



IMPLEMENTING A LOCAL ROAD SAFETY PLAN

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16. Abstract A Local Road Safety Plan (LRSP) provides a framework for identifying, analyzing, and prioritizing roadway safety improvements on local roads. While several jurisdictions have adopted this approach as a tool to improve safety on their local roads, a large number are finding it difficult to go from development of the plan to implementation. This report documents the difficulties experienced when moving plans through to implementation and strategies jurisdictions and States have used to overcome those barriers and challenges to achieve reductions in fatalities and serious injuries on local roadways. The report details several steps for successful LRSP implementation. For each step the report describes the challenges and roadblocks that States and localities face in implementing the step, how various States and localities have addressed those challenges, and recommendations for future action.			
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EXECUTIVE SUMMARY

A Local Road Safety Plan (LRSP) is a Federal Highway Administration (FHWA) proven safety countermeasure¹ that provides a framework for identifying, analyzing, and prioritizing roadway safety improvements on local roads. While several States and local agencies have adopted this approach as a tool to improve safety on their local roads, many are finding it difficult to go from development to implementation. This report provides strategies local agencies and States have used to overcome barriers and challenges to successfully implement their plans.

Successful LRSP implementation starts during the plan development process. The LRSP development process can help make the implementation process more successful, and the following items should be considered when putting together a LRSP:

- Obtain support and buy-in from officials and stakeholders that represent the 4Es of safety (engineering, enforcement, education, emergency medical services) from outside the local agency (e.g., local elected officials, State Department of Transportation (DOT) officials) and individuals in the local agency (e.g., agency or organization heads, other divisions such as maintenance).
- Identify funding mechanisms so the local agency or State knows what funding is available which will help when it comes time to prioritize projects and strategies for implementation.
- Determine the level of project development so LRSP owners know what is appropriate for the projects identified in the LRSP.
- Find a champion who was involved in the development of the LRSP and can advocate for implementation of the LRSP.
- Develop a clear vision and mission to unite all stakeholders with a common goal.

If a LRSP already exists, recommendations include actions that build on what was accomplished in the development process including:

- Strengthen support and buy-in from officials and 4E stakeholders by providing information on what the locality/State will be doing in implementation.
- Review the projects in the LRSP to remind those who will be implementing the projects in the plan what level of project development is required.
- Provide support to the champion so they understand what is involved in implementation.



Photo courtesy of Molly O'Brien, Kimley-Horn and Associates, Inc.

¹ FHWA, Office of Safety, Proven Countermeasures, https://safety.fhwa.dot.gov/provencountermeasures/local_road/.

Research conducted for the report also identified differences in LRSPs and how that impacts implementation. The research did not reveal a correlation between how LRSP development was funded and implementation of the projects in the LRSP. Who develops the LRSP (consultants or agency staff), does not necessarily impact implementation either. In States the use of a single consultant to prepare LRSPs for multiple local agencies using a consistent methodology can result in an easier project selection process by the State DOT when the local agency applies for funding to implement projects.

The geographic area (single agency or region) also does not impact implementation but there are pros and cons for both. For instance, coordination and buy in may be easier in a single agency plan. However, there are finite resources in a single agency and because of the size of the community, there are fewer stakeholders who may be able to participate given their current workload. Regional plans lend themselves to a systemic safety approach (systemic safety can also be done in a local area), and there can be more stakeholders who participate and are active. A larger group of stakeholders, however, can make reaching consensus more challenging and different agencies may have different priorities. The way projects are selected also varies and it is important to consider how the local agency plans to obtain funding, and the requirements of that funding mechanism. There should also be a clear understanding of the level of project development that is required to obtain the funding for projects that will be implemented.

When it comes to implementation there are several key steps that will ensure the effort is successful including the following:

MAINTAIN BUY-IN AND SUPPORT



Photo courtesy of Brian Keierleber, Buchanan County, IA

Maintain buy-in and support from key officials in the agency and those outside the agency, (e.g., elected officials) which can be accomplished by meeting with any agency or elected officials that have changed since the plan was developed; conducting on-going, regular meetings for stakeholders to keep them informed; developing a fact sheet on the LRSP; conducting briefings and presentations at board and agency meetings; collecting and sharing important information on a regular basis; and bringing in other offices in the local agency that may be able to help such as maintenance.

Part of maintaining buy-in and support is to identify a champion. A champion is the individual who speaks about the plan at meetings, promotes the plan at meetings with State officials, and becomes the public face of the LRSP to officials and stakeholders. Having a champion who can articulate what is being implemented can make the process of confirming or obtaining support from key individuals easier. That champion can be a local person or someone at the State level. In most locations with LRSPs, the champion is the county engineer, county supervisor, or city engineer.

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In Washington State, the champion comes from the State DOT (Local Technical Assistance Program (LTAP)) and is the person who oversees all local road safety initiatives. The Washington State DOT felt this gave the individual perspective on the issues and the knowledge and authority to address related problems. The individual initially met with all the counties and got many to agree to develop and implement the LRSP. This champion provides a consistent message, helps initiate conversations with other agencies, and generates insight for improving the process overall. While several LRSPs were started with support and involvement from the DOT, other efforts were generated locally.

IDENTIFY FUNDING MECHANISMS

Identify funding mechanisms by meeting with the local agency manager or the Executive Directors of Metropolitan Planning Organizations (MPO) in the area to find out what funding is available locally for safety projects. It is also a good idea to meet with the relevant personnel at the DOT who administers the Highway Safety Improvement Program (HSIP) funding to find out the requirements and application process. Review the current list of capital improvement projects to determine where recommendations from the LRSP overlap with future planned projects and determine whether it is possible to fund portions of the LRSP through public/private partnerships. While HSIP is the mechanism used most often to fund LRSP projects, there are other sources including bicycle/pedestrian improvement funding; sign replacement programs; MPO funding; Tribal transportation safety funding; specialty bond programs; Active Transportation Program; and inclusion of the LRSP in the county budget.

IDENTIFY AND PRIORITIZE PROJECTS

Identify and prioritize projects based on potential effectiveness and available resources (funding, staff). While identification of projects usually takes place during development, there may be a need to further identify projects during implementation which can be done through network screening and the systemic safety analysis process. Methods of project prioritization can include data analysis that selects projects based on crash histories or risk factors; regional safety prioritization which links to other plans in a region like Safe Routes to Schools; benefit-cost analysis which prioritizes projects based on those with the highest benefit when compared to the cost; and other methods such as field visits to review site conditions, selection based on the number of risk factors, and the ability to piggyback on already planned projects or for a policy or political reason.

Steps for Successful LRSP Implementation

- 1. MAINTAIN BUY-IN AND SUPPORT**
- 2. IDENTIFY FUNDING MECHANISMS**
- 3. IDENTIFY AND PRIORITIZE PROJECTS**
- 4. DETERMINE PROJECT DELIVERY METHODS**
- 5. EVALUATE EFFECTIVENESS**
- 6. CONTINUE COMMUNICATION AND COORDINATION**

DETERMINE PROJECT DELIVERY METHODS

Determine project delivery methods which is what occurs after all necessary funding has been secured. Project delivery usually starts with the design of a project and in some cases can be a design-build effort where the design and construction happen simultaneously. Project bundling where multiple projects of the same type are bundled together or where multiple agencies bundle projects can lessen the financial and management burden, and on-going maintenance can be utilized for project implementation. For instance, integrating the LRSP projects with pavement resurfacing, restoration, and preservation efforts.

EVALUATE EFFECTIVENESS

Evaluate the plan's effectiveness in reducing fatalities and serious injuries after implementation. There are several ways to evaluate the effectiveness of the LRSP. The first is to compare the number of fatalities and serious injuries before the plan projects were implemented and after implementation. Benefit-cost analysis can also determine if a project is effective but it can also be the number of local agencies who make the LRSP part of their daily business, and the number of projects that were implemented or the number of applications for funding that were received. Evaluation can take place when a LRSP is updated either because conditions change or on an update schedule. LRSP owners can also identify metrics that track progress such as the number of miles of rumble strips that have been installed. Expanding stakeholders is another way to continue the effectiveness of the effort by bringing in new voices and ideas.

CONTINUE COMMUNICATIONS AND COORDINATION

Continue active communications and coordination with agency colleagues, partner agencies, and the public by ensuring stakeholders are all on board for implementation; by aligning messaging across communication channels and programs; meeting with elected officials and attending committee and board meetings and workshops; hosting conferences/webinars to keep a focus/awareness on local road safety; and developing and distributing newsletters or other regular communication. Other ideas include conducting regular presentations to the county, city, or regional board or council, posting photographs and information on social media; and scheduling a meeting with key officials if you know a project may generate some opposition.

LRSPs have been developed throughout the U.S. at the county, city, Tribal, or regional level (State DOT district or region, MPO). While development of LRSPs is widespread and continuing to grow, implementation of LRSPs has been challenging for some agencies. A plan cannot reach the goal of reducing traffic related fatalities and serious injuries if it is not implemented. Recognizing the challenges State, local, Tribal and regional agencies face, this report provides guidance and examples of how to successfully address and accomplish LRSP implementation. Whether the issue is funding, lack of support, or an uncertainty on how to move forward, there are a number of localities and States that are achieving implementation success. Their experience, coupled with what the research indicates are effective approaches, provide a road map on how to move forward from development to execution. Achieving success takes hard work and effort, but the results are worth it when considering the goal is to save lives and prevent injuries.

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LIST OF ACRONYMS

4Es	Engineering, Education, Emergency Response, and Enforcement
DOT	Department of Transportation
DOTD	Department of Transportation and Development
CALTRANS	California Department of Transportation
CMAQ	Congestion Management and Air Quality
CMF	Crash Modification Factor
EMS	Emergency Medical Services
FHWA	Federal Highway Administration
GCAT	GIS Crash Analysis Tool
GIS	Geographic Information System
HFST	High Friction Surface Treatment
HRRR	High Risk Rural Roads
HSIP	Highway Safety Improvement Program
HSM	Highway Safety Manual
LPA	Local Public Agency
LRSP	Local Road Safety Plan
LTAP	Local Technical Assistance Program
MPO	Metropolitan Planning Organization
NCHRP	National Cooperative Highway Research Program
NHTSA	National Highway Traffic Safety Administration
NJTPA	North Jersey Transportation Planning Authority
NOACA	Northeast Ohio Areawide Coordinating Agency
RSA	Road Safety Audit
SHSO	State Highway Safety Office
SJTPO	South Jersey Transportation Planning Organization
SSARP	Systemic Safety Analysis Report Program
SHSP	Strategic Highway Safety Plan
SMS	Safety Management Systems
TAP	Transportation Alternatives Program
TRIS	Transportation Research Information Services
TZD	Toward Zero Deaths



Photo courtesy of Getty Images.

CHAPTER 1

INTRODUCTION

Local roads have a fatality crash rate that is 75 percent higher than interstates (1.02 per hundred million vehicle miles traveled on local roads versus 0.58 on interstates).² While not all roads in rural areas are local, a number of them are, and according to the Insurance Institute for Highway Safety, in 2018 **rural areas accounted for 46 percent of all fatalities**.³ In addition, the **fatality rate per 100 million vehicle miles traveled in rural areas in 2017 was two times higher than in urban areas**.⁴ To address this issue and other safety concerns, many States and local jurisdictions have developed LRSPs. LRSPs provide local agencies with a strategy to improve local road safety for all road users and support the goals of the State's overall Strategic Highway Safety Plan (SHSP). These plans provide a way for Federal, State, and local agencies to have a positive impact in areas where a significant amount of fatalities and serious injuries occur by identifying, analyzing, and prioritizing roadway safety improvements on local roads.

² Highway Statistics, 2018. Federal Highway Administration, Washington, DC, <https://www.fhwa.dot.gov/policyinformation/statistics/2018/fi30.cfm>.

³ December 2019. Fatality Facts 2018. Urban/Rural Comparison, Insurance Institute for Highway Safety, <https://www.iihs.org/topics/fatality-statistics/detail/urban-rural-comparison>.

⁴ June 2019. Traffic Safety Facts 2017, Rural/Urban Comparison of Traffic Fatalities, NHTSA, DOT, HS, 812 741, Washington, DC, <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812741>.

While a growing number of jurisdictions have developed a LRSP, many struggle to implement their plan and measure results. LRSPs can help localities or States identify local road safety needs and determine, through data analysis, the most effective way of addressing those needs. LRSPs can have a positive impact on local road safety, but only if they are implemented. Despite intensive technical assistance and widespread information about the success of the LRSP approach, implementation has proven to be difficult for many. This report is designed to address this situation through a focus on noteworthy practices and strategies for implementing recommendations included within LRSPs.



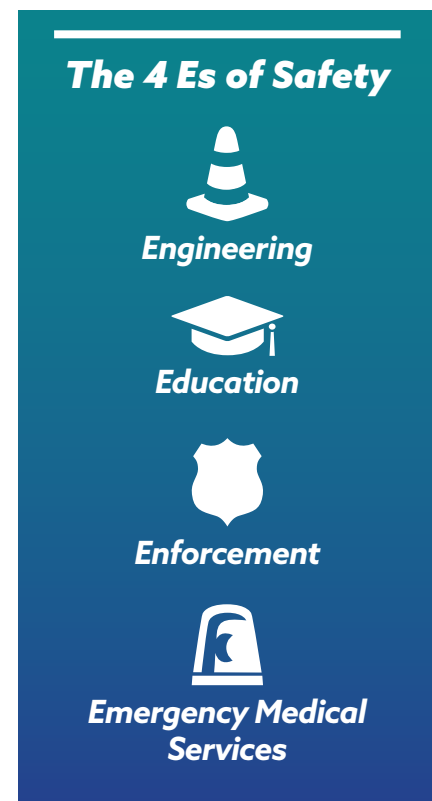
Photo courtesy of Molly O'Brien, Kimley-Horn and Associates, Inc.

Research conducted for this report examined a variety of implementation approaches to determine elements that lead to successful plan implementation and reviewed ways to overcome challenges and barriers associated with implementing a LRSP's recommendations. This report takes findings from a literature search as well as information gathered from State and local LRSP practitioners and details the challenges local and regional agencies face when implementing their LRSP; what

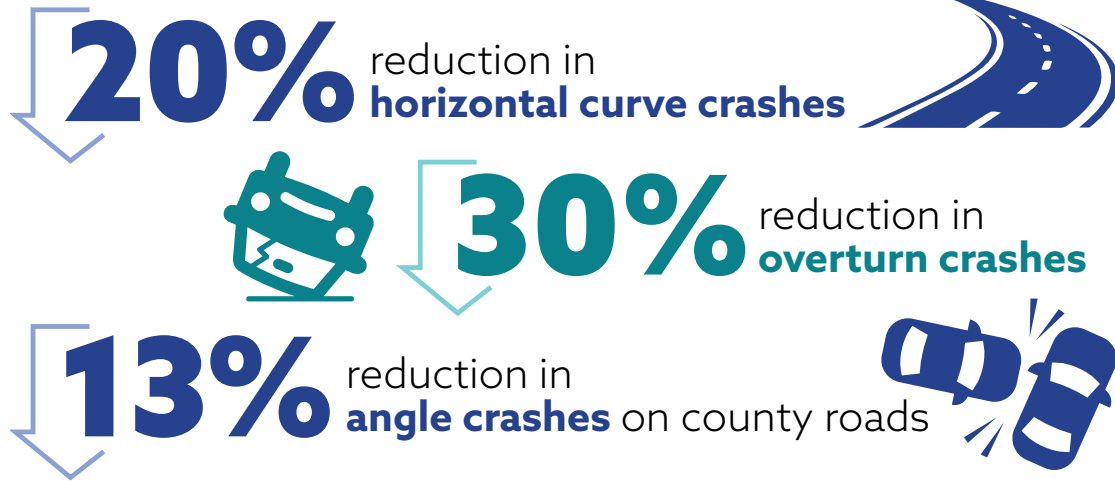
steps can result in successful implementation; and innovative and noteworthy implementation strategies. At the outset, it is helpful to identify what successful implementation entails. Successful implementation includes the following elements:

- Approval of an implementation plan from the county board or city council.
- Execution of identified safety projects/programs.
- Deployment of proven countermeasures.
- Integration of solutions across the 4Es of safety (engineering, education, enforcement, emergency response).
- Positive changes in an agency's policies and practices that increase support for safety.
- A reduction in fatalities and serious injuries.

These are just some elements of successful implementation; however, successful implementation will likely vary by jurisdiction. The important aspects are to get approval for implementation, determine what to implement based on a review of the data, available funding and resources, execute/construct projects, evaluate the effectiveness of LRSP implementation, and continue marketing and communication on the benefits of the plan. Several States and jurisdictions are already experiencing positive improvements from LRSP implementation.



Washington State experienced a



Thurston County, WA prioritized 270 signed curves, applied systemic measures, and saw a 35 percent reduction in target crashes.

Implementation of LRSPs in Minnesota resulted in a shift in safety emphasis from reacting to fatalities and serious injuries in spot locations to a proactive, system-wide approach. The State has also seen decreases in fatalities and serious injuries in several counties that have implemented a LRSP.



Photo courtesy of Getty Images.

CHAPTER 2

LRSP DEVELOPMENT

Successful LRSP implementation starts at LRSP development. The following sections discuss how the LRSP development process can help the implementation process and how the differences in LRSP development impact implementation. These recommendations also apply if there is an existing LRSP, but the jurisdiction or region is finding it difficult to move forward on implementation. Revisiting the steps taken during development and strengthening or enhancing what was previously accomplished can help to remind those involved in implementing the plan why it is important.

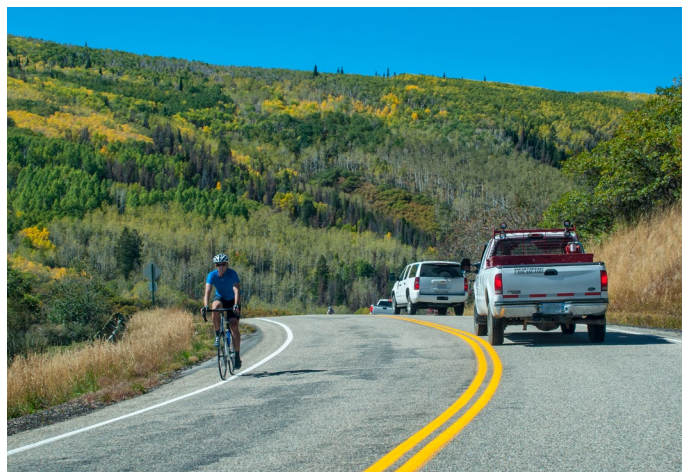


Photo courtesy of Neil Hetherington WTI-MSU.

THE RELATIONSHIP BETWEEN LRSP DEVELOPMENT AND IMPLEMENTATION

How a LRSP is developed plays a large part in the ability of a jurisdiction or region to successfully implement their plan. Factors like who is involved, the level of data analysis, and the types of projects and programs that are selected have a major impact on a LRSP's success. Support from key officials and data analysis that correctly identifies the right projects and programs goes a long way to setting the framework for successful LRSP implementation. The following development activities can make the transition to implementation easier and more successful:

- Obtain support and buy-in from officials and stakeholders** that represent the 4Es of safety (engineering, enforcement, education, emergency response) by providing information on the purpose of the LRSP, the benefits, and the role of officials and stakeholders. Support and active engagement of State DOT officials) and individuals in the local agency (e.g., agency or organization heads, other divisions such as maintenance) is needed throughout the LRSP development process and into implementation. Continue to cultivate their interest during implementation by providing information on what is being implemented and any results or success stories. The LRSP owners should foster open and frequent communication with stakeholders, community partners and citizens.
- Find a champion:** A champion who was involved in the development of the LRSP and can advocate for implementation of the LRSP will make it easier to transition to implementation. This individual can be a member of the jurisdiction's board, another elected official, the jurisdiction's engineer, or someone at the State DOT level.
- Conduct data collection and analysis:** Data is the foundation of the LRSP. It is used to identify problem areas, to determine appropriate solutions, and to monitor progress towards the plan's goals. Obtaining as much accurate data as possible during the development process allows for implementation to be targeted at locations that will be the most effective at reducing fatalities and serious injuries.
- Identify funding mechanisms and allocate appropriate resources:** Knowing how the local agency or State intends to fund the projects identified in the LRSP will help when it comes time to prioritize projects and strategies for implementation. It will also be important to determine what manpower and management are needed to ensure the plan's success.

How LRSP Development Can Impact Implementation

Obtain support and buy in from officials and stakeholders.

Find a champion.

Conduct data collection and analysis.

Identify funding mechanisms and allocate appropriate resources.

Determine the level of project detail that is needed to obtain funding.

Develop a clear vision and mission.

- **Determine the level of project detail that is needed to obtain funding:** LRSP owners should know what level of project detail (e.g., concept drawings, project description, preliminary design) is needed for the projects identified in the LRSP. This could be project sheets that mirror the funding application or a plan that will support project development.
- **Develop a clear vision and mission:** A strategic vision and mission unite all stakeholders with a common goal.⁵

By ensuring the development process includes the elements which can pave the way for successful implementation, States or localities are in a better position to achieve the goal of reducing fatalities and serious injuries on local roads. It is also important to keep in mind that local transportation agencies face many challenges daily which place a strain on limited funding and resources. It may be necessary to continually promote the LRSP to local officials and demonstrate how it is improving traffic safety, which is why obtaining and analyzing data is critical throughout the process

EXISTING LRSPS

If a LRSP already exists for your agency and you are ready to move into implementation or if there are struggles with moving into implementation, the following actions may help jump start the process:

- **Reaffirm support from the champion(s)** identified during the development process and re-engage them and make sure they understand the LRSP is moving into implementation. Review the recommendations and projects in the plan so they are familiar with what needs to be completed and how the projects accomplish the goal of reducing fatalities and serious injuries.
- **Strengthen support and buy-in from officials and 4E stakeholders** by providing information on what the locality will be doing in implementation. This information can be a review of why the LRSP was developed, e.g., a review of the fatality and serious injury data and what is planned for implementation. Implementation also offers an opportunity to brief 4E partners.



Photo courtesy of Neil Hetherington WTI-MSU .

In Michigan where the DOT oversees 12 regional plans, some held implementation meetings where individuals involved in development were brought up to date on what was planned for implementation. Participants included representatives from the counties, cities, and villages in the plan area, county engineers, commissioners, and others.

⁵ March 2012. Developing Safety Plans: A Manual for Local Rural Road Owners, Federal Highway Administration, FHWA-SA-12-017, page 9, Washington, DC, https://safety.fhwa.dot.gov/local_rural/training/fhwasa1108/.

- **Engage with others to implement behavioral safety countermeasures.** LRSPs can include both infrastructure and behavioral countermeasures. Some plans may just focus on infrastructure improvements while others determined, through data analysis, that a number of their problems are caused by road user behavior. That is why they include behavioral countermeasures such as increased enforcement and education to influence that behavior. If the LRSP does include behavioral countermeasures, it is a good opportunity to reach out to additional 4E stakeholders at the start of the implementation process. These 4E stakeholders include law enforcement agencies, education and prevention specialists, and other highway safety community leaders. These individuals can be helpful in implementing the behavioral countermeasures.
- **Clarify funding requirements and allocate appropriate resources.** Be prepared with information on what level of funding is needed, where it will be spent, and the benefits of using the funds for this purpose. Knowing how the local agency or State intends to fund the projects identified in the LRSP will help when it comes time to prioritizing recommendations and to obtain approval for the submitted list of projects. The local agency seeking Federal/ State funds to implement projects should determine the eligibility criteria of whatever funding sources were identified and know what the requirements are for the applications.
- **Review the level of project detail so projects in the LRSP are ready to be submitted for funding.** This will make it quicker and easier to start implementation. Project development starts with planning and programming what projects will be implemented, pre-design and scoping, design, and then implementation. In some cases a project can be implemented as part of a larger construction project, as part of maintenance, or through dedicated funding streams. In other cases it may be filling out a project sheet that mirrors the funding application or providing detail in a plan that will support project development.

DIFFERENCES IN LRSP DEVELOPMENT

LRSPs are as varied as the characteristics of the communities they serve. It is important to know there are different types of plans and the size of the plan and its components may vary. Several areas of differences in LRSP development include:

- Funding of LRSP development.
- Who develops the LRSP.
- Area covered by the LRSP.
- Project selection.
- Level of project development.

Funding of LRSP Development

There are a variety of ways agencies fund LRSP development. Some States fully fund LRSP development for their local jurisdictions, other States fund a significant portion of the LRSP development but require a local match. LRSP could also be developed and fully funded by a local agency. Research did not reveal a correlation between how the LRSP development was funded and implementation of the LRSP.

Who Develops the LRSP

LRSPs are developed by the local agencies in house, regional planning agencies or consultants procured at the State level, local level, or by the FHWA. In States where LRSPs are fully funded by the State, the State DOT typically procures and selects a consultant to prepare the LRSPs for multiple jurisdictions. This results in a consistent methodology applied across all plans and oftentimes the DOT has set aside funding for identified projects which results in an easier project selection process by the DOT when the local agency applies for funding.

Area Covered by the LRSP

LRSPs can be prepared for a county, city, MPO, Tribal area, or another region (State DOT district or region). When determining the area to be covered by the LRSP, agencies should consider how they will implement projects and what arrangement will result in the highest level of implementation for their area. While the geographic area covered by an LRSP does not impact implementation, there are some pros and cons associated with doing a county plan as opposed to a regional plan that may include several counties.

SINGLE AGENCY (CITY OR COUNTY) PLAN – PROS

Coordination and buy in may be easier in a single agency plan since it generally involves one local agency and maybe the State DOT.

Stakeholders within the jurisdiction are likely familiar with each other. This may make it easier in the decision-making process since the parties are familiar with each other's needs.

SINGLE AGENCY (CITY OR COUNTY) PLAN – CONS

There is a finite amount of resources available within a single agency such as staff and funding.

Because there are fewer stakeholders involved, it may be difficult for these individuals to devote the time and other resources needed to develop and implement the LRSP. Additionally, they may not have all the required safety expertise involved.

REGIONAL PLANS – PROS

Because the systemic safety approach focuses on evaluating a roadway network and looks at crash history on an aggregate basis to identify high-risk roadway characteristics, a regional approach may lend itself more to a systemic safety approach. This can also be true at the local level for a local road network.

There is always strength in numbers and a regional plan can result in more stakeholders being active in the LRSP development and eventually implementation, which can increase the chances of success. It also means a smaller number of plans need to be developed in the State and the larger crash area increases the crash sample size.

Regional plans provide a greater opportunity to leverage resources for implementation and they also provide a more diverse and interdisciplinary group of stakeholders.

REGIONAL PLANS – CONS

Because there are more stakeholders it may be difficult to obtain buy-in from everyone and to effectively coordinate the implementation process among a larger group of individuals.

Different agencies within a region may have different priorities and it may be difficult to reach consensus on what projects should be included in the LRSP and when it comes time for implementation which projects should be implemented and where.

Multiple agencies may have a large number of tasks to address and safety may not be the number one priority. This can make it difficult to elevate safety as a prime concern.

Project Selection

Agencies use three major project selection methodologies in LRSP development: risk factor analysis, high-crash locations, or a combination of risk factor analysis and high-crash locations. Projects can be identified through a systemic safety analysis using a risk factor analysis to identify locations with a high potential for crashes, and not necessarily a history of crashes. Since fatalities and serious injuries can be random in nature and spread throughout a local roadway system, this methodology allows for a proactive approach to reducing fatalities and serious injuries based on roadway, intersection, or curve features along the system.

Projects can also be identified through identification of high-crash locations or a “hot spot” analysis. This methodology is reactionary in nature and can result in improving locations where crashes have occurred in the past, as opposed to where they might occur in the future. A combination of risk factor analysis and high-crash locations can be utilized for project selection. For HSIP projects, they must be reflected in the State’s SHSP to be funded.

When developing the LRSP, consideration should be given to how the local agency plans to obtain funding, and the requirements of that funding mechanism. Projects should be selected with the methodology that is anticipated to result in successful funding applications that foster implementation of the LRSP.

If the LRSP contains behavioral safety projects or programs, funding for these must be obtained from the State Highway Safety Office (SHSO). These offices provide opportunities for agencies and other organizations to apply for grant funds on a yearly basis. Information on how to apply for these grants can be found on your State SHSO web site. A listing of State SHSOs is available at www.ghsa.org.

Level of Project Detail

Once the projects have been identified, it is necessary to determine what level of detail or effort is needed to move a project from concept to actual implementation. There may be a gap between the information on the project in the plan and what is actually needed to submit it for funding, scoping/design, and construction. The level of effort or detail varies from agency to agency. In some cases, it may be possible to implement a project as part of a larger effort such as a maintenance project like pavement preservation. If it is a pedestrian/bicycle safety project, dedicated funding for active transportation projects may be available or there may be resources including funding that are available from the local or regional agency.

For counties in Minnesota, Iowa, and Kansas that have LRSPs, project sheets are included for “top scoring” locations that mirror the HSIP application in their State for improvements such as wider edge lines, rumble strips, safety edge, destination lighting, and chevrons. The project sheets are submitted as part of or in lieu of the HSIP application. This helps streamline the implementation process, and projects move into design phase if funding is received.

As part of the California Department of Transportation (Caltrans) Systemic Safety Analysis Report Program (SSARP), one or more HSIP applications are prepared for the local agency by the consultant. The Caltrans HSIP application is far more detailed than applications in some other States. Having the application completed as part of the SSARP helps streamline the application process for agencies.

When developing the LRSP, there should be a clear understanding of the level of project development that is required to implement projects. States have varying levels of application processes. In some States with simpler applications, the LRSPs contain a project sheet that outlines the information that is needed for funding applications to ease the process for agencies to apply for funding after their LRSP is completed. Other States have more extensive funding applications that require preliminary design of the project, more detailed cost estimates, and/or benefit-cost analysis. In cases where more extensive information is required for funding applications, the agency may plan to have the application completed as part of their LRSP. Agencies can also plan to develop a project through another means such as through maintenance or pavement preservation.

Summary

Research and interviews did not necessarily determine that differences in LRSP development had a major impact on implementation. However, to be successful in implementation of a LRSP, there are items for local agencies to consider when preparing a LRSP. They include the availability of funding, how compatible are the projects in the LRSP with the State SHSP if seeking HSIP funds for implementation, whether the plan will be implemented at the county or regional level, how projects were selected, and if any work was done developing projects prior to implementation.

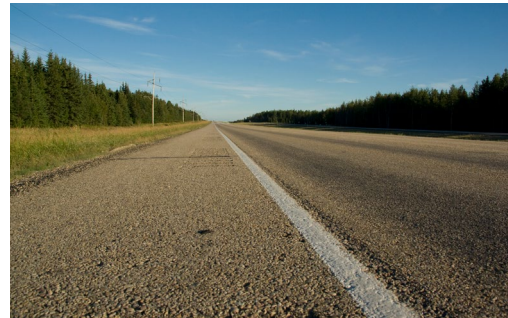


Photo courtesy of Getty Images.



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CHAPTER 3

STEPS FOR SUCCESSFUL IMPLEMENTATION

The development of a LRSP usually generates a good deal of interest, but the really challenging work happens in implementation, where identified strategies/projects are executed. It involves finding the funding or means to implement projects, prioritizing projects based on available resources, implementing the projects and determining their effectiveness, and making sure key individuals and the public remain interested and committed to the goals of the plan. In conducting research for this report, several



Photo courtesy of Getty Images.

steps surfaced that helped localities successfully implement their LRSPs. They include the following:

- Maintain buy-in and support from key stakeholders in the agency and those outside the agency (e.g., elected officials), and ensure someone is available to champion the plan throughout implementation.
- Identify funding mechanisms.
- Identify and prioritize projects based on potential effectiveness and available resources (funding, staff).
- Determine project delivery methods.
- Evaluate the project's effectiveness in reducing fatalities and serious injuries after implementation.
- Continue active communications and coordination with agency colleagues, partner agencies, and the public.

The following sections provide a more thorough discussion of each of these steps.

Steps for Successful LRSP Implementation

- 1. MAINTAIN BUY-IN AND SUPPORT**
- 2. IDENTIFY FUNDING MECHANISMS**
- 3. IDENTIFY AND PRIORITIZE PROJECTS**
- 4. DETERMINE PROJECT DELIVERY METHODS**
- 5. EVALUATE EFFECTIVENESS**
- 6. CONTINUE COMMUNICATION AND COORDINATION**

STEP 1 – MAINTAIN BUY-IN AND SUPPORT

It is essential to have buy-in and support for implementation from local elected officials, officials within the county and local agency implementing the plan, and key partners. Just because support was forthcoming during development does not mean it will continue during implementation specifically if there is a lag between development and implementation. Safety is just one priority facing a local agency; there may be other priorities that arise; therefore, it is important to continue to market the plan to ensure support for implementation. In addition, it is important to remember that elected officials change, so when there are new elected officials or new hires in the local agency, bring them up to speed on the LRSP, its purpose, benefits, and current implementation efforts.

Inform Leaders and Stakeholders

Keeping leaders and stakeholders informed on the LRSP is as important in implementation as it was during development. Once officials approve the LRSP and stakeholders participate in the identification of strategies and countermeasures, information sharing does not end. It is important to keep leaders and stakeholders informed about the implementation progress, achievements, and challenges on a regular basis. At the outset, remind officials and stakeholders what projects are in the plan; what funding is being sought to fund the projects; and how projects will be prioritized.

When briefing these individuals, describe the improvement and show photos or other graphics to illustrate the problem the project will address. This keeps stakeholders interested and actively involved. To keep leadership and stakeholders informed, a LRSP manager might develop and distribute an e-newsletter that provides information on current projects, success stories, and upcoming events. An annual ride along showcasing safety projects can also be conducted to inform leadership and stakeholders on the implementation progress.

The South Central Regional Safety Coalition in Louisiana, which has a regional LRSP, provides periodic updates via presentations to the area MPO board, along with information on current safety trends in the region. This helps elected officials understand safety problems in their area, which can increase buy-in for LRSP implementation.

In St. Louis County, MN the plan developer delivered an hour and a half presentation to the county board that included information on crash rates and the low-cost improvements identified in the LRSP to address those crashes.

Once implementation has occurred collect and analyze data at the location to show the impact on the traffic safety crash problem before and after implementation to show whether the project reduced those crashes.

Address Citizen Complaints/Concerns

As implementation moves forward, there may be objections or concerns raised about a particular project. The official can provide information on the benefits of a particular project or approach in a written or oral communication such as a letter, email, or phone call; they can provide general information on the improvements and why they are being done in a constituent newsletter or speak about the improvements at a community or other meeting.

In Otter Tail County, MN, for instance, citizens complained when the county installed edgeline rumble strips as part of the LRSP because they felt the rumble strips were noisy. Another criticism occurred when the county, after conducting systemic safety analysis, installed lighting in a remote area that had not experienced a severe crash problem. The county engineer was able to indicate county and agency officials supported the improvements, which helped alleviate some of the concern. Elected and agency officials in the county were fully informed about the benefits of both the edgeline rumble strips and the systemic safety approach and were able to provide information to the individuals who raised concerns.

Identify a Champion

A champion is someone who takes a leadership role in planning, promoting, and implementing the LRSP. This person is usually the individual who speaks about the plan at meetings, promotes the plan to State officials, and becomes the public face of the LRSP to officials and stakeholders. Having a champion who can articulate what is being implemented can make the process of confirming or obtaining support from key individuals easier. That champion can be a local person or someone at the State level. In most locations with LRSPs, the champion is the county engineer, county supervisor, or city engineer.

In Washington State, the champion comes from the State DOT (LTAP) and is the person who oversees all local road safety initiatives. The Washington State DOT felt this gave the individual perspective on the issues and the knowledge and authority to address related problems. The individual initially met with all the counties and got many to agree to develop and implement the LRSP. This champion provided a consistent message, helped initiate conversations with other agencies, and generated insight for improving the process overall. While several LRSPs were started with support and involvement from the DOT, other efforts were generated locally.

Obtain Support from Colleagues

In addition to backing from officials at the agency or board/county level, successful implementation also requires buy-in and support from colleagues within the local agency. The research revealed several suggestions, including maintenance, design, and construction. In each of these instances, individuals can incorporate projects from the LRSP into their work plan. For instance, maintenance can install new signage, design can include a safety edge on a local roadway, and construction personnel can install curve improvements.

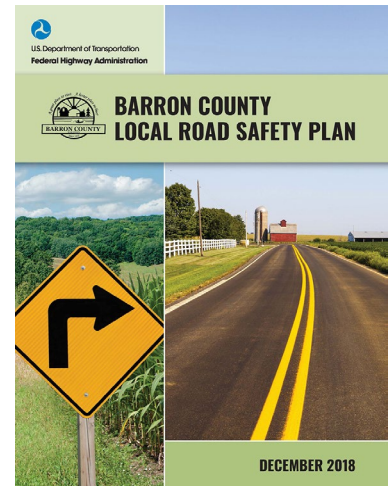
In Clackamas County, OR, after the plan was developed and implementation was started, the county engineer encountered resistance for safety improvements from the maintenance crew, so maintenance was brought into discussions on project implementation.

Step 1 Recommendations

Following are recommendations that will help to maintain support and buy-in for implementation of the LRSP.

- Reach out to current and any new agency or elected officials that have changed since the plan was developed. Schedule and conduct a meeting with these individuals, if possible, or send them the LRSP document and other related information about the plan.
- Conduct on-going, regular meetings for stakeholders to keep them informed on implementation plans and progress.

- Develop a one- to two-page fact sheet on the LRSP that includes why the plan was developed (data on the traffic crash problem and the number of fatalities and serious injuries), and what type of projects are planned to address the problem.
- Request a briefing or presentation to the agency board and a meeting with the local agency officials to describe what is planned for implementation. In some cases, it may be necessary to explain why certain projects were selected.
- Collect information throughout implementation on results of implementation and make sure to share information with officials and stakeholders on a regular basis. This can be as simple as a quick email message or an e-newsletter.
- Determine where other offices within the local agency can be of assistance such as maintenance and bring them into the implementation process in the beginning so they can offer suggestions on where they can help. In fact, it may be a good idea to bring in maintenance staff during the development process since they may have ideas on what projects would fit in with their work plan.



Maintaining buy-in and support from officials and stakeholders during implementation is not a one-time activity. It is an ongoing process that needs to be maintained throughout so individuals understand what is being accomplished.

STEP 2 – IDENTIFY FUNDING MECHANISMS

A LRSP will not have the desired effect if funding is unavailable for the plan's identified programs and projects. In some cases, the State does not provide funding to localities for safety improvements; in others, local agencies cannot afford to meet the funding match requirements for Federal or State safety funds; in other cases, the jurisdiction does not have the staff or resources to apply for Federal and/or State funds or cannot meet those requirements if funded. Following is a description of the various funding mechanisms and how several localities and States utilized each method.

HSIP Funding



Photo courtesy of Molly O'Brien, Kimley-Horn Associates, Inc.

Research found that [HSIP](#) funds are sought for implementation of most projects in the LRSPs. While some local entities have been successful in obtaining this funding, there are challenges for local entities to apply for and obtain the financial support. Some of the key challenges associated with HSIP funding include the following:

- The State's HSIP application process.
- HSIP funding availability for local agencies.
- Perception that the administrative burden associated with HSIP funding is difficult to manage.

HSIP APPLICATION PROCESS

The HSIP application process can sometimes be difficult to navigate for local agencies who are not familiar with applying for HSIP funding. To encourage local agencies to apply for funding, some States have developed guidelines for the application process, while other States have had their LRSPs include HSIP applications or project sheets that mirror the HSIP application.

Florida DOT's District 7 developed a "Local Agency Funding Guide for the Off-System Roadway" that served as a guide for the HSIP application process. This enhanced local awareness and increased the application of safety projects from three applications per year to 50+ applications.⁶

Caltrans developed the "Local Roadway Safety: A Manual for California's Local Road Owners,"⁷ which included guidance on the HSIP application process and the types of safety improvements that could be funded under HSIP and local match requirements. To further encourage local agencies to apply for HSIP funds, Caltrans then developed SSARP to address local agency reluctance to apply for HSIP funding because it was tied to Federal funding requirements and they did not have the resources to meet those requirements. The SSARP assisted local agencies with the information needed for their HSIP application.

HSIP FUNDING AVAILABILITY FOR LOCAL AGENCIES

How a State allocates HSIP funding to local agencies can vary significantly. Some States utilize HSIP funding exclusively for State-maintained roads, while other States utilize a portion for local roads, and in others the State and local agencies compete.

In the past, the Arizona DOT spent 80 percent of HSIP funds on State roadway projects and 20 percent on local projects. However, a review of the crash data showed there were more fatalities on local roads than State-maintained roads, so the Arizona DOT shifted to a competitive funding process and the 80/20 State-local funding split was eliminated. Now all HSIP funding requests are evaluated based on a benefit-cost ratio for all public roads including State, local, and Tribal. After shifting to a competitive funding process based on a benefit-cost ratio, the Arizona DOT increased the number of HSIP applications. After an eligibility review, 47 HSIP applications were approved for funding. Currently the split of HSIP funds is 60 percent local, 30 percent State, and 10 percent set aside for emergencies.

⁶ 2013. FHWA Safety, Safety Summit Yields Tenfold Increase in Number of Safety Applications Submitted by Local Agencies – Florida, 2013; https://rspcb.safety.fhwa.dot.gov/noteworthy/html/localrural_fl1.aspx?id=96.

⁷ 2020. Caltrans, Local Roadway Safety A Manual for California's Local Road Owners – California, 2020; <https://dot.ca.gov/-/media/dot-media/programs/local-assistance/documents/hsip/2020/lrsm2020.pdf>.

North Dakota DOT offers half of the HSIP funds they receive annually to the local public agencies (LPAs) and Tribal governments to do safety improvements within their jurisdiction out of the LRSPs and Tribal Safety Plans. Projects included in the local agency's LRSP are pre-approved for HSIP funding. The LTAP advises the LPAs and Tribal governments of the available North Dakota DOT funds. The local agency only needs to send in the application from their LRSP when they are ready to move forward with the project. This makes it easy for an agency to apply for the funding without having to fill out the application and submit the necessary data because that work was completed during the LRSP development. LTAP also conducts roadway safety training and reminds agencies to look at and use their LRSP.

PERCEPTION OF HSIP FUNDING BEING DIFFICULT TO UTILIZE

HSIP funding is a common form of funding for safety improvements; however, many local agencies perceive Federal funding to be more difficult to utilize than local funds for various reasons (i.e., administrative burden, limits on items the funding covers, difficulty in applying for the funds, and match requirement). In addition, they often have limited local funds to utilize as a funding match towards safety improvements when required. As such, safety projects identified in LRSPs are sometimes not implemented.

The Iowa DOT has implemented a swap of Federal funds for State funds for their HSIP secondary funding. (This is the name Iowa gives to HSIP funding which is spent on county roads. HSIP secondary funding is available for county-maintained roads.) The Iowa DOT notified counties of the change in the funding source for HSIP secondary funding and the benefits it would have for the counties. Since the swap of Federal funds for State funds has taken place, more counties are applying for HSIP secondary funding using the project sheets developed as part of their LRSP.

Behavioral Safety Funding

Some LRSPs include recommendations for both engineering and behavioral safety countermeasures within their plan. Based on a review of their data, these States and localities identify trends in crashes related to driver behavior, such as impaired or distracted driving, speeding, and lack of seat belt use. NHTSA provides [highway safety grants](#) to States to implement behavioral safety countermeasures through the SHSO. Following is a description of available NHTSA grant programs.

- "Section 402 State and Community Highway Safety Grant Program – Section 402 provides grants to States



Photo courtesy of Brian Keierleber, Buchanan County, IA.

to improve driver behavior and reduce fatalities and injuries from motor vehicle-related crashes in the areas of impaired driving, speeding, occupant protection, motorcycle safety, pedestrian and bicycle safety, school buses, enforcement of traffic laws, traffic records, emergency services, commercial vehicle safety, and driver's education.

- Section 405 National Priority Safety Programs – Section 405 provides grant funding to address selected national priorities for reducing highway deaths and injuries including occupant protection, State traffic safety information system improvements, impaired driving countermeasures, distracted driving, and motorcyclist safety.
- Section 154 Open Container Provision – Section 154 encourages States to enact an open container law. Although originally a transfer program, subsequent legislation amended the penalty provisions that apply to non-compliant States. Under current law, noncompliance results in reservation of the funds rather than an immediate transfer to other programs.
- Section 164 Repeat Offender Provision – Section 164 encourages States to enact a repeat offender law that provides specific minimum penalties to individuals convicted of a second or subsequent impaired driving offence. States that fail to comply with these minimum requirements have a portion of their highway funds reserved.
- Section 1906 Racial Profiling Prohibition Grants – Section 1906 provides grants to encourage States to maintain and allow public inspection of statistical information on the race and ethnicity of the driver for all motor vehicle stops made on all public roads except local or minor rural roads.”⁸

Behavioral safety funding is also available from private sector sources. The Allstate Foundation and the National Safety Council, for instance, sponsor and support Teen Safe Driving Coalitions in 10 States. These coalitions seek to establish a culture of teen safe driving based on the principles of graduated driver licensing. The Ford Motor Company's Driving Skills for Life program helps teach newly licensed teens and their parents the necessary skills for safe driving beyond what they learn in standard driver education programs.

Other Funding Sources

While HSIP is a common funding source for LRSPs, the research identified other funding sources including:

- Bicycle/pedestrian improvement funding which is provided through the Active Transportation Program (ATP), which consolidates existing Federal and State transportation programs and funding to encourage an increased use of active modes of transportation, such as biking and walking (California).
- Sign replacement programs such as the Sign Replacement Program for Cities and Counties (SRPFCC) which is conducted by the Iowa DOT's Traffic and Safety



Photo courtesy of Brian Keierleber, Buchanan County, IA.

⁸ Governors Highway Safety Association (GHSA), Federal Grant Programs, <https://www.ghsa.org/about/federal-grant-programs>.

Bureau. The program funds the replacement of damaged, worn out, obsolete or substandard signs and signposts (Iowa DOT).

- Funding from an MPO (Louisiana).
- Supplementing Tribal transportation safety funding (Nevada).
- Specialty bond programs such as Corridors of Commerce and Transportation Economic Development funding (Minnesota).
- Inclusion of the LRSP into the county's annual budget request to ensure funding is available for implementation (Chemung County, NY).
- Local agency force account (i.e., agency staff provide the labor while Federal funds cover the materials for pedestrian signal projects) (California).

States and local agencies can also use funds from the following sources:

- Congestion Management and Air Quality (CMAQ) – CMAQ is a flexible funding source available to State and local governments for transportation projects and programs to help meet the requirements of the Clean Air Act. Funding is available to reduce congestion and improve air quality for areas that do not meet the National Ambient Air Quality Standards for ozone, carbon monoxide, or particulate matter (nonattainment areas) and for former nonattainment areas that are now in compliance (maintenance areas). Traffic crashes and the resulting delay contribute to congestion and poor air quality.
- Transportation Alternatives Program (TAP) – TAP is a reimbursable Federal aid funding program for transportation-related community projects that strengthen the intermodal transportation system. TAP funds projects that create bicycle and pedestrian facilities and convert abandoned railway corridors to pedestrian trails. Ensuring these facilities and corridors are safe could be part of a LRSP project.

Step 2 Recommendations

When identifying funding, consider the following recommendations:

- Meet with your local agency manager or the Executive Directors of MPOs in your area to find out what funding is available locally for safety projects. For instance, there may be a Vision Zero program that has funding for pedestrian improvements. It is also a good idea to meet with that program manager to see where project and program implementation efforts match those in the LRSP.
- Meet with the relevant personnel at the DOT who administers the HSIP funding. It may be the safety engineer, but it also may be someone else. Ask the safety engineer who to contact and meet with them to discuss available funding. While HSIP will most likely be the major source of funding, there may be Federal and State funding that can be used. Familiarize yourself with these funding streams and learn what requirements are involved.
- Review the current list of capital improvement projects to determine where recommendations from the LRSP overlap with future planned projects and determine if it is possible to include the projects within the existing funding or whether budgets can be increased or modified to include the recommended safety improvements.

- Determine whether it is possible to fund portions of the LRSP through public/private partnerships. These partnerships have been utilized on the State and local level. Check with the head of your public works or transportation department, county or city manager, or State DOT safety engineer to determine whether this is something to pursue.

Being informed about available funding is not a one-time activity. As implementation of the LRSP moves forward it will be necessary to keep up to date on funding opportunities so there is no break in programs and projects getting off the ground.



Photo courtesy of Brian Keierleber, Buchanan County, IA.

STEP 3 – IDENTIFY AND PRIORITIZE PROJECTS

Identification of LRSP projects usually takes place during the LRSP development. However, there may be a need to further identify projects during implementation which can be done through [network screening](#) and the [systemic safety analysis process](#). Since funding and resources for implementation of LRSP projects is often limited, it is necessary to prioritize those efforts. Project prioritization makes implementation easier and helps localities determine what to submit during funding cycles. Determining what to implement is also a good opportunity to involve other stakeholders who have a unique perspective on traffic safety. Project prioritization is integral for effective LRSP implementation given the complexity of the data and limited staff and financial resources in many local jurisdictions. It may not be possible to implement every safety solution, so agencies need to prioritize projects to effectively improve safety. There are a variety of ways that projects can be identified and prioritized:

- Network screening.
- Systemic safety analysis process.
- Data analysis.
- Benefit-cost analysis.
- Cross-jurisdictional ownership.
- Link with priorities in other plans.
- Other approaches (piggy back on planned projects or policy/political reasons).

Methods of Project Identification

NETWORK SCREENING

A network screening process is used to identify sites for further investigation and potential treatment. The intent of the process is to identify sites expected to benefit the most from targeted, cost-effective treatments. Two approaches to network screening are general

utilized: a crash-based approach and a systemic approach. When using a systemic safety analysis process to complete network screening, site-specific geometric and operational attributes sites are used to select and treat sites.

Arizona DOT used a network screening process to identify the top 5 or 10 locations in each of their counties. The counties reviewed that information and decided where to implement projects from their plan. Prioritization was as simple as identifying the low hanging fruit first or projects that were easy to complete such as striping, signage and fixing sight distance issues. In fact, many LRSPs identified and implemented mainly low-cost safety improvements, (e.g., rumble strips, tree removal, signage improvements) because it enabled them to get projects implemented quickly and show how the improvements made a difference in safety.

St. Louis County, MN identified the three crash types that produced the most fatalities and serious injuries and then implemented the solutions. This allowed the county to see quick results and report success back to the county board.

SYSTEMIC SAFETY ANALYSIS PROCESS

The systemic approach to safety involves improvements that are widely implemented based on high-risk roadway features correlated with particular severe crash types. The key to the systemic approach is evaluating an entire system using a defined set of criteria, which results in an inferred prioritization that indicates some elements of the system are better candidates for safety investment than others.

The system-based approach acknowledges that crashes alone are not always sufficient to establish an implementation prioritization of countermeasures across a system. This is particularly true for many local and/or rural streets and highways with low volumes where crash densities tend to be extremely low and there are few high crash locations, and for crashes in urban areas where vehicles interact with vulnerable road users (pedestrians, bicyclists, and motorcycles).

Determining the right projects that would yield results at the local level was a key concern of the Washington State DOT. The DOT was highly supportive of the LRSP process but wanted to ensure counties in the State had enough knowledge and information to select and implement cost-effective projects. The DOT provided each county with crash statistics, conducted training on the systemic safety analysis process and a workshop on project prioritization. Cowlitz County, WA, one of the first counties in the State to develop a LRSP, developed a list of prioritized projects based on the crash data and information gained through the workshop and training. They also provided an estimated cost for each project. This list was submitted to the DOT and the DOT made the final decision on what was implemented in the county.

Methods of Project Prioritization

Local agencies should consider the HSIP or other funding application processes prior to determining how projects are prioritized. The following sections describe how different agencies have prioritized projects in LRSPs.

DATA ANALYSIS

Data analysis is not only used to identify project locations and appropriate countermeasures during the development of the LRSP, but it can also be used as a way to prioritize projects.

Minnesota LRSPs included a list of prioritized projects using data to determine what projects would address the most severe crash types and locations with high-risk roadway features.

Butler County, KS used data to identify high-profile intersections where there was a crash history. The fact that these locations scored the highest in the plan provided the confidence that these were the right places for a higher type of intersection control (flashing LED beacons on stop signs, advanced intersection warning signage).

BENEFIT-COST ANALYSIS

According to the Highway Safety Manual (HSM), "benefit-cost analysis compares all the benefits associated with a countermeasure (e.g., crash reduction,), expressed in monetary terms, to the cost of implementing the countermeasure. A benefit-cost analysis provides a quantitative measure to help safety professionals prioritize countermeasures or projects and optimize the return on investment."⁹

The Caltrans HSIP application requires projects to have a high benefit-cost ratio to be competitive in the application process. As such, projects are prioritized in SSARP based on benefit-cost analysis to be competitive for funding.

CROSS JURISDICTIONAL OWNERSHIP

One problem that can arise in implementation is cross-jurisdictional ownership. This usually occurs at an intersection where one roadway is owned by the local agency and the other by the State. While the LRSP may have made safety improvements at the intersection a priority, it may not be a priority for the State.

In Minnesota, several intersections were owned by both State and local agencies making it difficult to coordinate improvements when the two entities had different needs and priorities. The solution was to work with the State DOT to provide reasons why the local recommended improvement should be made such as addressing a high crash location for the local area.

⁹ January 2010. Highway Safety Manual, Federal Highway Administration, FHWA-SA-09-029, Washington, DC, Section 4.2, <https://safety.fhwa.dot.gov/hsip/resources/fhwasa09029/sec4.cfm>.

LINK WITH PRIORITIES IN OTHER PLANS

There may be other plans that have prioritized projects. The State's SHSP will have identified specific emphasis areas that the data show are the most serious traffic safety problems. In some cases, the SHSP may have prioritized projects and programs in each emphasis area which can help guide what could be prioritized in the LRSP.

In Louisiana, the nine regional safety plans use the State SHSP as a guide when they develop and implement their plans. In Northeast Ohio, the Northeast Ohio Areawide Coordinating Agency (NOACA) has a plan called "SAVE: NOACA's Plan for Transportation Safety (SAVE Plan)," which acts as the strategic plan for roadway safety in the five county Northeast region. A prioritized list of projects is included and the plan connects with other transportation plans including Safe Routes to Schools.

OTHER APPROACHES

The FHWA HSIP Manual includes "other considerations" for project prioritization which include the ability to piggyback on already planned projects such as repaving, project readiness, and in some cases, there may be a policy or political reason to prioritize a location.

King County, WA uses crash frequency as a minimum threshold to create a list of candidate locations with point density analysis or heat maps on their GIS system. Locations are then selected based on high crash rates. In the field at each site, county personnel review signing, markings, operations, and evidence of vehicle collisions (tire rubs on curbs, vehicle debris, damaged fixed objects, broken curb, etc.). Radar is also used to evaluate travel speed. The county then determines if there is a common crash pattern to see if the problem can benefit from an engineering solution.

Arizona DOT used road safety audits (RSAs) to identify two projects which they combined. For more systemic plans, projects are implemented in those locations with the highest "star" ranking or those that have the highest risk factor score.

The Michigan DOT educates individuals who manage the regional plans in the State on what to look for when identifying systemic safety locations and to prioritize those projects based on the risk factors identified for the State.

Step 3 Recommendations

Following are recommendations that will help identify and prioritize projects in the LRSP.

- Utilize the appropriate methods to identify projects including network screening and systemic safety analysis. These methods can be used individually or in combination which will ensure an examination of the whole local road system.
- Refer to the data to identify what projects would address the most serious traffic safety problems.
- Use other methods to determine the advantages of implementing one project over another such as benefit-cost analysis and select those that have a higher benefit (crash reduction) in relation to the cost of implementation.
- Have a clear understanding of the funding requirements to prioritize their projects and position them for successful funding applications.
- Determine if project prioritization has already been accomplished in other safety plans including the SHSP.



Photo courtesy of Molly O'Brien, Kimley-Horn and Associates, Inc.

STEP 4 - DELIVER PROJECTS

After a project has secured all the necessary funding, the next step in implementing a LRSP project is project delivery. These are the steps where a locality or State takes a project from concept to completion, and then determines the impact. It is also where all requirements, particularly for Federally funded projects, are identified. Often the project delivery process for LRSP projects takes time and patience. For Otter Tail, MN it took years to go from the idea to develop a LRSP to realizing the safety benefits after implementation. It is important to commit to being in the process for the long haul. Many localities start with the low hanging fruit and low-cost safety improvements. This can lead to some quick results, which can be helpful early in the implementation process. While implementing low-cost improvements initially is a good approach, individuals who have implemented a LRSP recommend balancing those improvements with more costly projects. This can be especially important after there has been several years of LRSP implementation.

Several States have offered support to local agencies with respect to design services and design build assistance to aid in implementation. Other locations have utilized project bundling or incorporation of safety projects into on-going maintenance efforts to implement the projects in their LRSPs.

Design

While some local agencies have staff and resources to design recommended improvements from their LRSP in-house or with consultants, other agencies lack the resources to prepare design documents.

The Minnesota DOT felt it would be difficult for each county in the State to implement the improvements identified in their LRSP without outside help, so the DOT provided preliminary engineering assistance from an outside contractor to counties who requested help in implementation.

To get projects off the ground and implemented, the South Jersey Transportation Planning Organization (SJTPO) offered final design assistance and served as project managers for consultant-led design services after selecting and approving projects for the local safety program. Applicants could request assistance by checking a box as part of their HSIP application. The North Jersey Transportation Planning Authority (NJTPA) also provided design assistance and support for the construction authorization process in their local safety program.¹⁰

Design Build

Design-build is when a locality or State will design and build a project concurrently, which consolidates the process. While this approach can be more economical and get the project constructed faster, it can be challenging for a locality that may not have the personnel to manage this task.

Florida DOT's District 7, in collaboration with FHWA Florida Division, developed a Design-Build Push Button framework that allowed the local agencies to request the use of a contractor to install preapproved safety measures. The contractor expedited the construction of simple or low-cost safety improvement projects and reduced the potential fatalities or serious injuries during the implementation period.¹¹

Project Bundling

One approach that can lessen the financial and management burden for local agencies is project bundling. Project bundling can occur in several different ways: multiple projects of the same type within one agency can be bundled together or multiple agencies can bundle projects together. Project bundling is a way for multiple local agencies or the State and a local agency to come together and implement similar projects on roadways across multiple jurisdictions. For instance, a jurisdiction could make their project part of a larger State effort such as a pavement marking or rumble strip installation.

Keokuk County, IA used project bundling to complete multiple projects that were similar in nature and near each other. These were mainly low-cost safety improvements such as clearing and grubbing the clear zone, wider edge lines, and rumble strips. Lee County in Iowa utilized their top 10 scoring intersections identified in their LRSP, based on a risk factor ranking, and bundled them together as one project.

¹⁰ North Jersey Transportation Planning Authority, Engineering Assistance, <https://www.njtpa.org/Projects-Programs/Local-Programs/Engineering-Assistance.aspx>.

¹¹ 2013. FHWA Safety, Design-Build Push Button Contract Significantly Reduces the Time It Takes to Implement Safety Improvements - Florida, 2013; https://rspb.safety.fhwa.dot.gov/noteworthy/html/localrural_fl2.aspx?id=97.

In Minnesota, adjacent counties partnered to submit projects across their roadway network. St. Louis County, MN used project bundling to reduce unit costs, which provided treatment for more miles of roadways at a lesser cost. The Minnesota DOT recently received an application that included implementation of destination lighting at 300 intersections. Usually the agency with more experience and the agency that can handle the cash flow and engineering takes the lead on implementation, making it easier for localities without the same resources or confidence to implement the project. The Minnesota DOT is receiving one to two applications including project bundling each year.

San Diego, CA is completing a project where they bundled 60 to 70 intersections together to implement leading pedestrian intervals as a result of the SSARP.

On-Going Maintenance

On-going maintenance can be utilized for project implementation. Maintenance crews generally possess detailed knowledge of every section of the local agency's roads, including current problem areas and those likely to be problematic in the future. While maintenance crews have an extensive knowledge of the agency's system, there sometimes might not be a clear line of communication between engineering and maintenance. A LRSP can provide an avenue for open dialog between the county engineer and maintenance staff and can lead to implementation of safety projects.

Projects can be implemented by integrating them with resurfacing, restoration, and preservation efforts. As noted in the publication "Good Practices: Incorporating Safety into Resurfacing and Restoration Projects," State and local transportation agencies have ongoing programs to improve safety and preserve the serviceability of pavement surfaces. Integrating safety improvements into resurfacing is a resource-efficient method of pursuing infrastructure and safety goals.¹²

In Keokuk County, IA, individuals leading the LRSP got the maintenance staff involved in the implementation process by selecting projects that could be completed through regular maintenance. The LRSP provided an opportunity to talk to maintenance staff about the recommendations and how a lot of what they are already doing is for safety. Maintenance staff can also use the opportunity to talk about areas of concern that they have within the county and discuss potential safety improvements.

One of the recommendations in the Otter Tail County, MN safety plan was increasing the edgeline to a 6-inch edgeline. A 6-inch wide edge line is now standard practice for all on-going striping projects. In addition, Safety Edge is being implemented as part of all paving contracts. None of this would have been possible without maintenance support.

¹² December 2006. Good Practices: Incorporating Safety into Resurfacing and Restoration Projects, Federal Highway Administration, FHWA-SA-07-001, Washington, DC, https://safety.fhwa.dot.gov/roadway_dept/strat_approach/fhwasa07001/

Other Project Delivery Methods

Other project delivery methods that have been successfully utilized for implementation include:

- The State DOT completes projects identified in the LRSPs that intersect with State roadways so local agencies and Tribal governments do not have to implement them (North Dakota).
- The local public agency delivers a project using force accounts (Mississippi).
- State DOT funds the replacement of signs that are damaged, worn out, obsolete or substandard (Iowa).

Step 4 Recommendations

There are several creative ways that LRSP projects can be implemented through different project delivery methods including the following:

- State DOTs assist local agencies with design help (either in-house or from consultants) or by offering design build assistance to aid in a more streamlined way to implement projects.
- Project bundling is an innovative way to implement projects from the LRSPs. Some agencies bundle similar projects or projects near each other, while other agencies have bundled projects across multiple jurisdictions.
- On-going maintenance is utilized for completing projects and recommendations that can be completed as part of routine maintenance projects.



Photo courtesy of Getty Images.

Agencies should also consider the project delivery methods identified to aid with implementation of their LRSPs.

STEP 5 – EVALUATE IMPLEMENTATION

Outcome and Output Evaluation

It would be difficult to determine if funds were invested in the right projects at the right places without evaluating the effectiveness of safety projects after completion. Data is used to track the effectiveness and to monitor progress in implementing the LRSP. For example, a plan may have established specific fatality and serious injury objectives and data are used to determine whether those objectives are being met. In this instance, the objective may be to reduce fatalities and serious injuries by two percent per year during the life of the LRSP. Data is then used to compare the objectives to the actual numbers. If objectives are not in the LRSP, data can also be used to determine progress and whether there has been reductions in crashes. It usually takes some time for the impact of engineering and behavioral improvements to

have an impact but when viewed over a period of several years, trends can show whether reductions in fatalities or serious injuries have occurred after the implementation of the plan started. This information can then be used to educate State and local officials as well as the public on the value of the LRSP and how it is making a difference. This return on investment is important to local elected and agency officials.

Existing conditions data analysis and collection happens during the LRSP development process. However, a lack of comprehensive local road crash data along with an inability to adequately analyze that data make it difficult for localities to evaluate the effectiveness of projects implemented as part of their LRSP. For most localities, this could involve project-level evaluation using a simple before-after analysis. Before implementing a project, agencies obtain data on the crash problem (usually fatalities and serious injuries) and after the project is implemented, they collect data again to determine if there was an impact on the safety problem. This simple before-after analysis can help the jurisdiction determine the crash modification factors for the identified location.

King County, WA uses a benefit-cost analysis to determine the effectiveness of the LRSP projects. During development, projects were identified based on crash rate history. The county publishes a report every four years, with a two-year supplement in between that matches the county budget cycle to show progress.

There are other ways to evaluate the success of the LRSP effort. Iowa DOT believes one of their accomplishments is the number of counties that are implementing elements of their LRSP as part of their daily business. The DOT feels this makes the plan worthwhile because the county has taken the initiative to implement best practices and safety improvements as part of their future projects and on-going maintenance.

In Minnesota, the DOT has defined success as the 85-90 percent of the counties that have implemented a project from the LRSP. The DOT receives over 100 applications for funding each year.

Process Evaluation

Evaluation can also identify potential opportunities and inform future decision making, which can lead to process changes. Local agencies respond to citizen complaints, but it is important to have data on hand to show that what the agency is implementing will have a lasting and beneficial impact on safety. A citizen might complain about a “dangerous” intersection, but an examination of the data could reveal the location was not an issue from a crash perspective.

Step 5 Recommendations

Conducting an evaluation on projects after they are implemented can be valuable to educate and obtain support from the community for implementation of future projects. Additionally, the evaluation results can help agencies determine what types of projects to focus on for future efforts.

- **Update the Plan:** As conditions in a county or region change, it will be necessary to change the LRSP. In Minnesota, several counties are already looking to revise their plans because they have implemented most projects. Establishing a regular update process may be worthwhile. The average number for most other safety plans is five years.
- **Identify Metrics:** There should be some way to measure the impact of the LRSP. Reductions in fatalities and serious injuries are the major metric that indicates whether the plan is successful, but there may be other ways to determine success. Identifying output measures, for instance, that indicate the level of activity such as the miles of rumbled strips installed or the number of curves that have been modified are ways to show progress.
- **Expand stakeholders:** It will always be necessary to update the stakeholders who are involved in the LRSP. In addition to replacing stakeholders who have retired or moved to other jobs, look to include people who have not been involved previously. For instance, it may be a good idea to involve law enforcement or representatives from the SHSO as implementation moves forward.¹³

STEP 6 – CONTINUE COMMUNICATION AND COORDINATION

Implementation requires greater emphasis on marketing and communication to keep interest in the LRSP active and alive. This activity can be regular email communications updating officials on the progress on implementation or a more formal newsletter that highlights progress on implementation.

Coordination with DOT and LTAP

Marketing and outreach should occur throughout LRSP development and implementation process. However, it was apparent from the research that several localities are expanding their efforts and reaching out more often to their partners. Often localities that have developed and are now implementing LRSPs have close working relationships with the DOT and the LTAP.

Marketing Ideas

Market the benefits of the plan and its implementation.

Inform people how data-driven analysis is used to target the right locations.

Use data to highlight how the plan is improving safety.

Let people know how funding is allocated to support projects like wider shoulders and rumble strips.

Revisit the LRSP's vision and mission.

¹³ Practical Tips & Tools for Developing a Local Road Safety Plan, National Center on Rural Road Safety, Winter 2019.

In North Dakota, the LTAP advised local agencies on available funding and provided roadway safety training to help with implementation. In Louisiana, the LTAP assisted with the road safety assessments and provided technical assistance to identify and implement infrastructure improvement projects.¹⁴

In Wisconsin the LTAP provided technical support to local agencies on project applications, coordinated data collection and analysis, and helped local agencies make informed decision about safety projects. In Michigan, the LTAP provided free technical support in coordinating safety projects with the State.¹⁵

Outreach to Other Stakeholders

Several localities are looking to other stakeholders such as law enforcement and behavioral highway safety specialists to broaden implementation of the LRSP by bringing in different perspectives on highway safety problems. Examples of this different perspective can be information on what law enforcement sees as they travel the roadways or what they have found when investigating a crash. Behavioral safety specialists may have ideas on how the LRSP can help change the safety culture in the locality or region by also focusing on road user behavior issues. Data analysis completed as part of development of the LRSP will reveal trends in crashes related to driver behavior. In addition to specific behavioral countermeasures such as law enforcement, engineering improvements can also help change behavior, such as installing rumble strips to help drivers stay focused, and engineering can reduce the severity of a crash when it happens, i.e., removing trees and other obstacles.

*Champaign County, OH used a unique way to reach out to stakeholders called the **C-H-A-R-M** process:*

C - Communicate with phone, emails, announcements; follow-up with thank you and outcomes.

H - Help, ask for it.

A - Activist - actively participate and volunteer for other groups.

R - Relationships - know who you are talking to and make a connection with them.

M - Motivate - make it personal.

¹⁴ 2013. FHWA Safety, Louisiana DOTD and LTAP Partnership Improves Local Agencies' Capabilities to Develop Regional Safety Plans, Access Funding, and Implement Safety Improvements, 2013; https://rspcb.safety.fhwa.dot.gov/noteworthy/html/localrural_la.aspx?id=146.

¹⁵ August 2016. FHWA Roadway Safety Professional Capacity Building program, Local Road Safety Data Analysis Approaches Peer Exchange, August 2016; https://rspcb.safety.fhwa.dot.gov/p2p_reports/peer_report_WA_Aug2016.pdf.

Champaign County also had some good tips in dealing with stakeholders including to set a schedule and keep it; capture progress and distribute it; ask for feedback, but be targeted about what is needed; and ask how things can be improved or what else can be done. Their LRSP only included infrastructure projects due to budget limitations, but they are now looking to reach out and make an impact on drunk drivers and young drivers. The county engineer, who led the development of the LRSP, will be contacting the local sheriff and school personnel.

Chemung County, NY identified potential stakeholders across twenty different professional areas to serve as an advisory group to their LRSP. The county also took advantage of every opportunity to speak in front of New York State assembly members who were champions for critical infrastructure and other transportation projects.

Clackamas County, OR worked with their Safe Communities Coalition, which brought people together to talk about common goals. It provided support for the infrastructure projects in the plan and identified behavioral programs, which helped the county implement their LRSP. The county now has a shared initiative with the Health Department through a health and transportation planner. It has generated a broader understanding of a safe systems approach, which differs from conventional safety practice by improving safety through environmental changes rather than relying solely on behavior. It also addresses risk with a comprehensive range of tools including vehicles, roadways, speeds, and behavior.

Safe systems are designed to anticipate human behavior and accommodate errors by drivers and other road users. For example, a safe systems approach recognizes that distraction may prevent a driver from seeing a pedestrian or vice versa. Separating pedestrians from traffic when possible prevents predictable errors leading to death or serious injury. Safe systems are also designed to reduce or eliminate opportunities for crashes that result in forces beyond human endurance. An example would be a crosswalk where pedestrians and vehicles occupy the same space. Reducing speed limits or changing the road design can prevent crashes. The effort is proactively changing the culture.

Washington State DOT is currently working with the SHSO to look for additional partners for the LRSP implementation, which is helping turn the current engineering-focused plans into something more comprehensive.

In Minnesota, some of the county plans work with Regional Toward Zero Deaths (TZD) coordinators who aid in marketing efforts. Many counties in the State reached out to Safe Communities programs. In Otter Tail County, MN, for instance, the sheriff was the champion of the Safe Communities program and emergency medical services (EMS) were at the table from the beginning. This started a review of all fatalities in the county, including State roads, that is still ongoing.

Step 6 Recommendations

To keep communication going and the LRSP at the forefront and ensure greater coordination consider the following:

- Ensure everyone is on board, and all stakeholders are accounted for including representation from the 4Es of safety – engineering, enforcement, education, and emergency medical services.
- Message across communication channels and programs so all available communication channels are used to promote the safety message (e.g., news, social media, television, industry associations, and videos).
- Meet with elected officials and attend committee and board meetings and workshops; prepare hot topic memos on emerging safety issues (e.g., pedestrian fatalities, and intersection crashes).
- Host conferences/webinars to keep a focus/awareness on local road safety
 - » Minnesota TZD meetings includes representatives from the 4Es.
 - » The Arizona Safety Summit includes a focus on rural transportation.
- Develop a newsletter or e-newsletter or memorandum that can be sent to all stakeholders updating them on implementation progress. This can include a description of projects that have started along with photos whenever possible, information on changes in traffic fatalities and serious injuries in the jurisdiction, or even extraordinary safety efforts by 4E partners such as a local police officer who had an outstanding arrest record for impaired drivers. The county public information officer may be willing to help set up the newsletter and even aid in compilation and distribution.
- Request and conduct regular presentations on the LRSP to the county, city, or regional board or council. These presentations can describe projects being implemented, provide any results when available, or information on new crash or safety trends. For instance, agencies may want to report on any increases in fatalities or serious injuries such as a spike in pedestrian fatalities and injuries.
- Post photographs, graphs or charts on the jurisdiction's web site or Facebook page. These can be photographs of the safety projects being started or updated fatality and serious injury charts.
- When you learn that a project may generate public opposition or criticism, it may be a good idea to schedule a meeting with the chair of your board or council and send follow up written documentation to let them know what you are doing, why it is important to improve safety, and why it may generate criticism. It is also important to engage the public and educate them about the benefits of safety solutions.



Photo of 2018 LRSP workshop at Wisconsin Dells courtesy of FHWA.



Photo courtesy of Getty Images.

CHAPTER 4

CONCLUSION

LRSPs are one of the 20 FHWA proven safety countermeasures.¹⁶ LRSPs have been developed throughout the country at the county, city, Tribal, or regional level (State DOT district or region, MPO). While development of LRSPs is widespread, implementation of LRSPs has been challenging for some agencies. For LRSPs to be an effective countermeasure for reducing fatalities and serious injuries on local roads, they must be implemented. Following are some steps to consider for implementation:

- **Engage your 4E stakeholders:** Stakeholders that were involved during the LRSP development process may have moved on once that process concluded. When starting implementation, it is a good idea to bring them back together and give them roles and responsibilities. For instance, form teams or groups to look at various aspects of implementation such as the progress getting projects implemented, assisting with communication functions, or promoting the plan to officials and the community. It may

¹⁶ FHWA, Office of Safety, Proven Countermeasures, https://safety.fhwa.dot.gov/provencountermeasures/local_road/.

also be necessary, given staff turnover, to identify new people. Maintaining contact with stakeholders can help move the implementation process forward and provide LRSP managers with opportunities to get input on the plan and its progress. Do not forget to reach out to stakeholders who can help with behavior safety issues such as law enforcement, education, and emergency medical services.



Photo courtesy of Neil Hetherington WTI-MSU.

- **Find a champion:** A local, regional, or statewide champion who was involved in the development of the LRSP and supports implementation of the LRSP will make it easier to transition to implementation. This individual can be a member of the jurisdiction's board, another elected official, or the jurisdiction's engineer.
- **Identify funding mechanisms:** In implementation, knowing what funding is available will help with both the project prioritization and project delivery. Funding may lend itself more to projects selected based on risk factor analysis, high crash locations, or a combination of both.
- **Prioritize projects:** Overall project prioritization makes implementation easier and allows localities to prepare for the next funding cycle. When prioritizing projects refer to the data to make sure the project will address the appropriate safety problems in the area.
- **Allocate appropriate resources:** Depending on what projects are selected for implementation, it will be necessary to determine what manpower and management are needed to take the projects through the project delivery process from design to installation as well as evaluation once the project is complete and has been installed for a period of time.
- **Determine project development:** When it comes to developing a project for implementation, determine if there are tools, such as a project sheet that mirrors the funding application, that would help with the process or whether a consultant or training could assist with filling out the application.
- **Undertake project delivery:** There are a lot of creative ways that LRSP projects can be implemented through different project delivery methods. State DOTs should consider ways to assist local agencies through design help (either in-house or from consultants) or by offering design build assistance to aid in a more streamlined way to implement projects. Project bundling is also a creative way to implement projects from the LRSPs. Some agencies bundle similar projects or projects near each other, while other agencies have bundled projects across multiple jurisdictions. On-going maintenance is another method for completing projects and recommendations that can be completed as part of routine maintenance projects. Agencies should consider some of the project delivery methods identified within this section to aid with implementation of their LRSPs.

- **Conduct evaluation:** Conducting an evaluation on projects after they are implemented can be valuable to educate and obtain support from the community for implementation of future projects. Additionally, the evaluation results can help agencies determine what types of projects to focus future implementation efforts.
- **Continue communications and coordination:** Marketing and communication on the LRSP should continue after the plan is completed. It is even more important to continually educate key elected and agency officials, colleagues, other stakeholders and the public about the value of the LRSP, the identified projects and how it is achieving positive results. A few ways to continue communication efforts including newsletters, web site postings, and presentations. Whatever vehicle is used to get the word out about LRSP implementation, it is a perfect opportunity to highlight how these plans get results.

The development of a LRSP usually generates a good deal of interest, but it can be challenging to implement the strategies and projects identified within the LRSP. It involves gaining buy-in for the LRSP, finding the funding to implement projects, prioritizing projects based on available resources, implementing the projects and determining their effectiveness, and making sure key individuals and the public remain interested and committed to the goals of the plan.



Photo courtesy of Getty Images.



Photo credit: Neil Hetherington WTI-MSU

CHAPTER 5

RESULTS OF IMPLEMENTATION

The following sections describe success stories that resulted from the successful implementation of a LRSP.

THURSTON COUNTY, WA

Scott Davis, former Thurston County Traffic Engineer

Matt Enders, Technical Services Manager, Washington State Department of Transportation

Since the Thurston County, WA LRSP was implemented, the county has seen a

35% REDUCTION

**in FATAL AND SERIOUS INJURY CRASHES
on horizontal curves.**

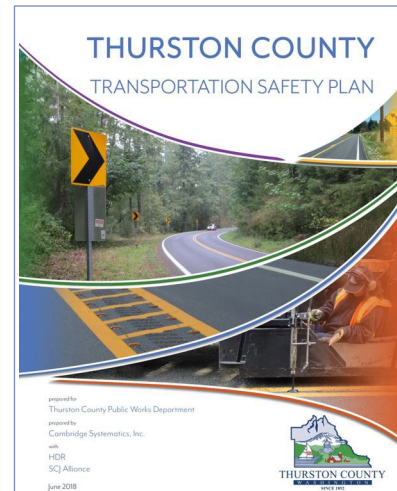
This means there are approximately 20 to 30 fewer fatalities on local roads in the county. Crashes on horizontal curves made up approximately 50 percent of the fatalities in Thurston County and as a result of the LRSP, the total number of fatalities were reduced substantially.

The LRSP also improved the safety culture of the Department of Public Works and ensured safety was more ingrained into planning, selection, and programming of projects. "It helped push our organization and staff to embrace new approaches to decision-making," said Scott Davis who was the county traffic engineer in Thurston County when the LRSP was developed and then implemented. "Safety is now a bigger consideration in all projects," said Matt Enders from Washington State DOT who oversaw the development of all LRSPs in the State.

It has led to better planning processes. "There are now quite a few people who are committed to safety and involved in the plan," Davis said. The plan also helped change the views of a new Public Works Director who initially did not think it was possible to reach a target zero on fatalities. After participating in the plan's implementation, the director's perspective changed. The LRSP led to adoption of statewide goal of zero in the County's Comprehensive Plan, incorporation of low-cost measures (e.g., rumble strips) into capital projects, roundabout policy, and using FHWA's "Intersection Control Evaluation Framework" to identify optimal solutions for intersections.

Scott Davis indicated the LRSP helped the county achieve a level of continuity. To successfully implement the plan, "you need more of an organizational approach rather than an individual effort," Davis said. "There are a lot of pieces [involved in implementation] and the plan allows safety to continue long after the original organizers are gone," he said.

When asked what would have happened in the county without the LRSP, both Davis and Enders indicated safety projects would have been done. "But we would not have looked at the issue as broadly," said Davis. Previously the county focused more on hot spots and now uses the systemic approach to identify risk factors countywide. The Washington DOT was already moving counties in the direction of system-wide, low cost improvements before Thurston County started their safety plan. Now nearly all counties in the State have one. This has helped the State address safety issues in a larger context. For instance, problems along one



corridor involved local roads owned by several counties. The LRSPs provided a way for the counties to come together to address the safety problem, said Enders.

Involvement of stakeholders in the LRSP development and implementation processes led to some impressive changes. In one instance problems of speeding along a rural corridor could not be adequately addressed by law enforcement because there was no place for sheriff deputies to pull off road. One of the strategies for rural roads was to provide law enforcement pull-outs. In another instance stakeholder involvement spawned a multi-agency study looking at an 8-mile urban corridor.

Safety is important to the people in Thurston County, said Davis. "People want to feel safe and the LRSP helps meet community needs by taking safety and making it more prominent in the decision-making process," he said.

ST. LOUIS COUNTY, MN

Victor Lund, PE, St. Louis County Traffic Engineer

Minnesota began development of LRSPs in 2010. Most counties started deploying low-cost, proactive safety improvements in 2012. Vic Lund, traffic engineer with St. Louis County, MN reported that:

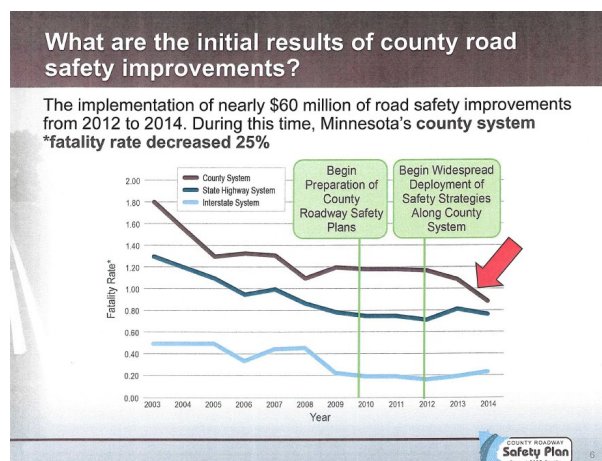
"When you look at the results of what is happening with all the counties in Minnesota who developed and then implemented a LRSP, there was a

35% REDUCTION

in the FATALITY RATE ON THE STATEWIDE COUNTY ROAD SYSTEM between 2012 and 2017."

For the State highway system, during the same period, he reported, the fatality rate stayed even. So, over the last six or seven years, the reduction in fatalities and the fatality rate in Minnesota occurred primarily on the county road system. Counties in Minnesota have, by and large, taken their LRSPs to heart. Lund reported there were some counties that were not on board with doing a LRSP at first, but who, in the last couple of years, have come around and supported the concept.

"When you look at fatal crashes on just the county road system in St. Louis County going back to 2005/2006, there was an average of about 10 fatal crashes per year. Since the time of systemically getting safety projects out onto the road, the county road system has experienced two separate years with the lowest number of fatal crashes in the last 20 years," he said. Historically for county roads in St. Louis County, most serious injury crashes were single vehicles that ran off the road. In 2019, Lund indicated the county will probably end up with four



Graph courtesy of Minnesota DOT.

fatal crashes, but only one of them will be a single vehicle, run-off-the-road crash, which had previously been the major cause of fatalities. The other fatal crashes involved motorcyclists and a truck/train crash.

Another outcome of implementing the LRSP has been how St. Louis County incorporated safety into design. For example, St. Louis County previously used only a 4-inch-wide edgeline whereas all projects on county State aid routes now receive a standard 6-inch wide edgeline. Another example is where St. Louis County now paves the shoulder if allowed by the cross-section and installs shoulder rumble strips on the new paved shoulder. "Rather than me pushing for the change, our construction people are incorporating these key safety strategies into their projects on their own," he said. The improvement has been institutionalized and is probably one of the reasons why there has been a reduction in run-off the road crashes.

Lund reported he keeps his county board members up to date on what is happening with the LRSP. Typically, twice a year the St. Louis County Board hosts a "Transportation Day" workshop where the various divisions within the Public Works Department come and talk about their programs and projects. "As the traffic engineer, I get a half-hour to talk about traffic and safety and can report on our success with the LRSP. This is key to maintaining that close relationship with our elected officials thereby gaining and maintaining their political support."

When asked about the first step that St. Louis County did when implementing their LRSP, Lund indicated that they looked at their serious crashes and identified run-off-the road crashes as the largest percentage of total serious crashes on the county road system. "We invested millions of dollars in deploying safety strategies that addressed run-off-the-road crashes by putting in shoulder rumble strips, chevron signs on curves, 6-inch-wide edgelines and other low cost, pro-active improvements," Lund said. St. Louis County has effectively completed all the low-cost, "low hanging fruit" type projects and now they are going back and doubling down on those safety improvements at the highest risk locations by completing projects such as high friction surface treatments (HFST) on curves, reconstructing intersections located within a curve, installing left-turn lanes major through routes and constructing innovative intersections such as reduced conflict intersections.

"For me, I look at this like an apple tree. In the beginning you just pick the apples you can reach. These represent those low-cost projects that are relatively easy and quick to implement. For the next go round, you have put forth a little more effort and get a ladder out so you can reach apples in the middle area of the tree. This represents those medium cost type projects such as HFST. And finally, you must climb out of the ladder onto the tree and work your way to the top of the tree reaching for the last fruit. This represents those high cost projects such as constructing roundabouts and reduced conflict intersections," Lund said. That is what we are doing now with our LRSP. "Our recommendation is to implement the low-cost first and then go for the costlier improvements next," he said. He said by doing this you will likely have the best opportunity to realize significant reductions in fatalities and serious injuries early on.



Photo courtesy of Getty Images.

APPENDIX

RESOURCES

FHWA has a number of resources on its website related to the development and implementation of LRSPs including:

[Countermeasures That Work](#) is a basic reference to assist SHSOs in selecting effective, evidence-based countermeasures for nine traffic safety problem areas.

[Developing Safety Plans: A Manual for Local Rural Road Owners](#), FHWA, provides guidance on the development of LRSPs.

[Good Practices: Incorporating Safety into Resurfacing and Restoration Projects](#), FHWA, provides information on institutional practices that integrate safety into resurfacing and restoration projects.

[Highway Safety Grant Programs](#), provides additional information on behavioral safety funding available from NHTSA.

[Highway Safety Improvement Program](#), FHWA, is a core Federal-aid program to achieve a significant reduction in traffic fatalities and serious injuries on all public roads.

[Highway Safety Manual](#), is the guidance document for incorporating quantitative safety analysis in the highway transportation project planning and development processes.

[Highway Statistics, 2018](#), FHWA, is an annual report that contains analyzed statistical information on motor fuel, motor vehicle registrations, driver licenses, highway user taxation, highway mileage, travel, and highway finance.

[Local Agency Funding Guide for the Off-System Roadway](#), Florida DOT, District 7, provides targeted information on roadway safety, and a step-by-step process to assess and improve the safety of the local road networks.

[Local Roadway Safety A Manual for California's Local Road Owners](#), Caltrans, is designed to help maximize the safety benefits for local roadways by encouraging all local agencies to identify and analyze their safety issues and to position themselves to compete effectively in call-for-projects.

[Network Screening](#) is the process of studying safety conditions on all of a road network or a subset of the network using the same method at each location so that the results can be compared and prioritized. Other information on network screening is available in the [HSIP Manual](#) and a [Network Screening Quick Start Guide](#).

[Proven Countermeasures](#), FHWA, is a list of 20 treatments and strategies that practitioners can implement to successfully address roadway departure, intersection, pedestrian and bicycle crashes.

[Rural/Urban Comparison of Traffic Fatalities](#), Traffic Safety Facts, NHTSA, is an annual report that presents descriptive statistics about traffic crashes of all severities in rural and urban areas.

[State Highway Safety Offices](#), is a listing of each state's Highway Safety Office.

[Systemic Approach to Safety](#) involves widely implemented improvements based on high-risk roadway features correlated with specific severe crash types.

[Transportation Alternatives Program](#), FHWA, are set-aside funds for projects related pedestrian and bicycle facilities, recreational trails, safe routes to school projects, community improvements, historic preservation, vegetation management, and environmental mitigation.

[Tribal Safety Plans](#), provides links to Transportation Safety Plans developed by Tribal Governments to share these Transportation Safety Plans.

RESEARCH METHODOLOGY

Information for this report was gathered from the following sources:

- A review of information from a variety of search engines and web sites including:
 - » FHWA Office of Safety website, Local and Rural Road Safety Program:¹⁷
 - Includes general information on HSIP, which provides funding to implement many of the infrastructure projects in the LRSP.
 - Videos and brochures on the important role local elected officials play in improving road safety particularly in approving funding to implement projects in the LRSP, and tips to local agency practitioners about how to talk about road safety with local elected officials.
 - “Assessment of Local Road Safety Funding, Training and Technical Assistance” report which summarizes State DOT practices for delivering funding and resources to local entities for road safety improvement projects.¹⁸
 - Information on how to implement a safety management system (SMS) at the local level. SMS provides tools and information to help decision makers and those who manage and maintain local roadways identify, prioritize, correct, and evaluate the performance of their transportation safety investments.
 - Manuals for Local Rural Road Owners that provide information on implementation approaches, safety analysis, and countermeasures for intersections and roadway departure.
 - Manual on Roadway Safety Information Analysis that includes information and case studies on crash data collection and analysis, and countermeasure selection.
 - Manual on Speed Management including identifying countermeasures (e.g., engineering, enforcement, and education), and implementing countermeasures including preparing for implementation, i.e., support, prioritization, funding, and evaluation.
 - Manual on Non-Motorized User Safety including selecting, implementing, and evaluating countermeasures.
 - Briefing sheets on local and rural road safety including applying the systemic approach on local roads, information on crash modification factors (CMFs) and how they can be used to evaluate the impact of improvements on fatalities and serious injuries, how implementing low-cost ITS applications can improve safety on local and rural roads, the safety needs and treatments of unpaved roads, and how to make local and rural roads safer for pedestrians and bicycles.

¹⁷ FHWA Office of Safety, Local and Rural Road Safety Program, https://safety.fhwa.dot.gov/local_rural/.

¹⁸ FHWA, Office of Safety, Assessment of Local Road Safety Funding, Training and Technical Assistance (https://safety.fhwa.dot.gov/local_rural/training/fhwasa13029/).

- "Addressing Safety on Locally-Owned and Maintained Roads, A Domestic Scan" includes information from seven States on how they were improving safety on their local roads. The report provides several noteworthy examples.¹⁹
- » FHWA Office of Safety Noteworthy Practices database,²⁰ including:
 - Safety Summit Yields Tenfold Increase in Number of Safety Applications Submitted by Local Agencies, 2013.
 - Highway Safety Improvement Program: Local Roads Safety Policy Peer Exchange, November 2016.
 - Overcoming Limited Data to Identify High Risk Rural Road (HRRR) Projects, 2018.
 - Caltrans Uses Local Road Safety Manual to Improve its Data-driven Approach to Statewide Safety Project Selection, 2013.
 - Ohio DOT's GCAT (GIS (Geographic Information System) Crash Analysis Tool) Helps Local Roadway Agencies Justify Funding Requests for Road Safety Improvement, 2013.
 - Local Road Safety Data Analysis Approaches Peer Exchange, August 2016.
 - Washington State DOT Implements \$26 Million in Local Roadway Safety Improvements through Local Agencies, 2015.
 - Design-Build Push Button Contract Significantly Reduces the Time It Takes to Implement Safety Improvements, Florida, 2013.
 - Louisiana Department of Transportation and Development (DOTD) and LTAP Partnership Improves Local Agencies' Capabilities to Develop Regional Safety Plans, Access Funding, and Implement Safety Improvements, 2013.
 - Overcoming Limited Data to Identify High Risk Rural Road (HRRR) Projects, 2018.
 - Tennessee DOT Local Roads Safety Initiative Assists Counties Challenged by Limited Staff with Road Safety Improvements, 2013.
- » Results from FHWA sponsored Local Road Safety Plan Implementation Peer Exchange, May 14-15, 2019, Bismarck, ND.
- » Transportation Research Board's online search engine, TRIS (Transportation Research Information Services).²¹
- » National Cooperative Highway Research Program (NCHRP) relevant research.²²

¹⁹ FHWA, Office of Safety, Addressing Safety on Locally-Owned and Maintained Roads, A Domestic Scan, https://safety.fhwa.dot.gov/local_rural/training/fhwasa10027/.

²⁰ FHWA, Office of Safety, Noteworthy Practices Database, <https://rspcb.safety.fhwa.dot.gov/noteworthy/default.aspx>.

²¹ TRB, TRIS, <https://trid.trb.org/>.

²² TRB, NCHRP, <http://www.trb.org/NCHRP/NCHRP.aspx>.

- » Google search.
- Input from State and local safety practitioners, including:
 - » State Department of Transportation (DOT) Officials.
 - » Local Technical Assistance Program (LTAP) representatives.
 - » County Engineers.
 - » Regional Coalitions.
 - » Metropolitan Planning Organization (MPO) representatives.



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