

ROADWAY SAFETY FOUNDATION



ROADWAY SAFETY GUIDE





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Introduction

This Guide is designed to provide local elected officials and other community leaders with basic information to improve roadway safety in their communities. Written for nonengineers, it is designed to be a hands-on, user-friendly document, providing community leaders with

- ▶ Strategies they can use right away to begin making roads safer.
- ▶ Basic information to improve roadway safety in cooperation with state and local transportation departments, highway engineers, highway safety officials, Safe Communities groups, and other safety programs.
- ▶ Clear descriptions of key funding and decision making processes that affect roadway safety.

The Guide is available on the RSF website, www.roadway.org, with updates to assist users in their ability to respond to emerging roadway safety problems.



Why Is Roadway Safety Important to Me?

Before we proceed, you may be asking, “What do you mean by the term *roadway safety* and why is it important to me?” Obviously, everyone who uses our road system is concerned about safety, especially elected officials and other community leaders. The contribution to the overall health and safety of your community made by roadway safety is not necessarily known by everyone.

First, the three major components of highway safety are driver behavior, vehicle safety, and roadway safety. *Roadway safety* refers to that portion of overall highway safety that is determined by the roadway’s physical features such as road design, roadway signs, pavement markings, operating conditions, roadside objects (such as utility poles, signs, trees, guardrails), bridges, and intersections.

The personal and economic costs of highway crashes to our citizens and communities are enormous. Here are a few points to consider:

- ▶ Unlike driver behavior and vehicle design, where significant gains have been made, the percentage of deaths related to crashes with roadside hazards has actually increased over the past two decades.

The Key Components of Highway Safety:

- ▶ Driver
- ▶ Vehicle
- ▶ Roadway

- ▶ Roadside crashes account for one-third of all U.S. highway fatalities each year. More than 15,000 people are killed and nearly one million people are injured when vehicles run off the road and crash. According to the Transportation Research Board (TRB), many of these casualties result from crashes into roadside objects, such as trees or poles, that are located dangerously close to the side of the road.

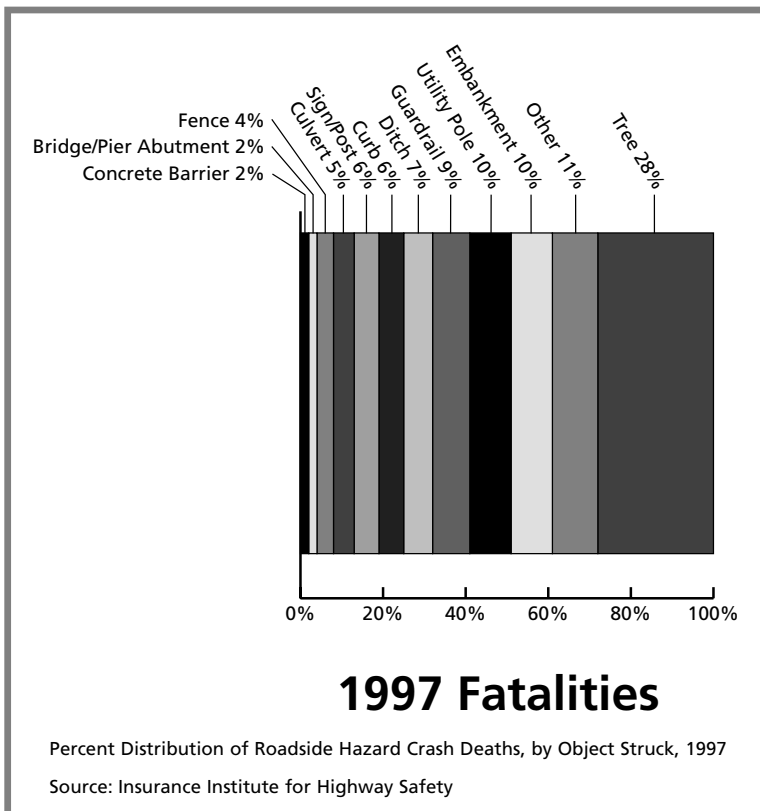
- ▶ Roadside crashes cost society \$80 billion per year. The economic costs to society in medical expenses, worker losses, property damage, and emergency services compound the personal tragedies resulting from highway crashes.
- ▶ Local governments' costs from negligence lawsuits are rising. Tort litigation (arising out of highway crashes) against local and state government transportation agencies and officials is common today. Sovereign immunity, which once protected local governments from liability, is often waived today. Citizens can now sue, successfully, under conditions set by law.

Finally, low-cost safety improvements are cost-beneficial in reducing highway crashes. Consider these results from a U.S. Department of Transportation study:

- ▶ Removing roadside obstacles and realigning roadways can reduce fatalities by 66%.
- ▶ Constructing dedicated turning lanes and traffic channelization at high-risk intersections can reduce fatalities by 47%.
- ▶ Improving motorist information through improved signage and pavement markings can reduce fatalities by up to 39%.

Other studies indicate that

- ▶ Installation of rumble strips along the roadside have reduced run-off-the-road crashes by 60%.
- ▶ Restoring surface friction by timely removal of ice and snow reduces injury crashes by 20% during winter months and by 88% right after a storm.



There are many sources of information and opinions about problems with our streets and roadways. Some come from the evening news, the local paper, local citizens, or our own everyday experience driving around town. But how do we get these problems fixed?

- ▶ Whom should we turn to?
- ▶ How do we decide which intersection, bridge, curve, roadside hazard, or operating condition poses the greatest safety risks to our community?
- ▶ Which one should “they” tackle first?
- ▶ Who will pay for it?
- ▶ How soon can it be fixed?



*The reality is that even though we believe that problems exist on certain roads, we may not be entirely certain what the problem is, what can be reasonably done about it, whose job it is to “fix it,” and how to pay for needed safety improvements. These are the types of real-world questions that come up every day in communities all across our nation. This Guide is designed to help you and other community leaders answer these questions. It does not contain all the answers, but it does tell you **how to ask the right questions, of the right people**—those whose jobs are to fix the problems with our streets and highways. **It also acquaints you with the process, tools, and techniques that highway engineers use so that you will be able to work with them to address your community roadway problems.***



Chapter 1

Getting Started: How to Identify Roadway Safety Problems

This chapter answers three basic questions:

1. How do you identify roadway safety problems?
2. Who is responsible for community roads and how do I contact them?
3. What kinds of information do you need to fully describe roadway safety problems and how can you work with transportation professionals to get the job done?

The strategy that follows will help you

- ▶ Identify those “problem” stretches of road, or “troublespots.”
- ▶ Identify unsafe operating conditions.
- ▶ Ensure that you have the information you need to describe roadway problems in your community.
- ▶ Ensure that your concerns get to the right people.

So where do you begin? What are you aiming for?

Community leaders like you have said: “We want to

- ▶ ...See a reduction in the number and severity of crashes on particularly troublesome roadways or during hazardous operating conditions.
- ▶ ...Be able to talk intelligently to the people responsible for building and maintaining our roads so that they will incorporate our concerns into their plans and execution strategies.
- ▶ ...Fix recurrent problems and do the repairs on the roads, preventing crashes *before* they occur.
- ▶ ...Save taxpayers’ money by reducing roadway costs, including those resulting from trauma, injury, and lives lost; crowded, congested roads; and travel delays due to road repairs and needless crashes.”

Such statements could be considered goals to work toward as you make your roads safer. What are the roadway safety goals specific to your community? Write them below:

You *can* make a difference, and your opinions *do* count. Now that you have some goals, what are the next steps to take?



Learn about nine potentially hazardous roadway conditions.

Safety experts name nine roadway conditions that, regardless of location, are considered potentially dangerous. In addition to these conditions, excessive speed, driver errors, and bad weather can be contributing factors that cannot be ignored. Remember to consider those conditions as you fill out the following checklist and describe your trouble spot or hazardous operating condition.

Does your trouble spot fit under one of the nine roadway conditions described below? Circle those conditions that are most applicable to your situation.

- 1. Roadway departure hazards:** Vehicles leaving the roadway, regardless of cause, represent approximately 15,000 deaths per year. Roadway departure crashes occur on both straight and curved sections of roadway and often involve either rollover of a vehicle or collisions with fixed objects such as trees and utility poles. Roadside hazards also include steep side slopes, drainage ditches along the roadway, and narrow shoulders not large enough to accommodate a vehicle in trouble.
- 2. Road surface conditions:** How often have you said or heard, “Boy, that road is slick in nasty weather,” or “That road is so full of potholes, I feel like I’m driving on an obstacle course!” Aberrations in the road surface, such as pavement edge drop-offs, potholes and reductions in surface friction due to age, wear, inadequate drainage during rain storms, and incomplete winter maintenance to remove ice or snow obviously impair vehicle stopping and maneuvering capabilities.
- 3. Narrow roadways and bridges:** Narrow roadways make it difficult for drivers to safely maneuver in emergency and nonemergency situations—

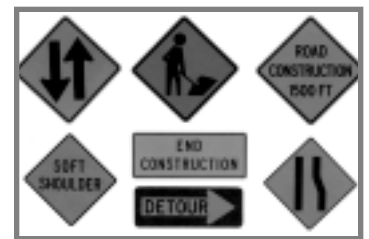
there simply isn’t enough room! Narrow bridges are particularly hazardous. Collisions with bridge ends are relatively infrequent, but they are often severe. Such crashes usually occur when the width of a bridge is less than that of the approaching traveling lanes and shoulders. As a result, vehicles strike the ends of bridges, guardrails, curbing, or vehicles traveling in the opposite direction.



4. Railroad crossings: Did you know that according to the Federal Railroad Administration, nearly every 100 minutes someone in America is hit by a train and that people are 30 times more likely to die when involved in a collision with a train than with another car, bus, or truck? Trains can't stop quickly or steer out of the way and a 150-car freight train traveling at 50 mph takes over 1½ miles to stop. Obviously, railroad crossings are of a critical concern, and they can be incredibly hazardous, regardless of how busy they are.



5. Work zones: Work zones, defined as construction, maintenance, and utility areas, create conditions that can be hazardous to drivers and highway workers. Some 700 people are killed and 37,000 are injured in work zones every year. Work zones are a necessary fact of life in our communities and can cause changing traffic patterns; reduced speed limits; congestion; and an influx of construction workers and equipment on the road. Sometimes work zones are poorly marked, and warning signs are hard to see, especially at night. Warning signs and traffic control devices may not be related to actual work in progress or accurately portray real work zone hazards. Drivers thus disregard these warning signs with potentially tragic consequences.



6. Intersections: We've all experienced dangerous intersections with confusing turn lanes, blind spots, or lack of appropriate or inadequate signage or traffic signals. Obstructions, including vegetation, can block a driver's view of signs, signals, and other traffic control devices.

7. Roadway design limitations: The safety of many local roads is limited because they were built to serve fewer cars traveling at slower speeds. Because of the explosion in vehicle miles traveled over the past 30 years, many of these roads are now high-speed commuter corridors. Their safety is compromised by hazards such as sharp curves, poor signs and markings, and lack of medians to separate oncoming traffic. Fatality rates on these roads can be five times as high as on the heavily traveled and high-speed Interstate system. Local governments, which are responsible for over 75% of our entire road network, target their limited resources to fix the most serious problems first. Drivers must therefore be aware of roadway hazards and drive with extra care.

8. Roadway access problems: We're all familiar with the roadway access conditions that can cause driver confusion/frustration, such as driveways, roadways into new developments/businesses, and blind entrances. In such situations, drivers must remain alert to changing traffic patterns that require quick reactions.

9. Pedestrian and bicycle traffic: Bicycle and pedestrian traffic must be accommodated and speeds must be controlled. There were 5,220 pedestrian deaths and 69,000 injuries during 1998,



and these numbers are expected to increase as our population ages. By 2030, one in five Americans will be over age 65. Pedestrians over 70 constitute approximately 9% of the population, but they account for 17% of the fatalities. In 1998, 761 bicyclists were killed and an additional 53,000 were injured in traffic crashes.



Identify your trouble spot by completing the Road Problem Checklist.

Date:

Your Name and Organization:

Describe your trouble spot or hazardous condition by answering the following questions.

1. Describe your trouble spot or hazardous condition. Where is it located? (Street name, names of intersecting streets, mileposts, other landmarks)

Is your trouble spot or hazardous condition

	Yes	No
A stretch of road	_____	_____
A curve	_____	_____
An intersection	_____	_____
Other: _____		

2. Is your trouble spot or hazardous condition located on a road that serves

(Circle all that apply)

high-speed traffic	pedestrians
local access to shopping, schools, etc.	truck traffic
commuters	farm vehicles
bicyclists	other: _____

3. If your trouble spot is located downtown or in a busy suburb, is enough parking available?

Yes ____ No ____

4. Do obstructions block a driver's view at your trouble spot?

Yes ____ No ____

If so, do the obstructions block a driver's view of

(Circle all that apply)

other vehicles

signals or stop signs

the road ahead

road markings or street signs

other: _____

What is causing the obstructions?

(Circle all that apply)

trees

parked vehicles

shrubs or other vegetation

snow

signs

other: _____

5. Are there roadside hazards that drivers can hit if they leave the roadway?

Yes ____ No ____

If so, are they

(Circle all that apply)

trees

guard rails

utility poles

street lights

bridge supports

other: _____

6. Do poor pavement conditions contribute to the trouble spot?

Yes ____ No ____

Conditions such as

(Circle all that apply)

slick pavement

slow removal of snow, ice,
and other debris

potholes

pavement drop-offs at road edge

other: _____

7. Are there other road conditions that could make driving hazardous?

Yes ____ No ____

If so, do they include

(Circle all that apply)

sharp curves

sunrise or sunset glare

narrow lanes

lack of adequate lighting

narrow or no shoulders to pull off
for emergency stops

missing or damaged guardrails

railroad crossings

missing or hard-to-see signs or
pavement markings

no median barriers

other: _____

8. Is your trouble spot in a highway construction work zone?

Yes ____ No ____

If so, is work going on when traffic signs say it is?

Yes ____ No ____

Are drivers given enough warning of new traffic patterns?

Yes ____ No ____

Are drivers given enough warning of the need to slow down or take other actions?

Yes ____ No ____

Are there obstructions in or along the road that make it dangerous to drive?

Yes ____ No ____

If so, do they include

(Circle all that apply)

debris

stopped or abandoned vehicles

work equipment or materials

other: _____

9. Are there hazardous conditions for pedestrians and bicyclists at the trouble spot?

Yes ____ No ____

If so, do they involve

(Circle all that apply)

lack of sidewalks

conflicts with vehicles

lack of crosswalks

jaywalking

lack of bike lanes or paths

traffic delays

other: _____

What You've Accomplished

Congratulations! You've taken another step toward making your community safer by completing your **Road Problem Checklist**. With this in hand, you will be better able to complete step 3.

Step 3

Work with your local, state, and regional highway engineers and other relevant agencies.

This Guide has taken you through a process that will keep you on the right track as you move forward with improving roadway safety in your community. Because you have followed the first two steps to identifying roadway safety problems described in the preceding pages, you are in a better position to ensure that the engineers and government officials who are responsible for your roads will understand your concerns and take action. Just who *is* responsible for your roads? This section will identify the local, state, and federal agencies that make it their business to address roadway concerns.

Below is a typical news item from a Kentucky community frustrated with major roadway problems.

Elected officials and community leaders need not feel powerless in the face of such challenges. The government agencies that control our roads may appear

to create a confusing web so perplexing at times that it seems easier to throw in the towel and live with the status quo. This section will help you to determine who has the authority to improve the safety of your roads so you won't throw in the towel. The pages that follow will

Decatur, Kentucky:

A multivehicle crash ensued yesterday on Simion Road after a portion of the road fell in. While there was significant property damage, there were no serious or fatal injuries. Families living near the site told reporters that an excessive number of potholes had been reported to local government officials just last week. Others interviewed stated the same problem occurs each year after the winter season, and complaints are waged annually. "Crews typically come, patch up the holes, and leave," said Sylvester Smith, Simion Road resident. The community's Citizens Organization has been told that the repair time will be lengthy and costly. Residents are up-in-arms. Said Rose Lymer, a 50-year resident, "There are a lot of older people here; how are we supposed to get out of the neighborhood while the construction goes on?"

- ▶ Describe the agencies responsible for the maintenance and safety of different types of roads, from the Interstate to local roads.
- ▶ List potential contacts to help identify those responsible for community roads.

Functions and agencies responsible for different types of roads





Road engineers, planners, and other professionals employ a variety of terms to describe the various “functions” of roads or the “jurisdiction” they fall under. For example, terms such as “collector roads” or “arterial highway” describe the function of specific roadways. But for the purposes of this Guide, it is more important for you to know *who* has the authority to make the safety improvements you want. The chart that follows gives you an overview of the names and symbols associated with roadway types, who is responsible for those roads, and approximate roadway mileage for each type of road.

Potential contacts to help identify those responsible for community roads

The American Association of State Highway and Transportation Officials (AASHTO) sets highway design and construction standards and policies on major roads and highways—even Interstate highways. These roads and highways are owned, operated, and maintained by state and local governments. Determining which government agency, state or local, is responsible for a particular section of road or intersection is usually straightforward, but not always! To better ensure that your roadway initiative yields positive results:

- ▶ **Remember, who you contact will depend on where you live.** Centerville, South Dakota’s local government agencies that deal with transportation problems will look very different from those located in New York City. Therefore, the information that follows is to get you started and should not be taken as definitive truth, particularly relating to your own community’s circumstances.
- ▶ **Take a good look at your Road Problem Checklist.** Does it clearly define your problem? If so, can you accurately and clearly describe it to appropriate government entities?
- ▶ **Be a savvy consumer.** Getting your questions answered and your concerns addressed requires finding out whom to talk to. Says a planner in a local department of transportation, “Becoming a savvy consumer is the first step toward having your concerns addressed effectively and efficiently.” Make sure you know “who owns the road”—you need to know if the targeted road is state-, municipally, or county-maintained. Your phone calls and letters should start with that particular level of government.
- ▶ **Be prepared to contact more than one agency.** Planning, building, operating, and maintaining roads is a responsibility shared among a variety of agencies: Metropolitan Planning Organizations, state DOT, local DOT, and the local Department of Public Works. Never assume that these entities are talking to each other or working together. Be prepared to contact all agencies who play a role in addressing your trouble spot or hazardous condition.

Who Is Responsible for Our Highways?

	State roadways	Federal roadways	Local roadways
Typical signage	 Interstate State routes State Park roads State toll roads 	Federal Park roads Federal Forest roads Military and Indian Reservation Roads 	 All other roads under the control of counties, cities, towns, and townships
Mileage	More than 808,000 miles	Almost 169,000 miles	2.3 to 2.7 million miles
Jurisdiction or agency responsible	State Departments of Transportation, local district office, and headquarters	National Park Service, Bureau of Indian Affairs, Federal Highway Administration	City, county, and other local Departments of Transportation/Public Works

Source: Highway Statistics 1997 Table HM-14, p. V-16.

On the local level

Most roads fall under local control. A great place to start is with your

Department of Public Works and/or Transportation

Often, Public Works and Transportation are combined or transportation issues are addressed separately under individual "Public Works" and "Transportation" headings. Make sure you investigate both. The key is to match your trouble spot with the department that has responsibility for the road. An excellent source of information is your local telephone book. Here are some examples of some of the offices you may encounter:

- ▶ Street and Sidewalk Maintenance
- ▶ Roads Inspection
- ▶ Street Assessments
- ▶ Highway Services Division
- ▶ Traffic and Parking Services
- ▶ Neighborhood Traffic Issues

- ▶ Transit Service Division
- ▶ Road Repair/Snow Removal
- ▶ Pothole Repair
- ▶ Roadside Maintenance
- ▶ Street Construction

Local elected officials

Your elected officials can be key partners in addressing safety concerns. They can help you locate the right contact in the responsible agency.

Sheriff’s or police department

The local sheriff or police chief is also an appropriate contact in smaller communities.

On the state level

State DOT

Just as with the local departments of transportation or public works, go to the office that appears to be most applicable to your trouble spot. Specific office titles you may find useful include

- ▶ State Highway or Transportation Agency/Department
- ▶ Division of Highways
- ▶ Planning and Environment
- ▶ Traffic Operations or Engineering
- ▶ Safety and Loss Control
- ▶ Public Information Office
- ▶ Maintenance

Each state DOT has district offices that can help you confirm whether a particular road is maintained locally or by the state. Contact your state DOT for district listings or visit the AASHTO website (www.aashto.org).

State Highway Safety Office

These agencies focus on highway safety issues related to driver behavior, such as impaired driving prevention; seat belt and child safety seat use; public information; and motorcycle, pedestrian, and bicycle safety. The Governor’s Highway Safety Representatives who head these offices can be very helpful in explaining state safety priorities and identifying state contacts for roadway safety and infrastructure issues.

Other divisions you may encounter on the state level include traffic records, state highway patrol, and emergency medical services. These also play a role in ensuring the safety of our roadways.

On the federal level

The major federal agency responsible for roads and highways is the U.S. DOT, Federal Highway Administration (FHWA). FHWA plays a key role in developing best practices for roadway safety and promotes research into important roadway safety issues and countermeasures. FHWA has division offices located

in each state. Additionally, FHWA has established four resource centers that can provide community leaders and elected officials like you with roadway safety information. A complete description of division offices and resource centers is included in Chapter 4 of this Guide. Contact numbers for the FHWA Division Offices and Resource Centers are listed in Chapter 4.

The National Highway Traffic Safety Administration (NHTSA) is another federal agency that has an important role in ensuring driver and passenger safety on our roads. Like the State Highway Safety Office described above, NHTSA focuses on the behavioral aspects of roadway safety: driver performance; safety belt, child safety seat, and air bag use; motorcycle, pedestrian, and bicycle safety; and public information. Improving the roadway environment for older drivers and pedestrians is another NHTSA activity. The agency has 10 offices across the United States that help integrate FHWA and NHTSA safety programs. Contact information for the 10 NHTSA regional offices are listed in Chapter 4.

At this point you have compared your trouble spot with the nine most hazardous roadway conditions, completed the Road Problem Checklist, and identified those “movers and shakers” in your community who can make changes happen.

What comes next? **Collaboration!** The information you have already collected can be put to good use here. It is time to provide the information you have collected to your community’s transportation professionals to objectively study the road problem you have identified and to put it in context with other highway problems known in your community. Then the process of determining the relative safety priority of each problem and when and how it can be fixed can begin.

How do highway engineers decide which road safety problems deserve attention first?

Clearly, data are needed to provide an objective basis for placing all roadway trouble spots or hazardous conditions in some priority order. Below is the general process by which highway engineers conduct highway safety improvements. *You need not learn all the details, but an appreciation for this process will help you understand the way they set priorities and to work effectively with them.*

What highway engineers do

The pages that follow will show you how the highway engineers prioritize road safety needs. They typically follow the series of steps shown below.

- 1. Identify hazardous location(s) and conditions.** With the information you have collected in your Road Problem Checklist, you can assist your community’s transportation professional in identifying hazardous locations.
- 2. Conduct a highway safety study.** Once a particular hazardous location or condition has been identified, a *highway safety study* is conducted. Supporting the completion of a safety study by your local highway engineer is one of the best ways to ensure your trouble spot or hazardous condition will be selected for attention. Here are the general steps in conducting a highway safety study that highway engineers follow:

- ▷ **Collect and analyze preliminary data.** The type of data available on your trouble spot will be dependent on the record keeping practices of local and state agencies. Primary data types include police accident records, complaint files, and maintenance records. For more complete information on conducting a highway safety study see *Local Highway Safety Studies User's Guide* available from the National Highway Institute, FHWA. Additional information is also contained in the appendix.
- ▷ **Identify and collect field data.** An initial visit may be made to the trouble spot to identify possible safety deficiencies.
- ▷ **Select and conduct appropriate detailed studies.** Highway professionals can conduct a range of studies depending on the type(s) of problems encountered. Some of the types of technical studies include traffic volume, sight distance, roadway and intersection capacity, and speed of police and emergency services response to traffic incidents and response time to clear hazardous operating conditions such as snow or ice.
- ▷ **Evaluate study results.** The data from the site are analyzed and evaluated to identify safety deficiencies. Results of the studies and field review activities are then integrated.
- ▷ **Determine safety and operational deficiencies.** This step determines if the results of the studies support or eliminate any of the possible safety deficiencies. A list of probable causes or safety deficiencies is developed that will be used to identify appropriate countermeasures.
- ▷ **Identify potential safety and operational improvement.** The purpose of this step is to develop candidate solutions to the safety deficiencies that are verified. See Appendix for a chart of possible solutions to specific problems and types of crashes.
- ▷ **Select appropriate improvements.** Decisions on the most appropriate countermeasures must be made recognizing the many fiscal and political constraints within a community. Chapter 2 provides examples of countermeasures to address nine potentially hazardous roadway conditions described in this chapter.

3. Establish priorities for project or policy implementation. This is the

step in the overall process where the engineers juggle budget and other factors in order to determine which of many projects to implement first. In the real world where there may be dozens of important and worthy safety-related road projects, priority choices must be made. *Those projects that address a well-documented need and have strong citizen support stand the best chance to be implemented sooner rather than later.*

For more complete information on conducting a highway safety study see *Local Highway Safety Studies User's Guide* available from the National Highway Institute, FHWA. Additional information is also contained in the appendix.

4. Schedule and implement safety projects. As in the step above, it pays to keep informed and stay involved with the process. It takes a lot of work and people to get from a project plan to actual workers working on the roadway or retraining workers in highway operations and maintenance. Be supportive and positive with the contacts you have made to see that your priority project stays on track.

5. Evaluate safety improvements. Once the asphalt is laid, the guardrail fixed, or the snow removal strategy refined, there is still work for you to do! Chances are that the roadway problem you identified has been fixed, but only time will tell. Over the next several years the roadway professionals will be evaluating the safety improvements they have made to determine if the problem has been solved. So should you as you drive through that former trouble spot. Keep in mind what made you take action on the trouble spot originally. Was it crashes, traffic tie-ups, driver behavior, or something else? Has there been a recurrence of hazardous operating conditions? Have there been improvements? If not, now you know who to call!

The community leader can play an important role in the last three steps of the Highway Safety Study Process. By working constructively with the highway engineers, other road professionals, and government leaders, you can influence the attention given to your road problem and make it a higher priority.

Chapter 2

Choosing Countermeasures: Best Practices

This Guide provides promising examples and strategies on how to make roadways safer. Chapter 1 gave you a framework to identify roadway hazards, and Chapter 2 takes a look at programs and countermeasures-in-action—effective initiatives, techniques, programs, and best practices generated by safety experts and community leaders like you.

What do you think?

A utility pole is too close to a curve in the road, and numerous cars have hit it. Here are some options:

- ▶ Move the pole.
- ▶ Install breakaway poles.
- ▶ Bury the utility lines underground.
- ▶ Install a guardrail or crash cushion and warning signs.

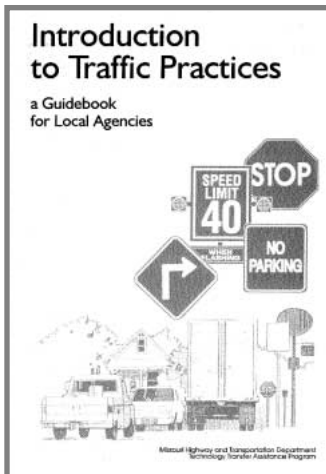
All factors must be considered. What if the roadside pole hazard is just one of many roadside hazards along a congested thoroughfare passing through the site of a major industrial park or housing development? Relocating dozens of utility poles or burying utilities underground suddenly becomes a major project and a significant budgetary challenge.

You may think, “With our limited county budget, installing a guardrail will cost us the least amount of money.” Think long-term and beyond the initial price tag! While the initial cost may be low, you need to factor in the costs of replacing the guardrail again and again after cars keep hitting it.

These countermeasures and best practices are grouped by the nine potentially hazardous conditions described in Chapter 1.

As you read through Chapter 2, remember the “Best Practices Golden Rules”:

- ▶ There is no “silver bullet” to roadway safety.
- ▶ One countermeasure seldom provides a total solution to a safety problem.
- ▶ Countermeasures should be adapted to your own community’s needs.
- ▶ Remain open to all options, and be prepared to use the strategies flexibly to meet your community’s unique circumstances.



- ▶ In order to succeed, a countermeasure is usually part of a broad long-term effort that may require changes in driver behavior as well as infrastructure and operating improvements.
- ▶ Decisions on the most appropriate countermeasures must be made while recognizing the many fiscal and political constraints within a community.
- ▶ The best approach is to collaborate with your local/state highway professionals to develop interim as well as long-term solutions, and to stay involved and in touch with your community's highway professionals every step of the way.

Improvements Save Lives

According to The Road Information Program (TRIP), a nonprofit research organization, statistics show that increased investment in road and bridge improvements saves lives. Making road lanes and shoulders wider, adding medians, and improving bridges are just a few of the improvements that significantly reduce fatalities. Listed below are key road and bridge improvements evaluated over a 20-year period by the Federal Highway Administration (FHWA) and the related reduction in fatality rates.

Improvements at Intersections

Create turning lanes and traffic channelization	47%
Make sight distance improvements	56%
Install new traffic signals	53%

Bridge Improvements

Widen a bridge	49%
Construct a new bridge	86%
Upgrade bridge rails	75%

Roadway Improvements

Construct median for traffic separation	73%
Widen or improve shoulder	22%
Realign roadway	66%
Groove pavement for skid treatment	33%

Roadside Improvements

Upgrade median barrier	66%
Create a new median barrier	63%



Roadway Departure Hazards

Over one-third of all traffic fatalities (over 15,000 in 1998) occur when a vehicle leaves the road. Vehicles often hit roadside obstacles, such as trees, utility poles, embankments, guardrails, ditches, curbs, culverts, sign or light posts, bridge supports, and mailboxes; they may also roll over after leaving the road. In rural areas, the situation is even worse—two-thirds of all traffic deaths are caused by “run-off-the-road” crashes.

*Two aspects of this national safety problem are particularly challenging: keeping drivers on the road and protecting drivers when they **do** leave the road. To reduce road departure crashes, community leaders need to consider ways to keep drivers on the road and protect them if they do leave the roadway. If there is a pattern of vehicles leaving the road, community leaders should work with their transportation professionals to investigate the reasons for roadway departures and assess the impact of collisions with roadside obstacles. An analysis of roadside obstacles at run-off-the-road crash sites is essential to determining if they present significant dangers.*

Keeping Drivers on the Road

Rumble strips are one of the most effective ways to keep drivers on the road. More visible signs, pavement markings, skid-resistant pavement, and better lighting have proven to be particularly effective in keeping drivers on local roads.

Rumble strips dramatically reduce crashes on the Pennsylvania Turnpike.

Overview

Special rumble strips, equipped with a Sonic Nap Alert Pattern (SNAP), produce a distinct warning sound and vibration that alert drivers whose vehicles are drifting off the roadway. In 1990, SNAP strips were installed on all 506 miles of the Pennsylvania Turnpike. After 1991, SNAP strips and recessed reflective pavement markers were routinely installed in new roadway segments on the Turnpike.

Results

After the Pennsylvania Turnpike Commission installed the shoulder SNAP strips in 1990, drift-off-the-road crashes decreased by 65% per month. Six years later, Turnpike officials credited the rumble strips with reducing the crash rate by 2.3 crashes per 100 million vehicle miles, or 100 crashes per year.

Contact

Planning and Programming Department, PA Turnpike Commission, (717) 939-9551

Protecting Drivers When They Leave the Roadway

Utility poles can be serious hazards when they are placed too close to roadways. These poles get in the way, drivers have little room to maneuver around them, and collisions occur. The example that follows shows how one community effectively addressed this problem.

King County, WA, reduces the number of off-the-road crashes.

Overview

Officials in King County, WA, decided to address their utility pole problem when the community was faced with roadside losses and rising liability claims resulting from collisions with poles. The Public Works Department inventoried

the roads under its jurisdiction, rating them for roadside safety. Public Works staff then reviewed accident reports to identify utility poles hit by motorists and created a monitoring system for poles hit more than once. Utility companies whose poles had been hit twice received letters from the county, noting specific poles as hazards.

Results

Utility companies were given the option of removing, moving, or protecting the poles with safety devices. After meeting with utility company risk managers, legislation was enacted that outlined where and how poles should be placed on roadways. Additionally, the legislation required that a licensed civil engineer, with expertise in safety, sign all utility company plans for replacing more than one pole, thus certifying that county requirements had been met.

Contact

Traffic Engineering, King County Department of Public Works, (206) 296-6596, Ext. 3762



Road Surface Conditions

Slick or slippery pavement, reduced visibility, and potholes all play roles in making driving hazardous in bad weather or in areas where roadways are not regularly maintained. Below are two examples of ways to maintain safe operating conditions despite adverse weather. One uses anti-icing strategies before a storm hits and the other uses Intelligent Transportation Systems (ITS)—a computerized motorist information system—to warn drivers of bad weather and dangerous road conditions.

Iowa DOT's anti-icing strategies—a simple solution goes a long way

Overview

Like most Midwestern states, Iowa experiences severe winter weather conditions, and in 1994, the state began to expand its anti-icing activities. Unlike most jurisdictions that use the traditional salt-and-sand combination, Iowa is experimenting with a liquid solution of salt and water. It is a preventative treatment applied *before* a storm, thus ensuring that roads remain less slippery. According to a state Department of Transportation (DOT) official, 40–50 pounds of solution is equivalent to 100 pounds of salt. Using a liquid solution makes sense because

- ▶ Highway maintenance workers are able to control where the applications go.
- ▶ It does not get “kicked off” the road by fast-moving trucks and other vehicles.
- ▶ While the start-up fees may be high, moving to this system appears to be cost-effective in the long run.

The state has made extensive training available to garages, ensuring that highway maintenance personnel understand the scope of the problem and how it is better treated with the liquid solution.

A weather report of an incoming storm gets the process rolling. A set of procedures and operational requirements is followed to alert garages to send their salt solution trucks out on the highways.

Results

Since 1999, the entire interstate system in Iowa—800 miles—has been treated with the liquid solution; prior to that time, the effort was restricted to Iowa's larger cities. In 2000, special emphasis will be placed on project evaluation and refinement.

While there is nothing quantifiable to date, vis-à-vis crash reduction statistics, the state DOT has noted that the state highway patrol is happy with the results and DOT plans to expand the program to the state's industrial and commercial network—6,000 lane miles—over the next two years.

Contact

Iowa Department of Transportation, Office of Maintenance Safety Services, (515) 239-1355

North Dakota's Advanced Transportation Weather Information System (ATWIS) saves lives.**Overview**

Created in 1996 by the University of North Dakota and supported by the private sector and the FHWA, this weather-reporting project provides travelers with weather forecasts and road conditions based on specific route numbers, directions, and mile markers. Travelers can access the system through their cellular phones (#SAFE) throughout the Dakotas. Updates are provided every three to six hours. All cell phone carriers in the state participate in the #SAFE program.

Results

As the nation's first and only rural, en route weather information system, ATWIS is breaking new ground for the rural ITS. Approximately 43,397 users took advantage of the system from November 1997 through October 1998. A telephone and mail survey conducted by the University of North Dakota indicated that #SAFE users found the information accurate, and most people did alter their travel plans as a result. Most respondents also agreed that the system was beneficial for travelers during bad weather.

The University of North Dakota is providing similar services to the state of Minnesota, and discussions are under way with Montana and Wisconsin to set up similar cellular phone systems.

Contact

University of North Dakota, Regional Weather Information Center, (701) 777-2479
Safety/Traffic Engineer, FHWA North Dakota Division Office, (701) 250-4348
website: www.rwic.und.nodak.edu/Research/atwis-dist



Narrow Roadways and Bridges

Run-off-the-road crashes and head-on collisions are frequently associated with narrow roads and bridges. Such crashes are related to lack of maneuvering room because of narrow lanes and shoulders and roadside hazards or curbing. Combine these factors with excessive speed, and the results may be deadly.

Crashes involving narrow bridges are not as frequent as roadway crashes but they are often fatal. For both narrow roadways and bridges, crash rates may be lowered by increasing lane and shoulder width or completely replacing the roadways and bridges. However, replacing them may not be possible because of space or funding constraints. Below are examples of how communities have developed low-cost ways to save lives.

The California Coalition cleans up “Blood Alley”

Overview

A 23-mile stretch of two-lane highway east of Paso Robles, CA, is no longer considered a “death trap” by residents of San Luis Obispo County. Formerly known as “Blood Alley,” Highway 46 claimed 29 lives in 19 crashes over a five-year period. More than two-thirds involved head-on collisions. Traffic on this major tourist artery included a high-speed mix of commuters, truckers, and vacationers.

A coalition of state, local, and private organizations devised a coordinated and innovative approach to dramatically reduce deaths and injuries on this road. The Coalition included the California Department of Transportation (CALTRANS), the California Highway Patrol (CHP), the San Luis Obispo Council of Governments, and the Fix 46 Committee of local businesses and residents. Because the state budget would not allow Highway 46 to be widened, lower cost strategies had to be developed. The CHP got approval from the state legislature to increase the number of patrols, double the fines, and station a helicopter at the county airport to fly crash victims to hospitals.

Additionally, more than a million fliers were printed and disseminated to alert drivers of the dangers on this highway. CALTRANS also developed an innovative “soft barrier” solution to Highway 46’s head-on collisions and run-off-the-road crashes. It used a combination of rumble strips, pavement reflectors, and raised thermoplastic striping placed along the shoulders and the centerline. Such devices alerted motorists when they drifted across the centerline or onto a shoulder.

Results

During the 16 months before and after completion of the project, fatal crashes were reduced from eight to zero; injury crashes were reduced by 14% and total collisions by 27%. CALTRANS is very pleased with the results and believes it represents the best alternative short of widening a dangerous highway corridor like Highway 46.

Contact

Office of Public Affairs, CALTRANS District 12, (805) 549-3281

Three strategies for improving bridges

Narrow bridges are very expensive to replace or widen. Communities may want to consider the following strategies to lower bridge crash potential:

- ▶ **Bridge improvements.** These can involve improvements to the bridge structure and to potentially hazardous bridge features, such as improving bridge rails and sidewalks, eliminating potholes and poor skid resistance on the deck surface, and formulating better connections between bridge abutments and guardrails.
- ▶ **Bridge approach improvements.** The safety of bridge guardrails and roadway approaches can be improved by installing crash cushions, changing the location of guardrails, and ensuring that guardrails on the approaching roads are appropriately attached to bridge guardrails.
- ▶ **Operational improvements.** These include improved signs, pavement markings, and delineation in the bridge approach area and on the bridge. They must be placed well in advance of the bridge to alert drivers to potentially hazardous conditions.



Railroad Crossings

A railroad crossing can present a dangerous situation for the motoring public, says Operation Lifesaver, Inc., a national organization devoted to educating the public about railroad crossing safety. Many drivers do not cross railroad tracks often enough to be familiar with the warning devices designed for driver safety. Often drivers are unaware that trains cannot stop as quickly as motor vehicles can to avoid collisions. Others simply ignore all warning signs because they are “in a hurry” and would rather play “beat the train” than wait. Driver inattention and impatience are the most common factors contributing to collisions, and thousands of people are seriously injured and hundreds are killed at highway-rail grade crossings each year.

In 1998, 431 people lost their lives and 1,303 were seriously injured at railroad crossings. Alarming, in the United States, approximately every 115 minutes a train collides with a person or vehicle. Throughout our history, railroads have served as reliable and critical modes of transporting goods and people. As life becomes more complicated and roads more congested, communities must strive to meet both commercial goals and objectives while keeping safety as a primary goal. Here is how one community dealt with this dual challenge.

Operation Lifesaver Ohio’s Community Partnership Program gets results.

Overview

For the past eight years, Operation Lifesaver Ohio has embarked on a community partnership campaign to reduce the number of vehicle crashes at railroad crossings throughout the state. Ohio ranks fourth nationally in rail carloads handled and has 6,249 public grade crossings. In 1998, Ohio ranked sixth nationally in crashes and ninth in grade crossing fatalities. Partnerships were formed to combat these problems.

The locations of the community partnership campaigns are based on two factors: railroad-crossing crash history and the presence of community support.

The components of each campaign are based on specific community characteristics and needs. Thus, each campaign looks slightly different; however, specific elements are present in all of them:

- ▶ A community meeting, consisting of individuals representing engineering, law enforcement, the media, the railroads, education, and the private/civic sector.
- ▶ A one-week media blitz that includes a press conference; luncheon; stepped-up enforcement; presentations to area schools and local safety groups; and mock crashes.
- ▶ During the one-week media blitz, Operation Lifesaver's "Officer on the Train" program is held. Legislators, community members, police chiefs, and citizens observe stepped-up enforcement efforts first-hand by riding on a train. Each car has a video monitor for viewing specific actions. Media involvement at this event is extensive.

Results

Ohio has 88 counties, and according to the source at Operation Lifesaver Ohio, two to four counties participate in the program per year. The results have been outstanding. In 1996, for example, Allen County, OH, experienced seven crashes, one fatality, and seven injuries. After its blitz in March 1997, the numbers decreased to three crashes, two fatalities, and zero injuries; in 1998, the community experienced only two crashes and zero fatalities and injuries. Finally, in 1999 Allen County experienced "zero" across the board: zero crashes, zero fatalities, and zero injuries. Other communities have encountered similar results after creating similar community partnership programs.

Contact

Operation Lifesaver Ohio, (614) 251-2650; Fax (614) 251-2651
e-mail: oplifeohio@aol.com



Work Zones

Work zones are dangerous places for motorists and highway workers. In 1999, almost 900 people died and 37,000 were injured in work zones. With the passage of federal legislation TEA-21, the number of work zones is expected to increase significantly. Will this lead to a dramatic escalation in the number of work zone deaths and injuries? Here are examples of how to make work zones safer for both motorists and highway workers.

North Carolina's Work Zone Safety Campaign "Work Zone—Stay Alert" aims to save lives.

Overview

Before the inception of "Work Zone—Stay Alert" in 1990, interviews with North Carolina's truckers and the traveling public indicated that both groups were aware of having driven through work zones but did not clearly understand what the signs meant or how to safely negotiate a work zone. Highway workers said speed was the major safety problem in work zones but also admitted that they themselves did not understand or practice safety procedures. They

also felt that drivers did not care about worker safety. As a result of focus groups and additional research, "Work Zone—Stay Alert," a multifaceted media campaign, was launched.

Over the past nine years, events, public service announcements (PSAs), ads, articles, and other informational material has been produced and disseminated to the motoring public. While the effort has been successful, a new initiative that focuses on young drivers and work zones has recently been launched by the state. The goal of this campaign is to make the issue more visible to a population that has traditionally not been addressed. The theme or tagline is "Recognition, Reaction, and Responsibility"—new drivers must recognize the hazards associated with work zones; they must learn how to appropriately react; and they must take responsibility for their actions. A video entitled *A Sudden Change in Plans* is being distributed to all driver education programs across North Carolina. Additionally, radio PSAs have been produced and broadcast; promotional items such as rulers, squeeze bottles, pencils, stickers, buttons, bumper stickers, pens, key chains, coloring books, and litter bags are being disseminated to high schools, middle schools, and elementary schools; new signs have been posted; and training programs are being initiated.

Results

According to the North Carolina Department of Transportation, while at first the driving public became more aware of work zones, attention to the issue slacked off over the years. The new youth-oriented initiative is designed to re-energize interest in work zone problems and to prevent fatalities among this high-risk group.

Contact

Construction Unit, NCDOT, (919) 733-2210

The Pennsylvania DOT uses computer technology to reduce risk of accidents in work zones.

Overview

When the Pennsylvania DOT began planning the rehabilitation of U.S. Route 22 between Easton and Allentown, it faced a huge challenge. The four-lane highway carries lots of traffic—approximately 85,000 vehicles per day—and has

several blind corners that make it hard for drivers to see if traffic ahead has slowed or stopped. This dual challenge increased the chances of rear-end collisions, which account for more than one-third of all accidents in work zones in the state. Rehabilitation of the road includes eight miles of pavement and several bridges. A private firm was hired to design a computer system that keeps drivers informed of traffic conditions on the road ahead 24 hours a day, seven days a week. The system, known as CHIPS (computerized

Did you know...

"...The Federal Highway Administration is currently coordinating the development of a standardized definition of work zones..."*
because every state defines work zones differently.

* "Proceed with Caution," *AAA World*, September/October 1999.

highway information processing) uses a system of 15 variable message signs placed along the road in advance of work zones to alert drivers if traffic ahead is stopped or has slowed or if a lane has been blocked by an accident. It also provides information on the estimated length of delays.

Results

While results are inconclusive at this time, CHIPS has saved money. The system cost about half as much as it would have cost to hire people to monitor traffic conditions 24 hours a day.

Contact

District ITS Coordinator, PA Department of Transportation, (717) 787-2838



Intersections

*Intersections constitute a very small part of rural and urban street/highway systems, yet they are implicated in 40% of all motor vehicle crashes and more than 9,000 deaths per year (1998 NHTSA data). National statistics show that the percentage of total motor vehicle accidents classified as intersectional has risen in the past 20 years. However, the percentage of **fatal** motor crashes located at intersections has **decreased!** This reduction is due in part to the implementation of improved intersection design/construction, new vehicle designs, and improved availability and use of various passenger restraints.*

Colorado Springs, Colorado, guards against red light running

Overview

DRIVE SMART Colorado Springs created an innovative and effective campaign to educate and stop red light running in Colorado Springs. The coalition, which was experienced in effectively communicating traffic safety messages, customized the campaign to send an additional message to drivers: Don't run red lights! The coalition concentrated specifically on victim spokespersons and created a video to tell victims' stories. The organization also worked successfully with law enforcement. Additionally, influential *Stop Red Light Running* committee members approached local TV affiliates with the campaign to seek sponsorship, with the understanding that each station would receive a small cash contribution (\$2,000 each) to join as a co-sponsor.

Results

Police agencies issued 35% more red light running citations during the campaign period compared with the same period the prior year. Media support for the campaign was tremendous, and shortly after the campaign's conclusion the city council approved the purchase of red light running cameras.

The police department is also piloting a red light running sting operation at the community's dangerous intersections. Additionally, the police department has installed signs at dangerous intersections, alerting the public that these trouble spots pose serious threats.

Contact

DRIVE SMART Colorado Springs, (719) 533-8424

About the Stop Red Light Running Campaign

Red light running is a dangerous form of aggressive driving. Each year, red light running accounts for nearly 1,000,000 automobile crashes and over 90,000 injuries and is associated with more than 1,100 deaths. The cost to the public is an estimated \$7 billion per year in medical expenses, lost productivity, and property damage. In response, the U.S. Department of Transportation/Federal Highway Administration created Stop Red Light Running (Stop RLR), a public information and education campaign about the dangers of red light running. The campaign is predicated on two elements: ensuring that signal systems are properly working and aggressively enforcing red light running violations—whether with stepped-up enforcement or camera system detection.

Following a successful pilot test in Charleston, SC (1994), the FHWA awarded Stop RLR Campaign mini-grants to 31 communities nationwide for the purpose of implementing and evaluating local Stop RLR campaign efforts. Hard data indicate that stepped-up enforcement resulted in a significant increase in traffic-signal-related citations in several sites. Coupled with increased public awareness of the dangers of red light running, the campaign led to a decrease in crashes in these same communities.

After the initial funding period for the 31 pilot communities, the Stop RLR campaign resulted in an overall reduction of approximately 50% in the number of red light running incidents and a decrease of up to 40% in the number of crashes in the localities that provided follow-up after their campaigns were completed.

For more information about Stop Red Light Running, contact

Stop RLR

111 East Wacker Drive

Chicago, IL 60601-3704

1-877-STOP-555

Prince William County, Virginia, guards against red light running

Overview

Each year, the Prince William County Police Department chooses a number of intersections for selective enforcement based on an analysis of traffic crashes in the county. The department also participates in health and safety fairs; conducts checkpoints; operates a program known as Smooth Operator, which targets high-risk offenses such as speeding through yellow lights; and uses a Speed Monitoring Awareness Radar Trailer (SMART), a self-contained trailer that displays speed to passing motorists.

Results

Of the 11 intersections targeted in 1998, nine have shown a reduction in the number of collisions. A total of 52 intersections were targeted over the past five years, and these efforts resulted in a reduction in crashes at 33 of these locations.

Contact

Prince William County Police Department's Public Information Office, (703) 792-7245

What's happening nationally...

Both the Federal Highway Administration (FHWA) and the Transportation Research Board have led the way for states to develop their own elder driver programs. The Transportation Research Board published the first comprehensive booklet on older driver needs and roadway improvements 10 years ago, and is currently updating it with the addition of experiences from successful programs throughout the country. For more information about this issue, read the Transportation Research Board's *Special Report 218: Transportation in an Aging Society*.

Providing for the needs and capabilities of older drivers poses many challenges for transportation officials. The FHWA has developed the *Older Driver Highway Design Handbook* and a one-day workshop to address these issues. The handbook, including background information, is available online at www.itsdocs.fhwa.dot.gov.

Roadway Design Limitations

Many local roads were not built to serve today's high-volume, high-speed traffic. Their safety is limited by hazards such as sharp curves, poor signs and pavement markings, and lack of medians to separate oncoming traffic. These limitations could present an even greater threat to highway safety because of the expected growth in the nation's elderly population. By 2030, the elderly population is projected to be one in five Americans. Automobile fatalities are expected to increase 45% for drivers over age 75, and pedestrian fatalities are also expected to increase as the population ages. The example below shows how one state is making its roads more user-friendly for older drivers, while at the same time benefiting all drivers in the community.

Florida's Elder Roadway User Program makes roads safer for older drivers

Overview

Florida leads the way in the implementation of roadway improvement measures that particularly affect the state's ever-increasing elderly population. According to Florida's DOT, individuals 65 years and older currently make up 18% of the state's population. This figure will climb to 25% by the year 2020. The state's DOT began the Elder Roadway User Program in 1992 to meet the needs of its elderly population. The program's goal is to help seniors maintain their mobility and provide a system that is safer for them to travel. The primary emphasis was to make roadway improvements that compensate for the natural effects of aging that apply to driving, especially visual and decision making skills. Short- and long-term improvements were initiated based on focus group and other research data.

Florida DOT's maintenance personnel installed

- ▶ Six-inch-wide pavement markings for better visibility
- ▶ Reflective pavement markings with 40-foot spacing, which is especially effective on rainy nights
- ▶ Large overhead street signs at busy intersections
- ▶ Advance street name signs
- ▶ Improvements to pedestrian features at intersections
- ▶ Increased emphasis on effective traffic control through work zones

Results

While quantitative results are not available, qualitative results are plentiful. A series of focus groups were convened before launching the campaign, and the road improvement strategies described above were well-received by elderly participants. According to a source at the Florida DOT, there was a definite decrease in specific types of crashes once these strategies were in place. Finally,

these improvements are now a part of the state's regular road maintenance program.

Contact

Traffic Engineering, Florida Department of Transportation, (850) 414-7618

FYI...

The use of modern "roundabouts" is worth considering when developing countermeasures to correct intersection problems. While the number of conversions of traditional intersections to roundabouts has been small, the results have been encouraging. For example, annual vehicle crash rates have decreased by an average of 37% at 11 U.S. intersections with the use of such roundabouts.



Roadway Access

Overview

Constantly growing traffic congestion, concerns over traffic safety, and the ever-increasing costs of upgrading our roads have generated a new interest in managing access to our highway systems. Access management is the process that provides access to land development while simultaneously preserving the flow of traffic on surrounding roadways. Three issues kept in the forefront of access management are safety, capacity, and speed.

Fewer direct accesses, greater separation of driveways, and better driveway design and location are the basic elements of access management. When these techniques are uniformly and comprehensively implemented, there is less

Access Management 101

A good access management program will

1. **Limit the number of trouble spots or conflict points at driveway locations.** Conflict points are places in the roadway that have the potential for trouble, where crashes can almost be predicted. We all have conflict points in our roadways, and the goal is to reduce the number of them. The more conflict points that occur at an intersection, the higher the potential for vehicular crashes. When left turns and cross-street through movements are restricted, the number of conflict points is significantly reduced.
2. **Separate conflict areas.** Intersections created by public streets and driveways represent basic conflict areas. Adequate spacing between intersections allows drivers to react to one intersection at a time, while simultaneously reducing crash potential.
3. **Reduce the interference of through traffic.** Through traffic often needs to slow down for vehicles exiting, entering, or turning across a roadway. Providing turning lanes, designing driveways with large turning areas, and restricting turning movements in and out of driveways allows turning traffic to get out of the way of through traffic.
4. **Provide sufficient spacing for placement of traffic signals.** Good spacing of signalized intersections reduces conflict areas and increases the potential for smooth traffic progression.
5. **Provide adequate and easy-access parking areas.** Design easily accessible on- and off-street parking that can accommodate cars and other vehicles. The goal is to cause minimal traffic disturbance, thus reducing the number of driveways that businesses need for access to major roadways.

Want to learn more about access management? Contact the National Highway Institute, FHWA's technical training organization. It develops and administers transportation-related training and education programs that assist federal, state, and local transportation agencies and private transport providers and firms.

National Highway Institute
4600 N. Fairfax Dr., Suite 800, Arlington, VA 22203
(703) 235-0500 or at their website, www.nhi.fhwa.dot.gov

occasion for through traffic to brake and change lanes in order to avoid turning traffic. Consequently, with good access management, the flow of traffic will be smoother and average travel speeds higher. There will definitely be less potential for accidents. Before-and-after analyses show that routes with well-managed access can have 50% fewer accidents than comparable roadways with no access controls. Take a look at *Access Management 101* to learn about specific countermeasures and how they can work for you in your community.



Pedestrian and Bicycle Traffic

In 1997 alone, almost 6,000 pedestrians and bicyclists of all ages lost their lives in the United States. According to the National Highway Traffic and Safety Administration (NHTSA), each year an estimated 5,220 pedestrians are killed; one of seven of those are children. In addition, 69,000 people, including thousands of children, are injured per year while walking on America's streets and sidewalks. Below is an example of how one community has kept pedestrian safety in the forefront. This example is followed by bicycle/roadway safety countermeasures, better known as Bicycle-Roadway Safety 101.

Greater Bethesda–Chevy Chase, Maryland's Pedestrian Safety Coalition says, "Drive with Care, Walk with Caution"

Overview

State and county officials teamed up with community leaders and businesses to announce the formation of the Greater Bethesda–Chevy Chase Pedestrian Safety Coalition to encourage people to "Drive with Care, Walk with Caution." Marking the official start of the high-volume foot and motor traffic 1999 summer season, the new coalition launched its first education and enforcement campaign to make the streets of downtown Bethesda, Chevy Chase, and Friendship Heights safer for pedestrians, bicyclists, and motorists.

Flanked by traffic and pedestrian safety signs, members of the new coalition detailed plans to increase pedestrian safety by focusing on what they are calling the "Three E's:" increasing public education, stepping up law enforcement, and making engineering improvements to hazardous intersections. Campaign materials highlight driving and pedestrian safety tips. Community volunteers and local businesses distributed thousands of safety brochures and bookmarks to pedestrians and motorists at intersections, parking garages, shops, restaurants, libraries, and community centers. The long-term goal is to change driving habits and attitudes so that it clearly becomes the norm that pedestrians have the right of way.

Results

Preliminary results indicate extensive community involvement. The campaign has received significant media coverage, and the campaign's bookmark and two-side palm card have been widely distributed. It appears that everyone is involved: police officers stand at key intersections handing out materials to pedestrians, and the local rescue squad and an Exxon station featured the campaign slogan on their message boards.

Contact

Greater Bethesda–Chevy Chase Services Center, (301) 986-4325



Did you know...

Pedestrians and community leaders can determine how “walkable” their community is by completing the *Walkable America Checklist*. The checklist helps to elicit what makes walking trips difficult or unsafe and then determines how a community scores on a walkability scale. Suggestions for immediate improvements and what can be done over time are listed. The *Walkable America Checklist* can be obtained through the National Safety Council.

FYI...

Pavement markings and special signs save pedestrian lives

According to the U.S. Department of Transportation, approximately 39% of non-fatal pedestrian injuries and 18% of fatalities occur at intersections. Urban environments are particularly hazardous. A study completed by the Insurance Institute for Highway Safety showed that the presence of special signs and pavement markings yielded promising results. The study, conducted in Darmouth, Nova Scotia, and Clearwater, FL, evaluated pedestrian behavior at three different and distinct points—before the installation of signs and pavement markings, after initial installation, and 11 months following installation.

The study indicated that “Conflicts between pedestrians and vehicles declined substantially from baseline levels when sign prompts were in place, and that all categories of observed behavior improved with the installation of painted prompts and improved somewhat further when signs were added” (*ITE Journal*, December 1996, p. 31). An additional plus to the use of these countermeasures is their cost—they are relatively inexpensive and can be widely applied in a variety of situations.

Contact:

Insurance Institute for Highway Safety, (703) 247-1500
website: <http://highwaysafety.org>

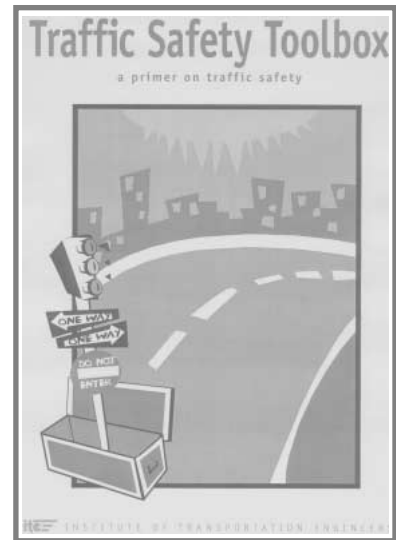
The *Walkable America Checklist* will help you answer these questions:

- ▶ How walkable is your community?
- ▶ How does your neighborhood rate?
- ▶ What can be done immediately and over time?

For a copy of the *Checklist*, contact the National Safety Council, (630) 775-2383. You may also download the *Checklist* from NSC's website: www.nsc.org/walkable.htm.

Bicycle-Roadway Safety 101

No matter where we live, the level of congestion on our roadways has increased. This can be particularly dangerous for the children, teens, and adults who ride bicycles. Creative and immediate countermeasures are needed to minimize future crashes between pedestrians, bicyclists, and motor vehicles. What are the most effective countermeasures? Here is a short list of solutions, suggested by the Institute of Transportation Engineers' Traffic Safety Toolbox. See how many countermeasures have been incorporated in your community.



Encourage helmet use among all bicyclists. Let's start with the obvious. According to the Institute of Transportation Engineers, 80% of fatal injuries and 75% of disabling injuries could be prevented by widespread use of bicycle helmets. If all bicyclists wore helmets, the current 1,000 annual fatalities could be reduced to as little as 300. Today fewer than 5% of all bicyclists wear helmets. In jurisdictions where helmet laws have been enacted and enforced (such as Seattle, WA), usage rates are on the increase. Traffic engineers and policy makers can influence helmet-wearing rates by

1. Securing NHTSA funds to promote the wearing of helmets.
2. Disseminating promotional material that supports the use of bicycle helmets.
3. Placing reminder signs at key locations, such as school zones, bicycle trails, and bridges.

Enhance bicyclist/motorist on-road visibility. This can be accomplished by

1. Enhancing roadway shoulders. Bicyclists should be separated from motorists by smooth, paved shoulders (4- to 6-foot minimum width recommended). This is critical, particularly for roadways with travel speeds of 35 mph or more.
2. Encouraging the use of exclusive bike lanes. These 4- to 6-foot bike lanes are becoming more popular, particularly in urban areas. They make bicyclists more visible to motorists and increase drivers' expectations of the presence of bicyclists. This helps avoid collisions during turning movements.
3. Incorporating "Share the Road" signs onto the roadway landscape. Sometimes crashes occur because motorists simply do not see bicyclists. Greater awareness can be encouraged by the strategic placement of signs.

On some Florida roadways and bridges, motorist recognition and respect toward bicyclists have improved because of "Share the Road" signs in problem areas.

(continued)

Bicycle-Roadway Safety 101 (continued)

Make neighborhoods safer for both bicyclists and motorists. The majority of bicycling injuries, particularly those incurred by children, take place in neighborhoods, says the Institute of Transportation Engineers. These injuries could be prevented by

1. Incorporating street closures and other similar measures.
2. Considering grouped diagonal parking. This allows for improved sight distances and reduces the likelihood of backing crashes in driveways.
3. Building independent trails through neighborhoods, thus reducing bicycle traffic on the streets. Such trails could lead to playgrounds, schools, and recreation facilities.
4. Ensuring the presence of sidewalk and bike lanes on larger roadways. Children may start their riding careers on sidewalks and graduate to bike lanes. On such roads, also ensure that the driving speeds are kept low and that side-street crossings are wide enough for children to safely cross the street on their bikes.

Ensure that bicyclists are kept in mind when bridges, tunnels, and other contained areas are built and/or maintained. This means

1. Providing bicyclists with reasonable shoulders throughout the length and ends of bridges and tunnels so they have sufficient room to travel safely.
2. Providing nonslip surfaces (no unusual or challenging surface hazards such as expansion joints or drainage grates).
3. Providing adequate shoulder widths for climbing and descending (ideally, 10 feet) helps bicyclists safely navigate during high winds, storms, and long climbs or descents.
4. In tunnels, ensuring the presence of exclusive bicycle lanes that take a bicyclist's psychological and physical needs into account. Additionally, all tunnels should be well lit so that motorists and bicyclists can easily see each other.
5. For underpasses, ensuring ample lighting, adequate sight distances on all approaches, no steep downgrades or climbs, barriers between bicyclists and obstacles, and adequate operating widths.

(continued)

Bicycle-Roadway Safety 101 (continued)

Take bicyclists into consideration when focusing on roadway maintenance and operational issues. Did you know that some bicycles balance on the space of two dimes (front/rear wheels) and are therefore more subject to surface irregularities than motorists? Even mountain bikes with their wide wheels (wheel contact with the road the size of a half-dollar) can get side-tracked by drainage grates and steel rails. It is therefore important that special attention be given to

1. Ensuring that bicyclists are detected and have adequate signal clearance times at intersections, and that signs are posted to alert bicyclists to special conditions.
2. When possible, keeping bike lanes clear of raised pavement markers and rumble strips.
3. At intersections in particular, adjusting lights and other safety equipment so these traffic devices can detect the presence of bicyclists. This practice would encourage bicyclists to obey traffic laws.

To learn more about how to make your roadways more bicycle-friendly, we suggest checking out

1. FHWA's *Implementing Bicycle Improvements at the Local Level* (can be obtained online at www.bikefed.org/bike_guide_online.htm).
2. Institute of Transportation Engineers' *The Traffic Safety Toolbox: A Primer on Traffic Safety, Chapter 20* (can be ordered online at www.ite.org; or call ITE at (202) 554-8050).
3. AASHTO's *Guide for the Development of Bicycle Facilities* (can be ordered online at www.aashto.org; or call AASHTO at 1 (800) 231-3475).
4. FHWA's *Pedestrian & Bicycle Safety Research Page* for articles, facts, and resources (www.tfhr.gov/safety/pedbike/research/research.htm).



Chapter 3

Getting It Done

Working with your community’s traffic engineers or other road professionals is the critical first step to ensuring that needed roadway improvements are completed. These individuals can help you identify roadway problems and potential solutions. The next step is to broaden the base of support for addressing the roadway safety issues you have identified. The more people who share your vision and voice their commitment, the more likely your issue will receive the attention it deserves.

This chapter specifically takes a look at

- ▶ Characteristics of good coalitions
- ▶ Building effective coalitions
 - ▷ Reaching local stakeholders
 - ▷ A word on the press
 - ▷ Coalitions in action (examples of coalitions doing their work)
- ▶ Coalition Checklist (confirms how specific coalition examples are effective)
- ▶ Funding sources
- ▶ Evaluating results and benefits



Characteristics of Good Coalitions

Since you are reading this Guide, it can be assumed that you are

- ▶ Part of an existing coalition;
- ▶ Hoping to join forces with an existing coalition; and/or
- ▶ Interested in learning how to create a coalition.

Regardless of your purpose, there are at least six characteristics that define how well a coalition will meet its goals:

- ▶ A cadre of community leaders should be at the table—from local officials, businesses, political leaders, and community groups to “moms and dads” who are concerned about their children’s safety.
- ▶ Everyone should share a common vision and sense of purpose.
- ▶ The press should be kept well-informed and be effectively utilized.
- ▶ The coalition must establish and maintain visibility.

- ▶ Efforts must be ongoing and consistent.
- ▶ Evaluation of the effectiveness of the coalition in addressing the trouble spot or hazardous roadway condition should be a part of coalition activities.



Building Effective Coalitions

Reaching Local Stakeholders

As you move through the labyrinth of government agencies concerned with roadway safety, don't forget to contact other stakeholders and organizations that may have a hand in keeping your roads safe. These might include

- ▶ Political leaders
- ▶ Local law enforcement agencies
- ▶ Suburban Sanitary Commission (water, sanitation, etc.)
- ▶ Electric power companies
- ▶ Waste Disposal Authorities
- ▶ Tourism Advisory Councils (particularly if you are in a tourist community)
- ▶ AAA and other auto clubs
- ▶ Auto insurance companies
- ▶ Safety advocacy groups
- ▶ Local park and planning and zoning commissions
- ▶ Metropolitan Planning Organizations

A Word on the Media

The media—newspaper and radio and television/cable stations—are resources right at your fingertips and can easily bolster support for addressing your roadway problems. The media can be used to

- ▶ Introduce a roadway problem
- ▶ Highlight governmental activity or inactivity on an issue
- ▶ Reinforce the need for continued support surrounding a particular project

A cautionary note: The media need not be placed in an adversarial role. Working *with* the system is always best; use the media to *support and applaud* your collaborative efforts. With this in mind, citizens can

- ▶ Write press releases and letters to the editor (sample found in the appendix of this Guide).
- ▶ Call into community radio talk shows.
- ▶ Arrange for television and radio coverage of safety initiatives.
- ▶ Orchestrate interviews on television and radio shows.

The following figure shows how a local organization—AAA Potomac—worked with the media to get government support for lifesaving roadway improvements to Northern Virginia's George Washington Parkway.

The George Washington Memorial Parkway: AAA Potomac's Campaign to Save Lives

Washington, DC's George Washington Parkway has been the scene of many motor vehicle crashes over the years. In a 10-month period between April 1996 through February 1997, for example, five people lost their lives and three people were injured. Created as a scenic roadway and built in the 1930's for relaxing country driving, its purpose has changed, and it has become a major thoroughfare between Maryland and Virginia, carrying approximately 45,000 cars per day. Major problems stemmed from an absence of barriers between the northbound and southbound lanes, resulting in head-on collisions.

In 1997, AAA Potomac "declared war" on the George Washington Parkway to make it safer, insisting that barriers to separate the flow of traffic be installed immediately.

AAA officials also noted that needless head-on collisions would continue until barriers were in place and speed better controlled on the Parkway.

A 1989 National Park Service Report had confirmed the need for and recommended installation of such barriers, and AAA said that the time to act was now!

So began an intensive three-week media campaign to change government inactivity into life-saving government activity. A series of crashes in 1997 prompted a dozen media stories, and AAA Potomac was invited to participate with Congressmen Jim Moran and Frank Wolf and Park Superintendent Audrey Calhoun in a major press conference beside the Parkway, announcing installation of barriers within 60 days.

Coalitions in Action

The following are examples of successful coalition-based efforts that address roadway problems and hazards.

AAA Michigan's Road Improvement Demonstration Project (Detroit)

Overview

Working with its partners Wayne State University, the Michigan Office of Highway Safety Planning, the Southeastern Michigan Council of Governments, and the City of Detroit's Public Safety Department, AAA Michigan began in 1996 to identify high-crash intersections and develop plans to improve them. Typical countermeasures were low-cost. They included adjusting the timing and placement of signal lights, replacing signal lenses to make them more visible, and adding left-turn signals and turning lanes. After improvements were made, beginning in the spring of 1997, their safety performance was evaluated, and adjustments were initiated to make them even more effective.

Results

There has been a 48% drop in the number of crashes and a 70% decline in the number of injuries at one high-crash intersection since program inception.

Fifty intersections were improved in 1998 with plans to expand to 105 high-crash sites in 1999 on city, county, and state roads in the Detroit area. While it

will take two years to collect crash data at all the high-risk sites, outlook for the future is bright. The Road Improvement Demonstration Project has leveraged the initial \$1 million investment by AAA into an additional \$7 million in federal, state, and local funds to continue its work. This program has successfully obtained additional funding because of its strong and thorough evaluation component. This is particularly important in attracting private-sector support.

Contact

Community Safety Services, AAA Michigan, (313) 336-1412

Citizens Traffic Commission (City of Lubbock, TX)

Overview

The city of Lubbock is composed of 199,450 citizens, but it serves as a metropolitan focal point for a much wider rural/farming community of 600,000 people.¹

The Citizens Traffic Commission (CTC) is an effective city-based coalition with a long-term commitment to roadway safety. It is an advisory board, composed of nine citizens appointed by the city council. Commission members are volunteers and have no job-related positions with the city of Lubbock. Created 33 years ago, CTC

- ▶ Researches, develops, and implements traffic safety programs that meet local needs.
- ▶ Acts in an advisory capacity to the city council and the city manager of the city of Lubbock.
- ▶ Coordinates traffic safety activities of the official agencies and departments of the city of Lubbock.
- ▶ Upon request, provides research and furnishes information to other official agencies.
- ▶ Promotes public acceptance of safety programs proposed or initiated by the city of Lubbock and assists in the overall reduction of traffic crashes, injuries, and deaths on the city's streets.

Sample CTC-endorsed programs include

- ▶ Adjustment of the community's 178 signalized intersections: the amount of all-red time was increased, thus making the intersections safer.
- ▶ "Red for a Reason": a red-light running prevention campaign consisting of PSAs and educational materials. This campaign won a statewide award for its creativity.
- ▶ "Speed, A Grave Mistake": a prevention campaign encouraging people to slow down.

The CTC focuses on two to three issues per year, and these roadway challenges are chosen either through citizen or by departmental request. The CTC convenes monthly meetings at which the police report on current crash statistics. Government departments and citizens can present roadway safety concerns as well.

¹ The city of Lubbock is also home to the Injury Prevention Coalition of the South Plains, NHTSA Safe Communities program, serving 24 counties. It has strong community representation and creates safety campaigns around drinking and driving, safety belt use, and other behavioral-related safety issues. This community is fortunate to have two programs that emphasize roadway safety.

Results

The CTC uses hard data to confirm its effectiveness through a regular review of the community's crash/fatality database (originating from the Traffic Engineering Department). This element is critical to evaluating the success of roadway improvement programs. For example, in its attempt to improve signalized intersections, a \$20,000 investment in equipment was made. Subsequently, the Commission was able to see an estimated savings of \$650,000 in traffic fatalities, injuries, and property-damage-related costs.

Contact

Citizens Traffic Commission c/o City Traffic Engineer, (806) 775-2130
website: <http://traffic.ci.lubbock.tx.us>

Deschutes County, Oregon, Safe Communities

Overview

Begun in 1996 with NHTSA funding, Deschutes County Safe Communities represents both the county and the city of Bend, OR. Its members consist of law enforcement personnel, the trauma hospital staff, citizens, and government officials who represent planning and transportation. During the first year, the coalition came to consensus on two goals: to re-engineer high-incident locations and to become a reliable source of data for planning. These goals have remained constant throughout the organization's existence. Deschutes County Safe Communities takes a serious look at engineering strategies, evaluates their effectiveness, and then makes appropriate changes based on hard data.

Results

The coalition publishes the *Annual Traffic Crash Summary* each year. Data come from a variety of sources, including police department records and the community's motor vehicle department database. Standard reports, which include county-wide information and street-by-street data, are made available to those agencies involved in re-engineering roads. Additional data are also provided to enable the community to better identify high-risk locations (information is updated every 30 days).



Follow-up research is initiated after roadway changes are completed, particularly for larger projects. Roadway modifications are executed on the basis of this evaluation process.

Contact

Deschutes County Safe Communities, (541) 317-3050

Florida Community Traffic Safety Teams (Statewide)

Overview

Florida’s Community Traffic Safety Teams (CTSTs) are locally based groups of highway safety advocates who are committed to solving traffic safety problems through a comprehensive, multijurisdictional, multidisciplinary approach.

The CTSTs function as “locals solving local problems.” Members, who are volunteers, represent local city, county, state, and occasionally federal agencies, as well as private industry. They may even represent just themselves! Safety Teams define the geographic boundaries of where their programs are located. Thus, activities can be targeted to a city, an entire county, a portion of a county, multiple counties, or any other jurisdictional arrangement.

Members come to the table to address safety issues and, in turn, provide resources to solve these roadway problems. Action item lists include a variety of safety challenges and possible solutions. The combination of engineering, enforcement, education, and emergency services (along with citizen input) keeps ideas flowing and issues in front of a team.

CTSTs implement public information and educational campaigns in which fliers, posters, videos, and educational demonstrations are used to deliver messages; special enforcement efforts are conducted; and roadway improvements are initiated. Teams also host carseat check points, bicycle rodeos, training classes, and safety fairs to maximize resources and minimize traffic crashes.

Deschutes County Safe Communities

Said Deborah Hogan, of Deschutes County Safe Communities, “The location of Greenwood and 4th Street was the site of 30 crashes over a three-year period, from 1995 to 1997. A close look at the location revealed that if 4th Street was limited to right turns only, the number of crashes would probably diminish. Signs were posted, and an initial enforcement effort was in place by September 1997. When the 1998 crash totals were compiled, we were stunned that there was only one crash. In 1999, again, there was only one crash.

We expanded the follow-up research to adjoining intersections to make sure we hadn’t shifted the problem somewhere else. The crash numbers at those locations did not go up. We succeeded! This is one success story. There are others, but this one is my favorite, as you can tell.”

The Florida Department of Transportation (FDOT) actively supports the CTSTs. Each FDOT District has a CTST Coordinator who works closely with the teams in his/her geographic area, and the Central FDOT Safety office acts as a liaison to the District Coordinators.

Results

The number of CTSTs has been growing slowly over the past seven years since the concept was initially piloted. In 1993 there were fewer than eight teams, and in 2000, the number of teams has grown to 47. While no formal evaluation of the projects exist, many teams informally track the success of their strategies. In 2000 a comprehensive evaluation of the program will be conducted for the first time. Data are currently being collected from the state's District Coordinators.

Contact

Community Traffic Safety Teams, Florida Department of Transportation, 605 Suwanee Street, MS 53, Tallahassee, FL 32399-0450; (850) 414-4590 website: www.dot.state.fl.us/safety/ctst.htm

Rollingwood, Texas, Coalition

Overview

Rollingwood is a neighborhood community tucked away in the hill country of Central Texas. It is also just a couple of miles from the heart of downtown Austin, the state capital, and the University of Texas at Austin. As such, this little town of just 2,000 residents is encountering all the traffic issues characteristic of a bedroom community surrounded by a geographic area that is experiencing fast-paced economic growth.

The community's traffic concerns are well-founded: a state highway that goes through town is a major route between central Austin and the booming residential area to the west. Injury crashes have steadily increased, according to the Rollingwood police department. For example, a one-mile stretch through Rollingwood was the scene of approximately 40 crashes in 1995, and that number is expected to jump to 70 in 2000.

With assistance from the Texas Department of Transportation (TxDOT), Rollingwood is making physical improvements to the roadway (adding shoulders, a middle turn lane, and traffic lights). In 1999, with full backing of the mayor and sponsored by the Rollingwood Planning and Zoning Commission and the Rollingwood Neighborhood Association, two evening neighborhood "breakout sessions" were held to gather community concerns and ideas. The 60 participants at these meetings focused on a variety of important roadway challenges and potential solutions:

- ▶ Improve visibility at intersections.
- ▶ Enforce and reduce speed limits; consider speed "humps" or "bumps" to counter the effect of steep hills on speed; establish reduced speed limits around the city park; and consider "circles" as traffic control devices.
- ▶ Control, direct, or reduce "cut-through" traffic.

- ▶ Look for more alternative modes of transportation; create more bike/pedestrian lanes.
- ▶ Develop a comprehensive master plan for citywide traffic solutions.
- ▶ Place safety concerns over other issues, such as noise, in determining four-way stops, and consider whether stop signs increase crashes and traffic citations.
- ▶ Place street lights where there are night-time visibility problems.
- ▶ Designate and mark school bus stops.
- ▶ Warn drivers of upcoming hazards or zones.
- ▶ Review “set-back” distance at stop signs.
- ▶ Address driveway problems.
- ▶ Provide stickers to identify the vehicles of neighborhood citizens.

Results

As a direct result of the community’s responding to and identifying its needs, the following initiatives were in place nine months later. These changes were made possible by the mayor and city council at little cost to the city:

- ▶ Large signs were placed on the main residential thoroughfare, advising of the 30 mph speed limit.
- ▶ Small green-and-white stickers were provided to all residents for their vehicles to help identify the extent and growth of cut-through traffic.
- ▶ A left turn has been prohibited, just off the state highway into a McDonald’s, to keep traffic flowing and to reduce the number of rear-end collisions at that location. Additional prohibitions on left turns directly from the highway are under consideration.
- ▶ A traffic engineer has been hired to look at specific intersections of priority concern to the residents.
- ▶ Traffic enforcement allows little tolerance for speeding over posted limits. Three years ago, the police department issued 2000 tickets. Two years ago 2,500 tickets were issued, and last year, the number increased to 3,400!
- ▶ Two officers are on duty during morning and evening rush hours, with one assigned to follow school buses that wind through town.
- ▶ Additional concerns and ideas continue to be generated through a series of joint public meetings of the city council and planning and zoning commission. Adding sidewalks (which are now almost nonexistent in the hilly and wooded terrain) and increasing street lighting are just two of the many ideas being further discussed and considered.

The community’s proactive approach will help it prosper safely through further development and roadway enhancements. Rollingwood is a great place to live, and the residents plan to work hard to keep it that way.

Contact

TxDOT Traffic Safety Section Director, Rollingwood Planning and Zoning Commissioner, (512) 416-3167



Coalition Checklist

Now that you've learned about some successful coalitions, take a look at our Coalition Checklist. It shows how many of the features of a successful coalition each of our examples has.

Coalition Checklist

Coalition Name	Does the coalition represent a strong cross-section of the community?	Have coalition members agreed on common goals and objectives?	Is the press kept well-informed, and is it well-utilized?	Has the coalition established and maintained visibility?	Are efforts ongoing and consistent?	Is there an evaluation component?
AAA Michigan	◆	◆	◆	◆	◆	◆
Citizens Traffic Commission (Lubbock, TX)	◆	◆	◆	◆	◆	◆
Deschutes County, OR, Safe Comm.	◆	◆	◆	◆	◆	◆
Florida Community Traffic Safety Teams	◆	◆	◆	◆	◆	❖
Rollingwood, TX, Coalition	◆	◆	◆	◆	◆	<>

Key:

- ◆ Element is present
- ❖ Some level of element is evident
- <> Element is not evident/ information is not available/data are not available (too early to determine results).



Sources of Funding

Getting financial support for safety projects is often difficult. So it's important to know where to look for potential sources of funding. This section will start with the "big picture" to show you the federal and state programs that may be used to finance roadway safety projects. Next, we'll look at how much of this money goes to each state and who generally controls the use of these funds. Finally, we'll describe your opportunities as a citizen to influence the priorities and funding decisions in your region by participating in the metropolitan planning process.

The Big Picture

Table 3-1 lists the major federal highway programs and their funding levels from 1998 through 2003, the life of the latest surface transportation bill, the Transportation Equity Act for the 21st Century (TEA-21). Safety projects can receive funds transferred from major highway programs such as the National Highway System, Interstate Maintenance, Bridge Rehabilitation and Replacement, Surface Transportation Program, and Congestion Mitigation and Air Quality. However, states or metropolitan planning organizations must request the transfer.

Safety Set-Aside

Funds are also specifically set aside to support roadway safety activities. Ten percent of the Surface Transportation Program—approximately \$685 million per year—is earmarked for hazard elimination and highway railroad grade crossing safety. Hazard elimination funds are used to resolve safety problems at high-accident locations. Railroad highway grade crossing funds are used to reduce the number of fatalities, injuries, and crashes at public highway railroad grade crossings. The funds are divided between the programs and administered by state transportation departments. Table 3-2 indicates the level of funding set aside for these programs in each state. Remember that roadway safety can also be funded by the larger programs described in the previous paragraph and by other sources of funds which will be described below. *The key is to convince states and metropolitan planning organizations that control these funds that roadway safety is a top priority and should be advanced.*

Table 3-1. Transportation Equity Act for the 21st Century (TEA-21)

(P.L. 105-178)

(Amounts in thousands of U.S. Dollars)

Title I – Federal-Aid Highways	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	Total
Interstate Maintenance Program	3,427,341	3,957,103	3,994,524	4,073,322	4,139,630	4,217,635	23,809,555
National Highway System	4,112,480	4,748,523	4,793,429	4,887,986	4,967,556	5,061,162	28,571,136
Bridge Program	2,941,454	3,395,354	3,427,472	3,495,104	3,552,016	3,618,966	20,430,366
Surface Transportation Program	4,797,620	5,539,944	5,592,333	5,702,651	5,795,482	5,904,689	33,332,719
Congestion Mitigation/ Air Quality Improv. Program	1,192,619	1,345,415	1,358,138	1,384,930	1,407,474	1,433,996	8,122,572

Table 3-2. Federal Funds Available for Hazard Elimination and Highway Rail Grade Crossing Safety in Fiscal Year 2000

(U.S. Department of Transportation, Federal Highway Administration)

State	Funds Available for Safety Construction (\$)	State	Funds Available for Safety Construction (\$)
Alabama	13,908,298	Montana	5,148,277
Alaska	6,774,678	Nebraska	6,010,573
Arizona	12,154,086	Nevada	4,858,911
Arkansas	9,871,125	New Hampshire	3,398,490
California	63,526,678	New Jersey	14,691,510
Colorado	8,999,529	New Mexico	6,082,170
Connecticut	7,783,114	New York	26,317,191
Delaware	3,281,033	North Carolina	19,719,964
District of Columbia	2,817,528	North Dakota	4,125,775
Florida	36,794,642	Ohio	23,231,935
Georgia	26,398,008	Oklahoma	12,256,395
Hawaii	3,441,913	Oregon	8,386,674
Idaho	4,625,063	Pennsylvania	23,417,802
Illinois	22,795,932	Rhode Island	3,550,046
Indiana	17,947,906	South Carolina	13,049,998
Iowa	8,809,690	South Dakota	4,632,156
Kansas	9,515,502	Tennessee	15,024,675
Kentucky	11,520,954	Texas	59,220,910
Louisiana	10,551,794	Utah	5,335,909
Maine	3,602,689	Vermont	3,197,730
Maryland	10,611,347	Virginia	18,042,591
Massachusetts	11,589,570	Washington	11,754,595
Michigan	24,804,893	West Virginia	5,076,964
Minnesota	12,372,282	Wisconsin	15,154,311
Mississippi	9,230,378	Wyoming	3,236,559
Missouri	16,767,701		

Other Sources of Funds

Two transfer provisions in TEA-21 could be another source of funds. States without laws banning open containers of alcohol in vehicles by October 1, 2000, must transfer 1.5% percent of their highway construction funds to drunk driving countermeasure and enforcement programs or the Hazard Elimination program. By October 2002, the transfer is increased to 3% if they still have not passed “Open Container” laws.

Another transfer provision targets states that haven’t enacted a Repeat Offender Intoxicated Driver law by October 1, 2000. States without these laws must transfer 1.5% of their highway construction funds to drunk driving countermeasure and enforcement programs or the Hazard Elimination program. The transfer increases to 3% by 2002. In addition, TEA-21 gives states the flexibility to use Occupant Protection Incentive grants for roadway safety and other highway programs.

The Governor’s Highway Safety Representatives in each state will play an important role in the decision about whether transfer or Occupant Protection funds are made available for roadway safety. In some cases, decisions are made jointly by the governor’s representative and the state Department of Transportation (DOT).



Who Decides How Funds Are Used?

Who makes the decisions about which funds will be used for safety and which safety projects will be advanced? There are no easy answers. Each state has its own laws and institutional arrangements. State DOTs are responsible for the construction and maintenance of state highways and take the lead in roadway safety activities such as elimination of roadside hazards. The Governors’ Highway Safety Representatives in every state are responsible for administering federal highway safety grants, preparing an annual plan, and implementing programs to carry out the plan at the state and local levels. In metropolitan areas with populations above 50,000, Metropolitan Planning Organizations (MPOs) play a key role in selecting projects for funding. Table 3-3 shows who generally has the lead in administering funds for the programs described in this chapter.

Table 3-3. Funding Sources

	State DOT	Governor's Highway Safety Representative	MPO ¹
National Highway System	◆		
Interstate Maintenance	◆		
Surface Transportation	◆		◆
Congestion Mitigation and Air Quality	◆		
Bridge Replacement	◆		
Hazard Elimination	◆		
Highway Railroad Grade Crossing Safety	◆		
Open Container Transfer	◆	◆	
Repeat Offender Transfer	◆	◆	
Seat Belt Grants	◆	◆	
.08 Incentive Grants	◆	◆	

¹ MPOs also receive funds to prepare long-range plans, Transportation Improvement Programs, and special studies.

At the local level, one of the best ways to make your project a funding priority is to develop relationships with staff and decision makers in your local MPO. Be sure to include the state DOT representative serving on the MPO. They can help provide access to state funds and technical expertise to get a project done. DOTs are experts in statewide planning, engineering, and roadway safety. Use the information from your safety checklist completed in Chapter 1 to inform MPO members about the need for your project. This kind of information will help to convince them of its merit. Now let's find out how MPOs work and how you can participate in the planning process.

Metropolitan Planning Organizations (MPOs)

So what are MPOs, anyway?

MPOs are the forum in which local elected officials in cooperation with the representatives of the state departments of transportation and transit operators determine the best mix of transportation investments to meet metropolitan needs. Created by Congress in 1970, MPOs are charged with transportation planning for specifically designated

areas. They usually encompass metropolitan areas but may include more than one area or even cross state boundaries.

Where do you find MPOs?

Any urbanized area above 50,000 in population has an MPO. There are approximately 339 MPOs across the country. Some MPOs are stand-alone organizations, while others are housed within larger organizations such as a Metropolitan Council of Governments. To find the MPO in your area, visit the Association of Metropolitan Planning Organizations' website at www.ampmo.org/ or call the Association at (202) 457-0710.

What do MPOs do?

The planning process requires MPOs to create a 20-year, long-range transportation plan for a designated geographic location and a three-year Transportation Improvement Plan (TIP). The long-range plan is updated as needed, and the TIP is updated every two years. Updates include a review of current activities and may provide the opportunity for consideration of additional projects.

Where does roadway safety fit in?

Before the passage of TEA-21, MPOs weren't required to consider safety in developing their long-range plans or TIPs. Metropolitan planners focused instead on congestion relief, economic development, Clean Air Act compliance, environmental assessments, and studies of major transportation investments.

With the passage of TEA-21, MPOs are required to "increase the safety and security of the transportation system for motorized and non-motorized users." This landmark legislation provides you with the opportunity to work with MPO leaders and staff to place greater emphasis on safety in your region.

When and how should you contact an MPO?

MPOs must provide citizens and other interested parties with "reasonable notice of and an opportunity to comment" on the long-range plan and the TIP. This means you are entitled to advance notification of changes in both plans. You are also entitled to participate in the planning process and any public outreach activities organized by the MPO to get citizen input. How can you make your views known?

- ▶ Attend and speak at your local MPO's public meetings.
- ▶ Write letters to your MPO.
- ▶ Arrange one-on-one meetings with key MPO members and staff.

Timing is critical, so contact your MPO and find out the status of the long-range plan and the TIP. Hearings are often scheduled to deal with proposed additions to the plans. Ask for a schedule of future hearings and opportunities to comment on the plans. Find out the requirements for presenting your views or suggestions for additional projects.

If you choose to speak at a hearing, work with coalition partners and community supporters to prepare your remarks. Ask them to attend TIP or long-range plan hearings where additional projects will be considered. If possible, include letters of endorsement from your public works director, city

or county engineer, elected officials, and residents of the area where the safety improvement is needed. This lets MPO leaders know that your project has community support.

Even if you don't have a specific project in mind, MPOs are important institutions to contact. They are constantly dealing with projects that affect the future of your community. Your neighborhood may be affected by a project being considered by a MPO. For example, your local government may propose the development of a new road that would connect your community with the neighboring city, and it will supposedly take the pressure off some of the local roads. As a community leader, you might have both positive and negative concerns about the new road. Getting plugged in to the MPOs' planning process is one of the best ways to learn about the merits and potential impacts of a proposed project. It's also an effective way to express your views.

For more information on how to work with your local MPO, see Chapter 4.

What if you don't live in an urbanized area?

If you live in an area below 50,000 in population, your state DOT is responsible for planning and selecting highway improvements in your area. State DOTs generally work with local elected officials in developing plans for these areas, so it's important to contact your local officials as well as representatives of the state DOT. Let them know about your safety concerns and any safety initiatives you would like considered as part of the planning process.

States prepare a State Transportation Improvement Program (STIP) which lists all the highway improvements endorsed in your state. The STIP includes not only projects for areas below 50,000 but also projects approved by MPOs for inclusion in their TIPs. Work with your state DOT to get your safety issues concerns addressed when the STIP is developed.



Evaluating Results and Benefits

Why should you evaluate your roadway safety improvement?

The purpose of evaluation is to determine the effectiveness of a specific action, countermeasure, or multicomponent program or project. A proper evaluation should tell you if what you did worked and how effective it was. There are two basic types of evaluations: administrative or effectiveness.

The *administrative evaluation* helps you determine how well the components, process, or resources of a project performed. For example, were the planned and actual costs of the project what you expected? Was the project completed in the time planned? Were all the identified roadside hazards addressed properly?

The *effectiveness evaluation* determines the bottom-line results. Did the number and severity of crashes on a hazardous section of road decrease? Were fewer pedestrians injured or killed? Were fewer red light violations recorded at intersections with red light cameras?

What are the benefits of evaluating your project?

An evaluation tells you how well the implemented solutions worked. It also helps you figure out what worked and what did not and approaches that might be tried in the future. An evaluation helps build visibility and support for a project or program and tells supporters that an honest effort was made and documented so that future efforts can be improved.

The importance of communicating the results of an evaluation to decision makers and the community is critical. During the course of a project, several interim evaluations should be performed to develop additional support and to generate midcourse adjustments.

Who performs evaluations?

Your state and local highway departments and state highway safety offices should be aware of the requirements for a proper evaluation and have experience in conducting them.



Chapter 4

Getting Help

Through a concrete, consistent research and evaluation process, you

- ▶ Have now identified and clarified your roadway trouble spots or hazardous operating conditions.
- ▶ Know how the experts move forward with roadway initiatives.
- ▶ Have a more comprehensive understanding of countermeasures that have proven effective.
- ▶ Understand and appreciate the importance of collaboration in making your roadways safer.

Here is a list of organizations and contact information.



Federal Resources

Subject: Roadway safety infrastructure

Name: Federal Highway Administration Resource Centers

The Resource Centers (RCs) listed below provide support and advice to the Federal Highway Administration's (FHWA) division offices so they in turn can do a better job of delivering programs to state Departments of Transportation, metropolitan planning organizations, and other partners and customers. The RCs serve as central locations for technical and program specialists who provide technical, process, and program assistance. The RCs develop and present training, support technology transfer activities, and assist with intermodal and inter-agency coordination.

Eastern Resource Center

Federal Highway Administration
(HRC-EA)
10 South Howard Street, Suite 4000
Baltimore, MD 21201
(410) 962-0777

Midwest Resource Center

Federal Highway Administration
(HRC-MW)
19900 Governors Drive, Suite 301
Olympia Fields, IL 60461-1021
(708) 283-3595

Southern Resource Center

Federal Highway Administration
(HRC-SO)
61 Forsyth Street SW, Suite 17T26
Atlanta, GA 30303-3104
(404) 562-3689

Western Resource Center

Federal Highway Administration
(HRC-WE)
201 Mission Street, Suite 2100
San Francisco, CA 94105
(415) 744-2657

Subject: Safety-roadway

Name: FHWA Headquarters and Division Offices

The Office of Safety at FHWA Headquarters in Washington, DC, provides information on red light running, pedestrian and bicycle safety, road safety audits, and safety management systems to community leaders.

Federal Highway Administration
Office of Safety
400 7th Street, SW
Washington, DC 20590
(202) 366-2288
www.safety.fhwa.dot.gov

FHWA's Division Offices support and provide technical assistance to state and local highway safety agencies. Division Offices are located in all 50 states and Puerto Rico. You can contact the Division Administrators through FHWA's website, www.fhwa.dot.gov.

Subject: Traffic safety issues

Name: National Highway Traffic Safety Administration (NHTSA) Regional Offices

NHTSA has 10 regional offices that work on the agency's mission to save lives, prevent injuries, and reduce traffic-related health care and other economic costs. Each regional office provides numerous services to the states and other public and private sector customers. They promote legislation, administer the Agency's grant programs, assist in coalition building, and deliver training and technical assistance. The Office of Communications and Outreach at NHTSA Headquarters can be helpful to community leaders. It can be reached at:

NHTSA
Office of Communications and Outreach
U.S. Department of Transportation
400 7th Street, SW
Washington, DC 20590
(202) 366-9294
www.nhtsa.dot.gov

NHTSA has 10 regional offices which serve all 50 states, the territories of Puerto Rico, Virgin Islands, American Samoa, Guam, the Marianas and the Tribal Indian Nations. You can contact the regional offices through NHTSA's website, www.nhtsa.dot.gov.

Subject: Roadway and community safety

Name: NHTSA's Safe Communities Program

More than 769 jurisdictions now participate in NHTSA's Safe Communities Program. All 50 states, the District of Columbia, and Puerto Rico are host to these programs. The primary goal of Safe Communities is to reduce transportation-related injuries through community leadership, citizen involvement, and a multidisciplinary intermodal approach to key injury problems. The American Public Health Association and the American Medical Association are Safe Community partners.

Safe Communities obtain assistance through NHTSA's Safe Communities Service Center, an information and technical assistance resource that advances the goals of Safe Communities nationwide. Specifically, the Center

- ▶ Links community coalitions directly to providers who can address specific needs.
- ▶ Identifies a national network of Safe Community practitioners.
- ▶ Markets best practices.
- ▶ Facilitates new partnerships.
- ▶ Promotes citizen involvement.
- ▶ Produces a bimonthly newsletter.

Safe Communities Service Center
c/o NHTSA Region VI
819 Taylor Street, Room 8A38
Fort Worth, TX 76102-6177
(817) 978-3653
(817) 978-8339 Fax
www.nhtsa.dot.gov/safecommunities

The LTAP Clearinghouse

1. Maintains contact information and mailing lists for LTAP centers, FHWA Headquarters, state DOTs, national transportation organizations, and others.
2. Distributes three publications, including the *LTAP Journal*, targeted to governmental agencies and community and transportation leaders.
3. Coordinates and plans national conferences and publishes a schedule of regional LTAP meetings.
4. Provides services to the tribal LTAP centers and includes a special section on the tribal LTAP on its website.
5. Maintains the LTAP Lending Library with demonstration disks, publications, CD-ROMs, and training videos. These may be used for professional development, staff training, sharing technology, or preview.
6. Maintains the LTAP Training Exchange, which lists courses that LTAP centers are willing to conduct at other centers.
7. Promotes LTAP best practices.

Subject: Safety on local, rural, and tribal streets and roads
Name: Local Technical Assistance Program (LTAP) Centers

The LTAP centers form a nationwide network that provides state-of-the-art technical assistance to urban, rural, and suburban local and tribal governments. The centers are located in all states, Puerto Rico, and five tribal communities.

They are generally housed at colleges, universities, or state Departments of Transportation. Community leaders can access LTAP's training courses, publications, video and print libraries, and technologies by contacting their states' LTAP centers. For a list of LTAP centers, visit the website of the LTAP Clearinghouse at www.ltap2.org.

OLTAP centers provide the most direct, hands-on method that FHWA and its partners have for moving innovative transportation technologies out of the lab, off the shelf, and into the hands of the people who maintain local, rural, and tribal streets and

LTAPs help to make roads safer. Here are two examples of LTAPs in action.

Making Roads Safer

After her grandson was hit by a car in a crosswalk within the town of Gardnerville, NV, a grandmother began a Gardnerville grassroots coalition to improve pedestrian safety. Seven months later, her efforts, in combination with those of the Nevada LTAP Center, brought about a Walkable Communities Workshop. The results of that workshop included improvements to 15 crosswalks and the realignment of a dangerous intersection.

Sidewalk Finishing Plow

Sidewalk snow removal is a routine part of winter maintenance in Charlevoix, MI. A front-mount blower, powered by an articulated tractor, does a pretty good job. But raising the blower edge up on shoes to prevent damage to the sidewalk surface often leaves a residue of snow on the walk which softens in the afternoon, then freezes into a hazardous mess. To solve the problem without extra effort or expense, Operator/Mechanic Rick Wilson fabricated a small plow that drags behind the tractor to clean up the residue.

If you're interested in more information, call the LTAP Office at (906) 487-2102.

roads.² Training is at the heart of all LTAP centers. Many offer courses on winter maintenance, work zone traffic control, and pedestrian safety, as well as workshops on the maintenance of gravel roads. Specifically, they

- ▶ Publish quarterly newsletters.
- ▶ Serve as clearinghouses for transportation information.
- ▶ Maintain mailing lists of tribal, local, and rural officials who have transportation-related responsibilities.
- ▶ Conduct training courses designed for local and tribal road agencies.
- ▶ Provide information on new and existing technologies.
- ▶ Perform a self-evaluation of LTAP program services.

In addition to training workshops, LTAPs offer

- ▶ Field demonstrations with hands-on training.
- ▶ Circuit rider and road show programs and distance learning activities.
- ▶ Lending libraries for videos, manuals, workbooks, and other publications and training materials.
- ▶ Internet applications and micro-computer software development.
- ▶ Adaptation and distribution of technical publications and user manuals.
- ▶ Studies on specialized topics.

LTAP

American Public Works Association
1401 K Street NW, 11th Floor,
Washington, DC 20005
(202) 408-9541
(202) 408-9542 Fax
www.ltapt2.org

² LTAP centers can help communities identify safety problems and appropriate countermeasures. However, such activities as conducting safety audits or similar programs are not done regularly because the costs are prohibitive.



Trade and Nonprofit Service Associations

Subject: Design, construction, and maintenance of highways and other transportation facilities

Name: American Association of State Highway and Transportation Officials (AASHTO)

AASHTO is committed to a safe transportation system that ensures mobility, enhances economic prosperity, and sustains the environment. It is an advocate for multimodal and intermodal transportation, representing state DOTs. AASHTO provides leadership, technical services, information, and advice on national transportation policy issues to state DOTs, U.S. DOT, and Congress. It also sponsors forums to facilitate communication among transportation-related interests.

AASHTO
444 North Capitol Street, NW
Suite 249
Washington, DC 20001
(202) 624-5800
(202) 624-5806 Fax
www.aashto.org

Subject: Automobile safety/travel concerns

Name: American Automobile Association (AAA)

While AAA's services to the public are well-known, regional offices also have departments of public affairs and/or government relations. These contacts can be valuable public relations/communications advocates as you move forward with your roadway safety initiative. Contact your local AAA for more information. See descriptions of local AAA activities in this Guide—AAA Michigan and AAA Potomac (in Chapter 3). Visit the AAA website to find the AAA Club in your area.
www.aaa.com

Subject: Highway safety documents

Name: Research and Technology Report Center (RTRC)

The RTRC stocks many of the research and technology transfer publications by the FHWA. Publications are free.

(301) 577-0818
(301) 577-1421 Fax

Subject: Automobile safety/travel concerns

Name: AAA Foundation for Traffic Safety

Over a 53-year period, the Foundation has funded more than 90 research projects on the causes of traffic crashes. It has used this research to develop dozens of focused, high-impact educational materials for drivers, pedestrians, bicyclists, and other road users. These products are used by

- ▶ Government agencies that need assistance in creating road and highway policies.
- ▶ Automobile clubs, driving schools, corporations, and other organizations that teach adults how to drive more responsibly.
- ▶ School districts that teach children and teens about pedestrian safety and safe driving habits.

Samples of recent research relevant to roadway safety include *The Impact of Jersey Median Barriers* and *Aging and the Visibility of Highway Signs*.

AAA Foundation for Traffic Safety
1440 New York Avenue, NW
Suite 201
Washington, DC 20005
(202) 638-5944
(202) 638-5943 Fax
www.aaafoundation.org

Subject: Metropolitan Planning Organizations

Name: Association of Metropolitan Planning Organizations (AMPO)

AMPO is the national organization representing all metropolitan planning organizations (MPOs). It specifically offers its member MPOs technical assistance and training, conferences and workshops, frequent print and electronic communications, research, and a forum for transportation policy development and coalition building. MPOs are key organizations that develop transportation plans for metropolitan areas and select projects for funding and implementation. For more information, see Chapter 3 and call AMPO at the number below or visit its website.

AMPO
c/o National Association of Regional Councils
1700 K Street, NW
Suite 1300
Washington, DC 20036
(202) 457-0710
www.ampo.org

Subject: Public works

Name: American Public Works Association (APWA)

APWA is a national service organization for public works professionals. It is the home organization for the LTAP Clearinghouse described earlier in this chapter. APWA also sponsors the Rural Communities/Small Cities Task Force, which may be helpful to community leaders. The Task Force focuses on the unique

public works challenges of small and rural communities by providing training and technical assistance, as well as convening forums and special conferences on topics of interest to these communities.

APWA
2345 Grand Boulevard, Suite 500
Kansas City, MO 64108-2641
(816) 472-6100
(816) 472-1610 Fax
E-mail: wa@apwa.net

Subject: Roadway safety equipment manufacturers

Name: American Traffic Safety Services Association (ATSSA)

ATSSA is a full-service trade association whose members are companies and individuals in the traffic control business. Members include suppliers of work zone traffic control products and services, pavement marking contractors, highway sign and guardrail manufacturers, and installers and manufacturers of traffic control materials and equipment. ATSSA state chapters address industry issues of local concern, and chapters develop close relationships with highway agencies in their areas through workshops and seminars.

American Traffic Safety Services Association
15 Riverside Parkway
Suite 100
Fredericksburg, VA 22406-1022
(540) 368-1701
(540) 368-1717 Fax
www.atssa.com

Subject: Transportation research and development

Name: Institute of Transportation Engineers (ITE)

ITE is an international educational and scientific association dedicated to providing educational and information sharing opportunities for traffic engineers, transportation planners, and other professionals who are responsible for meeting society's needs for safe and efficient surface transportation. Of interest to local community leaders are its 70 local and regional chapters that provide opportunities for information exchange, participation, and networking.

Activities include the development of standards and recommended practices, informational reports, handbooks, conferences, position papers, and newsletters. Of particular interest are ITE's Traffic Safety Toolbox and the ITS Cooperative Deployment Network, which focuses on sharing and exchanging information about intelligent transportation systems.

Institute of Transportation Engineers
525 School Street, SW
Suite 410
Washington, DC 20024
(202) 554-8050
(202) 863-5486 Fax
www.ite.org

Subject: Intelligent transportation systems

Name: ITS America (ITS)

ITS America is a national organization established to coordinate the development and deployment of intelligent transportation systems (ITS) in the United States. The ITS mission is to foster public/private partnerships that will increase the safety and efficiency of surface transportation through the accelerated development and deployment of advanced transportation systems. The organization serves as a clearinghouse for intelligent transportation systems—related information.

ITS America
400 Virginia Avenue, SW
Suite 800
Washington, DC 20024
(202) 484-4586
(202) 484-3483 Fax
www.itsa.org

Subject: County engineers

Name: National Association of County Engineers (NACE)

NACE has four primary objectives:

- ▶ Advance county engineering and management by providing a forum for the exchange of ideas and information.

About Intelligent Transportation Systems...

Intelligent Transportation Systems (ITS) enable people and goods to move more safely and efficiently through a state-of-the-art, intermodal transportation system.

ITS is composed of a number of technologies, including information processing, communications, control, and electronics. Joining these technologies to our transportation systems will save lives, time, and money. Safety applications of ITS technologies include state-of-the-art traffic signals, changeable messages signs, and traveler and weather information systems.

- ▶ Foster and stimulate the growth of state organizations of county engineers and road officials.
- ▶ Improve relations and cooperation among county engineers and other agencies.
- ▶ Monitor national legislation affecting county transportation/public works departments and provide input to Congress through the National Association of Counties.

Membership in NACE is open to county engineers, engineers serving in that capacity at the county level, or nonengineers with similar responsibilities as well as members whose counties have similar goals.

NACE
440 First Street, NW
Washington, DC 20001-2028
(202) 393-5041
(202) 393-2630 Fax
www.naco.org/affils/nace
nace@naco.org

Subject: Government highway safety management

Name: National Association of Governors' Highway Safety Representatives (NAGHSR)

This nonprofit organization represents the highway safety programs of states and territories that focus on the "human factors" of highway safety. It emphasizes occupant protection, impaired driving, speed enforcement, and motor carrier, school bus, pedestrian, and bicycle safety. NAGHSR's mission is to provide leadership in the development of national policy to ensure effective highway safety programs.

NAGHSR
750 First Street, NE
Suite 720
Washington, DC 20002-4241
(202) 789-0942
(202) 789-0946 Fax
www.naghsr.org

Subject: Work zone safety

Name: National Highway Work Zone Safety Information Clearinghouse

The Clearinghouse, a cooperative venture between the Federal Highway Administration and the American Road & Transportation Builders Association (ARTBA), is the first centralized, comprehensive information resource that can assist those interested in reducing crashes associated with highway work zones. Located at Texas A&M University, users will find the most comprehensive and up-to-date information on work-zone-related

- ▶ Laws
- ▶ Products
- ▶ Public education and outreach
- ▶ Regulations
- ▶ Research reports
- ▶ Specifications
- ▶ Statistics
- ▶ Training courses
- ▶ Contact information for key experts in each of these areas

Of particular interest to community leaders:

State Outreach Campaign Search Database: individuals can identify sample public education campaigns.

Work Zone Safety Best Practices Database: individuals can identify best practices by topic.

(888) 447-5556
(409) 845-0568 Fax
wzsafety.tamu.edu

Subject: Community safety

Name: National Safety Council (NSC)

Since its founding in 1913, the NSC has served as the premier source of safety and health information in the United States. It started in the workplace, particularly in factories, warehouses, and construction sites, making businesses aware of the ways to prevent unintentional injuries on the job. Subsequently, it expanded its efforts to include highway, community, and recreation safety. Contact NSC Headquarters for information about a local council near you.

NSC Headquarters
1121 Spring Lake Drive
Itasca, IL 60143-3201
(800) 621-7519
www.nsc.org

Subject: Pedestrian/bicycle safety

Name: Pedestrian and Bicycle Information Center

A new Pedestrian and Bicycle Information Center has been established on the Internet to help communities find the information and resources they need to create safe places for walking and bicycling.

The Center provides information on planning and designing facilities; how communities can encourage walking and bicycling; safety program ideas; and how to integrate new technologies in making pedestrians and bicyclists safer. Individuals with difficult or technical issues can e-mail the Center, which will put them in touch with a network of professionals and experts in various areas.

The Pedestrian and Bicycle Information Center
c/o UNC Highway Safety Research Center
730 Airport Road
Chapel Hill, NC 27514-3430
(877) WALKBIKE or (877) 925-5245
www.bicyclinginfo.org
www.walkinginfo.org

Subject: Improving America's roadways to reduce fatalities and injuries

Name: Roadway Safety Foundation (RSF)

Sample RSF Documents and Products

- ▶ Improving Roadway Safety: Current Issues
- ▶ Roadway Safety Checklist
- ▶ "It's No Accident" Radio Public Service Announcements CD
- ▶ Read Your Road Guide to Safe Driving

RSF is one of the few national organizations solely dedicated to reducing highway deaths and injuries by improving the physical characteristics of America's roadways. This encompasses design and engineering, operating conditions, removal of roadside hazards, and the effective use of safety features.

RSF attains its goals by building awareness through media campaigns and outreach activities, developing educational materials, and forming roadway safety partnerships between the private and public sectors.

RSF members include a diverse network of public and private sector partners. Industries represented include insurance, petroleum, highway construction, salt, trucking, automakers, and safety equipment manufacturers. Public sector members include safety leaders at all levels of government.

RSF's website includes

- ▶ A description of RSF's radio public service announcement campaign
- ▶ Publications for safety professionals
- ▶ Information on how to obtain a free Roadway Safety Checklist

The Roadway Safety Foundation
1776 Massachusetts Avenue, NW
Washington, DC 20036
(202) 857-1200
(202) 857-1220 Fax
www.roadwaysafety.org

Subject: Improving traffic congestion, highway travel, and other quality-of-life issues

Name: The Road Information Program (TRIP)

TRIP is a nonprofit organization that promotes the research of transportation policies focusing on relieving traffic congestion, improving air quality, making highway travel safer, and enhancing economic productivity. The association offers a cadre of research documents that local leaders might find useful.

The Road Information Program (TRIP)
1726 M Street, NW
Suite 401
Washington, DC 20036
(202) 466-6706
(202) 785-4722 Fax
www.tripnet.org

Sample TRIP documents

Key Facts About America's Road and Bridge Conditions and Federal Funding" (December 1999)

"The Most Effective Way to Reduce Traffic Congestion Combines Improving All Modes of Transportation, Including Roads, with Local Land-Use Planning Strategies, New Report Shows..." (December 1999)

"Traffic Congestion Is Not Just a Big City Problem" (August 1999)

Subject: De-icing and pavement protection

Name: The Salt Institute (SI)

SI is a nonprofit association dedicated to the study and use of salt or sodium chloride in our daily lives. Its members include salt producers, highway and maintenance engineers, journalists, elected government policy makers, and regulators. Of particular interest to local leaders concerned with roadway safety, SI sponsors field studies and laboratory investigations on the impacts of various uses of salt, including the contributions of de-icing to winter road accident reduction.

The Salt Institute
700 N. Fairfax Street, Suite 600
Fairfax Plaza
Alexandria, VA 22314-2040
(703) 549-4648
(703) 548-2194 Fax
www.saltinstitute.org



Nongovernmental Research Programs

Subject: Transportation management and vehicle control systems

Name: PATH

PATH is a research program that develops solutions to transportation problems. With more than 11,000 citations, the California PATH database is the world's largest bibliographic database pertaining to intelligent transportation systems.

(510) 231-9495

www.path.berkeley.edu

Subject: Nature and performance of transportation systems

Name: Transportation Research Board (TRB)

TRB is part of the National Research Council, and its mission is to promote innovation and progress in transportation by stimulating and conducting research, facilitating the dissemination of information, and encouraging the implementation of research results.

TRB has outstanding technical committees and task forces that address all modes and aspects of transportation. It publishes and disseminates reports and peer-reviewed research papers. TRB administers two research programs and conducts special studies on policy issues requested by Congress and government agencies. It operates a computerized file of transportation research information and hosts an annual meeting that typically attracts 8,000 transportation professionals.

Two TRB programs that local decision makers might find useful are the National Cooperative Research Program and the online information service known as the Transportation Information Service (TRIS) Online. Both are described in the figure below.

The National Cooperative Highway Research Program

The National Cooperative Highway Research Program (NCHRP) conducts research in acute problem areas that affect highway planning, design, construction, operation, and roadway maintenance nationwide. Research findings are published in the **NCHRP Reports** and the **Synthesis of Highway Practice** reports. The reporting format is designed specifically for transportation administrators and practicing engineers. In addition, to promote awareness and use of the research findings, the NCHRP produces **Research Results Digests** and **Legal Research Digests**. These and other publications can be ordered online through TRB's Bookstore (click "Bookstore" on TRB's home page).

NCHRP Manager
(202) 334-2379
(202) 334-2006 Fax
cjencks@nas.edu

TRIS Online

TRB also coordinates **TRIS Online**, the largest and most comprehensive source of information on published transportation research on the Web. **TRIS Online** currently contains over 400,000 records of published transportation research. TRIS not only provides access to the bibliographic records and abstracts, it also includes links to the full text of public-domain documents or document suppliers. Currently there are almost 200 links to full text documents and over 50,000 links to the websites of corporate authors. Links to full text documents will continue to be added. Access TRIS Online at <http://ntl.bts.gov/tris/>

The Transportation Research Board can be reached at:

(202) 334-2972
(202) 334-2519 Fax
www.nas.edu/trb
www.nationalacademies.org/trb/



Appendix



How do you identify a particular section of or location on a road?

Highway engineers have their own terminology for roads. Specifying a particular road intersection is pretty straightforward (assuming that the two roads do not cross at more than one location). But what about a dangerous curve somewhere along a 20-mile highway between intersections? It is important to have an understandable frame of reference. And it is essential to link accident and complaint data with a particular “problem” section of road. Here are the typical ways highway engineers identify road locations:

- ▶ **Milepost:** The numerical distance from a base point (often a political boundary, such as the county line) to a specific location is marked by signs.
- ▶ **Reference Point:** A location is marked or signed using a fixed, identifiable feature such as an intersection, railroad crossing, or bridge as a reference point.
- ▶ **Link Node:** “Node numbers” are assigned to highway intersections or other reference points. The section of road between nodes is referred to as a “link.” Engineers measure the distance from a node to a particular spot. Link node references are not identified by public signs, but are utilized in highway department record systems.
- ▶ **Coordinate or Geographical Information system (GIS):** Other roadway reference systems use map coordinates determined by Global Positioning System (GPS) satellite reference positioning.



Where do you find the types of information and data you need?

Data, information and sources

Several types of data are used to identify and evaluate a potential highway safety hazard or trouble spot. The type of data available in your community will depend on the record keeping practices of local and state agencies. Ideally, at least three years of data should be examined. Key data include

- Accident records
- Complaint files
- Maintenance records

Other types of data may also be available from state and local agencies including

- Enforcement records (traffic citation files)
- Roadway photologs or videologs
- Construction prints
- Traffic control device inventories

Where can you find this information?

Accident records are kept at the local, state, and federal levels by a variety of agencies.

Federal data

At the federal level, an agency at the U.S. Department of Transportation, the National Highway Traffic Safety Administration (NHTSA), maintains a national data system on fatal crashes, the **Fatality Analysis Reporting System or FARS**, composed of fatal crash reports from every state. FARS publishes *summary* fatal crash statistics for each state and can be queried to find out local summary fatal crash statistics for counties and some cities. FARS cannot compile fatal crash data for specific roads, road segments, or intersections.

To obtain information from the FARS database, contact the National Center for Statistics and Analysis, NHTSA, at (202) 366-4709. FARS information is also available at the NHTSA website: www.nhtsa.dot.gov.

State data

Most states maintain a reasonably good database on fatal crash reports collected from the various police agencies in the state. Some also include injury and other types of crash data to varying degrees of completeness. The department that maintains each state's accident database varies, but typically includes either the state police or highway patrol, state Department of Transportation or public safety agency. One easy way to determine where to go for this information is to contact your state's Governor's Highway Safety Representative (GR), whose job it is to keep abreast of the state's highway safety programs. The address and phone number of each state GR are listed in the website of the National Association of Governors' Highway Safety representatives—www.naghsr.org.

Local data

The availability of local accident data can vary from good to nonexistent, depending on the locality. Many localities may not maintain easily accessible records. Begin your search by talking to the local police agencies in your area. Some police agencies also keep traffic citation records and other enforcement information in their jurisdiction.

Other Highway Records

Complaint files, maintenance records, roadway video/photologs, highway construction information, and traffic control device records are typically kept in your local county, municipality, and state highway or public works departments. Again, start your search with your local police agency and state GR's office.

An example of a completed field-review checklist for an intersection follows. This is a checklist completed by an engineer after a field visit to a potentially hazardous site. It is included as an example of the types of activities and analyses carried out during field studies.

Field Observation Report for Intersections

LOCATION: Intersection of Chad & Shane Roads

DATE: April 17, 1986 TIME: 1:00 PM

OPERATIONAL CHECKLIST:	<u>NO</u>	<u>YES</u>
1. Do obstructions block the drivers view of opposing or conflicting vehicles?	_____	_____✓
2. Do drivers respond incorrectly to signals, signs or other traffic control devices?	_____✓	_____
3. Are there violations of parking or other traffic regulations?	_____✓	_____
4. Do drivers have trouble finding the correct path through the location?	_____✓	_____
5. Are drivers confused about routes, street names, or other guidance information?	_____✓	_____
6. Are vehicle speeds: too high?	_____	_____✓
too low?	_____	_____
7. Is vehicle delay causing a safety problem?	_____✓	_____
8. Are there traffic flow deficiencies or traffic conflict patterns associated with turning movements?	_____✓	_____
9. Are problems being caused by the volume of:		
through traffic?	_____✓	_____
turning traffic?	_____✓	_____
10. Are there other traffic flow deficiencies or traffic conflict patterns?	_____✓	_____
11. Do the presence of existing driveways contribute to accidents or erratic movements?	_____✓	_____
12. Do pedestrian movements through the location cause conflicts?	_____✓	_____
13. Does the lack of adequate lighting cause safety problems?	_____✓	_____

Other Special Studies

Highway professionals can conduct a range of studies depending on the type(s) of problems that are encountered. Below are the technical studies that may be applied to your specific trouble spot.

- ▶ Traffic Volume
- ▶ Spot Speed
- ▶ Ball Bank (determines maximum safe speed on a curve)
- ▶ Sight Distance
- ▶ Traffic Conflict and Event
- ▶ Travel Time and Delay
- ▶ Roadway and Intersection Capacity
- ▶ Gap (between traffic)
- ▶ Queue Length (backups)
- ▶ Skid Resistance
- ▶ Highway Lighting
- ▶ Weather-Related Factors
- ▶ School Crossing
- ▶ Railroad Crossing
- ▶ Traffic Control Device
- ▶ Bicycle and Pedestrian



Potential Solutions for Roadway Safety Problems

Table A-1 shows potential solutions for two common roadway safety problems:

Table A-1. Accident Pattern Tables

Accident Type	Possible Cause	Possible Study	Safety Enhancement
Overturn	Roadside features	Determine sideslope Investigate recovery zone	Provide traversable culvert end treatments Extend culverts Install/improve traffic barriers Flatten slopes and ditches Relocate drainage facilities
	Inadequate shoulder	Determine shoulder dimensions and composition Check for shoulder dropoffs	Upgrade shoulder surface Remove curbing/obstructions Widen lane/shoulder
	Pavement feature	Check for potholes and rutting Check for water ponding	Eliminate edge dropoff Improve superelevation/crown
Fixed object	Obstruction in or too close to roadway	Field observation to locate obstructions	Delineation/reflectorize safety hardware Remove/relocate obstacles Install breakaway features to light poles, signposts, etc. Protect objects with guardrail Install crash cushions
	Inadequate lighting	Check illumination	Improve roadway lighting
	Inadequate pavement markings	Review pavement markings	Install reflectorized pavement lines/raised markers
	Inadequate signs, delineators and guardrails	Review signs, delineators and guardrails	Install reflectorized paint and/or reflectors on the fixed object Add special signing Upgrade barrier system
	Inadequate road design	Check roadside shoulders and maintenance Check superelevation Perform ball-bank study	Install warning signs/delineators Improve alignment/grade Provide proper superelevation Provide wider lanes
	Slippery surface	Check skid resistance Check for adequate drainage Perform spot speed study	Reduce speed limit if justified by spot speed study Provide adequate drainage Improve skid resistance

Sample Press Release to Announce Red Light Running Campaign Progress

[insert local organization logo here]

FOR IMMEDIATE RELEASE

CONTACTS: [campaign spokesperson'(s)
phone number]

RED LIGHT RUNNING CAMPAIGN NABS MORE THAN [Place number here] VIOLATORS

[**Organization name**] announced today that the [**insert police agencies involved**] have issued more than [**insert quantity**] citations as part of the Red Light Running campaign. [**Organization name**] launched this enforcement effort along with a public information and education campaign on [**kickoff date**] to deter motorists from running red lights.

[**Insert quote from the police chief or campaign spokesperson/coordinator discussing the success of the campaign-reasons for its success and the support of community volunteers and organizations.**]

In [**insert numerical year before campaign kickoff**], police reported [**quote pre-campaign statistics, if available**] traffic crashes and deaths associated with red light running, and surveys conducted prior to the campaign's launching showed that [**percentage**] of the respondents admitted that they ran red lights. These statistics were one of the reasons why [**organization's name**] implemented the Federal Highway Administration (FHWA) Red Light Running campaign. The campaign is being sponsored by [**include funding organizations**].

FHWA is charged with ensuring that the nation's highways are safe and efficient. The agency is accomplishing these goals in part through public outreach and education campaigns and collaborating with local businesses and safety organizations throughout the country.

Incorporating public information and education with aggressive enforcement, the Red Light Running campaign is also [**describe other activities surrounding the campaign, including the kickoff, presentations, traffic safety fairs, as well as any financial support from private institutions or in-kind donations of publicity or materials. Insert quote by organization spokesperson regarding how the community is pulling together for the event, etc.**].