations do not require a Highway Safety Manual (HSM) analysis. For locations where little to no crash history exists, proposed systemic safety improvement or where additional support of the TOR is desired, Local Agencies are encouraged to utilize the HSM.

FY 2017, HSM Analysis Requirements:

- Use the MDOT HSM spreadsheet located at www.michigan.gov/mdot ~ Doing Business ~ Local Agency Program ~ Safety Program ~ Highway Safety Manual (HSM) Analysis Spreadsheet.
- An electronic copy of the analysis or screenshots of the input and output tabs must be included with the application submittal.
- Calibration factors for use as part of HSM analysis have been compiled by MDOT and are included in the spreadsheet. Local Agencies performing hand calculations will need to refer to the www.michigan.gov/highwaysafety website (see below) for calibration factors and distribution values.
- For any questions an agency might have regarding the HSM Calibration factors, please contact Dean Kanitz, MDOT Traffic and Safety Unit, at 517-335-2855.

Additional information for application development:

- Visit www.michigan.gov/highwaysafety or link to it from the MDOT Local Agency Safety Program Website
  - Traffic Crash Data (Maps) per Region (Traffic Crash Data)
  - HSM Calibration Factors/Distribution Values (Safety Links, Traffic Standards and Typicals, Safety Programs, Highway Safety Manual)
  - Safety Guides (Safety Links, Traffic Standards and Typicals, Safety Programs, Safety Guides)

Please send all eligible projects and supporting information by **Friday, August 14, 2015**, to the following:

Ms. Lynnette Firman, P.E.
Safety Engineer, Local Agency Programs
Development Services Division
425 W. Ottawa Street, P.O. Box 30050
Lansing, Michigan 48909-7550

Project Application Examples

- Systemic Safety Improvements such as corridor/area wide shoulder and center line rumble strips, improved permanent signing (such as chevrons on curves or intersection signing), pavement markings (such as the addition of edge line markings), clear vision corners or reflectorized backplates
- High Friction Surface applications at spot locations
- Elimination, replacement or installation of guardrail/Removal of fixed objects
- Traffic and pedestrian signal optimization, installation, and upgrades
- Access management
- Intersection safety improvements (Lighting, Stopping Sight Distance, Clear Vision Corners)
- Horizontal and vertical curve modifications
- Sight distance and drainage improvements
- Bridge railing replacement or retrofit
- Mid-block pedestrian crossings; improvements to school zones

This list is not all inclusive and other types of safety improvement projects can be submitted for consideration.

Michigan Department of Transportation
1627 (10/08)

LOCAL AGENCY PROGRAMS SAFETY PROJECT SUBMITTAL FORM

FUNDING TEMPLATE: FISCAL YEAR:

LOCAL AGENCY		LOCAL AGENCY CONTACT	
PHONE NO.	FAX NO.	EMAIL ADDRESS	
ALTERNATIVE CONTACT		PHONE NO.	FAX NO.
EMAIL ADDRESS		HOUSE DISTRICT	SENATE DISTRICT

PROPOSED PROJECT LOCATION, LIMITS AND PROJECT DESCRIPTION

PROPOSED COST	TIME OF RETURN (YEARS)	IMPROVEMENT CATEGORY (CHECK THE CATEGORY THAT APPLIES)
BENEFIT TO COST RATIO	TOWNSHIP/CITY	☐ Intersection Improvements ☐ Roadway and Structure Improvements ☐ Roadside Improvements ☐ Pedestrian and Bicycle Improvements ☐ Other _____
PLEASE LIST THE CRASH REDUCTION FACTORS USED:		
DOES A PROJECT IMPACT A SCHOOL OR OTHER SENSITIVE ORGANIZATION? PLEASE DESCRIBE:		

ROADWAY DATA		**CROSS ROAD DATA (If an intersection improvement)**	
PRIMARY ROUTE NAME		ROUTE NAME	
ADT		ADT	
PERCENT COMMERCIAL	*NO. OF CRASHES	PERCENT COMMERCIAL	*NO. OF CRASHES
* NO. OF FATAL CRASHES	*NO. OF "A" TYPE CRASHES	*NO. OF FATAL CRASHES	*NO. OF "A" TYPE CRASHES
*PERIOD OF CRASH DATA	FUNCTIONAL CLASSIFICATION	*PERIOD OF CRASH DATA	FUNCTIONAL CLASSIFICATION

*Please attach Crash Summary and UD-10's to your project submittal with the most recent 5 years of available data.

EXPLANATION OF HOW THE PROPOSED IMPROVEMENT WILL IMPROVE SAFETY AND REDUCE CRASHES

HAS YOUR LOCAL AGENCY RECEIVED APPROVAL OF A SAFETY PROJECT OR HRRR PROJECT THROUGH MDOT'S LAP UNIT IN THE PAST 5 YEARS?

☐ YES ☐ NO ☐ SAFETY PROJECT ☐ HRRR PROJECT

IF YES, HAVE ALL PROJECTS BEEN COMPLETED?

☐ YES ☐ NO

IF NO, PLEASE EXPLAIN WHY

OTHER PROJECT CONSIDERATIONS

Local Road Safety Peer Exchange

October 14th - October 15th

Aeronautics Auditorium - 2700 Port Lansing Road, Lansing, MI 48906

DAY 1

8:30 – Registration

9:00 – Introduction

Greg Johnson – Chief Operations Officer, Michigan DOT

9:15 – Why are We Here

Tim Colling – Director, Michigan LTAP

9:30 – Introduction of Attendees

9:45 - Focus Topic 1 - Implementation Factors on Systemic Fixes

Fixed Object Removal

Ryan Doyle - Lapeer County Road Commission

Road Diets

Andy Kilpatrick – Transportation Engineer, City of Lansing

Flashing Beacons

Bonnie Wood, Traffic Engineering Manager, Genesee County Road Commission

10:45 - BREAK

11:00 – Facilitated Discussion of Implementation Factors on Systemic Fixes

11:45 - Focus Topic 2 – Successful Case Studies

Roundabouts and Hawk Signals – Engineering and Analysis

Danielle Deneau, Director of Traffic Safety, Road Commission for Oakland County

Various Safety Fixes

Larry Hummel, Engineering Manager, Van Buren County Commission

12:30 – LUNCH

1:15 – Facilitated Discussion of Successful Case Studies

2:00 - Focus Topic 3 – Funding of Safety Programs

MDOT– Local Agency Programs Call for Projects / Local Road Safety Plans

Lynnette Firman, MDOT Local Agency Programs Safety Engineer

Kim Lariviere, MDOT Strategic Highway Safety Engineer

Funding of Local Agency Safety Programs

Larry Hummel, Engineering Manager, Van Buren County Commission

2:45 - BREAK

3:00 – Facilitated Discussion of Funding of Safety Programs

4:30 – Adjourn for the Day

DAY 2

8:30 – Introduction of Day 2 – Recap of Day 1

8:45 - Focus Topic 4 – Local Agency Rarely Used Fixes

Off Set Right Turn Lane

Karl Hanson, County Highway Engineer, Wexford County Road Commission

Facilitated Discussion of Local Rarely Used Fixes

10:00 - Focus Topic 5 – Changing the Safety Culture in Michigan

Successful Implementation of Controversial Rural Roundabout

Karl Hanson, County Highway Engineer, Wexford County Road Commission

Creating a Safety Culture for Oakland County

Gary Piotrowicz, Deputy Managing Director, Road Commission for Oakland County

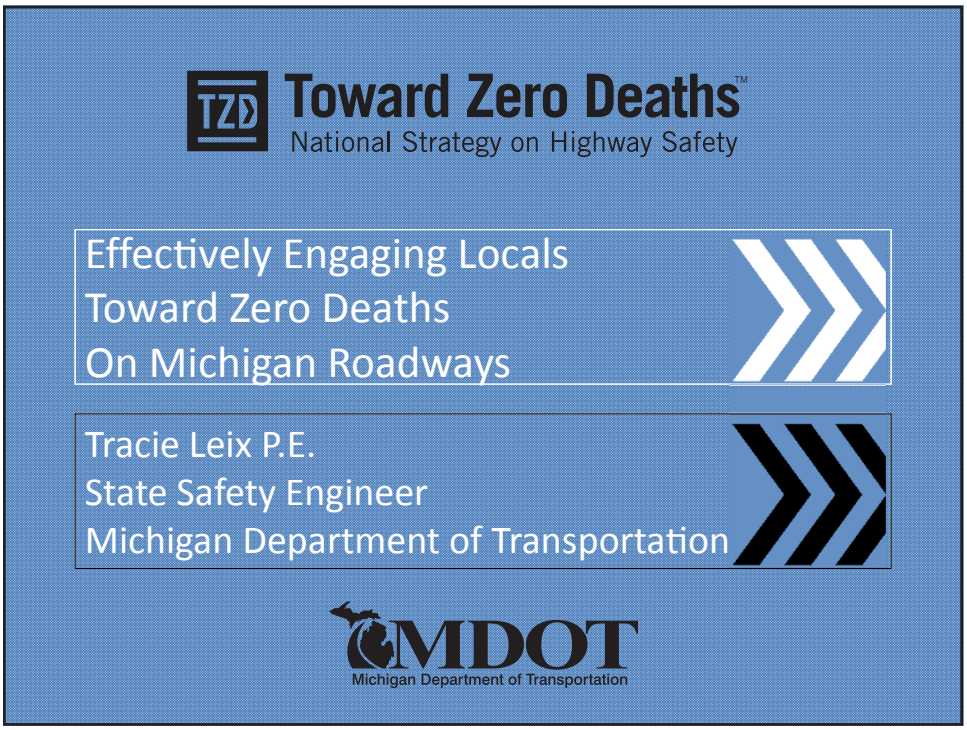
10:45 – BREAK

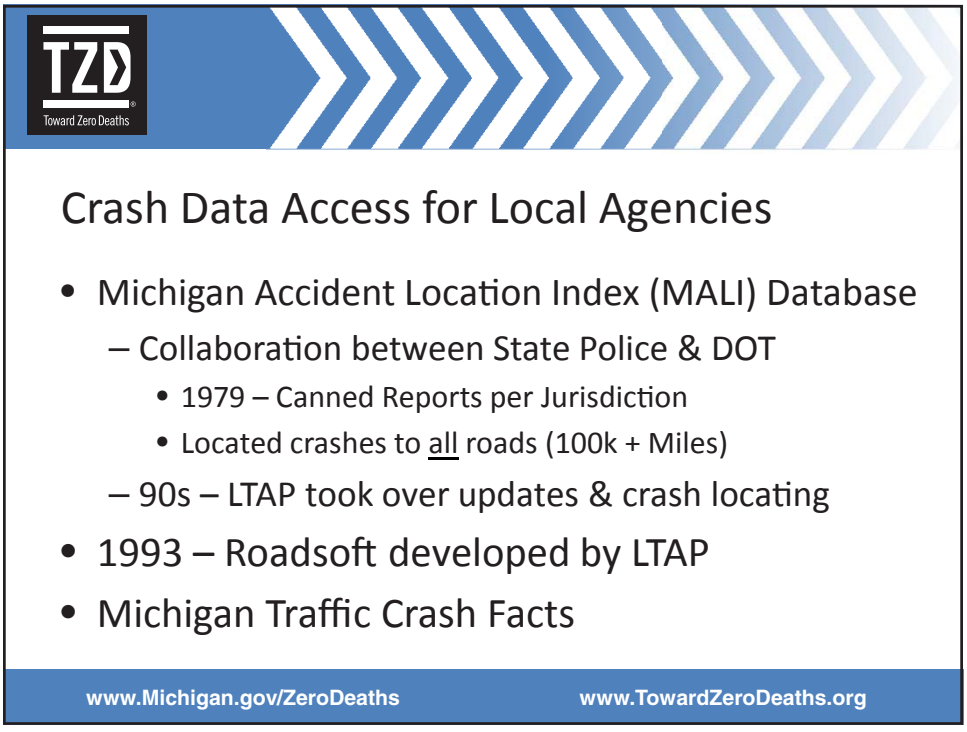
11:00 - Different County Prospective

Wayne Schoonover, Manager and Director, Mason County Road Commission

Facilitated Discussion of Changing the Safety Culture in Michigan

12:30 – Peer Exchange Wrap Up and Dismissal





Michigan Geographic Framework

- 1996 – State Level GIS Users Group
  - Vision: Linear Referencing System (LRS) for Michigan
  - Includes roads, rivers, RR, political boundaries, etc.
- Utilized MALI to create LRS/Framework
  - Common referencing system across all agencies
- Framework incorporated into Roadsoft

www.Michigan.gov/ZeroDeaths www.TowardZeroDeaths.org

Safety Engineering Support for Local Agencies

- FHWA TOPICS Program – 1968-1975
  - Traffic Ops Program to Increase Capacity & Safety
- High Crash Lists and Fixes
- Benefit to MDOT and Local Agency
  - Governor Hwy Safety Rep supported program – 80s
  - Emphasis on assisting cities

www.Michigan.gov/ZeroDeaths www.TowardZeroDeaths.org

MDOT Local Safety Initiative (LSI) – 2004

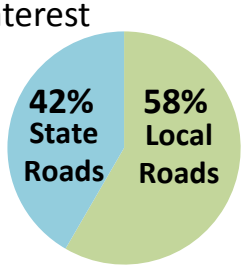
- Available to Road Owners:
  County, City, Village, Tribe
- Three-Pronged Approach to Assisting Local Agencies
- Free & Voluntary
- Funding

www.michigan.gov/highwaysafety

www.Michigan.gov/ZeroDeaths www.TowardZeroDeaths.org

LSI Traffic Safety Engineering Services

- Utilize Roadsoft
  – Trend Analysis
  – Site Specific Analysis – Locations of Interest
- Local Agency Reviews List
- Field Review & Suggestions
- Funding Sources



www.Michigan.gov/ZeroDeaths www.TowardZeroDeaths.org

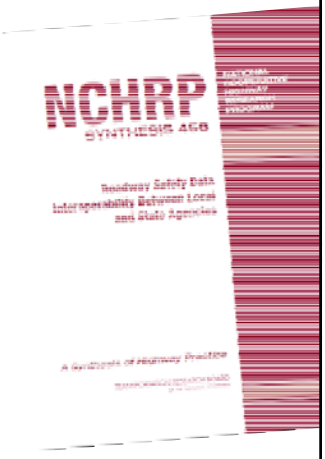
LSI Tool Development

- Roadsoft
- Time of Return Spreadsheet
  - Local data only
  - Commonly used Crash Reduction Factors
- Highway Safety Manual Spreadsheet
  - Michigan version
  - Michigan distributions and calibration factors

www.Michigan.gov/ZeroDeaths www.TowardZeroDeaths.org

Roadsoft Upgrades

- Collision Diagrams
- Enhanced Mapping
- Interactive Ranking Reports
- Aerial Imagery



www.Michigan.gov/ZeroDeaths www.TowardZeroDeaths.org

LSI & LTAP Safety Training

- "Behind the Wheel"
- With LTAP
  - Traffic Safety for Elected/Appointed Officials
  - Highway Safety Manual
- LTAP Roadsoft Safety Module Training
- Conferences

www.Michigan.gov/ZeroDeaths www.TowardZeroDeaths.org

Safety Summits

- Annual Michigan Traffic Safety Summit – 1995
  - Hosted by Office of Highway Safety Planning
  - 4E Audience
  - 400+ Attendees
  - LSI scholarships to attend
- MI Local Agency Safety Peer Exchange – 2014

www.Michigan.gov/ZeroDeaths www.TowardZeroDeaths.org

MI Local Agency Safety Peer Exchange

- Hosts: MDOT and LTAP
- Planning: MDOT, LTAP, and FHWA
- 49 Attendees
  - MDOT & LTAP
  - FHWA
  - County
  - City
  - Tribe
  - MPO
  - Consultant

www.Michigan.gov/ZeroDeaths www.TowardZeroDeaths.org

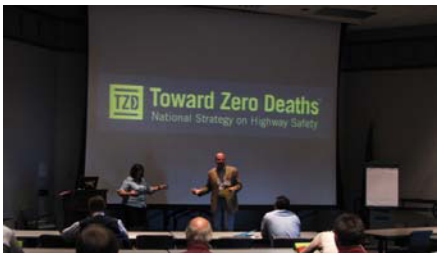
Peer Exchange Focus Topics

- Implementation Factors on Systemic Fixes
- Successful Case Studies
- Funding of Safety Programs
- Rarely Used Fixes
- Changing the Safety Culture in Michigan

www.Michigan.gov/ZeroDeaths www.TowardZeroDeaths.org

Peer Exchange Results

- Draft Report
- Presentation at MI Annual Safety Summit (4E)
- Positive Evaluations
  - Usefulness (4.6)
  - Repeat attendance (4.6)
- Biennial Event



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Results of the Local Safety Initiative*

- 85% Thought LSI was good use of time
- 40% Changed Project Types
- 35% Increased # Applications
- ~40% Changed Maintenance Practices
- Assisted 112 Local Agencies

*Based on a 2011 MDOT Survey of Participants

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Benefits of the Local Safety Initiative

- Brings Safety to Forefront
- Trust between MDOT and Locals
- Improved Safety Project Applications
- Save Local Agency Staff Time
- Validation of Local Agency Efforts
- "Another set of eyes"

www.Michigan.gov/ZeroDeaths www.TowardZeroDeaths.org

Funding Local Agency Safety Projects

	Pre-LSI	Post-LSI
Lead Time	1 Year	2 Years
Federal Match	$200,000	$600,000
Funding	Construction Only	Engineering* and Construction

- *LSI & 5% Locations

www.Michigan.gov/ZeroDeaths www.TowardZeroDeaths.org

Financial Goals for Local Safety Projects

FY 2016, Safety Program Financial Goals:

Project Type	Total Program
Road Safety Audits (RSA)	$50,000
Non-motorized facility/Pedestrian improvements	$100,000
High Friction Surface	$100,000
Centerline and Shoulder Rumble Strip	$200,000
Guardrail Upgrades and Clear Zone Improvements	$1,500,000
Projects with scopes that directly correct areas with a concentration of Types "A" and "K" crashes	$9,500,000
Safety Funds per MDOT Region	$350,000

Total Program (FY16): $15M

www.Michigan.gov/ZeroDeaths www.TowardZeroDeaths.org

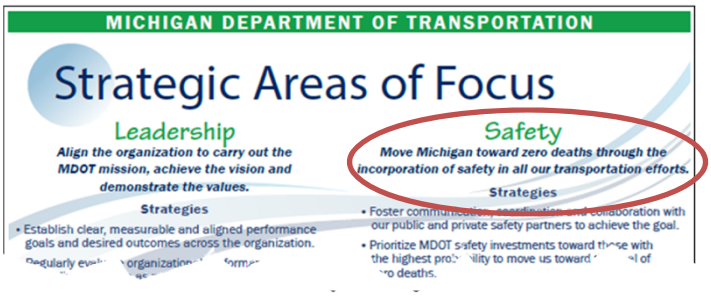
Incorporation of Toward Zero Deaths

www.Michigan.gov/ZeroDeaths www.TowardZeroDeaths.org

TZD Toward Zero Deaths

MDOT's 2010 Strategic Plan adopted the focus:

"Move Michigan Toward Zero Deaths…"



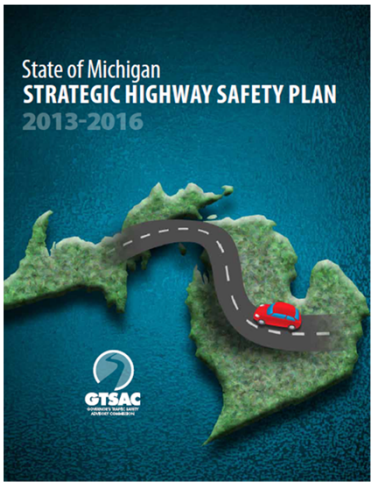
www.Michigan.gov/ZeroDeaths www.TowardZeroDeaths.org

TZD Toward Zero Deaths

TZD in Michigan

Michigan's 3rd SHSP adopted the VISION:

"Toward Zero Deaths on Michigan Roadways"



www.Michigan.gov/ZeroDeaths www.TowardZeroDeaths.org

Engaging Local Agencies in 3rd SHSP Update

- Stakeholder Survey
  - Annual Safety Summit
  - Listserves
- Five Focus Groups
- Action Teams via Web Conferencing

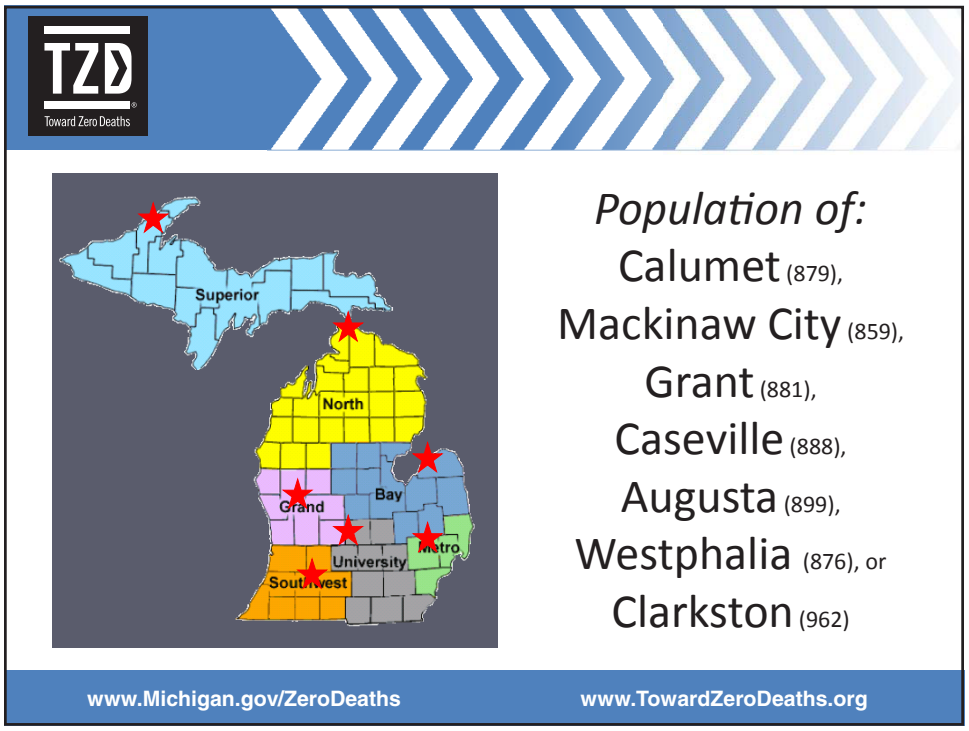
www.Michigan.gov/ZeroDeaths www.TowardZeroDeaths.org

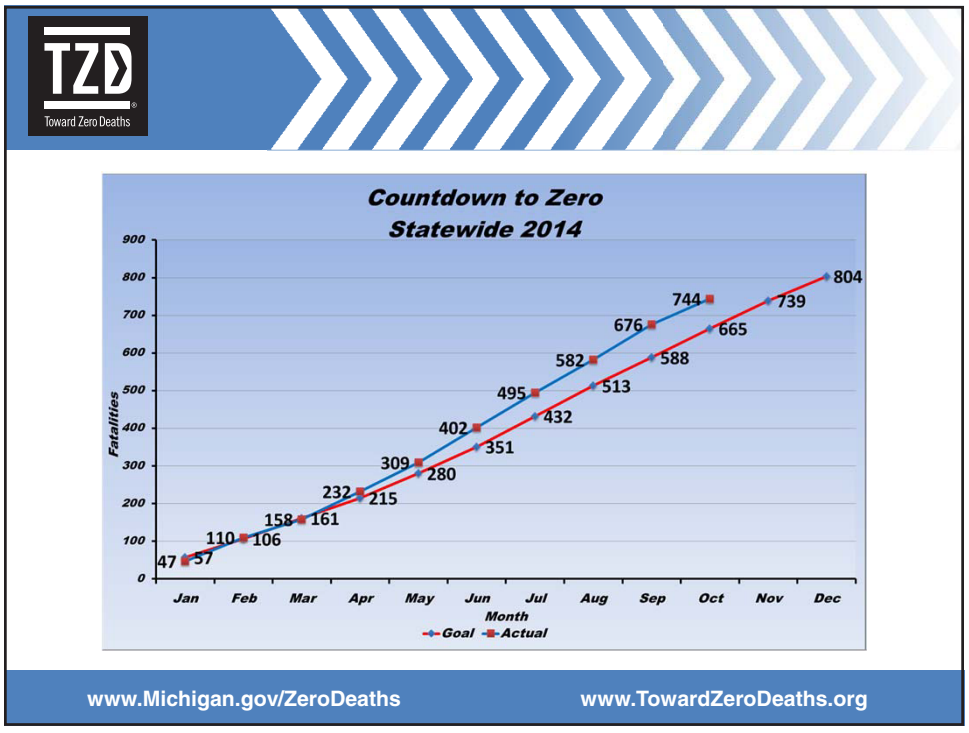
Michigan's SHSP Goals:

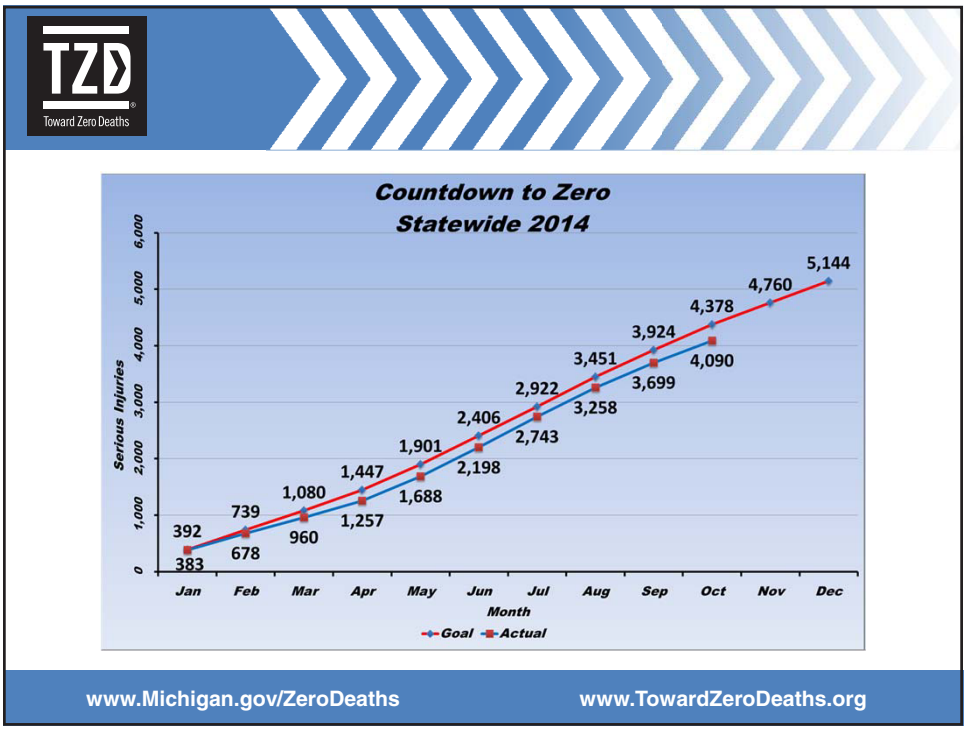
	2011 (actual)	2016 (goal)
Fatalities	889	750
A Injuries	5,706	4,800

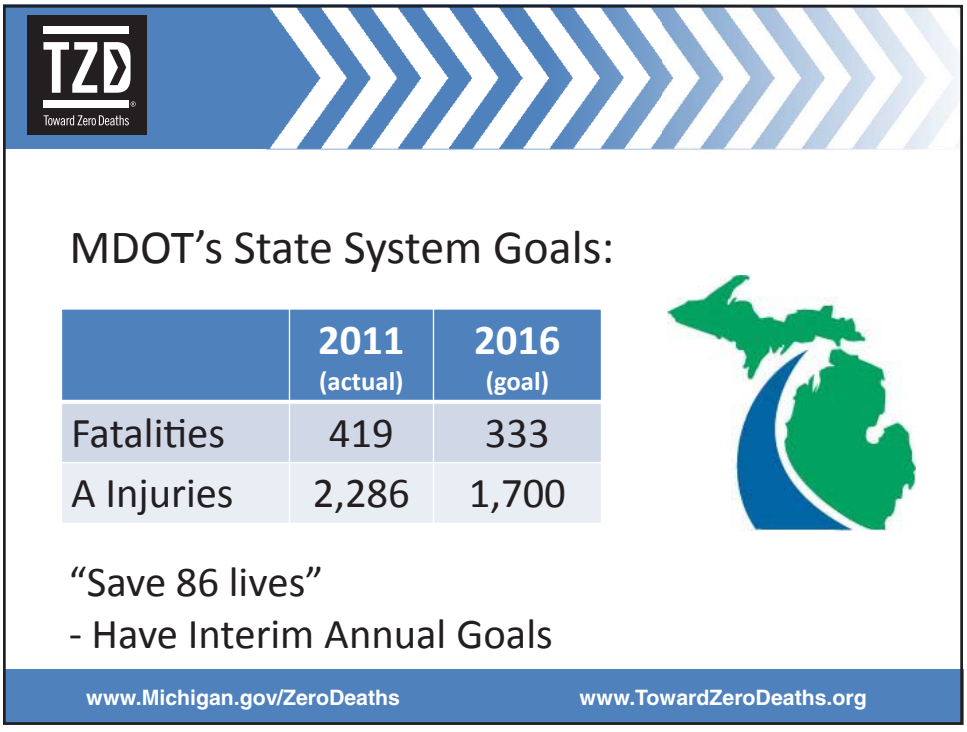
"Save 139 lives"

www.Michigan.gov/ZeroDeaths www.TowardZeroDeaths.org







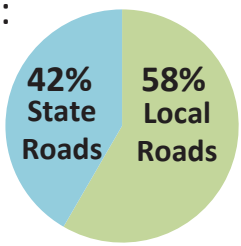


Where is Michigan headed?

www.Michigan.gov/ZeroDeaths www.TowardZeroDeaths.org

Predictions for MI's Future*

- Increase in several crash categories:
  - K/A for ages 21-24
  - K/A drug related crashes
  - Motorcycle Ks
  - Pedestrian Ks
- Decrease in seat belt use to 88%



*Source: UMTRI

www.Michigan.gov/ZeroDeaths www.TowardZeroDeaths.org

MDOT TZD Strategic Plan

- State Agency Strategies
- Local Agency Strategies
- Motoring Public

- Attack Complacency
  - Outreach
  - Branding

www.Michigan.gov/ZeroDeaths

www.Michigan.gov/ZeroDeaths www.TowardZeroDeaths.org

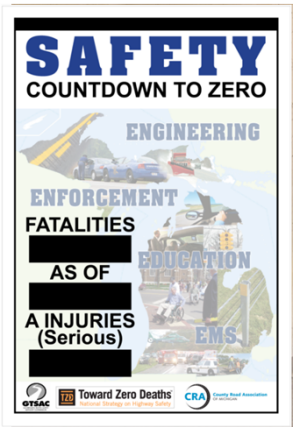
Web Communications

- MDOT Homepage
- Updated Weekly
- Links to MDOT's TZD page
- Locals Can link

www.Michigan.gov/ZeroDeaths www.TowardZeroDeaths.org

Internal Communication & Outreach

- Focused on Grabbing Attention
- Weekly Increase in K/A numbers
  - Associated story
- Available to Local Agencies
  - Support National Strategy
  - Goal: All counties



www.Michigan.gov/ZeroDeaths www.TowardZeroDeaths.org

Additional Outreach

- "What is TZD" Flyer

- Newsletters
  - MDOT
  - MSP-OHSP
  - MI County Road Association

www.Michigan.gov/ZeroDeaths www.TowardZeroDeaths.org

Next Steps - Branding

www.Michigan.gov/ZeroDeaths www.TowardZeroDeaths.org

Lapeer County - Millville turns into Bronson Lake

Chevron and shoulder improvements

Before

After

Made: **DRAFT**

Minnesota Department of Transportation
State Aid for Local Transportation

Pilot Program Summary: Township Sign Replacement and Inventory Program

This document provides a summary of the Township Sign Replacement and Inventory pilot program. Exhibit 1 – Detailed Summary, offers a summary by county, cost estimate range for the full completion of the program and statewide township summary.

Included in the 2005 Federal Transportation Bill was $3.0 million to begin the replacement of township signs in Minnesota; with the federal money providing 80% of the funding. In 2007, the Minnesota Legislature provided $2.5 million in funding to assist the Townships with the local match and continue the program.

This program was divided into two phases; Phase I - Engineering and Phase II – Construction. Phase I began in May 2007, this phase focused on the evaluation of the existing signs, developed a sign inventory, a set of sign plans and special provisions for each county broken out by township. Phase II has begun to move forward, it is anticipated that at all signs will be installed by the end of the 2009 construction season.

The funding splits are 80% federal, 10% state, 10% township for Phase I and 80% federal, 15% state, and 5% township for Phase II.

The awarded bid prices for the six pilot counties have been, on average, 23% below the Engineer's Estimate. We believe this reflects the state of the economy and the need for contractors to obtain work, but do not anticipate it will continue. The decrease in bid prices means one or two additional counties may be able to participate with the remaining federal funds. The state funds will be exhausted by the pilot counties, resetting the township's required cost participation to 20%, unless additional state monies are secured.

Lessons learned from the pilot project and available funds will determine how the Minnesota Association of Townships proceeds with the program.

Townships are strongly encouraged to remove non-essential signs whenever possible. Guidance on essential signage for low volume roads can be found in the Minnesota Manual of Uniform Traffic Control Devices (MN MUTCD). This reduction in signage offers short and long term savings by reducing the costs for installation, the yearly inventory and maintenance, i.e. a sign that is not installed, does not need to be inventoried or maintained.

Townships within the pilot program are responsible for annually certifying to the counties the signs and inventory provided to them are kept up-to-date and are being maintained; townships are accountable for all costs associated with these activities. Vandalism of signs by paint ball spray, bullet holes, theft, etc. continues to be a major problem.

BY SIMPLE SIGN COST:

The range of the simple cost **per sign** is **$188 - $239**. The cost to complete the pilot program based on this range is **$60 million - $76 million**.

Engineer and Construction Cost:

Lower Range:
$583,811 Phase I (Engineering)
+ $2,787,142 Phase II (Construction)
$3,370,953

Upper Range:
$583,811 Phase I (Engineering)
+ $3,692,900 Phase II (Construction)
$4,276,711

Cost per Sign:

Lower Range:
$3,370,953 [Actual Cost]
÷ 17,920 [Total Signs]
$188/Sign

Upper Range:
$4,276,711 [Estimated Cost]
÷ 17,920 [Total signs]
$239/Sign

Estimated Cost to Inventory and Replace Remaining Signs:

Number of Signs:	Lower Range:	Upper Range:
55,014 [Miles]	317,607 [Signs]	317,607 [Signs]
X 5.8 [Signs/Mile]	X $188 [Per Sign]	X $239 [Per Sign]
317,607 Signs	**$60 Million**	**$76 Million**

BY TOWNSHIP:

The **average cost** range **per township** is **$34,400 - $43,700**. The cost to complete the pilot program based on this range is **$58 million - $74 million**.

Cost per Township

Lower Range:
$3,370,953 [Actual Cost]
÷ 98 [Towns]
$34,397/Town

Upper Range:
$4,276,711 [Estimated Cost]
÷ 98 [Towns]
$43,640/Town

Estimated Cost to Inventory and Replace Signs in Remaining Townships:

Number of Townships:	Lower Range:	Upper Range:
1,785[Total Towns]	$34,397 [Cost/Town]	$43,640 [Cost/Town]
- 98 [Completed Towns]	X 1,687 [Towns]	X 1,687 [Towns]
1,687 Towns	**$58 million**	**$74 million**

Notes:

Not all signs and posts are being replaced in phase II; therefore, the simple cost per sign may be lower than the actual cost per sign.

These estimates assume a similar sign density (signs/mile) and similar costs of the completion of the Engineering (Phase I) (based on actual cost) and Construction (Phase II) (Lower Range: Based on the Engineer's Estimate (historical construction costs) for one (1) county and bid abstract cost of the remaining five (5) counties. Higher Range: Based on the Engineer's Estimate (historical construction costs)).

These figures do NOT take into account cost escalation due to inflation, cost increases due to project unknowns (i.e. risk factors), projected growth, etc.

The actual cost for each township may differ from these amounts.

Exhibit 1 - Detailed Summary

Township Sign Inventory and Replacement Pilot Program
Detailed Breakout By County

3/30/2009
MEV

County	Township Miles	RFP Estimated Signs and Markers	RFP Estimated Signs and Markers per Mile	Estimate Based on 4.7 Signs and Markers Per Mile	Actual Signs and Markers per Mile	Actual Sign and Marker Count	Signs and Markers Underruns and Overruns	Phase I Cost Estimate	Phase I Actual Project Cost	Phase II Cost Estimate (*)	Phase II Actual Project Cost (+!)
Carver	339	1600	4.7	1593	8.6	2929	1336	$40,764	$95,423	$602,797	$602,797*
Houston	450	n/a	n/a	2115	9.0	4058	1943	$54,122	$132,205	$514,452	$415,236
McLeod	469	n/a	n/a	2204	4.0	1872	-332	$56,399	$60,987	$384,865	$259,997
Mille Lacs	422	1995	4.7	1983	7.1	2980	997	$50,744	$97,085	$720,355	$485,917
Todd	1029	n/a	n/a	4836	3.9	4008	-828	$123,750	$130,576	$484,258	$374,577
Watonwan	395	n/a	3.3 - 5.1	1856	5.2	2073	217	$47,494	$67,536	$986,173	$648,618
TOTALS	3104		n/a	14587	5.8	17920	3333	$373,273	$583,811	$3,692,900	$2,787,142

Estimated Cost vs Actual Cost (+!)
Phase I and Phase II

Phase I - Estimated Cost		$373,273
Phase I - Actual Cost (with amendment)		$583,811
Phase II - Estimated Cost **(*)**		$3,692,900
Phase II - Actual Cost **(+)**		$2,787,142
Lower Range Total Cost		$3,370,953
Upper Range Total Cost		$4,276,711

Statewide Township Summary

Improved with Pilot Program
3,104 Miles of Township Road
98 Townships
17,920 Signs

Total Demand (includes Unorganized Township Roads)
58,118 Miles of Township Road in MN
1,785 Townships
UNKNOWN Signs

Still Requiring Improvement
55,014 Miles of Township Road
1,687 Townships
317,607 Signs

Cost Estimate to Complete Program

	Engineer's Estimate		Bid Abstract Cost (+)	
	Unit Cost (*) (Dollars)	Total (*) (Dollars)	Unit Cost (+!) (Dollars)	Total (+!) (Dollars)
Simple cost per sign	$239	$75,798,645	$188	$59,745,365
Average cost per Township	$43,640	$73,620,530	$34,397	$58,028,549

NOTES:

***: Based on Engineer's Estimate**

+: These estimates assume a similar sign density (signs/mile) and similar costs of the completion of the Engineering (phase I) (based on actual cost) and Construction (phase II) (Lowe Range: Based on the Engineer's Estimate (historical construction costs) for one (1) county and bid abstract cost of the remaining five (5) counties. Higher Range: Based on the Engineer's Estimate (historical construction costs)).

! : On avg 23% below Engineer's Est which reflects the state of the economy and the need for contractors to obtain work, but not anticipated to continue.

These figures do NOT take into account cost escalation due to inflation, cost increases due to project unknowns (i.e. risk factors), project growth, etc.

Table 3: Minnesota's Traffic Safety Tracking Indicators by Focus Area

Tracking Indicators	Traffic Safety Culture and Awareness	Intersections	Lane Departure	Unbelted	Impaired Roadway Users	Inattentive Drivers	Speed	Older Drivers	Younger Drivers	Motorcyclists	Pedestrians	EMS and Trauma Systems	Data Management	Management Systems	Bicyclists	Commercial Vehicles	Trains	Work Zones	Unlicensed Drivers	Vehicle Safety Enhancements
Number and percentage of fatalities		X	X	X	X	X	X	X	X	X	X				X	X	X	X	X	
Number and percentage of serious injuries		X	X	X	X	X	X	X	X	X	X				X	X	X	X	X	
Biennially measure Minnesota's traffic safety culture using the "Minnesota Traffic Safety Survey" [1]	X																			
Number of coordinated paid media buys aimed to improve traffic safety [2]	X																			
Number and percentage of designated trauma centers [3]												X								
Annual motor vehicle case fatality rate [4]												X								
Response times for motor vehicle crashes												X								
Number of partnerships within each TZD region														X						
Develop inventory of roadway features and traffic control devices to support safety analyses and planning														X						
Percent of counties with systematic safety plans for local roadways														X						
Percent of MnDOT districts with systematic safety plans for state roadways														X						
Implement singular crash database by 2016														X						
List of road data projects aimed at data quality improvement													X							
Percent of crash reports submitted electronically													X							
Accessibility of road data, crash data and linked data for professional use													X							
Develop crash data query tool for public use													X							
Track new vehicle safety enhancements and impact on infrastructure and policy																				X
Track type of new vehicle safety enhancements and proportion of fleet with them																				X
Develop roadway asset management systems that will support emerging technologies and connectivity																				X
Number of traffic fatalities and serious injuries per capita for drivers and pedestrians over the age of 65								X			X									
Number of roadway miles designated as high risk rural road		X	X																	

1. Initial survey is being conducted in 2014 to establish a baseline for Minnesota's traffic safety culture
2. Encompasses all organizations that promote traffic safety through public service announcements and paid media across multiple focus areas
3. Trauma hospitals in Minnesota are designated as Level I, II, III or IV with designations based on the availability of resources needed to resuscitate and care for an injured patient
4. Case fatality rate is the proportion of deaths within a designated population of "cases" over the course of the disease

Evaluation of the ALERT System, A Rural Intersection Conflict Warning System

Victor Lund, PE, St. Louis County, MN
Taek Kwon, PhD, University of Minnesota Duluth
Husam Ismail, University of Minnesota Duluth

Problem

For the ten year period of 2002 to 2011 in Minnesota, 43 percent of all intersection crashes occurred at unsignalized intersections. However, for this same period, 65 percent of serious intersection crashes (crashes that resulted in a fatality or incapacitating injury) occurred at unsignalized intersections. Rural, two-way stop-controlled intersections accounted for 76 percent of these serious intersection crashes at unsignalized intersections of which right-angle type crashes accounted for the largest percentage by crash type [1]. Research in Minnesota suggests that approximately 60 percent of right-angle type crashes at rural intersections involved a driver on the minor road that came to a stop and then entered the intersection whereas 26 percent of these crashes involved a driver on the minor road running through the STOP sign [2]. This literature suggests a focus of safety strategies at rural, two-way stop-controlled intersections should be to assist drivers on the minor approach in selecting appropriate gaps. The NCHRP Report 500 Series, Volume 5, identifies an automated real-time system to inform drivers of the suitability of available gaps as a safety strategy for unsignalized intersection crashes [3].

What is the ALERT System?

A rural, two-way stop control intersection conflict warning system.

(**A**dvanced **LE**D Warning System for **R**ural In**T**ersections)

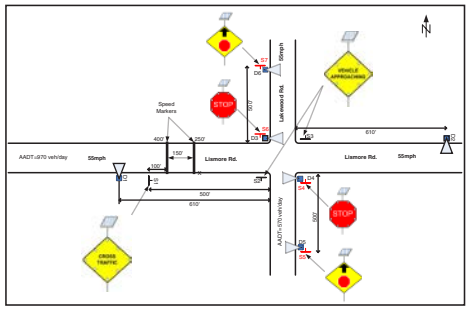
Data Analysis

Metrics

- Major road vehicle speeds
- Minor road vehicles
  - Wait time
  - Percent roll-through (left, thru, right)
- Mail-in survey of local residents

Data Collection Methodology

- Utilized video cameras
- Before installation, 42 days (system installed in August 26, 2012)
- After installation, 259 days (September 14, 2012 to May 31, 2013)
- Data analysis completed in Summer 2013



System Description

The ALERT System consisted of five LED blinker traffic signs and six vehicle detectors. On the minor road, a vehicle is first detected at the stop ahead warning sign. This detection activates the flashing STOP sign for a fixed time period based upon the typical deceleration of a vehicle to a stop condition. Once the vehicle arrived at the STOP sign, another detector activates the flashing CROSS TRAFFIC warning traffic sign located on the major road for the entire time this vehicle was detected at the STOP sign. On the major road, a vehicle approaching the intersection is detected which activates the flashing VEHICLE APPROACHING warning traffic signs for a fixed time period based upon the typical time for that vehicle on the major road to arrive and pass through the intersection.

- *Features: solar powered, wireless communication, dynamic LED signs and non-intrusive detection*
- *Goals: improve intersection safety, utilize "off-the-shelf technology", low installation and maintenance cost, easy to install, operate and maintain by local agency technicians*

Major Road Speed Analysis

The speed analysis was used as a surrogate measure of a driver's recognition of a conflict at the intersection due to a vehicle stopped on the minor road at the STOP sign. A decrease in these vehicle speeds is assumed to correlate to an improvement in conflict recognition whereby the driver attempted to increase the time to react to perform a successful evasive maneuver if necessary.

- Before and after installation of the ALERT System
- After installation of the ALERT System
  - No-conflict (minor road vehicle not present at stop bar → CROSS TRAFFIC sign not flashing)
  - Conflict (minor road vehicle present at stop bar → CROSS TRAFFIC sign flashing)

Major Road Vehicle Speeds Before and After Installation

Before Installation Average Speed (mph)	After Installation Average Speed (mph)	Difference (mph)
51.9	51.0	-0.9

Major Road Vehicle Speeds After Installation

No-Conflict (mph)	Conflict (mph)	Difference (mph)
51.8	47.9	-3.9*

*Statistically significant at 95.5% confidence interval

Minor Road Wait Time Analysis

The wait time analysis was used to determine if there was a change in the time that a driver was stopped on the minor road at the STOP sign when there was a vehicle on the major road approaching the intersection. This analysis was used as a surrogate measure of a driver's recognition of an acceptable gap. A longer wait time during a conflict is assumed to correlate to an improvement in selecting an appropriate gap. An acceptable gap was defined as when a vehicle on the major road is located at a distance greater than the minimum intersection sight distance.

- Before and after installation of the ALERT System
- After installation of the ALERT System
  - No-conflict (major road vehicle not approaching the intersection → VEHICLE APPROACHING sign not flashing)
  - Conflict (major road vehicle approaching the intersection → VEHICLE APPROACHING sign flashing)

Minor Road Wait Time Before and After Installation

Before Installation Average Wait Time (sec)	After Installation Average Wait Time (sec)	Difference (sec)
2.0	3.1	+1.1

Minor Road Wait Time After Installation

No-Conflict Average Wait Time (sec)	Conflict Average Wait Time (sec)	Difference (sec)
2.5	3.9	+1.9*

*Statistically significant at 99.5% confidence interval

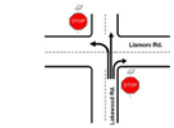
Roll Through Analysis

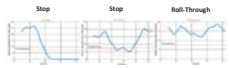
The roll-through analysis considered all three turning movements of a vehicle stopped on the minor road at the STOP sign: right-turn, through, and left-turn. In this analysis, a stop was defined as a vehicle that came to a complete stop and also a vehicle whose relative velocity was below an established threshold that was determined by the research team, referred to as a "rolling stop". All other vehicles were defined as a roll-through. These definitions were used to assess whether the ALERT System had a negative or positive effect on a driver's compliance with the STOP sign. If the percentage of roll-throughs increased during non-conflict periods, it is assumed to correlate to drivers using the ALERT System as a de-facto traffic signal. Conversely, a reduction in the percentage of roll-throughs during conflict periods is also assumed to correlate to an improvement in selecting an appropriate gap.

- Before and after installation of the ALERT System
- After installation of the ALERT System
  - No-conflict (major road vehicle not approaching the intersection → VEHICLE APPROACHING sign not flashing)
  - Conflict (major road vehicle approaching the intersection → VEHICLE APPROACHING sign flashing)

Observations

- Phase I Research: Percentage of roll throughs increased after the ALERT System was installed (no dynamic blinker STOP signs).
- Phase II Research (current project): Dynamic blinker STOP signs mitigated percentage of roll-throughs during no-conflict times and roll-throughs lower in the after period than before period.





Minor Road Vehicle Roll-Throughs Before and After Installation

Turning Movement	Before Installation (percent roll-through)	After Installation (percent roll-through)
Right	16.5%	9.9%
Through	13.3%	2.9%
Left	8.6%	5.2%
All Movements*	28.2%	14.3%

*All Movements are not the sum of the above turning movements.

Minor Road Vehicles Roll-Throughs After Installation

Turning Movement	No-Conflict (percent roll-through)	Conflict (percent roll-through)
Right	8.7%	0.8%
Through	2.8%	0.2%
Left	4.7%	0.2%
All Movements*	16.2%	1.2%

*All Movements are not the sum of the above turning movements.

Conclusions

When a conflict existed at the intersection, the ALERT System...

- Reduced vehicle speeds approaching the intersection on the major road.
- Increased the wait time for a vehicle stopped on the minor road before completing a turning movement.
- Nearly eliminated roll-throughs of vehicles on the minor road.

It appears the dynamic blinker STOP sign was able to mitigate the previously observed driver behavior that treated the ALERT System like a de-facto traffic signal. This suggests that drivers appear to be blending the sign definitions of the Manual on Uniform Traffic Control Devices (MUTCD).

Did the ALERT System improve safety at a rural, two-way stop control intersection?

This research project cannot directly answer this question based on crash data. However, the three surrogate metrics suggest the ALERT System was able to assist drivers on the minor road stopped at the STOP sign select an appropriate gap and reduce the speed of vehicles on the major road.

Suggested Future Research

- How can the observed behavior or reliance on the system as a de-facto traffic signal be better mitigated? Maybe this behavior is acceptable since by definition it occurs when there is not a conflict at the intersection?
- Drivers appear to blur the MUTCD sign definitions. The warning signs seemed to be treated like a "regulatory" type sign and the STOP signs seemed to be treated like a YIELD sign.
- Deployment of multiple similar systems over many years to determine the effectiveness of these systems.
- What is the preferred minimum and maximum traffic volumes to install an intersection conflict warning system?
- Can this system be commercialized through "modular" and "plug and play" technologies?

Mail-In Survey of Local Residents

An anonymous mail-in survey was conducted by sending out survey forms to residents living within a 2-mile radius of the intersection. A total of 206 survey letters were sent out, and a total of 119 were completed and returned for a 58 percent response rate. The first question asked how frequently they drive through the intersection. Most of the respondents, 89 percent, drove through the intersection at least once per day. A total of 92 percent of respondents either agree or strongly agree that the ALERT 2 System improved the safety of the intersection. A final question asked the respondent to rate the overall effectiveness of the warning system as excellent, good, fair or poor. Overall, 87 percent of the respondents rated the effectiveness of the system as excellent or good. The survey also included an option to provide comments. A total of 81 respondents, or 68 percent, included additional comments about the system. The comments ranged between positive, suggestive, negative, and irrelevant.

Statement	Strongly Agree	Agree	Total Positive	Disagree	Strongly Disagree	Total Negative
The warning system is easy to understand.	55%	39%	**94%**	5%	1%	**6%**
The warning system improved the safety of the intersection.	56%	36%	**92%**	1%	7%	**8%**
The vehicle activated blinker STOP signs obtain my attention.	70%	28%	**98%**	1%	1%	**2%**
The warning system could be used at other intersections.	53%	38%	**91%**	5%	4%	**9%**

References

[1] 2011 Intersections Green Sheets (Excel File). Minnesota Department of Transportation, State Aid Traffic Safety Resource. http://www.dot.state.mn.us/stateaid/sa_traffic_safety.html. Accessed Dec 27, 2013.

[2] H. Preston, R. Storm, M. Donath, and C. Shankwitz, Review of Minnesota's Rural Intersection Crashes: Methodology for Identifying Intersections for Intersection Decision Support (IDS), Report# 2004-31, Minnesota Department of Transportation, May 2004.

[3] NCHRP, A Guide for Addressing Unsignalized Intersection Collisions, Report 500, Volume 5, Transportation Research Record, Washington, D.C., 2003.

Implementing County Roadway Safety Plans

Minnesota Style

Wayne Sandberg, P.E.
Washington County, MN

County Roadway Safety Plans

Purpose

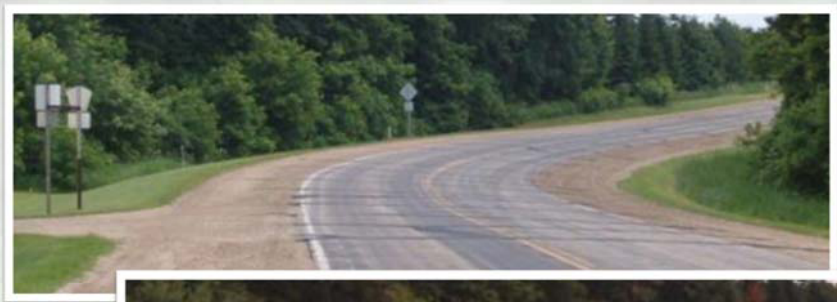
- Identify low cost safety projects
- Reduce crashes on County Highway System
- Statewide

Implementation

- Crashes continue to trend downward in MN
- Safety Plan projects are being implemented
- “Low Hanging Fruit” Projects
- Taking the next steps
  - What are they?
  - How?

3

Before & After



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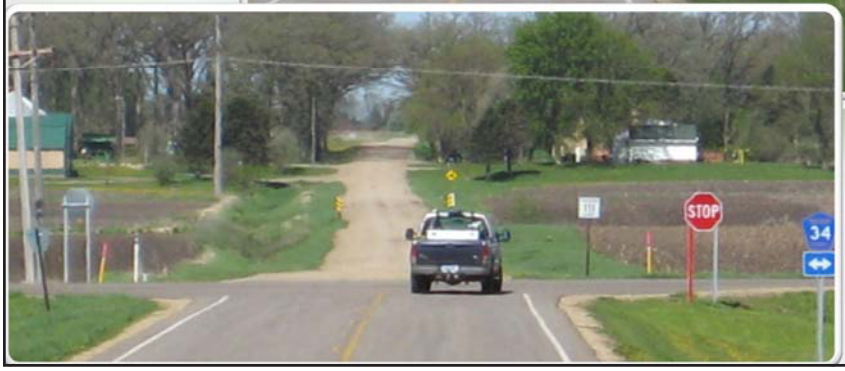
Before & After

5

Before & After



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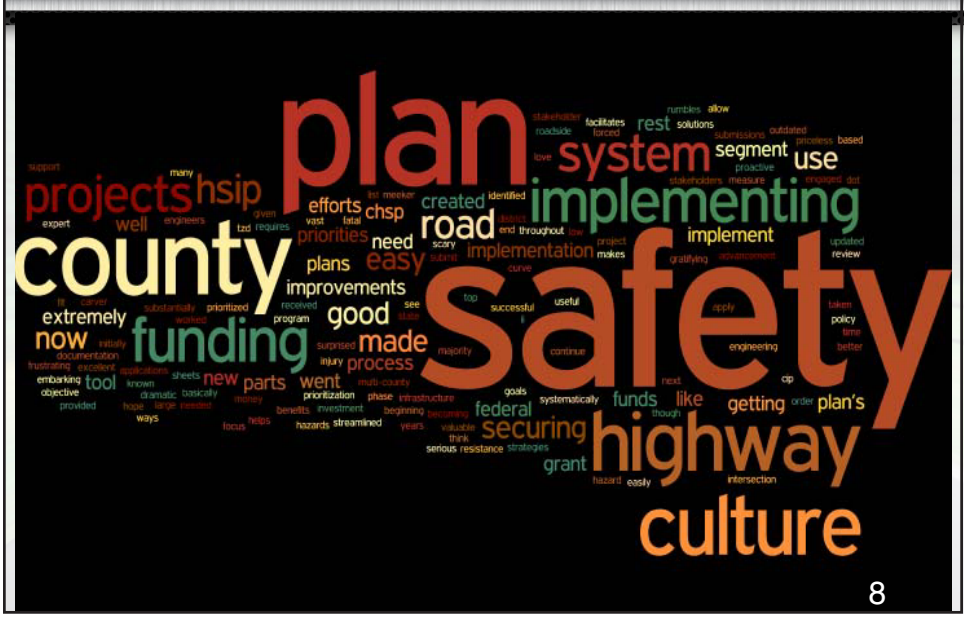
Project Types

- Horizontal Curve Enhancement
- Paved Shoulders (2 foot)
- Edgeline Rumble StripEs
- Intersection Signing Enhancement
- Rural Intersection Lighting
- Enhanced Pavement Markings

7

One Sentence….



8

Needed for success

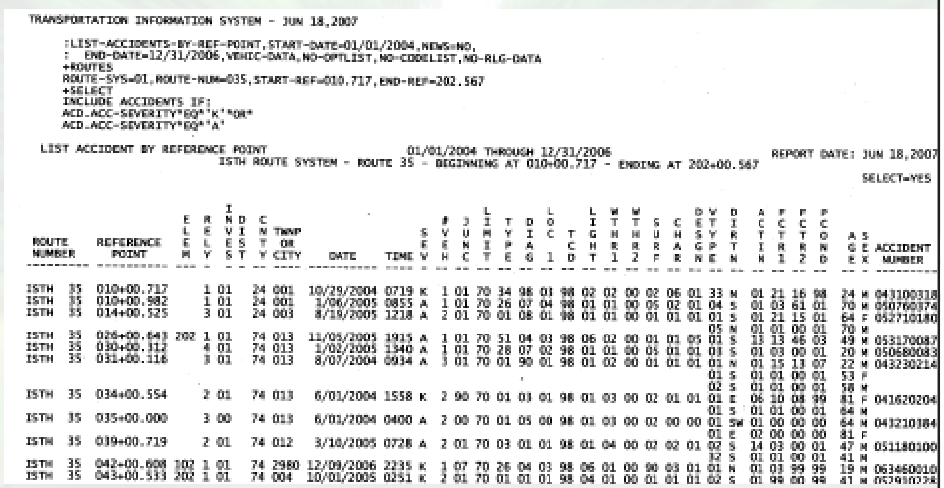
9

Data – Mn Crash Mapping

- MnCMAT
  - Crash Mapping and Analysis Tool
  - 10 Years of Data
- **Data is foundation**
- MnCMAT developed in partnership with Counties
- Counties paid for development
- Counties continue to fund updates and upkeep

10

Minnesota Crash Data – prior to 2000's List Accidents by Ref Point (paper)

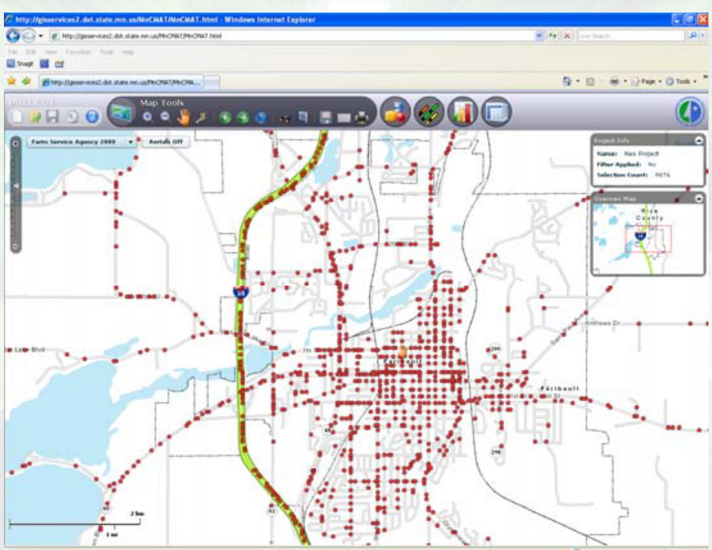


```
TRANSPORTATION INFORMATION SYSTEM - JUN 18,2007

    :LIST-ACCIDENTS-BY-REF-POINT,START-DATE=01/01/2004,NEWS=NO,
    :  END-DATE=12/31/2006,VEHIC-DATA,NO-OPTLIST,NO-CODELIST,NO-RLG-DATA
    +ROUTES
    ROUTE-SYS=01,ROUTE-NUM=035,START-REF=010.717,END-REF=202.567
    +SELECT
    INCLUDE ACCIDENTS IF:
    ACD.ACC-SEVERITY"EQ"'K'"OR"
    ACD.ACC-SEVERITY"EQ"'A'

LIST ACCIDENT BY REFERENCE POINT                 01/01/2004 THROUGH 12/31/2006             REPORT DATE: JUN 18,2007
                         ISTH ROUTE SYSTEM - ROUTE 35 - BEGINNING AT 010+00.717 - ENDING AT 202+00.567
                                                                                                        SELECT=YES
```

ROUTE NUMBER	REFERENCE POINT	ELEM	RELY	INVES	DIST	CNTY	TWNP OR CITY	DATE	TIME	SEV	# VEH	JUNC	LIMIT	TYPE	DIAG	LOC 1	TCD	LIGHT	WTHR 1	WTHR 2	SURF	CHAR	DESGN	VTYPE	DIRTN	ACTIN	FCTR 1	FCTR 2	PCOND	AGE	SEX	ACCIDENT NUMBER
ISTH 35	010+00.717		1	01		24	001	10/29/2004	0719	K	1	01	70	34	98	03	98	02	02	00	02	06	01	33	N	01	21	16	98	24	M	043100318
ISTH 35	010+00.982		1	01		24	001	1/06/2005	0855	A	1	01	70	26	07	04	98	01	01	00	05	02	01	04	S	01	03	61	01	70	M	050760374
ISTH 35	014+00.525		3	01		24	003	8/19/2005	1218	A	2	01	70	01	08	01	98	01	01	00	01	01	01	01	S	01	21	15	01	64	F	052710180
																								05	N	01	01	00	01	70	M	
ISTH 35	026+00.643	202	1	01		74	013	11/05/2005	1915	A	1	01	70	51	04	03	98	06	02	00	01	01	05	01	S	13	13	46	03	49	M	053170087
ISTH 35	030+00.112		4	01		74	013	1/02/2005	1340	A	1	01	70	28	07	02	98	01	01	00	05	01	01	01	S	01	03	00	01	20	M	050680083
ISTH 35	031+00.116		3	01		74	013	8/07/2004	0934	A	3	01	70	01	90	01	98	01	02	00	01	01	01	01	N	01	15	13	07	22	M	043230214
																								01	S	01	01	00	01	53	F	
																								02	S	01	01	00	01	58	M	
ISTH 35	034+00.554		2	01		74	013	6/01/2004	1558	K	2	90	70	01	03	01	98	01	03	00	02	01	01	01	E	06	10	08	99	81	F	041620204
																								01	S	01	01	00	01	64	M	
ISTH 35	035+00.000		3	00		74	013	6/01/2004	0400	A	2	00	70	01	05	00	98	01	03	00	02	00	00	01	SW	01	00	00	00	64	M	043210384
																								01	E	02	00	00	00	81	F	
ISTH 35	039+00.719		2	01		74	012	3/10/2005	0728	A	2	01	70	03	01	01	98	01	04	00	02	02	01	02	S	14	03	00	01	47	M	051180100
																								32	S	01	01	00	01	41	M	
ISTH 35	042+00.608	102	1	01		74	2980	12/09/2006	2235	K	1	07	70	26	04	03	98	06	01	00	90	03	01	01	N	01	03	99	99	19	M	063460010
ISTH 35	043+00.533	202	1	01		74	004	10/01/2005	0251	K	2	01	70	01	01	01	98	04	01	00	01	01	01	02	S	01	99	00	99	41	M	052910228

11

MnCMAT



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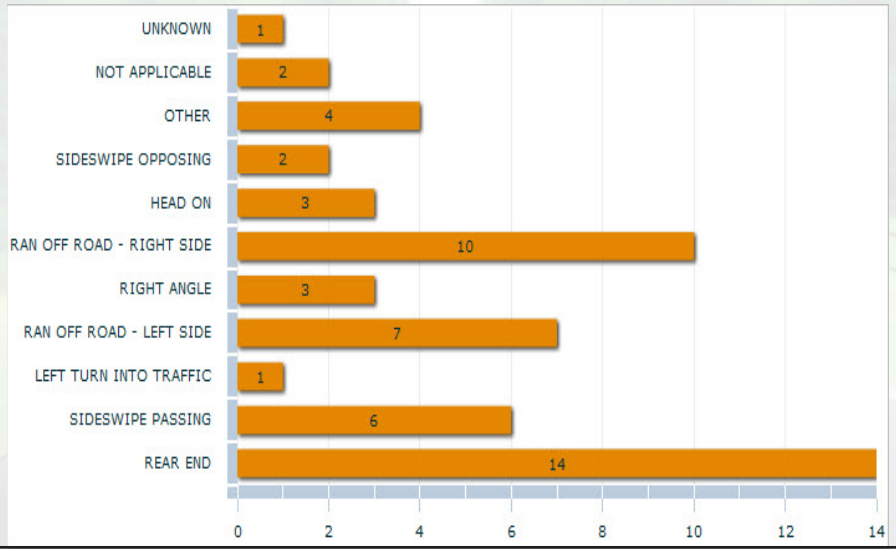
MnCMAT

Example Analysis

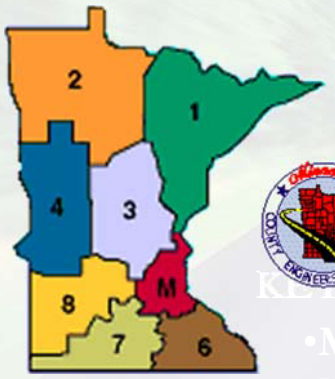
Q. “What are the most dominant crash diagram types resulting from chemical impairment as the 1st contributing factor in the City of Faribault?”

13

Crash Diagram resulting from Chemical Impairment in Faribault



Partnering for Success



MCEA Safety Committee

MnDOT – State Aid

MnDOT – Safety

FHWA Safety

KEY PARTNERS
•MN County Engineers Assoc.
•MN DOT -- State Aid
•FHWA

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Partnerships

- Strong relationship with DOT
  - Staffing – Safety Engineer
  - Toward Zero Deaths
  - Developing a "Culture of Safety"
- Include your Cities and Townships
  - Systemic treatments may work on non-county routes

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Resources

- Dedicated funding at county level
- Competition for state and federal funds
- Plans allow even smallest counties to be competitive

AVAILABLE HSIP FUNDS

	2015	2016
ATP 1		$ 729,847
ATP 2		
ATP 3		$ 1,720,588
ATP 4		$ 600,000
ATP 6	$ 1,107,698	$ 1,429,412
ATP 7	$ 723,529	$ 723,529
ATP 8		
Yearly Subtotal	$ 1,831,227	$ 5,203,376
Additional Funds	$	5,000,000

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Summary

- DATA, PARTNERSHIPS, RESOURCES
  - Critical to success
  - Culture of Safety
  - Statistics are showing improvements…
  - More to do
- Plan set up to “Make it Easy”

.

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Next Steps

- MNDOT Update State Highway Safety Plan
- County Road Safety Plans 2.0
  - Low Hanging Fruit is picked
  - Performance Measurement based
  - Criteria developed overlap with State DOT
  - Coordination with other statewide plans
    - State ITS Plan

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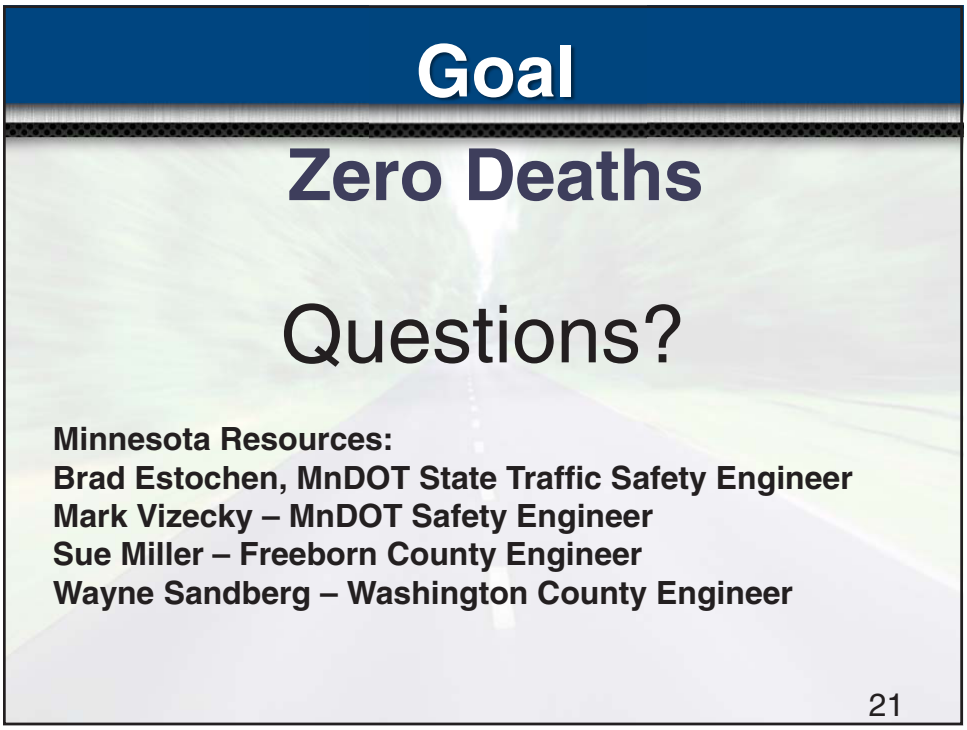
Safety Plans – where are we going?

20



Township Sign Safety Program: Before and After Pictures

MEMORANDUM OF UNDERSTANDING
between
STATE OF OREGON
DEPARTMENT OF TRANSPORTATION
and
ASSOCIATION OF OREGON COUNTIES
AND LEAGUE OF OREGON CITIES

THIS MEMORANDUM OF UNDERSTANDING (MOU) is made and entered into by the Oregon Department of Transportation, hereinafter referred to as ODOT, and the Association of Oregon Counties and League of Oregon Cities, hereinafter referred to as the AOC and LOC respectively, collectively referred to as "Parties".

PURPOSE

The purpose of this MOU is to document the understanding the Parties have reached to apply funding from the Federal Highway Safety Improvement Program (HSIP) for safety projects on roads managed by the Oregon Counties and Cities.

By developing a safety program for all public roads, the parties can increase awareness of safety on local roads, promote best practices for infrastructure safety, compliment behavioral safety efforts and focus limited resources to reduce fatal and serious injury crashes in the state of Oregon.

BACKGROUND

The Parties Agree to meet and discuss a proposal to share Highway Safety Improvement Program (HSIP) funds with local agencies. The goal was to outline a process by which the Parties can move collaboratively towards a "jurisdictionally blind" safety program that addresses the safety needs of all public roads in Oregon.

In the past HSIP funds have been obligated primarily for projects on State Highways. Given that the new Moving Ahead for Progress in the 21st Century (MAP-21) legislation allocates more funds to HSIP, the parties agree the timing is right to begin to develop a process that will be more inclusive in looking at safety on all roads in Oregon, culminating in a jurisdictionally blind process to address fatal and serious crashes on all public roads in Oregon.

The parties recognize that MAP-21 only includes funding for 2013 and 2104. That the principles and funding agreed to herein may need to be revisited if there are significant funding changes in the future authorizations.

PROGRAM PRINCIPLES

The parties discussed principles that should be followed when establishing a program for funding local agency safety projects. The parties Agree to the following:

Program principles

- The program goal is to reduce fatal and serious injury crashes
- The program must include all public roads.
- The program should be data driven and blind to jurisdiction.

- The program should be overseen by the ODOT regions.
- Commitments to the current STIP must be maintained for 2013 through 2015.
- Funding for a jurisdictionally blind program can be reasonably implemented beginning in 2017.

Funding principles

- Funds should be allocated to each ODOT region based on fatal and serious crashes.
- Funds should strive to be split proportionally between urban and rural local road safety needs based on an analysis of fatal and serious crash types in each region recognizing that a precise split may not be desirable given the relative cost of solutions.
- Funds should be used to support the fatal and serious crash reduction strategies and purposes agreed to by all parties within the region.
- A portion of the funds should be allocated to support behavioral safety strategies listed in ODOT's Transportation Safety Action Plan (TSAP), such as enforcement and education strategies.
- Part of the funding should address safety at specific locations and part address systemic low cost safety measures, the portion of each decided at the region level and based generally on fatal and serious injury crash types in each region.

Project Selection principles

- Projects/strategies should be focused on reducing fatal and serious injury crashes.
- A regional project selection process must engage local jurisdictions.
- Projects should primarily be developed and overseen by the ODOT.
- Projects on state and local roads should be combined where possible to make projects more cost effective and keep project administration costs low.
- The principals of practical design shall be used when designing projects.

Transition principles

- Funding to address local fatal and serious injury crashes should be started as soon as possible.
- A transition program should be developed to bridge the gap between 2013 and 2017.
- The transition program should primarily focus on a few systemic fixes.
- All parties should work together to develop a project/strategy selection process for the transition program and the jurisdictionally blind program.

PROGRAM FUNDING

The parties Agree to begin funding of safety to be used on local roads in 2013 starting with a transition program with a goal to have a jurisdictionally blind program in place in time for 2017 project selection. Local jurisdictions will be expected to provide matching funds for projects on their roadways. This match may be provided in-kind or through transfer of funds.
The parties Agree to the following funding:

For 2013-2015 (Transition Program)-

- Allocate a total of $10 million* to local roads.
- Allocate $1 million per year to fund strategies contained in the TSAP.

*Includes the remaining unused funds in the unused High Risk Rural Roads (HR3) program.

For 2016 (last year of Transition Program)-

- Allocate a total of $6 million HSIP to local roads.
- Allocate $1 million to fund strategies contained in the TSAP.

For 2017 and beyond (Jurisdictionally Blind Program):

- Implement "jurisdictionally blind" safety program to address safety on all public roads as part of 2017-2020 STIP process.
- New process should be developed in 2013.

Manager Signature _____ Date 2/15/13

Position Title: Paul Mather, ODOT Highway Division Administrator

Manager Signature _____ Date 2/12/13

Position Title: Troy Costales, ODOT Transportation Safety Division Administrator

Manager Signature _____ Date 1/29/13

Position Title: Mike McArthur, Executive Director, Association of Oregon Counties

Manager Signature _____ Date 2-1-2013

Position Title: Mike McCauley, Executive Director, League of Oregon Cities

The Changing Lens of Transportation Safety

Combining Road Safety Audits & Health Impact Assessments

Question: How would the results of a Road Safety Audit (RSA) change if multiple health issues were considered in the process?

Project Scope: Complete a bicycle/pedestrian focused Road Safety Audit on a high volume suburban arterial and analyze RSA recommendations using a Health Impact Assessment (HIA) process.

Road Safety Audit (RSA)

RSA Defined:
A formal safety performance examination of an existing or future road or intersection by a multidisciplinary team. It reports on road safety issues and identifies potential improvements for all users

Vicinity Map:
Highway 99E
- 5 Lanes
- Major Arterial
- AADT = 22,000
- High transit use

Project Team:
- DKS Associates
- 2 Citizens
- Tri-Met (transit agency)
- Clackamas County Traffic Engineers
- Clackamas County Transportation Planner
- Clackamas County Public Health
- Oregon Dept. of Transportation
- City of Portland

Scope
- Examine safety of 5 lane suburban arterial
- Focus on bicycle and pedestrian crossings
- Examine 3 intersections

Process:
- Use Qualitative Risk Scale
  - Exposure to feature
  - Probability of Crash
  - Consequence and severity
  - Scale of Least Risk to High Risk

Analysis:
- Crash data
- Field visit
- Bus ridership
- Focus on Pedestrian/Bicycle crossings of Hwy 99E

- Pedestrian network connectivity/sidewalk quality issues–add sidewalk, fill in gaps and repair
- Poor roadway/sidewalk lighting
- Visibility of pedestrian crossings – enhance crossings with signs/markings
- Locations of crosswalks not visible – add flashing beacons
- Background lighting from businesses - hard to see pedestrians – add better lighting over pedestrian facilities

Findings

Health Impact Assessment (HIA)

HIA Defined:
A structured process to identify and evaluate the direct and indirect public health consequences of proposals, and suggest actions to minimize impacts to health and optimize benefits

Health: A complete state of physical, mental, and social well-being and not just merely the absence of disease or infirmity - *World Health Organization, Health Promotion Glossary, 1998*

Goals/Scope
Examine direct and indirect health impacts of RSA recommendations to:
- Identify gaps/opportunities to address health impacts
- Assess RSA process to build method to include health in future RSA studies

Health Pathways:
How RSA recommendations could potentially affect health factors

Health Determinant: The range of personal, social, economic and environmental factors which determine the health status of individuals or populations

Examples: Behavioral determinants: consumption of fruits & vegetables, smoking; Environmental determinants: convenient access to healthy food, air quality, transportation infrastructure

Process
Examine RSA solutions and how certain health determinants are affected including:
- Opportunities for physical activity
- Exposure to air and noise pollutants
- Access to health supportive resources

Obesity Rates

Project Team:
- Clackamas County Public Health
- Oregon Public Health Institute
- Clackamas County Traffic Engineers
- Oregon Dept. of Transportation County Transportation Planner

Analysis
Assess each RSA recommendation based on its relative impact to the three health determinants

Access to physical activity:
Access to adjacent trails? Encourage walking/biking? Access to schools and parks?

Exposure to air toxins/noise:
Encourage walking/biking along routes parallel to Hwy 99E?

Access to resources:
Access to schools and employment?

Findings

- RSA study area has high rates of four key transportation-related health outcomes: obesity, asthma, diabetes and heart disease
- Most of the 42 RSA solutions would improve multiple health issues
- Physical activity is the health determinant impacted by most RSA solutions

Apply HIA evaluation criteria to RSA findings

Examples of RSA Solutions with HIA Scores

Examples of HIA Raw & Average Scores for Each Health Determinant

Potential Solutions proposed by the RSA	RSA Risk Score*		Total HIA Score	=	PHYSICAL ACTIVITY				+	EXPOSURE TO AIR & NOISE POLLUTION	+	ACCESS TO RESOURCES		
		HIA Score**			Access to the Trolley Trail	+	Walking, biking, or transit use	+	Access to schools and parks		Walking/ biking along parallel streets/paths		Access to schools	+	Access to employ - ment
Construct sidewalks at key locations	2	12	-	2	+	2	+	2	+	2	+	2	+	2
Install new street lighting/improve lighting uniformity and to increase pedestrian visibility	2	12	-	2	+	2	+	2	+	2	+	2	+	2
Add pedestrian crossing enhancements (e.g. warning signs, crosswalk markings, reflectors, advanced stop bars)	2	12	-	2	+	2	+	2	+	2	+	2	+	2
Install flashing beacons, Rectangular Rapid Flash Beacons (RRFB)	2	11.5	-	2	+	2	+	2	+	1.5	+	2	+	2
Improving street lighting to remove contrast with private illuminated signs and lights	2	9.5	-	2	+	2	+	0.5	+	2	+	1	+	2
Consider providing increased median width to provide sufficient space for two-stage crossings	2	-4.5	-	-1	+	-1	+	-1	+	-0.5	+	-0.5	+	-0.5

Notes:
*RSA Risk Score: Provided by RSA on a scale of 1.0 (low likelihood of crash/injury) to 3.0 (high likelihood of crash/injury)
**HIA Scoring: Scores for each impact category on a scale of -2.0 (relatively strong negative impact) to +2.0 (relatively strong positive impact). All scores are tallied for at total HIA Score.

Summary and Conclusions

- Combining Road Safety Audit and Health Impact Assessment focused on pedestrian and bicycle safety:
  - Broadens how we view solutions
  - Highlights transportation equity
- HIA screening criteria should be developed to guide analysis, as part of an RSA
- Add health related scoring to RSA process, focusing on:
  - Opportunities for physical activity
  - Access to health supportive resources
  - Exposure to air/noise pollution
  - Health equity*

*Defined as disparities that impacts on vulnerable groups such as youth, elderly, disabled, and low income groups (Braveman & Gruskin)

Lessons Learned

- Need to have willingness and interest to see through lens of another discipline, i.e. health and transportation
- Need roadway owners to agree to RSA/HIA approach

Next Steps

- Work on implementing RSA/HIA recommendations
- Plan second project incorporating HIA concepts
- Develop basic guideline to include health concepts into transportation projects

Health & Safety Relationships

Transportation Research Board
2015 Annual Meeting
TRB
Session 728: Recent Research, Best Practices, and Implementation of Zero Death Goals and Plans

Presented by:
Joseph F. Marek, PE, PTOE
Clackamas Safe Communities
Clackamas County, Oregon
joem@clackamas.us

Steve White
Oregon Public Health Institute
Portland, Oregon
Steve@OPHI.org

Centennial Accord Agreement
2014 Plan

Between the State of Washington
(Washington Traffic Safety Commission)
and the Tribes of Washington State

Purpose

The following document is a formal Government to Government agreement established between the state of Washington (Washington Traffic Safety Commission) and the Tribes of Washington State, in accordance with the Centennial Accord, the 2000 Millennium Agreement, and related Executive Orders for the purpose of enhancing traffic safety, thereby savings lives, preventing injuries, and the loss of property on Tribal lands throughout Washington resulting from traffic crashes.

Introduction

Traffic safety continues to be a high priority for the citizens of Washington State based on the dramatic impact traffic crashes have on their personal safety, the quality of their lives, and the state's economy. Governor Jay Inslee maintains public safety as one of his administrations highest priorities.

Survey data, both locally and nationally, documents that citizens throughout the country are more afraid of being killed or injured in a traffic crash than they are from violent crime. When comparing state and national crash data, it is clear that Washington has some of the safest roads in the country. However, Washington still lost 438 lives in 2012, and a majority of these deaths were preventable.

When analyzing Washington fatal crash data by heritage group, an alarming trend emerges when it comes to the number of Native American lives lost each year. If we make a comparison based on their representation within the state's population, the results are even more staggering. Worse — the gap is widening.

Native American fatalities compared to the general population:

- 2.4 times higher in the early 2000's
- 3.3 times higher per 2010 Tar*get Zero*® data
- 3.9 times higher per 2013 *Target Zero*® data

Looking at Washington Fatality Analysis Reporting System (FARS) data from 2003 - 2012, we see that the traffic fatality rates of Native Americans are higher than the general population in several areas.

- Unbelted fatality rate is 7.2 times higher
- Pedestrian fatality rate is 5.3 times higher
- Impaired-driver-involved fatality rate is 5 times higher
- Speeding fatality rate is 4.5 times higher
- Occupant vehicle fatality rate is 3.8 times higher

To complicate this situation, researchers and traffic safety experts agree that Tribal roadway crash data are under reported, making the death rates outlined above even worse.

Roads on tribal lands in Washington are often a mix of tribal, state, county, and city jurisdictions, resulting in complexities with law enforcement and collision reporting. Reservation roads are predominately two-lane rural roadways. When this road environment is combined with low seat belt usage, speeding, and impaired driving, the resulting death rate makes reservation roads a key concern for reaching the goals of *Target Zero*®.

Discussion

The WTSC continues to partner with the 29 federally recognized Tribal governments to provide data, technical support, and funding to assist in creating a safer motoring environment by improving traffic safety on Tribal roads.

Given that the trend of traffic related deaths involving Native Americans in Washington continues to rise, new and innovative strategies and countermeasures must be implemented if this trend is to be reversed. Moreover, the level of partnerships and sharing of resources between the state of Washington and the Tribes will significantly impact the success of these efforts in the future. The following initiatives are proposed as the basis for enhancing traffic safety on Tribal lands, therefore improving the health and welfare of Tribal communities throughout Washington.

Action Items

As a result of the 2009 Centennial Accord meeting, the Tribes and the state of Washington agree to implement the following initiatives to enhance traffic safety on Tribal lands in order to reduce the deaths and injuries among Native Americans in Washington State resulting from traffic crashes:

Maintain a Tribal Traffic Safety Advisory Board to the WTSC comprised of representatives from the following areas:

- Tribal Leadership (with one member acting as the Advisory Board Co-Chair)
- Tribal Law Enforcement
- Tribal Planning and Engineering
- Tribal Health and Education
- Tribal Emergency Medical Services
- Governor’s Office of Indian Affairs
- Department of Transportation
- WTSC - ex-officio members to support the board and one to act as the Advisory Board Co-Chair

The Tribal Traffic Safety Advisory Board is responsible for assisting both the Tribes and the Washington Traffic Safety Commission to:

1) Use *Target Zero*®, Washington's Strategic Highway Safety Plan, as a guide when developing and implementing effective traffic safety initiatives on Tribal lands.

2) Effectively invest human and financial resources on Tribal lands in proven strategies and best practices, as identified in Target Zero, that are proven to save lives and prevent injuries.

3) Assist in the planning and facilitating a Tribal-State Transportation Conference every other year to address behavioral traffic safety issues on Tribal lands, which support items #1 and #2 as outlined above.

4) Assist in facilitating a block grant to the Northwest Association of Tribal Enforcement Officers for Tribal traffic safety equipment purchases and public education and enforcement initiatives.

5) Work to improve the collection and analysis of crash data on Tribal lands.

6) Develop performance measures to evaluate the progress of these initiatives and create an accountability link directly to Governor Inslee.

7) Provide a highlights report on the above initiatives to the Governor's Office of Indian Affairs.

8) Coordinate with Federal agencies to identify additional funding for traffic safety initiatives on Tribal lands.

9) Work to build stronger and more effective partnerships between the WTSC and Tribal governments which mutually support traffic safety statewide as well as on Tribal lands.

10) Maintain Tribal government involvement in the updates of *Target Zero*®.

_____ _____

Director, Washington Traffic Safety Commission **Date**

Agency Contact Information:

Washington Traffic Safety Commission
621 8th Avenue SE, Suite 409
PO Box 40944

Olympia, WA 98504-0944
Main Line – 360.753.6197
Fax – 360.586.6489
www.wtsc.wa.gov

Tribal Liaison
MJ Haught
360.725.9879
mjhaught@wtsc.wa.gov

Agency Director
Darrin T. Grondel
360.725.9899
dgrondel@wtsc.wa.gov

CONTRACT TO PERFORM GOVERNMENTAL ACTIVITIES
Between
THURSTON COUNTY
And
THE NISQUALLY INDIAN TRIBE

THIS CONTRACT is entered into in duplicate originals pursuant to RCW 39.34.080 between THURSTON COUNTY, hereinafter "County," and The Nisqually Indian Tribe, hereinafter "Tribe."

WHEREAS, it is to the mutual advantage of the County and the Tribe to cooperate in the State Route 510 Corridor Study between Yelm Highway and Reservation Road by conducting a traffic study in order to consider the transportation planning needs of the County and the Tribe and in order to make the most efficient use of their powers to provide services and facilities needed by the citizens residing within their respective jurisdictions; and

WHEREAS, RCW 39.34.080 authorizes a public agency to contract with another public agency to perform any governmental activity that each public agency is authorized by law to perform, provided that such contract shall be authorized by the governing body of each party to the contract;

NOW, THEREFORE, in consideration of the mutual promises and covenants recited herein, or attached and incorporated and made a part hereof, it is mutually agreed by the parties as follows:

I. PURPOSE

The purpose of this Contract is to permit the parties to make the most efficient use of their resources by enabling them to cooperate in the performance of a traffic study along the State Route 510 Corridor between Yelm Highway and Reservation Road.

II. SCOPE OF SERVICES

The Tribe shall perform a traffic study according to the "draft" scope of work identified in Exhibit A, attached hereto and incorporated herein by reference. The traffic study will be conducted by a professional engineer licensed and registered in the State of Washington under contract with the Tribe. The Tribe and County will cooperate on the selection of the professional engineer to conduct the traffic study and selection will be by consensus. The Tribe will also coordinate the traffic study with the Washington State Department of Transportation and Thurston Regional Planning Council. The scope of work will be finalized after the Tribe, County and selected professional engineer complete the kickoff meeting as identified in Exhibit A with the Washington State Department of Transportation and Thurston Regional Planning Council.

III. DURATION

The terms and performance of this Contract shall commence after the approval by the governing body of each party and following the filing of this Contract in accordance with RCW

39.34.040. This Contract shall terminate upon completion of its purpose unless terminated sooner as provided herein.

IV. RESPONSIBILITY OF THE COUNTY

The County shall:

1.) Provide engineering oversight of the development of the traffic study;
2.) Provide drafting of maps, figures or diagrams needed for traffic study or presentations;
3.) Allow the Tribe or the selected professional engineer to use a County computer software for the preparation of the traffic study. The software to be provided includes, HCS+, Synchro, and aaSidra;
4.) Print necessary documents produced by the traffic study;
5.) Collect traffic counts and other traffic data needed for the traffic study; and
6.) File this Contract in accordance with RCW 39.34.040.

V. RESPONSIBILITY OF THE TRIBE

The Tribe shall:

1.) Contract with a professional engineer who is licensed and registered in the State of Washington to conduct the traffic study described in Exhibit A;
2.) Pay for all costs and expenses related to the professional engineer under contract with the Tribe to perform the traffic study;
3.) Return the County computer software in the same condition as it was when received by the Tribe. All County computer software shall be removed from the Tribe's or its agent's computer at the conclusion of the study. The Tribe shall be responsible for the proper care and security of the software until returned to the County, and any damage while in the possession of the Tribe or the selected professional engineer will be the responsibility of the Tribe; and
4.) The Tribe shall provide in writing the contact information for the professional engineer selected to complete the traffic study.

VI. ADMINISTRATION

The following individuals are designated as representatives of the respective parties. The representatives shall be responsible for administration of this Contract and for coordinating and monitoring performance under this Contract. In the event such representatives are changed, the party making the change shall notify the other party.

The County's representative shall be Scott Davis, 9605 Tilley Road SW, Olympia, WA 98512, 360-709-3034, davissa@co.thurston.wa.us.

The Tribe's representative shall be Jim Longley, 4820 She-Nah-Num Dr SE, Olympia WA 98513-9199, 360-456-5221 x1178, Longley.jim@nisqually-nsn.gov.

Wherever written notice is required under this Contract, such notice shall be provided to the representatives designated above.

VII. RELATIONSHIP OF THE PARTIES

The employees or agents of each party who are engaged in the performance of this Contract shall continue to be employees or agents of that party and shall not be considered for any purpose to be employees or agents of the other party. This Contract is for the benefit of the parties, and no third party beneficiary relationship is intended. No separate legal entity is created by this Contract and no joint organization is established. No common budget is to be established and no personal or real property is to be jointly acquired or held.

VIII. INDEMNIFICATION AND HOLD HARMLESS

Each party agrees to indemnify and hold harmless the other party, its elected and appointed officers, officials, employees, and agents solely for third party claims relating to bodily injury, sickness or death, or real or personal property damage or destruction and loss of use thereof, including costs and attorneys fees in defense thereof, caused by or arising out of the negligence of either party in the performance of this Contract. In the event of concurrent negligence of the parties, each party's obligations hereunder shall apply only to the extent of fault attributable to that party, its elected and appointed officers, officials, employees, and agents. Nothing herein shall require the County or the Tribe to indemnify or hold harmless the other or its elected and appointed officers, officials, employees, and/or agents from any claims arising from that party's sole negligence or that of its elected and appointed officers, officials, employees, and/or agents. The terms of this section shall survive the expiration or termination of this Contract and completion of the services set out under this Contract.

IX. INSURANCE

The Tribe shall maintain Commercial General Liability or equivalent for bodily injury, personal injury and property damage, subject to limits of not less than $1,000,000 per loss. The general aggregate limit shall apply separately to this Contract and be no less than $2,000,000.

The Tribe shall furnish Thurston County with properly executed certificate of insurance or a signed policy endorsement which shall clearly evidence all insurance required in this section prior to commencement of services. The certificate will, at a minimum, list limits of liability and coverage. The certificate will provide that the underlying insurance contract will not be canceled or allowed to expire except on thirty (30) days prior written notice to Thurston County.

Certificates of Insurance shall show the Certificate Holder as Thurston County and include c/o the Office or Department issuing this Contract. The address of the Certificate Holder shall be shown as the current address of the Office or Department.

Written notice of cancellation or change shall be mailed to Thurston County at the following address:

Attn: Risk Analyst
Human Resources
2000 Lakeridge Drive S.W.
Olympia, Washington 98502

X. RECORDS RETENTION AND AUDIT

During the progress of the services and for a period not less than six (6) years from the expiration or termination of this Contract, the records and accounts pertaining to the services and accounting therefore are to be kept available for inspection and audit by either party and/or the Federal Government and copies of all records, accounts, documents, or other data pertaining to the services will be furnished upon request. If any litigation, claim, or audit is commenced, the records and accounts along with supporting documentation shall be retained until all litigation, claim, or audit finding has been resolved even though such litigation, claim, or audit continues past the 6-year retention period.

XI. TERMINATION

Either party may terminate this Contract upon thirty (30) days prior written notice to the other party. If this Contract is so terminated, the parties shall be liable only for performance rendered or costs incurred in accordance with the terms of this Contract prior to the effective date of termination. The indemnification and hold harmless provisions of this Contract shall survive termination of the Contract.

XII. LEGAL RELATIONS

No liability shall attach to the parties by reason of entering into this Contract except as expressly provided herein.

XIII. CHANGES, MODIFICATIONS, AND AMENDMENTS

The Contract may be changed, modified, amended or waived only by written agreement executed by the parties hereto.

XIV. GOVERNANCE

This Contract is entered into pursuant to and under the authority granted by the laws of the State of Washington. The provisions of this Contract shall be construed to conform to those laws, and shall be governed by those laws as to interpretation and performance. Any action at law, suit in equity, or judicial proceeding arising out of this Contract shall be instituted and maintained only in a court of competent jurisdiction in Thurston County, Washington.

XV. WAIVER OF SOVEREIGN IMMUNITY

Pursuant to the above paragraph XIV., the Tribe expressly grants a limited waiver of sovereign immunity and consents to the personal jurisdiction of the Superior Court of the State of Washington solely for the purposes of bringing suit in Thurston County for claims, disputes, proceedings or actions in any way arising under or relating to this Contract which includes third party claims. This limited consent to suit extends to section VIII., Indemnification and Hold Harmless. The Tribe's governing body shall execute a formal Resolution of Limited Waiver of Sovereign Immunity.

XVI. SEVERABILITY

If any provision of this Contract or any provision of any document incorporated by reference shall be held invalid, such invalidity shall not affect the other provisions of this Contract which can be given effect without the invalid provision, if such remainder conforms to the requirements of applicable law and the fundamental purpose of this Contract, and to this end the provisions of this Contract are declared to be severable.

XVII. WAIVER

A failure by either party to exercise its rights under this Contract shall not preclude that party from subsequent exercise of such rights and shall not constitute a waiver of any other rights under this Contract unless stated to be such in a writing signed by an authorized representative of the party.

XVIII. ENTIRE CONTRACT

This Contract contains all the terms and conditions agreed upon by the parties. No other understandings, oral or otherwise, regarding the subject matter of this Contract shall be deemed to exist or to bind any of the parties hereto.

IN WITNESS WHEREOF, the parties have caused this Contract to be executed this 22 day of February, 2011.

The Nisqually Indian Tribe

Signature
Authorized Representative

RICHARD A. WELLS
TRIBAL ADMINISTRATOR
Printed Name

Title

Approved as to Form:

Tribal Attorney

Board of County Commissioners
Thurston County

Chair

Excused Absence
Vice-Chair Romero

Commissioner

ATTEST:

LaBonita L. Bowman
Clerk of the Board

Approved as to Form:
Jon Tunheim
Prosecuting Attorney

By: Catherine Galvin
Deputy Prosecuting Attorney

D-116

Cowlitz County Strategic Risk-Based Assessment

developed using the

Systemic Safety Project Selection Tool

Cowlitz County Department of Public Works
June 2014

Introduction

Cowlitz County is committed to reducing fatalities and serious injury accidents on County maintained roads. As outlined in the Target Zero Washington State Strategic Highway Safety Plan, identification of accident trends and contributing factors is key to implementing successful accident reduction strategies.

Reasons for Conducting Data Analysis

Cowlitz County collects detailed accident information and retains it over time. This allows us to return to the data and review it to determine if accident trends exist for some period of time. Additionally, the State of Washington has provided statewide accident data. With the two data sources, we can compare accident type incidents, predict where accidents may occur and work to reduce accident types exceeding the average rate of occurrence. Targeting accident types and connecting factors allows Cowlitz County to be efficient and cost-effective in identifying and implementing accident reduction strategies.

Washington State Target Zero Plan

Washington State's Target Zero plan highlights the importance of data driven accident reduction strategies. Through the Corridor Traffic Safety Program, low-cost, near-term projects can be identified which will improve roadway safety through systemic, meaningful action. As noted in the 2013 Target Zero plan "the greatest challenge in addressing fatalities and serious injuries on rural roads is the geographic randomness of collisions scattered over tens of thousands of miles."

Target Zero Priorities

Cowlitz County utilized the Target Zero Priority matrix to identify locations and specific strategies, for three priority levels.

- Priority Level 1: Contributing factors that are involved in 30% or more of fatality or serious injury accidents.
- Priority Level 2: Contributing factors that are involved in 10% or more of fatality or serious injury accidents.
- Priority Level 3: Contributing factors that are associated with less than 10% of fatality or serious injury accidents but are common factors that will improve traffic safety for all users.

Identification of Relevant Risk/Crash Types

Data sourcing

Data for the analysis was provided by WSDOT or was retrieved from the County Road Administration Board (CRAB) online system for dates January 1, 2008 through December 31, 2012. The data was entered from accident reports provided by the Cowlitz County Sheriff's Department or Washington State Patrol for accidents occurring in Cowlitz County.

Methodology

The three E's are being used to address safety topics: Education, Enforcement, Engineering. This report focuses on Engineering strategies, but also acknowledges that partnerships with law enforcement and

other public safety agencies can result in a real and beneficial safety gain for the targeted risk group, as well as other motorists.

System Accident Evaluation

Our data analysis began with data provided by Washington State Department of Transportation. Highlighted are factors that exceed the state average for accidents involving fatalities or serious injury accidents. By determining contributing factors, establishing a risk rating, and prioritizing sites with multiple features connected with higher risk rates, low cost safety projects can be targeted to provide the maximum benefit to the traveling public, reducing the risk of serious injury or fatality accidents on Cowlitz County roads.

The table below describes Washington State overall average percentage rates for the state, compared to the same accident types for only Cowlitz County. The table highlights areas where Cowlitz County's rates exceed the average rates and point towards accident types and features, which Cowlitz County has investigated further. Priority Level 1 items are shown in bold.

Appendix A includes the 2008 – 2012 Cowlitz County Data that was provided by WSDOT. Areas highlighted in the data are those areas where the Cowlitz County data is overrepresented compared to the percentage of crashes in other Washington Counties or on all Washington Public Roads. Percentage of crashes from the WSDOT provided data that are overrepresented are also included in the table below (rows marked with * indicate that the data is not considered significantly different between the County and the Statewide averages or that the County percentage is less than the Statewide average):

Analysis of WSDOT data

Table 1 – Analysis based on WSDOT provided data.

	Fatal/Serious Injury Crashes Only		Total Crashes	
Overall Numbers	Statewide All Counties Average	Cowlitz County	Statewide All Counties Average	Cowlitz County
% of Alcohol Related Collisions	33.2	43.6	12.4	17.7
By Collision Type				
Hit Fixed Object	41.3	61.5	40.4	63.1
By Light Condition				
Dark – No Street Lights	*	*	22.3	31.3
By Junction Relationship				
Non-intersection	65.2	79.5	54.4	71.9
By Roadway Curvature				
Horizontal Curve	39.5	61.5	28.1	52.5
Vertical Curve	4.1	7.7	3.8	6.5
Hit Fixed Object Crashes Only – By Fixed Object Hit				
Ran over Embankment	*	*	6.9	11.2
Mail box	*	*	4.5	7.5

By Contributing Circumstance				
Exceeding Safe Stated Speed	25.5	33.8	*	*
Under Influence of Alcohol/Drugs	*	*	8.9	12.2
Over Centerline	*	*	9.3	12.2
Improper Passing	1.9	6.2	*	*
By Vehicle Type				
Motorcycle	15.7	25.5	2.1	3.3
By Speed Limit				
35	36.3	47.7	43.7	63.2
40	11.3	18.2	10.4	13.1

The WSDOT or state data was used in determining the contributing factors for each priority level as follows:

- Priority Level 1 – Contributing factors that are involved in 30% or more of fatality or serious injury accidents. These contributing factors are alcohol related collisions; hit fixed object, dry roadway, daylight, non-intersection, horizontal curve, exceeding safe/stated speed, passenger cars and 35 MPH roads.
- Priority Level 2 - Contributing factors that are involved in between 10% and 30% of fatality or serious injury accidents. These contributing factors are wet roadway surface, dark – no street lights, straight roadway (level and on grade), hit fixed object (tree/stump, ran over embankment, earth bank, fence, under influence of alcohol/drugs, light truck/SUV, motorcycle and 25 and 40 MPH roadways.
- Priority Level 3: Contributing factors that are involved in less than 10% of fatality or serious injury accidents but are common factors that will improve traffic safety for all users. These contributing factors include overturning, hitting other vehicles, hitting pedestrians, wildlife collisions, ice, dawn, dark – street lights off, intersection and driveway related, vertical curves, culverts and roadside ditches, mailboxes, utility poles, wood sign posts, concrete barriers, boulders and rock banks, over centerline, operating defective equipment, inattention/distraction, improper passing, headlight violation, failing to yield and improper turns as well as failing to yield to pedestrian/cyclist, heavy trucks and speed limits of 30, 45 and 50 mph.

Analysis of County Data

While it is important to consider the state data in order to determine the applicable risk factors, it is also important to note that small changes can skew the data and that factors unique to Cowlitz County also need to be considered. An example is that each increase or decrease of 1 fatal/serious injury is 2.6 percentage points. This raises the concern that there is not enough data to target the risk factors appropriately. Another concern are factors that are unique to Cowlitz County. Take, for instance, the crashes that occur on roads that are posted at 35 mph. While the state data shows this to be overrepresented, a review of the County data shows that of the County's 528.9 miles of road, 220.6 miles (41.7%) and 51% of the total traffic occurs on the County roads that are posted at 35 mph.

In order to determine the best risk factors to use, we analyzed County data that is stored in CRAB's mobility database, while also keeping in mind that the goal is to reduce the amount of fatal/serious

injury crashes that could occur anywhere on our system. The data is pulled from 916 total accidents, including 338 injury accidents and 9 fatalities on 528.9 miles of Cowlitz County roads system. Corresponding to the Washington State data, Cowlitz County analysis shows that curves represent a majority of both injury and fatality accidents at 58.8%. Of the nine fatalities during the study time period, 5 occurred in curves. Hit fixed object also is a significant contributing factor, with 7 of 9 fatalities occurring with an associated hit fixed object, which includes water (river or lake). The data analyzed by the County was also used to determine the possible contributing factors for each priority level. Note that the following is for all injury and fatality accidents, not just serious injury/fatality accidents:

- Priority Level 1 – Contributing factors that are involved in 30% or more of fatality or injury accidents. These contributing factors are hit fixed object, dry roadway, daylight and dark – no street lights, non-intersection, horizontal curve and straight, on a grade and level, and 35 MPH roads. In addition, these factors include a shoulder width of 2' or less and less than 1000 ADT.

- Priority Level 2 - Contributing factors that are involved in between 10% and 30% of fatality or serious injury accidents. These contributing factors are alcohol related collisions, exceeding safe/stated speed, wet roadway surface, snow-ice, dark – street lights, and 25 and 40 MPH roadways. In addition, these factors include shoulder widths greater than 2' and greater than 1000 ADT.

- Priority Level 3: Contributing factors that are associated with less than 10% of fatality or serious injury accidents but are common factors that will improve traffic safety for all users. These contributing factors include overturning, hitting other vehicles, dawn and dusk, dark – street lights off, intersection and driveway related, vertical curves, over centerline, improper passing and speed limits of 30, 45 and 50 mph. In addition, these factors include unpaved roads and ADT of less than 100.

Combining the state and county data, we have developed the following factors for the Priority levels:

- Priority Level 1 – Combined contributing factors that are involved in 30% or more of fatality or injury accidents. These contributing factors are alcohol related collisions, hit fixed object, dry roadway, daylight and dark-no street lights, non-intersection, horizontal curve and straight - on a grade and level, exceeding safe/stated speed, passenger cars, shoulder widths less than 2', 35 MPH posted speed and less than 1,000 ADT.

  The factors that will be rated for Priority Level 1 will include non-intersection related segments of roads, roads with horizontal curves, shoulder widths of less than 2', 35 MPH speed and less than 1,000 ADT and the risk of severe injury/fatality. The risk of severe injury/fatality is based on the clear zone characteristics and if there is a history of accidents. Alcohol related collisions, dry roadway, daylight, straight, on a grade and level, and passenger cars will not be included in the priority rating. Alcohol related collisions should be addressed through enforcement and education. Dry roadways, daylight, straight, grade and level are characteristics that are not considered contributing factors to the collisions. While dark-no street lights, and exceeding safe/stated speed will not be rated, countermeasures selected will be appropriate for these factors.

  Countermeasures to be proposed for the priority level 1 locations will include those that are appropriate for reducing run off the road accidents.

- Priority Level 2 - Contributing factors that are involved in between 10% and 30% of fatality or injury accidents. These contributing factors are wet roadway surface, dark – no street lights, straight roadway (level and on grade), hit fixed object (tree/stump, ran over embankment, earth bank, fence), under influence of alcohol/drugs, light truck/SUV, motorcycle, 25 and 40 MPH roadways, exceeding safe/stated speed, snow-ice, dark – street lights, shoulder widths greater than 2' and greater than 1000 ADT.

  The factors that will be considered in ratings for priority level 2 will include non-intersection, dark – no street lights, 25 and 40 mph roadways, shoulder widths greater than 2' and greater than 1000 ADT. Alcohol related collisions should be addressed through enforcement and education. Straight roadway (level and grade) are not considered contributing factors to the collisions. While wet roadway surface, and snow/ice will not be rated, countermeasures selected will be selected with these factors in mind.

  Countermeasures to be proposed for the priority level 2 locations will include those that are appropriate for reducing run off the road accidents.

- Priority Level 3: Contributing factors that are associated with less than 10% of fatality or injury accidents but are common factors that will improve traffic safety for all users. These contributing factors include overturning, hitting other vehicles, hitting pedestrians, wildlife collisions, ice, dark – street lights off, intersection and driveway related, vertical curves, run off the road (culverts and roadside ditches, mailboxes, utility poles, wood sign posts, concrete barriers, boulders and rock banks), over centerline, operating defective equipment, inattention/distraction, improper passing, headlight violation, failing to yield and improper turns as well as failing to yield to pedestrian/cyclist, heavy trucks, speed limits of 30, 45 and 50 mph, dawn and dusk, unpaved roads, pavement widths less than 20', shoulder widths greater than 2', and ADT of less than 100.

  The factors that will be considered in ratings for priority level 3 will include vertical curves, intersections, runoff the road, speed limits of 30, 45 and 50, shoulder widths greater than 2' and ADT of less than 100. The other factors not included for rating are considered to be enforcement/education/experience related such as ice, dawn/dusk, defective equipment, inattention/distraction, improper passing, over centerline, headlight violation, unpaved roads and failing to yield to a pedestrian/cyclist.

Evaluation of County Road System

Once the contributing factors have been determined, the next step in the plan is to evaluate the existing County road system to determine where the high risk factors currently occur and to determine the appropriate countermeasures to employ. Locations are then prioritized based on how many of the high risk factors are present. A priority array is prepared that includes the high risk factors and assigns a * if the risk factor is present. Factors that have not been evaluated are noted at 'TBE'. The following tables contain the result of the road evaluation.

Priority Level 1

Road and Milepost Range	Begin Milepost	End Milepost	Horizontal Curves	Shoulder Widths less than 2’	35 MPH posted speed	< 1,000 ADT	Run off the Road Risk
Allen Street	1.26	2.42	*	*	*	*	*
Barnes Drive	0	1.89	x	*	x	*	*
Barnes Drive	1.89	4.82	*	*	x	*	*
Bodine Road	0	2.61	*	*	x	*	*
Bunker Hill Place	0	0.3	*	*	x	*	TBE
Butte Hill Road	0	0.46	*	*	*	*	x
Butte Hill Road	1.19	1.79	*	*	*	*	*
Cameron Creek Road	0	1.31	*	*	x	*	*
Carnine Road	0	1.52	*	*	*	*	x
Chapman Road	0.27	1.24	*	*	*	*	x
Coal Creek Road	1.5	3.48	*	*	*	x	*
Coal Creek Road	6.57	6.65	TBE	*	*	*	TBE
Columbia Heights Road	0	1.65	*	*	*	*	TBE
Columbia Heights Road North	0.25	1.18	*	*	*	*	TBE
Dike Road	0	3.05	x	*	x	*	*
Dike Road	3.05	7.79	*	*	x	*	*
Dike Access Road	0.48	1.83	x	*	x	*	x
East MacAdams	0	0.97	*	*	x	*	*
Englert Road	0.48	0.59	*	*	*	*	TBE
Frank Smith Road	0	1.49	*	*	*	*	TBE
George Taylor Road	0	3.12	*	*	*	*	TBE
Goble Creek Loop Road	0	0.78	*	*	*	*	*
Green Mountain Road	3.34	3.7	*	*	*	*	TBE

Green Mountain Road	4.2	10.25	*	*	*	*	TBE
Hendrickson Drive	0.2	0.88	x	*	*	*	TBE
Holcomb Road	0.49	4.35	*	*	*	*	*
Hooper	0	1.25	*	*	x	*	*
Kalama River Road	0.2	9	*	x	*	x	*
Kalama River Road	9	16.95	*	*	*	*	TBE
King Road	0	0.55	*	*	x	*	TBE
Kroll Road	0.05	1.47	*	*	*	*	x
Little Kalama River Road	2.72	7.24	*	*	*	*	TBE
McKee Road	0	1.97	*	*	*	*	*
Mill Creek Road	1.66	2.7	*	*	*	*	*
Oak Point Road	0	2.28	*	*	*	*	TBE
Pleasant Hill Road	0	3.19	*	*	*	*	*
Pleasant Hill Road	3.72	3.87	*	*	*	*	*
Pleasant Hill Road	4	4.08	*	*	*	*	*
Pleasant Hill Road	4.38	4.81	*	*	*	*	*
Powell Road	0.25	1.3	*	*	*	*	TBE
Ragland Road	0	1.6	*	*	*	*	*
Sandy Bend Road	0	0.22	*	*	*	*	TBE
Sandy Bend Road	0.38	2.63	*	*	*	*	TBE
Schaffran Road	0	2.65	*	*	*	*	TBE
Shirley Gordon Road	0.54	1.97	*	*	*	*	TBE
Si Town Road	0	1.04	*	*	*	*	TBE
Slide Creek Road	0	2.8	*	*	x	*	*
South Pekin Road	2.35	2.89	*	*	*	*	*
South Toutle Road	0	2	*	x	x	x	*

South Toutle Road	2.56	2.9	x	x	*	x	*
South Toutle Road	2.9	4.21	*	*	*	*	*
South Toutle Road	4.68	6.35	*	*	*	*	*
Spruce Creek Road	0.87	1.15	*	*	*	*	TBE
Studebaker Road	0	1.15	*	*	*	*	TBE
Studebaker Spur #2	0	0.63	*	*	*	*	TBE
Toutle Park Road	0.16	0.93	*	*	*	*	x
Toutle River Road	0	0.86	*	*	*	*	TBE
Willow Grove Road	4.14	4.3	*	*	*	*	x
Willow Grove Road	4.3	7.5	*	*	*	*	*

Priority Level 2

Only the roads that met each criteria were included in priority level 2.

Road and Milepost Range	Begin Milepost	End Milepost	No Street Lights	Shoulder Widths > 2’	25 and 40 MPH posted speed	> 1,000 ADT	Run off the Road Risk
PH 10	0.72	0.8	*	*	*	*	*
Rose Valley Road	0	0.61	*	*	*	*	*
Rose Valley Road	2.43	5.17	*	*	*	*	*
Whalen Road	1.49	1.97	*	*	*	*	*
Kalama River Road	2.39	2.59	*	*	*	*	*
South Toutle River Road	0	2	*	*	*	*	*
South Toutle River Road	2.56	2.9	*	*		*	*

Generally, the roads in Priority Level 2 were addressed in a recent High Risk Rural Roads Program Grant. The locations noted above had roadside delineation installed. No projects were selected from this category while the effectiveness of the roadside delineation is evaluated.

Priority Level 3

The following intersections were evaluated with Priority level 3.

Road and Milepost Range	Intersection	Vertical Curve	Pavement Width < 20'	Shoulder Widths > 2'	30, 45, and 50 MPH posted speed	< 100 ADT
South Cloverdal/Confer Intersection	*	*	*	*		
South Cloverdale/Martin's Way intersection	*	*		*		
Pacific Way	*			*		
Wren Loop Road/West Side Highway	*	*	*		*	

Selection of Countermeasures

When locations that are at higher risk of fatal/serious injury crashes have been determined, then low cost countermeasures that would be effective at reducing the risk are considered. Countermeasures have been evaluated through FHWA's crash modification factors (CMF) clearinghouse. The CMF clearinghouse contains safety countermeasures and the effectiveness at reducing crashes. If a CMF has a rating of less than 1 then it has been shown or is expected to reduce the quantity of crashes. For example, if the cmf is 0.80, then the amount of crashes would be expected to be 80% of the existing number of crashes. Another term used is crash reduction factor (crf), which is the percent reduction in crashes. For the cmf of 0.8 the crf is 0.2, which means the crashes are reduced by 20%.

The countermeasures considered as a part of this plan are as follows:

Objective	**Countermeasure**
Reduce Run of the Road occurrences	Delineation
	Roadway signing – Curve Warning signs and chevrons
	Improve Roadway geometry
Minimize severity of roadside departures	Install guardrail/traffic barrier with delineators
	Replace non-standard guardrail
	Widen clear zone
	Remove/relocate objects in hazardous locations in the clear zone
Reduce intersection related collisions	Install/upgrade signing and delineation
	Improve roadway geometry
	Improve sight distance

Project Priority Selection

The list below contains the project priorities with an estimated cost for each.

Priority 1: Install guardrail/5 star locations adjacent to waterways /Willow Grove Road, MP 4.30-MP 7.50/$570,000
Priority 2: Install guardrail/5 star locations adjacent to waterways/South Pekin Road, MP 2.35 – 2.89/$120,000
Priority 3: Install guardrail/3 and 4 star locations adjacent to waterways/Dike Road/$590,000
Priority 4: Install guardrail/4 and 5 star locations – countywide/ $530,000
Priority 5: Install Roadside Delineation/4 and 5 star locations countywide/$260,000
Priority 6: Install and/or upgrade curve warning signs and chevrons/4 and 5 star locations/ countywide/$110,000
Priority 7: Raise low guardrail and upgrade terminals/3-5 star locations/ Pleasant Hill Road and Kalama River Road/$275,000
Priority 8: Intersection Improvements/reconstruct intersection/3 star locations/South Cloverdale-Confer intersection/$355,000
Priority 9: Intersection Improvement/minor grade and alignment revisions, upgrade signing and striping/ 3 star locations/ South Cloverdale-Martin's Bluff intersection/$85,000

Conclusion

A majority of the crashes in Cowlitz County are strongly associated with curves and often involve hitting a fixed object. Data propels Cowlitz County to seek low cost safety features that target the risk factors that have a higher rate of occurrence. County roads have been identified utilizing these specific risk criteria and prioritized towards roads with greater opportunity to mitigate risk. This plan should be updated every three years to evaluate the success of the program and to identify additional risk factors and employ new countermeasures as needed. In addition, criteria used to evaluate locations, such as ADT, should be updated concurrently.

Appendix A

WSDOT and County Data

2008-2012 County X Data	Fatal/Serious Injury Crashes Only											Total Crashes										
	All Public Roads		All Counties		County X							All Public Roads		All Counties		County X						
	2008-2012	%	2008-2012	%	2008-2012	%	2012	2011	2010	2009	2008	2008-2012	%	2008-2012	%	2008-2012	%	2012	2011	2010	2009	2008
Overall Numbers																						
Total # of Collisions	12,447		3,246		37		4	11	5	12	5	513,944		70,278		470		79	105	109	118	59
# of Fatal Collisions	2,190	17.6%	682	21.0%	8	21.6%	1	2	2	3	0	2,190	0.4%	682	1.0%	8	1.7%	1	2	2	3	0
# of Serious Injury Collisions	10,257	82.4%	2,564	79.0%	29	78.4%	3	9	3	9	5	10,257	2.0%	2,564	3.6%	29	6.2%	3	9	3	9	5
# of Alcohol-Related Collisions	3,268	26.3%	1,078	33.2%	7	18.9%	1	3	0	1	2	38,860	7.6%	8,700	12.4%	56	11.9%	8	11	11	18	8
Total # of Fatalities	2,375		732		9		1	2	2	4	0	2,375		732		9		1	2	2	4	0
Total # of Injuries	17,770		4,503		42		4	12	5	13	8	235,108		35,239		218		36	69	35	49	29
By Collision Type																						
Hit Fixed Object	3,439	27.6%	1,340	41.3%	21	56.8%	4	6	2	5	4	99,255	19.3%	28,374	40.4%	273	58.1%	40	65	64	70	34
Overturn	1,281	10.3%	424	13.1%	9	24.3%	0	2	3	3	1	14,764	2.9%	4,893	7.0%	77	16.4%	11	16	21	19	10
Wildlife	149	1.2%	78	2.4%	4	10.8%	0	2	0	2	0	9,262	1.8%	1,839	2.6%	45	9.6%	11	14	8	10	2
Head On	642	5.2%	182	5.6%	2	5.4%	0	0	0	2	0	2,896	0.6%	858	1.2%	7	1.5%	0	0	1	5	1
Angle (T)	1,369	11.0%	324	10.0%	1	2.7%	0	1	0	0	0	79,814	15.5%	9,440	13.4%	17	3.6%	6	4	4	3	0
Hit Parked Car	185	1.5%	33	1.0%	0	0.0%	0	0	0	0	0	33,799	6.6%	2,390	3.4%	8	1.7%	2	1	2	2	1
Sideswipe (Opposite Direction)	183	1.5%	58	1.8%	0	0.0%	0	0	0	0	0	3,693	0.7%	1,060	1.5%	8	1.7%	2	1	2	1	2
Sideswipe (Same Direction)	318	2.6%	74	2.3%	0	0.0%	0	0	0	0	0	47,595	9.3%	2,933	4.2%	5	1.1%	2	1	1	1	0
Rearend	1,169	9.4%	157	4.8%	0	0.0%	0	0	0	0	0	148,372	28.9%	10,515	15.0%	4	0.9%	0	0	0	2	2
Angle (Left Turn)	697	5.6%	126	3.9%	0	0.0%	0	0	0	0	0	28,023	5.5%	3,001	4.3%	3	0.6%	2	1	0	0	0
Hit Pedestrian	1,667	13.4%	208	6.4%	0	0.0%	0	0	0	0	0	8,927	1.7%	740	1.1%	3	0.6%	0	0	1	1	1
Hit Cyclist	678	5.4%	92	2.8%	0	0.0%	0	0	0	0	0	6,759	1.3%	618	0.9%	3	0.6%	0	1	1	1	0
Other	659	5.3%	148	4.6%	0	0.0%	0	0	0	0	0	30,673	6.0%	3,599	5.1%	17	3.6%	3	1	4	3	6
By Roadway Surface																						
Dry	9,085	73.0%	2,372	73.1%	33	89.2%	4	9	5	10	5	333,394	64.9%	43,160	61.4%	282	60.0%	53	61	61	70	37
Wet	2,644	21.2%	655	20.2%	2	5.4%	0	1	0	1	0	135,756	26.4%	17,955	25.5%	39	8.3%	7	8	13	8	3
Snow / Slush	241	1.9%	51	1.6%	1	2.7%	0	0	0	1	0	16,541	3.2%	2,791	4.0%	54	11.5%	2	12	16	18	6
Other	181	1.5%	51	1.6%	1	2.7%	0	1	0	0	0	10,969	2.1%	1,297	1.8%	14	3.0%	5	6	1	1	1
Ice	296	2.4%	117	3.6%	0	0.0%	0	0	0	0	0	17,284	3.4%	5,075	7.2%	81	17.2%	12	18	18	21	12
By Light Condition																						
Daylight	7,169	57.6%	1,753	54.0%	28	75.7%	3	7	5	9	4	334,748	65.1%	40,604	57.8%	287	61.1%	42	65	66	75	39
Dark - No Street Lights	2,014	16.2%	941	29.0%	5	13.5%	1	1	0	2	1	43,360	8.4%	15,673	22.3%	140	29.8%	32	25	33	35	15
Dawn	215	1.7%	66	2.0%	1	2.7%	0	0	0	1	0	9,469	1.8%	1,799	2.6%	13	2.8%	1	4	5	3	0
Other	109	0.9%	37	1.1%	3	8.1%	0	3	0	0	0	9,754	1.9%	1,073	1.5%	10	2.1%	2	7	0	1	0
Dusk	412	3.3%	122	3.8%	0	0.0%	0	0	0	0	0	14,114	2.7%	2,110	3.0%	11	2.3%	1	4	2	2	2
Dark - Street Lights On	2,418	19.4%	289	8.9%	0	0.0%	0	0	0	0	0	98,641	19.2%	8,121	11.6%	7	1.5%	0	0	3	2	2
Dark - Street Lights Off	110	0.9%	38	1.2%	0	0.0%	0	0	0	0	0	3,858	0.8%	898	1.3%	2	0.4%	1	0	0	0	1

2008-2012 County X Data	Fatal/Serious Injury Crashes Only											Total Crashes										
	All Public Roads		All Counties		County X							All Public Roads		All Counties		County X						
	2008-2012	%	2008-2012	%	2008-2012	%	2012	2011	2010	2009	2008	2008-2012	%	2008-2012	%	2008-2012	%	2012	2011	2010	2009	2008
By Junction Relationship																						
Non-Intersection (Not Related)	6,705	53.9%	2,117	65.2%	33	89.2%	3	9	5	11	5	230,934	44.9%	38,222	54.4%	385	81.9%	58	90	94	97	46
Intersection-Related	4,107	33.0%	711	21.9%	1	2.7%	0	1	0	0	0	207,667	40.4%	22,056	31.4%	38	8.1%	10	9	9	8	2
Driveway-Related	960	7.7%	212	6.5%	0	0.0%	0	0	0	0	0	50,371	9.8%	6,704	9.5%	23	4.9%	8	2	5	4	4
By Roadway Curvature																						
Horizontal Curve	3,353	26.9%	1,282	39.5%	27	73.0%	2	8	4	8	5	77,321	15.0%	19,729	28.1%	243	51.7%	30	59	59	63	32
Straight & Level	6,588	52.9%	1,397	43.0%	8	21.6%	2	2	1	3	0	322,235	62.7%	36,635	52.1%	129	27.4%	34	23	32	26	14
Straight & Grade	2,165	17.4%	441	13.6%	2	5.4%	0	1	0	1	0	95,899	18.7%	10,665	15.2%	81	17.2%	13	17	14	26	11
Vertical Curve	352	2.8%	132	4.1%	2	5.4%	0	1	1	0	0	10,912	2.1%	2,655	3.8%	16	3.4%	3	4	6	2	1
Unknown	123	1.0%	50	1.5%	0	0.0%	0	0	0	0	0	10,598	2.1%	1,491	2.1%	5	1.1%	0	3	0	1	1
Hit Fixed Object Crashes Only - By Fixed Object Hit																						
Roadway Ditch	339	9.9%	171	12.8%	5	23.8%	2	0	1	2	0	12,020	12.1%	5,533	19.5%	53	19.5%	5	11	21	12	4
Earth Bank	249	7.2%	103	7.7%	4	19.0%	0	3	0	1	0	5,398	5.4%	2,160	7.6%	31	11.4%	7	10	6	6	2
Tree / Stump (Stationary)	642	18.7%	334	24.9%	3	14.3%	1	1	0	0	1	9,828	9.9%	3,779	13.3%	42	15.4%	4	11	11	10	6
Ran Over Embankment	299	8.7%	136	10.1%	2	9.5%	0	0	1	0	1	4,085	4.1%	1,948	6.9%	34	12.5%	4	5	9	12	4
Boulder (Stationary)	55	1.6%	30	2.2%	2	9.5%	1	0	0	0	1	1,080	1.1%	452	1.6%	15	5.5%	4	3	2	5	1
Fence	214	6.2%	105	7.8%	1	4.8%	0	1	0	0	0	8,003	8.1%	3,146	11.1%	31	11.4%	5	7	7	8	4
Guardrail	247	7.2%	56	4.2%	1	4.8%	0	0	0	0	1	8,153	8.2%	1,349	4.8%	17	6.3%	3	2	2	4	6
Culvert	63	1.8%	47	3.5%	1	4.8%	0	1	0	0	0	785	0.8%	466	1.6%	8	2.9%	1	3	2	1	1
Retaining Wall	77	2.2%	18	1.3%	1	4.8%	0	0	0	1	0	2,001	2.0%	331	1.2%	6	2.2%	0	3	1	2	0
Rock Bank	49	1.4%	11	0.8%	1	4.8%	0	0	0	1	0	687	0.7%	100	0.4%	5	1.8%	0	0	0	4	1
Utility Pole	317	9.2%	146	10.9%	0	0.0%	0	0	0	0	0	7,402	7.5%	3,451	12.2%	6	2.2%	0	2	1	1	2
Wood Sign Post	88	2.6%	25	1.9%	0	0.0%	0	0	0	0	0	4,200	4.2%	949	3.3%	5	1.8%	1	3	0	1	0
Bridge Rail	68	2.0%	6	0.4%	0	0.0%	0	0	0	0	0	3,614	3.6%	200	0.7%	3	1.1%	1	2	0	0	0
Misc. Debris on Road	20	0.6%	4	0.3%	0	0.0%	0	0	0	0	0	1,201	1.2%	122	0.4%	3	1.1%	0	2	0	1	0
Mail Box	72	2.1%	49	3.7%	0	0.0%	0	0	0	0	0	2,477	2.5%	1,289	4.5%	2	0.7%	1	0	0	1	0
Fire Hydrant	17	0.5%	3	0.2%	0	0.0%	0	0	0	0	0	1,019	1.0%	202	0.7%	2	0.7%	1	0	0	0	1
Snow Bank	10	0.3%	4	0.3%	0	0.0%	0	0	0	0	0	740	0.7%	141	0.5%	2	0.7%	0	0	0	1	1
Fallen Rock / Tree	12	0.3%	4	0.3%	0	0.0%	0	0	0	0	0	401	0.4%	80	0.3%	2	0.7%	0	1	0	1	0
Utility Box	20	0.6%	9	0.7%	0	0.0%	0	0	0	0	0	910	0.9%	383	1.3%	1	0.4%	0	0	0	0	1
Building	28	0.8%	3	0.2%	0	0.0%	0	0	0	0	0	1,381	1.4%	193	0.7%	1	0.4%	0	0	1	0	0
Concrete Barrier	135	3.9%	5	0.4%	0	0.0%	0	0	0	0	0	7,884	7.9%	151	0.5%	1	0.4%	1	0	0	0	0
Metal Sign Post	35	1.0%	3	0.2%	0	0.0%	0	0	0	0	0	1,287	1.3%	139	0.5%	1	0.4%	1	0	0	0	0
Underside of Bridge	1	0.0%	0	0.0%	0	0.0%	0	0	0	0	0	276	0.3%	48	0.2%	1	0.4%	0	0	1	0	0

2008-2012 County X Data	Fatal/Serious Injury Crashes Only											Total Crashes										
	All Public Roads		All Counties		County X							All Public Roads		All Counties		County X						
	2008-2012	%	2008-2012	%	2008-2012	%	2012	2011	2010	2009	2008	2008-2012	%	2008-2012	%	2008-2012	%	2012	2011	2010	2009	2008
By Contributing Circumstance																						
Over Centerline	1,606	9.0%	619	12.8%	10	22.2%	3	3	2	2	0	21,156	3.4%	8,292	9.3%	92	17.8%	20	32	30	6	4
Under Influence of Alcohol / Drugs	3,178	17.7%	1,016	20.9%	8	17.8%	3	2	1	1	1	36,519	5.8%	7,936	8.9%	43	8.3%	7	9	12	10	5
Exceeding Safe / Stated Speed	3,682	20.6%	1,236	25.5%	7	15.6%	0	1	3	2	1	117,420	18.7%	20,090	22.4%	126	24.4%	16	19	34	36	21
Inattention / Distraction	1,587	8.9%	402	8.3%	3	6.7%	0	1	1	1	0	86,025	13.7%	12,716	14.2%	76	14.7%	9	19	15	24	9
Apparently Asleep	335	1.9%	90	1.9%	3	6.7%	0	1	0	2	0	8,210	1.3%	2,005	2.2%	22	4.3%	3	5	6	6	2
Operating Defective Equipment	382	2.1%	101	2.1%	1	2.2%	0	0	0	0	1	13,110	2.1%	2,239	2.5%	22	4.3%	3	4	6	2	7
Failing to Yield	1,949	10.9%	361	7.4%	1	2.2%	0	1	0	0	0	104,075	16.6%	9,864	11.0%	16	3.1%	5	5	2	2	2
Other	1,771	9.9%	424	8.7%	12	26.7%	1	2	0	5	4	71,376	11.4%	9,853	11.0%	90	17.4%	12	24	19	23	12
Improper Passing	272	1.5%	93	1.9%	0	0.0%	0	0	0	0	0	5,991	1.0%	1,492	1.7%	7	1.4%	2	1	1	1	2
Disregard Stop Sign	438	2.4%	171	3.5%	0	0.0%	0	0	0	0	0	11,316	1.8%	2,711	3.0%	6	1.2%	1	0	3	0	2
Improper Backing	26	0.1%	2	0.0%	0	0.0%	0	0	0	0	0	10,788	1.7%	1,063	1.2%	4	0.8%	4	0	0	0	0
Apparently Ill	200	1.1%	39	0.8%	0	0.0%	0	0	0	0	0	3,802	0.6%	747	0.8%	4	0.8%	2	0	1	0	1
Failing to Yield to Ped / Cyclist	816	4.6%	58	1.2%	0	0.0%	0	0	0	0	0	7,839	1.3%	462	0.5%	2	0.4%	0	0	0	2	0
Disregard Yield Sign	12	0.1%	3	0.1%	0	0.0%	0	0	0	0	0	882	0.1%	61	0.1%	2	0.4%	0	1	1	0	0
Following Too Close	521	2.9%	80	1.6%	0	0.0%	0	0	0	0	0	83,421	13.3%	5,957	6.7%	1	0.2%	0	0	0	0	1
Improper Turn	132	0.7%	23	0.5%	0	0.0%	0	0	0	0	0	16,785	2.7%	1,441	1.6%	1	0.2%	0	0	0	1	0
Apparently Fatigued	51	0.3%	11	0.2%	0	0.0%	0	0	0	0	0	1,758	0.3%	376	0.4%	1	0.2%	1	0	0	0	0
Failing to Signal	12	0.1%	5	0.1%	0	0.0%	0	0	0	0	0	683	0.1%	143	0.2%	1	0.2%	0	0	0	1	0
Improper Parking Location	15	0.1%	5	0.1%	0	0.0%	0	0	0	0	0	954	0.2%	135	0.2%	1	0.2%	0	0	0	1	0
By Vehicle Type																						
Motorcycle	2,459	12.8%	703	15.7%	20	47.6%	1	6	5	5	3	11,819	1.2%	2,320	2.1%	37	6.9%	8	10	6	7	6
Passenger Car	8,235	43.0%	1,797	40.1%	12	28.6%	1	4	0	6	1	499,063	52.7%	53,374	49.4%	204	38.1%	38	43	37	56	30
Light Truck / SUV	7,126	37.2%	1,735	38.7%	7	16.7%	2	2	1	2	0	372,041	39.3%	46,614	43.2%	254	47.4%	44	54	70	59	27
Heavy Truck	724	3.8%	115	2.6%	2	4.8%	0	1	0	0	1	28,951	3.1%	2,505	2.3%	26	4.9%	5	5	5	7	4
Other / Not Stated	480	2.5%	124	2.8%	1	2.4%	0	0	0	1	0	28,430	3.0%	2,491	2.3%	13	2.4%	0	1	5	3	4
School Bus	28	0.1%	7	0.2%	0	0.0%	0	0	0	0	0	1,841	0.2%	412	0.4%	2	0.4%	1	0	0	0	1
By Speed Limit																						
20 MPH	75	0.4%	10	0.2%	0	0.0%	0	0	0	0	0	5,268	0.7%	535	0.5%	2	0.4%	0	1	1	0	0
25 MPH	2,137	12.3%	369	8.8%	0	0.0%	0	0	0	0	0	135,462	16.8%	11,933	12.2%	47	9.4%	9	10	10	9	9
30 MPH	2,192	12.6%	136	3.2%	0	0.0%	0	0	0	0	0	142,121	17.6%	4,875	5.0%	4	0.8%	0	2	1	1	0
35 MPH	4,350	25.1%	1,519	36.3%	6	15.4%	1	1	1	3	0	224,655	27.8%	42,732	43.7%	99	19.8%	20	13	20	33	13
40 MPH	1,312	7.6%	474	11.3%	1	2.6%	0	0	1	0	0	49,421	6.1%	10,122	10.4%	13	2.6%	5	1	3	1	3
45 MPH	1,063	6.1%	444	10.6%	0	0.0%	0	0	0	0	0	34,008	4.2%	8,328	8.5%	1	0.2%	0	1	0	0	0
50 MPH	1,944	11.2%	1,057	25.2%	32	82.1%	3	11	4	11	3	40,596	5.0%	16,905	17.3%	330	66.1%	56	80	76	81	37
55 MPH	1,445	8.3%	167	4.0%	0	0.0%	0	0	0	0	0	28,713	3.6%	2,127	2.2%	3	0.6%	0	0	1	1	1

Cowlitz County Data 2008-2012

	Injury and Fatal Collisions	
Injury	338	97%
Fatal	9	3%
Total	**347**	**100%**

Horizontal Alignment		
Curve	204	58.8%
Straight	140	40.3%
Unknown	3	0.9%
Total	**347**	**100.0%**

Vertical Alignment		
Grade	163	47.0%
Level	154	44.4%
Hillcrest	10	2.9%
Sag	17	4.9%
Unknown	3	0.9%
Total	**347**	**100.0%**

Pavement Width		
Unpaved	5	1.4%
Less than 20	8	2.3%
20-21.9	52	15.0%
22-23.9	74	21.3%
24-27.9	96	27.7%
28 and greater	112	32.3%
Total	**347**	**100.0%**

Pavement Width (w/ greater than 2' gravel shoulder)		
Unpaved	-	
Less than 20	5	1.4%
20-21.9	20	5.8%
22-23.9	21	6.1%
24-27.9	36	10.4%
28 and greater	11	3.2%
Total	**93**	**26.8%**

Pavement Width (w/ less than 2' gravel shoulders)		
Unpaved	-	
Less than 20	3	0.9%
20-21.9	32	9.2%
22-23.9	53	15.3%
24-27.9	60	17.3%
28 and greater	101	29.1%
Total	**249**	**71.8%**

Speed Limit		
None	3	0.9%
25	41	11.8%
30	21	6.1%
35	183	52.7%
40	66	19.0%
45	31	8.9%
50	2	0.6%
Total	**347**	**100.0%**

ADT		
0-49	8	2.3%
50-99	13	3.7%
100-249	42	12.1%
250-499	60	17.3%
500-999	68	19.6%
1000-199	70	20.2%
2000-620	86	24.8%
Total	**347**	**100.0%**

Road Condition		
Dry	207	59.7%
Wet	103	29.7%
Snow/Ice	35	10.1%
Other	2	0.6%
Total	**347**	**100.0%**

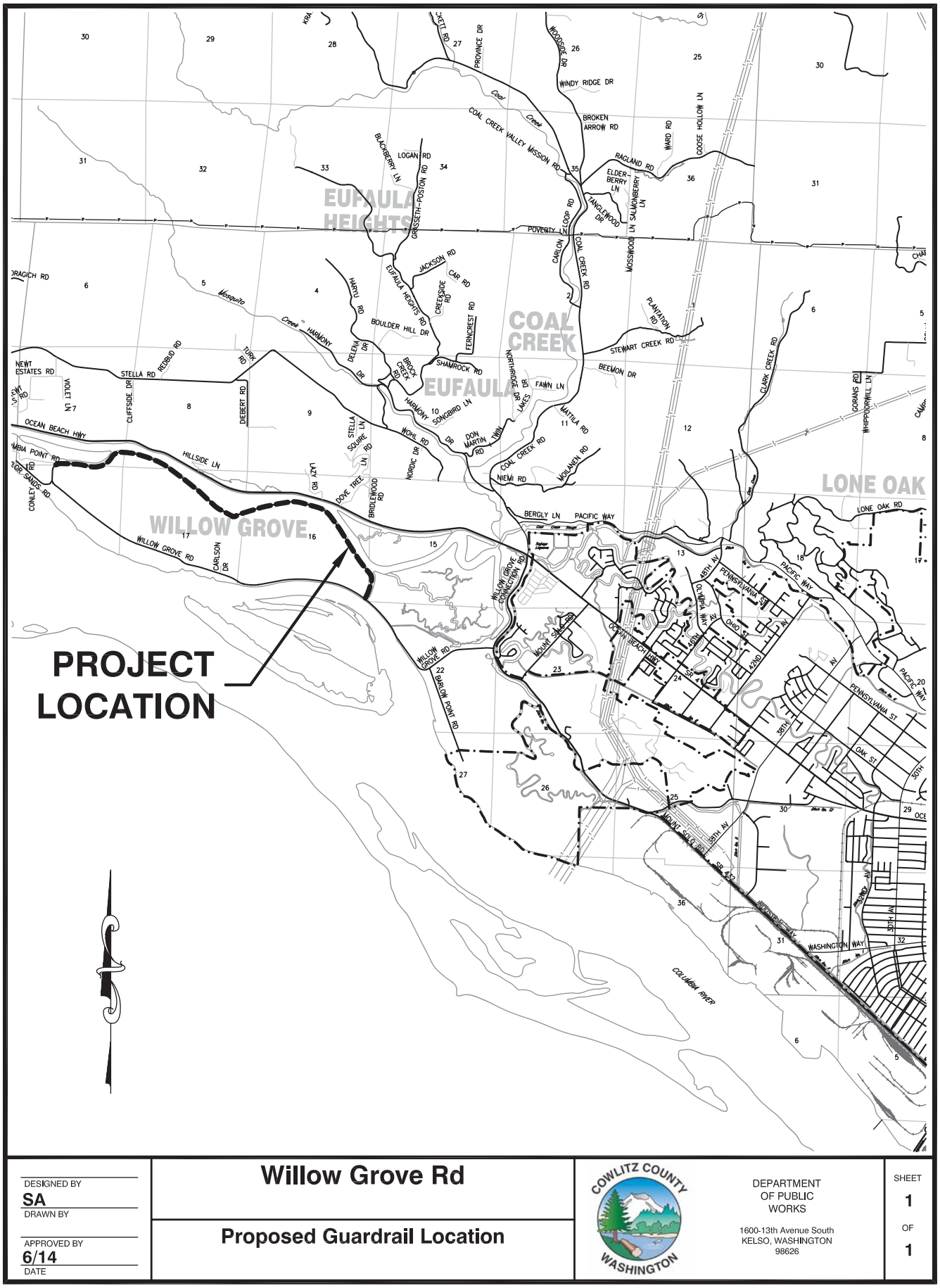
Light		
Dawn	5	1.4%
Daylight	199	57.3%
Dusk	8	2.3%
Dark - Str	11	3.2%
Dark	120	34.6%
Unknown	4	1.2%
Total	**347**	**100.0%**

Collision Type		
Hit Objec	227	65.4%
Vehicle o	32	9.2%
Entering a	9	2.6%
Same dire	26	7.5%
Opposite	24	6.9%
Other	29	8.4%
Total	**347**	**100.0%**

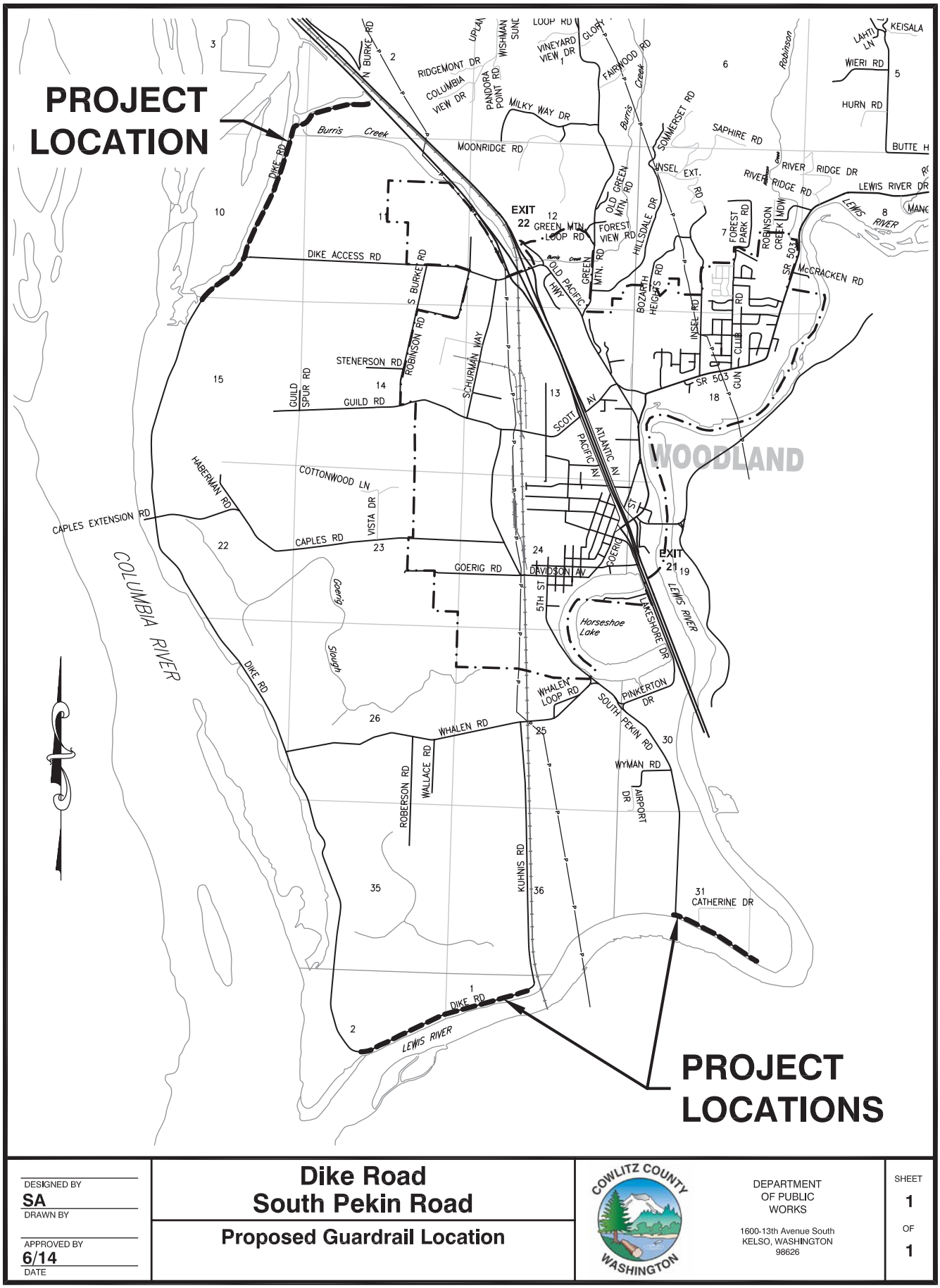
Contributing Circumstance		
Speed	99	28.5%
Influence	76	21.9%
Over Cent	16	4.6%
Improper	6	1.7%
Total	**197**	**56.8%**

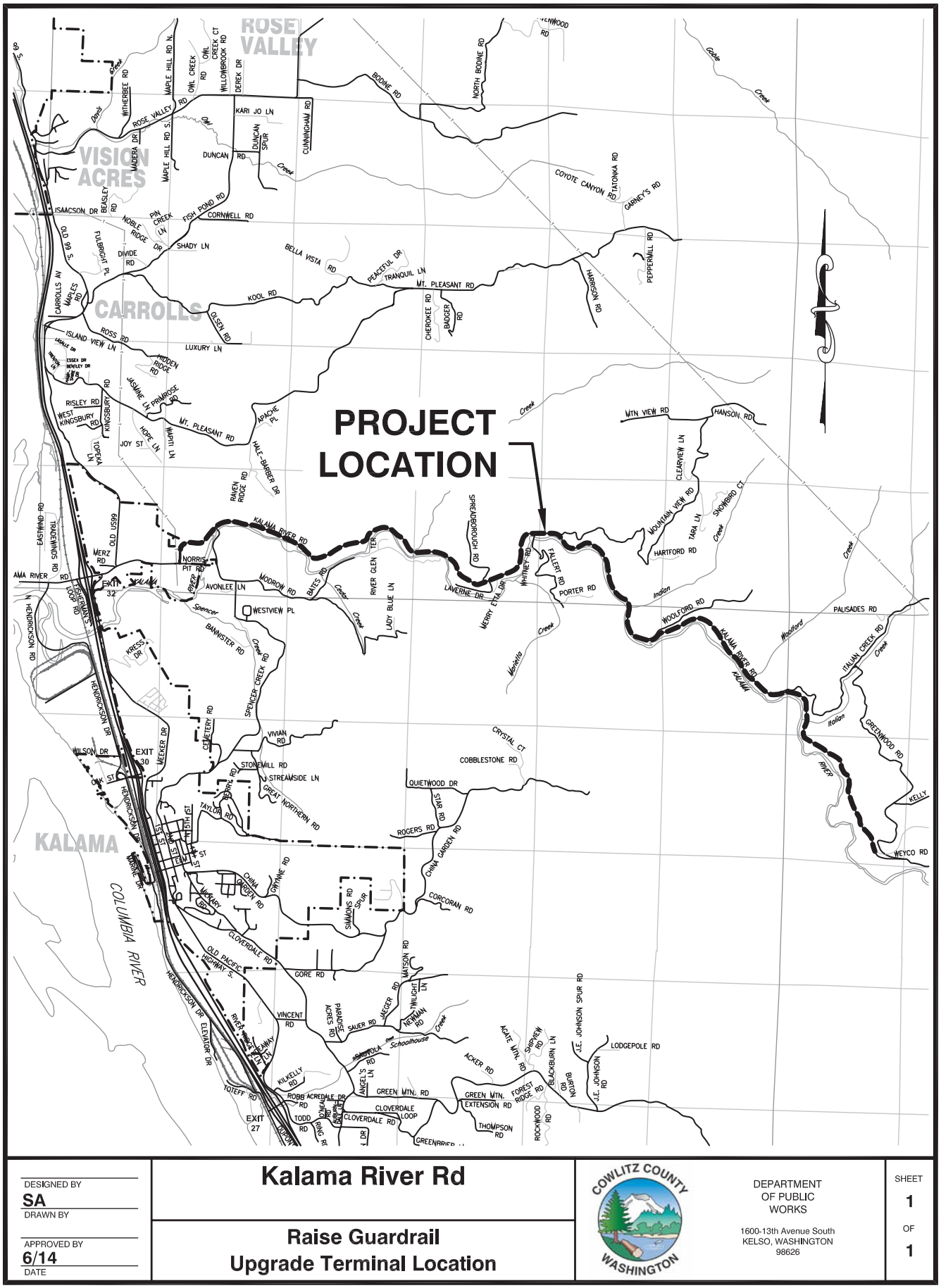
Appendix B

Vicinity Maps

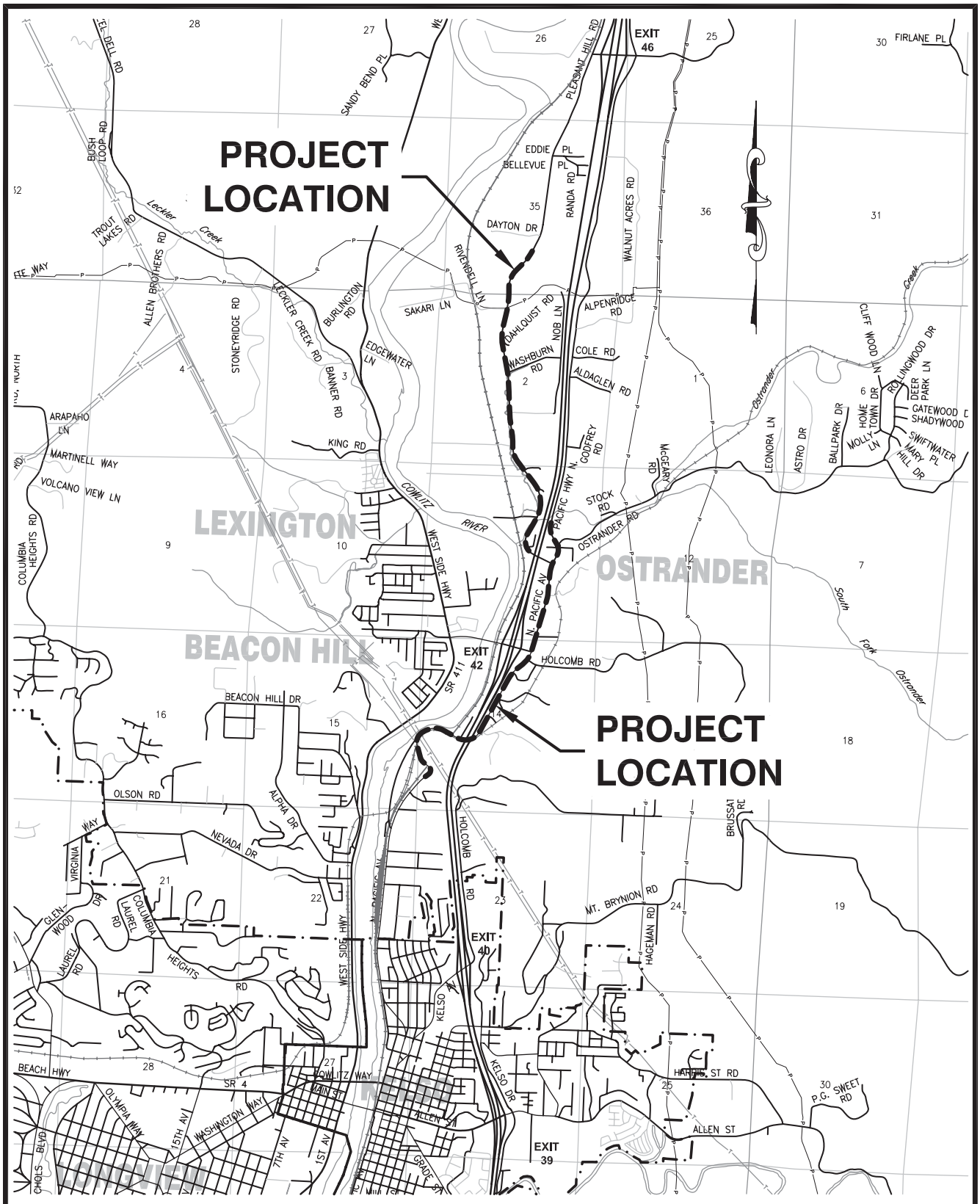


D-134

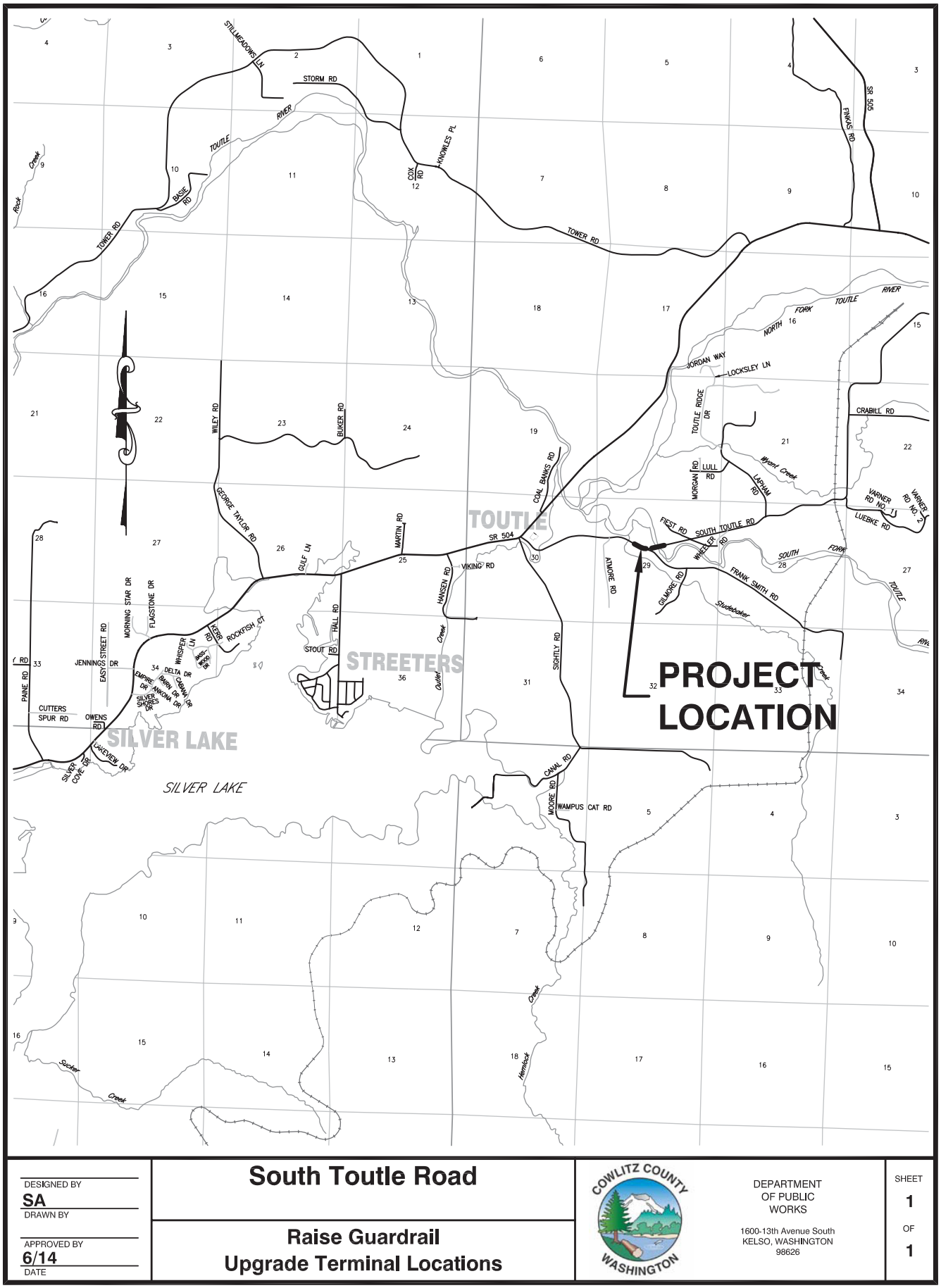




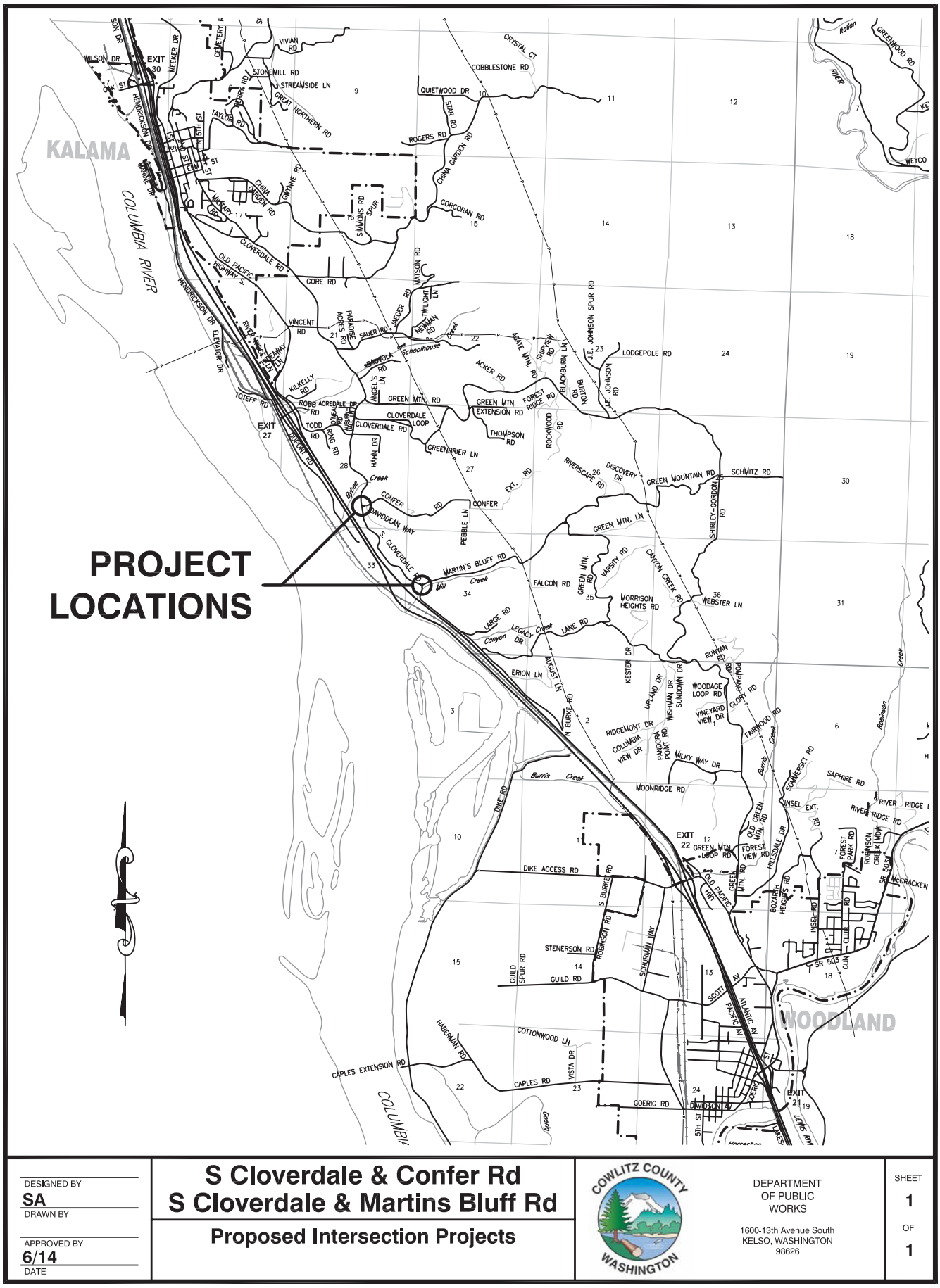
D-136



DESIGNED BY SA DRAWN BY APPROVED BY 6/14 DATE	**Pacific Avenue North** **Pleasant Hill Road** **Raise Guardrail** **Upgrade Terminal Locations**	COWLITZ COUNTY WASHINGTON DEPARTMENT OF PUBLIC WORKS 1600-13th Avenue South KELSO, WASHINGTON 98626	SHEET 1 OF 1



DESIGNED BY SA DRAWN BY APPROVED BY 6/14 DATE	**South Toutle Road** **Raise Guardrail Upgrade Terminal Locations**	COWLITZ COUNTY WASHINGTON	DEPARTMENT OF PUBLIC WORKS 1600-13th Avenue South KELSO, WASHINGTON 98626	SHEET 1 OF 1



Appendix C

Cost Estimates

PROJECT: 2014 County Safety Program - Willow Grove Road guardrail

Preliminary Engineer's Estimate

6/30/2014

BID ITEM	UNIT	QUANTITY	UNIT PRICE	TOTAL AMOUNT
1. MINOR CHANGES	FA	1	7,000.00	7,000.00
2. SPCC PLAN	LS	1	1,000.00	1,000.00
3. MOBILIZATION	LS	1	35,000.00	35,000.00
4. FLAGGERS AND SPOTTERS	HR	480	50.00	24,000.00
5. OTHER TEMPORARY TRAFFIC CONTROL	LS	1	10,000.00	10,000.00
6. FLEXIBLE GUIDE POST ON GUARDRAIL POST	EA	500	18.00	9,000.00
7. BEAM GUARDRAIL TYPE 1 - 6 FT LONG POSTS	LF	250	20.00	5,000.00
8. BEAM GUARDRAIL TYPE 1 - 8 FT LONG POSTS	LF	6975	23.00	160,425.00
9. BEAM GUARDRAIL TYPE 1 - 9 FT LONG POSTS	LF	5825	27.00	157,275.00
10. BEAM GUARDRAIL TYPE 1 - 11 FT LONG POSTS	LF	3375	30.00	101,250.00
11. BEAM GUARDRAIL NON-FLARED TERMINAL - TL2	EA	6	2,250.00	13,500.00
12. REMOVE EXISTING GUARDRAIL	LF	350	4.50	1,575.00
		SUBTOTAL		525,025.00
		Construction Engineering		20,000.00
		State Services		5,000.00
		GRAND TOTAL		550,025.00

PROJECT: 2014 County Safety Program - South Pekin Road guardrail

Preliminary Engineer's Estimate

6/30/2014

BID ITEM	UNIT	QUANTITY	UNIT PRICE	TOTAL AMOUNT
1. SPCC PLAN	LS	1	500.00	500.00
2. MOBILIZATION	LS	1	6,000.00	6,000.00
3. FLAGGERS AND SPOTTERS	HR	120	50.00	6,000.00
4. OTHER TEMPORARY TRAFFIC CONTROL	LS	1	1,500.00	1,500.00
5. FLEXIBLE GUIDE POST ON GUARDRAIL POST	EA	25	18.00	450.00
6. BEAM GUARDRAIL TYPE 1 - 6 FT LONG POSTS	LF	750	20.00	15,000.00
7. BEAM GUARDRAIL TYPE 1 - 8 FT LONG POSTS	LF	750	23.00	17,250.00
8. BEAM GUARDRAIL TYPE 1 - 9 FT LONG POSTS	LF	800	27.00	21,600.00
9. BEAM GUARDRAIL TYPE 1 - 11 FT LONG POSTS	LF	500	30.00	15,000.00
10. BEAM GUARDRAIL NON-FLARED TERMINAL - TL2	EA	2	2,250.00	4,500.00
		SUBTOTAL		87,800.00
		Construction Engineering		10,000.00
		State Services		2,500.00
		GRAND TOTAL		100,300.00

PROJECT: 2014 County Safety Program - Dike Road guardrail

Preliminary Engineer's Estimate

6/30/2014

BID ITEM	UNIT	QUANTITY	UNIT PRICE	TOTAL AMOUNT
1. SPCC PLAN	LS	1	500.00	500.00
2. MOBILIZATION	LS	1	35,000.00	35,000.00
3. FLAGGERS AND SPOTTERS	HR	480	50.00	24,000.00
4. OTHER TEMPORARY TRAFFIC CONTROL	LS	1	10,000.00	10,000.00
5. FLEXIBLE GUIDE POST ON GUARDRAIL POST	EA	100	18.00	1,800.00
6. BEAM GUARDRAIL TYPE 1 - 6 FT LONG POSTS	LF	3000	20.00	60,000.00
7. BEAM GUARDRAIL TYPE 1 - 8 FT LONG POSTS	LF	4000	23.00	92,000.00
8. BEAM GUARDRAIL TYPE 1 - 9 FT LONG POSTS	LF	7000	27.00	189,000.00
9. BEAM GUARDRAIL TYPE 1 - 11 FT LONG POSTS	LF	3500	30.00	105,000.00
10. BEAM GUARDRAIL NON-FLARED TERMINAL - TL2	EA	6	2,250.00	13,500.00
		SUBTOTAL		530,800.00
		Construction Engineering		20,000.00
		State Services		5,000.00
		GRAND TOTAL		555,800.00

PROJECT: 2014 County Safety Program - Countywide guardrail

Preliminary Engineer's Estimate

6/30/2014

BID ITEM	UNIT	QUANTITY	UNIT PRICE	TOTAL AMOUNT
1. SPCC PLAN	LS	1	500.00	500.00
2. MOBILIZATION	LS	1	35,000.00	35,000.00
3. FLAGGERS AND SPOTTERS	HR	480	50.00	24,000.00
4. OTHER TEMPORARY TRAFFIC CONTROL	LS	1	10,000.00	10,000.00
5. FLEXIBLE GUIDE POST ON GUARDRAIL POST	EA	750	18.00	13,500.00
6. BEAM GUARDRAIL TYPE 1 - 6 FT LONG POSTS	LF	7500	20.00	150,000.00
7. BEAM GUARDRAIL TYPE 1 - 8 FT LONG POSTS	LF	5000	23.00	115,000.00
8. BEAM GUARDRAIL TYPE 1 - 9 FT LONG POSTS	LF	2000	27.00	54,000.00
9. BEAM GUARDRAIL TYPE 1 - 11 FT LONG POSTS	LF	0	30.00	-
10. BEAM GUARDRAIL NON-FLARED TERMINAL - TL2	EA	30	2,250.00	67,500.00
		SUBTOTAL		469,500.00
		Construction Engineering		25,000.00
		State Services		5,000.00
		GRAND TOTAL		499,500.00

PROJECT: 2014 County Safety Program - Roadside Delineation

Preliminary Engineer's Estimate

6/30/2014

BID ITEM	UNIT	QUANTITY	UNIT PRICE	TOTAL AMOUNT
1. SPCC PLAN	LS	1	500.00	500.00
2. MOBILIZATION	LS	1	15,000.00	15,000.00
3. FLAGGERS AND SPOTTERS	HR	500	50.00	25,000.00
4. FLEXIBLE GUIDEPOSTS	EA	10000	18.00	180,000.00
			SUBTOTAL	220,500.00
			Construction Engineering	20,000.00
			State Services	2,500.00
			GRAND TOTAL	243,000.00

PROJECT: 2014 County Safety Program - Upgrade/Install Curve Signs/Chevrons

Preliminary Engineer's Estimate

6/30/2014

BID ITEM	UNIT	QUANTITY	UNIT PRICE	TOTAL AMOUNT
1. SPCC PLAN	LS	1	500.00	500.00
2. MOBILIZATION	LS	1	7,500.00	7,500.00
3. FLAGGERS AND SPOTTERS	HR	500	50.00	25,000.00
4. CURVE SIGNS/CHEVRONS	EA	300	175.00	52,500.00
			SUBTOTAL	85,500.00
			Construction Engineering	12,500.00
			State Services	2,500.00
			GRAND TOTAL	100,500.00

PROJECT: 2014 County Safety Program - raise guardrail/upgrade terminals

Kalama River Road, South Toutle Road, Pleasant Hill Road, Pacific Avenue North

Preliminary Engineer's Estimate

6/30/2014

BID ITEM	UNIT	QUANTITY	UNIT PRICE	TOTAL AMOUNT
1. SPCC PLAN	LS	1	500.00	500.00
2. MOBILIZATION	LS	1	15,000.00	15,000.00
3. FLAGGERS AND SPOTTERS	HR	300	50.00	15,000.00
4. OTHER TEMPORARY TRAFFIC CONTROL	LS	1	7,500.00	7,500.00
5. RAISE GUARDRAIL	LF	10000	10.00	100,000.00
6. BEAM GUARDRAIL NON-FLARED TERMINAL - TL2	EA	40	2,250.00	90,000.00
	SUBTOTAL			228,000.00
	Construction Engineering			20,000.00
	State Services			2,500.00
	GRAND TOTAL			250,500.00

Cowlitz County
Department of Public Works

South Cloverdale/Confer Road Intersection Improvement

June 30, 2014

Item	Approx Quantity		Description	Unit Price	Amount
1	1	Force Acct	Minor changes	$ 7,500.00	$ 7,500.00
2	1	Lump Sum	SPCC Plan	$ 500.00	$ 500.00
3	1	Lump Sum	Mobilization	$ 20,000.00	$ 20,000.00
4	640	Hours	Flaggers and Spotters	$ 50.00	$ 32,000.00
5	1	Lump Sum	Other Temporary Traffic Control	$ 1,000.00	$ 1,000.00
6	1	Lump Sum	Clearing and Grubbing	$ 2,500.00	$ 2,500.00
7	1	Lump Sum	Removal of Structures and Obstructions	$ 1,500.00	$ 1,500.00
8	3200	CY	Roadway Excav, Embank & Disp Incl. Haul	$ 12.00	$ 38,400.00
9	1235	CY	Rock Excavation Including Haul	$ 60.00	$ 74,100.00
10	25	CY	Unsuitable Foundation Excavation Incl. Haul	$ 20.00	$ 500.00
11	1	Lump Sum	Trimming and Cleanup	$ 1,000.00	$ 1,000.00
12	360	Tons	Structural Fill	$ 20.00	$ 7,200.00
13	2120	Tons	Crushed Surfacing Base Course	$ 20.00	$ 42,400.00
14	490	Tons	HMA Class 1/2" PG 64-22	$ 110.00	$ 53,900.00
15	40	Tons	HMA For Approach Class 1/2" PG 64-22	$ 150.00	$ 6,000.00
16	1	CALC	Asphalt Cost Price Adjustment	$ -	$ -
17	147	LF	CPE Storm Sewer Pipe, 12-inch Diameter	$ 35.00	$ 5,145.00
18	56	LF	CPE Storm Sewer Pipe, 18-inch Diameter	$ 50.00	$ 2,800.00
19	1	Lump Sum	Shoring or Extra Excavation Class B	$ 500.00	$ 500.00
20	1	LS	Seeding Fertilizing and Mulching	$ 750.00	$ 750.00
21	47	LF	Cement Concrete Curb and Gutter	$ 75.00	$ 3,525.00
22	2	EA	Mailbox Support Type 1	$ 300.00	$ 600.00
23	1	EA	Mailbox Support Type 2	$ 1,000.00	$ 1,000.00
24	1	LS	Permanent Signing	$ 200.00	$ 200.00
25	1736	LF	Paint Line	$ 0.50	$ 868.00
26	24	LF	Plastic Stop Line	$ 25.00	$ 600.00

Total	$	304,488.00
Construction Engineering (15%)	$	45,673.20
	$	350,161.20

Cowlitz County
Department of Public Works

South Cloverdale/Martins Bluff Road Intersection Improvement

June 30, 2014

Item	Approx Quantity		Description	Unit Price	Amount
1	1	Force Acct	Minor changes	$ 2,500.00	$ 2,500.00
2	1	Lump Sum	SPCC Plan	$ 500.00	$ 500.00
3	1	Lump Sum	Mobilization	$ 5,000.00	$ 5,000.00
4	160	Hours	Flaggers and Spotters	$ 50.00	$ 8,000.00
5	1	Lump Sum	Other Temporary Traffic Control	$ 1,000.00	$ 1,000.00
6	1	Lump Sum	Clearing and Grubbing	$ 1,500.00	$ 1,500.00
7	1	Lump Sum	Removal of Structures and Obstructions	$ 1,500.00	$ 1,500.00
8	200	CY	Roadway Excav, Embank & Disp Incl. Haul	$ 20.00	$ 4,000.00
9	100	CY	Rock Excavation Including Haul	$ 60.00	$ 6,000.00
10	25	CY	Unsuitable Foundation Excavation Incl. Haul	$ 20.00	$ 500.00
11	1	Lump Sum	Trimming and Cleanup	$ 1,000.00	$ 1,000.00
12	50	Tons	Structural Fill	$ 20.00	$ 1,000.00
13	500	Tons	Crushed Surfacing Base Course	$ 20.00	$ 10,000.00
14	180	Tons	HMA Class 1/2" PG 64-22	$ 110.00	$ 19,800.00
15	1	LS	Seeding Fertilizing and Mulching	$ 750.00	$ 750.00
16	1	LS	Permanent Signing	$ 200.00	$ 200.00
17	600	LF	Paint Line	$ 0.50	$ 300.00
18	24	LF	Plastic Stop Line	$ 25.00	$ 600.00

Total	$	64,150.00
Construction Engineering (15%)	$	9,622.50
	$	73,772.50

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Grant County Local Road Safety Plan

June 2014

This Safety Plan is being completed for the 2014 County Safety Program Grant Application. The plan is a way to prioritize locations based upon Grant County data. The 2008 – 2012 Grant County Accident Data (Appendix 1) was utilized for this plan.

The three (3) major collision types that represented 80% of all Fatal/Serious Injury and 70% of Total Crashes; Overturn, Hit Fixed Object & Angle. These 3 collision types are the top priority for this Safety Plan. The Overturn & Hit Fixed Object crashes are road segment related crashes and the Angle crashes are intersection related crashes.

Prioritization – Overturn & Hit Fixed Objects.

The Overturn & Hit Fixed Objects are Run Off the Road crashes that involved the Roadway Ditch, Embankment or an Earth Bank. The Accident Data showed that approximately 60% of all Fatal/Serious Injury are on Straight Road Segments and 40% are on Curved Road Segments. These types of Road segments will be evaluated separately. Conditions that are not be evaluated include Ice, Snow & Slush as these conditions are short term, hit the road system normally all at once and are addressed thru Road Maintenance.

Straight Road Segments (Appendix 2)

One (1) Star was assigned to each of the following conditions:

- FFC's 06 – Minor Arterial, 07 – Major Collector, 08 – Minor Collector, 09 – Local Access
- ADT > 1,000
- Posted Speed >= 50mph
- Pavement Type: Hot Mix Asphalt

Countermeasure Selection (From Washington State Strategic Highway Safety Plan 2013) – 4 Star Routes – Priority #1 (If only part of the Road was 4 stars the other segments where included for consistency along the Road and Roads that where less than 0.5 miles in length were taken out.) Addresses Dark and Over Centerline crashes.

- 1 Reduce the number of vehicles leaving the roadway
  - 1.1 – Improve roadway signing and shoulder delineation, especially in curves
    - **Install Recessed Pavement Markers on Centerline** (additional delineation).
    - In 2012 & 2013 all roads in this group had horizontal curve signs upgraded and guideposts installed.
  - 1.4 – Install center and/or edge line rumble strips
    - **Test Section – Install Shoulder Rumble Strips** (Dodson Section selected based on the numerous run off the road crashes and the consequences for leaving the road; embankment/wetland area – Test Section will be evaluated on public input/concern (noise), reduction in crashes & effects on the pavement condition)

Horizontal Curve Road Segments (Appendix 3)

One (1) Star was assigned to each of the following conditions:

- FFC's 09 – Local Access (08's & 07's upgrade last safety project)
- ADT > 100
- Posted Speed >= 35mph
- Pavement Type: Hot Mix Asphalt, BST Surface

Countermeasure Selection (From Washington State Strategic Highway Safety Plan 2013) – 4 Star Routes – Priority #2 & 3 Star Routes – Priority #5 (Unless Classified as a Primitive Road – anything 3 Stars and above should not be a primitive road) Addresses Dark and Over Centerline crashes.

- 1 Reduce the number of vehicles leaving the roadway
  - 1.1 – Improve roadway signing and shoulder delineation, especially in curves
    - **Install Updated Horizontal Alignment Signs**.

Intersections (Appendix 3)

(Last 5 Years)

One (1) Star was assigned to each of the following conditions:

- Disregard Stop Sign
- Fatal and / or 2 Injury Crashes
- 2 or more Crashes at Intersection

Countermeasure Selection (From Washington State Strategic Highway Safety Plan 2013) – 3 Star Intersections – Priority #3 (Addresses Disregard Stop Sign Crashes)

- 1 Reduce motor vehicle collisions at intersection
  - 1.12 – Improve visibility of intersection by providing enhanced signing and delineation
    - **Install Solar Power LED Flashing Stop Signs**

Guardrail Safety Data (Appendix 5)

All Guardrail locations on Grant County Roads.

Countermeasure Selection (From Washington State Strategic Highway Safety Plan 2013) Addresses Hit fixed Object Crashes.

- 2 Minimize the consequences of leaving the roadway
  - 2.2 – Install/maintain roadside safety hardware such as guardrail, cable barrier, concrete barriers, etc.
    - **Collect Data on all existing Guardrail to prioritize future Guardrail Upgrades – Data Collected includes; Verification of Location & Type, Standard / Sub-Standard, Terminal Type & Height**

Cable Barrier Upgrade

All Cable Barrier locations on Grant County Roads.

Countermeasure Selection (From Washington State Strategic Highway Safety Plan 2013) Addresses Hit fixed Object Crashes.

- 2 Minimize the consequences of leaving the roadway
  - 2.2 – Install/maintain roadside safety hardware such as guardrail, cable barrier, concrete barriers, etc.
    - **Upgrade Sub-Standard Cable Barrier to current Standard Barrier.**

Federal highway safety laws require the state to create this crash database for use in obtaining federal safety improvement funds. Under Section 409 of Title 23 of the United States Code, crash data is prohibited from use in any litigation against state, tribal or local government that involves the location(s) mentioned in the crash data.

2008-2012 Grant County Data

	Fatal/Serious Injury Crashes Only											Total Crashes										
	All Public Roads		All Counties		Grant County							All Public Roads		All Counties		Grant County						
	2008-2012	%	2008-2012	%	2008-2012	%	2012	2011	2010	2009	2008	2008-2012	%	2008-2012	%	2008-2012	%	2012	2011	2010	2009	2008
Overall Numbers																						
Total # of Collisions	12,447		3,246		78		17	21	9	14	17	513,944		70,278		1,700		336	339	361	334	330
# of Fatal Collisions	2,190	17.6%	682	21.0%	27	34.6%	4	6	4	7	6	2,190	0.4%	682	1.0%	27	1.6%	4	6	4	7	6
# of Serious Injury Collisions	10,257	82.4%	2,564	79.0%	51	65.4%	13	15	5	7	11	10,257	2.0%	2,564	3.6%	51	3.0%	13	15	5	7	11
# of Alcohol-Related Collisions	3,268	26.3%	1,078	33.2%	28	35.9%	4	8	1	8	7	38,860	7.6%	8,700	12.4%	169	9.9%	29	31	39	35	35
Total # of Fatalities	2,375		732		29		5	7	4	7	6	2,375		732		29		5	7	4	7	6
Total # of Injuries	17,770		4,503		103		21	27	11	21	23	235,108		35,239		727		127	134	146	149	171
By Collision Type																						
Overturn	1,281	10.3%	424	13.1%	28	35.9%	5	9	3	5	6	14,764	2.9%	4,893	7.0%	322	18.9%	61	60	54	70	77
Hit Fixed Object	3,439	27.6%	1,340	41.3%	23	29.5%	5	5	3	4	6	99,255	19.3%	28,374	40.4%	665	39.1%	134	137	154	127	113
Angle (T)	1,369	11.0%	324	10.0%	12	15.4%	3	3	2	2	2	79,814	15.5%	9,440	13.4%	180	10.6%	28	42	48	38	24
Head On	642	5.2%	182	5.6%	5	6.4%	1	1	0	2	1	2,896	0.6%	858	1.2%	14	0.8%	2	1	2	5	4
Sideswipe (Same Direction)	318	2.6%	74	2.3%	2	2.6%	1	1	0	0	0	47,595	9.3%	2,933	4.2%	93	5.5%	26	20	18	13	16
Rearend	1,169	9.4%	157	4.8%	1	1.3%	0	0	0	1	0	148,372	28.9%	10,515	15.0%	118	6.9%	27	18	29	27	17
Wildlife	149	1.2%	78	2.4%	1	1.3%	0	1	0	0	0	9,262	1.8%	1,839	2.6%	80	4.7%	14	16	15	19	16
Sideswipe (Opposite Direction)	183	1.5%	58	1.8%	1	1.3%	0	0	1	0	0	3,693	0.7%	1,060	1.5%	22	1.3%	4	4	5	6	3
Hit Pedestrian	1,667	13.4%	208	6.4%	1	1.3%	1	0	0	0	0	8,927	1.7%	740	1.1%	6	0.4%	2	2	1	1	0
Other	659	5.3%	148	4.6%	4	5.1%	1	1	0	0	2	30,673	6.0%	3,599	5.1%	92	5.4%	12	16	16	13	35
Hit Parked Car	185	1.5%	33	1.0%	0	0.0%	0	0	0	0	0	33,799	6.6%	2,390	3.4%	82	4.8%	19	19	14	12	18
Angle (Left Turn)	697	5.6%	126	3.9%	0	0.0%	0	0	0	0	0	28,023	5.5%	3,001	4.3%	21	1.2%	7	3	4	2	5
Hit Cyclist	678	5.4%	92	2.8%	0	0.0%	0	0	0	0	0	6,759	1.3%	618	0.9%	5	0.3%	0	1	1	1	2
By Roadway Surface																						
Dry	9,085	73.0%	2,372	73.1%	70	89.7%	17	20	6	14	13	333,394	64.9%	43,160	61.4%	1,194	70.2%	229	235	239	253	238
Ice	296	2.4%	117	3.6%	3	3.8%	0	1	0	0	2	17,284	3.4%	5,075	7.2%	265	15.6%	58	67	54	44	42
Wet	2,644	21.2%	655	20.2%	3	3.8%	0	0	2	0	1	135,756	26.4%	17,955	25.5%	93	5.5%	17	17	23	16	20
Snow / Slush	241	1.9%	51	1.6%	1	1.3%	0	0	0	0	1	16,541	3.2%	2,791	4.0%	107	6.3%	22	13	34	16	22
Other	181	1.5%	51	1.6%	1	1.3%	0	0	1	0	0	10,969	2.1%	1,297	1.8%	41	2.4%	10	7	11	5	8
By Light Condition																						
Daylight	7,169	57.6%	1,753	54.0%	43	55.1%	13	11	4	6	9	334,748	65.1%	40,604	57.8%	952	56.0%	191	192	191	194	184
Dark - No Street Lights	2,014	16.2%	941	29.0%	25	32.1%	3	8	3	6	5	43,360	8.4%	15,673	22.3%	538	31.6%	102	113	119	106	98
Dusk	412	3.3%	122	3.8%	5	6.4%	1	0	2	1	1	14,114	2.7%	2,110	3.0%	49	2.9%	9	9	13	10	8
Dawn	215	1.7%	66	2.0%	3	3.8%	0	2	0	0	1	9,469	1.8%	1,799	2.6%	66	3.9%	11	15	18	8	14
Dark - Street Lights On	2,418	19.4%	289	8.9%	1	1.3%	0	0	0	0	1	98,641	19.2%	8,121	11.6%	56	3.3%	15	5	14	8	14
Dark - Street Lights Off	110	0.9%	38	1.2%	1	1.3%	0	0	0	1	0	3,858	0.8%	898	1.3%	11	0.6%	0	0	1	4	6
Other	109	0.9%	37	1.1%	0	0.0%	0	0	0	0	0	9,754	1.9%	1,073	1.5%	28	1.6%	8	5	5	4	6
By Junction Relationship																						
Non-Intersection (Not Related)	6,705	53.9%	2,117	65.2%	59	75.6%	12	16	7	10	14	230,934	44.9%	38,222	54.4%	1,102	64.8%	212	222	230	223	215
Intersection-Related	4,107	33.0%	711	21.9%	13	16.7%	2	4	2	3	2	207,667	40.4%	22,056	31.4%	389	22.9%	73	73	91	79	73
Driveway-Related	960	7.7%	212	6.5%	3	3.8%	2	0	0	0	1	50,371	9.8%	6,704	9.5%	145	8.5%	45	36	26	12	26
By Roadway Curvature																						
Straight & Level	6,588	52.9%	1,397	43.0%	39	50.0%	9	10	4	7	9	322,235	62.7%	36,635	52.1%	1,133	66.6%	225	212	242	223	231
Horizontal Curve	3,353	26.9%	1,282	39.5%	29	37.2%	7	8	4	5	5	77,321	15.0%	19,729	28.1%	354	20.8%	67	78	71	79	59
Straight & Grade	2,165	17.4%	441	13.6%	10	12.8%	1	3	1	2	3	95,899	18.7%	10,665	15.2%	151	8.9%	28	34	40	24	25

Vertical Curve	352	2.8%	132	4.1%	1	1.3%	0	1	0	0	0	10,912	2.1%	2,655	3.8%	52	3.1%	11	12	10	4	15
Unknown	123	1.0%	50	1.5%	0	0.0%	0	0	0	0	0	10,598	2.1%	1,491	2.1%	23	1.4%	5	7	3	5	3
Hit Fixed Object Crashes Only - By Fixed Object Hit																						
Roadway Ditch	339	9.9%	171	12.8%	5	21.7%	0	1	0	1	3	12,020	12.1%	5,533	19.5%	179	27.1%	34	35	41	37	32
Ran Over Embankment	299	8.7%	136	10.1%	5	21.7%	2	0	2	1	0	4,085	4.1%	1,948	6.9%	61	9.2%	16	12	16	10	7
Earth Bank	249	7.2%	103	7.7%	3	13.0%	1	1	1	0	0	5,398	5.4%	2,160	7.6%	79	12.0%	15	18	19	19	8
Fence	214	6.2%	105	7.8%	2	8.7%	0	1	0	0	1	8,003	8.1%	3,146	11.1%	70	10.6%	11	14	17	15	13
Utility Pole	317	9.2%	146	10.9%	2	8.7%	1	0	0	1	0	7,402	7.5%	3,451	12.2%	53	8.0%	10	6	15	10	12
Mail Box	72	2.1%	49	3.7%	2	8.7%	1	0	0	1	0	2,477	2.5%	1,289	4.5%	33	5.0%	8	4	7	8	6
Wood Sign Post	88	2.6%	25	1.9%	1	4.3%	0	1	0	0	0	4,200	4.2%	949	3.3%	18	2.7%	2	6	4	3	3
Culvert	63	1.8%	47	3.5%	1	4.3%	0	1	0	0	0	785	0.8%	466	1.6%	10	1.5%	3	3	3	0	1
Bridge Rail	68	2.0%	6	0.4%	1	4.3%	0	0	0	0	1	3,614	3.6%	200	0.7%	7	1.1%	3	1	1	0	2
Other Objects	79	2.3%	30	2.2%	1	4.3%	0	0	0	0	1	3,142	3.2%	835	2.9%	30	4.5%	5	9	8	4	4
Tree / Stump (Stationary)	642	18.7%	334	24.9%	0	0.0%	0	0	0	0	0	9,828	9.9%	3,779	13.3%	39	5.9%	6	9	7	8	9
Guardrail	247	7.2%	56	4.2%	0	0.0%	0	0	0	0	0	8,153	8.2%	1,349	4.8%	21	3.2%	3	5	4	4	5
Boulder (Stationary)	55	1.6%	30	2.2%	0	0.0%	0	0	0	0	0	1,080	1.1%	452	1.6%	17	2.6%	4	4	4	4	1
Ran Into River / Lake	11	0.3%	4	0.3%	0	0.0%	0	0	0	0	0	379	0.4%	200	0.7%	13	2.0%	2	1	2	4	4
Curb / Raised Traffic Island	116	3.4%	15	1.1%	0	0.0%	0	0	0	0	0	3,347	3.4%	305	1.1%	7	1.1%	3	1	2	0	1
Utility Box	20	0.6%	9	0.7%	0	0.0%	0	0	0	0	0	910	0.9%	383	1.3%	4	0.6%	3	0	0	0	1
Building	28	0.8%	3	0.2%	0	0.0%	0	0	0	0	0	1,381	1.4%	193	0.7%	3	0.5%	0	2	0	0	1
Luminaire Pole	69	2.0%	4	0.3%	0	0.0%	0	0	0	0	0	3,296	3.3%	190	0.7%	3	0.5%	1	1	1	0	0
Misc. Debris on Road	20	0.6%	4	0.3%	0	0.0%	0	0	0	0	0	1,201	1.2%	122	0.4%	3	0.5%	1	1	0	0	1
Rock Bank	49	1.4%	11	0.8%	0	0.0%	0	0	0	0	0	687	0.7%	100	0.4%	3	0.5%	1	2	0	0	0
Retaining Wall	77	2.2%	18	1.3%	0	0.0%	0	0	0	0	0	2,001	2.0%	331	1.2%	2	0.3%	0	1	1	0	0
Concrete Barrier	135	3.9%	5	0.4%	0	0.0%	0	0	0	0	0	7,884	7.9%	151	0.5%	2	0.3%	0	1	0	0	1
Snow Bank	10	0.3%	4	0.3%	0	0.0%	0	0	0	0	0	740	0.7%	141	0.5%	1	0.2%	1	0	0	0	0
Fallen Rock / Tree	12	0.3%	4	0.3%	0	0.0%	0	0	0	0	0	401	0.4%	80	0.3%	1	0.2%	1	0	0	0	0
Traffic Signal Pole	30	0.9%	5	0.4%	0	0.0%	0	0	0	0	0	793	0.8%	43	0.2%	1	0.2%	0	0	1	0	0
Construction Materials	1	0.0%	0	0.0%	0	0.0%	0	0	0	0	0	79	0.1%	9	0.0%	1	0.2%	1	0	0	0	0
By Contributing Circumstance																						
Exceeding Safe / Stated Speed	3,682	20.6%	1,236	25.5%	35	28.2%	4	10	3	9	9	117,420	18.7%	20,090	22.4%	608	27.1%	115	118	133	126	116
Under Influence of Alcohol / Drugs	3,178	17.7%	1,016	20.9%	23	18.5%	3	6	2	6	6	36,519	5.8%	7,936	8.9%	148	6.6%	27	24	39	29	29
Over Centerline	1,606	9.0%	619	12.8%	18	14.5%	5	7	3	2	1	21,156	3.4%	8,292	9.3%	272	12.1%	81	86	81	14	10
Inattention / Distraction	1,587	8.9%	402	8.3%	14	11.3%	3	3	3	3	2	86,025	13.7%	12,716	14.2%	323	14.4%	70	63	60	72	58
Disregard Stop Sign	438	2.4%	171	3.5%	9	7.3%	0	3	1	3	2	11,316	1.8%	2,711	3.0%	103	4.6%	8	20	31	25	19
Failing to Yield	1,949	10.9%	361	7.4%	4	3.2%	2	0	1	0	1	104,075	16.6%	9,864	11.0%	137	6.1%	26	31	30	24	26
Apparently Asleep	335	1.9%	90	1.9%	4	3.2%	1	2	0	0	1	8,210	1.3%	2,005	2.2%	60	2.7%	9	12	16	9	14
Operating Defective Equipment	382	2.1%	101	2.1%	3	2.4%	2	0	0	0	1	13,110	2.1%	2,239	2.5%	82	3.6%	14	15	19	13	21
Following Too Close	521	2.9%	80	1.6%	2	1.6%	1	1	0	0	0	83,421	13.3%	5,957	6.7%	84	3.7%	18	15	14	20	17
Improper Turn	132	0.7%	23	0.5%	2	1.6%	0	2	0	0	0	16,785	2.7%	1,441	1.6%	23	1.0%	5	6	1	5	6
Improper Passing	272	1.5%	93	1.9%	1	0.8%	0	1	0	0	0	5,991	1.0%	1,492	1.7%	69	3.1%	15	15	16	8	15
Improper U-Turn	77	0.4%	12	0.2%	1	0.8%	1	0	0	0	0	3,939	0.6%	565	0.6%	23	1.0%	4	6	4	3	6
Headlight Violation	52	0.3%	15	0.3%	1	0.8%	0	0	1	0	0	537	0.1%	99	0.1%	2	0.1%	0	0	1	0	1
Other	1,771	9.9%	424	8.7%	7	5.6%	2	1	1	1	2	71,376	11.4%	9,853	11.0%	220	9.8%	41	30	41	51	57
Improper Backing	26	0.1%	2	0.0%	0	0.0%	0	0	0	0	0	10,788	1.7%	1,063	1.2%	46	2.0%	9	11	14	5	7
Failing to Signal	12	0.1%	5	0.1%	0	0.0%	0	0	0	0	0	683	0.1%	143	0.2%	12	0.5%	4	2	5	0	1
Improper Parking Location	15	0.1%	5	0.1%	0	0.0%	0	0	0	0	0	954	0.2%	135	0.2%	12	0.5%	5	4	3	0	0
Apparently Fatigued	51	0.3%	11	0.2%	0	0.0%	0	0	0	0	0	1,758	0.3%	376	0.4%	8	0.4%	0	3	2	2	1

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Grant County Local Road Safety Plan - Appendix 1

Apparently Ill	200	1.1%	39	0.8%	0	0.0%	0	0	0	0	0	3,802	0.6%	747	0.8%	5	0.2%	1	1	1	2	0
Disregard Signal	512	2.9%	56	1.2%	0	0.0%	0	0	0	0	0	18,267	2.9%	1,047	1.2%	3	0.1%	1	0	1	0	1
Improper Signal	6	0.0%	0	0.0%	0	0.0%	0	0	0	0	0	278	0.0%	62	0.1%	3	0.1%	0	1	0	1	1
Failing to Yield to Ped / Cyclist	816	4.6%	58	1.2%	0	0.0%	0	0	0	0	0	7,839	1.3%	462	0.5%	2	0.1%	1	0	1	0	0
On Wrong Side of Road	51	0.3%	17	0.4%	0	0.0%	0	0	0	0	0	509	0.1%	91	0.1%	2	0.1%	0	1	0	1	0
By Vehicle Type																						
Light Truck / SUV	7,126	37.2%	1,735	38.7%	40	39.6%	8	10	3	8	11	372,041	39.3%	46,614	43.2%	1,034	44.0%	195	197	229	213	200
Passenger Car	8,235	43.0%	1,797	40.1%	36	35.6%	5	11	4	9	7	499,063	52.7%	53,374	49.4%	1,038	44.2%	207	206	215	215	195
Motorcycle	2,459	12.8%	703	15.7%	13	12.9%	3	4	3	2	1	11,819	1.2%	2,320	2.1%	33	1.4%	7	8	6	6	6
Heavy Truck	724	3.8%	115	2.6%	9	8.9%	5	1	1	0	2	28,951	3.1%	2,505	2.3%	156	6.6%	35	38	33	22	28
Other / Not Stated	480	2.5%	124	2.8%	3	3.0%	1	1	1	0	0	28,430	3.0%	2,491	2.3%	77	3.3%	18	13	23	6	17
School Bus	28	0.1%	7	0.2%	0	0.0%	0	0	0	0	0	1,841	0.2%	412	0.4%	8	0.3%	2	1	2	0	3
Bus	98	0.5%	2	0.0%	0	0.0%	0	0	0	0	0	4,633	0.5%	227	0.2%	5	0.2%	0	2	2	1	0
By Speed Limit																						
20 MPH	75	0.4%	10	0.2%	0	0.0%	0	0	0	0	0	5,268	0.7%	535	0.5%	90	4.2%	18	23	20	10	19
25 MPH	2,137	12.3%	369	8.8%	4	4.0%	0	2	1	0	1	135,462	16.8%	11,933	12.2%	129	6.0%	31	17	35	25	21
30 MPH	2,192	12.6%	136	3.2%	0	0.0%	0	0	0	0	0	142,121	17.6%	4,875	5.0%	10	0.5%	2	1	1	6	0
35 MPH	4,350	25.1%	1,519	36.3%	7	7.0%	1	4	0	1	1	224,655	27.8%	42,732	43.7%	316	14.7%	75	67	56	53	65
40 MPH	1,312	7.6%	474	11.3%	1	1.0%	0	0	0	0	1	49,421	6.1%	10,122	10.4%	9	0.4%	1	0	2	4	2
45 MPH	1,063	6.1%	444	10.6%	0	0.0%	0	0	0	0	0	34,008	4.2%	8,328	8.5%	24	1.1%	7	9	3	3	2
50 MPH	1,944	11.2%	1,057	25.2%	32	32.0%	6	7	6	7	6	40,596	5.0%	16,905	17.3%	648	30.2%	114	111	143	147	133
55 MPH	1,445	8.3%	167	4.0%	53	53.0%	11	14	5	11	12	28,713	3.6%	2,127	2.2%	866	40.3%	120	191	210	184	161
60 MPH	2,312	13.3%	12	0.3%	3	3.0%	3	0	0	0	0	131,759	16.3%	175	0.2%	54	2.5%	52	0	1	0	1
65 MPH	77	0.4%	0	0.0%	0	0.0%	0	0	0	0	0	1,929	0.2%	1	0.0%	0	0.0%	0	0	0	0	0
70 MPH	448	2.6%	1	0.0%	0	0.0%	0	0	0	0	0	13,623	1.7%	5	0.0%	1	0.0%	0	0	1	0	0
By Contributing Circumstance (Ped Only)																						
Inattention / Distraction	81	6.0%	17	8.4%	1	100.0%	1	0	0	0	0	408	8.3%	60	11.1%	1	20.0%	1	0	0	0	0
Failing to Yield	375	27.6%	62	30.7%	0	0.0%	0	0	0	0	0	1,258	25.5%	132	24.4%	1	20.0%	0	0	1	0	0
On Wrong Side of Road	20	1.5%	10	5.0%	0	0.0%	0	0	0	0	0	64	1.3%	26	4.8%	1	20.0%	0	0	0	1	0
Apparently Ill	1	0.1%	0	0.0%	0	0.0%	0	0	0	0	0	9	0.2%	1	0.2%	1	20.0%	0	0	0	1	0
Other	306	22.5%	54	26.7%	0	0.0%	0	0	0	0	0	1,311	26.6%	177	32.7%	1	20.0%	0	1	0	0	0
By Facility Used (Ped Only)																						
Roadway	892	46.2%	158	65.0%	1	100.0%	1	0	0	0	0	3,170	31.5%	410	47.8%	4	57.1%	1	1	1	1	0
Marked Crosswalk	570	29.5%	21	8.6%	0	0.0%	0	0	0	0	0	4,258	42.3%	153	17.8%	1	14.3%	1	0	0	0	0
Shoulder	140	7.2%	32	13.2%	0	0.0%	0	0	0	0	0	520	5.2%	119	13.9%	1	14.3%	0	1	0	0	0
Other	63	3.3%	11	4.5%	0	0.0%	0	0	0	0	0	235	2.3%	45	5.2%	1	14.3%	0	0	0	1	0
By Contributing Circumstance (Bike Only)																						
Failing to Yield	115	24.3%	20	30.8%	0	#DIV/0!	0	0	0	0	0	1,116	26.8%	123	28.5%	3	50.0%	0	1	0	1	1
On Wrong Side of Road	31	6.6%	7	10.8%	0	#DIV/0!	0	0	0	0	0	443	10.6%	64	14.8%	1	16.7%	0	1	0	0	0
Inattention / Distraction	39	8.2%	8	12.3%	0	#DIV/0!	0	0	0	0	0	373	9.0%	46	10.6%	1	16.7%	0	0	0	0	1
Disregard Stop Sign	42	8.9%	5	7.7%	0	#DIV/0!	0	0	0	0	0	259	6.2%	39	9.0%	1	16.7%	0	0	0	0	1
By Facility Used (Bike Only)																						
Roadway	412	59.3%	63	65.6%	0	#DIV/0!	0	0	0	0	0	3,205	46.3%	350	54.9%	5	100.0%	0	1	1	1	2

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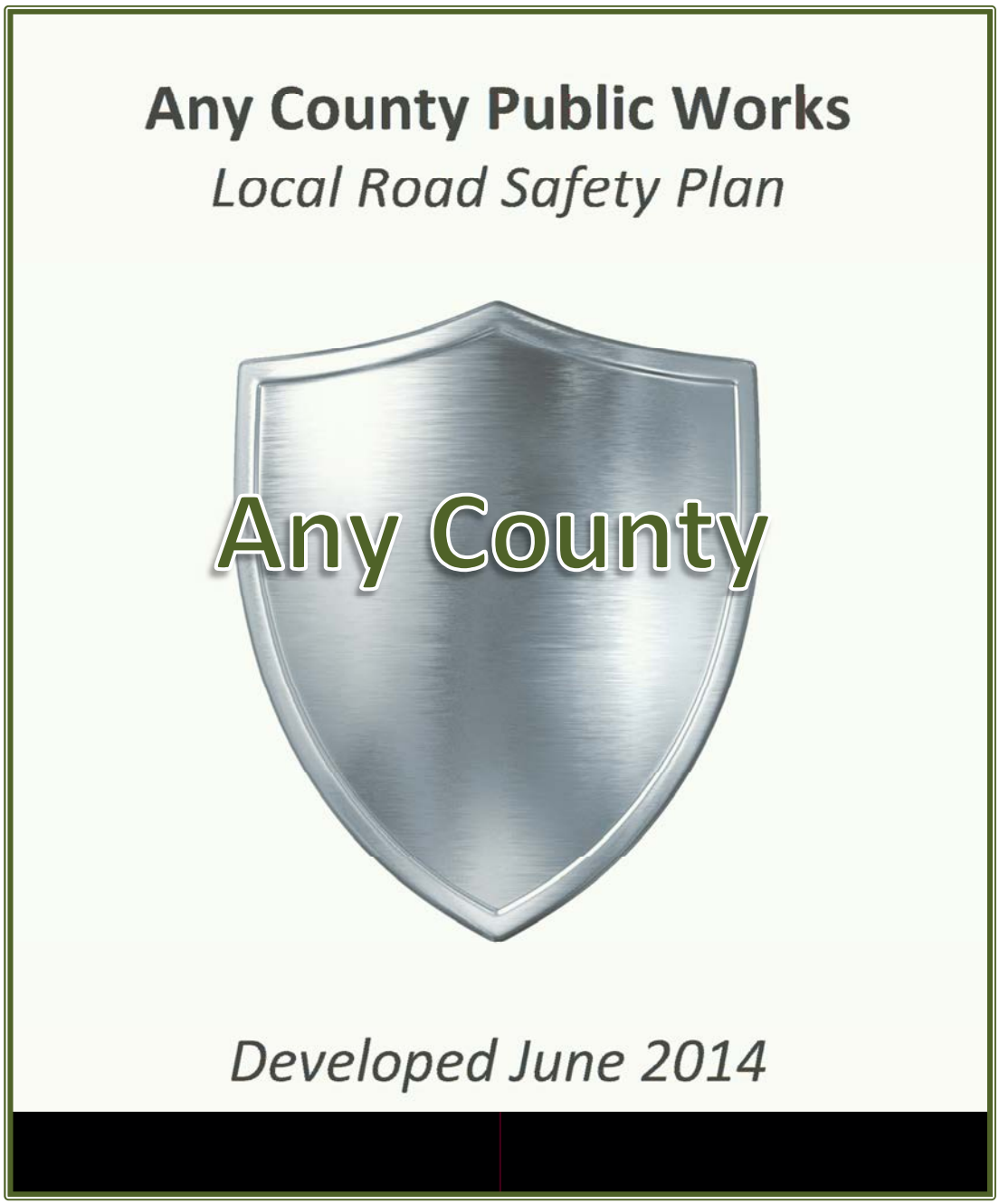
Grant County Local Road Safety Plan - Appendix 2

																Stars				
ROADNAME	ROADLOG	BMP	EMP	LENGTH	LANES	WIDTH	PAVE	ADT	ADTYR	FFC	FEDRT	TRKRT	TRKCLS	MAINT	SPEED	FFC	ADT > 1000	Speed > 50mph	HMA	Total
No Name Road	Road 1	0.0000	1.0000	1.0000	2	17.00	I	1818	2013	7	C131	75	T3	33	55	1	1	1	1	4
No Name Road	Road 2	1.0000	1.2200	0.2200	2	17.00	I	1821	2010	7	C131	75	T3	33	55	1	1	1	1	4
No Name Road	Road 3	1.2200	1.9700	0.7500	2	17.00	I	1821	2010	7	C131	75	T3	33	55	1	1	1	1	4
No Name Road	Road 4	1.9700	2.2700	0.3000	2	17.00	I	1821	2010	7	C131	75	T3	33	55	1	1	1	1	4
No Name Road	Road 5	2.2700	2.3000	0.0300	2	17.00	I	1821	2010	7	C131	75	T3	33	55	1	1	1	1	4
No Name Road	Road 6	2.8000	3.3200	0.5200	2	17.00	I	2782	2010	7	C131	75	T3	33	55	1	1	1	1	4
No Name Road	Road 7	3.3200	3.9100	0.5900	2	17.00	I	2782	2010	7	C131	75	T5	33	55	1	1	1	1	4
No Name Road	Road 8	0.3080	0.9160	0.6080	2	16.00	I	4664	2011	7	H131	5	T4	32	55	1	1	1	1	4
No Name Road	Road 9	0.0980	0.5100	0.4120	2	18.00	X	1696	2012	7	P137	26	T3	22	50	1	1	1	1	4
No Name Road	Road 10	0.5100	1.0100	0.5000	2	18.00	X	1696	2012	7	P137	26	T3	22	50	1	1	1	1	4
No Name Road	Road 11	1.0100	1.7700	0.7600	2	18.00	X	1301	2012	7	P137	26	T3	22	50	1	1	1	1	4
No Name Road	Road 12	1.7700	2.0100	0.2400	2	18.00	X	1301	2012	7	P137	26	T3	22	50	1	1	1	1	4
No Name Road	Road 13	0.0000	0.5100	0.5100	2	17.00	I	1414	2013	9		25	T5	22	50	1	1	1	1	4
No Name Road	Road 14	2.1100	2.7410	0.6310	2	17.00	I	1187	2013	7	E133	80	T3	32	60	1	1	1	1	4
No Name Road	Road 15	14.7800	15.6300	0.8500	2	17.00	I	1521	2013	7	E133	80	T3	31	60	1	1	1	1	4
No Name Road	Road 16	16.6400	17.3600	0.7200	2	17.00	I	1510	2013	7	E133	80	T3	31	60	1	1	1	1	4
No Name Road	Road 17	17.3600	17.3800	0.0200	2	17.00	I	1400	2012	7	E133	80	T3	31	60	1	1	1	1	4
No Name Road	Road 18	17.3800	17.6400	0.2600	2	17.00	I	1400	2012	7	E133	80	T3	31	60	1	1	1	1	4
No Name Road	Road 19	17.6400	17.6500	0.0100	2	17.00	I	1400	2012	7	E133	80	T3	31	60	1	1	1	1	4
No Name Road	Road 20	17.6500	18.1400	0.4900	2	17.00	I	1400	2012	7	E133	80	T3	31	60	1	1	1	1	4
No Name Road	Road 21	18.1400	18.3900	0.2500	2	17.00	I	1400	2012	7	E133	80	T3	31	60	1	1	1	1	4
No Name Road	Road 22	18.3900	18.6400	0.2500	2	17.00	I	1400	2012	7	E133	80	T3	31	60	1	1	1	1	4
No Name Road	Road 23	18.6400	19.1400	0.5000	2	17.00	I	1434	2013	7	E133	80	T3	31	60	1	1	1	1	4
No Name Road	Road 24	19.1400	19.6700	0.5300	2	17.00	I	1400	2012	7	E133	80	T3	31	60	1	1	1	1	4
No Name Road	Road 25	19.6700	20.1700	0.5000	2	17.00	I	1400	2012	7	E133	80	T3	31	60	1	1	1	1	4
No Name Road	Road 26	20.1700	20.6500	0.4800	2	17.00	I	1400	2012	7	E133	80	T3	31	60	1	1	1	1	4
No Name Road	Road 27	20.6500	20.6800	0.0300	2	17.00	I	1400	2012	7	E133	80	T3	31	60	1	1	1	1	4
No Name Road	Road 28	20.6800	21.5600	0.8800	2	17.00	I	1400	2012	7	E133	80	T3	31	60	1	1	1	1	4
No Name Road	Road 29	21.5600	21.6800	0.1200	2	17.00	I	1400	2012	7	E133	80	T3	31	60	1	1	1	1	4
No Name Road	Road 30	21.6800	22.4100	0.7300	2	17.00	I	1400	2012	7	E133	80	T3	31	60	1	1	1	1	4
No Name Road	Road 31	22.4100	22.6800	0.2700	2	17.00	I	1400	2012	7	E133	80	T3	31	60	1	1	1	1	4
No Name Road	Road 32	22.6800	23.2000	0.5200	2	17.00	I	1339	2013	7	E133	80	T3	31	60	1	1	1	1	4
No Name Road	Road 33	23.2000	23.6700	0.4700	2	17.00	I	1371	2012	7	E133	80	T3	31	60	1	1	1	1	4
No Name Road	Road 34	23.6700	23.6800	0.0100	2	17.00	I	1371	2012	7	E133	80	T3	31	60	1	1	1	1	4
No Name Road	Road 35	4.0000	4.1400	0.1400	2	17.00	I	1006	2012	7	C131	75	T3	34	55	1	1	1	1	4
No Name Road	Road 36	4.1400	5.0500	0.9100	2	17.00	I	1006	2012	7	C131	75	T3	34	55	1	1	1	1	4
No Name Road	Road 37	5.0500	5.3500	0.3000	2	17.00	I	1006	2012	7	C131	75	T3	34	55	1	1	1	1	4
No Name Road	Road 38	5.3500	5.5500	0.2000	2	17.00	I	1006	2012	7	C131	75	T3	34	55	1	1	1	1	4
No Name Road	Road 39	5.5500	5.7700	0.2200	2	17.00	I	1006	2012	7	C131	75	T3	34	55	1	1	1	1	4
No Name Road	Road 40	5.7700	6.0200	0.2500	2	17.00	I	1006	2012	7	C131	75	T3	34	55	1	1	1	1	4
No Name Road	Road 41	6.0200	6.0800	0.0600	2	17.00	I	1006	2012	7	C131	75	T3	34	55	1	1	1	1	4
No Name Road	Road 42	6.0800	6.5700	0.4900	2	17.00	I	1006	2012	7	C131	75	T3	34	55	1	1	1	1	4
No Name Road	Road 43	6.5700	6.7600	0.1900	2	17.00	I	1006	2012	7	C131	75	T3	34	55	1	1	1	1	4
No Name Road	Road 44	6.7600	7.0200	0.2600	2	17.00	I	1006	2012	7	C131	75	T3	34	55	1	1	1	1	4
No Name Road	Road 45	0.0000	0.7100	0.7100	2	17.00	I	1794	2013	7	C131	75	T3	34	55	1	1	1	1	4
No Name Road	Road 46	0.0000	0.5700	0.5700	2	18.00	I	1287	2013	7	E131	77	T3	33	60	1	1	1	1	4
No Name Road	Road 47	0.5700	1.0900	0.5200	2	18.00	I	1325	2013	7	E131	77	T3	33	60	1	1	1	1	4
No Name Road	Road 48	1.0900	1.1000	0.0100	2	18.00	I	1325	2013	7	E131	77	T3	33	60	1	1	1	1	4
No Name Road	Road 49	1.1000	1.9200	0.8200	2	18.00	I	1325	2013	7	E131	77	T3	33	60	1	1	1	1	4
No Name Road	Road 50	1.9200	2.2400	0.3200	2	18.00	I	1325	2013	7	E131	77	T3	33	60	1	1	1	1	4



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3. Overview:

The Any County Department of Public Works used the concepts discussed in the FHWA Systemic Safety Project Selection Tool to develop a Local Road Safety Plan. The development of a Local Road Safety Plan is intended to increase local roadway safety and to develop and implement road safety improvements to reduce fatalities and injuries on local public roads. A Local Road Safety Plan is a way to prioritize locations for improvements based upon data. The county's summary data, provided by WSDOT, was used as a starting point to identify possible priority crash categories (such as: hit fixed object crashes, night time crashes, crashes on 50 mph roads, crashes on horizontal curves, etc.). The full county's crash dataset from the County Road Administration Board's (CRAB) Mobility database, traffic data from Vias, and GIS mapping of identified crash locations were used to more closely identify the criteria that would be used to identify specific locations or corridors of concern. Scores applied to these criteria were used to further identify roads and corridors for prioritization and implementation of countermeasures, as part of the county's Local Road Safety Plan.

4. Contact:

Any D. Body, P.E.
ssistant County Engineer
Any County Public Works
2121 NE Memory Lane
Any, WA 98532
hone: (360) 555-1515
E-Mail: Any.Body@Anycountywa.gov

5. Focus Crash Type:

The focus crash type was identified based on a review of serious injury and fatal crash data from the "2008-2012 Any County Data" spreadsheet, provided by WSDOT, and a compilation of all Any County crash data from the County Road Administration Board's (CRAB) Mobility database and our own GIS mapping. Serious injury and fatal crash data show that the two major crash types are: Hit Fixed Object (62.7%) and Overturn/Rollover (16.7%). The data also indicates the locations of a majority of these crashes are by junction relationship-Non-Intersection Related (85.3%), and by roadway curvature-Horizontal Curve (50%). The committee then reviewed county crash data from Mobility for Hit Fixed Object and Overturn/Rollover type crashes and found that "Ran off the Road" was the sequence of events listed for the vast majority of these crash types. The listing of objects struck includes: Roadway Ditch (30.52%), Tree or Stump (stationary) (14.58%), Fence (10.01%), Utility Pole or Box (9.35%), Earth Bank or Ledge (8.81%), Over Embankment - No Guardrail Present (8.32%), Mailbox (4.16%), etc., further indicating "Ran off the Road" type crashes. After evaluation of this data, the committee determined that roadway departure (Ran off the Road) crashes would be the focus crash type of this safety plan.

6. Focus Facility Type:

It was determined that the entire county roadway system, with a focus on corridors, would be considered for safety improvements. The primary focus will be on Federal-Aid roadways, and then Local Access roads, where right-of-way or permitting does not constrain us from completing low-cost widespread safety fixes covering significant miles of the county roadway network. The areas where right-of-way and permitting are identified as an issue that currently prevents the installation of countermeasures in an economically or timely fashion will be addressed as the County has funding and staff time available.

7. Identified Risk Factors:

The risk factors identified as the key factors in identifying roadways and corridors where potential countermeasures may reduce the number of roadway departure crashes are as follows:

- Federal Functional Classification
- Average Daily Traffic
- 85th Percentile Speed
- Weighted Crashes/Mile
- Number of Ran off the Road Crashes/Mile
- Number of Overturn/Rollover Crashes/Mile
- Horizontal Curve Density
- Roadway Width Deficiency
- Accidents per Million Vehicles Miles (vs. statewide rate for all counties)
- Number of Fatalities

8. Identified Countermeasures:

The countermeasures identified as having the potential for reducing the severity and occurrence of roadway departure crashes includes:

- Slope Flattening
- Fixed Object Removal
- Guardrail
- Concrete Traffic Barriers
- Enhanced Curve Delineation
- Delineation of Roadside Objects (Trees, Utility Poles, etc.)
- Enhanced Pavement Markings
- Shoulder Rumble Strips
- Mid-Lane Rumble Strips
- Shoulder Widening
- Pavement Safety Edge
- Flexible Guideposts
- Culvert End Treatment
- Skid-Resistant Pavement Surfaces
- Improved Design of Roadside Hardware (e.g., Bridge Rail)
- Clear Zone Widening
- Improved Curve Geometry
- Reduction of Pavement Edge Drop-Offs
- Improve Ditch Sections
- Upgrade Traffic Signs

9. Prioritization of Roadways/Corridors:

The prioritization of roadways and corridors for safety countermeasures was completed by using a balance of quantitative analysis and input from Public Works staff. The quantitative analysis was completed by developing a priority ranking tool that assigns a point value to each of the ten identified risk factors. Data was collected for each risk factor and entered into the priority ranking tool (spreadsheet), analyzed to determine the range where points are assigned, and then assigned points derived from a series of formulas in the priority ranking tool. Each risk factor was assigned a point value between 0 and 10, giving each roadway or corridor a potential total score of 100. Public Works staff then analyzed the top ranking locations and provided their input based on knowledge of the roadway system, countermeasures already in place, and whether permitting or right-of-way issues prevent the installation of safety countermeasures. The top ranking roadways were then further analyzed to determine if any safety improvements had recently been installed or constructed that may have changed the risk factors, and the roadway was further analyzed into smaller finite sections to target needed improvements.

(Priority Ranking Tool – Scoring Results, *page 7*)

Any County - Local Road Safety Plan *June 2014*

Priority Ranking Tool - Scoring Results

Signifies: Corridor

Rank	Road No.	Road Name (Corridor)		FFC	Avg. ADT	Avg. 85th	Weighted Accidents per Mile	Run Off Road per Mile	Overturned Roll Over per Mile	Curve Density	Width & Shoulders	APMVM	Fatalities	Total (100 possible)
1	1	Any Road		8	8	6	10	10	10	4	10	8	0	74
2	2	Any Road		10	10	6	10	10	6	6	10	4	0	72
3	3	Any Road		9	10	6	10	10	6	2	10	8	0	71
4	4	Any Road		10	8	6	10	10	8	6	6	6	0	70
5	5	Any Road		10	10	8	10	8	6	2	8	2	5	69
5	5	Any Road		10	10	8	10	8	6	2	8	2	5	69
5	5	Any Road		10	10	8	10	8	6	2	8	2	5	69
6	6	Any Road		8	4	6	10	10	6	8	6	8	0	66
7	7	Any Road		10	6	8	10	6	6	2	6	6	5	65
7	7	Any Road		10	6	8	10	6	6	2	6	6	5	65
7	7	Any Road		10	6	8	10	6	6	2	6	6	5	65
8	8	Any Road		9	10	6	10	8	10	2	6	4	0	65
9	9	Any Road		10	10	6	10	10	6	0	6	2	4	64
10	10	Any Road		10	10	6	10	10	6	0	10	2	0	64
11	11	Any Road		10	10	8	10	8	6	6	0	4	1	63
12	12	Any Road		10	10	8	8	6	4	2	10	2	1	61
13	13	Any Road		7	10	4	10	10	10	6	0	2	0	59
14	14	Any Road		6	8	6	10	8	10	2	4	4	0	58
15	15	Any Road		10	10	6	10	8	4	2	2	2	3	57
15	15	Any Road		10	10	6	10	8	4	2	2	2	3	57
16	16	Any Road		10	8	8	10	8	6	0	0	6	1	57
17	17	Any Road		8	6	6	8	6	6	6	4	6	1	57
18	18	Any Road		6	10	6	10	10	10	0	0	4	0	56
19	19	Any Road		6	10	8	10	10	4	0	4	4	0	56
20	20	Any Road		8	2	6	10	6	4	6	4	8	0	54
21	21	Any Road		6	4	4	10	8	0	10	0	10	0	52
22	22	Any Road		8	6	6	6	6	6	6	4	4	0	52
22	22	Any Road		8	6	6	6	6	6	6	4	4	0	52
23	23	Any Road		8	4	6	10	6	0	10	4	4	0	52
24	24	Any Road		10	10	8	10	4	4	4	0	2	0	52
25	25	Any Road		10	10	6	8	4	6	0	8	0	0	52
26	26	Any Road		8	10	6	8	6	6	0	4	2	0	50
27	27	Any Road		10	10	6	10	4	2	4	2	2	0	50
28	28	Any Road		6	2	6	8	8	4	6	2	8	0	50
29	29	Any Road		10	8	8	4	4	2	4	6	2	2	50
30	30	Any Road		10	4	6	4	4	2	8	4	6	1	49
31	31	Any Road		7	10	2	8	6	4	0	6	6	0	49
31	31	Any Road		7	10	2	8	6	4	0	6	6	0	49
32	32	Any Road		8	4	6	6	4	4	6	0	8	2	48
32	32	Any Road		8	4	6	6	4	4	6	0	8	2	48
33	33	Any Road		6	2	0	10	10	10	0	0	10	0	48
34	34	Any Road		9	8	6	8	6	2	2	2	4	1	48
34	34	Any Road		9	8	6	8	6	2	2	2	4	1	48
35	35	Any Road		8	2	6	4	4	2	10	4	4	3	47
35	35	Any Road		8	2	6	4	4	2	10	4	4	3	47
36	36	Any Road		8	4	8	6	4	4	4	4	4	1	47
36	36	Any Road		8	4	8	6	4	4	4	4	4	1	47
37	37	Any Road		6	10	6	4	4	4	6	2	4	0	46
38	38	Any Road		6	2	4	6	6	2	10	0	10	0	46
39	39	Any Road		6	8	6	10	4	6	2	2	2	0	46
40	40	Any Road		10	6	2	10	6	0	0	4	8	0	46
41	41	Any Road		10	2	8	4	2	2	6	2	6	4	46
41	41	Any Road		10	2	8	4	2	2	6	2	6	4	46
42	42	Any Road		8	4	8	4	4	4	6	2	4	1	45
43	43	Any Road		8	2	6	4	2	2	6	6	6	2	44
44	44	Any Road		10	10	6	10	2	2	4	0	0	0	44
45	45	Any Road		7	4	6	6	4	4	6	2	4	1	44
45	45	Any Road		7	4	6	6	4	4	6	2	4	1	44
46	46	Any Road		6	2	6	2	2	4	10	4	8	0	44
47	47	Any Road		8	10	8	6	0	0	0	10	0	1	43
48	48	Any Road		8	6	6	4	2	0	4	10	2	0	42
49	49	Any Road		10	8	8	6	2	2	4	2	0	0	42
50	50	Any Road		6	2	4	4	4	4	10	4	4	0	42

10. Prioritization of Countermeasures:

The prioritization of countermeasures for the identified roadways and corridors was determined by Public Works staff. The countermeasures chosen are intended to maximize the safety benefits of this funding, based on the prevalent accident type, and provide widespread safety solutions that can be implemented to reduce fatalities and serious injuries. We have chosen Slope Flattening, Culvert End Treatment, Shoulder Widening, Guardrail, Improved Design of Roadside Hardware (e.g., Bridge Rail), Upgrading Traffic Signs, Clear Zone Widening, Reduction of Pavement Edge Drop-offs, and Improve Ditch Section as the most effective combination of safety improvements to reduce the number and severity of roadway departure crashes.

11. Project Submittal:

After identifying the roadways/corridors and cost-effective countermeasures, Public Works staff compiled the following listing of projects for submittal for funding consideration:

Priority #1 Location: All Top-20 ranked roads listed on page 7 of Any County's Local Road Safety Plan/Mileage – 54 miles /☆☆☆☆☆/PE = $11,637, CN = $96,975

1. Countermeasure Description: Flexible Guideposts (*unless previously installed*)

Priority #2 Location: #1 /☆☆☆☆☆/PE = $14,699, CN = $122,490

1. Countermeasure Description: Slope Flattening, Culvert End Treatment, Shoulder Widening, Guardrail, Improved Design of Roadside Hardware (e.g., Bridge Rail), Upgrading Traffic Signs, Clear Zone Widening, Reduction of Pavement Edge Drop-offs, and Improve Ditch Section.

Priority #3 Location: #2 /☆☆☆☆☆/PE = $11,099, CN = $92,490

1. Countermeasure Description: Slope Flattening, Culvert End Treatment, Shoulder Widening, Guardrail, Improved Design of Roadside Hardware (e.g., Bridge Rail), Upgrading Traffic Signs, Clear Zone Widening, Reduction of Pavement Edge Drop-offs, and Improve Ditch Section.

Priority #4 Location: #3 /☆☆☆☆☆/PE = $41,525, CN = $346,044

1. Countermeasure Description: Slope Flattening, Culvert End Treatment, Shoulder Widening, Guardrail, Improved Design of Roadside Hardware (e.g., Bridge Rail), Upgrading Traffic Signs, Clear Zone Widening, Reduction of Pavement Edge Drop-offs, and Improve Ditch Section.

Priority #5 Location: #4, #4-1, & #4-2 /☆☆☆☆☆/PE = $3,395, CN = $28,296

1. Countermeasure Description: Slope Flattening, Culvert End Treatment, Shoulder Widening, Guardrail, Improved Design of Roadside Hardware (e.g., Bridge Rail), Upgrading Traffic Signs, Clear Zone Widening, Reduction of Pavement Edge Drop-offs, and Improve Ditch Section.

Priority #6 Location: #5 MP /☆☆☆☆☆/PE = $12,439, CN = $103,662

1. Countermeasure Description: Slope Flattening, Culvert End Treatment, Shoulder Widening, Guardrail, Improved Design of Roadside Hardware (e.g., Bridge Rail), Upgrading Traffic Signs, Clear Zone Widening, Reduction of Pavement Edge Drop-offs, and Improve Ditch Section.

Priority #7 Location: #6, #6-1, & #6-2 /☆☆☆☆/PE = $5,136, CN = $346,044

1. Countermeasure Description: Slope Flattening, Culvert End Treatment, Shoulder Widening, Guardrail, Improved Design of Roadside Hardware (e.g., Bridge Rail), Upgrading Traffic Signs, Clear Zone Widening, Reduction of Pavement Edge Drop-offs, and Improve Ditch Section.

Priority #8 Location: #7 /☆☆☆☆/PE = $5,310, CN = $44,250

1. Countermeasure Description: Slope Flattening, Culvert End Treatment, Shoulder Widening, Guardrail, Improved Design of Roadside Hardware (e.g., Bridge Rail), Upgrading Traffic Signs, Clear Zone Widening, Reduction of Pavement Edge Drop-offs, and Improve Ditch Section.

Priority #9 Location: #8 /☆☆☆☆/PE = $21,870, CN = $182,250

1. Countermeasure Description: Slope Flattening, Culvert End Treatment, Shoulder Widening, Guardrail, Improved Design of Roadside Hardware (e.g., Bridge Rail), Upgrading Traffic Signs, Clear Zone Widening, Reduction of Pavement Edge Drop-offs, and Improve Ditch Section.

Priority #10 Location: #9 /☆☆☆☆/PE = $5,136, CN = $42,798

1. Countermeasure Description: Slope Flattening, Culvert End Treatment, Shoulder Widening, Guardrail, Improved Design of Roadside Hardware (e.g., Bridge Rail), Upgrading Traffic Signs, Clear Zone Widening, Reduction of Pavement Edge Drop-offs, and Improve Ditch Section.

Priority #11 Location: #10 MP /☆☆☆☆/PE = $7,453, CN = $62,112

1. Countermeasure Description: Slope Flattening, Culvert End Treatment, Shoulder Widening, Guardrail, Improved Design of Roadside Hardware (e.g., Bridge Rail), Upgrading Traffic Signs, Clear Zone Widening, Reduction of Pavement Edge Drop-offs, and Improve Ditch Section.

Priority #12 Location: #11 MP ☆☆☆/PE = $77,900, CN = $649,170

1. Countermeasure Description: Slope Flattening, Culvert End Treatment, Shoulder Widening, Guardrail, Improved Design of Roadside Hardware (e.g., Bridge Rail), Upgrading Traffic Signs, Clear Zone Widening, Reduction of Pavement Edge Drop-offs, and Improve Ditch Section.

Priority #13 Location: #12 & #12-1 /☆☆☆/PE = $42,379, CN = $353,166

1. Countermeasure Description: Slope Flattening, Culvert End Treatment, Shoulder Widening, Guardrail, Improved Design of Roadside Hardware (e.g., Bridge Rail), Upgrading Traffic Signs, Clear Zone Widening, Reduction of Pavement Edge Drop-offs, and Improve Ditch Section.

Priority #14 Location: #13 /☆☆☆/PE = $6,581, CN = $54,846

1. Countermeasure Description: Slope Flattening, Culvert End Treatment, Shoulder Widening, Guardrail, Improved Design of Roadside Hardware (e.g., Bridge Rail), Upgrading Traffic Signs, Clear Zone Widening, Reduction of Pavement Edge Drop-offs, and Improve Ditch Section.

Priority #15 Location: #14 /☆☆☆/PE = $18,649, CN = $155,406

1. Countermeasure Description: Slope Flattening, Culvert End Treatment, Shoulder Widening, Guardrail, Improved Design of Roadside Hardware (e.g., Bridge Rail), Upgrading Traffic Signs, Clear Zone Widening, Reduction of Pavement Edge Drop-offs, and Improve Ditch Section.

Priority #16 Location: #15 /☆☆☆/PE = $78,093, CN = $650,766

1. Countermeasure Description: Slope Flattening, Culvert End Treatment, Shoulder Widening, Guardrail, Improved Design of Roadside Hardware (e.g., Bridge Rail), Upgrading Traffic Signs, Clear Zone Widening, Reduction of Pavement Edge Drop-offs, and Improve Ditch Section.

Priority #17 Location: #16 /☆☆/PE = $18,906, CN = $157,554

1. Countermeasure Description: Slope Flattening, Culvert End Treatment, Shoulder Widening, Guardrail, Improved Design of Roadside Hardware (e.g., Bridge Rail), Upgrading Traffic Signs, Clear Zone Widening, Reduction of Pavement Edge Drop-offs, and Improve Ditch Section.

Priority #18 Location: #17 /☆☆/PE = $3,660, CN = $30,498

1. Countermeasure Description: Slope Flattening, Culvert End Treatment, Shoulder Widening, Guardrail, Improved Design of Roadside Hardware (e.g., Bridge Rail), Upgrading Traffic Signs, Clear Zone Widening, Reduction of Pavement Edge Drop-offs, and Improve Ditch Section.

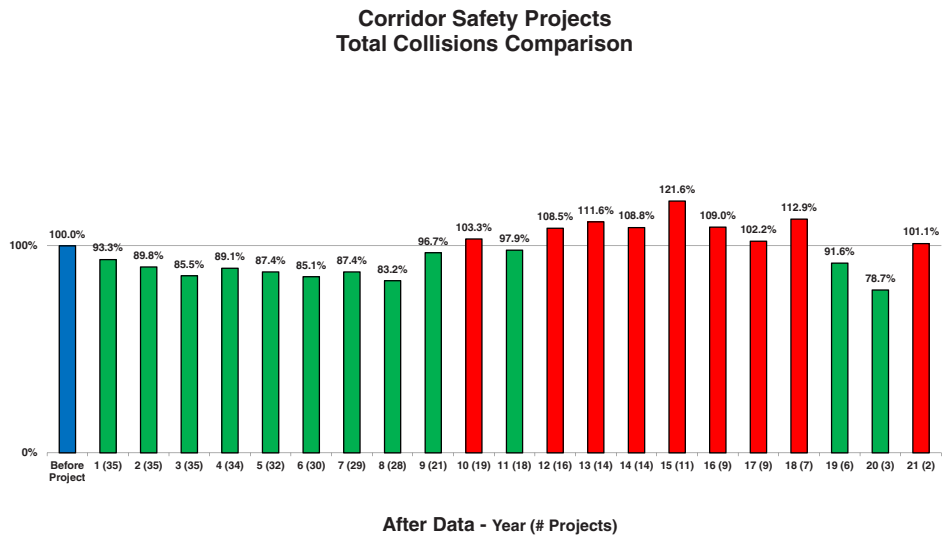
It was determined that three roads (#18, #19, & #20) in the Top-20 of the county's Local Road Safety Plan would not be programmed for safety countermeasures. This determination was made based on:

- The presence of the necessary countermeasures to avoid roadway departure crashes.
- In the case of #19, it is on the county's current TIP and will be reconstructed with a center turn-lane that will reduce the number and frequency of rear-end crashes, which is the prevalent crash type on this road.

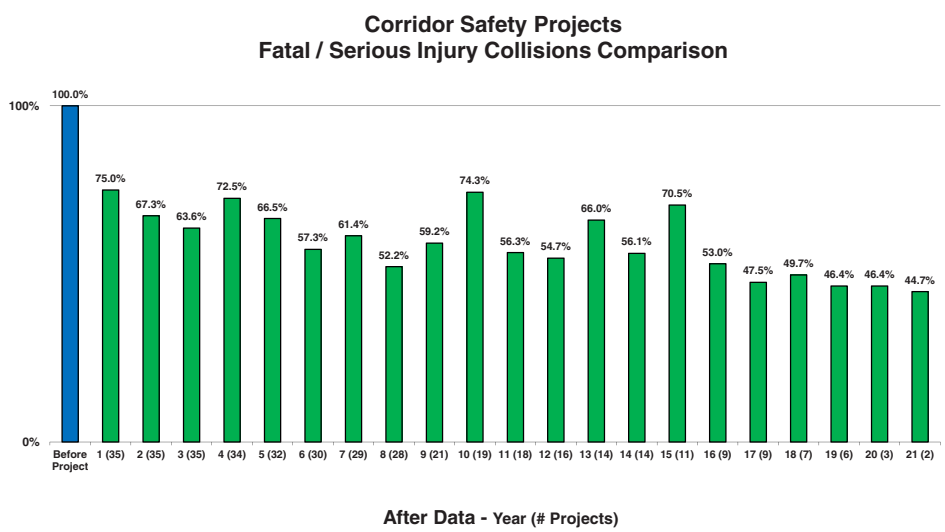
Proven Success (35 Projects)

- Total collisions down **8%**
- Total injuries down **13%**
- Alcohol-related collisions down **13%**
- Fatal & serious injury collisions down **29%**
- Benefit/cost ratio = **34.0** ($34 saved for every $1 invested)

Long Term – Total Collisions



Long Term – Fatal/Serious Collisions



Cape Horn – Case Study

Problem Identification
15.3 mile stretch of SR 14 in southwest Washington, designated a traffic safety corridor because of high crash rates and types.

Crash History
- 17 fatal / serious injury collisions in 3 years
- Daily volumes of 4,000 – 4,500 vehicles
- Top collision types: hit fixed object (75), overturn (20), opposite direction sideswipe (14)

Causes
- Top contributing causes: exceeding safe speed (88), over centerline (33), under influence of alcohol (11)
  - ✓Exceeding Safe Speed: crashes occur 86% higher than on similar highways in the region and 104% higher than on state highways
    - •Single leading contributing cause of fatal and serious crashes on the corridor.
  - ✓Over the Centerline: crashes occur 375% higher than region and 740 percent higher state.
  - ✓DUI: crashes occur 13% higher than region and 40% higher than state.

Strategies and Activities
- Financial, environmental and/or social impacts prevent a construction-only approach from addressing most problem corridors
- Cape Horn Project's strategy is a multi-disciplinary effort that used the following strategies:
  - ✓Designated a stretch of SR14 as a traffic safety corridor.
  - ✓Created a partnership between WTSC, WSDOT, WSP, the County Sheriff, and a local Steering Committee.
  - ✓Designated three subcommittees to focus on Enforcement, Engineering, and Education.

Cape Horn – Education

Education
Generated community member awareness by building project support through local resident and business outreach by:
•Installing corridor information signs
•Distributing educational materials
•Launching a corridor website
•Developing media stories

▪The education sub-group, in coordination with Education Service District 112, increased public awareness by reinforcing safe driving habits.
▪Other strategies included:
✓ Town-hall style kick-off event
✓ Signage, billboards, promotional items, brochure, website
✓ Media, business, and citizen outreach
✓ Commercial Vehicle Program
✓ Designated Driver Program
✓ Distributed safe driving materials, that included a safe driving brochure at local public events
✓ Implemented a public awareness campaign that included press releases resulting in numerous articles about the project being published in local papers, a billboard containing a traffic safety message and brochure throughout the local area and asked businesses to display materials in their establishments
✓ Launched a speaker's bureau that targeted young drivers and community groups

After two years and upon the completion of the corridor, the task force reported the following results:

• Over 18,000 educational and promotional items given out to community members – Brochures, pens, vehicle garbage bags and air fresheners.
•1000 utility bill inserts sent to customers within the project area.
•4,000-4,500 vehicles a day are exposed to traffic safety messages on signs

Cape Horn – Engineering

Engineering

WSDOT initiated a number of low cost engineering fixes, including:

•Installed Corridor Safety Project signage and installed warning signs to highlight areas of concern;

•Installed centerline rumble strips throughout the corridor;

•Installed Highway Advisory Radio Systems (HARs) to warn of dangerous road conditions;

•Improved pedestrian crossings and warning information at the Beacon Rock State Park.

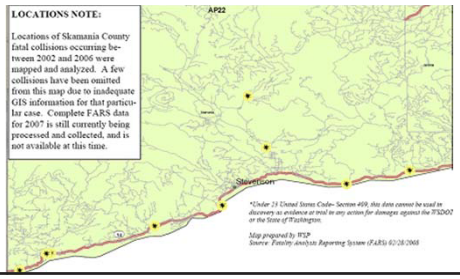
▪At the request of the enforcement subcommittee, WSDOT changed the WSDOT Motor Carrier Rule for commercial vehicles traveling on SR 14 to require that such vehicles be accompanied by three escort vehicles.
▪The drivers must be professionals familiar with the route to alert other motorists to the presence of an over-dimensional load.

Cape Horn – Enforcement

Partnered Solutions:

WSP and Skamania County Sheriff's Office partnered enforcement efforts targeting the excessive speed, following too closely and improper passing.

- Utilize lasers and in-car video cameras
- Emphasis patrols on drinking and driving on peak evenings
- Encourage drivers to use "slow moving vehicle turnouts"
- WSP motorcycle, Commercial Motor Vehicle Enforcement, and Aggressive Driving Apprehension Team officers were utilized
- Citations issued in conjunction with the task force were stamped "Traffic Safety Corridor so that the district court judge was aware of the effort



After two years and upon the completion of the corridor, the task force reported the following results:

- Total contacts increased 158%
- 30% of contacts resulted in a ticket
- Total number of tickets increased 110% (from 851 to1,785 tickets written)
- DUI arrests increased 55% (from 20 to 31 arrests)
- Speed contacts increased 103% (from 1,522 to 3,093 contacts)
- 52% of all stops were for speed violations (3,093 contacts)
- Seatbelt contacts increased 73.2% (from 205 to 355 contacts)

2006 Problem Oriented Public Safety (POPS) Exemplary Project

Cape Horn – Results

Results:
The Cape Horn Corridor Traffic Safety Project established community relationships and inter-agency collaboration, and also made SR- 14 safer for motorists and passengers:

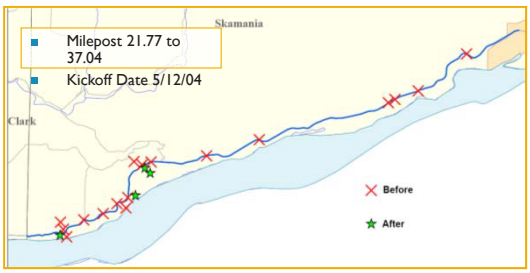
Total Number of Collisions
Before (3 years) = 174 (58 / year)
After (2 years) = 98 (49 / year)

Total Number of Alcohol-Related Collisions
Before (3 years) = 21 (7 / year)
After (2 years) = 6 (3 / year)

Total Number of Fatal / Serious Injury Collisions
Before (3 years) = 17 (6 / year)
After (2 years) = 4 (2 / year)

SR 14 Safety Improvement Highlights

- Total Collisions **Down 16%**
- Total Injuries **Down 51%**
- Alcohol-Related Collisions **Down 57%**
- Fatal / Serious Injury Collisions **Down 65%**
- Hit Fixed Object Collisions (#1 Type) – **Down 17%**
- # Speeding Drivers in Collisions (#1 Cause) – **Down 37%**



Thurston County, Washington, Public Works Department Applies Systemic Safety Project Selection Tool

The Thurston County Public Works Department used the *Systemic Safety Project Selection Tool* (Tool)[1] to explore the potential benefits of proactive safety planning. Although Thurston County staff had experience conducting strategic safety planning in partnership with the Washington State Department of Transportation (WSDOT), those efforts focused on site-specific safety improvements such as turn lanes, guardrail enhancement, and shoulder paving and widening.

Process and Results

Based on a review of severe crash data, Thurston County selected roadway departure in horizontal curves as the focus crash type. Because 81 percent of the severe curve crashes occurred on arterial and collector roadways, Thurston County chose curves on these roadway types as their focus facility. Because this effort coincided with ongoing efforts to identify and upgrade warning signs for signed horizontal curves on their County road system, Thurston County chose to apply the Tool to currently signed horizontal curves.

Focus crash type: roadway departure crashes on horizontal curves

Focus facility type: signed curves on arterials and collectors

Identified risk factors:

- ✓ **Roadway class of major rural collector**
- ✓ **Presence of an intersection**
- ✓ **Traffic volume of 3,000 to 7,500 annual average daily traffic**
- ✓ **Edge clearance rating of 3**
- ✓ **Paved shoulders equal to or greater than 4 feet in width**
- ✓ **Presence of a vertical curve**
- ✓ **Consecutive horizontal curves (windy roads)**
- ✓ **Speed differential between posted approach speed and curve advisory speed of 0, 5, and 10 miles per hour**
- ✓ **Presence of a visual trap (a minor road on the tangent extended)**

Selected countermeasures:

- ✓ **Traffic signs—enhanced curve delineation with the addition of Chevrons and larger advance warning signs**
- ✓ **Pavement markings—dotted extension lines at intersections and recessed raised pavement markers**
- ✓ **Shoulder rumble strips**
- ✓ **Roadside improvements—object removal, guardrail, and slope flattening**

Thurston County accessed an inventory of their roads and intersections through a database maintained by the statewide County Road Advisory Board[2]. In addition, Thurston County assembled crash data for the 2006-to-2010 timeframe from the WSDOT crash database. Thurston County then applied a spreadsheet-based macro that linked the road, intersection, and curve data with crash data. These data were used—along with aerial photography and geographic information system (GIS) files—to identify risk factors as part of the systemic planning process. Thurston County assembled a list of 19 potential risk factors and then performed a descriptive statistics analysis to identify 9 risk factors for use in screening and prioritizing candidate locations.

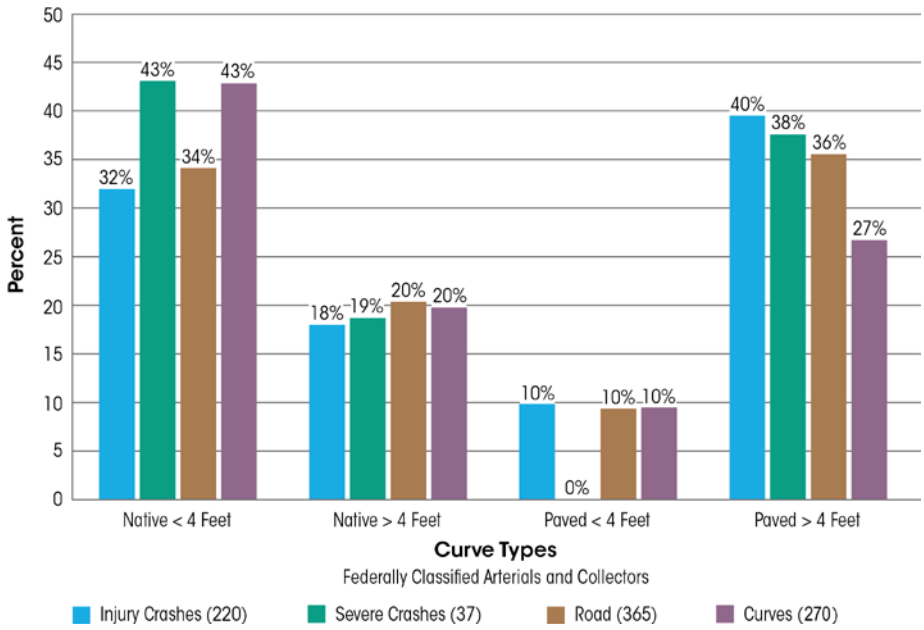
Based on the level of confidence resulting from the analysis, Thurston County decided that a risk factor could be worth one point or a one-half point. Those factors present in at least 30 percent of the severe (fatal and injury) crashes and overrepresented by at least 10 percent (when comparing the proportion of all locations with the proportion of severe crash locations) were used as a guideline to have a high confidence and assigned one point in the risk assessment process. The risk factors that had a lower confidence in their relative data were assigned one-half point. Figure 1 shows the results of analyzing shoulder type and width as a risk factor.

Thurston County then tallied the number of risk factors present for each of the curves. The risk factor totals for the ten curves with the highest scores ranged from 4.5 to 6.0. All 270 signed curves were prioritized for potential low cost safety investments. Five low-cost, low-

[1] FHWA. 2013. *Systemic Safety Project Selection Tool.* U. S. Department of Transportation. Federal Highway Administration. http://safety.fhwa.dot.gov/systemic/.
[2] County Road Advisory Board. http://www.crab.wa.gov/.

maintenance countermeasures with documented crash reductions will be systematically implemented at the signed curves: Chevron and Large Arrow signs, larger signs, rumble strips, barrier delineation, and extension lines.

Figure 1. Thurston County Analysis of Shoulder Type and Width for Risk Factor Selection



Note: 38 percent of severe crashes occurred in curves with paved shoulders greater than 4 feet, while only 27 percent of all reviewed curves have wide, paved shoulders. Because paved shoulders greater than 4 feet accounted for more than 30 percent of severe crashes and because the difference between crash locations and all locations exceeded 10 percent (38 percent to 27 percent = 11 percent), any curve with wide paved shoulders was assigned one point.

Benefits

The Tool provided Thurston County a proactive, data driven and defensible approach to identifying curves for improvement prior to a severe crash occurring, rather than reacting after an incident has occurred. Upon conclusion of the systemic analysis, Thurston County applied for Highway Safety Improvement Program (HSIP) grant funding using the results as documentation for the request. The WSDOT approved the grant and the County is moving forward with implementing the systemic countermeasures identified through this systemic analysis. The Tool also proved to present a process that is flexible and implementable by a local agency with limited funding and staffing resources. A benefit of working with the WSDOT to apply the systemic safety planning process is that the experience provided County staff an opportunity for greater involvement in Strategic Highway Safety Planning (SHSP) activities.

Contact

Scott Davis, P.E.
Traffic Engineering and Operations Manager
Thurston County Public Works
davissa@co.thurston.wa.us

APPENDIX E

Links to Resources Identified

Several of the findings contained in this synthesis report can also be found online at the various agency websites. A series of links to the online resources are presented in the following sections to this appendix.

Federal Highway Administration

Highway Safety Improvement Program Reports: http://safety.fhwa.dot.gov/hsip/reports
Local and Rural Road Safety Program: http://safety.fhwa.dot.gov/local_rural/
Roadway Safety Noteworthy Practices Database: http://rspcb.safety.fhwa.dot.gov/noteworthy/default.aspx
State Strategic Highway Safety Plan: http://safety.fhwa.dot.gov/hsip/shsp/state_links.cfm

Connecticut

Crash Data Repository System: www.ctcrash.uconn.edu

Florida

Design-Build Push Button: http://www.tampabaytrafficsafety.com/DBPB/SitePages/Home.aspx
Local Agency Safety Funding Guide for Off-System Roadways: http://www.tampabaytrafficsafety.com/SafetySummit/2015%20Resources/D7%20Local%20Agency%20Safety%20Funding%20Guide%20for%20Off-System%20Roadways%202015-04-08.pdf
Signal Four Analytics: https://s4.geoplan.ufl.edu/
Fletcher Avenue Project: http://hillsboroughcounty.org/index.aspx?NID=3587#

Iowa

Traffic Safety Improvement Program (TSIP): http://www.iowadot.gov/tsip.htm
Highway Safety Improvement Program (HSIP)—Secondary Program: http://www.iowadot.gov/traffic/sections/HSIP.html
Horizontal Curve Sign Program: http://www.iowadot.gov/traffic/horizontalcurve.html
Information and Instructions for Data Entry into Horizontal Curve Spreadsheet: http://www.iowadot.gov/traffic/documents/Horizontal%20Curve%20Sign%20Spreadsheet.xlsx
Local Road Safety Workshop: http://www.intrans.iastate.edu/events/local-road-safety-workshops/
Crash Mapping Analysis Tool (CMAT): http://www.iowadot.gov/crashanalysis/data.htm
High Five Rural Traffic Safety Project Initiative: http://www.dps.state.ia.us/commis/pib/Releases/2014/04-01-2014_GTSB_HighFive.htm
Guide to Transportation Funding Programs: http://www.iowadot.gov/pol_leg_services/Funding-Guide.pdf

Louisiana

Local Road Safety Program: https://www.ltrc.lsu.edu/ltap/lrsp.html
Louisiana Local Road Safety Program Project Application 2015: http://www.ltrc.lsu.edu/ltap/pdf/2015_LRSP_Application_Rev_Dec_2014.pdf
Destination Zero Deaths (DZD) Initiative of the SHSP: http://www.destinationzerodeaths.com/strategic/
South Central Regional Transportation Safety Plan (SCRTSP): http://www.scpdc.org/wp-content/uploads/SCRTSP-Updated-Feb-2013_withAug2013Status.pdf
Federal Highway Administration (FHWA) 2013 National Roadway Safety Award: http://www.roadwaysafety.org/wp-content/uploads/2013-noteworthy-practices-guide.pdf

Michigan

Local Agency Program's Before/After Study: http://michigan.gov/documents/mdot/FY_2010_Before-After_Study_487691_7.pdf
Southeast Michigan Council of Governments Reliable, Quality Infrastructure: http://archive.semcog.org/Outcomes_RQI.aspx?id=91105

Minnesota

State Aid for Local Transportation: http://www.dot.state.mn.us/stateaid/
Local Road Improvement Program: http://www.dot.state.mn.us/stateaid/admin/info/lrip.pdf
County Roadway Safety Plans: http://www.dot.state.mn.us/stateaid/county-roadway-safety-plans.html
County Roadway Safety Plans for Otter Tail County: http://www.dot.state.mn.us/stateaid/trafficsafety/county/ottertail-crsp-final-aug2011.pdf
Township Sign Replacement Program: http://www.dot.state.mn.us/stateaid/township-sign-program.html
Sign Maintenance and Management for Local Agencies: http://www.mnltap.umn.edu/training/topic/traffic/onlinesign/index.html
Towards Zero Deaths Initiative: http://www.minnesotatzd.org/whatistzd/
Towards Zero Deaths Regional Partnerships: http://www.minnesotatzd.org/initiatives/regions
Towards Zero Deaths Safe Roads Grant Program: http://www.minnesotatzd.org/initiatives/saferoads
Towards Zero Deaths Enforcement Grant Program: http://www.minnesotatzd.org/initiatives/enforcement
Statewide Trauma System: http://www.minnesotatzd.org/initiatives/trauma
Minnesota SHSP: http://www.minnesotatzd.org/initiatives/safetyplan
County and District Safety Plans: http://www.minnesotatzd.org/initiatives/countyplans
Crash Records System: http://www.minnesotatzd.org/initiatives/records
Crash Help Demonstration: http://www.minnesotatzd.org/initiatives/crashhelp
Highway Enforcement of Aggressive Traffic (HEAT): http://www.minnesotatzd.org/initiatives/heat
Towards Zero Deaths Initiatives Regional Partnerships: http://www.minnesotatzd.org/initiatives/regions
Area Transportation Partnerships: http://www.dot.state.mn.us/planning/program/mpordcatp.html
Minnesota Crash Mapping Analysis Tool: http://slideplayer.com/slide/762043/

Ohio

Highway Safety Programs: http://www.dot.state.oh.us/Divisions/Planning/ProgramManagement/HighwaySafety/HSIP/Documents/Other%20Safety%20Programs.pdf
Township Sign Safety Program: http://www.dot.state.oh.us/Divisions/Planning/LocalPrograms/Pages/Township_Sign_Safety_Grant_Program.aspx
Geographic Information Systems Crash Analysis Tool: http://www.dot.state.oh.us/Divisions/Planning/ProgramManagement/HighwaySafety/HSIP/Pages/GCAT.aspx

Oregon

Local Agency Program: http://www.oregon.gov/ODOT/TD/AT/Pages/Local-Program.aspx
All Roads Transportation Safety: http://www.oregon.gov/ODOT/HWY/TRAFFIC-ROADWAY/Pages/ARTS.aspx
Performance Plans and Annual Evaluation: http://www.oregon.gov/ODOT/TS/pages/plans.aspx
Oregon Traffic Safety Performance Plan: http://www.oregon.gov/ODOT/TS/docs/!FINAL%20(without%20405%20app)%202014%20Federal%20Version.pdf
Safe Communities: http://www.oregon.gov/ODOT/ts/pages/safecommunities.aspx#Program_Introduction
Transportation Safety Action Plan: http://www.oregon.gov/ODOT/TS/docs/tsap_revised_03-20-12.pdf

Utah

Zero Fatalities Program: http://ut.zerofatalities.com
Asset Management: http://www.udot.utah.gov/main/uconowner.gf?n=6581026708572391
Collection and Use of Roadway Asset Data in Utah Roadway Safety Data and Analysis: http://safety.fhwa.dot.gov/rsdp/downloads/utahiidarcasestudy.pdf

Washington State

Local Programs: http://www.wsdot.wa.gov/LocalPrograms
Target Zero: Strategic Highway Safety Plan: http://wsdot.wa.gov/planning/SHSP.htm
Highway Safety Improvement Program Reports: http://safety.fhwa.dot.gov/hsip/reports/
2013 Annual Collision Summary: http://www.wsdot.wa.gov/mapsdata/collision/pdf/AnnualCollisionSummary2013.pdf
Washington Traffic Safety Commission: http://wtsc.wa.gov/
Traffic Safety Annual Report: http://wtsc.wa.gov/wp-content/uploads/dlm_uploads/2014/07/2014-Annual-Report_FINAL12.29.14.pdf
Transportation Safety Projects: http://www.co.thurston.wa.us/publicworks/Projects/61458.aspx
WSDOT LTAP Newsletter 3rd Quarter: http://www.wsdot.wa.gov/NR/rdonlyres/39EB00CF-BEB7-40C4-8415-0FD9E54FA43F/0/Quarter3_2014.pdf
Tribal Transportation Program Safety Funds (TTPSF) Discretionary Grants for FY2014: http://flh.fhwa.dot.gov/programs/ttp/safety/documents/ttpsf-application-info-2014.pdf
SR 510—SE of Reservation Rd.—Intersection Improvements: http://www.wsdot.wa.gov/projects/sr510/reservationintersection
Traffic Safety Successes on the Colville Reservation: http://wtsc.wa.gov/programs-priorities/tribes/

Abbreviations and acronyms used without definitions in TRB publications:

A4A	Airlines for America
AAAE	American Association of Airport Executives
AASHO	American Association of State Highway Officials
AASHTO	American Association of State Highway and Transportation Officials
ACI–NA	Airports Council International–North America
ACRP	Airport Cooperative Research Program
ADA	Americans with Disabilities Act
APTA	American Public Transportation Association
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
ATA	American Trucking Associations
CTAA	Community Transportation Association of America
CTBSSP	Commercial Truck and Bus Safety Synthesis Program
DHS	Department of Homeland Security
DOE	Department of Energy
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FAST	Fixing America's Surface Transportation Act (2015)
FHWA	Federal Highway Administration
FMCSA	Federal Motor Carrier Safety Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
HMCRP	Hazardous Materials Cooperative Research Program
IEEE	Institute of Electrical and Electronics Engineers
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991
ITE	Institute of Transportation Engineers
MAP-21	Moving Ahead for Progress in the 21st Century Act (2012)
NASA	National Aeronautics and Space Administration
NASAO	National Association of State Aviation Officials
NCFRP	National Cooperative Freight Research Program
NCHRP	National Cooperative Highway Research Program
NHTSA	National Highway Traffic Safety Administration
NTSB	National Transportation Safety Board
PHMSA	Pipeline and Hazardous Materials Safety Administration
RITA	Research and Innovative Technology Administration
SAE	Society of Automotive Engineers
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (2005)
TCRP	Transit Cooperative Research Program
TDC	Transit Development Corporation
TEA-21	Transportation Equity Act for the 21st Century (1998)
TRB	Transportation Research Board
TSA	Transportation Security Administration
U.S.DOT	United States Department of Transportation

TRANSPORTATION RESEARCH BOARD
500 Fifth Street, NW
Washington, DC 20001

ADDRESS SERVICE REQUESTED

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