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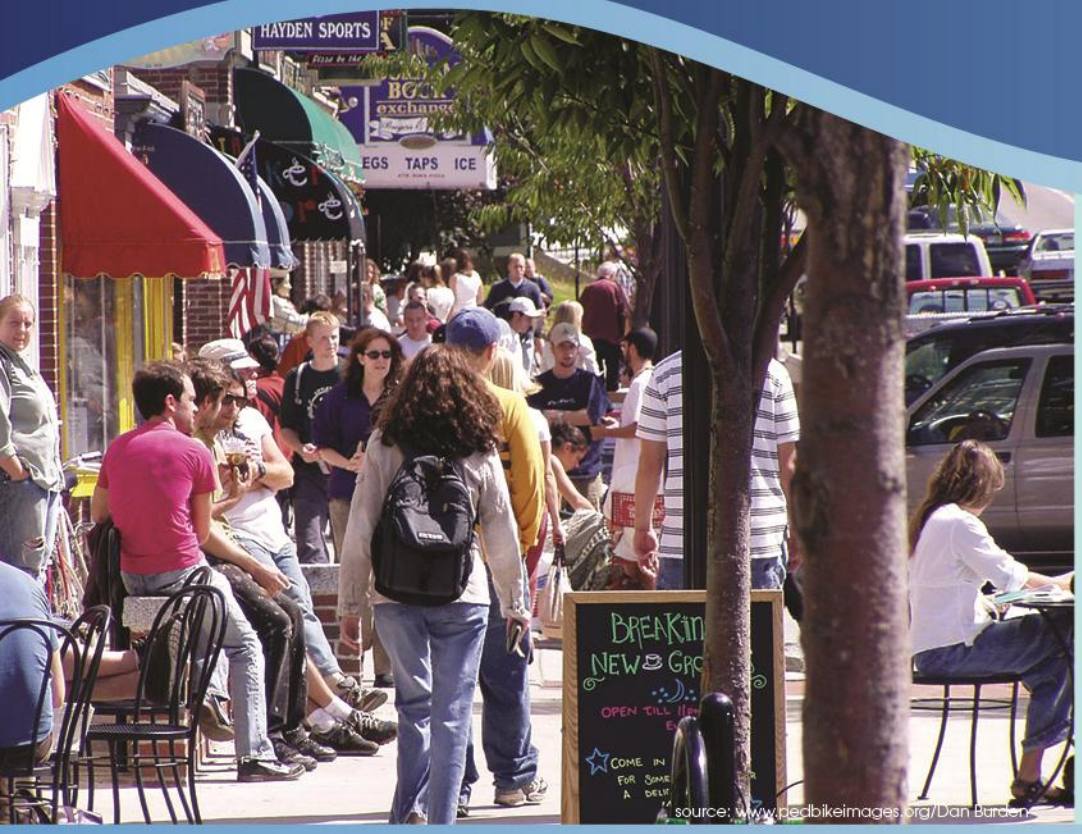
A Focused Approach to Safety
Guidebook



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U.S. Department of Transportation
Federal Highway Administration

Safe Roads for a Safer Future
Investment in roadway safety saves lives

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16. Abstract

The Federal Highway Administration (FHWA) has developed the Focused Approach to Safety in order to better address the most critical safety challenges by devoting additional attention to high priority States. The purpose of the Focused Approach is to further decrease the number of fatalities and serious injuries on the Nation's highways through a more targeted delivery of technical assistance and resources. FHWA's safety focus also calls for the transportation community to think beyond traditional approaches and to consider low-cost, comprehensive, systematic safety solutions. This approach allows focus States to demonstrate dramatic results and to take advantage of the lessons learned across the country from States and localities that have shown safety improvements on their highways.

This guidebook provides a concise resource for safety stakeholders to utilize. It outlines the program's purpose, benefits, and history. It summarizes the methodology for how a State becomes eligible to participate, as well as the basic steps for success. Finally, it provides an overview of each of the focus areas (Intersections, Pedestrians, and Roadway Departure) with success stories and resources to fully engage each focus State in developing and implementing proven countermeasures. Highway safety requires a comprehensive, focused approach to deliver results.

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SI* (MODERN METRIC) CONVERSION FACTORS

APPROXIMATE CONVERSIONS TO SI UNITS

Symbol	When You Know	Multiply By	To Find	Symbol
		LENGTH		
in	inches	25.4	millimeters	mm
ft	feet	0.305	meters	m
yd	yards	0.914	meters	m
mi	miles	1.61	kilometers	km
		AREA		
in^2	square inches	645.2	square millimeters	mm^2
ft^2	square feet	0.093	square meters	m^2
yd^2	square yard	0.836	square meters	m^2
ac	acres	0.405	hectares	ha
mi^2	square miles	2.59	square kilometers	km^2
		VOLUME		
fl oz	fluid ounces	29.57	milliliters	mL
gal	gallons	3.785	liters	L
ft^3	cubic feet	0.028	cubic meters	m^3
yd^3	cubic yards	0.765	cubic meters	m^3
	NOTE: volumes greater than 1000 L shall be shown in m^3			
		MASS		
oz	ounces	28.35	grams	g
lb	pounds	0.454	kilograms	kg
T	short tons (2000 lb)	0.907	megagrams (or "metric ton")	Mg (or "t")
		TEMPERATURE (exact degrees)		
°F	Fahrenheit	5 (F-32)/9 or (F-32)/1.8	Celsius	°C
		ILLUMINATION		
fc	foot-candles	10.76	lux	lx
fl	foot-Lamberts	3.426	$candela/m^2$	cd/m^2
		FORCE and PRESSURE or STRESS		
lbf	poundforce	4.45	newtons	N
lbf/in^2	poundforce per square inch	6.89	kilopascals	kPa

APPROXIMATE CONVERSIONS FROM SI UNITS

Symbol	When You Know	Multiply By	To Find	Symbol
		LENGTH		
mm	millimeters	0.039	inches	in
m	meters	3.28	feet	ft
m	meters	1.09	yards	yd
km	kilometers	0.621	miles	mi
		AREA		
mm^2	square millimeters	0.0016	square inches	in^2
m^2	square meters	10.764	square feet	ft^2
m^2	square meters	1.195	square yards	yd^2
ha	hectares	2.47	acres	ac
km^2	square kilometers	0.386	square miles	mi^2
		VOLUME		
mL	milliliters	0.034	fluid ounces	fl oz
L	liters	0.264	gallons	gal
m^3	cubic meters	35.314	cubic feet	ft^3
m^3	cubic meters	1.307	cubic yards	yd^3
		MASS		
g	grams	0.035	ounces	oz
kg	kilograms	2.202	pounds	lb
Mg (or "t")	megagrams (or "metric ton")	1.103	short tons (2000 lb)	T
		TEMPERATURE (exact degrees)		
°C	Celsius	1.8C+32	Fahrenheit	°F
		ILLUMINATION		
lx	lux	0.0929	foot-candles	fc
cd/m^2	$candela/m^2$	0.2919	foot-Lamberts	fl
		FORCE and PRESSURE or STRESS		
N	newtons	0.225	poundforce	lbf
kPa	kilopascals	0.145	poundforce per square inch	lbf/in^2

*SI is the symbol for the International System of Units. Appropriate rounding should be made to comply with Section 4 of ASTM E380.
(Revised March 2003)

Acronyms

DOT	Department of Transportation
CMF	Crash Modification Factor
ELCSI-PFS	Evaluation of Low-Cost Safety Improvements Pooled Fund Study
EMS	Emergency Medical Service
FARS	Fatality Analysis Reporting System
FHWA	Federal Highway Administration
HELPERS	Hazard Elimination Local Project for Roads and Streets
HPMS	Highway Performance Monitoring System
HSIP	Highway Safety Improvement Program
ISIP	Intersection Safety Implementation Plan
LPA	Local Public Agency
MPO	Metropolitan Planning Organization
NHI	National Highway Institute
RSA	Road Safety Audit
RT&E	Research, Technology and Education
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SHSP	Strategic Highway Safety Plan
TZD	Toward Zero Deaths
VMT	Vehicle Miles Traveled

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Executive Summary

The Federal Highway Administration (FHWA) has developed the Focused Approach to Safety in order to better address the most critical safety challenges by devoting additional attention to high-priority States. The purpose of the Focused Approach is to further decrease the number of fatalities and serious injuries on the Nation's highways through a more targeted delivery of technical assistance and resources. FHWA's safety focus also calls for the transportation community to think beyond traditional approaches by considering low-cost, comprehensive, systematic safety solutions. This approach allows focus States to achieve dramatic results and to take advantage of the lessons learned across the country from States and localities that have demonstrated safety improvements on their highways.

This guidebook provides a concise resource for safety stakeholders. It describes the Focused Approach to Safety's purpose, benefits, and history. It also describes the methodology for how a State becomes eligible to participate, as well as the basic steps for success. Finally, it provides an overview of the three focus areas —Roadway Departure, Intersections, and Pedestrians — with success stories and resources to fully engage each focus State in developing and implementing proven countermeasures. Included in the Appendix of the guidebook is the Focused Approach to Safety Toolbox, which provides links to additional safety resources.

Overall Benefits of the Focused Approach

The Focused Approach provides several benefits that apply to all States. The program:

- Increases awareness of critical severe crash types.
- Provides data analysis and action plan development for focus areas from initiation to implementation.
- Leads to critical safety infrastructure improvements.
- Promotes use of effective safety countermeasures.
- Assists FHWA, State DOTs, and local agencies when prioritizing resources.
- Creates positive organizational changes in safety culture, policies, and procedures.

Benefits to the Focus States:

Focus States will realize several benefits from the Focused Approach. The program:

- Assists with existing Strategic Highway Safety Plan (SHSP) fatality reduction goals in Roadway Departures, Intersections, and Pedestrians.
- Provides additional access to FHWA Resource Center technical experts to further advance safety programs.
- Provides additional training and technical assistance, individualized to meet the State needs, to support deployment of effective safety countermeasures.
- Identifies and implements research on proven safety countermeasures.
- Provides additional tools and technologies to identify and address safety problems.
- Improves awareness and understanding of infrastructure-related crash factors.

Program Purpose

The Federal Highway Administration (FHWA) has developed the Focused Approach to Safety in order to better address the most critical safety challenges by devoting additional attention to high-priority States. The purpose of the Focused Approach is to further decrease the number of fatalities and serious injuries on the Nation's highways through a more targeted delivery of technical assistance and resources. FHWA's safety focus also calls for the transportation community to think beyond traditional approaches by considering low-cost, comprehensive, systemic safety solutions. This approach allows focus States to achieve dramatic results and to take advantage of the lessons learned across the country from States and localities that have demonstrated safety improvements on their highways.

Developing and delivering tools and technologies where they will have the greatest impact are paramount to the success of a safety program. Using the 4 E's of highway safety (engineering, enforcement, education, and emergency services), FHWA will continue to concentrate resources on the three focus areas in which the greatest percentage of highway fatalities occur:

- Roadway departure crashes (53 percent of all highway deaths).
- Intersection-related crashes (21 percent of all highway deaths).
- Pedestrian crashes (11 percent of all highway deaths).

The objective of the Focused Approach to Safety is to provide resources (i.e., people, time, tools, and training) where they are needed the most. A focus State participates in the Focused Approach areas after meeting the eligibility criteria in one or more of the safety focus areas. A focus State receives additional resources to help achieve its Strategic Highway Safety Plan (SHSP) fatality goals in eligible focus areas. A tailored approach is used to meet the needs of the focus State.

Program Benefits

The following sections describe the overall benefits of the Focused Approach, as well as the benefits of the program to individual States.

Overall Benefits

The Focused Approach to Safety offers the following overall benefits to address the safety improvement needs of focus States and of our national roadway system as a whole:

- **Increases awareness of critical severe crash types.** The three focus areas were selected due to the frequency of fatal and serious injury crashes occurring within these categories.
  - Roadway departure crashes are frequently severe and account for the majority of highway fatalities. In 2009, there were 14,968 fatal roadway departure crashes resulting in 16,265 fatalities. These crashes accounted for 49 percent of all fatal crashes in the US that year *(1)*.
  - Intersection safety is a national, state, and local priority. Intersection crashes represent a disproportionate share of the safety problem. In 2009, 7,043 fatalities were at intersections or were intersection related. These fatalities represent 21 percent of the fatalities that occurred in the US that year *(1)*.
  - Pedestrians are the most vulnerable of all road users. They are overrepresented in crashes, especially fatal crashes, in comparison to their mode share of trips. In 2009, there were 4,092 pedestrian fatalities on the Nation's roadways. These fatalities represent 12 percent of all fatalities in the US that year *(1)*.

- **Provides data analysis and action plan development for Focus Areas from initiation to implementation.** FHWA offers an Implementation Plan Workshop that further addresses the safety needs of the focus States. To develop an evidence-based analysis, FHWA works with the focus States to create a customized data analysis package. This Implementation Plan identifies a set of cost-effective countermeasures, deployment levels, and the funding needed to achieve the State's SHSP fatality and serious injury reduction goals based on State data. The Implementation Plan may include traditional treatments at high-crash locations, systemic treatments on corridors with a moderate level of crashes, and comprehensive safety solutions incorporating law enforcement and education to reduce the number and severity of focus-area crashes.

- **Leads to critical safety infrastructure improvements by promoting the use of effective safety countermeasures.** The widespread implementation of proven safety countermeasures can serve to accelerate the achievement of local, State and national safety goals. In the stewardship and oversight role for federally funded highway programs, FHWA strongly encourages Federal, State, local agencies, and tribal governments to include safety in their investment decision-making process. FWHA encourages implementing the following nine proven safety countermeasures: Road Safety Audits (RSA), rumble strips and rumble stripes, median barriers, safety edge, roundabouts, left and right turn lanes at stop-controlled intersections, yellow change intervals, medians and pedestrian refuge areas in urban and suburban areas, and walkways *(2)*.
- **Assists FHWA, State Departments of Transportation (DOTs), and localities when prioritizing resources.** Safety is a complex issue and usually no single solution can completely solve an identified road safety problem. Safety measures may vary in cost, involve an educational, engineering, or enforcement approach, or be categorized as a "quick fix" or a long-term strategy. Safety professionals are constantly challenged to weigh the menu of possible solutions and prioritize those that best address the problem given existing constraints and resources *(3)*. The Focused Approach can assist with prioritization, particularly within the Highway Safety Improvement Program (HSIP), through targeting the most frequent fatal and serious injury crash types and the greatest safety challenges.
- **Creates positive organizational changes in safety culture, policies, and procedures**. The Focused Approach is another mechanism to bring together a wider range of highway safety stakeholders to work toward institutional and cultural changes. The Focused Approach supports the Towards Zero Death (TZD) vision through a data-driven effort and creating additional opportunities for changing American culture as it relates to highway safety. TZD will develop strong leadership and champions in involved organizations that can directly impact highway safety through engineering, enforcement, education, emergency medical service (EMS), policy, public health, communications, and other efforts *(4)*.

Benefits to the Focus States

In addition to overall benefits, the Focused Approach to Safety also offers the following direct benefits to the focus States:

- **Assists with existing SHSP fatality reduction goals in the Focus Areas of Roadway Departures, Intersections, and Pedestrians.** Many focus States already have the three focus areas in their SHSPs. The Focused Approach will help tailor resources to boost State efforts and achieve targeted safety benefits.

- **Provides additional access to FHWA Resource Center technical experts to further advance safety programs.** The Resource Center routinely provides assistance to FHWA Division Offices and to focus States. The Center provides a leadership role in deploying safety countermeasures that will assist both FHWA and focus States in advancing their safety goals. The Resource Center is an integral part of FHWA in delivering the Federal-aid Program and achieving agency strategic goals. Their key services include national policy leadership, technical assistance, and program delivery through technology deployment, interagency / intermodal coordination, and training support. The technical assistance offered by the Resource Center to the focus States will involve a collaborative partnership and dialogue. The assistance will entail a tailored approach to customize advice and strategies to engage the needs of each focus State.
- **Provides additional training and technical assistance, individualized to meet the State needs, to support deployment of effective safety countermeasures.** FHWA provides technical training sessions to States that are tailored to their specific focus area needs. The National Highway Institute (NHI), a division of the FHWA, also works with the Focused Approach to improve the performance of the transportation industry through training. The training includes a process to select recommended countermeasures. To achieve this mission, NHI provides transportation-related training in several formats, including classroom-based workshops, online webinars, and asynchronous training materials *(5)*.
- **Identifies and implements research on proven safety countermeasures.** The FHWA's Office of Safety Research and Development strives to generate new solutions, build more effective partnerships, and provide better information and tools for decision making. This enables the States to make the best safety investments on their surface transportation system. FHWA's research role is to provide leadership to address current and emerging needs facing focus States and the highway safety profession. FHWA's leadership role signifies a commitment to working collaboratively with focus States in defining safety research needs to achieve established safety goals, particularly when focus States implement many of the safety tools developed *(6)*.
- **Provides access to additional tools and technologies to identify and address safety problems.** FHWA provides and supports a wide range of data and safety analysis tools for focus States and local practitioners. These tools have been designed to help practitioners understand safety problems on their roadways, link crashes to their roadway environments, and select and apply appropriate countermeasures. The tools' capabilities range from simple to complex. Some provide general information; others allow more complex analysis of crashes under specific conditions and/or with specific roadway features. Together, these

safety analysis tools can identify the biggest safety challenges to achieving significant results. The Focused Approach Toolbox, which includes a comprehensive list of safety analysis tools, is provided in Appendix A.

- **Improves awareness and understanding of infrastructure-related crash factors.** Examining the crash history in focus States will help practitioners identify locations with existing roadway departure, intersection, or pedestrian problems and will also provide information to identify locations that are susceptible to future crashes. In addition to the location, the data can also provide information on crash causation. This will give insight into identifying potentially effective countermeasures. For the systemic treatment of crashes based on proven low-cost countermeasures, the Focused Approach will use available State crash data to determine where specific crash types are predominant.
- **Aids in streamlining the process of receiving Federal funding for HSIP projects.** The Focus States will work with their FHWA Division Office to identify opportunities to streamline the Federal-aid process to advance HSIP implementation efforts. These opportunities might include programmatic categorical exclusions, task order contracting, bundling projects for letting, etc.

Program History

In 2005, the President signed into law the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), which guaranteed funding to make significant progress in reducing highway fatalities. SAFETEA-LU raised the stature of the highway safety programs by establishing highway safety improvement as a core program tied to strategic safety planning and performance *(7)*. In the same year, FHWA launched the Focused Approach to Safety to better direct national resources where there is greatest opportunity to save lives and prevent serious injuries. The Focused Approach is a unique data-driven and State-specific approach to safety. Since the start of the program in 2005, 36 States have participated in the Focused Approach. Studies show a 12 to 19 percent reduction in fatalities in focus States areas from 2002 to 2008 *(8)*.

Focused Approach to Safety Evaluation

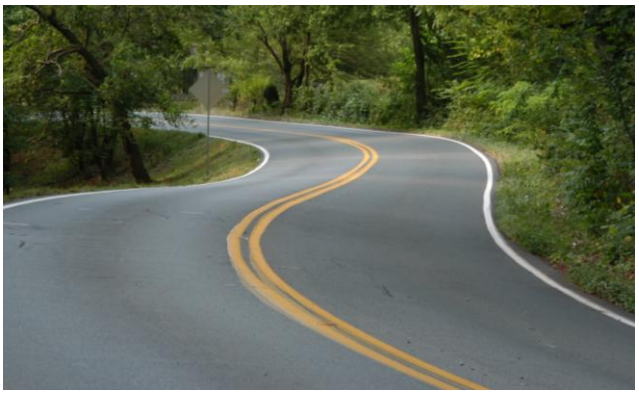
FHWA partnered with the Volpe Center in 2010 to complete an evaluation of the Focused Approach. According to the Volpe findings, it is still too early in the program to fully evaluate the success, as plans in each focus State are at various stages of implementation; however, they did recommend continuing the program. The report states that the availability and application of Focused Approach resources enabled many of the States to reduce severe crashes in the three focus areas. FHWA followed that report with further analysis, consideration, and redesign. The findings have been considered in the enhancements to the Focused Approach. In 2011, FHWA enhanced the design of the Focused Approach to better meet the needs of the focus States. These changes and highlights include the following:

- Concentration on three primary focus areas — Roadway Departure Safety, Intersection Safety, and Pedestrian Safety.
- Preferred access for focus States to additional FHWA resources.
- A tailored approach to conform to each State's SHSP and specific needs.
- New criteria for eligibility to become a focus State that uses a data-driven analysis of safety statistics.

Focus State Eligibility Criteria

The criteria and methodology for determining focus State eligibility were revised in 2011. Each focus area has its own data-driven process for determining eligibility. In general, eligibility is based on States with the greatest potential for safety improvement. States who meet the eligibility criteria are invited by FHWA to participate in the Focused Approach. All eligibility criteria use a three-year average of the most recent available state and national fatality data. At the time of publication of this document, data analysis was based on 2007-2009 FARS and HPMS data.

Roadway Departure



States are eligible to be Roadway Departure States based on their number of roadway departure fatalities and the fatality rate per centerline mile and per vehicle miles traveled (VMT) over a three-year period. Based on these criteria, States are eligible to be Roadway Departure Focus States if they did one of the following: 1) annually averaged more than the national average of roadway departure fatalities (393 roadway departure fatalities) and had a roadway departure fatality rate per mile greater than the national average (0.52 fatalities per centerline mile); OR 2) annually averaged more than the national average and had a roadway departure fatality rate per VMT greater than the national average (0.73 per 100M VMT).

Intersections

States are eligible to be Intersection Focus States based on a combination of their average number of intersection fatalities over a three-year period and the ratio of their actual intersection fatality rate versus the expected intersection fatality rate. The expected fatality rates are estimated based on a State's distribution of urban and rural VMT. Based on these criteria, States are eligible to become Intersection Focus States if their intersection fatalities were more than the national average (154 intersection fatalities per state) and they had

an actual-to-expected ratio greater than 1.0. States with a ratio higher than 1.0 have more fatalities than expected given their ratio of urban to rural VMT.

Pedestrians

For the pedestrian focus area, FHWA recognizes focus cities and focus States. Cities are eligible to participate as Pedestrian focus cities based on the number of pedestrian fatalities or the pedestrian fatality rate per population over a three-year period. Based on these criteria, cities are identified for eligibility if they had more fatalities than the national average (20 average annual pedestrian fatalities per city) or a pedestrian fatality rate greater than the national average (2.33 per 100,000 population). States that contain a pedestrian focus city are automatically eligible to be considered pedestrian focus States.

Steps for Success

The Focused Approach to Safety Program provides a simple four-step process to engage State and local safety stakeholders. These steps form the basis for success and outline how to get started and how to sustain the effort to achieve a State's safety goals.

Step 1: Assemble the Team

For each Focus State, the primary coordinator and advocate from FHWA will be the safety specialist from the local FHWA Division Office. FHWA will assemble a cross-functional, intra-agency team to coordinate the additional resources and options available to the focus State. The team will consist of the Division Office safety specialist, FHWA Resource Center staff, FHWA Office of Safety staff, and contractor support. This team will work directly with the focus State and other State and local safety partners. Working together will result in additional lives saved and injuries prevented.

Step 2: Kick-off Meeting

The team will conduct a kick-off meeting to create a tailored approach to find the right mix of resources (people, time, tools, and training) to assist in meeting the State's SHSP fatality and serious injury reduction goals for the focus areas identified. In some existing focus States, this will be an opportunity to continue the previous Focused Approach efforts. The safety specialist from the local FHWA Division Office and the team will tailor a Focused Approach strategy for the State that will maximize the benefits to the State. The Focused Approach to Safety allows for deployment of significant FHWA resources to support a comprehensive safety management approach involving the 4 E's: engineering, enforcement, education, and emergency services.

Step 3: Addressing the Focus States' Safety Challenges

The adopted State SHSP is the overall plan to meet the State's safety goals. The Focused Approach is another support resource that a focus State can count on to achieve those goals. As part of the Focused Approach, FHWA will provide additional resources (people, time, tools, and training) to help implement the SHSP. While most resources available from FHWA come at no cost to the State, it is best to anticipate ways to leverage State and Federal resources in order to maximize benefits. For instance, a focus State would be expected to do the following:

- Identify the best approach to use the resources provided.
- Work with FHWA Division Offices and contractors to provide data to expedite the safety goals.
- Implement pertinent results.
- Evaluate results periodically and adjust strategy accordingly.

The Focused Approach can help States to focus their time and attention on the specific priorities and activities that can make the biggest difference in their safety goals. In many focus States, FHWA can provide a considerable amount of detailed and State-specific data analysis, training, technical assistance, and other resources that the State might have to otherwise perform on its own.

Step 4: Ongoing Support to Meet State Safety Goals

States need ongoing, consistent support to meet long-term safety goals. The Focused Approach provides a long-term partnership between Federal resources and a focus State's safety needs. Over time, the Focused Approach can be a reliable source of technical assistance and training for each involved State.

Initial Deployment Checklist

The following checklist will serve as a general guide for all involved to successfully deploy the Focused Approach to Safety in the focus States. It is important to tailor the approach to meet the focus States' capabilities and needs.

FHWA	Focus States	Deployment Activity
☐	--	Participate in Focused Approach to Safety Webinar 1: Kick-off with FHWA (September 2011).
☐	--	Invite focus State to Webinar 2.
☐	☐	Participate in Focused Approach to Safety Webinar 2: Kick-off with focus States (September 2011).
☐	☐	Create a tailored approach with the focus State through the Division Office with Resource Center and Office of Safety using the Strategic Highway Safety Plan as the starting point.
☐	--	Match resources to needs and deliver Focused Approach analysis and implementation plan in the focus State.
--	☐	Implement the safety projects/activities identified over the years recommended.
--	☐	Monitor and report challenges and success stories to FHWA.
☐	☐	Maximize return on investment by evaluating program effectiveness.

Prior Focus States

Since its inception, 36 States have participated in the Focused Approach. Some of these States may not currently meet the new eligibility requirements. FHWA will still provide support to prior focus States, as needed. FHWA wants to hear and share the valuable feedback, lessons learned, and success stories from prior focus States that can assist other focus States as they participate in the Focused Approach to Safety. All States should stay in contact with their safety specialist in the local FHWA Division Office and provide any feedback regarding the Focused Approach to Safety.

Assistance for All States

All of the guidance, planning tools, training, technical guidebooks, and printed resources created for the Focused Approach are available to all States. FHWA is committed to applying these resources and tools in the focus States. Focus States will receive priority in response to requests for safety resources to address their safety challenges in one or more of the three focus areas. However, non-focus States can use the tools and materials for their own safety efforts. FHWA may be able to apply some technical assistance to non-focus States once the needs of the focus States have been met.

For additional general information on the Focused Approach to Safety please contact:

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Focus Area Highlights

The following section provides critical information for each of the three focus areas —Roadway Departure, Intersections, and Pedestrians. Each area is described with several success stories and highlights. Finally, the top proven countermeasures are described for each area (additional countermeasures are listed in FHWA's CMF Clearinghouse, www.cmfclearinghouse.org). The Focused Approach Toolbox, found in Appendix A, has several links to additional resources in one centralized location at the end of this guide.

Systemic Approach

In addition to working with States to apply the best countermeasures to address high crash locations, each Focus Area stresses the importance of using a low-cost, systemic approach to improve safety. The systemic approach complements, and yet is slightly different than the traditional highway safety management process. The traditional approach starts with the identification of sites with potential for safety improvements and then selects countermeasures to impact crash patterns at those locations. The systemic approach defines a set of specific, proven, low-cost countermeasures and analyzes crash data to identify high risk roadway geometric features where they can be deployed cost effectively *(9)*. Here are two widespread applications:

- A State selects common crash types through safety data analysis. The State-identified locations experiencing these crash types and locations with similar basic geometric features are treated systemically with low-cost safety countermeasures. At a minimum, the analysis segregates locations and establishes thresholds by ownership (e.g. State versus local), context (e.g. rural versus urban), and for intersections, control (e.g. stop-controlled versus signal-controlled).
- A State identifies low-cost, effective countermeasure packages to address common traffic safety issues. Once a basic set of countermeasures is identified, the State uses the systemic approach to analyze the crash data to choose locations where the countermeasures can be best deployed. States can make estimates of the impacts of implementation in terms of deployment cost and the benefits related to the potential reduction of severe crashes *(10)*.

Benefits of the systemic approach may include the following:

- **Widespread effect.** The systemic approach can impact safety issues at a large number of locations on an entire roadway network. For instance, the number of intersections identified as possible opportunities for treatments is usually in the thousands. This is a significantly higher number of locations than would be associated with the traditional

approach, yet it represents only a fraction of the number of intersections that exist in a State.

- **Proactive Crash Prevention.** Using predominant crash types with moderate-to-high levels of crashes, an agency can address locations that have not yet experienced these crash types but have similar characteristics to locations with such crash histories (e.g., context, traffic control, geometric conditions, traffic volume).
- **Cost-effectiveness.** Implementing low-cost solutions across an entire system can be a cost-effective approach to addressing safety. By approaching the improvements on a large-scale basis (i.e., district, region, or statewide), there are often cost advantages that can be realized such as reducing the countermeasure unit costs for large quantities.
- **Reduced data needs.** The systemic approach can be used without detailed crash history for specific locations, potentially reducing data needs.

In order to achieve success with the systemic approach, States examine the construction and delivery of low-cost safety solutions. The systemic approach favors centralized decision making and large contracts that can deploy countermeasures throughout the State using on-call contractors for both the study and the implementation *(9)*.

For additional general information on the systemic safety model please contact:

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Roadway Departure

Roadway departure crashes account for the majority of highway fatalities in the United States. An average of 16,551 fatal roadway departure crashes occurred in the US each year between 2007 and 2009 *(1)*. A roadway departure crash is defined as a non-intersection crash that occurs after a vehicle crosses an edgeline or a centerline or otherwise leaves the traveled roadway. FHWA's Roadway Departure focus area concentrates on:

- Keeping vehicles on the roadway;
- Providing an opportunity to return to the road safely if a vehicle leaves the roadway; and
- Minimizing the severity of a roadway departure crash if it occurs.

FHWA currently offers roadway departure technical assistance to State highway agencies in the form of crash data analysis and implementation plan development. Roadway Departure Implementation Plans have been developed for Kentucky, North Carolina, Oregon, South Carolina, and Tennessee, with additional State plans for Louisiana, California, and Arizona at various stages of development. Each plan is designed to address State-specific roadway departure safety issues on both State and local roadways to the extent that relevant data can be obtained and as appropriate based on consultation with State and local agencies and the FHWA Division Office *(11)*.

FHWA works with participating roadway departure focus States to develop an individual data analysis package focused on crash history and roadway attributes and a set of strategies that can be used to reduce roadway departure crashes. Using a systemic approach, the plans identify a set of cost-effective countermeasures, deployment levels, and funding needs to reduce the number and severity of roadway departure crashes in the State by a target amount consistent with their SHSP goals. The final plan quantifies the costs and benefits of a roadway departure-focused initiative and provides a step-by-step process for implementation.

Success Stories and Testimonials

Below are two examples of Roadway Departure Safety Implementation Plans created through the Focused Approach. The first example is from Oregon, and the second example is from Kentucky.

Oregon Testimonial

> *"Although I was fairly skeptical to begin with, I could quickly see the benefits of this new approach. The analysis and the selection of proven countermeasures allowed Oregon to fashion the Roadway Departure initiative in a way that made it our own. Stakeholders were excited about the process and participated readily. We are now in the process of implementing*

the strategies and we are excited to see the results. We were so sold on the process that we immediately asked to do the same sort of thing for intersections."

– Douglas W. Bish, P.E., Traffic Services Engineer, Oregon DOT

Oregon: Roadway Departure Safety Implementation Plan

In 2010, the Oregon DOT and FHWA began a project to analyze roadway departure crashes on both State and local roads. The result of the study would be a Roadway Departure Safety Implementation Plan designed to reduce roadway departure crashes. The plan can be found at the web link in the reference section *(13)*. Roadway departure crashes account for approximately 66 percent of all fatalities in Oregon. Data analysis of Oregon crashes was combined with cost-effective strategies to identify locations for the most effective use of funds to achieve an approximate 20 percent reduction in roadway departure fatalities. This systemic approach involves deploying large numbers of relatively low-cost, cost-effective countermeasures.

Spot location data (by milepost or GPS coordinate) was available for crashes that occurred on State-maintained routes. However, this level of detail was unavailable for crashes occurring on locally-maintained roadways. Crashes could be located on certain roadways but not at a specific point on that roadway. At the time of the data analysis, neither traffic volume counts nor the length of each roadway were available for local roads.

The Oregon DOT faced two significant limitations to the ability to analyze its roadway departure crash data on the local system. Lacking were specific location and roadway attribute information on local roads, which made it impossible to pinpoint specific curves or sections of roadway for treatment. Also, not having traffic counts or roadway lengths made it impossible to calculate crash rates.

Due to these limitations, it was necessary to focus instead on the available information. The State did have information on the contributing circumstances of local crashes, including the following:

- Run off road right;
- Run off road left;
- Head-on; and
- Opposite direction sideswipe.

The State also had crash data that included the following additional information:

- Occurrence on a curve or straight section;

- Wet, ice-covered, or snow-covered pavement; and
- Lighting conditions (day/night).

The Oregon DOT and FHWA used this information to identify systemic treatments for local roads, including curve signing and delineation, rumble strips, and tree removal. Cost estimates were based on an average length of 10 miles for each local road, which, when applied over the system, provided a sufficient estimate for preliminary program planning.

The Oregon DOT will proceed with low-cost safety treatments on the identified roadways based on the type of roadway departure crashes that occurred on each local road. They will also seek to improve data availability, starting with determining the length of each local roadway. Future plans include efforts to determine the location of local road crashes along the roadway by coding all crashes by latitude and longitude.

Kentucky: Implementation Plan of Cost-Effective Countermeasures

In Kentucky, roadway departure crashes account for more than 60 percent of all highway fatalities. Roadway departure crashes resulted in an average of 628 fatalities annually from 2005-2009. When Kentucky joined the Focused Approach, FHWA first provided a technical training session to the Kentucky Transportation Cabinet (KYTC) and other traffic safety stakeholders. The training included a discussion of recommended roadway departure countermeasures.

The second event was an Implementation Plan Workshop tailored to the roadway departure safety needs of Kentucky. FHWA worked with the State to develop a customized data analysis package and identified a set of cost-effective countermeasures, deployment levels, and funding needed to achieve a 15 percent reduction in roadway departure fatalities. When implemented, this will help Kentucky save up to 65 lives per year. The Implementation Plan developed for KYTC included traditional treatments at high-crash locations, systemic treatments on corridors with a moderate level of crashes, and comprehensive safety solutions incorporating law enforcement and education to reduce the number and severity of roadway departure crashes (12).

KYTC is installing hundreds of miles of rumble strips/stripes in conjunction with its pavement

Kentucky used the customized Implementation Plan and local knowledge of safety problems and effective countermeasures to begin implementing solutions to reduce roadway

departure crashes. Kentucky has installed approximately 38 miles of centerline rumble strips on existing two-lane roads with 11-foot or wider lanes. KYTC plans to install more than 100 additional miles of retrofit center line rumble strips in 2011. Kentucky has incorporated rumble strips and rumble stripes into its pavement resurfacing projects, including:

- 28 miles of shoulder rumble strips,
- 240 miles of edgeline rumble stripes, and
- 200 miles of centerline rumble stripes.

Kentucky is taking advantage of the low cost of rumble strips, especially as add-ons to existing surface overlay projects. Costs to date have been much lower than originally estimated, allowing KYTC to plan for more than 200 additional miles of rumble strips and rumble stripes on resurfacing projects in 2011.

In addition to the rumble strips and rumble stripes effort, Kentucky has selected 32 sites to apply high-friction surface treatments. Increasing friction on roadways with a history of wet weather crashes has been proven to yield significant safety benefits.

In conclusion, Kentucky's success was predicated on resources provided by the Focused Approach to create an Implementation Plan and targeted resources to address severe roadway departure crashes.

Proven Countermeasures

Listed below are four strategies and countermeasures that are commonly used in roadway departure focus States and throughout the United States:

- Road Safety Audits.
- Rumble Strips and Rumble Strips.
- Median Barriers.
- Safety Edge.

In addition, the Toolbox (Appendix A) provides a comprehensive list of resources to address intersection safety. For additional information on the Roadway Departure Safety Focus Area, please contact:

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Intersections

Between 2007 and 2009, intersection and intersection related crashes accounted for over 7,800 fatalities annually in the US. These crashes represent 21 percent of the annual fatal crashes in the US *(1)*. FHWA recognizes that while a number of States have identified intersection safety as an emphasis area in their SHSP, they may not have an implementation plan to guide their intersection safety implementation activities on State and local roads. To date, FHWA has worked or is working with 16 States to develop Intersection Safety Implementation Plans (ISIPs). (These include Arizona, Florida, Georgia, Indiana, Louisiana, Massachusetts, Mississippi, Missouri, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, South Carolina, Tennessee, and Washington State.) Using a systemic approach, these ISIPs include the specific activities, countermeasures, strategies, deployment levels, implementation steps, and estimates of funds necessary to achieve the intersection component of the State's SHSP goals *(9)*. FHWA is also providing assistance to those States through webinars, technical assistance, and training courses.

FHWA, and State partners, have recognized the following general tenets through prior Focused Approach activities:

- When strategizing intersection safety improvements, States should take steps to help reduce the likelihood that driver errors will take place.
- States should include local road practitioners in the implementation plan in order to address safety issues on all public roadways.
- Intersection design and features should take the limitations of human performance into account.
- Drivers perform best under moderate levels of driver workload and tend to make more errors under low- or high-workload environments.
- To achieve moderate driver workload conditions, States should apply the two guiding principles of intersection design and operation to their planning: clarify and simplify *(10)*.

- **Clarify** means that the approaches to intersections are readily visible to the driver as they relate to configuration, lanes, and type of traffic control.
- **Simplify** means that the driver workload is at a medium level and never at a high level. This is accomplished by separating the actions of the driver approaching an intersection.

Success Stories and Testimonials

Below are two examples of how the Focused Approach to Safety has helped to advance safety priorities within a State. The first example is from South Carolina and the second example is from Indiana.

South Carolina Testimonials

"For many years, the safety program in South Carolina focused on improving locations utilizing the "black" spot methodology. At a time when our safety office was in the process of implementing a more systemic/systematic approach to highway safety, we had the opportunity as an FHWA focus State for intersections to receive assistance from FHWA. This effort led to the development of a project to systematically improve safety through low-cost strategies at over 2,200 intersections across the State. These intersections represented only 2% of the State-maintained intersections in the State but accounted for nearly 50% of all intersection fatalities and intersection crashes.

FHWA was very instrumental in the success of the project. They not only provided a comprehensive review and analysis of the statewide crash data but also provided two-day workshops to our headquarters staff in addition to each of our seven district field offices. Statewide training of our construction and maintenance field personnel was needed to improve and create consistency of typical placement of traffic signs, signals, and markings. The training included classroom and field visits and provided information on guidelines and practices aimed at improving traffic safety across the State tailored to SCDOT for improving specific problems SCDOT was experiencing. This workshop provided nearly 200 SCDOT employees with valuable training."

– D. Brett Harrelson, PE – SCDOT State Traffic Safety Engineer

"As part of the FHWA Focused Approach, SCDOT participated in a training course [that] included partners from the State Highway Safety Office, EMS, and others. Through the workshop, participants developed a comprehensive plan with strategies that could be effectively utilized. The use of a multi-disciplinary approach, the implementation of proven strategies included in the Strategic Highway Safety Plan, the new selection process, and the training provided through the workshop greatly enhanced efforts to improve intersection safety

in the State, and resulted in significant reductions in intersection crashes, injuries, and fatalities. During the first year of SHSP implementation (FY 2007 – 2008 compared to FY 2006 – 2007), South Carolina experienced an 8.5% reduction in intersection crashes, an 8.7% reduction in intersection crash injuries, and a 27.8% reduction in intersection crash fatalities."

– Terecia Wilson, former SCDOT Director of Safety

South Carolina: Intersection Safety Implementation Plans

South Carolina has been an intersection focus State since the program's inception and now has a mature ISIP that has resulted in the implementation of many low-cost, systemic safety improvement projects. According to the South Carolina SHSP released in February 2007, nearly one out of every five traffic fatalities in South Carolina can be attributed to an intersection crash. In July 2008, FHWA conducted a workshop with staff from the South Carolina Department of Transportation (SCDOT) and safety partners from other organizations to discuss how the intersection safety goals identified in the SHSP could be achieved. The group determined that the targeted reduction in intersection fatalities could be attained *if* several conditions were met. One of these conditions was that the initiative must incorporate a *systemic approach* (whereby a combination of low-cost yet cost-effective strategies are implemented at many intersections Statewide) and a *comprehensive approach* (which emphasizes engineering, education, and enforcement in areas where severe intersection crashes are more frequent). Shortly after the workshop, the South Carolina ISIP was developed "to provide the specifics on countermeasures, actions, key steps, schedules, and investments needed to achieve this goal" of reducing fatalities at intersections throughout South Carolina.

Through the development of its ISIP, South Carolina identified more than 2,000 intersections that were targeted for improvement by the end of 2012. Sites were selected based on a review of crash data and included a variety of intersection types, including rural and urban, signalized and stop-controlled, and those having two-lane and multi-lane cross streets. The construction efforts began in September 2009, and approximately 650 intersections have been improved to date — primarily through upgrades to the existing signing and pavement markings.

South Carolina is one of seven volunteer States participating in the ongoing Evaluation of Low-Cost Safety Improvements Pooled Fund Study (ELCSI-PFS) and will be contributing data for two of the study's targeted strategies: Signalized Intersection Multi-Strategy Improvements and Stop-Controlled Intersection Multi-Strategy Improvements. Because SCDOT is administering all of its intersection improvements out of its Central Office through a single contract, it has a readily-available centralized database of all completed installations. In addition to the installation data, South Carolina will also be providing its crash, roadway inventory, and traffic volume data

associated with each intersection. Each data type will be compiled and linked to the others as part of the documentation of the before-period (i.e., the period of time prior to the intersection being improved). The second phase of the study is expected to commence in the next several years and will involve the analysis of the crash data collected during the after-period so that the safety effectiveness of the intersection strategies can be assessed.

Indiana Testimonial

> *"At a time when INDOT was still forming our local safety program, being a Focus State for Intersections provided us with resources to help educate local agencies, develop a focus on safety initiatives geared to them, and provided training and leadership in conducting successful Road Safety Audits. Additionally, when INDOT and the Indiana LTAP launched HELPERS (Hazard Elimination Local Project for Roads and Streets) to provide outreach to local agencies regarding safety, the Focus State status again allowed for valuable advice and assistance to the staff of that program. The end result is that we were able to deploy HELPERS as an effective local assistance program in a much shorter time frame."*
>
> – Mike Holowaty, State Safety Engineer, Indiana DOT

Indiana: Hazard Elimination Local Project for Roads and Streets (HELPERS)

The Hazard Elimination Local Project for Roads and Streets (HELPERS) serves as the primary assessment program for traffic safety performance and emerging safety needs on local Indiana roads outside of Metropolitan Planning Organization (MPO) areas. The program is a Local Public Agency's (LPA) primary point of contact *(15)*. The Focused Approach provided additional resources to educate local agencies, centered leadership on local safety issues, and provided training in how to conduct successful RSAs. This included five statewide safety presentations with involved safety partners, seven safety workshops focused on RSAs, intersection safety, and pedestrian safety, and three local technical assistance efforts. Finally, the Focused Approach shortened the delivery time of these important local assistance programs, particularly the HELPERS program.

As part of the HELPERS program, engineers routinely:

- Analyze Indiana DOT (INDOT) data to provide timely advice and notification regarding their critical safety challenges and high-crash locations.
- Provide specialized traffic safety training and technical assistance to implement low-cost, systematic safety improvements.
- Perform RSAs at the request of the LPA and maintain a list of trained volunteers to help conduct RSAs.

- Provide program oversight for the portion of HSIP funds.
- Provide the LPAs with impartial advice in deciding if Federal-aid funds are a good fit for a particular safety need.
- Complete applications for available Federal safety funding.
- Conduct post-construction crash analysis required for federally-funded safety improvements.
- Chart the progress of approved local HSIP projects and work with both the multi-disciplinary Highway Safety Advisory Committee and the LPAs to keep scheduled projects in line with the available HSIP funding for each fiscal year.

Proven Countermeasures

There are four effective strategies and countermeasures that are commonly used in intersection focus States throughout the United States:

- Road Safety Audits.
- Roundabouts.
- Left and Right Turn Lanes at Stop Controlled Intersections.
- Yellow Change Intervals.

In addition, the Toolbox (Appendix A) provides a comprehensive list of resources to address intersection safety. For additional information on the Intersection Safety Focus Area, please contact:

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Pedestrians

Each year, pedestrian fatalities comprise about 12 percent of all traffic fatalities. Between 2007 and 2009, an average of 4,402 pedestrian fatalities occurred on the Nation's roadways each year *(1)*. Another 59,000 pedestrians are injured in roadway crashes annually. Pedestrian safety improvements depend on an integrated approach that involves the 4 E's: engineering, enforcement, education, and emergency services.

FHWA's Office of Safety is aggressively working to reduce pedestrian fatalities by providing resources to focus States and cities. The Focused Approach effort has helped raise awareness of pedestrian safety problems and helped draw attention and resources to generate momentum for addressing pedestrian issues. The Focused Approach has provided support in the form of course offerings, conference calls, web conferences, data analysis, and technical assistance for development of Pedestrian Safety Action Plans, which help focus State and local officials know where to begin to address pedestrian safety issues *(16)*.

The Focused Approach offers free technical assistance and training courses to each of the focus States and cities and free bi-monthly webinars on a comprehensive, systemic approach to preventing pedestrian crashes. Training is available at a cost to non-focus States and cities through the Pedestrian and Bicycle Information Center and is made available through the National Highway Institute *(17)*.

Success Stories and Testimonials

Below are testimonials and examples of Focused Approach implementation from New York City and California.

Pedestrian Testimonials[1]

> *"The overall training opened my eyes to pedestrians' needs and the efforts that must be taken in order to provide a safe passageway. This training will no doubt have a positive effect on how I design traffic signals going forward."*
>
> – Jeff P. Lindgren, Nassau County, Department of Public Works

[1] * These quotes, and other information about the pedestrian action plan process can be found in the document: "Pedestrian Safety Action Plan Progress Report: September 2004 – December 2007" online at http://www.walkinginfo.org/training/collateral/PSAPReport_noAppendix.pdf

"The training was useful in raising the level of discussion about pedestrian safety issues within the New York City context by providing a baseline of information to a large number of DOT and other city employees."

– Matthew Roe, New York City DOT

New York City: Focused Approach Implementation

In 2007, there were 278 pedestrian fatalities in New York State—the fourth highest in the Nation. New York City, with more pedestrian fatalities than any other city, was selected as a focus city. New York's FHWA Division Office worked with the New York Metropolitan Transportation Council (NYMTC) to coordinate activities. Under the coordination of NYMTC, 12 training courses were delivered in locations throughout the NYMTC region and beyond. Attendees included transportation engineers, law enforcement personnel, transportation planners, and public officials from a variety of State and local government agencies. By 2009, more than 280 people had received training through the Focused Approach. NYMTC continues to promote the courses to local municipalities within and beyond the New York City region *(18)*.

Testimony from training participants has been overwhelmingly positive. All evidence has pointed toward increasing demand for Focused Approach courses throughout the downstate New York region. Many course participants cited interest in attending additional courses on pedestrian safety topics or in providing additional opportunities for colleagues to attend the courses. Focused Approach training participants felt that the courses:

- Were timely, practical, and useful;
- Introduced new techniques for assessing pedestrian safety problems and strategies to address them;
- Were well-presented by interesting and qualified trainers; and
- Used visual materials and field examples well *(18)*.

There were several positive outcomes:

- **Program activities improved participants' understanding of pedestrian safety issues.** The Focused Approach to Pedestrian Safety courses increased awareness of the importance of pedestrian safety among transportation professionals and agencies throughout the downstate region. This was especially true for engineers who attended the "Designing for Pedestrian Safety" course. For course participants who were already familiar with pedestrian safety issues and countermeasures, the courses reinvigorated their interest in implementing safety measures *(18)*.

- **Program activities raised awareness of pedestrian safety issues.** The large number of courses in the downstate region likely helped to create a critical mass of city employees across several disciplines—planning, operations, law enforcement, design, and construction—that were interested in pedestrian safety. This contributed to a shift in priorities towards greater concern for pedestrian issues. Furthermore, the additional training had a positive multiplier effect, as they energized a number of course participants to raise awareness of pedestrian safety issues and countermeasures in their communities *(18)*.
- **Program activities spurred various pedestrian safety projects and initiatives.** The Focused Approach training courses provided transportation professionals from diverse disciplines with strategies to incorporate pedestrian safety in their work. Participants cited several specific examples of countermeasures and initiatives influenced by the courses:
  - Conducting pilot studies of countdown timers, developing a Pedestrian Safety Action Plan, and establishing a "Safe Streets for Seniors" Program in New York City;
  - Expanding sidewalks and redesigning crossings in Manhattan; and
  - Developing pedestrian safety plans in several municipalities *(18)*.

California: Focused Approach Implementation

In 2006, California was eligible to become a focus State because of its high number of pedestrian fatalities—709, more than any other State in the country. Through the Focused Approach, the California Department of Transportation (Caltrans) led a comprehensive effort to deliver pedestrian safety training statewide. Under the coordination of the Caltrans Division of Transportation Planning Bicycle and Pedestrian Program, 13 pedestrian safety courses were offered throughout the State in fiscal years 2006-2007. In addition, several Californians augmented their training by participating in periodic teleconferences and web conferences sponsored by the FHWA's Pedestrian Safety Program *(18)*.

Overall, the training course participants felt that the training courses offered through the Focused Approach:

- Were relevant to their jobs;
- Expanded their knowledge of pedestrian safety issues;
- Included practical pedestrian safety design and planning techniques; and
- Provided a useful forum for a cross section of professionals to share ideas and concerns.

Interviewees spoke favorably about the periodic conference calls and web conferences, saying that the calls:

- Offered an opportunity to learn from peers about initiatives around the country;
- Focused the conversation on state-level issues; and
- Generated useful discussions and presentations on training techniques.

There were several positive outcomes:

- **Program activities improved awareness of pedestrian safety issues.** There was a consensus among participants that the Focused Approach activities created momentum for improved pedestrian safety initiatives at the State and local levels. For example, Caltrans, which has had four employees dedicated solely to pedestrian and bike safety since the late 1990s, took advantage of the activities to focus and expand its pedestrian safety work. The courses also gave pedestrian safety issues legitimacy as a transportation issue. Increasing awareness has been effective in stimulating dialogue on pedestrian safety that probably would not have occurred without the Focused Approach *(18)*.
- **Program activities spurred various pedestrian safety initiatives throughout the State.** The courses provided engineers and planners with strategies to incorporate pedestrian safety in their work. In a Los Angeles suburb, the training was helpful in building relationships among engineers, planners, police, and transit operators. The city's transportation planner continues to provide guidance to colleagues on pedestrian safety issues covered in the course. Some of the specific strategies she has seen implemented include zebra crosswalk striping, pedestrian refuge islands, in-pavement crosswalk lighting, and new pedestrian signals. In addition, the city is adding pedestrian countdown signals as they replace outdated signals. City officials are incorporating elements of the FHWA's pedestrian safety training into the land use and circulation elements of their long-range land-use and zoning plans *(18)*.
- **Program activities have prompted follow up training initiatives.** Because of the success of the courses, demand for training quickly outstripped its supply. Caltrans worked with the FHWA Resource Center to offer 13 additional courses to augment the courses delivered through the FHWA's Focused Approach. Some of these initiatives included an online course and template to help agencies develop a Pedestrian Safety Action Plan, as well as the first Pedestrian Safety and Advocacy Conference *(18)*.

Proven Countermeasures

The following three countermeasures are commonly used in pedestrian focus States throughout the United States:

- Pedestrian Road Safety Audits.
- Medians and Pedestrian Refuge Areas in Urban and Suburban Areas.
- Walkways.

In addition, the Toolbox (Appendix A) provides a comprehensive list of resources to address intersection safety. For additional information on the Pedestrian Safety Focus Area, please contact:

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References

1. National Highway Traffic Safety Administration, *Fatality Analysis Reporting System Encyclopedia*, Washington, D.C. Accessed online 29 July 2011, http://www.fars.nhtsa.dot.gov/.
2. Lindley, Jeffrey A., *Guidance Memorandum on Consideration and Implementation of Proven Safety Countermeasures*, Federal Highway Administration, 10 July 2008, http://safety.fhwa.dot.gov/policy/memo071008/
3. Federal Highway Administration, *Highway Safety Improvement Program Manual*, Report No. FHWA-SA-09-029, Washington, D.C., January 2010.
4. "Toward Zero Deaths," FHWA Office of Safety, Accessed online 29 July 2011, <http://safety.fhwa.dot.gov/tzd/>.
5. "Introduction to the National Highway Institute," National Highway Institute, Federal Highway Administration, Accessed online 29 July 2011, <http://www.nhi.fhwa.dot.gov>.
6. "Office of Safety Research and Development (R&D)," Federal Highway Administration Research and Technology, Accessed online 15 August 2011, <http://www.fhwa.dot.gov/research/tfhrc/offices/safety/>.
7. "SAFETEA-LU," FHWA Office of Safety, Accessed online 30 July 2011, <http://safety.fhwa.dot.gov/safetealu/>.
8. John A. Volpe National Transportation Systems Research Center, *Evaluation of the Focused Approach to Safety*, prepared for the Federal Highway Administration, October 2010.
9. Federal Highway Administration, *Low-Cost Safety Enhancements for Stop-Controlled and Signalized Intersections*, Report No. FHWA-SA-09-020, Washington, D.C., May 2009.
10. Federal Highway Administration, *Human Factors Issues in Intersection Safety*, Intersection Safety Issue Brief No. 12, Report No. FHWA-SA-10-005, Washington, D.C., November 2009, <http://safety.fhwa.dot.gov/intersection/resources/fhwasa10005/brief_12.cfm>.
11. Federal Highway Administration, *Roadway Departure Safety: A Manual for Local Rural Road Owners*, Report No. FHWA-SA-11-09, Washington, D.C., January 2011.
12. Federal Highway Administration, *Roadway Departure Safety Implementation Plans*, 2-page flyer No. FHWA-SA-11-20, March 2011, <http://safety.fhwa.dot.gov/roadway_dept/strat_approach/fhwasa1120/>.
13. "Roadway Departure Safety," Traffic-Roadway Section (TRS), Oregon Department of Transportation, Accessed 29 July 2011, <http://www.oregon.gov/ODOT/HWY/TRAFFIC-ROADWAY/roadway_departure.shtml>.
14. Federal Highway Administration, *Intersection Safety: A Manual for Local Rural Road Owners*, Report No. FHWA-SA-11-08, Washington, D.C., January 2011.

15. *Highway Safety Improvement Program Local Project Selection Guidance*, Indiana Department of Transportation, December 2010, <http://www.in.gov/indot/files/LocalHSIPProjectSelectionGuidance.pdf>.

16. Federal Highway Administration, *How to Develop A Pedestrian Safety Action Plan*, Report No. FHWA-SA-05-12, Washington, D.C., revised March 2009.

17. Pedestrian Safety Focus States and Cities, FHWA Office of Safety, accessed 29 July 2011, <http://safety.fhwa.dot.gov/ped_bike/ped_focus/>.

18. John A. Volpe National Transportation Systems Research Center, *Evaluation of the Focused Approach to Pedestrian Safety*, prepared for the Federal Highway Administration, February 2009, <http://safety.fhwa.dot.gov/ped_bike/ped_focus/efapsp020509/index.cfm#toc>.

Appendix A. Focused Approach to Safety Toolbox

This toolbox provides a listing of links to several additional safety resources. Each item is described by which focus area it is designated and whether it is primarily for program delivery, technical assistance, technical tools, guidance, or outreach.

Category	Overall	Intersection	Pedestrian	Roadway Departure
Program Delivery				
AASHTO's Strategic Highway Safety Plan (AASHTO, 2005)	X			
Highway Safety Improvement Program (HSIP) Assessment Toolbox (FHWA, 2010)	X			
Highway Safety Improvement Program (HSIP) Manual	X			
Lane Departure Strategic Action Plan: Example Plan (FHWA, 2005)				X
Pedestrian Safety Strategic Plan (FHWA, 2010)			X	
Strategic Plan for Improving Roadside Safety (NCHRP, 2001)				X
Technical Assistance				
Access Management in the Vicinity of Intersections Technical Summary (FHWA-SA-10-002) (2010)		X		
Alternative Intersections and Interchanges (FHWA-HRT-09-060) (2009)		X		
Accident Modification Factors (AMFs) for Traffic Engineering and ITS Improvements (NHCRP, 2008)		X		X
Application of Crash Reduction Factors (CRF) (FHWA-NHI-380093)	X	X	X	X
Clear Zone and Horizontal Clearance FAQs (FHWA, 2011)				X

Category	Overall	Intersection	Pedestrian	Roadway Departure
Comprehensive Intersection Resource Library (FHWA, 2010)		X		
Designing and Operating Intersections for Safety (FHWA-NHI-380074)		X		
Driver Attitudes and Behaviors at Intersections and Potential Effectiveness of Engineering Countermeasures (FHWA, 2006)		X		
Engineering Countermeasures to Reduce Red-Light Running (FHWA, 2009)		X		
Evaluation of Pedestrian Countermeasures in Three Cities: San Francisco, Las Vegas, and Miami (FHWA, 2008)			X	
Interactive FHWA Office of Safety Web conference	X	X	X	X
Field Guide for Inspecting Signalized Intersections to Reduce Red-Light Running (FHWA-SA-05-008) (2005)		X		
Human Factors Issues in Intersection Safety (FHWA, 2009)		X		
Innovative Intersection Safety Improvement Strategies & Management Practices (FHWA-SA-06-016) (2005)		X		
Intersection Safety Case Study Series (FHWA, 2009)		X		
Intersection Safety Technologies – Technical Summary Series (2009)		X		
Intersection Safety Workshop (FHWA-NHI-380077)		X		
Low Cost Safety Improvements (FHWA-NHI-380076 and Web-based FHWA-NHI-380083)		X		
Low-Cost Safety Enhancements for Stop-Controlled and Signalized Intersections (FHWA-SA-09-020) (2009)		X		
Low-Cost Treatments for Horizontal Curve Safety (FHWA, 2006)				X
Mini-Roundabouts Technical Summary (FHWA-SA-10-007) (2010)		X		
Modern Roundabouts: A Safer Choice Video/DVD (FHWA-SA-10-023) (2010)		X		
National Strategies for Advancing Child Pedestrian Safety (NHTSA, 2001)			X	
New Approaches to Highway Safety Analysis (FHWA-NHI-380075)		X	X	X

Category	Overall	Intersection	Pedestrian	Roadway Departure
Overview of the Railroad-Highway Grade Crossing Improvement Program (FHWA-NHI-380097)		X		
Pavement Friction (FHWA)				X
Peer-to-Peer technical assistance on Roundabouts-related issues and topics		X		
Presentations on general intersection safety, signalized intersections, unsignalized intersections, roundabouts, and red-light running.		X		
Revised Assessment of Economic Impacts of Implementing Minimum Levels of Pavement Marking Retroreflectivity (FHWA, 2010)				X
Road Safety Audits/Assessments Training (FHWA-NHI-380069)	X	X	X	X
Roadway Departure Safety Implementation Plans (FHWA, 2011)				X
Roundabouts: A Safer Choice Brochure (FHWA-SA-08-006) (2008)		X		
Roundabouts Technical Summary (FHWA-SA-10-006) (2010)		X		
Safety Benefits of Raised Median and Pedestrian Refuge Areas (FHWA, 2010)			X	
Safety Benefits of Walkways, Sidewalks, and Paved Shoulders (FHWA, 2010)			X	
Safety Edge Toolkit (FHWA)				X
Safety Evaluation of Improved Curve Delineation (FHWA, 2009)				X
Safety Evaluation of Lane and Shoulder Width Combinations on Rural, Two-Lane, Undivided Roads (FHWA, 2009)				X
Safety Evaluation of Red Light Cameras (FHWA-HRT-05-048) (2005)		X		
Stop-Controlled Intersection Safety: Through Route Activated Warning Systems		X		
Surrogate Safety Assessment Model (SSAM) Tech Brief (FHWA-HRT-08-049) (2008)		X		
Technical Advisory: Center Line Rumble Strips (FHWA, 2011)				X

Category	Overall	Intersection	Pedestrian	Roadway Departure
Technical Advisory: Shoulder and Edge Line Rumble Strips (FHWA, 2011)				X
Toolbox of Countermeasures and Their Potential Effectiveness for Pedestrian Crashes (FHWA, 2008)			X	
Toolbox of Countermeasures and Their Potential Effectiveness for Roadway Departure Crashes (FHWA, 2007)				X
Toolbox on Intersection Safety and Design: An ITE Informational Report (sponsored in part by FHWA) (2004)		X		
Traffic Signal Design and Operation Course (FHWA-NHI-133028)		X		
Two Low-Cost Safety Concepts for Two-Way Stop-Controlled, Rural Intersections on High-Speed Two-Lane, Two-Way Roadways Summary Report (FHWA-HRT-08-063) (2008)		X		
Technical Tools				
Bicycle Countermeasure Selection Tool			X	
Crash Modification Factor (CMF) Clearinghouse	X	X	X	X
Crash Modification Factors Clearinghouse Brochure (FHWA-SA-10-008) (2010)	X	X	X	X
FHWA Signal Timing Manual (FHWA, 2008)		X		
Highway Safety Manual (AASHTO, 2010)	X	X	X	X
Intersection Safety Issue Briefs Third Edition (FHWA-SA-10-005) (2009)		X		
Intersection Safety Strategies for Improving Safety at Unsignalized and Signalized Intersections (Companions to the NCHRP 500 Series, Volumes 5 and 12) Guide Sheets and Brochure (FHWA-SA-08-008) (2008)		X		
Manual on Uniform Traffic Control Devices (MUTCD) (FHWA, 2009)		X		
Pedestrian and Bicycle Crash Analysis Tool			X	
Pedestrian Safety Guide and Countermeasure Selection Tool			X	
Railroad-Highway Grade Crossing Handbook Revised Second Edition (FHWA-SA-07-010) (2007)		X		

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Red Light Camera Systems Operational Guidelines (FHWA-SA-05-002) (2005)		X		
Roadside Design Guide (AASHTO, 2002)				X
SafetyAnalyst (AASHTO)	X	X	X	X
Guidance				
A Resident's Guide for Creating Safe and Walkable Communities (FHWA, 2008)			X	
Guide for the Development of Bicycle Facilities (AASHTO 1999)			X	
Highway Safety Manual Practitioners Guide for Intersections (FHWA-NHI-380105)		X		
Intersection Safety Implementation Plan Process (FHWA-SA-10-010) (2010)		X		
Pedestrian and Bicycle Intersection Safety Indices (FHWA, 2007)		X	X	
Pedestrian Safety Guide for Transit Agencies (FHWA, 2008)			X	
Roadway Safety Guide (Roadway Safety Foundation)	X			
Roundabouts: An Informational Guide (FHWA-RD-00-067) (2000)		X		
Signalized Intersections: Informational Guide (FHWA-HRT-04-091) (2004)		X		
Strategic Intersection Safety Program Guide (FHWA-SA-09-004) (2009)		X		
Outreach and Communication				
Designing for Pedestrian Safety Webinar Series (FHWA)			X	
FHWA University Course on Bicycle and Pedestrian Safety			X	
Pedestrian and Bicycle Information Center			X	
Pedestrian Forum Newsletter (FHWA)			X	

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Pedestrian Safety Campaign			X	
Planning for Pedestrian Safety Webinar Series (FHWA)			X	
Safer Bicycle Journey (FHWA)			X	
Safer Pedestrian Journey (FHWA)			X	
The Bicycle Safety Education Resource Center			X	
Data Improvement				
Background Report: Guidance for Roadway Safety Data to Support the Highway Safety Improvement Program	X			
Crash Data Improvement Program (CDIP) Guidebook	X			
Guidance Memorandum on Fundamental Roadway and Traffic Data Elements to Improve the Highway Safety Improvement Program	X			
Market Analysis of Collecting Fundamental Roadway Data Elements to Support the Highway Safety Improvement Program	X			
Model Inventory for Roadway Elements (MIRE) Version 1.0	X			

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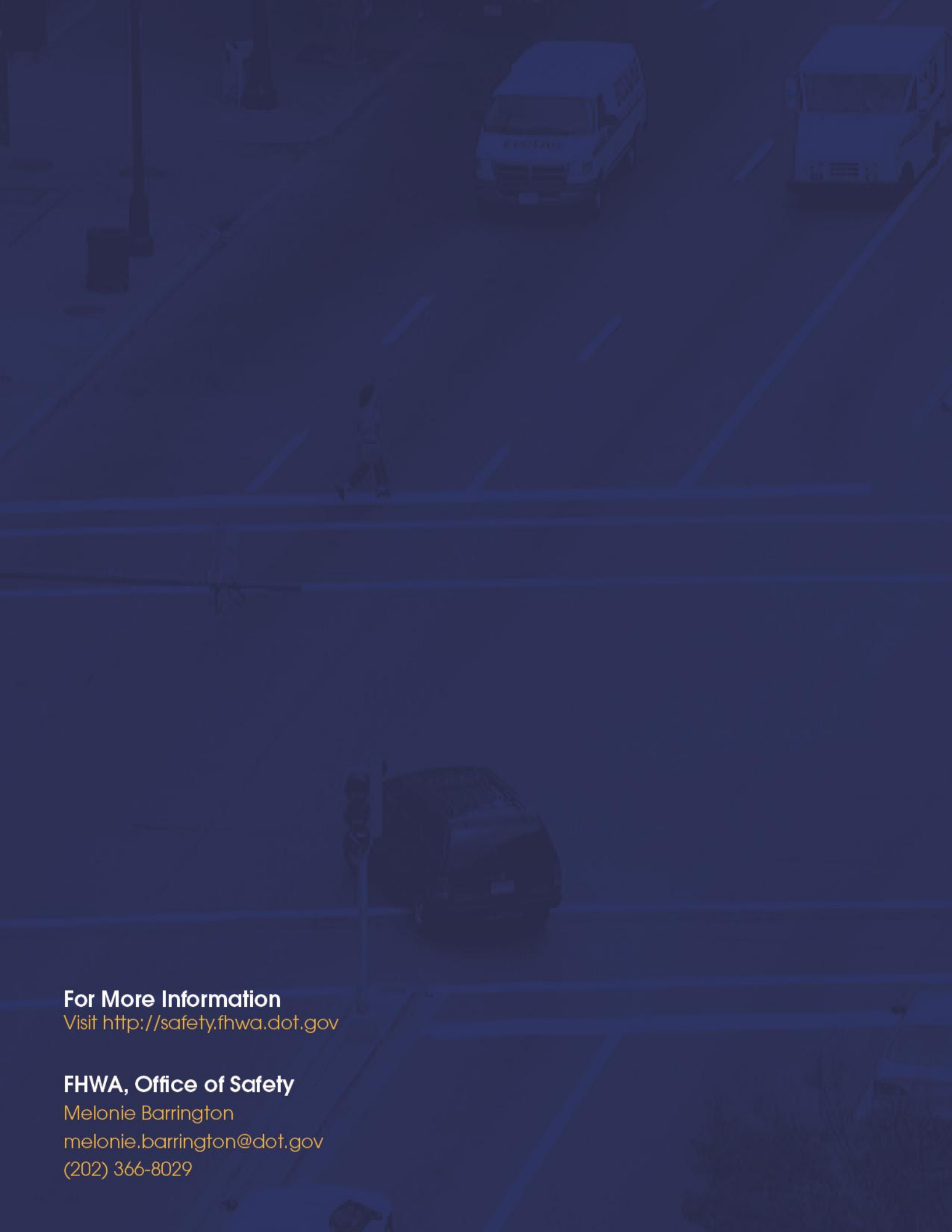

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